

November 1955

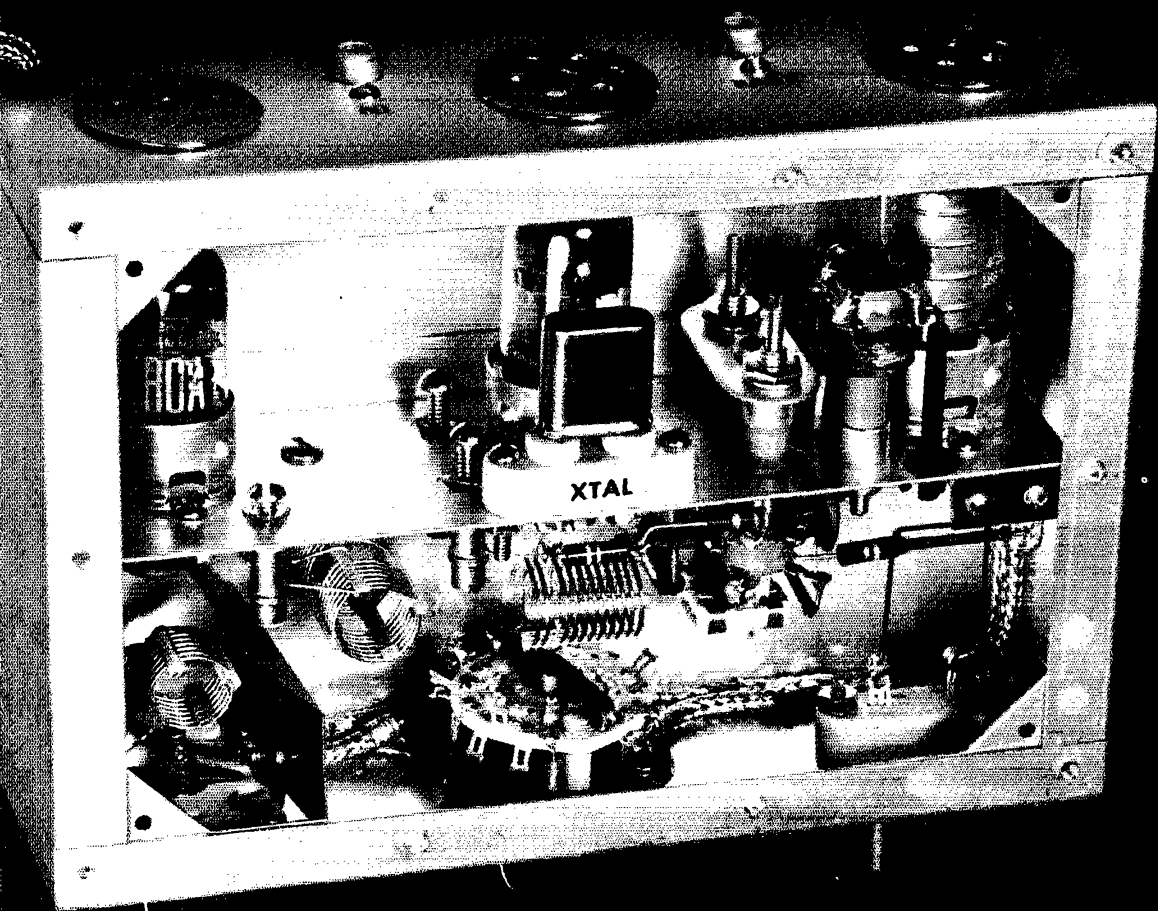
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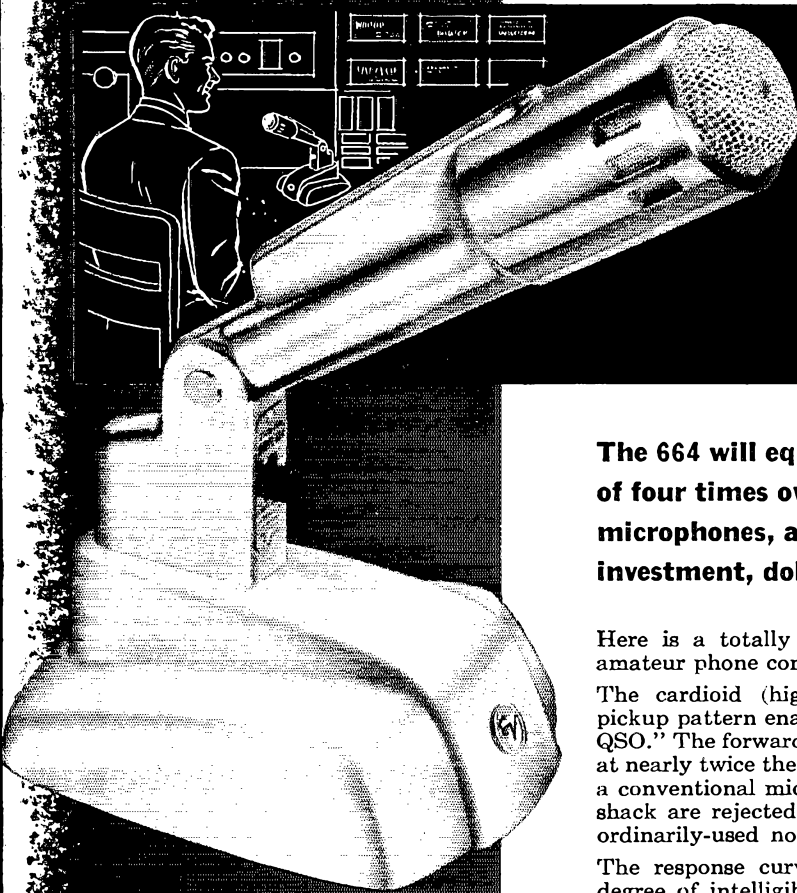


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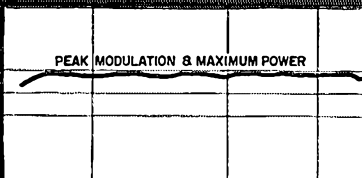
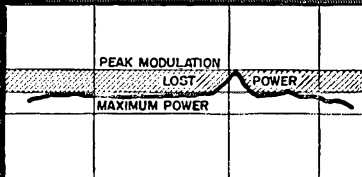
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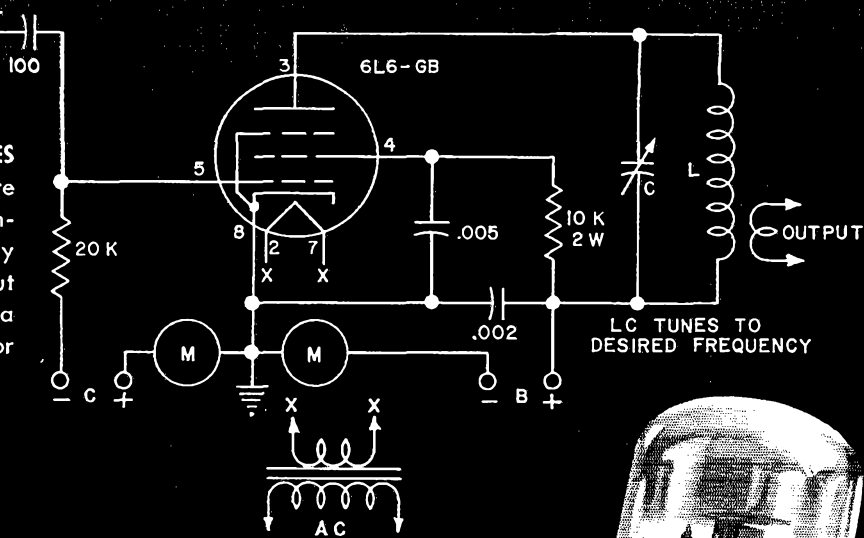
\*\*Forward gain is that compared to a pressure mike; actual front-to-back hemisphere pick-up ratio is 20 db.

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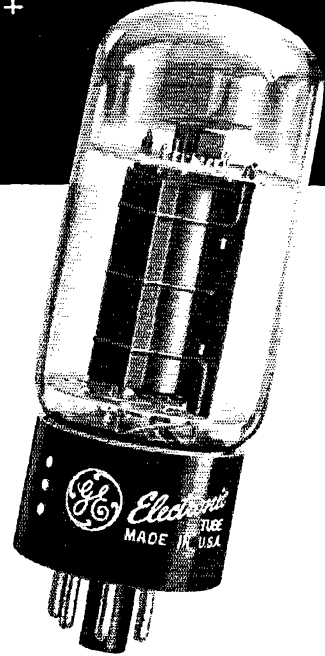


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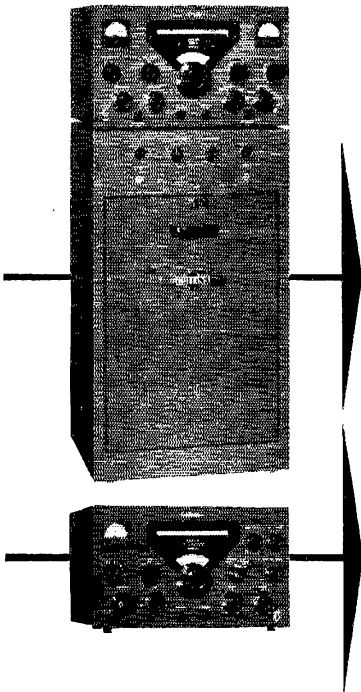
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# QST

NOVEMBER 1955

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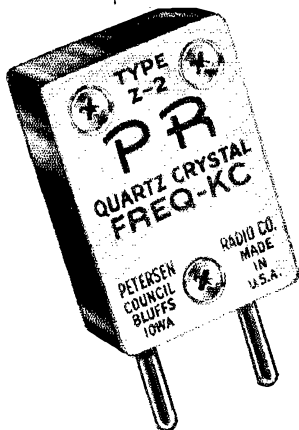
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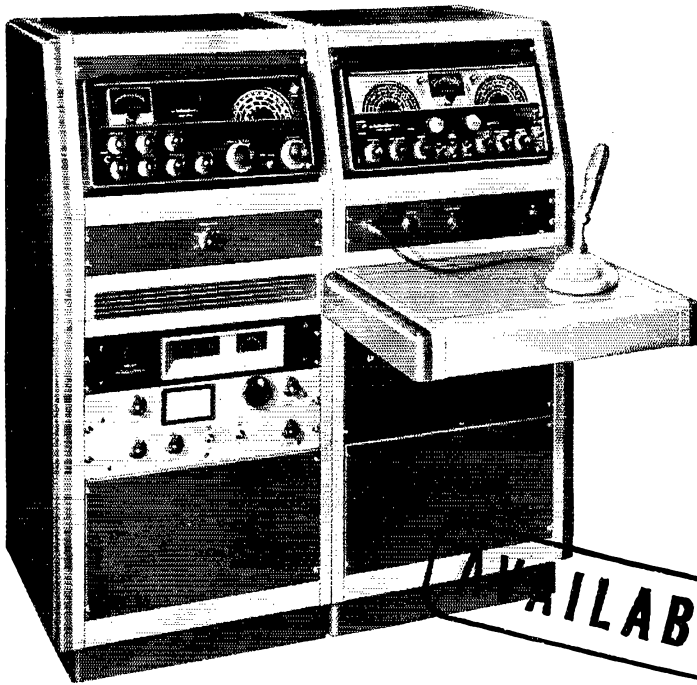
## Section Communications Managers of the ARRL Communications Department

**Reports Invited.** All amateurs, especially League members, are invited to report station activities on the first of each month (or 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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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.

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HARRY M. MATTHEWS . . . . . W9UQT  
702 So. 8th, Springfield, Ill.  
**Vice-Director:** George E. Keith . . . . . W9QLZ  
RFD 2, Box 22-A, Utica, Ill.

### Dakota Division

ALFRED M. GOWAN . . . . . W0PIR  
1012 South Willow Ave., Sioux Falls, S. D.  
**Vice-Director:** Forrest Bryant . . . . . W0PDS  
6940 Harriet Ave., Minneapolis, Minn.

### Delta Division

GEORGE H. STEED . . . . . W5BUX  
1912 Beech St., Pine Bluff, Ark.  
**Vice-Director:** George S. Acton . . . . . W5BMM  
Plain Dealing, La.

### Great Lakes Division

JOHN H. BRABB . . . . . W8SPF  
708 Ford Bldg., Detroit 26, Mich.  
**Vice-Director:** Robert L. Davis . . . . . W8EYE  
247 Highland Ave., Salem, Ohio

### Hudson Division

GEORGE V. COOKE, JR. . . . . W20BU  
88-31 239 St., Bellerose 26, N. Y.  
**Vice-Director:** Thomas J. Ryan, Jr. . . . . W2NKD  
2339 Redwood Rd., Scotch Plains, N. J.

### Midwest Division

WILLIAM J. SCHMIDT . . . . . W0OZN  
306 S. Vassar, Wichita, Kansas  
**Vice-Director:** James E. McKim . . . . . W0MVG  
1404 S. Tenth, Ballina, Kansas

### New England Division

PHILIP S. HAND . . . . . W1DBM  
Route 58, Redding Ridge, Conn.  
**Vice-Director:** Clayton C. Gordon . . . . . W1HRC  
65 Emerson Ave., Pittsfield, Mass.

### Northwestern Division

R. REX ROBERTS . . . . . W7CPY  
837 Park Hill Drive, Billings, Mont.  
**Vice-Director:**

### Pacific Division

HARRY M. ENGWICHT . . . . . W6HC  
770 Chapman, San Jose 26, Calif.  
**Vice-Director:**

### Roanoke Division

P. LANIER ANDERSON, JR. . . . . W4MWH  
428 Maple Lane, Danville, Va.  
**Vice-Director:** Theodore P. Mathewson . . . . . W4FJ  
110 N. Colonial Ave., Richmond, Va.

### Rocky Mountain Division

CLAUDE M. MAER, JR. . . . . W0IC  
740 Lafayette St., Denver, Colo.  
**Vice-Director:** Walter M. Reed . . . . . W0WRO  
1355 E. Amherst Circle, Denver, Colo.

### Southeastern Division

JAMES P. BOKN, JR. . . . . W4ZD  
25 First Ave., N. E., Atlanta, Ga.  
**Vice-Director:** Randall E. Smith . . . . . W4DQA  
902 Plaza Court, Orlando, Fla.

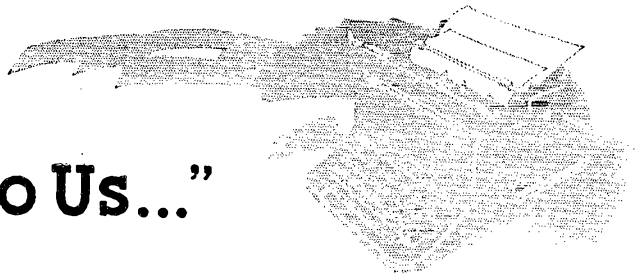
### Southwestern Division

WALTER R. JOOS . . . . . W6EKM  
1315 N. Overhill Drive, Inglewood 3, Calif.  
**Vice-Director:** Robert E. Hopper . . . . . W6YXU  
4327 Santa Cruz, San Diego 7, Calif.

### West Gulf Division

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**Vice-Director:** John F. Skelton . . . . . W5MA  
1901 Standish Dr., Irving, Texas

# "It Seems to Us..."



## RACES

The Radio Amateur Civil Emergency Service was created three years ago last August, after several years of intensive planning and preparatory meetings involving the Federal Civil Defense Administration, the military, the Commission, and the League. RACES was born of a need, initially recognized and pointed out by us amateurs, for assurance that in time of serious national emergency our communications skills could be put immediately to use without delays in selecting frequencies or processing personnel for security clearance. We remembered the sorry spectacle at the beginning of War II, when the absence of any plan denied amateur communications facilities to authorities who might have needed them badly (and by the grace of God did not); and how it required six months of government red tape to get the War Emergency Radio Service plan set up. Now the problem has been recognized by our Government, and the RACES plan worked out.

For many years (since 1935, in fact), the chief instrument for amateur emergency communications planning has been the Amateur Radio Emergency Corps (AREC), sponsored by the League. The AREC still exists, is stronger than ever under the impetus of RACES. We need a strong AREC to get the ball rolling toward an efficient RACES set-up; and a RACES organization that will make maximum use of the existing AREC establishment for quickest and most decisive civil defense communications plans. RACES and the AREC are not rivals; they are partners.

After a slow start, in the past three years RACES has grown, in general, satisfactorily. There is of course a need for more RACES plans and set-ups, just as there is always a need for more public participation in all aspects of civil defense. In perhaps more instances than there should be, public-spirited amateurs have run into difficulties in attempting to organize a civil defense communications operation. Local politics is the usual problem. There is a lack of understanding, in many cases, on the part of local civil defense authorities as to what radio communications can contribute. Many of them can't conceive of a situation where the landline telephone isn't available.

A failure to organize in advance hinders the performance of amateurs, RACES or otherwise, when the 'phone lines do go out and the authorities are left in a state of confusion. In one Connecticut city in the recent floods the communications chief didn't know how to answer an offer by hams in a neighboring city to send in emergency powered gear and mobiles — because he didn't know what circuits his authorities needed, and apparently they didn't either.

In some cities where a RACES plan exists, the political problem is a continuing one. Police or fire chiefs install gear for RACES frequencies in their official cars, want to make use of them for routine communications. C.d. directors and sometimes communications officers themselves are replaced when the political party in control changes. A c.d. director, or even the communications chief, may be appointed because he or she is friendly with the mayor — or perhaps because no one else can be found to take the job. These are typical of the problems. And so to an extent it can be shown that there are reasons for the antipathy by amateurs in some areas toward getting involved in a c.d. set-up.

But we'd like to observe that problems of this nature, however unfortunate, are here to stay. We amateurs had to work long and hard to sell the RACES idea at top federal levels. We have no basis for assuming that success at that point automatically dissolved all other obstacles. We have had to sell state and local authorities as well. And we shall have to continue facing problems as they might arise locally from authorities lacking an understanding of communications matters. It's just part of the job.

We're prompted to select this subject this month because the current proposal to apply CONELRAD to the amateur service drives home the importance of preparing in advance for civil defense communications. In the event of an enemy attack, amateur stations not in RACES will be shut down. In the event of war, the shutdown will be for the duration. Only amateurs enrolled in RACES will be able to supply their community with the communication which will be so vitally needed. The CONELRAD system provides that the ama-

teur service — except for RACES — closes down in the event of an alert. RACES continues. It has security clearance and frequency clearance. Only the RACES phase of the amateur service will provide civil defense communications.

Civil defense communications in the form of RACES are here because we asked for them. The plan is not simply one in which we are allowed to participate; the plan is built around us. No one but an amateur of the proper license class can obtain a RACES station authorization. The plan contemplates that amateurs will largely supervise and man the entire operation. The success or failure of RACES lies in our hands, local administrative and political problems notwithstanding.



November 1930

... Editor Warner stresses that it is of the utmost importance that League members take an active part in election of ARRL Directors. He states that the future of the League and amateur radio will depend greatly on the capability of those to whom offices are bestowed. He further states that the League should have "the best direction we members can give it — men of experience, knowledge, wisdom, intelligence and vision."

... QST announces the creation of a new California Section. Named the San Joaquin Valley Section, this addition to the League field organization embraces the counties of Amador, Calaveras, San Joaquin, Tuolumne, Stanislaus, Mariposa, Madera, Merced, Fresno, Tulare, and Kings.

... Woody Darrow, W3JZ, "insulting engineer to QST's technick staff," revolutionizes amateur radio with the "Milkotron." The secret of this sensational invention is that instead of emitting signals to be bounced off the Heaviside layer, it utilizes the reflecting properties of the *Milky Way!*

... "Something New in Receiver Design," by C. R. Stevens, offers a description of a sensitive, selective and rugged h.f. receptor designed for d.c. operation and tuning 8 to 200 meters. It is comprised of an aperiodic antenna coupling stage, a t.r.f. stage, a two-tube detector and two stages of audio. The detector circuit features one tube for regeneration and the other for detection.

... S. M. Douglas, jr., W4ACB, tells how to build "An All-Purpose Filament Transformer." It is constructed from four pieces of cigar-box wood, a few brads, waxed paper, No. 24 d.c.c. wire for the primary, No. 18 d.c.c. for the secondary, and a core taken from an old transformer.

... The station of the month is W5ZG-W5VY, H. C. Sherrod, jr., dial twister. Operation is on 7130 kc. with a 75-watt crystal-controlled r.f. ejector. For reception, a home-made all-band receiver plus a Grebe CR-8 followed by a Grebe RORK amplifier are utilized.

## OUR COVER

This month's cover shows the innards of W1JEQ's latest converter, a simple job for 50-Mc. mobile featuring double conversion and crystal control. The regular car receiver is used as a tunable i.f. A full description of this unit appears in this issue starting on page 17.

## KC4USA-Z, Antarctic Expedition, Departs

Seven ships, carrying the personnel of Task Force 43, Operation Deepfreeze, will be en route to the Antarctic Continent via Panama and N.Z. during November. Older amateurs will recall their earlier work with KC4USA, and still earlier contact with KJTY-WHEW, the Byrd Antarctic Expedition of '34. The expedition's first goal is to set up bases for American participation in the International Geophysical Year, designated '57-'58 (all projects will not reach completion until Feb., '59). Amateur operation from the main bases is expected to start in March 1956.

KC4USA identifies the Little America amateur station on Kainan Bay. KC4USV at the Air Operating Facility on McMurdo Sound is expected on the air about the same time.

Staff Communications Officer Cmdr. C. A. Snay, K4GFR, estimates that between thirty and forty amateurs are on the expedition's roster. Four Navy cargo vessels will accompany the three ice breakers, the Coast Guard's *East Wind*, the Navy's USS *Edisto* and *Glacier*. These are all scheduled for sailing between 20 October and 14 November.

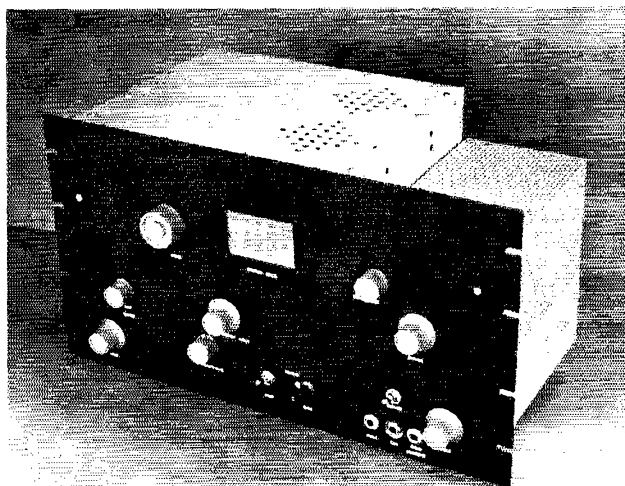
From the main base construction men will move overland and "Byrd station" KC4USB will operate from an advance base in Marie Byrd Land; also by airdrop of men and matériel South Pole Station KC4USN is expected to be established in late '56 or early '57. FCC has allocated the call block KC4USA-Z for these and other amateur units in case these are needed. There's ample gear along for c.w. or voice (a.m. and s.s.b.). Amateur bands from 3.5 Mc. to the v.h.f.s will be used. Among expedition veterans, Bud Waite, W2ZK, will lead a Signal Corps group. Some personnel will return in mid-'56. Volunteers will winter over at the first two bases, and at all bases in later phases of this operation. Chief Radioman A. B. Garrett, USN, is senior radioman in the wintering-over party. He asks that voice-operating amateurs who can handle relay schedules for morale purposes and are interested in so doing advise the expedition's Washington Office, addressing Staff Comm. Officer, Task Force 43, Room 831, Old P.O. Bldg., 12th and Penna. Ave. N.W., Washington, D. C. This same address also goes for QSL cards, once radio contacts with amateurs are being made; of course, there will be some months' delay getting those postmarked in the Antarctic delivered to you. Advance schedules are not being announced in view of the uncertainties in transmission conditions as well as in the duty assignments of personnel. The plan and pattern to be established is expected to provide times dedicated to amateur traffic and to voice contacts and DX. ARRL hopes to provide such details for you in W1AW, OBS system, and ARRL bulletin releases, as soon as KC4USA and KC4USV are operational.

Get ready to work the KC4s and assist in expedition communications. Welcome, Operation Deepfreeze!

— F. E. H.

◆  
The high-powered 2-meter rig, with shielding enclosures in place. The small unit at the right houses the tripler and driver stages.

◆



## A High-Powered Tetrode Rig for 144 Mc.

*Improved Performance for the 2-Meter DX Enthusiast*

BY EDWARD P. TILTON, W1HDQ

CHECK with anyone who is running high power on 144 Mc., and you're likely to find that he's dissatisfied with the amount of power he has to run to his driver stage. Data sheets show that 4-125As, for instance, require only 6.6 watts driving power to the pair, but most 2-meter men employing these tubes end up with an 829B or 5894 in the driver stage, running at close to full rated power. Should it take 80 to 100 watts input to drive a tetrode final that runs 600 to 800 watts input on 144 Mc.?

This question bothered the writer for years, carrying through the design and use of the 4-125A rig that has been in the last three editions of the *Handbook*. That outfit did well at W1HDQ for several seasons, much of the time taking a full kilowatt input, on c.w. The original tubes were still in use when the rig was dismantled recently, so we have evidence that they were not too severely abused by such treatment. But that 9903 driver stage running at 80 watts input never seemed quite right. There should have been an easier way out of the high-power problem than that.

The driver stage showed good efficiency when checked with a dummy load. Where did all the power go? Some was being radiated, instead of coupled into the load. That could be helped by shielding. Some went into heating of the links, due to improper matching. Properly designed coupling circuits should correct this. There was heating loss in the final grid circuit; it ran hot, even though the inductance was  $\frac{1}{4}$ -inch copper strap. Better tank circuit design was an obvious move.

The old rig was rather critical in adjustment. Neutralizing was fussy, and there was a tendency for adjustments to drift appreciably when the final was operated at maximum power level. Antenna loading and modulation adjustments had to be watched closely. In short, the rig worked much like other high-powered 2-meter rigs we've seen. It put out a "big signal" but there was definitely considerable room for improvement.

With more than three years' experience with the first model to guide us, and following suggestions from several other high-power enthusiasts (W3LZD and W9MUD, among others) who had gone through a similar disillusionment with "low-drive" tetrodes, we set about the job of building a more modern version. It would be completely shielded. The driver portion would be a separate unit, so that either final or driver could be altered without upsetting the other. Where drive might be a problem, interstage coupling would be by means of coaxial line, with the coupling loops at each end provided with series capacitors to tune out their reactance. There would be provision for insertion of a standing-wave bridge in the links, so that the coupling circuits could be adjusted readily for minimum s.w.r. and maximum transfer of power.

The result is shown herewith. The same two 4-125As still burn brightly in the final stage, but they are driven adequately by an RCA 6524. This stage runs under 100 ma., plate and screen current, at 400 volts; about half the driver power used in the earlier model. The tripler stage that pushes the 6524 is an Amperex

6360 dual tetrode that loafs along at well below its full capabilities.

Neutralization is no longer critical, and only the variable screen-to-ground capacitor,  $C_6$ , is needed. Maximum grid current, minimum plate current and maximum output coincide neatly at one setting of the plate tuning capacitor. Modulation characteristics of the amplifier show up well, and the plate and grid meters stand still when full modulation is applied. There is no gradual detuning when the amplifier is run for extended periods at maximum ratings. Reports on the signal are complimentary. If the reader draws the conclusion from the above statements that we are pleased with the way the new rig works, he's right.

### The Driver Portion

The tripler and driver stages both operate well inside their CCS ratings. Self-tuned grid circuits are used. This not only simplifies the layout, but in the driver it reduces the likelihood of self-oscillation. The 6524 grid circuit is resonant with the tube's input capacitance at around 130 Mc. There is little tendency to oscillation, therefore, and no neutralization is required.

An exciter delivering about 5 watts on 48 Mc. may be used, or if the builder already has a low-powered 2-meter rig it can be hooked up to the driver, omitting the tripler stage. The exciter currently in use at W1HDQ is a band-switching 6146 job<sup>1</sup> that was used with the former rig. If this seems like an excess of drive, let it be known that the 6146 is running at 10 to 15 watts input on 48 Mc. The tripler may also be driven by the 5763 doubler in the exciter, skipping the 6146 stage.

Tripler and driver are built on a standard  $5 \times 10 \times 3$ -inch aluminum chassis, with the tripler at the back. Its plate circuit is tuned from the front panel by an extension shaft. To forestall the inevitable letters, omission of the screen by-pass on the tripler is intentional. This omission always bothers some readers, but

<sup>1</sup> Tilton, "A High-Powered Driver-Amplifier for 144 Mc.," *QST*, July, 1952, p. 11. Also, *The Radio Amateur's Handbook*, 30th, 31st and 32nd editions.

if the stage works well without the by-pass, why put it in?

On the first check of the driver portion we found that the 6524 was being overdriven. This was corrected by squeezing the driver grid coil turns closer together, lowering the resonant frequency until the desired 2.5 to 3.5 ma. was obtained across the band. The farther it can be resonated below 144 Mc. the less likelihood there is of self-oscillation in the driver stage.

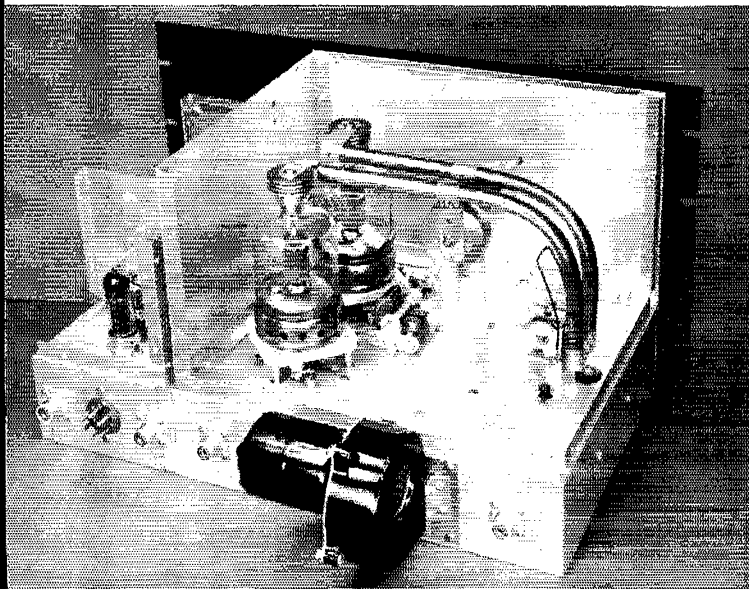
The 6524 is mounted horizontally, and holes are drilled in the chassis under the tube to allow for air circulation. Plate leads are made of thin phosphor bronze or copper, bent into a semicircle, connecting the butterfly capacitor and the heat-dissipating connectors. This allows the latter to be removed for changing tubes, without putting undue strain on the plate pins. The connectors have to be sawed or filed down on the insides to fit on the 6524 pins. The coupling link at the driver plate circuit is tuned, to provide efficient transfer of energy to the amplifier grids.

Small feed-through by-passes are used in the driver screen circuit.  $C_5$  is mounted in the aluminum plate that supports the 6524 socket, and  $C_6$  is in the chassis surface.

### Amplifier Features

Difficulties with the former 4-125A grid circuit indicated that experimentation was in order at that point in the new unit. The input capacitance of 10.8  $\mu\text{mf}$ . per tube makes it impossible to use a conventional tuned grid circuit at 144 Mc., so a half-wave line was tried in the amplifier. This and the series-tuned coupling link, plus shielded construction, resulted in markedly better driver efficiency than we had heretofore obtained. The grid line,  $L_1L_2$ , was originally made of No. 12 wire. This ran hot, so  $\frac{1}{4}$ -inch copper tubing was substituted, with improved results.

Maintaining the 4-125A screens and filament leads at ground potential for r.f. is important in achieving stability. To this end, the tube sockets are mounted above the chassis, rather than below. They are elevated only enough to allow the socket contacts to clear the chassis, and are mounted corner to corner, with the inner corners



Rear view of the 4-125A final stage. The split-stator capacitor near the middle of the picture is the screen neutralizing adjustment. The plate line is tuned with a capacitor made from parts of a neutralizing unit, mounted on ceramic stand-offs.

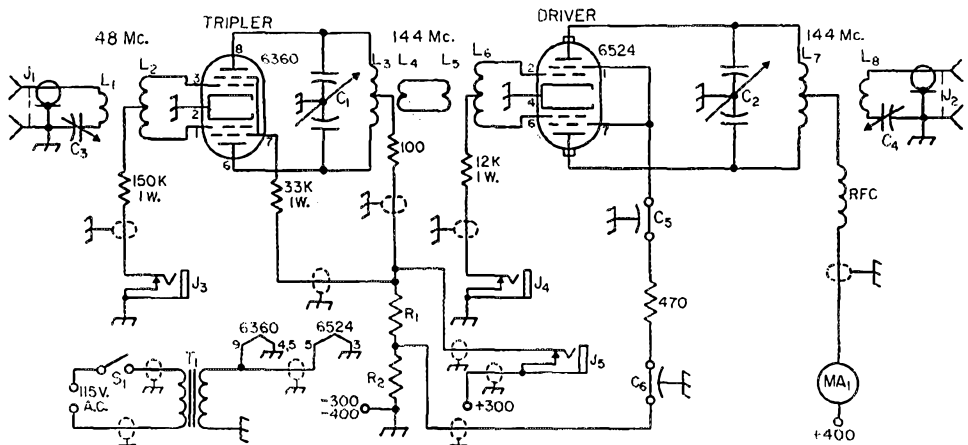


Fig. 1 — Schematic diagram of the tripler and driver stages of the high-powered 2-meter transmitter.

- C<sub>1</sub>, C<sub>2</sub> — 10.5- $\mu$ mf. per-section butterfly variable (Johnson 10LB15).  
 C<sub>3</sub> — 25- $\mu$ mf. screwdriver-adjustment variable (Hammarlund APC-25).  
 C<sub>4</sub> — 25- $\mu$ mf. miniature variable (Bud LC-1642).  
 C<sub>5</sub>, C<sub>6</sub> — 500- $\mu$ mf. feed-through by-pass (Centralab FT-500).  
 R<sub>1</sub> — 11,000 ohms 2 watts (two 22,000-ohm 1-watt resistors in parallel).  
 R<sub>2</sub> — 50,000 ohms 2 watts (two 100,000-ohm 1-watt resistors in parallel).  
 L<sub>1</sub> — 2 turns insulated wire around center of L<sub>2</sub>. Twist leads to J<sub>1</sub> and C<sub>3</sub>.  
 L<sub>2</sub> — 13 turns No. 20,  $\frac{3}{8}$ -inch diam.,  $\frac{7}{8}$  inch long, center tapped (B & W Mininductor No. 3007).  
 L<sub>3</sub> — 3 turns No. 14 enamel,  $\frac{3}{4}$ -inch diam., spaced  $\frac{1}{16}$  inch, center-tapped.

- L<sub>4</sub> — 2 turns No. 18 enamel, same as L<sub>3</sub>, inserted at center.  
 L<sub>5</sub> — 2 turns No. 18 enamel, same as L<sub>6</sub>, inserted at center.  
 L<sub>6</sub> — 4 turns No. 14 enamel,  $\frac{1}{2}$ -inch diam., turns spaced wire diameter.  
 L<sub>7</sub> — 2 turns No. 14 enamel, 1-inch diam., spaced  $\frac{1}{4}$  inch.  
 L<sub>8</sub> — 1 turn No. 14 enamel between turns of L<sub>7</sub>.  
 J<sub>1</sub>, J<sub>2</sub> — Coaxial fitting, female (Amphenol 83-1R).  
 J<sub>3</sub>, J<sub>4</sub>, J<sub>5</sub> — Closed-circuit jack. Insulate J<sub>5</sub> from panel and chassis.  
 MA<sub>1</sub> — External meter not shown in photo, 200 ma.  
 S<sub>1</sub> — Toggle switch.  
 T<sub>1</sub> — Filament transformer, 6.3 volts, 3 amp. (UTC S-55).

almost touching. The grid line is brought up through  $\frac{1}{2}$ -inch chassis holes and soldered directly to the grid contacts. This determines the line spacing, about  $1\frac{1}{2}$  inches center to center.

The inner filament terminals on each socket are grounded to the chassis. The others connect to feed-through by-passes with the shortest possible leads. These are joined under the chassis with a shielded wire and tied to the filament transformer. The r.f. chokes in the screen leads are under the chassis, their wire leads coming up through Millen type 32150 feed-through bushings inserted in chassis holes under the screen terminals. The two screen terminals on each socket are strapped together with a  $\frac{3}{8}$ -inch-wide strip of flashing copper. The screen neutralizing capacitor is mounted as close to the sockets as possible and still leave room for the shaft coupling on its rotor. Leads to its stators are about one half inch long.

More compact and symmetrical design is possible if a modified single-section capacitor is used for C<sub>6</sub>. It should be the type having supports at both ends of the rotor shaft. The Millen 19140 and Hammarlund MC140 are suitable units for the purpose. The stator bars are sawed at each side of the center stator plate. The front rotor plate is removed, making a split-stator variable with 4 plates on each stator and 8 on the rotor. This procedure may not be applicable to all 140- $\mu$ mf. capacitors, but any

method that results in a balanced unit having about 50  $\mu$ mf. per section should do.

Construction of the final plate circuit should be clear from the photographs. Tuning is done with parts of a disk-type neutralizing capacitor (Millen 15011) mounted on ceramic stand-offs  $3\frac{1}{2}$  inches high. These are made of one 1-inch and one  $2\frac{1}{2}$ -inch stand-off each, fastened together with a threaded insert. Connection to the lines is made with copper or silver strap,  $4\frac{1}{2}$  inches from the plate end. Silver plating of all tank-circuit parts is a worth-while investment, though it should not be considered a necessity. A shaft coupling designed for high-voltage service is attached to the threaded shaft of the movable plate, and this is rotated with a shaft of insulating material brought out to the front panel.

A word about the extension shafts is in order at this point. If they are of metal they may have a serious detuning effect in some circuits, even though they are connected through insulating couplings. Originally we used  $\frac{1}{4}$ -inch lucite rod, which looked very nice, but it wilted in a hurry when the final enclosure was buttoned up and the rig operated at high power. Bakelite rod is fine, but since the insulating qualities are of no importance,  $\frac{1}{4}$ -inch wooden doweling will do the job just as well. Suitable doweling can be bought for about 5 cents per 3-foot length at most hardware stores.

The final chassis is aluminum, 10 by 12 by 3

inches, matching up with the driver chassis to fit a standard 10½-inch rack panel. Complete enclosure is a must for TVI prevention, and it pays dividends in improved stability by providing effective isolation of circuits that tend to give trouble in open layouts. TVI drove us to the use of enclosed rigs, but the improvement in performance that has resulted from the step makes the old TVI threat take on the aspect of a blessing in disguise, even though it makes some extra work and brings on the need for forced-air cooling.

The enclosures were made by mounting ½-inch aluminum angle stock around the edges of the chassis of both units and cutting the sides and covers to fit. It was not intended to cool the driver unit originally, so the enclosure was made of perforated aluminum. The blower for the final provided plenty of air, however, so three holes were made in the walls of the two chassis to allow some of the air flow to go through the driver enclosure as well. The chassis are bolted together where the vent holes are drilled. The main flow is up through the amplifier chassis, around the 4-125As, and out through the ¼-inch holes drilled in the top cover above the tubes. Holes in the amplifier chassis are drilled to line up with the ventilating holes in the 4-125A

sockets. All other holes and cracks are sealed with household cement to confine the air to the desired paths, and bottom covers are fitted tightly to both units.

The somewhat random appearance of the front panel is the result of the development of the unit in experimental form. A slight rearrangement of some of the noncritical components could be made to achieve a symmetrical panel layout readily enough.

### Operation

The two units have their own filament transformers. Plate supply requirements are 300 volts at 50 ma. for the tripler, 400 volts at 100 ma. for the driver, 300 to 400 volts at 75 ma. for the final screens and 1000 to 2500 volts at 400 ma. for the final plates.

The driver plates and final screens may be run from the same supply, but more flexibility is possible if they are supplied separately. A variable-voltage supply for the final screens is a fine way to control the power level, a desirable feature in a v.h.f. station. At W1HDQ the high-voltage supply provides a choice of 1100 or 2500 volts for the 4-125A plates. This is done by switching in the 220- or 110- volt primary on the plate transformer, resulting in inputs of 300 or 900

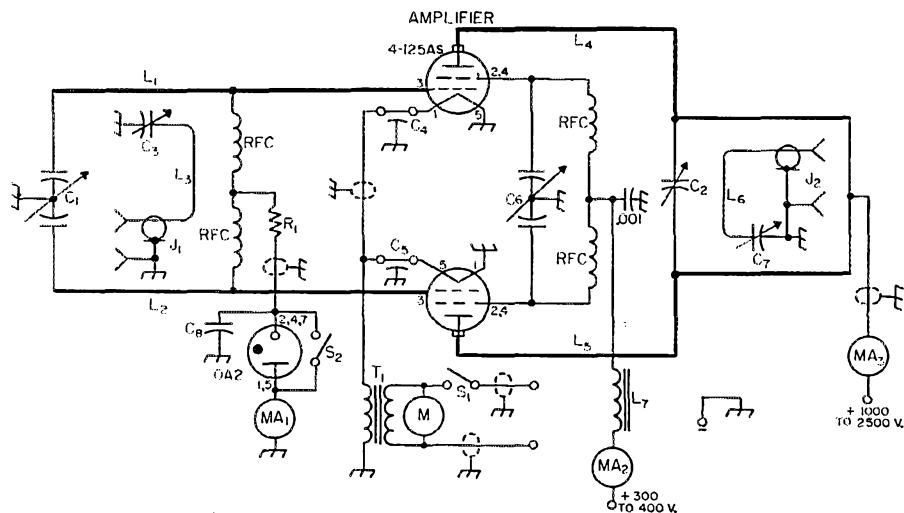


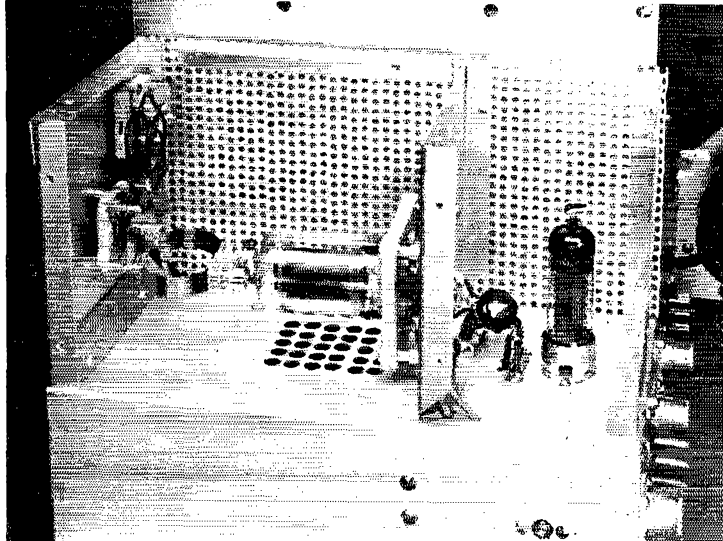
Fig. 2 — Schematic diagram of the 4-125A amplifier for 144 Mc.

- C<sub>1</sub> — 30- $\mu$ f. per-section split-stator variable (Hammarlund HFD-30X).
- C<sub>2</sub> — Plate tuning capacitor made from Millen 15011 neutralizing unit; see text and photo.
- C<sub>3</sub> — 25- $\mu$ f. miniature variable (Bud LC-1642).
- C<sub>4</sub>, C<sub>5</sub> — 500- $\mu$ f. feed-through by-pass (Centralab FT-500).
- C<sub>6</sub> — Approx. 50- $\mu$ f. per-section split-stator variable. Make from Millen 19140 or Hammarlund MC-140; see text.
- C<sub>7</sub> — 25- $\mu$ f. variable (Johnson 25L15).
- C<sub>8</sub> — 0.25- $\mu$ f. tubular.
- R<sub>1</sub> — 5000 ohms, 10 watts.
- L<sub>1</sub>, L<sub>2</sub> — ¼-inch copper tubing, 12 inches long, spaced 1½ inches center to center. Bend around 1½-inch radius, 1 inch from grid end.
- L<sub>3</sub> — Loop made from 5 inches No. 14 enamel. Portion coupled to line is 1 inch long each side, about ⅜ inch from line.

- L<sub>4</sub>, L<sub>5</sub> — ½-inch copper tubing 12 inches long, spaced 1½ inches center to center. Bend around 2-inch radius to make line 4 inches high. Attach C<sub>2</sub> 4½ inches from plate end.
- L<sub>6</sub> — Loop made from 7 inches No. 14 enamel. Sides spaced 1¼ inches.
- L<sub>7</sub> — 5-hy. (min.) 100-ma. rating filter choke.
- J<sub>1</sub>, J<sub>2</sub> — Coaxial fitting, female (Amphenol 83-1R).
- MA<sub>1</sub>, MA<sub>2</sub>, MA<sub>3</sub> — External meters, not shown; 100, 200 and 500 ma.
- M — Motor-blower assembly, 17 c.f.m. (Ripley Inc., Middletown, Conn., Type 8133).
- RFC — v.h.f. solenoid choke (Ohmite Z-144). Four required.
- S<sub>1</sub> — Toggle switch.
- S<sub>2</sub> — Rotary jack-type switch (Mallory 720).
- T<sub>1</sub> — Filament transformer, 5-volt 13-amp. (Chicago FO-513).



Side view of the tripler and driver stages. Coil adjacent to the 6360 tripler tube is the grid coil for the 6524 driver. Plate leads for the driver tube are flexible copper straps, to permit removal of the tube from its socket. Screwdriver adjustment at the lower right is the reactance tuning capacitor for the tripler input link.



watts at the flip of a switch. All work except DX schedules on c.w. is normally done at the lower level. The screen supply is variable from zero to 400 volts by means of a small Variac in the primary circuit of its power transformer.

In putting the rig on the air the stages were fired up separately, beginning with the tripler. A jack ( $J_3$ ) is provided on the front panel for measuring the 6360 grid current. About 1 ma. through the 150,000-ohm grid resistor is plenty of drive. The series capacitor,  $C_3$ , in the link can be used as a drive adjustment, if more than necessary is available.

Next plug the grid meter into the 6524 grid current jack,  $J_4$ , and tune the 6360 plate circuit for maximum grid current. It need be no more than 3 to 4 ma., with no plate voltage on the driver. If it is higher than this value increase the inductance of the grid coil,  $L_6$ , by squeezing its turns closer together.

Now apply plate and screen voltage to the 6524, and check for signs of self-oscillation. There should be none across the band, though if the plate circuit is tuned down to the same frequency as that at which the grid coil resonates with the tube capacitance, the stage may take off on its own. As long as it is stable across the intended tuning range there should be no operating difficulty resulting from a tendency to oscillate lower in frequency, and no neutralization should be needed.

Connect a coaxial line between the driver output and the final grid input, preferably with a standing-wave bridge connected to indicate the standing-wave ratio on this line. A Micro-Match or similar power-indicating bridge is ideal for this application, as it may be left connected in the circuit while adjustments are made with full driver power. Tune the driver plate circuit and its series-tuned link for maximum forward power on the Micro-Match indicator, or for maximum grid current in the final amplifier. Adjust the final grid tuning,  $C_1$ , for maximum grid current, and the series capacitor,  $C_3$ , in the link for minimum reflected power on

the s.w.r. bridge. Adjust the coupling loop position for maximum transfer of power, setting it at the least coupling that will achieve this end. Recheck all adjustments carefully.

Adjust the screen neutralizing capacitor for maximum final grid current, with the plate voltage off. Now we're ready to fire up the final.

Rule 1: Never operate a tetrode final stage having a fixed screen supply without load! The screen dissipation goes sky high when the plate load is removed, or is made too light, and the tube can fail in short order. It is important to meter the screen current at all times. With 4-125As you can tell if you're endangering the plates by their color, but the screen-current meter is all that can save you from tube damage to that element.

We know of no inexpensive dummy load that is suitable for testing a high-powered v.h.f. rig. Lamps are out; they don't come even close to simulating the 50- or 75-ohm load you must have to adjust a coax-output rig of this power level. The best thing we know of is an antenna, and that's what was used in setting up the initial adjustments on this job—a gamma-matched dipole, fed with coax. It was strung up in the basement laboratory at Headquarters, and its series capacitor adjusted for a standing-wave ratio of close to 1:1. The Micro-Match saw service in this operation, but it was none too happy with the 500 watts or so of r.f. that the 4-125As are capable of delivering. Better make such adjustments at something less than full power, and don't take the "forward power" indication too literally. Watch out for any sign of heating in the bridge unit, or you may have to buy a new one soon.

The position of the coupling loop,  $L_6$ , should be adjusted for maximum transfer of energy to the antenna, keeping the coupling as loose as possible. The series capacitor,  $C_7$ , can be used as a loading adjustment thereafter. If the screen voltage is continuously variable it will be found that there is a range around 325 to 350 volts where the efficiency of the final stage seems to

peak. Using the variable-voltage supplies in the ARRL Lab set-up, here are some typical conditions of operation:

Stage	$E_p$	$I_p$	$E_{ac}$	$I_{ac}$	$I_k$
Tripler	300 v.	35 ma.	—	—	1.5 ma.
Driver	400 v.	92 ma.	—	8 ma.	3-4 ma.
Final	1000 v.	300 ma.	400 v.	60 ma.	22 ma.
Final	2000 v.	350 ma.	350 v.	45 ma.	30 ma.
Final	2500 v.	400 ma.	320 v.	40 ma.	18 ma.

The first and third conditions given for the final stage represent extremes, both exceeding the tubes' ratings in some way, so they are not recommended. At low plate voltages the screen has to be run above recommended ratings to make the tubes draw their full rated plate current and operate efficiently. At high plate voltages the screen dissipation drops markedly. The use of 4-125As at a full kilowatt input is a considerable stretching of the manufacturer's maximum ratings, and is done at the user's risk. It should not be attempted except in c.w. work, where the periods of maximum dissipation are short. To operate safely, the maximum plate voltage for voice work at 144 Mc. should probably not go over 2000. At this level the tubes will handle 600 watts input very easily on voice, and 750 watts on c.w. is certainly no strain.

### Modulation and Keying

Use of c.w. is increasing steadily on 144 Mc. It is a must for weak-signal DX work, and some of the gang prefer c.w. to voice for routine rag-chewing purposes. We strongly recommend that every 2-meter rig include provision for keying, even though the builder is not a c.w. man at heart.

Keying in this rig is done in the screen circuit of the driver stage, and in the screen and plate circuits of the tripler. Cathode keying of the driver was attempted, but it brought on instability troubles, so was abandoned. The screen method makes the key hot, so an insulated key or a keying relay must be used in the interest of safety. The keying jack must, of course, be insulated from the panel.

Fixed bias for the final amplifier is provided by the VR-tube method. When the tube ignites at the application of drive, the capacitor  $C_s$

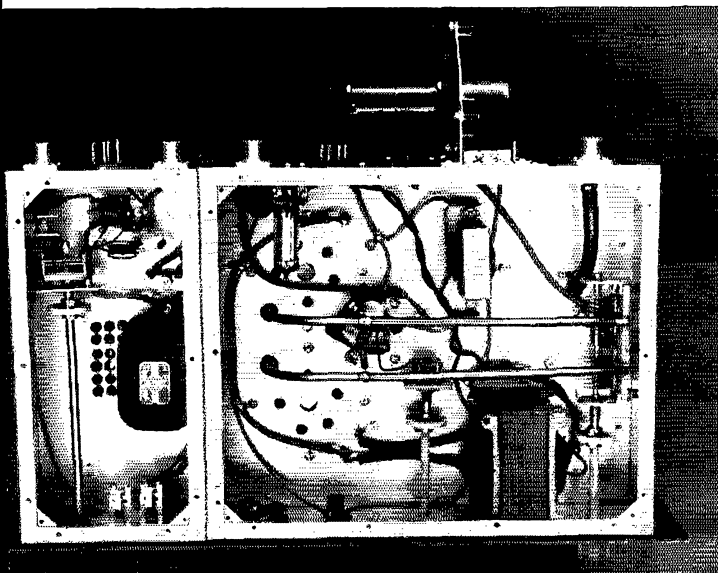
charges. Removing excitation stops the flow through the VR tube and leaves the negative charge in the capacitor applied to the amplifier grids. The effectiveness of this system depends on the leakage characteristics of the capacitor, so it may be necessary to try several types to find one that will hold the charge sufficiently. The value is not important, and oddly enough the best one we found was an inexpensive paper tubular type of uncertain vintage.

Modulation is applied to the plates only. A choke of about 10 henrys is connected in the screen lead, or the modulation can be supplied through a screen winding on the modulation transformer. In either case the by-pass value in the screen circuit should be low enough to avoid affecting the higher audio frequencies. Occasionally audio resonance in the screen choke may cause a singing effect on the modulation. If this develops, the choke may be shunted with a resistor. Use the highest value that will stop the singing. Too low a resistance will impair the effectiveness of the choke in its modulation role.

In neutralizing the 4-125As it may be found that what appears to be the best setting of the screen capacitor will result in a very large drop in grid current when plate voltage is applied. The setting may be altered slightly, raising the full-load grid current, without adversely affecting the stability of the amplifier. For example, the grid current with no plate voltage may be 25 ma. or so. When the plate voltage is applied and the amplifier loaded up, the grid current may drop as low as 10 to 12 ma. The screen capacitor may be reset until the full-load grid current is about 18 ma., without there being any tendency toward oscillation. The final check for neutralization is twofold. There should, of course, be no oscillation when drive is removed; and maximum grid current, minimum plate current and maximum output should all show at one setting of the plate tuning capacitor. The latter condition may be observed only when the amplifier is operated without fixed bias.

It may be desirable, especially if c.w. is to be used regularly, to make provision for changing the grid-leak resistance. At W1HDQ a 5000-ohm

*(Continued on page 98)*



Under-chassis view of the 2-meter transmitter. Tripler grid and plate circuits are at the upper left. Only two of the three jacks on the front panel show in the lower left. The halfwave line used in the 4-125A grid circuit is the main item of interest in the amplifier section. Both units are fitted with bottom covers, to provide shielding and confine the flow of cooling air to the desired areas.

# Double Conversion in a Crystal-Controlled 50-Mc. Mobile Converter

*Stable Reception Using a B.C. Receiver as the Tunable I.F.*

BY C. VERNON CHAMBERS, W1JEQ

• This 50-Mc. mobile converter combines simplicity with up-to-date v.h.f. design practice. Although only three tubes are used, the converter includes a stage of r.f. amplification plus dual conversion with crystal-controlled oscillators. The choice of intermediate frequencies results in a high order of image rejection. A car b.c. receiver is used as the tunable i.f. for the unit and also supplies the necessary plate power.

As business on 6 starts to pick up—and Tilton's recent series of articles<sup>1</sup> certainly should start the ball rolling—many hams will consider v.h.f. mobile operation for the first time. In selecting 50 Mc. as the band for a new venture, these fellows will be taking advantage of several favorable factors not associated with operation at any other frequency.

First, there is the very nature of the band. As W1HDQ has said, 50 Mc. is in between territory having the reliable coverage of the higher v.h.f. bands and a nearly complete freedom from serious interference problems. Band openings do offer DX conditions from time to time, but the local or extended-local coverage is the bright spot in the picture. This solid aspect makes 6 a natural for either plain mobile work or for that extra civil defense network.

Transmitter power output requirements are not ordinarily as high at 50 Mc. as they are at the lower frequencies. A simple mobile rig

<sup>1</sup> Tilton, "Six Meters for the Beginner," *QST* May, June and July, 1955.

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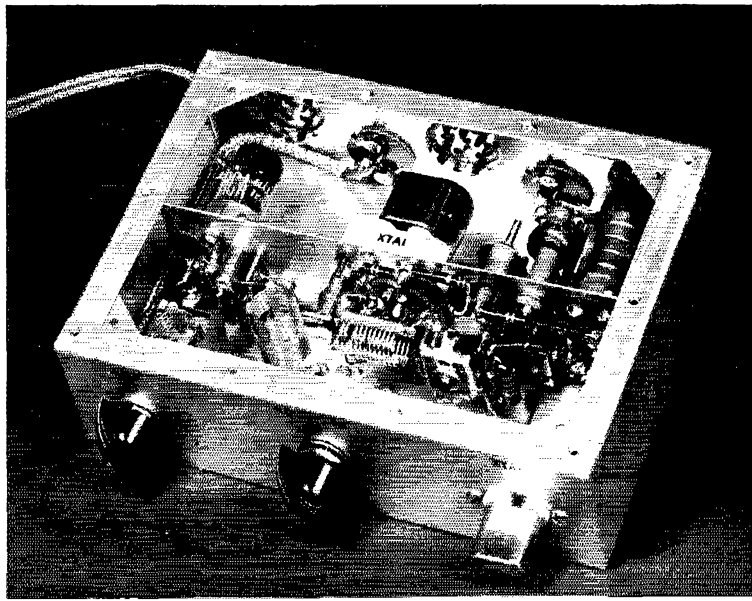
The input tuning capacitor ( $C_1$ ), the antenna-heater switch ( $S_1$ ), and the low-frequency crystal ( $Y_2$ ) are in line from left to right on the front wall of the chassis. A metal partition, mounted along the center line of the chassis, supports the tubes, the v.h.f. crystal ( $Y_1$ ), and most of the r.f. components.

◆

running at 10 watts or less can do a splendid job on 6 without putting undue stress on the car battery. In addition, mobile antennas for 50 Mc. are inconspicuous and easily installed. Portable beams for 6 can be conveniently carried in the car trunk, ready for quick use at a stationary site when something extra in the way of a radiator is desirable. On the other hand, the car b.c. antenna can frequently be used as the mobile whip, thus completely eliminating need for disfiguration of the car body.

Mobile operation at 50 Mc. does present one problem to the chap who prefers commercial equipment. Good 6-meter mobile converters of commercial design are few and far between. Fortunately, though, there is no special skill nor tricks involved in the construction of a well designed homemade converter. The cost and tube line-up of a first-class 50-Mc. job may both be comparable to those of a low-frequency unit.

The converter to be described is a relatively simple unit. The circuitry is conventional and construction is not complicated. Dual conversion with crystal-controlled oscillators assures maximum stability, helps with the image problem, and permits the car broadcast receiver to be used as the tunable i.f. The use of two crystal oscillators may appear to be expensive and complicated, but this is most certainly not the case. Anyone who attempts to stabilize a v.h.f. converter that must stand any bouncing around will soon discover that crystal control is actually the more simple solution to the problem. And now that inexpensive v.h.f. crystals, designed for operation in simple triode oscillators, are readily available, the cost of a rock-bound circuit is probably less than



that of most stabilized tunable arrangements.

An antenna peaking capacitor is the only operating-type control on the converter. Ordinarily, one adjustment of this control holds over a wide portion of the band. Four low-frequency crystals, any one of which may be plugged into the front of the unit, provide selection of 1-Mc. segments of the 6-meter range. With this arrangement, a tuning range of 1 Mc. is obtained with each full swing of the broadcast receiver tuning dial. Of course, a single i.f. crystal will suffice for those who confine operation to one section of the band. There is room in the converter

to minimize cross-modulation, an effect frequently encountered in mobile operation where receiving equipment is often moved within the field of a strong local transmitter.  $C_1$  is the grid-circuit peaking capacitor. Output from the r.f. amplifier is coupled through a simple bandpass circuit,  $C_5L_3C_6L_4$ , to a 12AT7 mixer. The second half of the 12AT7 is operated as a crystal oscillator at 43.5 Mc. to provide injection voltage for the mixer. Thus, the i.f. output from the mixer is set by the frequency of the incoming 50-Mc. signal and will fall within the 6.5- to 10.5-Mc. range. Incidentally, this particular mixer-oscillator com-

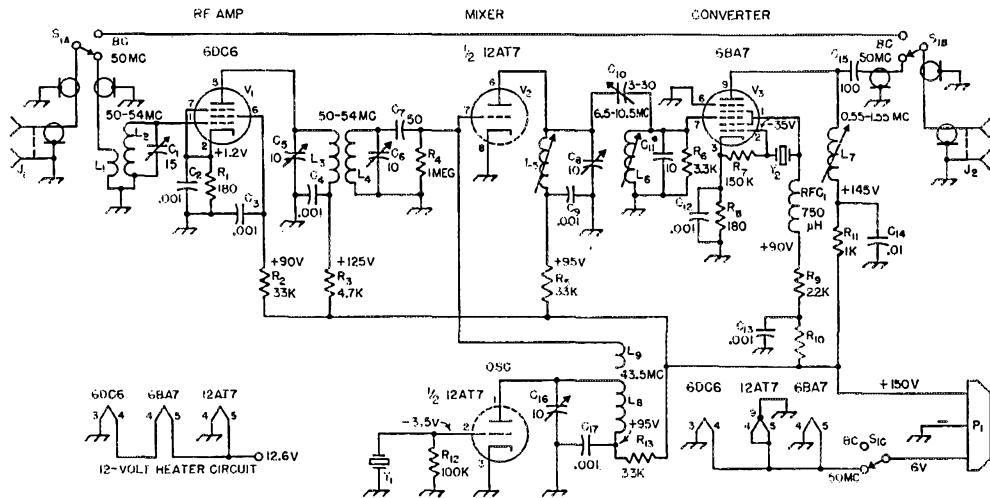


Fig. 1—Circuit diagram of the crystal-controlled mobile converter. All resistors  $\frac{1}{2}$  watt. \* Indicates a mica capacitor; all other fixed capacitors disk ceramic. All capacitors less than  $0.001 \mu\text{f}$  are in  $\mu\text{f}$ .

$C_1$  — 15- $\mu\text{f}$ . variable (Hammarlund HF-15).

$C_5, C_6, C_3, C_{16}$  — 1.5-10- $\mu\text{f}$ . tubular trimmer (Centralab 829-10).

$C_{10}$  — 3-30- $\mu\text{f}$ . ceramic trimmer (National M-30).

$L_1$  — 4 $\frac{1}{2}$  turns insulated magnet wire, (20-20) close-wound over grounded end of  $L_2$ .

$L_2, L_3, L_4$  — 7 turns No. 20 tinned,  $\frac{3}{16}$  inch long,  $\frac{1}{2}$ -inch diam. (B & W 3003). See text.

$L_5, L_6$  — 9-18- $\mu\text{h}$ . slug-tuned coil (North Hills Electric 120-D).

$L_7$  — 105-200- $\mu\text{h}$ . slug-tuned coil (North Hills Electric 120-H).

$L_8$  — 9 turns No. 20 tinned,  $\frac{3}{16}$  inch long,  $\frac{1}{2}$ -inch diam. (B & W 3003).

$L_9$  — 2 turns No. 20 tinned,  $\frac{1}{8}$  inch long,  $\frac{1}{2}$ -inch diam. (B & W 3003). See text.

$J_1, J_2$  — RCA-type phono jack.

$P_1$  — 3-prong male plug (Cinch-Jones P-303-CCT).

RFC1 — 750- $\mu\text{h}$ . r.f. choke (National R-33).

$S_1$  — 3-pole 5 position (used as 3 p.d.t.) selector switch (Centralab PA-2007 or PA-5 wafer mounted on PA-300 index).

$Y_1, Y_2$  — Crystals. See text (International Crystal type FA-9).

for a crystal switch should this added convenience be desirable.

The form factor of the converter, patterned after a crystal-controlled converter of previous date,<sup>2</sup> is ideal for mobile installation. The shallow depth of the unit allows it to be suspended directly under the car receiver, where it is nearly out of sight and also clear of front-seat passengers. Power for the converter, approximately 13 ma. at 150 volts, may be obtained from the b.c. receiver power supply.

### The Circuit

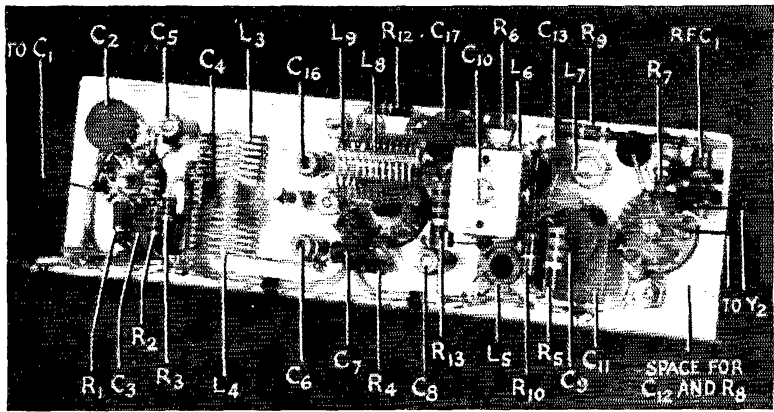
The circuit diagram is shown in Fig. 1. A 6DC6 is used as an r.f. amplifier. This tube features a semiremote cut-off characteristic to

<sup>2</sup> Chambers, "Bandswitching a Crystal-Controlled Mobile Converter," *QST*, January, 1955.

bination was selected because triode tubes are favored for v.h.f. mixer operation, since they are less critical as to operating conditions at this frequency as compared to most pentodes.

A second bandpass circuit,  $C_3C_{10}C_{11}L_5L_6$ , is connected between the plate of the mixer and the grid of a Type 6BA7 converter tube. The oscillator section of the 6BA7 uses crystals ground for 5.95, 6.95, 7.95 and 8.95 Mc. These crystals, in the order listed, provide 1-Mc. i.f. ranges (from the 6BA7) beginning at 0.55 Mc. For instance, the tuning range of the converter will be 50 to 51 Mc. with a 5.95-Mc. crystal ( $Y_2$  in Fig. 1) in use, and this section of the 6-meter band will be covered by tuning the b.c. receiver between 550 and 1550 kc.  $L_7$  is a slug-tuned plate coil for the converter tube and  $C_{15}$  is the output coupling capacitor.

This view identifies the components mounted on the front of the subassembly. Spacing between the tube socket centers is  $2\frac{1}{2}$  inches. The enamel-covered leads leaving the unit at the left and the right connect to  $C_1L_2$  and  $Y_2$ , respectively. The cable at the lower left is terminated at  $L_1$  and  $S_1c$ .



A loading resistor,  $R_6$ , is connected between the control grid of the 6BA7 and ground. Its purpose is to flatten out the response of the low-frequency (6.5 to 10.5 Mc.) bandpass coupling circuit.  $S_1$  performs the switching necessary in shifting from 50 Mc. to broadcast input.  $S_{1A}$  and  $S_{1B}$  shift the antenna from the converter to the b.c. receiver, while  $S_{1C}$  turns off the converter filaments. Heater circuits for both 6.3- and 12.6-volt operation are shown in Fig. 1.

### Construction

The converter is built into a  $2 \times 5 \times 7$ -inch aluminum chassis. The top cover (actually a bottom plate for the chassis, and not shown in the photographs) is a flat piece of aluminum measuring 5 to 9 inches. The extra inch of overlap on each side provides lips for fastening the converter to the bottom of the b.c. receiver by means of machine screws and metal spacers.

The aluminum partition for the subassembly should be made first. This subassembly is shown centered in the chassis in the first view of the converter, and in two detail photographs. The detail photographs identify the components in the subassembly. When the bracket has been bent and drilled, place it against the inside bottom surface of the chassis and mark the mounting holes in the chassis. Then place the bracket against the rear wall of the chassis and

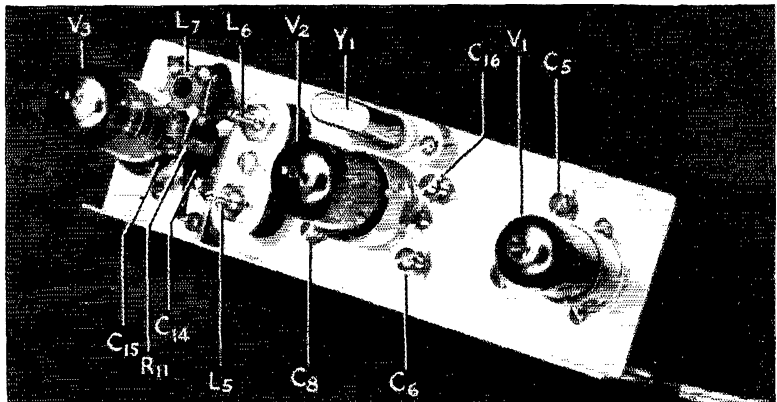
use it as a template to mark the position of the 1-inch holes that permit removal of the tubes.

The positions of  $J_1$ ,  $J_2$  and the cable grommet may be marked on the rear wall of the chassis and mounting holes for  $C_1$ ,  $S_1$  and the crystal socket for  $Y_2$  may be spotted on the front wall. The two controls and the crystal socket are spaced with  $2\frac{1}{2}$  inches between centers. When the mounting holes have been drilled or punched, the jacks, controls and the crystal socket may be mounted in place. Mount  $C_1$  with the shaft hardware and with the threaded mounting foot facing toward  $S_1$ . The mounting foot for  $C_1$  will be used to support the copper shield to be placed between the amplifier grid and plate coils. Lengths of RG-58/U coaxial cable may now be connected between  $S_1$  and the jacks.

When mounting components in the subassembly, orient the tube sockets in the following manner: Pins 3 and 4 of  $V_1$  facing toward the top of the bracket; Pin 7 of  $V_2$ , and Pins 4 and 5 of  $V_3$  pointing toward the bottom of the bracket. One-terminal tie-point strips, held in place by the socket hardware, should be mounted at the bottom of  $V_1$ , to the right of  $V_2$  (as seen in the front view) and at the top of  $V_3$ . A 2-terminal tie-point strip should be mounted to the right of  $V_1$ .

The  $\frac{1}{8}$ -inch clearance holes for  $L_5$  and  $L_6$  are spaced  $\frac{7}{8}$ -inch between centers and are located in between the sockets for  $V_2$  and  $V_3$ . A rubber

The subassembly bracket measures  $1\frac{1}{4}$  by  $6\frac{1}{4}$  inches and has a  $\frac{3}{8}$ -inch mounting lip at the bottom. The support plate for  $L_5$  and  $L_6$  measures  $\frac{5}{8}$  by  $1\frac{1}{2}$  inches, and is mounted on a  $\frac{1}{2}$ -inch metal pillar.  $L_5$  and  $L_6$  pass through  $\frac{1}{2}$ -inch holes punched in the subassembly bracket.



grommet, mounted in the bracket just above the socket for  $V_3$ , passes a lead between Pin 9 of the 6BA7 and the plate coil,  $L_7$ .

The rear view of the subassembly shows the socket for  $V_1$  mounted directly above the 12AT7. Adjustment screws for  $C_5$ ,  $C_6$ ,  $C_8$  and  $C_{16}$  are also visible in this view. A 3-terminal tie-point strip to the right of  $V_3$  (just below  $L_7$ ) supports the output end of  $C_{15}$  and the associated coax lead, the grounded sides of the coaxial cable and capacitor  $C_{14}$ , and the B+ end of  $R_{11}$ .

To assure mechanical stability, the coils for the first bandpass circuit ( $L_3$  and  $L_4$ ), and those of the 43.5-Mc. oscillator ( $L_5$  and  $L_9$ ) are made up as follows:  $L_3L_4$  is made from an 18-turn length of type 3003 Miniductor having 4 turns removed at the exact center. Do not break the support bars when removing the turns, and be sure to leave leads approximately  $\frac{3}{4}$  inch long at both ends of each winding;  $L_8L_9$  is made from a 12-turn length of Type 3003 Miniductor having the tenth turn removed (without breaking the supports), thus leaving a 9-turn coil for the oscillator plate circuit ( $L_8$ ) and a 2-turn ( $L_9$ ) for coupling injection voltage to the mixer grid. Clip the inside end of  $L_9$  right at the support bar, and leave an inch or more at the outside end for connection to Pin 7 of the 12AT7. No connection is to be made to the inside end of  $L_9$ . If anyone wishes to experiment further with injection coupling, he should break the winding at the end of the oscillator plate section, and then remove the tenth turn a  $\frac{1}{4}$  turn at a time as the performance of the mixer is tested.

In mounting  $L_3L_4$ , use  $C_5$  and the tie point to the right of  $V_1$  as the support for the  $L_3$  end of the assembly. The inside end of  $L_4$  should be returned directly to a grounded soldering lug and the grid end of the coil may be connected to  $C_6$ . The oscillator plate coil,  $L_8$ , is supported by Pin 1 of the 12AT7 socket and by the tie point (not readily seen in the photographs) at the right of the socket. The inside end of  $L_9$  is to be left floating and the other end goes to Pin 7 of the 12AT7.

The tie-point strip located below  $V_1$  is used for

terminating the heater wiring and the bottom lug on the 2-terminal strip (to the right of  $V_1$ ) is used for connection between the incoming plate voltage lead and the B+ ends of both  $R_2$  and  $R_3$ . The terminal strip to the right of  $V_2$  is used for the junction of  $C_{17}$ ,  $R_{13}$  and  $L_8$ . The low-frequency bandpass-adjustment capacitor,  $C_{10}$ , is mounted on the terminals of  $L_5$  and  $L_6$ .  $RFC_1$  and  $R_9$  are connected to the terminal mounted just above  $V_3$ .

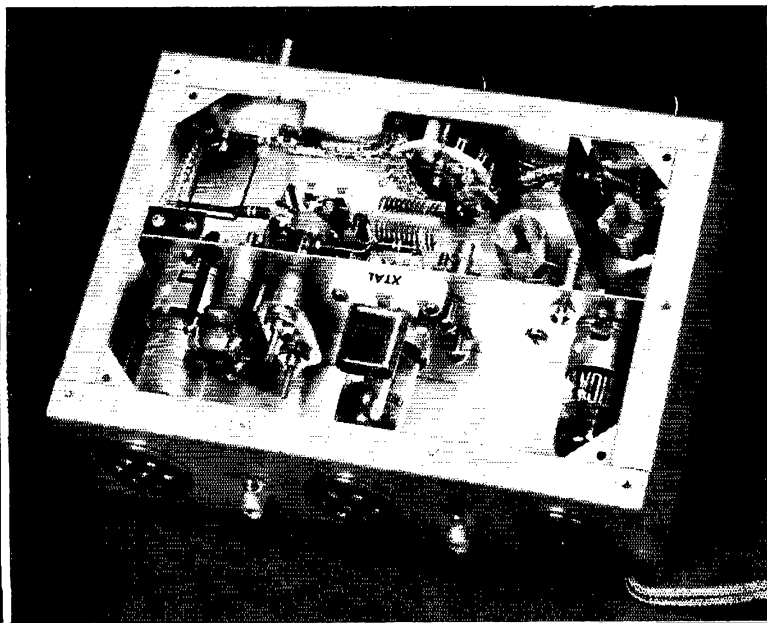
When the subassembly has been completed, it may be mounted and the interchassis wiring completed. However, the alignment of the tuned circuits is more conveniently handled if the subassembly is worked on out in the open. This procedure necessitates that the input circuit,  $C_1L_1L_2$ , be mounted temporarily at one corner of the bracket (adjacent to  $V_1$ ). Power leads and a pair of wires for connection to  $Y_2$  must also be provided. Cables to a b.c. receiver and signal generator may be temporarily terminated at  $C_{15}$  and  $L_1$ , respectively.  $S_1$  need not be connected if the unit is to be aligned and tested out of the chassis.

### Testing

The converter requires 0.9 ampere at 6 volts — or 0.45 ampere at 12 volts — for the heaters, and approximately 13 ma. at 150 volts for the plate supply. This power may be conveniently taken from the car b.c. receiver as outlined in a previous article.<sup>2</sup> If the b.c. supply delivers output much in excess of 150 volts, it is desirable to limit the input to the converter by means of a dropping resistor. A resistance of approximately 80 ohms for each volt to be dropped will do the job.

If flat response of the bandpass circuits is to be obtained, a signal generator for alignment should be on hand. The generator should cover 6.5 to 10.5 as well as the 50-Mc. band. On the other hand, a generator is not necessary if the converter circuits are to be peaked for maximum response in one section of the 6-meter band. In other words, you do not have to go to the trouble of broad-banding the interstage circuits if, for

(Continued on page 98)



Connectors  $J_1$  and  $J_2$  are mounted in that order, from right to left, on the rear wall of the converter. Shielded power leads pass through a rubber grommet at the lower right-hand corner. One-inch holes, covered with snap-in ventilating plugs, permit the removal of tubes. A copper plate, located inside the unit at the upper right-hand corner, provides shielding between the grid and plate coils for the r.f. amplifier.

QST for

# Single Sideband with the BC-610

## Using a Popular Transmitter as a Linear Amplifier

BY R. H. MITCHELL,\* W5DWT

• If you have a BC-610 and don't know how to use it as a linear amplifier for an s.s.b. exciter, this is your article. The modifications are simple and the results well worth your while.

WHEN we decided to go on s.s.b. at KA2EC, procurement of a Multiphase 10-B exciter was the first step. The next one was finding enough power amplification to make the s.s.b. worth while on our trans-Pacific relay schedules. We had been running a BC-610 at about 850 watts input as the a.m. transmitter, but the BC-610 was designed well before the current cycle of amateur interest in single sideband began. At first glance it appeared that the rig — other than the power-supply section — was completely unsuited to s.s.b. operation.

Stan Clark, one of the operators at W6FCS, suggested that we use the 10-B to drive the 250-TH final in the BC-610. I didn't think that the exciter had enough output to drive the 250-TH into full Class B, but decided to make a check on operation of the final as a Class A linear. Modification of the transmitter was very simple. All audio and r.f. driver tubes were removed, and the 10-B was coupled to the final using a capacitance-divider system on the 807 plate coil, as shown in Fig. 1. The normal bias lead to the 250-TH (the lead from  $PL_{11}$ , No. 1, to  $TS_2$ , No. 5)<sup>1</sup> was removed, and a jumper was connected from the rotor arm of  $R_{12}$  (the modulator

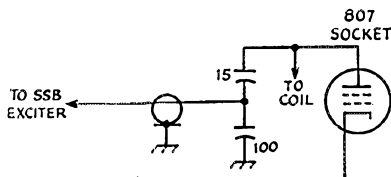


Fig. 1 — BC-610 driver circuit revision for coupling the output of an s.s.b. exciter to the 250-TH final.

bias rheostat) to  $TS_2$ , No. 5. The bias was set to -60 volts, and plate power was applied. Then the grid bias was reset to give 80 ma. resting plate current. The final ran at about 200 ma. fully loaded, with maximum drive and tone input. At maximum drive, grid current kicked up to about 2 ma., which meant that the final was not running true Class A. However, a check made with a selective receiver showed that the sideband suppression of the signal had not been degraded

by the addition of the final. The rig worked out nicely with this hook-up. Quality reports received from stations equipped with selective receivers or selectable-sideband adapters were gratifying. However, only about 150-ma. peak plate current could be run with voice input before flattening occurred, and this wasn't enough power to make us a leader in the trans-Pacific 14-Mc. rat race.

### A Driver Stage

Obviously, a more powerful driver was required for the 250-TH. The 610 had used a pair of 807s as a driver, so we decided to try using these, rather than to add an "outboard" stage. The 807s had not been intended for use as a linear amplifier either, and conversion of this stage

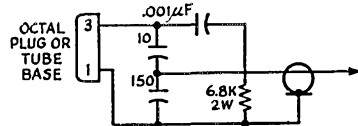


Fig. 2 — Adapter plug circuit for feeding the s.s.b. signal to the grid circuit of the driver stage. The octal plug goes in the 6L6 socket.

looked more troublesome than conversion of the final had been. Our main concern was with the screen supply, where a series dropping resistor was employed. As any good s.s.b. operator knows, this leads to poor screen-voltage regulation and consequent distortion. We weren't allowed to make any modifications to the 610 which would prevent its return to its original form in more than an hour, so we had to leave the screen supply intact. Next, we tackled the bias problem. Originally, the 610 used a common bias source for the 807s and the 250-TH, but this will not work on s.s.b. The grid-bias lead to the 807s (lead from  $PL_{11}$ , No. 5, to  $TS_2$ , No. 7) was disconnected, and the negative lead from a 45-volt battery was connected to  $TS_2$ , No. 7. The positive lead was connected to ground ( $TS_2$ , No. 12). The 807 grid-bias resistor,  $R_8$ , was shorted out with a piece of hook-up wire, to prevent bias fluctuation in case grid current should flow. The grid circuit of the 807s was supplied by the original 6L6 buffer-doubler plate coil. This tank had been tuned to 7 Mc., and it had to be converted to 14 Mc. before the 807s could be operated as a linear amplifier. The tuning-unit cover was removed and half the turns were shorted out on the coil. Then a capacitance divider was wired into an octal plug, as shown in Fig. 2, and the plug was inserted in the 6L6 socket. A 6800-ohm 2-watt noninductive resistor was wired across the tank

\* 7303 Hirsch Drive S.E., Albuquerque, N. M.

<sup>1</sup> Circuit symbol numbers are for BC-610-E.

(Continued on page 108)

# A Super-Selective Converter

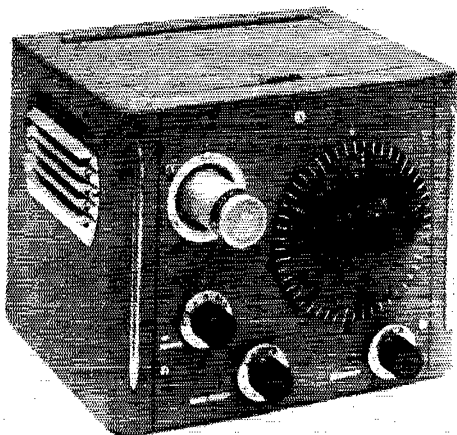
*Improving the Performance of a Small Receiver*

BY JOHN L. TREGAY,\* W9YQL

How could I improve the performance of my economy receiver? Adding a Q5-er or a crystal filter would provide the necessary selectivity, but the front-end stability wasn't enough to hold high-frequency signals with the present selectivity. And, of course, a smooth vernier bandspread dial would add greatly to operating pleasure.

It looked like a new front end and a new back end were needed. Since this seemed like going a little too far in trying to save our original investment, an attempt was made to build selectivity into a new front end. The results have been very satisfying.

The solution was to use a 1525-kc. cascaded half-lattice crystal filter in the output of a new



This "super-selective converter" is a complete receiver front end plus a two-stage 1525-kc. crystal lattice filter. It is intended to work ahead of any receiver capable of tuning to 1525 kc. The oscillator coil is plugged in, at the upper left.

front end. The result is a converter with built-in steep skirt selectivity closely approaching the best commercial receivers and featuring good stability, adequate sensitivity and calibrated bandspread. Although no actual tests were made, it seems likely that this arrangement would have a minimum amount of overloading and cross-modulation difficulties, because the selectivity is introduced at the earliest possible stage.

Some of the mobile hams may want to go a

\* 2817 S. 13th Ave., Broadview, Ill.

<sup>1</sup> Burns, "Sideband Filter Using Crystals," *QST*, Nov., 1954.

<sup>2</sup> Morrison, "Phone Selectivity for the BC-312," *QST*, Feb., 1954. Also, "Cascaded Half-Lattice Filters for Phone and C.W.," *QST*, May, 1954.

• Here is an interesting article about a gadget that will improve small-receiver performance without too great a cash outlay. It is a tunable converter followed by a 1525-kc. crystal lattice filter, which will add tuning ease and high selectivity to any receiver capable of tuning to 1525 kc.

step further in working out a 1500-kc. filter in a mobile converter or as an insertion unit between a converter and a regular b.c. set in the car.

## The Circuit

The filter circuit is similar to one of those described by Burns,<sup>1</sup> except that it was necessary to ground the load resistor between sections a little differently, in order to obtain balance with the layout used. This can be seen in Fig. 1.

In working with the 1525-kc. crystals, they were found to function the same as the 460-kc. crystals described by Morrison.<sup>2</sup> As he mentioned, the basic requirement is to use the proper *LC* ratio to suit the crystals being used. The necessity for switching out both sides of the unused crystal, as well as the effect of a small trimming capacity across the high frequency crystal, were also verified.

The 6AK5 r.f. stage operates only on 14 Mc. and above, to simplify bandswitching and reduce the possibility of overloading. Separate antenna connections are provided for the low (3.5 and 7 Mc.) and high ranges (14 and 30 Mc.). No r.f. gain control is provided, since the r.f. stage can be detuned slightly in the few cases where it might be necessary. The 47-ohm resistor in the grid is a parasitic suppressor and might be eliminated with a little more work.

The 6BE6 uses a high-*C* oscillator circuit with a double-bearing 35- $\mu$ mf. bandspread condenser that has wide-spaced plates. The values of inductance and capacitance in the oscillator portion of the circuit were selected so that on all bands (except 28 Mc.) the frequency will be approximately equal to the dial reading plus the low-frequency edge of the band in kc. For example, on the 7-Mc. band, dial readings from 0 to 500 on the National PWO dial will be from 7000 kc. to 7500 kc. so that 250 on the dial represents 7250 kc., etc. On 10 meters, 0 to 400 on the dial covers 28 to 30 Mc.

A 0A-2 miniature voltage regulator tube is included to maintain a constant 150 volts on the 6BE6 and 6AK5.



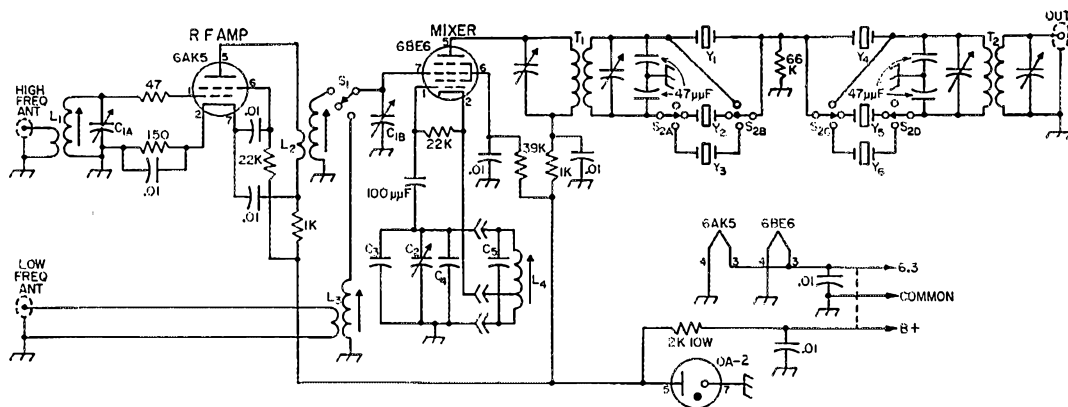


Fig. 1 — Schematic diagram of the super-selective converter.

- C<sub>1</sub> — Split-stator variable, 100- $\mu$ f.-per-section (Hammarlund MCD-100-S).
- C<sub>2</sub> — 35- $\mu$ f. variable (Hammarlund MC-35-SX).
- C<sub>3</sub> — 50- $\mu$ f. temperature-compensating, N750 type (Centralab TCN).
- C<sub>4</sub> — 39- $\mu$ f. silver mica.
- L<sub>1</sub> — 12 turns No. 18 enam. close-wound on National XR-50 form. Common ground tap at 2 turns.
- L<sub>2</sub> — 10 turns No. 18 enam. close-wound on National XR-50 form. Primary winding, 4 turns No. 18 enam. adjacent to ground end.
- L<sub>3</sub> — 44 turns No. 26 enam. close-wound on National XR-50 form. Common ground tap at 4 turns.

- L<sub>4</sub> — 3.5 Mc.: 26 turns No. 26 enam., close-wound. Cathode tap at 5 turns. C<sub>5</sub>, 10- $\mu$ f. silver mica.
- 7 Mc.: 20 turns No. 26 enam., close-wound. Tap at 4 turns. C<sub>5</sub>, 15- $\mu$ f. silver mica.
- 14 Mc.: 6 turns No. 18 enam., spaced to occupy  $\frac{3}{8}$  inch. Tap at 2 turns. C<sub>5</sub>, 20- $\mu$ f. silver mica.
- 28 Mc.:  $3\frac{1}{2}$  turns No. 18 enam., spaced to occupy  $\frac{3}{8}$  inch. Tap at 1 turn. C<sub>5</sub>, 25- $\mu$ f. silver mica. Each L<sub>4</sub> wound on Millen 74001 plug-in shielded form,  $\frac{1}{2}$ -inch diam.
- S<sub>1</sub> — Single-pole 3-position rotary.
- S<sub>2</sub> — Made from two 2-pole 3-position rotary switches (Centralab PA-2011 with one section removed and Centralab PA-2003). See photograph.
- T<sub>1</sub>, T<sub>2</sub> — 1500-kc. i.f. transformer (Merit BC-315).
- Y<sub>1</sub>-Y<sub>6</sub> — See text.

It was found necessary to provide good isolation or shielding between the two half-lattice sections. By-passing of the power leads returning to the receiver prevented leakage of the signal around the filter and improved performance.

The Merit type BC-315 i.f. transformers provided a satisfactory match for the crystals without modification of the windings. The 47- $\mu$ f. silvered midget micas were soldered directly to the terminals inside the respective i.f. shield cans. The output i.f. transformer was modified to leave the output coil untuned. A Merit BC-314 was tried but the center-tapped coil was not balanced well enough to eliminate the need for the condensers, so the BC-315 without center tap was used.

### Crystals

The crystals used were 1525-kc. FT-243 type available on the surplus market. Surplus 1632.5-kc. crystals were also found to work satisfactorily. Two of the six crystals needed were shifted 2 kc. higher by grinding with a few figure-eight strokes on a piece of plate glass, using fine water-mixed valve grinding compound as an abrasive. Two others were shifted 8 kc. higher in the same manner, while the remaining two were used without change. Although this part of the job seemed easy, a couple of practice crystals may be needed unless previous experience has been acquired. Checking the crystal frequency as grinding progresses will be discussed later.

### Construction

Although the use of the National PWO dial has turned out to be a most satisfying feature,

its size increased the difficulty of obtaining an optimum chassis layout.

The usual precautions in rigidity of wiring and component mountings must be observed if good stability is to be obtained.

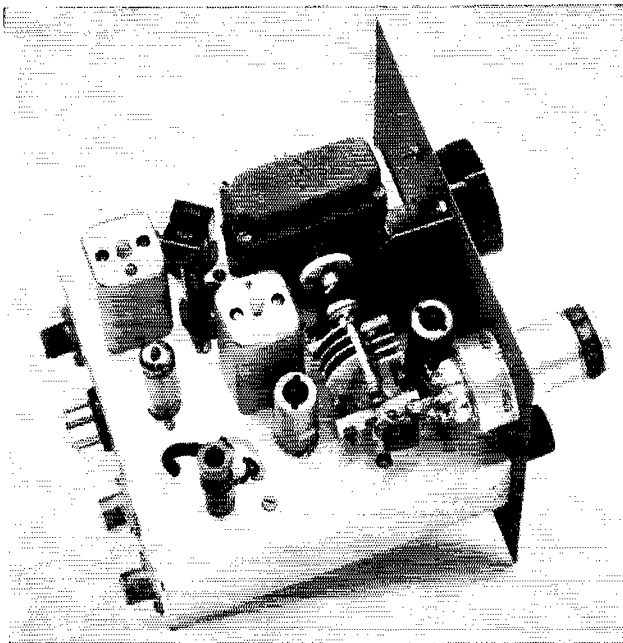
The complete converter is mounted in an ICA type 3860 cabinet using a 7 × 7 × 2-inch aluminum chassis which is mounted  $1\frac{3}{4}$  inches up from the bottom of the panel. A cut-off chassis bracket was used to mount the oscillator tuning condenser and to steady the chassis. The socket for the oscillator plug-in coil was mounted on a "below the panel" socket shell. The crystals are plugged into octal sockets with no extra shielding except that provided by a handmade aluminum bracket, as can be seen in one of the photographs.

Since there are only two terminals on the National XR50 coil forms, L<sub>1</sub> was wound onto the coil form and held in place by soldering leads into the circuit after the coil is mounted. The terminals for the taps on L<sub>1</sub> and L<sub>3</sub> were formed by making a small loop in the wire at the tap point and continuing the winding. In coil L<sub>3</sub>, the turns after the ground tap were separated from the main part of the coil by winding the remaining turns on the base portion of the coil form just below the terminal. This was necessary in order to maintain enough selectivity for image rejection.

In the oscillator circuit the condenser C<sub>5</sub> was mounted inside the coil shield of each oscillator coil.

### Alignment

The method of alignment depends upon the test equipment available, and the following



Top view of the super-selective converter. The tuning capacitor, mounted on the partition, has been changed since the photograph was taken. The slug-tuned coil in the lower left is the high-frequency coil,  $L_1$ . The 6AK5 r.f. stage is to the right of  $L_1$  — the 6BE6 mixer is close to the panel.

description applies to a method that can be used with a minimum of available equipment.

After checking the wiring, the power is connected and the converter allowed to warm up. If the regulator tube is not glowing, the 2000-ohm dropping resistor should be reduced until glowing indicates that the regulator is operating.

Before working on the crystals or crystal filter, it is desirable to align and check the converter on at least one band with the filter out. The selectivity switch,  $S_2$ , is turned to the "filter out" position, the bandswitch,  $S_1$ , is set to the low range, and the 3.5-Mc. oscillator coil is plugged in. The crystals need not be plugged in yet. The output of the converter is connected to the antenna terminals of the receiver to be used, and an antenna is connected to the low-frequency antenna input of the converter.

Set the receiver by its own calibration as close as possible to 1525 kc. (or the i.f. frequency to be used).

Peak up the noise or signals on the r.f. tuning and then peak the i.f. transformers,  $T_1$  and  $T_2$ . Some systematic juggling of the i.f. transformers and the r.f. tuning may be required to get them peaked simultaneously. Of course, a grid-dip meter to check the r.f. tuning, and a signal generator to aid in aligning the i.f. transformers, would be helpful. The slug in the mixer coil can then be adjusted so that r.f. peaking occurs near the high capacitance end for the 3.5-Mc. band.

Now the antenna is disconnected and a signal of known frequency in the 3.5-Mc. band (from a crystal oscillator or VFO) is connected to the converter input through a small capacitance of  $10 \mu\mu$ f. or less. Set the dial to correspond to the signal frequency. For example, if the signal is 3700 kc., set the dial at 3700 minus 3500, or 200.

Adjust the slug in the oscillator coil until the signal is heard. Change the frequency of the VFO or crystal oscillator and tune in the signal with the main dial. The new dial setting should agree closely with the new signal frequency. The

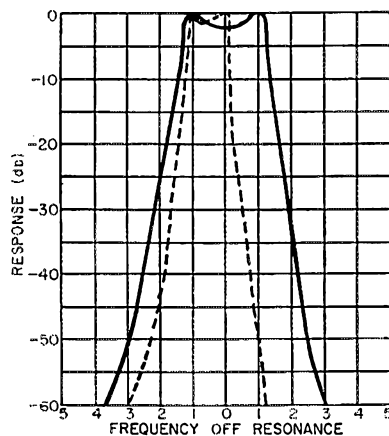


Fig. 2 — Response curve of the converter and S-20-R receiver. The solid line is for the 'phone filter, the dashed for c.w.

calibration across the band should be within 15 kc. on the 3.5-Mc. band, 5 kc. on the 7- or 14-Mc. band and about 50 kc. on the 28-Mc. band. Higher values of  $C_5$  will reduce the band covered across the dial, and vice versa. The calibration can be set to favor the part of the band being used at the time. This is done by adjusting the oscillator coil slug so the dial reading is exact for a known frequency signal in the center of that portion of the band being used.

After it is verified that one dial division equals approximately 1 kc., the work on the crystals can begin. Switch to the 'phone setting and insert one of the crystals in the  $Y_1$  socket. Short across the  $Y_4$  socket and again tune in the VFO or crystal oscillator signal. If an S-meter is not available on the receiver, it will be necessary to connect a vacuum-tube voltmeter or a 20,000 ohms/volt d.c. voltmeter (2.5-volt scale) across the diode load resistor, as described by Howard Morrison. The a.v.c. should be turned off and the r.f. gain of the receiver adjusted to give a reasonable reading on the meter.

A sharp peak in the tuning will indicate when the signal is being converted to the series resonant frequency of the crystal. The receiver and i.f. transformers should be trimmed to align on this peak.

Each of the crystals to be used can now be tried in socket  $Y_1$ . They should all peak at the same dial setting and within a couple of db. of the same meter reading. All of the several crystals tried at W9YQL were matched well enough.

At this point the converter can be used to check the crystal grinding operation. After each trial grind, the crystal is cleaned, assembled and plugged into position  $Y_1$ . With the input signal held to a constant frequency, the dial reading for two of the crystals ( $Y_2$ ,  $Y_6$ ) should be shifted 2 divisions (2 kc.) and .8 of a division for two others ( $Y_3$ ,  $Y_6$ ).

Plug in a 1527-kc. crystal in position  $Y_2$  and a 1525-kc. crystal in position  $Y_1$ , leaving the short across position  $Y_4$ . Set the dial between the two crystal peaks and trim up the i.f. transformers. Tuning across the signal will show the effect of one section of the filter. Adding a small capacitance across the 1527 crystal will produce steeper sides on the selectivity curve but too much

capacitance will bring in objectionable side lobes. The capacitance used here was obtained by twisting short lengths of insulated wire. It was adjusted so that the side lobes were at least 35 db. down. When the characteristics of this section are satisfactory, the crystals are removed and the other set of 1525- and 1527-kc. crystals is plugged into positions  $Y_4$  and  $Y_6$ . The procedure is repeated for the second section of the filter with a short across position  $Y_1$ .

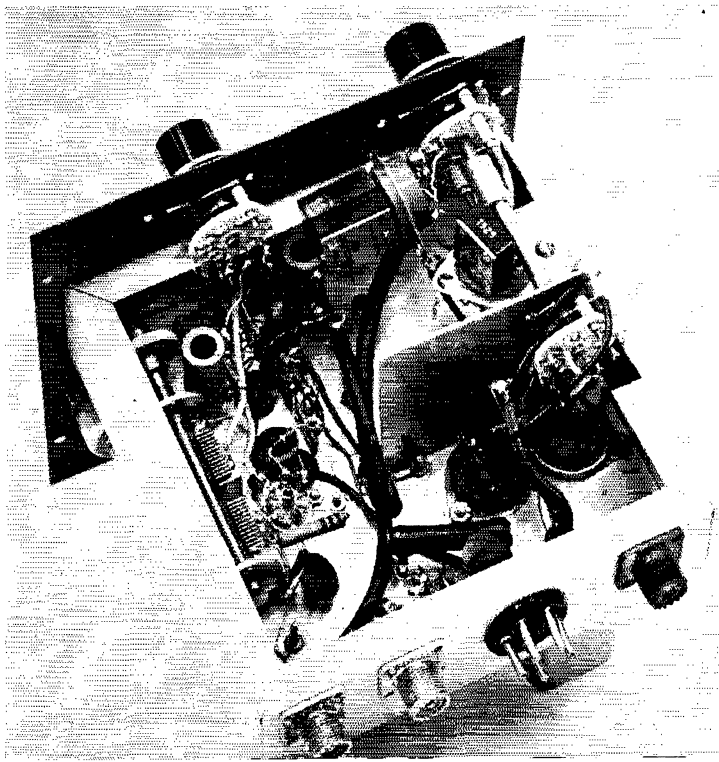
Next, all the crystals are plugged in and the characteristic 'phone and c.w. curves as shown in Fig. 2 should result. Less crystal-frequency separation can be used for c.w. if a narrower bandwidth is desired.

In using other i.f. transformers, it should be noted that an excessive dip in the center of the curve indicates too low an inductance in the coil. A rounded or peaked curve indicates too high an inductance. Reference should be made to the two articles by Morrison, which have been very helpful here at W9YQL in building and aligning this converter.

The remaining oscillator coils should be adjusted and the bandspread checked as described above. When the high-frequency range is checked, the slugs in the r.f. coil and the high-frequency mixer coil should be peaked together so the r.f. tuning is near the high-capacitance end for the 14-Mc. band.

In general, the performance of the converter has been very satisfactory. In some cases, as in an extremely quiet location or where a short receiving antenna is used, it might be advantageous to include the r.f. stage in the 7- and 3.5-Mc. ranges, but the need for it hasn't been felt here yet. The main objective of this article was to report that 1500-kc. crystal lattice filters are both practical and extremely useful.

◆  
Bottom view of the converter. The selectivity switch, at the right, is made from two ganged sections, to provide isolation between the sections of the filter.  
◆



# Budget 7-Mc. Vertical Antenna

## Simple Construction with Available Materials

BY W. PETE CZERWINSKI,\* W2JTJ

• If you are interested in 7-Mc. DX and wish to "break through the economic barrier," this article is for you. The author shows considerable ingenuity in utilizing readily-available materials for the construction of the antenna.

AFTER looking around at the available antenna information, the author decided he must have a ground-plane antenna. Being partial to 40-meter c.w., 7050 kc. was selected for the design frequency, which works out to be a length of 32 feet. To give a fair amount of broad-band performance, a diameter of 2 inches or more was considered desirable.

While searching for material that would meet the target dimensions and limited budget, the

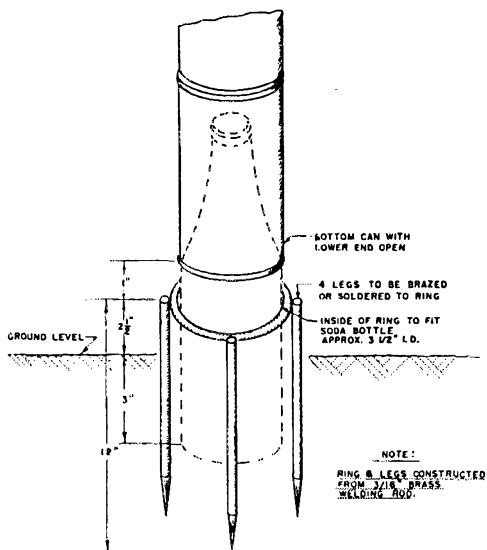


Fig. 1—Details of the base support for the 7-Mc. vertical antenna.

author discovered that standard size beer cans are approximately 2½ inches in diameter and the supply available, especially during the summer months, is veritably inexhaustible.

Further investigation showed that they take solder readily and have a protective coating of lacquer both inside and out, besides being very

\* 202 Beechwood Drive, Shrewsbury, N. J.

1 Although the author calls this antenna a "ground plane," it is more correctly a "quarter-wave vertical." A ground-plane antenna doesn't become effective as such until the radials are a quarter wavelength or more above the ground.—Ed.

light and strong. Furthermore, they are made perfectly symmetrical and do not require any jigs to insure alignment. The author simply sat one can on top of another, turned the cans so the vertical seams were staggered 180 degrees apart, aligned the top of one can so that it sat uniformly over the bottom can and spot soldered them together at three points. Then, laying the two cans over on their sides and using a 135-watt iron, the writer rotated them while applying solder to the two joined edges. It is recommended that not too much heat be applied to the solder because the tin content may be burned, leaving the soldered joint brittle. This performance is repeated by adding one can at a time to the growing mast until a length of approximately five feet is reached. After a sufficient number of "lengths" is made up to total 32 feet, they can be joined together to complete the mast. This step, however, requires outdoor space and some fairly level ground. The author had no difficulty in shimming the lengths so they were aligned for soldering.

The can ends were left intact to act as baffles and provide rigidity to the mast. Some desiccant such as "Dry-Rite" or silica-gel crystals, found in little sacks packed around surplus equipment, was dropped into each can. These crystals will remove all moisture trapped within the soldered cans and prevent rust action there. The bottom can should have the lower end removed with a can opener so as to fit over the base insulator.

It was found that a quart-size soda bottle makes a jim-dandy base insulator. The tapered neck provides a certain amount of pivoting freedom to the mast when adjusting the guy lines. For the radial ground wires the author constructed a junction ring, which also serves as a supporting bracket for the soda bottle base insulator. See Fig. 1.

The 52-ohm coax feeder line and the four radial ground wires (32-foot lengths of 1/8-inch aluminum wire) can be buried below the surface of the earth. The only items that remain visible are the vertical radiator and its supporting guy lines. Where possible, as in the author's case, the guy lines can be tied to existing structures so as not to provide an additional obstacle for the children playing in the back yard.

Before erecting the mast, the author soldered four wires, 90 degrees apart, around the lower edge of the bottom beer can. These four wires were brought to a junction and serve as a feed point for the mast—the point where the center conductor of the coax is attached. In addition to this, the guy-line rings also must be installed. See Fig. 2.

The guy-line rings are made from  $\frac{1}{8}$ -inch diameter aluminum wire. The wire is shaped by twisting loops every  $1\frac{1}{2}$  inches until three such loops are made, and then wrapping it around the can. These loops can be twisted tighter once the ring is located properly. The ridge made at the junction of two cans is sufficient to keep the guy ring from sliding down. Although the guys are nonconductors, the upper set was fastened through egg-type insulators to insure no loss at this high-voltage point of the radiator. The guys are  $\frac{3}{8}$ -inch diameter plastic covered clothesline, the type containing no metal core.

The following breakdown will show total expense if a constructor had to purchase all material needed for this project:

82 beer cans .....	0
200 ft. plastic covered clothesline .....	\$1.80
3 guy-line insulators .....	.36
1 soda bottle .....	.05
1 hank of solder .....	.25
130 ft. $\frac{1}{8}$ -inch diameter aluminum clothesline or ground wire (solid) .....	2.50
4 pieces of $\frac{3}{16}$ -inch diameter brass welding rod .....	.50
1 can of pressurized aluminum paint (for spray application) .....	1.39
<b>Total .....</b>	<b>\$6.85</b>

### Installation

The completed mast, glistening with the new coat of aluminum paint, is now ready for installation. The author suggests that four men be used on this job. The first step: While two men support the mast at its center section, a third

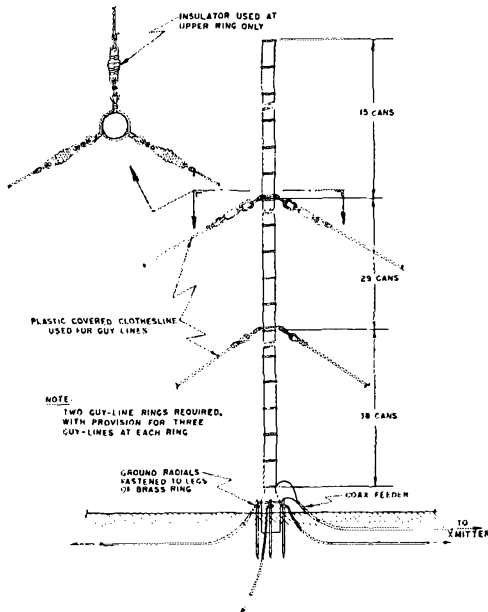


Fig. 2—Guy-rope details of the antenna. The four radials form a cross under the base of the antenna.



Here W2JTJ is touching up a spot on his antenna he missed with the aluminum paint the first time around. A lot of thought and libation went into the construction of this vertical.

man should climb a stepladder and place the top end on a near-by first-story roof or other structure of approximately the same height. Second step: One man foots the base of the mast while two men, one on either side of the mast, hold one top and one bottom guy line apiece. The fourth man then takes the remaining set of guys and climbs up the stepladder, now located at the far side of the mast. This fourth man pulls up the mast, keeping each guy at equal tension so the mast doesn't get a chance to bow. The two side men also keep equal tension but locate themselves so the fourth man doesn't pull the mast over on himself after it passes through dead center. Now that the mast is up, the man who had footed it can lift it up and place it on the soda-bottle base insulator. The mast is very light so this step is no problem. The final step is to tie the guy lines down to the selected points, while adjusting proper tension so the mast remains straight.

The author accomplished these steps with the help of his XYL and his two young sons, experiencing no difficulty whatever. The XYL did comment on the neat appearance of my new antenna, although she confessed that there were times, as I was soldering the beer cans together, when she thought I had finally lost my marbles.

Electrically, the vertical turned out even better than expected. In addition to receiving fine reports from foreign countries on transmitting, my receiver showed an improvement of at least 10 db. to all signals. Last but not least, I have finally licked ITV. This is probably due to the vertical polarization of the ground plane as compared to the horizontal polarization of television antennas. Gone forever and good riddance to that 15-ke. TV howl.

# Pi and Pi-L Design Curves

## Easy Computation of Tank-Circuit Constants

BY R. C. MIEDKE,\* WØRSL

SINCE pi and pi-L networks are being used increasingly in transmitter output circuits, the graphs shown here have been prepared in an effort to simplify the design of such tank circuits. The merits of these circuits will not be

• In a series of charts, this article presents the necessary design data for the popular pi and pi-L tank circuits. Only the simplest arithmetic (and very little of that) is needed for arriving at the proper  $L$  and  $C$  values.

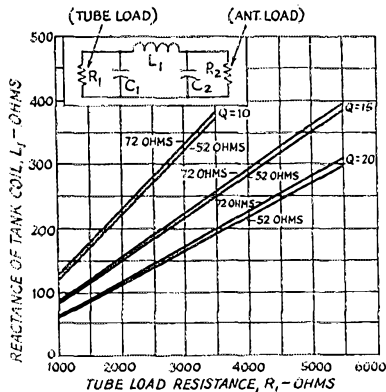


Fig. 1 — Reactance of tank coil,  $L_1$ , as a function of tube load resistance,  $R_1$  (for pi networks).

discussed here since they have been covered in the later references on page 104. Figs. 1, 2 and 3 can be used for determining the values of the components in a pi network while Figs. 3, 4, 5 and 6 can be used for pi-L networks. These

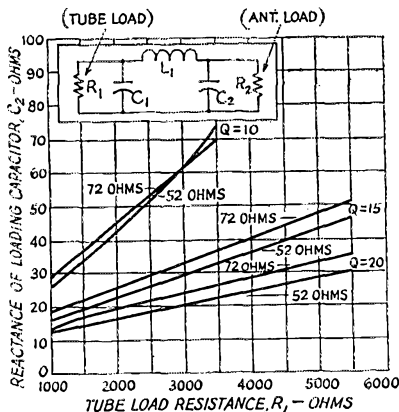


Fig. 2 — Reactance of loading capacitor,  $C_2$ , as a function of tube load resistance,  $R_1$  (for pi networks).

curves are drawn for special cases but cover the most generally used operating  $Q$ s, tube load resistances and antenna impedances. To use the charts it is only necessary to know the type of tube to be used in the final amplifier, its plate

voltage and plate current, the desired operating  $Q$ , and the antenna impedance.

### Using the Pi-Network Charts

- 1) Choose the power amplifier tube to be used.
- 2) Select the plate voltage and current for normal operation from tube manuals or tables.
- 3) Determine tube load resistance from

$$R_1 = 500 \frac{E_b}{I_b}$$

where  $R_1$  is the approximate a.c. plate load resistance,  $E_b$  is the plate voltage and  $I_b$  is the

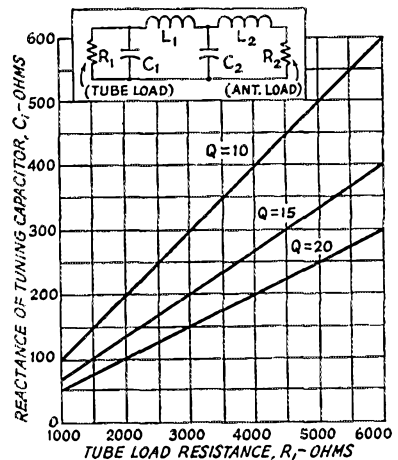


Fig. 3 — Reactance of tuning capacitor,  $C_1$ , as a function of tube load resistance,  $R_1$  (for pi and pi-L networks).

plate current in milliamperes when the amplifier is properly resonated and loaded.

- 4) Determine the operating  $Q$ . Operating  $Q$  is the  $Q$  of the plate circuit when the power amplifier is properly resonated and loaded. Low operating  $Q$  means lower harmonic attenuation but better efficiency while high operating  $Q$  means better harmonic attenuation but lower efficiency. It is therefore necessary to compromise, and it is considered good practice to use an operating  $Q$  between 10 and 20. With the emphasis on reduction of TVI, it might be better to use operating

\* Engineer, Collins Radio Co., Cedar Rapids, Iowa.

$Q$ s between 15 and 20 and design the tank coils to handle the small additional losses.

5) Determine the antenna load resistance. These charts are designed for use with either 52- or 72-ohm loads as these are most generally used and coax cables for these impedances are readily available.

Having made the above decisions, we can find the reactance of the tank coil from Fig. 1, the reactance of the loading capacitor from Fig. 2 and the reactance of the tuning capacitor from Fig. 3. These reactances can be changed to inductances and capacitances at the desired operating frequency by the use of reactance charts or slide rules,<sup>1</sup> or from the following formulas:

$$C_{\mu\text{f.}} = \frac{159,000}{f_{\text{Mc.}} X_C}$$

$$L_{\mu\text{h.}} = \frac{0.159 X_L}{f_{\text{Mc.}}}$$

*Example:* Power amplifier tubes, two 6146  
 Plate voltage 600 volts  
 Plate current 200 ma.  
 Operating  $Q$  15  
 Antenna impedance 52 ohms

Then  $R_1 = 500 \frac{E_b}{I_b} = 500 \times \frac{600}{200} = 1500$  ohms.

Using Fig. 1, we find that the  $R_1 = 1500$  ohms line intersects the 52-ohm ( $Q = 15$ ) line at 112 ohms. Thus the reactance of  $L_1$  equals 112 ohms. Using Fig. 2, we find that the  $R_1 = 1500$  ohms line intersects the 52-ohm ( $Q = 15$ ) line at 19 ohms. Thus the reactance of  $C_2$  equals 19 ohms. Using Fig. 3, we find that the  $R_1 = 1500$  ohms

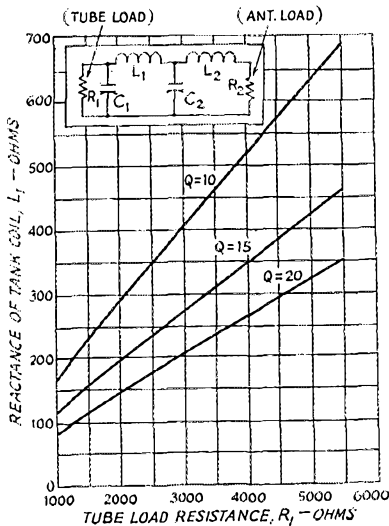


Fig. 4— Reactance of tank coil,  $L_1$ , as a function of tube load resistance,  $R_1$  (for pi-L networks).

line intersects the  $Q = 15$  line at 100 ohms. Thus the reactance of  $C_1$  equals 100 ohms.

From the reactance formulas, we find the following at an operating frequency of 3.5 Mc.:

<sup>1</sup>Such as the chart in the Miscellaneous Data chapter in the Handbook, or Figs. 3-83 and 3-84 in the Antenna Book.

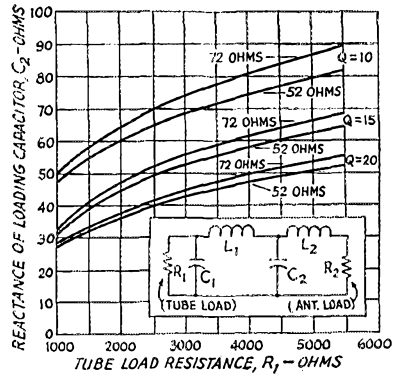


Fig. 5— Reactance of loading capacitor,  $C_2$ , as a function of tube load resistance,  $R_1$  (for pi-L networks).

if  $X_{L1} = 112$  ohms, then  $L_1 = 5 \mu\text{h.}$ ;  
 if  $X_{C2} = 19$  ohms, then  $C_2 = 2400 \mu\text{f.}$ ;  
 if  $X_{C1} = 100$  ohms, then  $C_1 = 450 \mu\text{f.}$

If it is difficult to get 2400  $\mu\text{f.}$  for  $C_2$ , we could let  $Q = 10$  and we would get the following values by using the above process:

$X_{L1} = 170$  ohms;  $L_1 = 7.0 \mu\text{h.}$   
 $X_{C2} = 34$  ohms;  $C_2 = 1200 \mu\text{f.}$   
 $X_{C1} = 150$  ohms;  $C_1 = 300 \mu\text{f.}$

Here is a case where practical considerations in

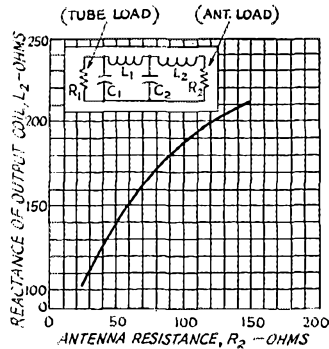


Fig. 6— Reactance of loading coil,  $L_2$ , as a function of antenna load resistance,  $R_2$  (for pi-L networks).

selecting components could dictate the use of lower operating  $Q$ s at the lower frequencies.

#### Using the Pi-L Network Charts

- 1) Choose the power amplifier tube type.
- 2) Select plate voltage and plate current.
- 3) Determine the tube load resistance from

$$R_1 = 500 \frac{E_b}{I_b}$$

- 4) Choose operating  $Q$ .
- 5) Choose antenna load resistance.

Then Fig. 3 gives the reactance of tuning capacitor  $C_1$ , Fig. 4 gives the reactance of tuning coil  $L_1$ , Fig. 5 gives the reactance of loading capacitor  $C_2$ , and Fig. 6 the reactance of loading coil  $L_2$ .

(Continued on page 104)

# A Pair of 45s in Push-Pull

BY KEITH S. WILLIAMS,\* W6DTY

• Here is a factual account that will bring back fond memories to old timers and perhaps a better appreciation of amateur radio to newcomers. We think you will enjoy reading about one phase of "the good old days."

THE other day a few of us were sitting around chewing the fat, mostly cussing QRM, 'phone, c.w., single sideband, narrow-band f.m., Novices, old timers, the FCC, the ARRL, and the like. Joe Twerp, a ham of fairly recent vintage, remarked, "Seems like everybody you work nowadays has a Monster III transmitter. I'll bet it's used by more hams than any other single rig in the history of radio."

There was a general nodding of heads, all except for me and Hiram C. Hartley. Hiram cut his teeth on rotary gaps and three-slide tuners and I was not far behind, having built a straight-gap spark rig that never amounted to much because spark rapidly fell into disrepute shortly thereafter. Hiram turned to me and said, "Mike, do you recall the 'Complete Amateur Transmitter for Forty-Five Dollars?'"

"I sure do! But who ever put forty-five bucks into one?" I answered. "Come to think about it, the push-pull 45 rig was so far out in front of any other rig that such an item as the Monster III should not be mentioned in the same breath."

Joe Twerp asked, "Was it called push-pull 45 because it cost forty-five bucks?"

Hiram was shocked. "Ye gods! Do you mean to say you never heard of a 45 tube? The 45 was a triode audio amplifier tube, never even remotely intended for use in r.f. circuits, which for a time was probably the most popular single vacuum tube ever used in ham transmitters."

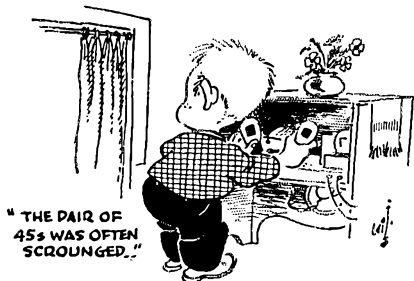
So Joe learned all about push-pull 45s; the discussion went on to other things and the session finally broke up. But I kept thinking about that old rig. Hiram's remarks had dredged up some pleasant memories.

History's Most Popular Ham Transmitter was first described in *QST* for November, 1930, in an article by George Grammer. Its immediate popularity was due to several causes, probably the most important being the Depression. It was pretty tough to keep beans on the table and a signal on the air at the same time. The standard transmitter of the day was a single 210 tube in a Hartley oscillator with 550 volts on the plate. This was a self-controlled transmitter, by the way, directly or inductively coupled to the antenna. Only rich guys had crystals and only a few were so far advanced technically that they could build a transmitter with two or more

stages. Type 10 tubes cost money, and the power supply necessary in order to get decent output was almost out of the question for the majority of hams, whose billfolds were completely flat.

A majority of broadcast receivers in 1930 used a pair of 45s in the audio output stage, with a Type 80 rectifier in a 350-volt power supply. Therefore, 45s and 80s were comparatively cheap and plentiful, and the corresponding power supply components were easy to acquire. The Type 45 had been a widely-used audio tube for some time, but the manufacturers stated emphatically that the tube was not suitable for use as an oscillator so hams hadn't tried it in transmitters.

Grammer's article in *QST* stated that all parts for the push-pull 45 rig could be purchased new for \$45.00 or less. Actually, the only parts ordinarily bought and paid for were the power transformer, filter choke and wet electrolytic filter condenser. All other parts, including the pair of 45s, were usually scrounged. (Many were the families who couldn't hear Morton Downey because Junior had pinched the 45s out of the b.c. set and was upstairs stoking them up on 80.) In

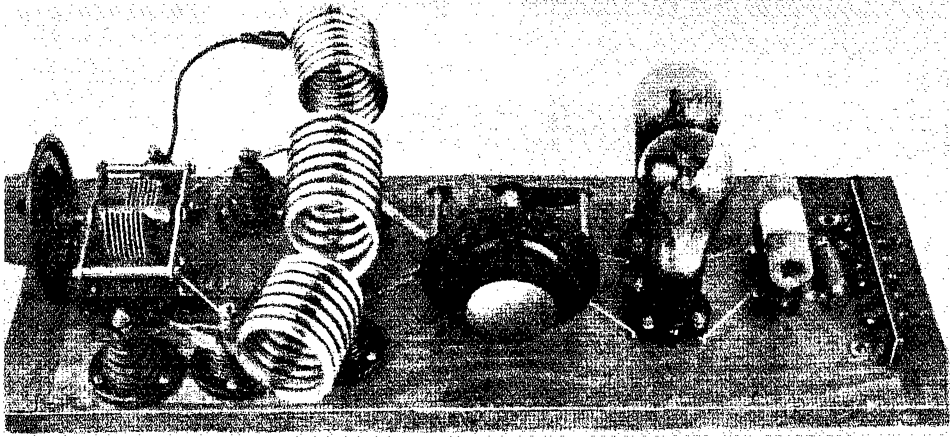


some cases the quarter-inch copper tubing for the tank coil had to be bought, but even this item could usually be managed without breaking the piggy bank. The rig was built on breadboard. Well, it was actually built on anything handy, but rigs in *QST* were always built on real, honest-to-gosh breadboards — the kitchen-cabinet variety. It was a push-pull self-controlled oscillator. It had a medium high-*C* plate tank for a modicum of frequency stability, an untuned grid coil, an antenna tuning condenser, and two or three small parts. It was simple to build and sure-fire in operation — the answer to a ham's prayer.

The appearance of this rig in *QST* coincided with a tremendous upsurge in the ham population. With the Depression, a large number of people found themselves with time on their hands. Those who couldn't get a steady job selling apples began to take up inexpensive hobbies in order to keep occupied while waiting for the NRA and the return of beer and light wines. Ham tickets began to be issued in droves. Commercially

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Here is the famous transmitter, as described in *QST* 25 years ago. The "beehive" stand-off insulators, the Cardwell tuning capacitors, the copper tubing coils and the tube sockets with binding posts were all familiar sights at that time, as was the true breadboard construction. The only components underneath the "chassis" were two filament by-pass capacitors, a center-tapped resistor, and the homemade plate-circuit r.f. choke.

built ham gear, except for a few items like the National Thrill Box and the Pilot Super Wasp,<sup>1</sup> was almost nonexistent and it was a rare would-be ham who could afford ready-made equipment, anyway. However, with Grammer's contraption you could get on the air for next to nothing and enjoy the thrill of talking to distant places by short-wave radio! Practically every new ham built the push-pull 45 transmitter and started out pounding brass on 80-meter c.w. Old timers who built a new rig in those days usually ended up with a pair of 45s in push-pull. Beginners generally started on 80 meters because self-excited transmitters usually tended to behave in a civilized manner on that band but could be unmanageable brutes on the higher frequencies. The push-pull 45 rig I had on the air in 1932 was very tame on 80 — most of the reports I received were either "PDC" or "NDC" and once in a while some liar would give me an "XTAL PDC" report<sup>2</sup> and I would like to bust with pride. But on 40 meters, although the rig put out gobs of r.f., the note sounded like a buzz saw ripping through knots; on 20 meters the 45s ran red-hot and smoking while putting out about two watts to the antenna. I must say others had better luck.

The receiver that was companion piece to the p.p. 45 rig was, almost without exception, a two-tube gadget consisting of regenerative detector and one stage of audio, with headphones. It was cheap and simple and always worked, although it suffered grievously from such diseases as microphonics (akin to Swiss bell ringing) and hand capacity (drive you clean out of your mind).

<sup>1</sup> The Thrill Box used an untuned r.f. stage, regenerative detector and two stages of audio; the coil(s) plugged in. The Super Wasp featured a *tuned* r.f. stage. The coils plugged in, and there were separate tuning controls for the r.f. and detector stages. — Ed.

<sup>2</sup> Before the R-S-T scale was adopted, tone reports ran "PDC" (pure d.c.), "NDC" (near d.c.), and "RAC" (interpreted as rectified a.c. and raw a.c.). "XTAL PDC" meant the signal sounded crystal-controlled or completely chirp-free and had no modulation.

Tubes used were always a pair of 201As, 199s, or 230s, with battery power supply. The most popular Hints & Kinks of the day concerned: (1) elimination of the terrific audio howl that occurred just as the detector went into oscillation, and (2) reduction of the hand-capacity nuisance. Hand capacity was pretty hard to lick. Moving your hand near the receiver would cause it to shift frequency in an alarming manner. Once you tuned in a signal you hardly dared move a muscle for fear the signal would shove off for parts unknown and never be heard from again. Many's the time I almost died of suffocation because I held my breath while copying a weak DX station.

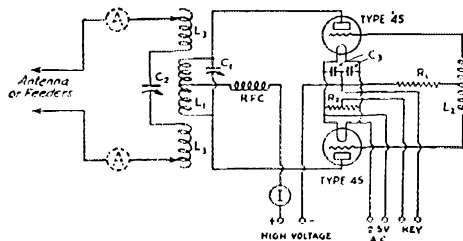


Fig. 1 — The circuit for "45a in push-pull."

When working a local, hand capacity was no bother because all other signals disappeared anyway. Usually, when a local station came on the band, your receiver completely collapsed; you just copied its grunts and gasps of pain.

Yes, indeed, that push-pull 45 rig was without doubt the most popular ham transmitter ever to be seen in W-land. After Hiram C. Hartley mentioned it the other day I got to pawing back among the stacks of old QSL cards stowed away on a closet shelf. I picked up a batch of old cards, circa 1932. Out of the first 38 cards, 24 cards said, "XMTR: PAIR 45s IN PP." That's 63 per cent, and I can easily believe that from 1931 to 1934 at least 63 per cent of all hams in this country were using that identical rig.

# A Transistorized Control Unit

Voice Control, Keying, and Other Control Functions  
in Compact Design

BY BRUCE E. PACKHAM,\* W3UWV

• The author calls this a "versatile little gadget," and we agree with him. Using a transistor as a current amplifier to operate a sensitive relay from minute currents, it offers a number of possibilities for on-off control in addition to the principal one of providing a compact, easily-built antitrip type voice control unit for 'phone break-in.

THIS ARTICLE describes a simple, effective, and compact control device that can be used for many purposes around the hamshack and one which is easily adapted to existing equipment. When used as a means of voice control, it can be used either at the home station or unplugged and used in a mobile rig. By connecting the speech input terminals to the output of a tape recorder it makes an excellent keyer for taped transmissions

decided to incorporate all of them in one compact unit. The original circuit utilized vacuum tubes, but it was felt that if the circuit could be transistorized, some additional advantages would be realized in portability and ease of operation. Essentially the circuit is designed and adjusted for voice control of a transmitter. Once adjusted for this mode of operation, no further adjustment is needed for its other uses.

## The Circuit

Reference to the schematic diagram of Fig. 1 will show that the circuit consists simply of two signal inputs which are rectified into opposing voltages and balanced out on the arm of the potentiometer,  $R_1$ . When the balance pot establishes this balance, the input circuits supply no current to the base or control element of the CK722 transistor. When the audio voltage applied to the "speech amplifier input" is greater

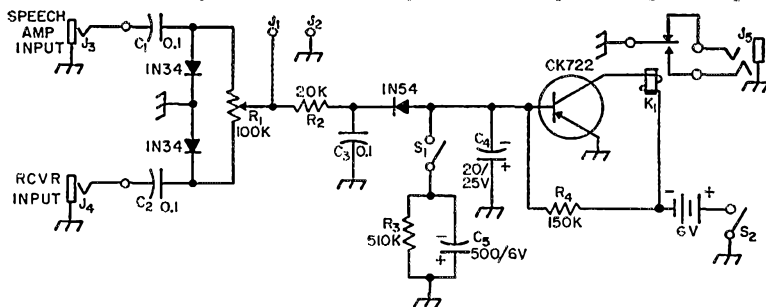


Fig. 1 — Circuit of the transistorized control unit.

$C_1, C_2, C_3$  — 200-volt paper.

$C_4, C_5$  — Electrolytic.

$R_1$  — 0.1-megohm potentiometer, linear taper.

$J_1, J_2$  — Tip jack (Johnson 105-602-1).

Capacitances are in  $\mu\text{f.}$ ; fixed resistors  $\frac{1}{2}$  watt.

$J_3, J_4$  — Open-circuit jack (Switchcraft No. 41).

$J_5$  — 3-circuit jack (Mallory SCA-2B).

$K_1$  — Sigma 4F, 5000-ohm coil.

$S_1, S_2$  — S.p.s.t. slide switch.

such as prepared messages for c.w. nets. Or connecting it to the output of a receiver provides a means of alarm, signifying that a station is on a particular monitored frequency.

The circuit evolved from a search for a simple means of keying a transmitter with a standard tape recorder. This was achieved by recording the Morse characters formed by an electronic key and audio oscillator on erasable plastic magnetic tape. Playing back the tape and rectifying the audio signal recorded gives a d.c. voltage that can be used to control a relay keying the transmitter. This is one of the uses for the gadget.

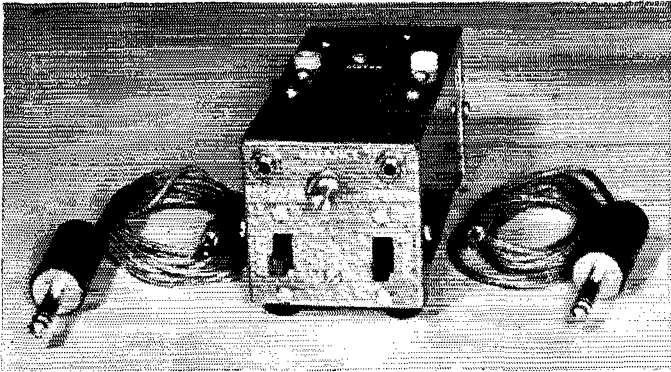
However, since then a few additional uses of the circuit presented themselves, such as voice-controlled break-in operation of a transmitter with receiver antitrip operation, and it was de-

than that applied to the "receiver input," this balance is upset and current will flow to the base of the CK722. The transistor acts as a sensitive milliampererelay by this microampere current flow.

The collector current is somewhere in the neighborhood of 600 microamperes in the idling condition, and rises to 1.2 milliamperes upon application of control voltage. The circuit is such that only a negative control current reaches the control element. The CK722 transistor provides a current gain of 10 to 12 while a high-alpha junction-type transistor such as the CK721 would provide a gain of 30 to 40. Clearly, a more sensitive circuit could be had by using the latter, but the CK722 is less expensive and does the job quite adequately.

Audio voltages from the speech-amplifier input

\* 5316 Plymouth Road, Baltimore 14, Md.



The control unit is assembled in a Minibox which also houses the penlight-cell power supply. Miniature jacks and plugs are used to introduce control signals from the receiver and speech amplifier.

and receiver input are applied to their respective rectifier circuits through coupling capacitors. These capacitors provide d.c. isolation between the audio sources and the rectifiers. The speech-amplifier audio is rectified into a negative voltage with respect to ground by a 1N34 diode in a standard half-wave rectifier circuit. Similarly, the receiver audio is rectified into a positive voltage by another 1N34 diode.  $R_1$ , the means of balancing between these two polarities, is adjusted during the initial installation of the device when used as a voice-control circuit.

The 20K resistor following the arm of the potentiometer was found to aid in giving additional filtering of the control voltage as well as providing protection for the transistor by limiting the current flow to the base. The 0.1- $\mu$ f. capacitor connected between this resistor and ground serves to "tie down" the cathode end of the 1N54 diode when an audio signal is applied to the inputs. Unless this capacitor is present, enough a.c. signal leaks through to be rectified by this diode and hence place a small undesirable bias voltage on the base of the transistor. The base of the CK722 must see only a negative voltage to avoid damaging the transistor as well as to insure proper operation. This is the purpose of the forward-connected 1N54 diode. This diode was chosen because of its high back resistance, thus assuring maximum protection to the transistor.

At this point you may feel that the circuit could be simplified for voice control still further by eliminating the positive supply, since we take pains to erase its effect on the CK722. While the positive voltage developed by the rectified audio from the receiver has no effect on the CK722, the sound from the receiver would excite the microphone and speech amplifier, thus generating a negative volt-



Side view with bottom of box removed. The sensitive relay is at the left, with the output jack mounted on the wall next to it. The battery is wrapped in tape to prevent short circuits and is wedged in place near the right-hand end. (Photos by E. Thornton Packham)

age. This would trip the relay if it were not for the opposing positive voltage at the arm of the potentiometer. True, we could eliminate the positive voltage supply and set the operating threshold value of the transistor high enough so that this would not happen except on very strong signal inputs. This, however, is a rather poor approach to true voice control.

The 150K resistor,  $R_4$ , biases the transistor to a collector current of approximately 600 microamperes. This means more sensitivity for the device since the rectified control

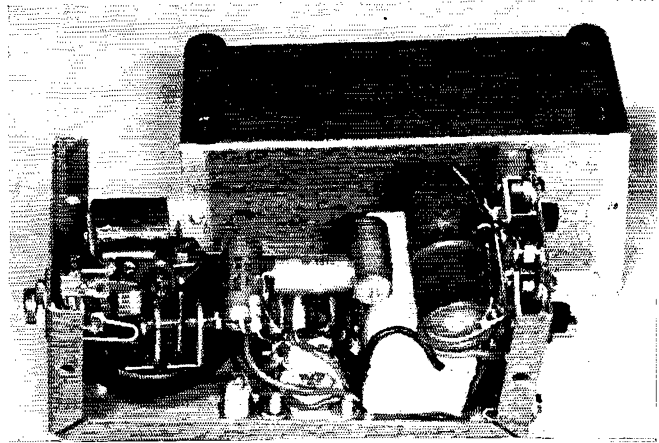
signal need only add a small quantity to this bias value to operate the relay.

The 20- $\mu$ f. capacitor is a necessity if smooth, chatter-free operation of the relay as a code keyer is to be secured. If the circuit is to be used only for voice-control purposes, this capacitor may be eliminated. The 500- $\mu$ f. capacitor and 510K resistor furnish the  $R/C$  network which holds the control bias on the base of the transistor needed to secure the delay time for voice-control operation. These component values were found to be adequate for a proper delay time at normal syllabic rate, but should they not meet your requirements, the 510K resistor may be raised or lowered to increase or decrease the delay. The switch,  $S_1$ , removes the network when the device is to be used for code keying and other purposes. The battery should last a long time since the maximum current drawn is 1.2 milliamperes.

### Construction

The gadget is housed in a  $2\frac{1}{4} \times 2\frac{1}{4} \times 5$ -inch Minibox. Most of the constructional details can be seen from the accompanying photographs. Placement of parts is not critical except that all parts must fit in a rather confined space. The relay is mounted in the bottom of the Minibox on three tubular spacers each  $\frac{3}{8}$  inch long. If the relay does not have a connection to one side of the contacts, provide one by soldering a fifth lead to the unused terminal and bringing this lead through a hole drilled in the base of the relay. The relay thus modified allows control of the receiver

(Continued on page 105)



# Using the Voltage Doubler

## A Simple Voltage-Regulated Supply for the VFO

BY WILLIAM L. BLAIR,\* W3ZKE

• A simplified discussion of the principles of voltage-doubling circuits and voltage-regulator tubes for the beginner. Included is an example of practical application in a small power supply for a VFO.

As the Novice proceeds in his thinking and planning about the "big rig" he will have after attaining his General ticket, one of the considerations will naturally be the type of variable-frequency oscillator, or exciter, which he will use to drive the final. There are many good circuits in the literature today which will fill the bill nicely. In addition, there are available several good pieces of surplus military equipment which, with minor modifications, serve the purpose of a stable VFO. However, any of these is only as good as its power supply, for stability of the oscillating frequency is usually very dependent on the regulation of the voltage applied to the plate of the oscillator tube.

The circuit to be described and illustrated in this article delivers just such a regulated voltage at a minimum of cost and effort, and its construction serves to acquaint the builder with the operation of voltage doublers as well as the voltage-regulator tube.

The author decided to make use of a Command-series transmitter as a VFO. For the 80-meter amateur band, either the T-19/ARC-5 covering from 3 Mc. to 4 Mc., or the BC-457 covering from 4 Mc. to 5.3 Mc., may be used with very little modification. The major re-

\* % Haller, Raymond and Brown, Inc., State College, Pa.

quirement for putting either of these units into operation is an adequate power supply. The high-voltage supply may be of the standard type, with an output of from 500 to 750 volts. However, the supply used for the oscillator plate and screen of the amplifier tube should deliver about 210 volts at 35 ma. and have good regulation.

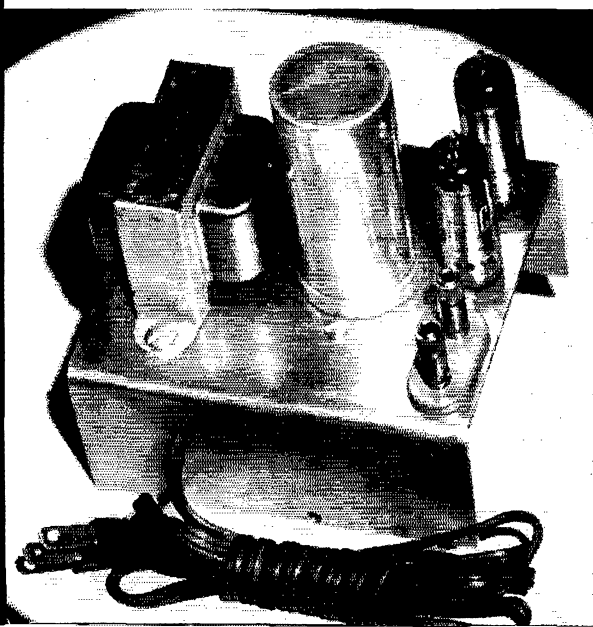
The junk-box parts which were available dictated, in part, the type of supply which was built. It was felt that an isolating transformer was necessary as a matter of safety. The only transformers available were of 1:1 ratio with a 40-ma. rating. In other words, with 115 volts on the primary, the secondary delivered about 115 volts under load. This was only about half of the required 210 volts, so it was decided that a voltage-doubler circuit was the answer. However, as usual, one does not get something for nothing. In doubling the voltage, the current which may be drawn from the transformer is cut in half. Thus, two of the small 1:1 transformers were connected in parallel. These transformers are inexpensive and are available from supply houses as TV booster transformers.

### Circuits

There are several different voltage-doubler circuits in common use and it was felt that a brief look at a few of them might be beneficial before selecting the one for the regulated supply. The circuit in Fig. 1A illustrates one type of voltage doubler. It has the advantage that, if the unit is operated directly from the a.c. line, one side of the output is common with one side of the input and may be connected so that this common side is grounded. A disadvantage is that the output is equivalent to that from a half-wave rectifier and should have further filtering circuits to smooth out the a.c. ripple.

Before beginning to analyze these circuits, it might be wise to clear up any possible confusion in the beginner's mind over the symbol used to represent a selenium rectifier in a schematic drawing. The conventional symbol for a selenium

◆  
A simple voltage-regulated supply for the beginner. This top view shows one of the two isolating transformers, the dual electrolytic capacitor, and the two 0B2 regulator tubes.  
◆



QST for

rectifier has an arrowhead pointing in the direction of least resistance. The arrow head corresponds to the plate in a tube rectifier, and the bar corresponds to the cathode. If this is kept in mind, the operation of these voltage-doubler circuits is very simple.

Looking again at Fig. 1A, it will be seen that, when the alternating input voltage swings negative (upper terminal negative in respect to the lower terminal), selenium rectifier  $CR_1$  passes electrons against the arrowhead and charges capacitor  $C_1$  to nearly peak line voltage, or about

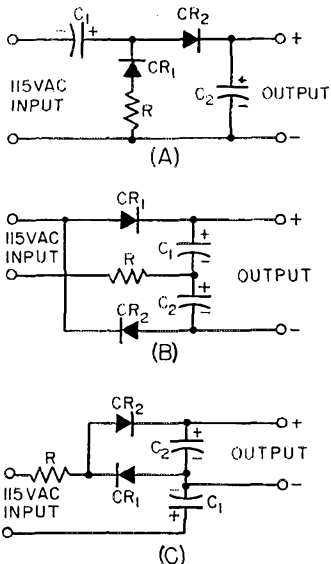


Fig. 1 — Typical voltage-doubler circuits.

150 volts. Resistor  $R$  limits the surge current when  $C_1$  first charges. If the capacitor is electrolytic, it must be connected with the polarity shown in the diagram. The capacitor then is charged with its left plate negative and its right plate positive. During the next half cycle, when the input polarity is reversed, the 150 volts across  $C_1$  is actually connected in series with the line-voltage source and the total voltage across  $CR_1$  is twice peak line voltage, or about 300 volts. However,  $CR_1$  will not pass electrons, for they cannot flow in the direction of the arrow. But, at this point,  $CR_2$  does conduct, and proceeds to charge capacitor  $C_2$  to nearly 300 volts. This process repeats once each cycle of the line voltage and is therefore similar to a half-wave rectifier output. The working voltage of  $C_2$  obviously must be twice that of  $C_1$ , or on the order of 400 volts as a minimum.

Another voltage-doubler circuit is illustrated



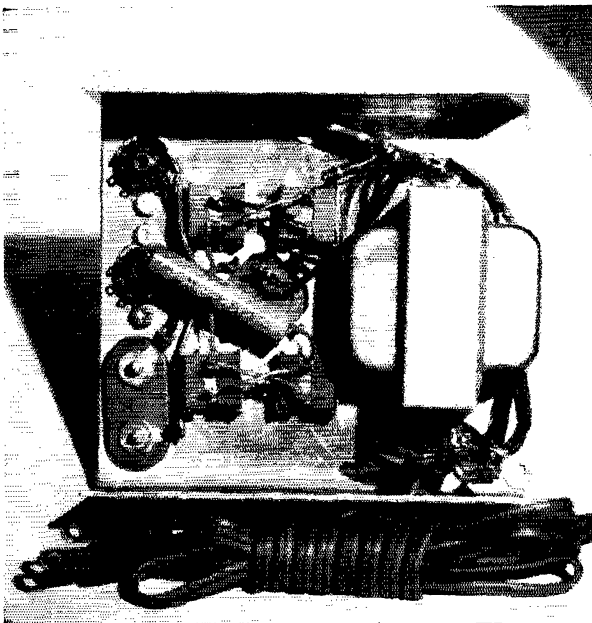
Bottom view of the simple voltage-regulated power supply. The second isolating transformer is mounted underneath the chassis, along with the selenium rectifiers.

in Fig. 1B. From some standpoints, this is one of the best circuits for achieving a multiplication of voltage. It is equivalent to a full-wave rectifier, and it has no capacitors in series with the output. This means that a minimum of filter is required to eliminate a.c. ripple.

In this circuit, when the line voltage swings positive,  $CR_1$  conducts electrons to the left, charging  $C_1$  to about 150 volts with the polarity shown. During the negative half cycle,  $CR_2$  conducts electrons to the right, and charges  $C_2$  to 150 volts as shown.  $R$  again limits surge-current flow through the rectifiers. Now it may be seen that  $C_1$  and  $C_2$  each have a charge equal to peak line voltage and, since they appear connected in series aiding at the output terminals, this voltage under no-load conditions is almost 300 volts. Of course, as current is drawn from any of these voltage doublers, the capacitors maintain an average charge somewhat less than peak, and the output voltage drops off fairly rapidly. If moderately large capacitors are used, currents on the order of 100 ma. are easily obtained without excessive loss of voltage.

As a last example of a voltage-doubler circuit, refer to Fig. 1C. Here  $C_1$  is charged through  $CR_1$  during the negative half of the input cycle, and then its charge is effectively in series with the line voltage during the positive half of the cycle, at which point  $C_2$  is charged to twice the peak line voltage through  $CR_2$ . This is again similar to a half-wave rectifier and has the disadvantage of a series capacitor in the output. However, it does have one convenient advantage. The two capacitors have their negative terminals connected to a common point. This means that both size and cost may be conserved by using a dual capacitor with a common negative terminal. If a filter network consisting of a choke, or resistor, and another capacitor is desired, a triple-unit capacitor may be used, since all three will have a common negative terminal.

Since space was at a premium and the current requirement of the BC-457 was only moderate, the circuit selected for this regulated power



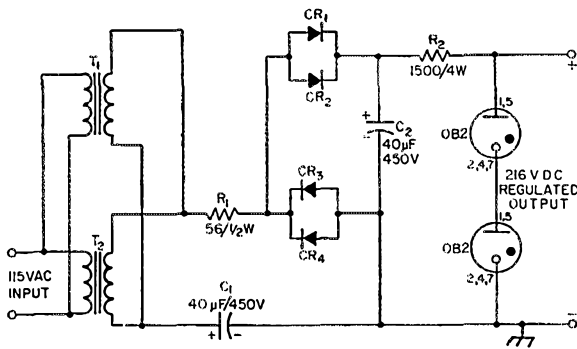


Fig. 2—Circuit of the simple voltage-regulated power supply. Each pair of 130-volt 35-ma. selenium rectifiers may be replaced with a single 130-volt 65-ma. unit. The capacitors may be separate units, or combined in a dual unit.  $T_1, T_2$ —Isolation (TV booster) transformer, 115-volt primary, 115-volt secondary, 35 ma. or greater (Triad R-30X, Merit P-3045, Chicago PV-50A, Thordarson 22R12, etc.). These two transformers may be replaced with a single unit of higher-current rating, such as the Merit P-3096 or UTC R-72.

supply was that of Fig. 1C. Fig. 2 shows the actual circuit used. As mentioned earlier, two transformers were used in parallel to supply the required current, since these were already on hand. For the same reason, four 35-ma. rectifiers were used where only two of 50-65 ma. capacity would have sufficed. If one is planning to build this unit using newly-purchased parts, it is recommended that adequately-rated single components be used for the transformer and selenium rectifiers in the interests of economy.

### VR Tubes

Since voltage-regulator tubes have the property of maintaining a relatively constant voltage across them, regardless of the current through them within certain limits, they act as very good a.c.-ripple filters and, consequently, no further filtering was necessary in this supply. Selecting the proper value of  $R_2$  is very important in obtaining the desired regulation, so a brief explanation of the operation of a voltage regulator may be in order.

A voltage-regulator tube consists, generally, of a cylindrical plate surrounding a small-diameter rod cathode, and is sealed in an inert gas atmosphere inside of a glass envelope. If a certain minimum "firing" voltage is applied across the tube (positive to the plate and negative to the cathode), the gas ionizes and a current flows from the cathode to the plate. That is, electrons are freed from the gas atoms and are attracted toward the positive plate. At the same time more electrons leave the cathode and recombine with the electron-shy atoms, or positive ions. The result is a steady flow of electrons into the cathode terminal and out of the plate terminal.

The 0B2 used in this circuit has a minimum firing potential of 133 volts or, for two in series, 266 volts. Once the tubes conduct, the voltage across each tube drops to 108 volts and will remain within  $\pm 1$  volt of this value over a range of 5 to 30 ma. through the tube.

If the total voltage across the two 0B2s tend to rise with changing load, the tubes immediately draw more current in proportion to the increase in voltage. This increase in current must flow through  $R_2$ , and consequently causes an increase in voltage drop across  $R_2$ , with the result that the voltage across the voltage-regulator tubes remains very nearly constant.

In using this regulated power supply, with the BC-457 surplus transmitter serving as a variable-frequency oscillator, it was decided to key the 1626 oscillator tube. When the key is open in the arrangement used, there is a minimum of about 10 ma. being drawn from the supply by the screens of the r.f. amplifier tubes and, when the key is closed, the maximum load is about 35 ma. The difference between the maximum and minimum loads, or 25 ma., must be absorbed by the voltage-regulator tubes when the key is open. The tubes will extinguish if less than 5 ma. load flows through them, and it is wise to allow another 5 ma. as a safety factor. Therefore, when the transmitter exciter is drawing its maximum load from the power supply,  $R_2$  must be of such a value that approximately 10 ma. flows through the VR tubes at the same time. Then, when the key is opened, the load change of 25 ma. is added to that already flowing through the VR tubes, making a total of about 35 ma. This is 5 ma. more than the manufacturer's rating for this tube, but amateur equipment is generally used much more intermittently than commercial equipment, and this small overload will not shorten the tube's life appreciably.

$R_2$  has been selected to give proper operation under these particular load conditions. If a greater load is imposed on the power supply, the VR tubes will extinguish and the output will no longer be regulated. Regulation may be restored by decreasing the value of  $R_2$ .  $R_1$  again limits the surge current through the selenium rectifiers and its value is not critical.

See You in the

A. R. R. L.

SS

Rules on Pages 44-45

# Reading Circuit Diagrams

## Some Whats and Whys of Circuit Diagrams

BY LEWIS G. McCOY, WIICP

• You have to learn a sign language in ham radio: the schematic symbols. It really isn't as tough as it seems at first, although there are some misconceptions you might acquire along the way. Here is the Rosetta Stone and the warnings about the misconceptions.

To a newcomer a schematic diagram may look, at first glance, like the hieroglyphics one would expect to see on the walls of an Egyptian tomb. However, as one learns to identify schematic symbols, schematic diagrams become easy to follow. Every amateur should learn to read circuit diagrams. It is required knowledge for some of the questions in the General and Extra Class FCC exams.

Before going further in the discussion of circuit diagrams, let's clear the air on one very important point. Contrary to the opinion of many amateurs, a circuit diagram is *not* a constructional diagram. In other words, if the circuit diagram shows a vacuum tube with a coil to its left and a transformer to its right, the three components do not have to be mounted on the chassis in that relationship. Sometimes there are good reasons for laying out the components in much the same relationship that they have in the circuit diagram, but more often than not there are good reasons for not doing it that way. The circuit diagram merely shows what components are connected to what other components, and whether by means of wires or through the metal chassis. The experienced builder translates the information given in the diagram into wiring instructions of a sort. Circuit diagrams might well be considered a type of road map. What we hope to accomplish in this article is to show what the symbols represent, and how a schematic diagram should be interpreted.

### Schematic Symbols

A confusing thing for the beginner to understand is the ground symbol in a diagram. He immediately thinks of earth as a ground, and while that assumption is correct, the term "ground" in radio usually means the reference point in a circuit. In other words, assuming we have a transmitter wired and mounted on a metal chassis, all voltages both positive and negative are measured from the chassis. We think of the chassis as "ground," or as having a potential of zero volts with respect to ground. The circuit symbols for a chassis connection and for an actual connection to earth are shown in Fig. 1. Inci-

dentally, and this point should be remembered, up to April of this year the symbol for chassis connection and earth connection were the same in A.R.R.L. publications. At that time, *QST* adopted the new symbols of the American Standard. Not all radio publications have as yet adopted these standards, so the builder should take this point into consideration when reading a schematic diagram.

A photograph is worth a thousand words and, in this article, we have elected to show the various components in photographs with the corresponding circuit symbol given alongside each one. Some of these components can bear a little further explanation. For example, the circuit symbol for a capacitor is sometimes confusing to the newcomer. This is probably due to the many different types of capacitors that are represented by the same symbol. If you will look at the photograph showing capacitors, you'll

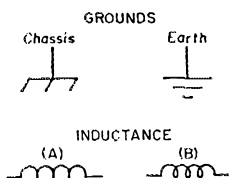


Fig. 1 — Shown above are the symbols for chassis or earth ground connections. There are two approved methods of drawing an inductance either with the closed loops (A), or with open loops (B).

notice that there are several different types that use the same symbol. The constructor will find that the type needed for a particular application will be shown on the diagram or in the text describing the unit.

There are two common types of resistors, fixed or adjustable. The fixed resistor can be either a single resistor with no taps, or it can be tapped at different points. When it is tapped, the resistor is shown with lines connected to its body. The placement of the taps in the symbol has no particular significance, but merely indicates that the resistor is tapped.


An adjustable resistor can have a slider which makes contact with the resistance element of the resistor. The slider is indicated by an arrow either touching the symbol for the resistor or drawn through it.


Notice that in the photograph showing adjustable inductances are drawn with arrows and fixed taps with lines. As with resistors, the placement of the taps merely indicates that the coil is tapped. The description or caption of the drawing will indicate the correct placement of the taps.


Another stumbling block for Novices is tube

# SCHEMATIC SYMBOLS USED

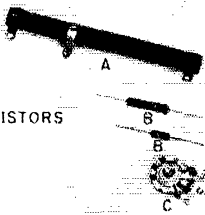
**BATTERIES**





**SINGLE CELL**  



**MULTICELL**  


**RESISTORS**




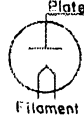
**A-TAPPED**  


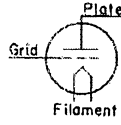
**B-FIXED**  


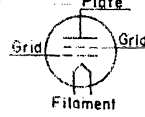
**C-ADJUSTABLE**  


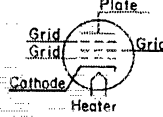
**VACUUM TUBES**



**DIODE**  


**TRIODE**  


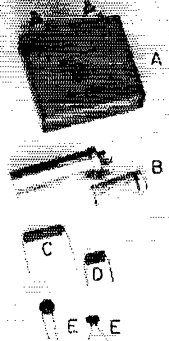
**TETRODE**  


**PENTODE**  


**CAPACITORS**


**Fixed**

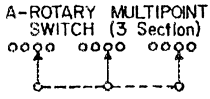
A - Oil-Filled Paper  
 B - Electrolytic  
 C - Paper  
 D - Mica  
 E - Ceramic

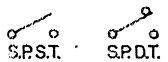



**Variable**


F - Trimmer  
 G - Single-Section  
 H - Split-Stator




**A-ROTARY MULTIPPOINT SWITCH (3 Section)**  


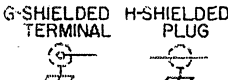
**B-TOGGLE SWITCH**  


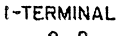
**C-COAX CABLE**  


**D-SHIELDED WIRE**  


**COAX CONNECTORS**

**E-RECEPTACLE F-PLUG**  


**G-SHIELDED TERMINAL H-SHIELDED PLUG**  


**I-TERMINAL**  




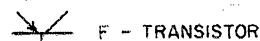
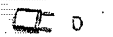
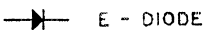
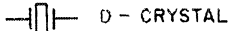
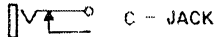
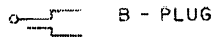
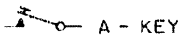
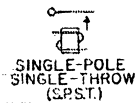
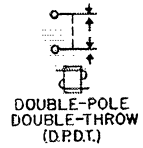
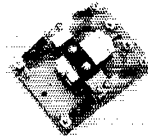
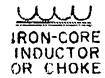
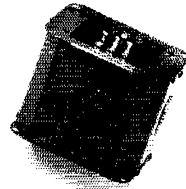
# IN CIRCUIT DIAGRAMS



METERS

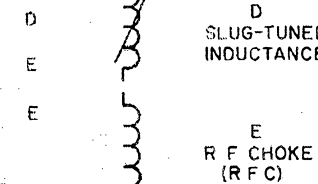
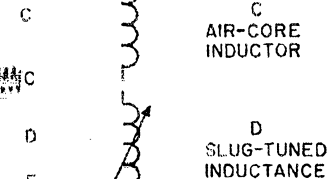
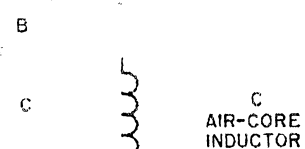
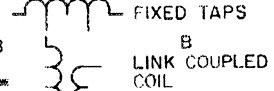
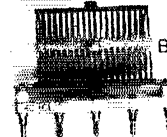


# INSERT APPROPRIATE DESIGNATIONS  
 A - AMMETER  
 V - VOLTMETER  
 MA - MILLIAMMETER  
 ETC.



F

## INDUCTANCE



base numbering. There are two common types of tubes used currently, miniatures and octals. Upon examination of an octal tube socket, it will be found that the center guide hole has a slot in it. This insures that the tubes will always be inserted with tube pins in the correct holes in the socket. Looking at the *bottom* of the socket, the pins are numbered clockwise starting from the slot. With miniature tube sockets it will be found that one space between the pin holes is greater than the other spaces. Again looking at the bottom of the socket, the pins are numbered clockwise starting from this large gap.

It is common construction procedure to use a single multisection switch to perform various functions in a circuit. In the schematic the usual custom for designating the different sections is by the letter "S," then a number, and then a subscript letter indicating each section. For example, a four-section switch would be shown as  $S_{1A}$ ,  $S_{1B}$ ,  $S_{1C}$ , and  $S_{1D}$ . In addition, it is common procedure to show the sections are ganged by drawing a dotted line from section to section, although this is not always done.

The contacts of a multi-contact switch section can be drawn either in a circle (as they actually are in a wafer section) or, in a straight line such as is shown in the photograph.

### Component Designations

The present *QST* style of marking component values on circuit diagrams is aimed at making diagrams as easy to read as possible. Values are marked alongside the components in the diagram and all tube pins are numbered. The numbering of tube connections saves the reader the tedious job of looking up base connections. When a component is discussed in the text or shown in a parts table, the component is marked with an identifying letter and number such as  $C_1$ ,  $R_1$ , etc.

Variable capacitors are usually marked with their maximum value. The following list shows the breakdown of values as used by League publications:

1-999 micromicrofarads — shown as a whole number such as 47  $\mu\mu\text{f.}$ , 470  $\mu\mu\text{f.}$ , 680  $\mu\mu\text{f.}$ , etc.

1000  $\mu\mu\text{f.}$  and above — shown as a decimal or whole number such as .001, .005, .01, .5, 2, 20, etc. (1000  $\mu\mu\text{f.}$  equals .001  $\mu\text{f.}$ .)

1-999 ohms — whole number is used, as 10 ohms, 680 ohms, 820 ohms, etc.

1000-999,000 ohms — shown as a number with a 1000 multiplier, the multiplier designated by the letter "K," as 1K, 15K, 68K, 560K, etc.

1 megohm and above — shown as a number followed by "meg.," as 1 meg., 2.2 meg., 4.7 meg., etc.

1-999 microhenrys — shown as a whole number, as 10  $\mu\text{h.}$ , 200  $\mu\text{h.}$ , etc.

1-1000 millihenrys — shown as a whole number, as 1 mh., 2.5 mh., etc. (1000 microhenrys equal 1 millihenry).

### Interpreting the Schematic Diagram

In order to convert a schematic diagram into a working unit, one must try to visualize the

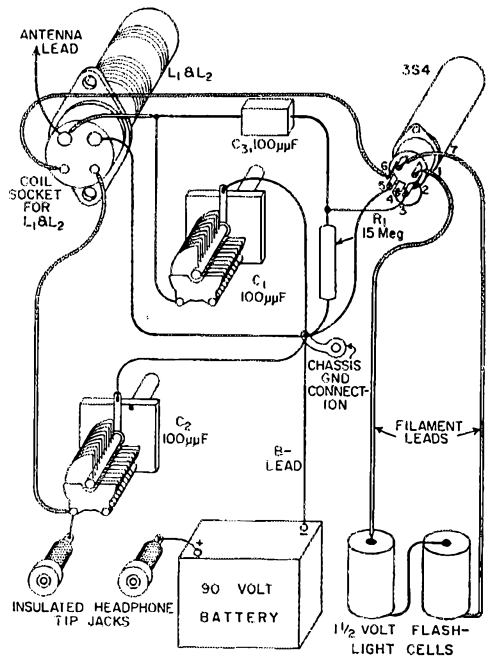
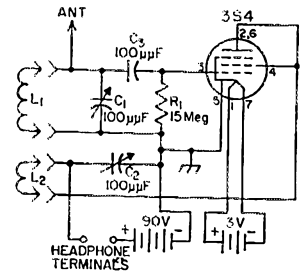


Fig. 2 — Pictorial (above) and schematic diagrams of a one-tube receiver.



various components involved and how they will be mounted and wired. One way of illustrating this procedure is to take an actual circuit diagram and compare it to a pictorial diagram of the same unit. For an example, let's take the one-tube regenerative receiver described in *How To Become A Radio Amateur*, a booklet published by ARRL.

In Fig. 2 we see the pictorial diagram and immediately below, the schematic for the same unit. The only item missing from the pictorial is the metal chassis on which the parts would be mounted. Studying the schematic, we can see how the various components are connected together. Incidentally, when two lines in the schematic connect to each other, the connection is shown by a dot. When they cross over each other but do not connect, there is no dot. By comparing the schematic to the pictorial, we can see the type of components the designer elected to use in this particular unit.

The beginner in radio will probably ask, "Why not use pictorials to describe all equipment?" Just stop and ask yourself how com-

(Continued on page 108)

# • Recent Equipment —

## The Model 380 T-R Switch

VARIOUS approaches have been tried to permit using the same antenna for transmitting and receiving, ranging from a changeover switch or relay to various electronic devices. For true break-in operation, as can be achieved with c.w. or voice-controlled 'phone break-in, it is desirable to use something that works faster than a switch or relay, and thus the electronic approach is indicated. The Model 380 T-R Switch is certainly an answer.

The name "T-R" switch is an abbreviation of "transmit-receive" and first came into popular usage in radar in the '40s. To the best of our knowledge, the first person to describe a tube as the coupling element between receiver and transmitting antenna for break-in purposes was Tom Puckett, as outlined in his c.w. break-in system in *QST* for February, 1955. Here a triode was used as a grounded-grid amplifier between antenna and receiver, and when the transmitter was on a high bias was applied to the tube, effectively cutting it off and letting very little r.f. through. The Model 380 T-R Switch is a considerable simplification of the idea, since it lets the tube de-

3.5 to 30 Mc. is obtained through the use of a special ferrite-cored transformer,  $L_1$ , which is loaded by the 1000-ohm resistor. Any incoming signal that exceeds the cathode bias, such as the signal from one's transmitter, is rectified in the grid circuit and applied as additional bias through  $L_1$ . Consequently, little power reaches the receiver. The manufacturer states that the unit

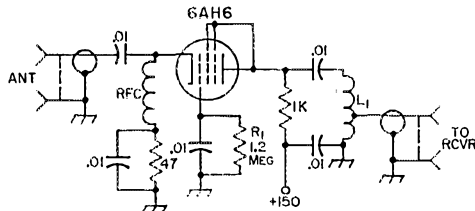


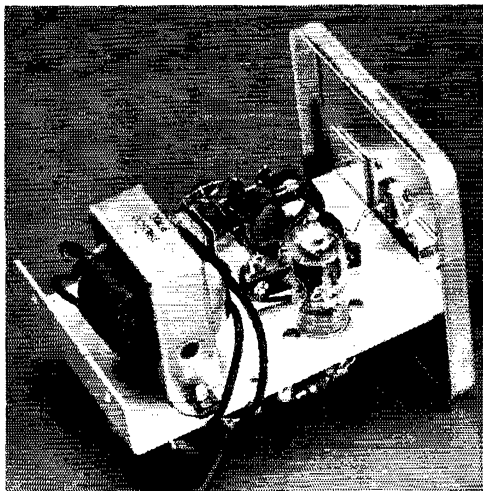
Fig. 1 — Partial schematic diagram of the Model 380 T-R Switch. The input side (marked ANT) connects to the coaxial cable running from the transmitter to the antenna. A T-type coaxial connector is convenient for the job.

will handle a kilowatt. It is intended for use in a 50- to 75-ohm line.

But don't get the impression that some people have, that a T-R switch of this type completely eliminates the signal to the receiver. Enough gets through to block the receiver, but it is well below the level that might be harmful. If you want to use the receiver for direct monitoring of your signal, some additional means must be provided for reducing the receiver gain.

For those who might worry about the attenuation of the unit on receiving, the manufacturer states that the gain varies from about 6 db. at 3.5 Mc. to 0 db. at 30 Mc. Those who are already planning to duplicate the unit will be pulled up short by the realization that they don't have access to a broad-band transformer such as  $T_1$ , but this could be overcome by designing the circuit for the band in use.

The unit is complete with its own power supply, and the manufacturer points out that the Model 380 T-R Switch is a "fail-safe" device — if you forget to turn it on and the transmitter is on, practically no energy can reach the receiver. Although no mention is made of it in the instructions we received with the unit, it seems likely that the unit should be connected in the line between the transmitter and low-pass filter or antenna coupler, since the grid rectification would generate harmonics that might cause TVI. Although it isn't shown in Fig. 1, chokes are used in the 6AH6 heater circuit. We understand from the manufacturer that these were included to eliminate some harmonics that got out via the power transformer and a.c. line. The addition of the switch has a



The chassis of the T-R Switch serves as a shield between the output and input (not visible) coaxial connectors. The r.f. choke partially visible under the chassis is in the cathode circuit of the grounded-grid amplifier. The black doughnut-shaped object in back of the tube is the ferrite core of the output coil.

velop its own bias through grid rectification. The circuit is shown in Fig. 1.

Referring to the circuit diagram, a triode-connected 6AH6 is used as a grounded-grid amplifier. Cathode bias is obtained across the 47-ohm resistor, to give an operating bias for receiving conditions. All-band operation from

very slight effect on the s.w.r. and, of course, only from the switch back to the transmitter.

Some hams will have to revise their transmitters slightly when they use a T-R switch of this type. If the output stage of the transmitter draws plate current with the key up, the noise level in the receiver will be high, because the transmitter stage acts like a diode noise generator and it is closely coupled to the receiver through the T-R switch. This is something the s.s.b. gang discovered almost as soon as voice-controlled break-in was used, but it may come as

a shock to anyone who has worked "break in" with a small receiving antenna reasonably remote from the transmitting antenna. The problem is, of course, not at all serious—it is just pointed out here in the hope that it will prevent a few letters about "noisy T-R switches." Actually, the 380 switch does not degrade receiver performance in any way and, in many cases, reception will be improved through the use of the better antenna and the additional gain.

The Model 380 T-R Switch is manufactured by Barker & Williamson, Inc. — B. G.

## Model 370 Single-Sideband Receiving Adapter

SELECTABLE-SIDEBAND receiving methods have been available to us since 1941, when J. L. A. McLaughlin first described his invention in *QST*. They didn't enjoy very widespread use in amateur circles until the current interest in s.s.b. transmission developed, despite the availability of a commercial unit by Millen and several *QST* how-to-do-it articles. The revived interest occasioned by s.s.b. centered primarily around units using an audio phase-shift network to obtain the effective selectivity, thanks to the groundwork of Don Norgaard and a couple of commercial units (YRS-1 and the Signal Slicer). Receiver manufacturers are picking up the need for selectable-sideband selectivity in current receivers, as evidenced by the latest Collins and Hallicrafters products.

Before you get too confused as to just what selectable-sideband reception is, a word of explanation is in order. Basically, it is a receiving method whereby an operator can, by the simple flick of a switch, listen to one or the other of the two sidebands of an a.m. signal. When QRM is present, he listens to the sideband that has the

of s.s.b. signals, but bear in mind that they are primarily devices for better a.m. reception. Since an a.m. signal has identical information in two channels (the two sidebands), selectable-sideband reception gives you two chances at QRM-free reception instead of one, if you can select the sideband to copy.

The Model 370 Single-Sideband Receiving Adapter utilizes the basic McLaughlin principle, with the addition of a few operating features that have been found useful in the last few years. Referring to the block diagram in Fig. 1, the receiver's high-level i.f. output is fed to the grid of a 6K8 mixer tube. One of two oscillator circuits can be switched in at will (Positions SB1 or SB2) to put the oscillator frequency 17 kc. higher or lower than the receiver i.f. The mixer output then passes through a filter so sharp (see Fig. 2) that only one sideband of an a.m. signal can get through. The resultant signal is amplified in the 6A8 and then rectified in the 1N34 diode detector. Two stages of audio and a built-in loudspeaker complete the signal path.

If the receiver is tuned to an a.m. signal so

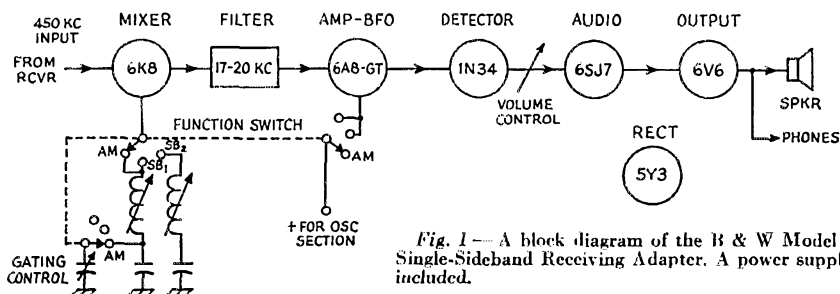


Fig. 1—A block diagram of the B & W Model 370 Single-Sideband Receiving Adapter. A power supply is included.

lesser amount of interference. The "flick of a switch" mentioned above is important, since it is an operating convenience that for years McLaughlin has argued is quite important. One can obtain somewhat the same effect through the use of a BC-453 "Q5-er" but not by the flick of a switch—it is necessary to retune the Q5-er or the receiver. Methods that give good selectable-sideband reception also give good reception

that its carrier is at 450 kc. in the i.f., one sideband can pass through the sharp filter when the 6K8 oscillator is 17 kc. higher in frequency (467 kc.), and the other sideband is accepted when the 6K8 oscillator is 17 kc. lower (433 kc.). Perhaps it can best be illustrated by the sketch of Fig. 3. Fig. 3A shows the a.m. signal as it exists in the receiver, 3B and 3C show the inversion of the sidebands depending upon the

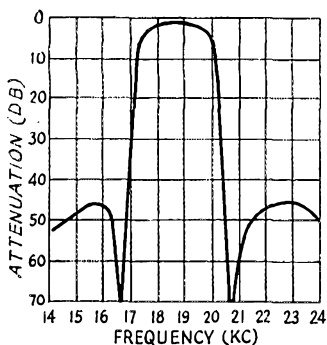


Fig. 2—The selectivity characteristic of the band-pass filter used in the adapter. Toroid coils are used for inductors.

oscillator frequency, and 3D shows that a narrow filter will pass only the one sideband. Since the filter is always at the same frequency, it is obvious that switching the oscillator frequency switches the sideband falling within the filter. It is, of course, necessary that the receiver be tuned so that the desired carrier falls right at 450 kc. in the receiver i.f. amplifier.

The principle is not confined to receivers with a 450-kc. i.f.—this was just a number we picked to make the arithmetic simple. The Model 370 can be used with any receiver that has an i.f. between 450 and 500 kc., since the oscillator circuits are adjustable within the adapter and will be aligned properly by the user. The only other requirement of the receiver i.f. amplifier is that it be able to deliver signals at a level of around 2 volts, which is quite reasonable for any communications receiver worthy of the name.

In order not to confuse you, we left out a few things in the preceding explanation. As you may have noticed from the block diagram, turning the switch to either SB1 or SB2 also turned on the b.f.o. portion of the 6A8 stage. With this b.f.o. set at 17 kc., the incoming carrier was at zero beat and all that its presence did was to give "exalted carrier" reception of the signal. If the receiver wasn't tuned properly and the incoming carrier did not fall exactly on 450 kc. in the i.f., the resultant beat note would tell you so. Exalted-carrier reception is useful in the reception of weak a.m. signals in the presence of adjacent strong ones. And, of course, if the carrier never was there, as in the case of an s.s.b. signal, the ex-

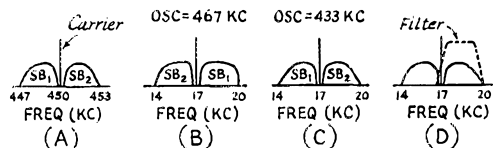
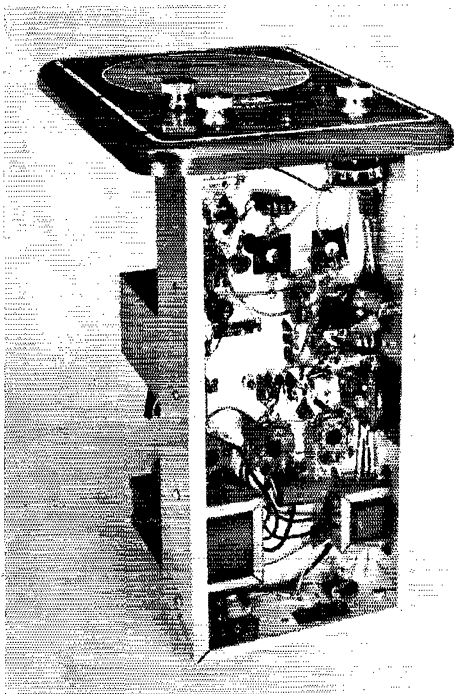


Fig. 3—The principle of selectable-sideband reception. (A) An a.m. signal as it appears in the receiver i.f. (B), (C) Depending upon the local oscillator frequency, the signal of (A) is or is not inverted at the lower frequency. (D) The filter characteristic superimposed on the signal, showing how only one sideband is passed.

planation shows how it gets back and in the right relative position (except that there is no warning heterodyne of receiver mistuning, but the resultant unintelligible signal is warning enough!).

For a.m. reception (without exalted carrier), the b.f.o. is switched off and a trimmer available at the panel is switched in. The manufacturer calls this the "gating control"—its effect is to move the filter characteristic across the incoming a.m. signal without the need for touching the



The apparent simplicity of the Model 370 single sideband receiving adapter is very misleading when contrasted with the job it does. In this view the band-pass filter (the heart of the unit) can be partially seen at the left-hand side of the chassis top. Under the chassis components of interest include the printed-circuit in the audio section (square wafer just above the 10- $\mu$ f. electrolytic between the chokes) and the two toroid coils used in the low-pass r.f. filter (right-hand wall). The large circular area at the top of the panel is the loud-speaker grill cloth.

receiver tuning control. Thus one or the other sideband of the incoming signal can be examined, and an interfering signal can be rejected if it isn't too close in frequency. In this condition, the carrier of the incoming signal must fall within the filter or there will be nothing for the sideband to beat against in the detector, so the limits of useful excursion of the gating control are those that drop the carrier outside the filter. The actual excursion is more than twice this usable value.

The Model 370 measures 8 inches wide by 12 inches high by 13½ inches deep, so it isn't too hard to find table room for it. The front panel carries the speaker, 'phone jack, volume and gating controls and the function switch. A

(Continued on page 136)

# Announcing the 22nd ARRL Sweepstakes

Certificates to C.W. and 'Phone Winners in Each Section  
and to Top Club Scorers; Special Novice Awards

## CONTEST PERIODS

Time	Start	End
	Nov. 12th & 19th	Nov. 14th & 21st
EST	6:00 P.M.	3:01 A.M.
CST	5:00 P.M.	2:01 A.M.
MST	4:00 P.M.	1:01 A.M.
PST	3:00 P.M.	12:01 A.M.

It's time to ready your station for the 22nd ARRL Sweepstakes. The contest provides you with the opportunity to pit your skill against the best operators in your section, and to pick up states and provinces needed for WAS and WAVE. Every licensed amateur in every ARRL section is urged to participate. Whether or not you're a League member, you are invited to get into the SS. All scores reported in accordance with the rules will be listed in a tabulation of final results in *QST*.

The rules are the same as last year. The contest period will run over two consecutive week ends, with a maximum allowable total operating time of 40 out of the possible 66 hours for each entry ('phone or c.w.). You may take part on both 'phone and c.w., but please submit separate logs for each mode.

Certificates will be awarded to c.w. and 'phone winners in each of the 73 ARRL sections. Within a club, single-operator entries can compete for certificates given to the club's top scorer on 'phone and c.w. A cocobolo gavel, with an engraved silver band, will be offered to the club whose members post the highest aggregate score. A special certificate will also go to the top-scoring Novice or Technician in each section from which three or more such licensees submit valid entries.

It doesn't take the newcomer long to catch on to SS procedure. Simply call "CQ SS" or answer such a call, exchange preambles in the form shown elsewhere in this announcement, and keep your log properly. ARRL will gladly send you contest forms upon request, or you can draft your entry in accordance with the sample.

The Sweepstakes puts a premium on operating skill rather than on power, since the score multiplier (1.25 on c.w., 1.5 on 'phone) for stations running 100 watts input or less insures that there will be much low-power operation.

For the purposes of this contest VESs in N.W.T. may be considered attached to Yukon. Similarly, Newfoundland (VO) and Labrador count as Maritime section.

Whether you plan to operate full time or just an hour or two, seeds of amateurs will be anxious to trade SS messages with you. We

suggest you review the 1954 SS results in May and June, 1955, *QST*'s to get an idea of your local competition. Then glance over the rules below to familiarize yourself with the details and stand by for two November week ends packed with operating enjoyment.

## Rules

1) *Eligibility*: The contest is open to all radio amateurs in (or officially attached to) sections listed on page 6 of this issue of *QST*.

2) *Time*: All contacts must be made during the contest periods indicated elsewhere in this announcement. Time may be divided between week ends as desired, but a total of 40 hours must not be exceeded for each entry. Time spent in listening counts as operating time.

3) *QSOs*: Contacts must include certain information sent in the form of a standard message preamble, as shown in the example. C.w. stations work only c.w. stations and 'phone stations only other 'phones. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your preamble and/or receipt of a preamble.

4) *Scoring*: Each preamble sent and acknowledged counts one point. Each preamble received counts one point. Only two points can be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see p. 6) worked during the contest is the "sections multiplier." It is not necessary for preambles to be sent both ways before a contact may count, but one must be received, or sent and acknowledged, before credit is claimed for either point(s) or multiplier. Apply a "power multiplier" of 1.25 to c.w. entries and 1.5 to 'phone entries if the input power to the transmitter output stage is 100 watts or less at all times during contest operation.

The final score equals the total "points" multiplied by the "sections multiplier" multiplied by the "power multiplier."

5) *Reporting*: Contest work must be reported as shown in the sample form. Lithographed contest forms will be sent gratis upon receipt of radiogram or postcard request. Indicate starting and ending times for each period on the air. All Sweepstakes reports become the property of ARRL and none can be returned.

There are no objections to one's obtaining assistance from logging, "spotting" or relief operators, but their use places the entrant in the multiple-operator class, and it must be so reported.

A single-operator station is one manned by an individual amateur who receives no assistance from other persons during the contest periods. He may not have assistance in any manner in keeping the station log and records, or in

## HOW TO SCORE

Each preamble sent and acknowledged counts one point.

Each preamble received counts one point.

Only two points can be earned by contacting any one station, regardless of the frequency band used.

For final score: Multiply totaled points by the number of different ARRL sections worked; that is, the number in which at least one bona fide SS point has been made. Multiply c.w. scores by 1.25 and 'phone scores by 1.5 if you used 100-watts-or-less transmitter input at all times during the contest.

## EXPLANATION OF "SS" CONTEST EXCHANGES

<i>Send Like a Standard Msg. Preamble, the . . . . NR</i>		<i>Call</i>	<i>CK</i>	<i>Place</i>	<i>Time</i>	<i>Date</i>
<i>Exchanges</i>	Contest serial numbers, 1, 2, 3, etc., for each station worked	Send your own call	CK (RST report of station worked)	Your ARRL section	Send time of transmitting this NR	Send date of QSO
<i>Sample</i>	NR 1	WIAW	589	CONN	1812	NOV 12

spotting stations during a contest period. The operation of two or more transmitters simultaneously at single-operator stations is not allowed. Contest reports must be postmarked no later than December 7, 1955, to insure eligibility for QST listing and awards.

6) *Awards:* Certificates will be awarded to the highest c.w. scorer and to the highest 'phone scorer in each ARRL section. A c.w. certificate will also be awarded to the highest scoring Novice or Technician in each section where at least three such licensees submit c.w. logs; similarly, a 'phone certificate will be earned by a Novice or Technician in each section where a total of three such licensees submit 'phone logs. Only single-operator stations are eligible for certificate awards. Multiple-operator scores will receive separate QST listing in the final results.

A gavel will be awarded to the highest club entry. The aggregate scores of 'phone and c.w. reported by club secre-

taries and confirmed by the receipt at ARRL of contest logs constitute a club entry. Segregate club entries into 'phone and c.w. totals. Both single- and multiple-operator scores may be counted, but only the scores of bona fide club members, in a local club territory, may be included in club entries.

The highest single-operator c.w. score and the highest single-operator 'phone score in any club entry will be rewarded with a "club" certificate where at least three single-operator 'phone and/or three single-operator c.w. scores are submitted.

7) *Disqualification:* Failure to comply with the contest rules or FCC regulations or the necessity for avoiding interference with channels handling amateur emergency communication shall constitute grounds for disqualification. In all cases of question, the decisions of the ARRL Contest Committee are final.

### Sample of report form that must be used by contestants

#### STATION W. . . . — LOG, 22nd A.R.R.L. SWEEPSTAKES

Freq. Band (Mc.)	Time On or Off Air	<i>Sent (1 point)</i>						<i>Received (1 point)</i>						Number of Each Different New Section as Worked	Points
		NR	Stn.	CK-RST	Section	Time	Date (Nov.)	NR	Stn.	CK-RST	Section	Time	Date (Nov.)		
3.5	On 1810	1	WIAW	589	Conn.	1812	12	7	W2IFP	589	E. N. Y.	1814	12	1	2
"	"	2	"	589	"	1815	"	6	W1BFT	599	N. H.	1817	"	2	2
"	"	3	"	579	"	1820	"	6	W1BIH	579	Conn.	1821	"	3	2
7	"	"	"	"	"	"	"	24	W5MSH	479	Ark.	2005	"	4	1
"	"	4	"	479	"	2115	"	38	W5DWB	579	N. Mex.	1915	"	5	2
"	"	5	"	579	"	2128	"	45	W6BIP	479	S. F.	1820	"	6	2
"	"	6	"	589	"	2133	"	9	KN2HXR	589	E. N. Y.	2134	"	..	2
Off 2135 Time: 3 hrs. 25 min. On 1845															
14	"	7	"	569	"	1915	13	94	KH6IJ	569	Hawaii	1418	13	7	2
"	"	8	"	569	"	1925	"	127	W7HAH	569	Idaho	1728	"	8	2
"	"	9	"	469	"	1935	"	114	W7HRM	569	Wyo.	1730	"	9	2
3.5	"	10	"	579	"	2110	"	130	W0ARB	579	N. D.	2005	"	10	2
"	"	11	"	589	"	2112	"			W5MSH	Ark.			..	1
Off 2115 Time: 2 hrs. 30 min.															

Total Operating Time: 5 hrs. 55 min.

3.5, 7 and 14 Mc. used.

10 Sec., 22 Pts.  
85 Watts Input Power

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

Claimed score: 22 points × 10 sections = 220 × 1.25 (85 watts input) = 275

Type transmitter (tube line-up if home-built) .....

Receiver .....

Antennas .....

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

Signature .....

Number different stations worked .....

Address .....

# Contacts vs. Multipliers

Or, "Via Which Way Do the Points Pay?"

BY ELLEN WHITE, WIYYM

SHOULD all the contest post-mortem "ifs" be laid end to end, they just might reach from here to the Moroccan City of (where else?) Ifni. Let's face it! Sooner or later almost every contest operator wonders if it paid off chasing an elusive VE8 for an additional section multiplier during the Sweepstakes or that rare prefix during the annual DX Competition. But would it pay off? How would our over-all score be influenced by one more multiplier at the expense of other contacts?

The aftermath of the '54 Sweepstakes renewed a familiar phase of this "if" business. Amid a pile of scrap paper, pencil shavings, impossible graphs, fingernail remnants and the like, good old fashioned algebra reared its neglected head and came to the rescue. Stock phrases were still emanating from the hamshack (you know the kind — "Boy, if I'd just snagged North Dakota, Feverish Phil would have had it" . . . "15 more QSOs and ol' Regenerative Rod would have cried Uncle!" . . .) when our score variables fell into a very elementary formula.

In the scoring of almost every contest, just two variables are present: the number of contacts and the multiplier (whether it be sections or countries). At any point in such an affair we can find out in a snappy fashion just how many contacts (represented by the letter  $Z$ ) would be required to give us the same score that one more multiplier would give us. For instance, let  $X$  equal the number of contacts at any time, and  $Y$  the number of sections (or countries) (Fig. 1). If we increased our number of QSOs by some amount equal to  $Z$  (without gaining an additional multiplier), we could say our score would be

$$= (X + Z) Y$$

However, if we worked one more station and it happened to be a new multiplier, our score would be

$$= (X + 1) (Y + 1)$$

You'll note to increase our multiplier by 1, we had to work another station, hence the addition to both  $X$  and  $Y$ .

The stock high school phrase "things equal to the same thing are equal to each other" serves in good stead about now. If we set the above two formulas equal to each other and solve for  $Z$  (that unknown number of QSOs), we come up with

$$Z = \frac{X + Y + 1}{Y}$$

For instance, if you have 120 QSOs and 28 sections and are wondering about chasing sections or just racking up contacts, how many contacts would you actually have to work to give you the same point total that one new section brings with it? Let's total:

$$Z = \frac{120 + 28 + 1}{28} = \text{approximately } 3 \text{ QSOs.}$$

However, if we had 360 QSOs and 52 sections, what then?

$$Z = \frac{360 + 52 + 1}{52} = \text{approximately } 8 \text{ QSOs.}$$

You've undoubtedly noted that our formula is actually the sum of three fractions:

$$\frac{X}{Y} + \frac{Y}{Y} + \frac{1}{Y}$$

This gives us somewhat of a short-cut to hurry-up approximations. For all scores where the multiplier is five or more, we can discard the

term  $\frac{1}{Y}$ ; note that  $\frac{Y}{Y}$  is equivalent to 1; all of

which now means we can divide  $\frac{X}{Y}$  and add the numeral 1 to that figure for our term  $Z$ . So:

$$\frac{X}{Y} + 1 = Z$$

Let's use an example based on the results of the '54 SS. W6CHV, San Diego Section, tallied 69,300 points on 350 QSOs in 66 sections. Our quick-check formula tells us how many contacts W6CHV would have had to make to give him the same final score a 67-section multiplier offers:

$$\frac{350}{66} + 1 = 6$$

This problem, academic to some, but practical to others, becomes intensified when some of the big boys debate the merits of that 73rd section against the "let nature take its course" school

(Continued on page 154)

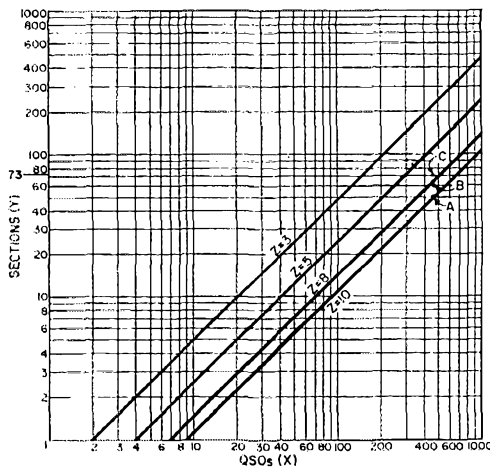


Fig. 1.



# Happenings of the Month

## ELECTION RESULTS

In four of the eight ARRL divisions currently holding elections, incumbent directors have been returned to office without opposition, remaining on the job for another two-year term beginning January 1st. They are Dakota Director **Alfred M. Gowan, WØPHR**; Great Lakes Director **John H. Brabb, W8SPF**; Pacific Director **Harry M. Engwicht, W6HC**; and Southeastern Director **James P. Born, W4ZD**.

Similarly unopposed, **Robert L. Davis, W8EYE**, was declared re-elected as Vice-Director, Great Lakes Division.

All other offices are contested, and ballots have been sent to Full Members of the divisions concerned. A total of 37 eligible candidates for the 16 posts in the current election is believed to be a record number for an ARRL director election.

## TEN-YEAR CLUB ADDITIONS

Two new staff members were recently added to the ARRL Hq. Ten-Year Club, an occasion marked by a dinner party for 18 of the Hq. staff plus President Dosland and Vice-President Noble, who were in West Hartford for an Executive Committee meeting.

If it seems odd to record only a tenth staff anniversary for a man as well known in organized amateur radio as **Edward P. Tilton, W1HDQ**, we hasten to point out that Ed was a contributing editor to *QST* for some six years previous to joining the staff, full time, at the end of World War II. He got in ham radio some 22 years ago, interested primarily in 5-meter portable gear; as *QST* once said, he "carried pack sets on his back to the top of about every worth-while bump in central and southern New England." Ed has since recognized the existence of the d.c. bands below 30 Mc., even working some of them on occasion, but his first love still remains in any equipment oscillating at 50 million cycles or more.

**W1HDQ** made a name for itself and for its location, Wilbraham Mountain, in the mid-1930s. With the passing of **Ross A. Hull, QST's** genius-editor who among many other interests handled v.h.f. matters for ARRL, Ed was the logical candidate to take over that field with a column devoted to promoting interest in the higher frequencies. Ed did this job for some years as a sideline to his regular employment at the Sickles coil plant in Springfield, Mass. War II saw him journeying around this hemisphere to install radiolocation gear for Sub-Signal and the Navy. Postwar, we persuaded him to join the

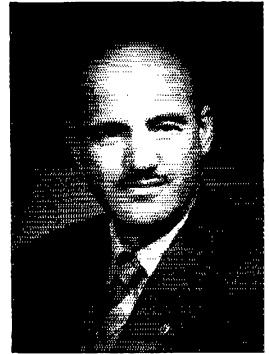
Hq. staff to devote full time to the world above 50 megacycles.

Ten years ago **Samuel K. Cowles** saw a classified ad in the Hartford papers seeking a shipping clerk in an office at 38 LaSalle Road. He answered it — and we're mighty glad he did. Unlike most

»

W1HDQ

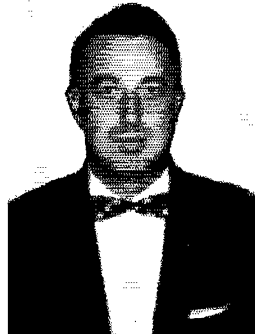
»



«

WNICKZ

«



of our transient shipping crew, **Sam** became a permanent fixture in the Circulation Department's handling each year of hundreds of thousands of League publications. Two years ago he moved up to head all shipping activities of ARRL — a specialized and exacting task requiring an intricate knowledge of packing, rates and routing in parcel post, truck, express and railroad freight transportation. And not long thereafter, the pressure of exposure to ham interest became too much — and he became **WNICKZ**.

## 420-MC. POWER LIMIT

Pursuant to the filing of petitions by **W3RE** and **W5SAH** requesting the abandonment of the power restriction on 420 Mc., the Federal Communications Commission has amended our rules to provide that, effective October 12th, the

(Continued on page 110)



# Correspondence From Members -

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

## EXTRA PRIVILEGES

Route 2, Box 686  
Visalia, Calif.

Editor, *QST*:

It has been a puzzle to me why the Extra Class license was set up and issued without it providing some extra privileges. The whole amateur licensing structure offers plenty of precedents for such, both in the past and at the present time. To those who work the twenty-meter band it is evident that W4CWZ's suggestion to set aside the 14,300-14,350 kc. portion of the band for Extra Class operation is a good one. This segment is exceptionally quiet, and its recommended use would relieve the congestion found in present twenty-meter 'phone operation, as well as provide that incentive for advancement which has become such an important part of our American way of life.

— Knor W. Nicholson, K6DG

118 Highland Ave.  
Dover, Ohio

Editor, *QST*:

In addition to the privileges suggested by Mr. Payne, I suggest that the Extra Class operator be permitted higher power (possibly 5 kw. above 50 Mc.) and exclusive right to the 20-, 15- and 10-meter 'phone subbands. Give 75 to the Novices — it's for the birds.

I also believe that every amateur should be required to pass the Extra Class license within five years of the date of issue of his first license — or have his amateur license cancelled. . . .

I cannot imagine ANYONE who could be satisfied with being mediocre when with a little perseverance and application he could become superior. . . .

— Adrian J. Mathias, W8JDN

4607 Convent Lane  
Philadelphia 14, Pa.

Editor, *QST*:

I believe he has something, but not for the purpose of giving exclusive rights to a group of operators. It seems that in the old days when 75- and 20-meter 'phone were restricted to Class A that there was an incentive to get the license in order to enjoy the privileges and the use of those special frequencies. Now that there is no band restricted to a particular group, there seems to be very definite areas that are not in use. I have in mind 3600-3700 kc. on the 80-meter band, 7050-7150 on 40 meters, 14,100-14,200 and 14,300-14,350 in the 20-meter band, 28,000-28,500 in the 10-meter band. I believe if you will monitor these frequencies generally you will find they are quite inactive during long periods each day. Since it seems, to restrict a particular group of frequencies as a special privilege increases the desire for their use, it would be smart to increase activity in these areas by limiting for special purposes, probably to the Extra Class licensee.

— G. S. Van Dyke, jr., W3ELI

P. O. Box 188  
Chester, Vermont

Editor, *QST*:

I feel that he is putting the cart before the horse. He appears to believe that the Extra Class license is an end in itself, and that special privileges should be set up to stimulate us ignorant General Class hams to try for the lace-lined license.

Now this trend of thought ignores the facts. When we take an FCC exam, the government is merely holding up our knowledge to a measuring stick to be sure that we will conform to certain minimum standards. They don't give a whoop how much we know, but they're very concerned with how little. If we pass the exam, then FCC gives us a permit

to talk to one another within the rules established, that's all. The license is just a piece of paper; just the beginning. The real measure of a ham is his signal and operating technique. Censure helps to eliminate the lads and monitoring stations whip the careless operators into line. If a General Class licensee decides to try RTTY or s.s.b., only his own know-how will get the rigs working properly. If something goes haywire, then he asks around for advice and hits the books. Forcing him to pass the Extra Class exam will not automatically instill him with all-powerful knowledge. If he wants to go s.s.b. he'll have to know the facts, license, or no license.

Let's not monkey with the present license structure. We have what we want now, a general purpose license with unlimited privileges. That means that the holder thereof can do as he darn well pleases within the rules. I ask you now, isn't that the American way of life? Maximum freedom with a minimum of restriction?

Remember, a ticket is just a permit to operate, no different from a driver's license, and not a gold-plated Cadillac to be stared at and admired. Interest in radio and a gregarious desire to talk with others of a similar bent should be all the incentive needed for a ham.

— Jerome S. Miller, W8IDP/1

1656 Liggett Ct.  
St. Louis 19, Mo.

Editor, *QST*:

I agree with W4CWZ that the amateur Extra ops should get extra privileges on some little used band. How about above 30,000 Mc.?

— Bob Mulholland, W0TGC

## CRYSTAL GAZING

11374 Hubbell  
Detroit 27, Michigan

Editor, *QST*:

Lew McCoy, W1ICP, doesn't have to change fortune tellers. So far as my Novice son (WN8UBS) and I are concerned, the predicted results have been nothing short of phenomenal on that one-tube oscillator mentioned in August *QST*.

We put the rig together in two easy nights, and without even trying we've worked over 30 states in four evenings. Not only that, but England, France, Jamaica, Hawaii, Venezuela, Argentina and three Provinces in Canada were logged! All except England and Argentina were worked in the 40-meter Novice band. The average R-S-T has been 5-7-9. This little rig has proven to be a real potent signal squirter.

We're using a Windom antenna with the 5-Band Antenna Coupler mentioned in April *QST*. Slight modifications were made; a meter was used instead of the dial lamp and the crystal socket was placed on top of the chassis rather than the front. We felt this would eliminate any accidental bumping of the protruded rock. No B & W 3900 was available in town so we used the 10 turns to the inch B & W I found in my junk box. We discovered no stand-off insulators were necessary since the coil proved to be self supporting once it was soldered to the proper components inside the 6x6 box. This can eliminate a lot of work for the Novice. The key jack was mounted at the rear of the rig because we run our key line through a hole in the wall and up from under the table.

We're very pleased with this rig and highly recommend it for the Novice. It's easy to put together, inexpensive, and most of all, it works great.

Now if Mr. McCoy can design something as simple as this for twenty meters or a two-stage job that can be modulated, we'll surely build it.

— Harry Wayne, W8RYH

# The World Above 50 Mc.

1215-1300

2300-2450

3500-3700 4650-5925

10,000-10,500 21,000-22,000

30,000-9

CONDUCTED BY EDWARD P. TILTON, WHDQ

IN the course of sorting papers in the Headquarters library recently, there was unearthed a verbatim record of testimony given prior to the formulation of the Radio Act of 1912. It was the sort of thing that could be used for a whole string of editorials, but among the bits of "wisdom" presented therein is a priceless gem.

One learned authority, who shall be nameless, stated that he was all for amateur radio, but — (This approach has been used ever since whenever amateur assignments are under attack.) His special "but" was that amateurs had done much good work, but there was no longer any need for them. Amateurs, he stated, were justified only on the grounds that they could contribute to knowledge of wave propagation, and by that time everything had been learned on the subject.

Nothing left to learn, in 1911? As we look back on our progress since then, it would seem that just about everything we now know about how radio signals get from here to there has been turned up since 1911!

Skip to 1929. In that year, three learned gentlemen published a paper in a well-known technical journal of the day. In it they took all that was then known about v.h.f. propagation, and made an educated guess as to what all frequencies above about 30 Mc. or so might be good for in the way of communications ranges. When we get up beyond where ionospheric reflections take place, they said, radio waves travel just slightly beyond the visual horizon, and then are lost. That thinking governed much of our allocations planning right up until almost the present day — but v.h.f. ham operators were learning that this concept was full of holes as long ago as the early '30s.

Tropospheric propagation, sporadic-E skip, aurora reflection, high peaks of maximum usable frequency for the *h'* layer at the top of a sunspot cycle, scattering in the troposphere and ionosphere, reflections from meteor trails — these are some of the means by which hams and others have knocked the "line-of-sight" idea into a cocked hat.

Often the first breaks came as a result of *lack* of knowledge on the part of hams, rather than because of any scientific acumen we possess. Not knowing any better, we have tried things that better heads would have "known" to be useless, only to find new v.h.f. horizons awaiting us. But we tend to have our own preconceived notions, too. Years of experience have shown us what to expect, and when to expect it, so we check on the v.h.f. bands by the clock and the calendar. Yet every so often something new turns up, to show that we could use a little more persistence and an open-minded approach to advantage.

Take the September V.H.F. Party. Your conductor lost a couple of long-held superstitions in the first few hours of that event. Winding up a trip through northern Maine, we set up for the contest on Cadillac Mountain, Bar Harbor,

(Continued on page 184)

## 2-METER STANDINGS

Call	States	Call	States		
Area	Miles	Area	Miles		
W1RFU	19 7	1150	W6W8Q	5 3	1380
W1HDD	19 6	1020	W6DNG	4 2	350
W1UIZ	17 6	880	W6ZL	3 3	1400
W1CCB	17 5	870	W6BAZ	3 2	320
W1WZY	16 6	750	W6NLZ	3 2	360
W1EEO	16 5	475	W6MMU	3 2	240
W1KCB	16 5	600			
W1AZK	16 5	850	W7VMP	6 4	1280
W1MNF	14 5	600	W7LEE	5 3	1020
W1BCN	14 5	850	W7JU	4 2	353
W1DJK	13 5	520	W7YZU	3 2	240
W1MMN	12 5	520	W7JOO	3 2	140
W2ORI	24 8	1000	W8WXY	28 8	1200
W2NLY	23 7	1050	W8SRW	23 8	850
W2AZL	21 7	1050	W88FG	23 8	860
W2QED	21 7	1020	W8LPD	23 8	—
W2BLV	20 7	910	W88VI	22 8	725
W2OPQ	19 6	—	W8RAH	22 8	690
W2DWL	18 6	832	W8DX	22 7	675
W2OAC	18 6	660	W8WRN	20 8	670
W2UTH	18 7	880	W8BAX	20 8	685
W2AMJ	17 5	550	W8JWV	19 8	710
W2PAU	16 6	740	W8EF	18 7	800
W2PCQ	16 5	650	W8ZCV	17 7	870
W2LHI	16 2	550	W8RWV	17 7	830
W2CFT	15 5	525	W8W8E	16 7	800
W2DFV	15 5	—			
W2BRJ	15 5	590	W9EHX	24 7	725
W2RFJ	15 5	435	W9EVJ	23 8	850
W2LXB	15 5	—	W9EYV	23 7	1000
			W9EQC	22 8	820
W3RUF	24 8	950	W9KLR	21 7	690
W3KCA	21 7	—	W9UHC	21 7	750
W3NKM	19 7	660	W9ZHL	21 7	—
W2IBH	19 7	650	W9KPS	19 7	660
W3BNC	18 7	750	W9MUD	19 7	640
W3FPH	18 7	—	W9REM	19 6	—
W3TDF	18 6	720	W9LF	19	—
W3GKP	17 6	800	W9ALU	18 7	800
W3KWL	16 7	720	W9GAB	18 7	750
W3LNA	16 7	720	W9JGA	18 6	720
			W9WOK	17 6	600
W4HHK	23 9	1280	W9MBI	16 7	660
W4AO	23 7	950	W9BOV	15 6	—
W4PCT	20 8	—	W9LEE	15 6	780
W4JFV	18 7	830	W9DSP	15 6	760
W4MKJ	16 7	660	W9NZ	15 6	560
W4UMF	16 6	600	W9DGL	14 6	700
W4OLK	15 6	720	W9FAN	14 7	680
W4OXC	14 7	500	W9QKM	14 6	620
W4JHC	14 5	720	W9JTY	13 6	560
W4WCB	14 5	740	W9UIA	12 7	540
W4TCR	14 5	720	W9ZAD	11 5	700
W4UBV	14 5	435	W9CTA	11 5	540
W4TIV	14 5	700	W9BFF	10 5	760
W4IKZ	13 5	720			
W4JFU	13 5	720	W9EMS	27 8	1175
W4UDQ	11 5	850	W9GUD	25 7	1065
W4LQJ	11 5	500	W9HDD	24 7	870
W4ZBU	10 5	800	W9OP	18 6	—
W4WNH	10 4	600	W9ONQ	17 6	1090
W4MDA	10 4	680	W9INI	15 6	830
			W9OAC	14 5	725
W5RCI	21 7	925	W9TJF	13 4	—
W5FTL	19 7	1000	W9ZJB	12 7	1097
W5ATJ	13 5	1260	W9WQZ	11 5	760
W5QNL	10 5	1400			
W5CVW	10 5	1180	VE3DIR	22 7	700
W5ABN	10 3	780	VE3AIB	22 8	890
W5MWW	9 4	370	VE3DER	15 7	800
W5ML	9 3	700	VE3BQN	14 7	790
W5ERD	8 3	370	VE3FP	13 6	715
W5ERK	8 2	380	VE3AOK	12 6	550
W5VX	7 4	—	VE3AOG	11 7	800
W5VY	7 3	1200	VE1QY	11 4	900
W5ONS	7 2	950	VE7FJ	2 1	365
W5FSC	7 2	500			

# YL NEWS and VIEWS



BY ELEANOR WILSON,\* W1QON

## YLRL 16th Anniversary Party

Here is an invitation to you from the president and vice-president of the Young Ladies Radio League:

The YLRL will be "sweet sixteen" this year, and you will be missed if you don't attend the annual celebration. Don't let QRM, QSB, or the ir. ops. keep you away. Whether you are a YLRL member or not, join us for the festivities (YLS only at this party, though). No gifts necessary, but you may win a cup or a certificate, and you'll be sure to make many new YL friends.

### The rules follow:

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

**Eligibility:** This contest is open to all licensed YL or XYL operators throughout the world (not restricted to YLRL members). Only YLRL members are eligible for awards. Contacts with OMs do not count -- the YL-OM Contest will be held at a later date.

**Procedure:** Call "CQ YLRL."

**Exchange:** QSO number; RS or RST report; name of state, U. S. possession, VE call area, or country.

**Scoring:** (a) Add total number of contacts. Multiple contacts with same station, regardless of number of different bands used, will count as one contact. (b) Multiply five times the total number of different contacts, regardless of location. (c) All contestants running 150 watts or less input at all times, whether 'phone or c.w., may then multiply the result of item (b) by 1.25.

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

Pretty in their party togs are the twelve YLs who got together at the ARRL Roanoke Division Convention at Old Point Comfort, Virginia. Hurricane Diane was an uninvited guest who dampened everything but the

## CONTEST PERIOD

'Phone —

Starts: Wednesday, Dec. 7th, 12 noon EST

Ends: Thursday, Dec. 8th, 12 midnight EST

C.W. —

Starts: Wednesday, Dec. 14th, 12 noon EST

Ends: Thursday, Dec. 15th, 12 midnight EST

Operate no more than 20 hours on 'phone and/or 20 hours on c.w.

**Awards:** For YLRL members only. (Certificates will be awarded to non-members.)

Highest 'phone score . . . . . a cup

Highest c.w. score . . . . . a cup

These cups are awarded on a yearly basis. Any operator winning the cup three times gains permanent possession. Winner of one award is not eligible for any other. Should awards be donated, they shall be given to the second- and third-place winners, both 'phone and c.w. Certificates will be given for high score for 'phone and c.w. in each U. S. district, Possession, VE call areas and countries. All winners receive certificates.

**Logs:** Copies of all logs ('phone and c.w.) must be post-marked not later than December 31, 1955. They should be sent directly to YLRL Vice President Gloria Mataska, W9YBC, 2322 South Second Ave., North Riverside, Ill. When submitting logs, please list 'phone and c.w. contacts separately. (See p. 58, Nov. 1954 QST, for sample log.)

## Keeping Up with the Girls

At the first meeting of the new Portland (Ore.) YL Club, W7RVM, Helen, was elected President; W7QKU, Donna, V.P. and Treas.; and WN7ZMN, Phyllis, Secy. and Pub. Chmn. . . . W8MBI, Marie, and W8IAA, Jean, succeed W8HUX, Marvel, and W8HWX, Lillian, as editors of the newsletter *Ham Shack Gossip*. . . . W7ENU, Mary, is NCS of the Oregon Emergency Net. . . . K5CCJ is the new call of ex-KH6TI and W1YLP. Dell's new address is 1421 Hamiel Drive, Las Cruces, New Mexico. . . . YLRL stationery in two sizes may be purchased from Club Treasurer W0MMT, Marie. A complete list of YLRL members may be obtained from Secy. W3VLX, Lolly, for a small charge. . . . W3s AKB, Fran, CDQ, Liz, and MSU, Ethel, attended a convention of the Society of Women Engineers

(Continued on page 154)

spirit of the occasion. *Left to right, front row:* WN3CAI, Ann's Mother WN3RIW, W3CDQ, W4LAS, W3MSU, and W4RFV. *Back row:* W4BLR, W4ZKX, W4ZFF, W3AKB, W3TSC, and K4BNG.



# How's DX?

CONDUCTED BY ROD NEWKIRK,\* W9BRD

## How:

Time flies! A whole decade, to be exact. . . . It seems like only yesterday that V-E and V-J Days excitement simmered down and the ten-meter band was thrown open once again to amateurs. And having 28 Mc. back meant that four years of yearning were over — *DX was back* as of November 15, 1945. The rush began. Famished DXers world wide hauled out prewar paraphernalia and headed for ten. Others whipped out soldering irons and threw together a few watts and dipoles without delay. (Simple, then — remember? No TVI.) Man, it was *great* to be back on!

DX pickings on ten at that time were slim. We were emerging from a sunspot minimum, not far from our present position on the solar-cyclic curve. The gang made the best of it, though, for our other DX bands were not to be opened for months to come. The north-south 28-Mc. path held good day after day and most DX QSOs by far were between amateurs in the Americas. Then came those first thrilling openings to Africa, Europe and Oceania which brought the Gs, ZSs, VKs and ZLs rolling through as of yore. Long time no see! The boys with mushrooming antenna farms began to pick off occasional Asians, too, and the race toward postwar ARRL DXCC certification was on.

The return of DX after WW-2 naturally meant the return of "How's DX?" to *QST* pages. Conductor WIJPE, now WIDX, brushed the cobwebs off the dusty DX mailbag and "How's" was back in biz with a bang. By's flippant factum, Jeeves, packed away his fusiliers regalia (see p. 16, December 1945 *QST*) and resumed those monthly DXploits which seem to have no end.

We've had quite a ball since that renascent period. New types of beams, double-conversion and crystal-controlled receivers, harmonicless transmitters, polished operating techniques — even a brand new DX band. We've weathered the storms of TVI and an abysmal sunspot mini-

\* Please mail all reports of DX activity to DX Editor Newkirk at 4128 North Tripp Ave., Chicago 41, Illinois.

mum. Almost 3000 postwar DXCC memberships have been won — QSLs confirming well over 300,000 "new countries" have been processed carefully at League headquarters over the past ten years. And this doesn't take into account those additional thousands of QSLs received for DXCC endorsements. Operating highlights? Dozens. We'll never forget FO8AJ of Clipperton and W1BB's 160-meter WAC, to mention two.

Thus we glance briefly back. Happy anniversary! And now we look ahead. We look forward to years of improved DX propagation conditions, countless globe-girdling friendships a-making, new circuitry and antennas to try, new commercial DX-accented ham gear available. . . . In short, OMs, the best is yet to come!

— . . . —

On a related theme, we again touch upon that curious business of the 1941 Pearl Harbor Day QSO between Hawaii's K6SRZ and an unidentified western U. S. amateur ("How's" for July, 1955, and December, '54). Mailbag comments and suggestions were received from W4WXX (ARRL SCM), W7NVY/1, W0KCL, W0YAU, W5WVR and others. Yet the mystery remains. W2TNC, former op at K6SRZ and instigator of the inquiry, continues to collect and catalog all clues. Got a lead?

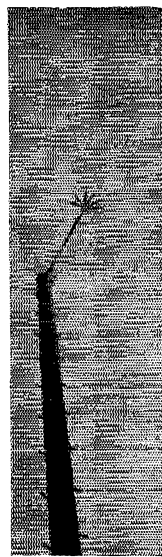
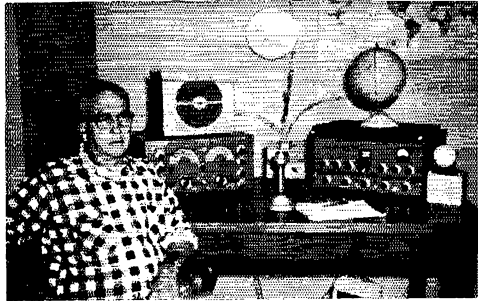
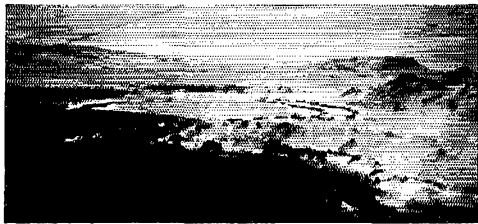
## What:

We're rapidly moving into winter conditions in North American latitudes. Nowadays this means hot hunting on 30, 15 and even 10 during daylight hours, with 40, 80 and even 160 taking over in hours of darkness. The long paths should provide interesting diversion, particularly on 20 and 40, with VKs, ZLs and occasional Asians poking through in the midafternoons. Shortly after dark 15 and 20 may erupt with Oceanians for the boys with low-angle radiators.

Incidentally, you oldtimers will recall the "30 up and 30 out" antenna, a rudimentary form of ground-plane, which became quite the DX rage on 7 Mc. in the early 1930s. The period represented a sunspot minimum. It wasn't long thereafter that the design's DXing superiority seemed to fade in favor of the horizontal flat-top. Now we know what happened, although it was scarcely appreciated at the time: Higher-angle multihop propagation began predominating as the sunspot minimum waned, and folk with low Zepps, doublets and long-wires commenced to get out on 40 as they never got out before.

Well, here we are again, just about two solar cycles later. Prop students are watching for that boom in higher-angle multihop, but don't tear down those lower-frequency ground-planes yet, men — OM Ionosphere still has holes in his head.





OA5G has become an all-band fixture on the north-south paths, operated from quarters at the Marcona Mining Co. base on Peru's San Juan Bay (above). Chief op George L. Starkey, W6ZLH, is at the operating position where a kilowatt transmitter now is readying for action. The main antenna mast, shown at right, is the center of a Vee umbrella whose legs each measure 800 feet. Included on the OA5G agenda for this season is a healthy swipe at 160 meters where many DX "firsts" are in prospect.

**20** c.w. will serve to set our Bandwagon a-rollin' on its monthly combing of the kilocycles. W8KAK climbs aboard with FB8BR (50) 22, FF8BF (20) 23, ISICFX (50), 23 and VO6LQ (80) 5. . . . With a school-vacations-only tally (of 121/94, W2IWC caught up with CR6AI 20 HA7OL 4-35) 23, HZ1AB (65) 20-21, I5LV (34) 22, JA5 2LC 12, 6AA 12, 8AF 12-13, 8AQ 12, KC6CG (55) 13, KR6QM 13, one LX1MC (1) 20, LZ1KAB (72) 21, SUIREC (85) 22 on an Egyptian motor safari, VS6CG (12) 13, ZC4RX (40) 21 and ZD2FNX (13) 20. . . . CRs 6RX (51) 18, 6CZ (41) 18-19, 7AD (80) 19, FK8AO (16) 3, FO8AL (41) 1, KJ6FAB (95) 1, KM6AX (80) 1, KX6NA (19) 1, OQ5HI (80) 17, VO5EK (73) 19, VRs 2CZ (90) 1-2, 3B (80) 1, one ZA2A (5) 22, ZDa 2DCP (43) 19-20, 4BM (53) 22, 6BX (45) 18-19 and ZE2JC (83) 11 raised K2GMO's 9-month countries total to a healthy 149. . . . With 101 worked, W9APY/5 hopes to hold out in Biloxi until DXCC is his. ET3LF (40) 21, FF8BI (15) 21, FK8AH (10) 4, an I5 and VO4RF (95) 18 were no hindrance. . . . W3VOS signed up for FL8AD (60) 20, HE9LAA 20, an HZ1, ISIAHK 23, JA5 IACA 2AT 3AH 3AZ 3BB 9BE all between 10 and 12, an LX1DZ (5) 18, LZ1s KDP 23, KSA 1, OD5AF (52) 20, OY7ML 16, SUIs DD (30) 17, IC 0, TA3US 20, VO3FN 20, ZC4IP 21, ZDs 3A (38) 21-1, 4BC 21, ZEv6s JJ 19, JP (10) 20, 3A2AW, 4X4s FS 23; 10 21 and several 9S4s between 20 and 22. . . . DL4ZC hooked SV0WS (34) 20, VK1RA 22 of Antarctica's Mawson Base, VSs IGX (50) 14-16, 6CW 17, ZS8L (80) 16-17 and 4S7GE 15. . . . K2BZT's customers included DU7SV (90) 15, FB8AB (40), an HE specimen, JA5 2DL (67) 13, 6AO (50) 13, 6HK (45) 12, KJ6BH (79) 2, MP4QAL (70), ZP9AY (95) 0, a ZSS, 4X4GT (61) 19, plus two we almost forgot - EA6AU (62) 22 and FF8BF (38) 0. . . . The Viking Ranger at W8OTI picked off an ET3, F9YP/FC (30) 3, FF8AP (60) 7, FO8AX (100) 4, FY7YF (70) 1, ZC4GF (25) 23, an aforementioned ZS8 and 5A2CL (45) 0. . . . Count U. R. Kuntreys friend, W2HSZ, palavered with CR6s, EA9AC, FF8s AC JC, an FY7, HP1EH, JA5 3HD 5XF 9AA 9CA, LUGXA, OD5LX, OQ5BT, one of those PAX1ARs, SUICN, VK9AU, VO4EO, YO8 2VM 3CY 3RF 3VA, a ZSS, 4X4s AE and DR. . . . K2DGT captured CT2BO, CR6s, JA5s AA AB, a KC6, OA4J, VPIFL, 3V8AN (10) 20 and others with his 813s. On W3TYW's scoresheet we find GC3EML (31), GD3IBQ (23), IIBNU/Treaste (55), an IS1, KG1AA (36), TI2PZ (20), ZB1CH (60) and ZE3JL (19). . . . FA9RW (60) 19, VK9VP (57) 8, VS2DW (50) 15 and 9S4AX (6) 22-23 crossed W6NJU's path. . . . Miscellaneous triumphs here and there: first at W1OJR: FA8CR (80) 20, PILLS (70) 0, W1YO U: CT3AT, ZE6LI, W2FBS: PX1, MP4 YI2AM (110) 20, W2ZGB: KX6 MP4 PX1 VS6AE KJ6 12-14, ZD2WAF (28) 20-21, ZD3 ZSS, K3GFQ: KC6 KJO KX6, K2GMF: HB1RM, HK4EG (14), W9PMM (60), W3YUW: YO3RZ, YU2HO, W5C4Y: VP9PM, W5HIS: CE3RE 10, JA6AK 22, K6GAK: VO2DC, XZ2SS, ZE2KR, Marion Islander ZS2MI, W3JTN: Uliithi KC6, W9CLH: CX6AD, FM7WF, VP3VN, VQ4, W9ZQA: TF2WAF (50) 1, W0PFW: CP5EP, W9JFM: KA2KS 5, WY1AI 14, ZB1GBF 21, PS10: EA9DF, ET3GB, JZ9AG, VP5DC of Turks, and other goodies. . . . 20-c.w. DX directory amassed via the West Gulf DX Club's *DX Bulletin*, W5DMR chief proprietor: AP2s M (35) 3, U 19, CR7DI

(70) 13-20, EA5 6AM (70) 21, 8BC (40) 0, 8BF (55) 3, 8BP (32) 0, ET2RP (50) 2, FK8s AC (2) 5, AE (60) 4-5, AL (65) 6, AM (36) 5, AQ (63) 4, FO8AM (1) 6-7, FW8AB (35) 15, FY7YC (25) 12, GD3UB (22) 23-0, HA5KBZ 15, HK0AI (70) 0, ITIAGA (55) 21, KA6JL (33) 12, KG6s ABN (76) 14, AFT (90) 14, KW6BD (55) 14, LZ1KAA 16, M1B 15-16, MD5s CC (70) 16, UK (84) 21, MP4s BBL (59) 4, KAB 15, ODSAS 18, OQ6CZ (51) 1, PZICD (20) 1, SPs 5RQ 15, 8AG (10) 20, ST2s AR (50) 19, DB 19, TF3KG (25) 23, UA5 3CR (48) 5, 6UD 16, 6UI 16, 9KKU 15-16, VP8s KH (93) 14, BL (85) 1, VO8 3JTW (55) 14, 4NZK (80) 13-14, 8AG (14) 13, VR2AA (51) 4, VS1s GS (50) 16, GU (15) 16, VS2s CV (50) 15, EI (85) 15, ET (60) 17, VS6s CI (60) 12, CO (46) 16, DG (50) 12, VU2s GD 17, GM 17, HF (65) 16, RC (70) 2, XZ2OM (95) 15, YI3WW 17-18, YJ1DL (4) 3, YO3VA 15, ZCs 4PB (75) 20, 5CT, ZDs 2NNW (24) 1, 6RM (14) 19, ZEGJV (70) 13, ZP9AY (55) 0, ZS91, 3V8AB (25) 7, 4X4s AM (75) 21, GS (5) 22, 5A3TR (19) 2, 9S4s BN (95) 21 and CH (33) 22. . . . No. Calif. DX Club's DXer clinches things with hints on ACs 3SQ (96) 17, 5PN (91), 9AA, CBTZ (65) 16, CE7ZU (62) 15, FUBAA (61) 7, GC3KAV (43) 16, HI2FL (65) 23, one KV2AD (35) 22, LB8YR (39) 6 back home, MP4TAA, OY4XX (47) 15, SPs 5AR 5, 6AR (65) 4-5, 8KAF (6) 5, UB5KAA (70) 16, UG6AB (53) 4-6, UI8KAA (62) 4, UQ2AN (65) 15, VO8 1AM (104), 2IN (52) 14, 4AQ (13) 20, 5FS (50) 19, 8CB (94) 15, VR2BZ (62) 8, VU2s AL (25) 16, JG (72) 17, JK (18) 16, KM (56) 16, MA (71) 19, shipboarder X1NP (56) 9-10 in Australian waters, XW8AB (13) 17, XZ2AD (87) 15, YS10 (17) 22-23, 4S7WF (65) 17, 5As 1TL (20) 0 and 3TZ (40) 17.

**20** 'phone logically is next. W2IWC tried out his Telrex and Viking-II on EA8AI (98) 16, HHIIB 15, HK0AI (190) 15 of San Andres Islet, KX6BU (215) 12, SV8WM (100) 21 and YN4HA 14. . . . YS10 is slated over a 3V8As QSO. . . . W8YIN chatted with DU7SV (192) 14, KG6AFT (260) 7, VSs 1CZ (145) 14-15, 6CW (102) 14 and others. . . . Pitcairn's VR6AC (143) 6 and ZSs in quantity returned W6NJU's compliments. . . . GD3IBQ (135) 22 and LX1DU (230) 21 are okay for K2BZT's money. . . . W8KAK braved kilowatt alley for YI2CHV, YN4CB (140) 1 and XE1RE (150). The quickest route to a Mexico QSO and QSL continues to be 'phone. . . . W9WHM collected VO8AL (109) 13, ZB1AJX 20 and reports succumbing to the temptations of 21 Mc. . . . Designated active or imminently active on 14-Mc. voice by WQDXC are C3WV (105), CRs 5NC (191) 22, 7CO (195) 14, 7DI (145) 17, GS3AC (330) 1, ET2s AG (175) 17, US (235) 17, HA5KBZ (211) 0, HI6EC (164) 0, JY2AE, KAs 2AK (10) 3, 9J1 (190) 13, K6SCK (201) 13, KB6AQ (275) 4, KG1FR 4, KJ6s B3 (222) 11, BJ (250) 10, MP4Os AB (150) 18, AL (270) 18, OJ5EC (160) 18, PXTYR (145) 22, PZICD (120) 23-1, SU8s AS (175) 15, CR (190-235) 19, ST2DB (165) 15, TA3US (202) 6, VKs 1DC (100), IZM (100), 9BS (158) 9, 9FN (180) 5, 9OK (145) 7, VP2s DL (110) 15, KAF (160) 16, VO5FS (160) 17-18, VR2s NL (138) 7, CV (190) 5, VSs IXT (165) 16, 2DV (150) 14, YI3WW (120-190) 19, ZCs 4R (202) 6, 5CT, ZDs 3BFC (105) 17-18, 9AC (220) 18-19, ZSs 2MI (145) 13-15, 7C (220) 18, 4X4DK (162-202) 6 and 5A3TR (335) 21. . . . Newark News Radio Club members

avedropped on 20-meter 'phones CP5s EP 2, ET, CT1AG 16, DU5 1AP 13, 1CV 1DU 6IG 78V (228), 12, EA9s AR AZ, FK8AC (175) 4, FM7WQ, FO8s AM AS, GC8FQ 1, GD3UB (180) HC8GI (115), HZ1AB (160) 3, IS1BV, JA5 1MP (170) 13, 4AM 6HK, KC6UZ (248) 12, KGs 1AA 5, 1BO 4AO 4AX 6AFX 6AGB 6NAA 6SB, KJ6FAA (225) 8, KM6AX, KP6AK, KR6s AF AK BV (140), CR KS (115), NC QX, KT1WX 20-21, KV4s AA BB, KW6s BB (220) 7, BD 11, OD5s AB (120) 7, AM DA, OO5FO, OY2Z 19, PJ2s AF AL CA CH, SP5CC (160) 5, SV6s WS WT 3, TF2s WAF 6, WAG, TG9s AX MB, VK9s BW EB RH, VP5 1ET 6-7, 1EV 7NG 7NZ 4, VO8 2DL (180) 22, 3FA 4EU 23, 4FB, VR5 2AS 2CS 4AB, VS5 1BI 1EW 1FS (150), 2CU 2DO (140), 6BE, XZ2KN 15, ZBs 1EX 2A (150), ZD6BX (140) 5, ZK1BL, ZM6s AS AT 6-7, ZP5CG, 3V8BA, 457NG, 4X4s CX (150) 20-21, GB (150), GT 5As 1TL 2UL 2TD 2TZ 4TX, 9S4s AD and BS, AP2s 1N and U also were heard on the East Coast, as were KAs 2CA 2GE 2IM 2JW 2MB 2NY 2OJ 2OL 2RB 2RV 3EB 5WW 7HH and 8SD.

**40** c.w. next in line. Early fall doings on 7 Mc. confirmed the beginnings of a DX trend toward higher frequencies. With 20 and 15 in much finer fettle this season, 7 Mc. was slow to awaken after the long hot summer. ZS7D (15) 15 was a pleasant surprise for W6NJU, however, and K2DGT of Flushing flushed KM6AX (26) when the W6s weren't looking. W6NJU also raised CE7ZJ and FK8AO . . . . . DM2ADL (33) 3, SP8CK (22) 3-4 and XE3AH (61) 4 took W2GXV's bait. . . . . W17BL burned the oil for HA7PC, HB1OP/HE, LZ1KSZ, YU1BFG, a DM2 and other Europeans. . . . . W4ZSW snooded around between midnight and wee hours to snaffle YN1KK, YV3BD and more South Americans. . . . . A flock of Europeans, a VK6, TI2PZ and YU2DU replied to K2GMF. Sporty VE7AAP/KL7 was an unusual one at W5CAY. Neighbor W5HIS grabbed KR6LJ 13. . . . . W0VBS let CR6AI 22, HK5BY 4, KG1AA 4, YV5ES 3 and ZE6JJ 22 get away temporarily - but scored with four PYs, VP9BK and ZLs. A CM1 or CO1 will fix Bob up with a WACD diploma. . . . . EA9BJ and HB1KU/HE worked W3YUW's 60-watter. . . . . YS1O speared UB5KAB on the band and already has the pasteboard to prove it. . . . . OE6PH, YU5 1IT 3DDE 4EPO and SP1KAA shortly will receive W4EUH QSLs. . . . . F9YP/FC, a KGI, UD6KAD, YU3KI and others borrowed K2HZR's headset. . . . . Novice KN4CQA made the long haul to WH6BPE. While on the subject of Novices, KN4s ADJ AZY DTN and WN4HTL will be delighted to know they were heard across the pond at G3JFD.

**15** 'phone now is being talked up plenty. CR7AD (265), EA9EE (212), GC3EML (120), OQ5BQ (225), PZ1RM (245), YS1RA (258), ZD4BR (325) 17, ZE2KR (126) and 4X4DK (234) may be the beginnings of a fast DXCC for W9ICL's Globe Champ and homespun beam. . . . . W9WHM found ZB1AJX 20, ZC4RX (245) 20 and ZS9G (200) 20 amenable. . . . . A span of nine non-contest hours produced DU7SV 0, KA2AZ 2, KG1AW 21, OQ5AU 18, SV0WO 17, VO4FU 18 and a ZB1 for W3YDF. SP2AM 17-18 escaped. . . . . W6ZZ was on hand for EL3A, HK3PC, JA1ANG, KA2KS, KV4BD, KW6BB, OA5G, VP6FR, YN1KK, YV5EC, ZLs 1GI 1GJ 4BO and a sumptuous helping of KH6s and KZ5s. And just before press time Miles tells us of picking up VO4EO. . . . . W4NQM's airmail-special brings forth CR7BB, a GC3, HB1KU/HE, KG1KW, LX11DC, MP4BBL, SP5AH, YO3GM and others. . . . . EA8BQ and EA9AZ contacted W4WVM. . . . . LU4AA snagged many Europeans, CN8MM, GC3EBK and 4X4BD without much fuss. . . . . CR9AH, KJ6FAB, KM6AX, KR6AF, KX6BU, VS6s CG and CW are steady 21-Mc. chums of KA2AK. . . . . NNRcers point out CE3HB, CX2CO, HK2GA, HR1HM, PJ2AA, TG9AD, TI2BX, VP6GN, VO4EU, YN4CA, YV5AB, ZB1TD, ZP5JE and 4X4GB as likely 15-meter A3 candidates.

**15** c.w. is coming along nicely. PJ2AV 22, YN1AA 22 and ZS3E 21-22 hooked-up with DL4ZC with absence of QRM. . . . . W5UBW trapped EA8BQ and a

variety of European entries. . . . . FAs 30A 8CR and VO4SS raised W6ZZ to the 21-Mc. 71-country mark. Miles reports competition building up fast as the kw-beam boys arrive to cash in on the easy pickings. OQ5RU is another recent entry in the W6ZZ 15-meter archives, pump-handle style. . . . . Now a peek at Novice 21-Mc. doings. WN3DJW's Novice gallon (75 watts, of course) clobbered F9TK, JA1RL, VK3AXI, VO2HH and a smattering of additional Europeans. In fact, from what we see on John's list, a simple South American sample would clinch WN3DJW's Novice WAC. . . . . Fifteen watts on fifteen helped WN5HNS to his first helping of DX - KN4CIO/KV4 and TI2EA. . . . . WN9TEI nominates 4X4KD (c.w. to 'phone) as another Asia possibility who tunes for Novices.

**CAUTION**

Effective September 1, 1955, FCC-licensed amateurs are free to communicate with amateurs in Thailand (HS prefix). Another revision since last this box appeared: Laos amateurs (XWs prefix) may be freely contacted as of July 20th.

Under this country's treaty obligations and on formal notice received from other nations, FCC-licensed amateurs are warned to engage in no communications with stations in the countries listed below. This is in accordance with FCC Public Notice of December 21, 1950 (p. 23, Feb., 1951 QST), and as since revised.

French Indo-China (Cambodia and Viet-Nam), Republic of Indonesia, Iran, Korea.

Prefixes to be avoided: F1S-31W8, PK, EP-EQ, HL.

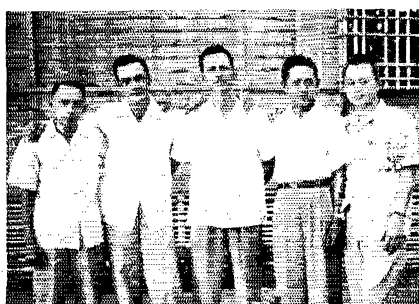
**10** 'phone begins to break its north-south-paths-only habits but not without great reluctance. W0UWD's roster is typical of the times: CXs 2AX 19, 4CS 20, HPs 1EH 22, 31A 23, HR3HH 0, LU1FAE 23, PY1AGP 22 and TI3LA 22. . . . . Far south of the border LU4AAR hears the Near East busting through, 4X4BL in particular. . . . . W1YKD's long-wire and 100 watts got the word to a dozen LUs, CE2HD, CXs 2BF 5CV 7BA 7BH, HC1s ES RT, HI6EC, HP3FL, VP9AY and YV5EW.

**160** is about to play host to another session of "signal, signal, who hears the signal?" The atmospheric level is falling fast and 1.8-Mc. horizons beckon to the annual Transatlantic Tests gang. WIBB and W3RGQ, ring-leaders of last season's festivities, are sounding the call to 160-meter arms and we'll carry the usual announcement of Test details next month. . . . . As recounted in "How's," the special summer tests were concluded in September with interesting results. WIBB, K2BWR and W3RGQ worked Europe in midsummer, something new in 1.8-Mc. annals. Indeed, WIBB's c.w. was reported heard on eight consecutive Sundays in the British Isles. Only the stringent British power limitation (10 watts) appears to have monkey-wrenched consummation of many more summertime transatlantic QSOs this year. On your mark and get set!

**Where:**

"Any correspondence regarding VP8BE QSLs should be sent to 55, Robins Lane, Frome, Somerset, England, and I would like to take this opportunity to thank all the friends I made in the U. S. A. for their consideration, patience and kindness." So states VP8BE upon forwarding a stack of Grahamsland QSLs our way via bureaus. . . . . According to W1VG, W6AWT is scheduled to distribute 11DCO/M1 cards to Ws who worked this San Marino venture in July. I1BRN also participated. . . . . Ex-KA2DV awaits QSL inquiries at the address to follow and expects to be back on DX bands from Otis AFB with a fresh W1 call before Christmas. This via W1RDV. . . . . DL4PR notes that the DL4 QSL bureau now is in the hands of DL4KN. However, to our knowledge, the bureau's mailing address remains the same. . . . . W1s OJR RLV TYQ UED WPO ZDP, W2s BRV BX4 IWC, K2s BZT DGT, W3s TYW VOS, W6s UED ZZ, W8KAK, W6s CPM PWN VBS VFM, DL4ZC,

Our roving "How's" camera dropped in on a few 1955 DXfests and now introduces you to some of the gang you've undoubtedly swapped signals with during the past year. At left, half the active amateurs of Honduras trade DX banter on the spacious HR1LW antenna farm at Tegucigalpa. Lower, l. to r., are IIR1s LW JZ EM and HR4WH; standing, IIR1s AT MC and JP. . . . . Center, l. to r., DU6s IV JI RC CO and FC comprise the entire ham population of the sixth Philippine call area, Iloilo. . . . . Right, the 1955 annual meeting of Switzerland's USKA brought together Swiss DXCC members (front, l. to r.) HB9s FE X J, (middle) HB9s BX GJ AT, (rear) HB9s KB and MQ.



KA2AK, V. Brener, NCDXC, NNRC, SCDXC and WGDXC figure these QTHs can be lettered neatly on the backs of somebody's QSLs:

AP2BP, Imperial Bank House, Lyallpur, Pakistan  
 CM8OZ, M. E. Tamayo Miranda, Box 40, Banes, Oriente, Cuba  
 CP5EP, W. L. Quiroga, Box 519, Cochabamba, Bolivia  
 DL4AJ, F. Yanko, 603rd AC&W Sqn., Dept. 4, APO 66, New York, N. Y.  
 ET2MZ (ex-MI8KV-11SYG), Aldo Baroni, P.O. Box 35, Massaua, Eritrea  
 ET2RP, APO 843, New York  
 ex-F7EH, R. C. Mitchell, WISWX, Box 36, Bridgton, Maine  
 FD4AB (ex-FD8AB-FF8BE), Pierre Duvourdicu, P.O. Box 185, Lome, French Togoland  
 FK8AQ, Box 104, Noumea, New Caledonia  
 FL8AD (QSL via REF)  
 G3KBI, M. P. Hughes, Northdean, Meopham nr. Gravesend, Kent, England  
 HC2BH, G. Buchanan, P. O. Box 213, Guayaquil, Ecuador  
 IH4MV, c/o Radio 4VEH, P. O. Box 1, Cap-Haitien, Haiti  
 HRIOS, P. O. Box 484, Tegucigalpa, Honduras  
 ex-KA2DV, Capt. R. A. Vogel, W3WV/1, 961st AEW&C Sqn., Otis AFB, Mass.  
 KA2RB, QSL to P. O. Box 179, Foley, Fla.  
 KG1AG, J. B. Holsten, jr., 1st Eng. Arctic Task Force, APO 33, New York, N. Y.  
 KG1AM, J. J. Gross, APO 23, New York, N. Y.  
 KG1BF, A/2c J. J. Capobianco, APO 23, New York, N. Y.  
 KJ6FAB, APO 105, San Francisco, Calif.  
 KM6AX, Box 19, Navy 3080, FPO, San Francisco, Calif.  
 KR6QW (QSL to OARC)  
 OD5AY, Boite Postale 3647, Beirut, Lebanon  
 OQ5ER, G. Balzat, P. O. Box 503, Luluabourg, Belgian Congo  
 OY5S, S. Poulsen, P. O. Box 27, Torshavn, Faeroes  
 PI1LS (QSL via PA8HF)  
 PY8CV, A. R. Monteiro, P. O. Box 174, Manaus, Amazonas, Brazil  
 SU1DD (QSL via RSGB)  
 TG9TU, F. Urrutia, P. O. Box 12, Guatemala City, Guatemala  
 UA4PL, P. O. Box 74, Odessa, U.S.S.R.  
 VE8BA, IIMCS Troquois, c/o FMO, HMC Dockyard, Halifax, N. S., Canada  
 VP1FL (QSL via W2HQI)  
 VP6PJ, C. Jones, Black Rock, St. Michael 26, Barbados, B.W.I.  
 VP6RF, E. FitzGoodridge, Rockley New Road, Christ Church, Barbados, B.W.I.  
 VP6RG, R. G. Gibbs, Beachgate, Hastings, Christ Church, Barbados, B.W.I.  
 VP7NY, H/S Co., 332 EAB, Eleuthera AFB, B.W.I., via Patrick AFB, Fla.  
 VP8BH (QSL via RSGB)  
 VR2AA, W. L. McMillan, Box 334, Suva, Fiji  
 VR3B, D. Laws, c/o Cable & Wireless, Fanning Island, via Suva, Fiji  
 VS1GR, G. W. Morgan, 383A Bukit Timah Rd., Singapore  
 VS1GS, A. Cundy, RAF MCE Base, Selator, Singapore  
 VS2EO, Sgt. B. Dosssetter, Signals Unit, 1poh, Malaya  
 VS2EP, Lt. W. Wood, 1st Fijian Regt., Batu Pahat, Malaya  
 W6YEF/HS, Specialist 1st Class W. D. Kreuzinger, JUSMAG, APO 74, Box B, San Francisco, Calif.  
 W9RJ/VE8, A. H. Bruhn, 920th AC&W Sqn., APO 677, New York, N. Y.  
 YN4HA, P. O. Box 4, Bluefields, Nicaragua  
 ZC5CT-VS5CT-VS4CT (QSL via MARTS)  
 ZD2NW, c/o Shell Oil Co., Lagos, Nigeria  
 ZD9AD (QSL via RSGB)  
 ZE6JV (ex-ZS6YN), John C. H. Chater, P. O. Box 408, Umtali, So. Rhodesia  
 5AITJ, APO 231, New York, N. Y.  
 5AITL, Box 372, Tripoli, Libya.

## Whence:

Asia — Stationed in Korat, Thailand, W6YEF learns that somebody is intermittently appropriating his California call. Now that Thailand has removed itself from the ITU ban list perhaps he'll be able to fire up under an HS label and catch the culprit personally. From W2-FBS we hear that YI2AM is slated to close his Iraqi logs in February. Before that time the YI hopes to nail down his lone WAS holdout — Vermont — XW8AB works

VS2DW has been the subject of many "How's" reports from Asia. Tan, now 45, was an SWL for twenty years before becoming the first and so far only native Malay to hold a VS2 call. Twenty c.w. is VS2DW's specialty when he's not on duty as a legal interpreter in Ipoh. (Photo via K6DY and W1QON)



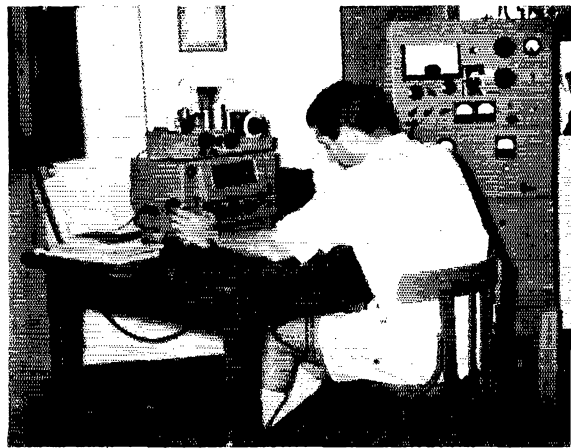
AC5PN on 14,013 and 14,050 kc. between 1300 and 1500 GMT but doesn't credit the AC5's 20-watt and nondescript receiver with much DX potentiality. WGDXC sources hear that XW8AB nipped off almost a hundred countries and a hundred W6-W7 entry in seven short weeks of Laotian opping. Elegantly sufficient advance notice on a 1956 DX project courtesy RCA (Argentina) secretary LU3EF: "Our member LU2DX will work an amateur radio station from Nepal from February 15, 1956, until March 31, 1956. Mr. Lugo will integrate the Argentine Expedition to the Himalayas. He will carry 50-watt equipment, rotary beams for 14 and 21 Mc. and will work c.w. and 'phone. The transmitter will be installed in a camp at a height of 5400 meters." So you have three months to install those stacked rhombics beamed on Nepal.

Africa — W2s BRV and BXA write about FD4AB, a guy who seems to specialize in QSOing the New York area. Pierre slithers about 20 like a phantom with an eight-watt 6J5-6F6-6V6 combination, Windom antenna and BC-342 receiver. FD4AB claims the only French Togoland ham ticket in use at this time — see you in the fringe area of those pileups. K6GAK reports favorably on ZS2MI's latest splurge of activity on Marion Isle. ZS6ANE acts as liaison between ZS2MI and the DX-hungry world with 14,175-kc. schedules every Saturday on 'phone around 1230 GMT. The receiver at ZS2MI is nothing to write home about so you may have to fill out your carriers when he tunes for Ws on the long path. ZS2MI QSLs still go via ZS6FN. ZE6JV heads a government school at Umtali with 24 proctors and a thousand pupils. John sticks to c.w. but s.s.b. has him ver-r-ry intrigued at the moment. A multistage 813 rig feeds a "plain disgrace" 15-ft.-high 67-ft. longwire. WGDXC Africanotes: PR7ZA's temporary QRT was occasioned by a two-month holiday in France. FB8ZT appears on 40 occasionally around 1430 GMT and FB8XX engages in 7- or 14-Mc. operation at 1800-1900 GMT. FB8BK on Tromelin Islet is catchable but not very active, while one FB8AX is scheduling 1956 Adelle Land availability. ZD9AD (G3HPAD) about to touch off the first Gough Island DX Contest, will maintain skeeds with a CW friend for the purpose of transmitting log-entry QSL data. Woe unto the DXers who mess up these contacts! Conditions may be improved, all right, but they ain't yet the greatest, judging from VQ6LQ's lines to K2GFQ. "Took part in the LABRE test with very unsatisfactory results — conditions hardly could have been worse here. Only heard three South American stations and worked one of them. 74 test contacts in all. Fun, anyway!" VQ8AG tells K2GFQ. "In a few months I hope to increase power and get on 'phone using 1130-1400 (long path) and 0400-0500 best for U. S. A. this time of year.

Oceania — ZC5DT, ex-VS5CT-VS4CT, got fired up in British North Borneo on schedule to complete a neat DX-peditionary triple play. KA2AK hears that Pete heads back home to G3DCT this month for a well-earned holiday. Pacific patter courtesy WGDXC sources: Coconut planter VR3C pops up on 'phone now and then but hasn't yet contracted serious DX fever. YI1AB, a malarialogist, doesn't cotton to the "listen for my buddies" routine. Bob uses a 6L6 20-watt on 20, 40 and 80, a hot 4-tube superhet with peachy peaked audio and a variety of sky-hooks. Back home at VK2QZ the chief interest is v.h.f. Don't demolish your beam if it fails to phase ZM6AT. Norm's fierce local noise level chooses to peak with openings Statesward. ZLs 1PA and 2GX portend a DX-cursion to the Kermadec Isles, new addition to the ARRL DXCC Countries List, come January and doubtless will have enough concentrated r.f. sent their way to give them

(Continued on page 118)

EA0AC appears to be using a bit of mental english to pull some weak VE5 through the 14-Mc. W/K fusillade that spattered him during this year's ARRL DX Competition. Juan hits 15, 20, 40 and 80 from Fernando Poo with a 3-stage rig modulated by 811s, a Safari receiver with converter, and various skywires.







# Hints and Kinks

For the Experimenters



## IMPROVED MOUNTING FOR GRID-DIP METER COILS

GRID-DIP METERS that use a fiber socket for mounting the plug-in coils frequently perform erratically after prolonged use because of socket failure. One method of making a simple repair is to thread a pair of binding posts into the original socket prongs. The Eby-type bakelite binding post having a 6-32 threaded stud is best for the job. The eye in each post can be enlarged with a drill to accommodate the prongs of the coils.

Usually, it is not necessary to take the meter apart while making the modification. If the coils are more difficult to couple to in the new mounting position (they will now protrude out at right angle to the meter case), the condition may be remedied by using link coupling as described by W9AA on page 38 of *QST* for February, 1955.

One thing for sure: The new mount will be more rugged than the original so long as the binding posts are threaded securely in place.

— Warren Smith, KH6WW

## FLEXIBLE SHIELDING FOR CABLES AND JOINTS

CUSTOMARY methods of shielding fall short of the requirement when a shielded cable or lead has to be tapped. The following idea permits a tap or joint to be effectively shielded even when it is desirable to maintain flexibility of the conductor.

First, cover the area where the wire is exposed with thin electrical tape such as Scotch Tape No. 33. Next, cut some paper thin brass or copper sheet into  $\frac{1}{2}$ -inch strips of convenient length. Now, "tape" the joint with the metal strip, overlapping the regular shield braid  $\frac{1}{4}$  inch or so at each end of the wrap. Lightly and quickly solder the metal wrapping to the braid at each end and you have a flexible shielded joint.

— George F. Reynolds, VE4AG

## A NEON-TUBE KEYING MONITOR

WHILE the use of a neon bulb as an r.f. indicator is well known, and its properties as a discharge device have been used in many ways, it may not be generally appreciated that it may also be used as a relay. This application is based on the fact that the gas in the bulb becomes conductive when it is ionized, not only when a suitable voltage is applied to the electrodes, but also when the bulb is located in a strong r.f. field. In the latter case, the bulb can act as a relay, controlling the flow of current in an external circuit when ionized by proximity to an r.f. field. This

characteristic makes possible the construction of a very simple keying monitor as shown in Fig. 1.

In Fig. 1,  $V_1$  is a neon bulb located near the final tank, an antenna wire, or wherever the r.f. field is strong enough to ionize completely the gas in the bulb as evidenced by a strong glow.

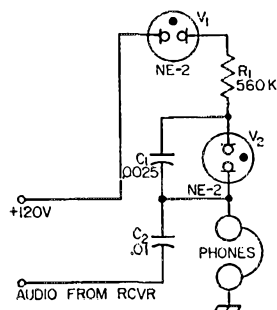


Fig. 1 — Circuit diagram of the neon-tube keying monitor.  $C_2$  is a coupling capacitor for the audio output from the receiver.  $V_1$  and  $V_2$  are 1/25-watt neon bulbs, GE type NE-2. Other component values are discussed in the text.

Incidentally, it is better to keep the bulb out of the field of the tank coil itself to minimize any possible r.f. pick-up on the leads. A suitable location would be adjacent to the stator plates of the tank condenser, being sure that all leads are well insulated against direct contact. No perceptible detuning of the tank should result, and the power absorbed by the device is negligible. As a further precaution against any unwanted radiation, the leads to the relay bulb should be shielded. They may, however, be as long as necessary.

The rest of the circuit is the familiar neon-bulb audio oscillator connected in series with the headphones. The values of  $R_1$  and  $C_1$  will determine the frequency of the tone generated. The values shown will give about an 800-cycle note, and provide a comfortable volume in high-impedance headphones. If greater volume is desired, the ratio of  $C_1$  to  $R_1$  should be increased. Increasing  $C_1$  alone, of course, will lower the frequency, so that for the same audio frequency,  $R_1$  must be reduced as  $C_1$  is increased.

There are a few precautions to be observed in building the monitor. If the voltage is too high, it may be found that the oscillator continues to operate after the key is released. If the voltage is too low, the neon bulb may not strike. Also, the voltage source should be well regulated, as otherwise a most annoying chirp will result. For this reason, as well as for convenience in construction, the use of a bleeder across the receiver power

(Continued on page 132)



# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
GEORGE HART, WINJM, Natl. Emerg. Coordinator  
PHIL SIMMONS, WIZDP, Asst. Comm. Mgr., C.W.

ROBERT L. WHITE, WIWFO, DXCC Awards  
LILLIAN M. SALTER, WIZJE, Administrative Aide  
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., 'Phone

22nd Annual Sweepstakes! It hardly seems possible after the previous history of increases that the last SS showed an increase in logs of close to 10 per cent over the preceding year. Such was the fact, however, and the increased popularity was about equal in the c.w. and 'phone departments. November again brings operating opportunity to all U. S. and Canadian amateurs to enter the "SS" and try to make a "clean sweep" of the 73 sections. The full rules appear elsewhere in this issue of *QST*.

Review WIZDP's write-up in the May and June issues to get the tempo of this widely acclaimed activity, if you like; at any rate don't pass up the chance to work new states and ARRL sections in the "SS" and get in on the fun. Besides certificates as usual to all section winners, top-Novice results likewise will be certified wherever a section has three or more WN/KN entries. The top Novice last year (KN2HXR) had a score of better than 10,000 points from working 138 stations in 31 ARRL sections! In the whole Sweepstakes, operating time is limited to 40 hours of operation. A very high percentage of the entries are in the power class of those running 100 watts input or less. A power multiplier helps all scorers in this power bracket compete with the 1000-watters. It's an inviting operating test to see what your station can do as well as a chance to increase operating know-how and station records. See you in the SS!!

Fall-Winter WIAW Schedule. Effective with the change from Daylight to Standard Time October 30th, WIAW is on the fall-winter schedule detailed elsewhere in these columns. You

may note that it is not necessary for members to write for a schedule to accomplish two-way work with the League station. *General Operating periods* are prescribed in each different band as indicated in the table, to allow for calls to make initial contact (and station-QSL) in the case of a new QSO or for other special purposes. Code-practice periods continue to start *daily* at 8:30 P.M. CST and practice speed ranges 5 to 35 w.p.m.; monthly certification speeds are 10 to 35 w.p.m. Information bulletins addressed to amateurs, CRPL forecasts and any "specials" are sent starting at 7 and 11 P.M. CST (c.w.) and 8 and 10:30 P.M. CST (voice).

Stations Voluntarily Sending Code Practice To Be Listed. Each year we arrange a new lithographed station list to send to those asking for helps in getting started; we also list in *QST* from time to time those stations that put on local practice programs. In sending *any* schedule to ARRL, to include in such lists, please advise your frequency, days of transmission, and your starting time and duration of such transmissions as well as the speed ranges covered. You are invited to send your schedule if you will engage in this type activity and if you will religiously abide by your days and times of transmission so it honestly represents a service to fellow amateurs.

We suggest that clubs and amateurs planning local practice programs fully utilize our ten-meter and v.h.f. bands, since this avoids too many practice transmissions in the lower frequency amateur bands where congestion and interference become greater.

ARRL solicits information on such code practice schedules as are in effect or presently planned. In return for a schedule planned six to ten weeks ahead (it does take time to get information in print) we'll list your schedule in *QST* and send you data on giving practice, if you so request.

Getting Code Practice. This is just a tip to the newer newcomers and any interested old timers and club groups as well to use the *ARRL CP program*. May we especially invite all new amateurs and Novices to use the daily practice from WIAW and the monthly runs for certifications.

One who is trying to advance his speed should not limit practice to "copy" that can be put to paper complete and perfect. He should go out of his way to find faster text where his speed of mental coordination is properly challenged. Make *writing down* of all Official Bulletins from WIAW or other stations (i.e., all you can get of them)

## A.R.R.L. ACTIVITIES CALENDAR

- Nov. 5th: CP Qualifying Run — W6OWP
- Nov. 12th-13th, 19th-20th: Sweepstakes
- Nov. 18th: CP Qualifying Run — WIAW
- Dec. 2nd: CP Qualifying Run — W6OWP
- Dec. 12th: CP Qualifying Run — WIAW
- Jan. 7th: CP Qualifying Run — W6OWP
- Jan. 7th-8th: V.H.F. Sweepstakes
- Jan. 14th-15th: CD QSO Party (c.w.)
- Jan. 17th: CP Qualifying Run — WIAW
- Jan. 21st-22nd: CD QSO Party ('phone)
- Feb. 3rd: CP Qualifying Run — W6OWP
- Feb. 4th-19th: Novice Round-up
- Feb. 10th-12th: DX Competition ('phone)
- Feb. 14th: Frequency Measuring Test
- Feb. 15th: CP Qualifying Run — WIAW
- Feb. 24th-26th: DX Competition (c.w.)
- Mar. 3rd: CP Qualifying Run — W6OWP
- Mar. 9th-11th: DX Competition ('phone)
- Mar. 15th: CP Qualifying Run — WIAW
- Mar. 23rd-25th: DX Competition (c.w.)

as well as the practice transmissions a habit. Copy in one's head doesn't do as much for making you a real operator. In the qualifying program where text is to be sent in by you on the once-a-month runs, the certificate awards start at 10 w.p.m. But don't let your aim stop there, or even with your government license; the code ability and full license privileges open the door to you to go after world wide DX, to handle traffic, to accomplish things *only* high code ability can get you, under adverse band conditions. About sending, practice in sending is also reflected into good receiving ability. Setting one's self up to send in step with W1AW tapes on the dates where practice texts from *QST* are announced in *QST* will be beneficial. As a newcomer you may find it hard to believe, but sending *well* is a more difficult accomplishment than merely copying down! For those now going up for General Class let us make the suggestion that you first acquire your ARRL CP endorsement sticker for 15 w.p.m. This allows a factor of safety in case taking a test tends to paralyze or slow down your copying ability. Practice (and more practice) is the sure road to getting there as also proved by the fact that active WNs have hardly any trouble in most cases in getting their General Class *well ahead* of the twelve months apprenticeship under that grade of ticket. — F. E. H.

### CODE-PRACTICE STATIONS

Top cooperation in both patience and regularity has been the keynote of the code-practice sessions maintained by W0EGQ and W0LGG, alternately transmitted from Leigh, Neb., and Marshalltown, Iowa.

Licensed in September of 1951 as a Novice, and making General Class shortly thereafter, Bob McMullin, W0EGQ, operates both 'phone and c.w. on 160, 80 and 40 meters. Bob's code-practice text is from *The Braille Technical Press* via a Viking II (tuned entirely by the audio methods prescribed by Bob Gunderson, W2JIO).

Bob and Bertha Willits, W0LGG, cordially invite all code-practice trainees to listen in on their schedule, shown below.

The following is an up-to-date list of all stations currently transmitting code practice in the ARRL Code-Practice Program:

W1ACT, Fall River ARC, 57 Richmond St., Fall River, Mass.; 3545 kc.; Mon., Wed., Thurs. and Fri., 1900 EST; 5-7 w.p.m.

W1QZO, Harry Warner, 11 Berlin St., Wollaston, Mass.; 146.8 Mc.; Tues. through Sun., 1900 EST; 6-14 w.p.m.

W1SRB, Al Vesce, 84 N. Main St., Thompsonville, Conn.; 29.6 Mc.; Mon., Wed. and Fri., 1930 EST; beginner's speeds.

W2HEI, William Teso, Mountain Ave., Hillburn, N. Y.; 3950 kc.; Sat. and Sun., 1400 EST; 5-18 w.p.m.

K2IBC, Avenel Radio Club, by W2FSL, Adolph F. Elster, 53 Commercial Ave., Avenel, N. J.; 3675 kc.; Sat., Sun. and holidays, 0730 EST; beginner's speeds.

W2NRM, Howard B. Jack, 12 Beech St., Ramsey, N. J.; 29.118 and 145.188 Mc.; Mon. through Sun., 0800 EST; Mon., Tues. and Fri., 2200 EST; Wed., 1915 EST; 3-8-15 w.p.m.

»

Code-practice station W0EGQ.

»

November 1955

### NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

These frequencies are generally employed by amateurs using radioteletype in the United States.

W3KWH, Steel City Amateur Radio Club, R.D. 5, McMichael Rd., Pittsburgh 5, Pa.; 29.108 Mc.; Wed., 2000 EST; 5-13-25 w.p.m.

W3IUD, Walter C. Downes, R.D. 2, Box 328, Jeannette, Pa.; 3585 kc.; Sun. 0930 EST, Wed. 1830 EST; 5-15 w.p.m.

W3VEJ, James M. Alcorn, 207½ Longfellow St., Vandergrift, Pa.; 7150 kc.; Mon. and Wed., 1900 EST; 5-15 w.p.m.

W4RUR, for St. Petersburg Amateur Radio Club, E. J. Blatt, 538 16th Ave. So., St. Petersburg, Fla.; 28.05 Mc.; Mon. and Wed., 1900 EST; 6-22 w.p.m.

W4ZRH, Carlton R. Commander, 17 Joyce St., Mt. Pleasant, S. C.; 3700 kc.; Mon. through Fri., 1830 EST; 5-13 w.p.m.

W5JRV, for Galveston County Amateur Radio Club, Blanchard Boldman, 4802 Ave. Q½, Galveston, Tex.; 1882 kc.; Mon. and Fri., 1900 CST; 3-15 w.p.m.

W5USN, Dan Baird, W5SPZ, Chief-in-Charge, 8th Hq. USNR Radio Station, Marconi Drive and Robert E. Lee Blvd., Route 3, New Orleans 24, La.; 7100 kc.; Mon. through Fri., 1230 CST, 15 w.p.m., 7100 and 3750 kc.; Fri. through Mon., 1930 CST, 15 w.p.m.

W6JZ, Ray Cornell, 909 Curtis St., Albany 6, Calif.; 3590 kc.; Mon. Wed. and Fri., 1830 PST, 5-25 w.p.m., 1920 PST, 35-45 w.p.m. (When needed, schedule maintained by W6EFD.)

K6TUSN, Cmdr. J. M. McCoy, 12th Naval District Reserve Electronics Stn., Bldg. 7, Treasure Island, San Francisco, Calif.; 3590 kc.; Tues. and Thurs., 1830 PST; 5-25 w.p.m.

K7FCV, Lyle B. Clemans, CWO USAF, MARS Base Dir., Davis-Monthan AFB, Tucson, Ariz.; 3825 kc.; Tues., 1830 MST; 8-20 w.p.m.

W7FWD, O. U. Tatro, 513 N. Central, Olympia, Wash.; 3646 kc.; Mon. through Fri., 1700 PST; 4-25 w.p.m.

W8MAI, Blossomland Amateur Radio Assn., % W8FGB, Dean Manley, R.F.D. 1, Box 147F, St. Joseph, Mich.; 1890 kc.; Mon. through Fri., 2000 EST; 5-20 w.p.m.

W8STR, Meredith Gayle Bargar, Box 446, Gnadenhutten, Ohio; 3690 kc., Mon., Wed., Fri., Sat. and Sun., 1900 EST; 5-10 w.p.m.

W9NPC, for Fox River Radio League, Lewis R. Hill, 212 N. Evanslawn Ave., Aurora, Ill.; 1810 kc.; Mon. through Sat., 1900 CST; 5-20 w.p.m.

W9UTN, Joseph H. Kadlec, 1148 Ashland Ave., Evanston, Ill.; 7240 kc.; Sat. and Sun., 0800 CST; 5-7½ w.p.m.

W0DQL, Herbert Williams Patterson, 3111 12th Ave. So., Minneapolis 7, Minn.; 3690 kc.; Sun., 1700 EST; 13 w.p.m.

W0LGG, Bertha V. Willits, 108 N. 19th St., Marshalltown, Iowa; 3695 kc.; Mon. through Sun., 1800 CST; 5-13 w.p.m., text from *QST*. Same schedule alternated with W0EGQ, Bob McMullin, Route 1, Leigh, Neb., with text from *The Braille Technical Press*.

W0LQC, F. Bion McCurry, 1234 Stanford, Springfield, Mo.; 29.18 Mc.; Tues., 2130 CST; beginner's speeds.

W0SQE, Bill Heitritter, 1114½ Virginia St., Sioux City, Iowa; 3750 kc.; Mon. through Fri., 1600 CST; 5-13 w.p.m.





Tommy King, W4UZZ, was able to be of service recently in checking on a rumor that a man traveling from Enid, Oklahoma, to Jackson, Tenn., had been killed in an auto accident. The man in question was an amateur with a mobile unit in his car. Tommy was able to locate him, with the help of W4s YMB DQH and FYX and affirm that the rumor was "grossly exaggerated." (Photo courtesy of Jackson (Tenn.) Sun.)

ing on the quantity and completeness of accounts received from participating amateurs. It is now too late, when you read this, to make that issue; however, send us your story anyway, if you have not already done so, so that it can at least be chronicled in this column.



Up this way, we are just getting our breaths back after some rugged sessions of operating in connection with the Diane floods in August. Many amateur organizations, groups and nets covered themselves with glory during the extended operation, some of which lasted for two weeks and more, such was the extent of communications disruption. Along with the glory heaped on us by the press and public officials comes also the usual bitter self-criticism and controversial discussions among ourselves as to what we should have done instead of what we did.

Self-criticism is a good thing, even when it amounts to criticizing each other, as it does in this case. The thing we have to remember is that if we criticize ourselves too much and too loud, disinterested listeners may soon begin to agree with us that we did a rotten job instead of with the press and public officials that we did an excellent one. In other words, let's keep these critical discussions among ourselves and, for the most part, off the air.

We wish there were room in this column to go into some of the controversial aspects of amateur operation during emergencies. Unfortunately, QST space being at a premium, we find it more feasible to deal with such details in bulletins. The October CD Bulletin, mailed to all ARRL appointees, contained some detailed discussions of emergency communications problems and their solutions, stemming from actual experience in the recent Diane floods. Although these discussions are approached from broad premises (as they must be), each group that participated in the flood emergency contributes to these discussions by writing to tell us of the problems they encountered and how they solved them.

The complete story of amateur participation in the Diane floods is tentatively scheduled for December QST, depend-

A delayed item: On February 22nd, W7AEF reported into the Cascade Net (29,200 kc.) with the information that a young girl in a Portland hospital with leukemia was in need of watermelon, not available locally. W7GPJ and W7ODZ switched to 40 meters to contact the Los Angeles area. Through the efforts of the net and the Oregon Emergency net, word was sent via amateur radio clear to Florida and up the East Coast and to Hawaii. At 0500 the following day the first watermelons arrived by plane from Texas; at 1710 two more shipments arrived by air from Chicago; and three air shipments arrived at 2210. The hospital, with melons to spare, announced the possibility of starting a "watermelon bank."

W1QMB, EC for Portland, Conn., tries to make it easy for AREC members in his area to keep him informed of their circumstances. Recently, he sent out a brief letter to each registrant asking five questions pertinent to their availability situation. Under each question he gave several suggested possible answers. Enclosed with the letter was a post card on which the recipient could indicate which of the various answers to each question applied to him. The post card was already stamped and addressed to W1QMB. Assuming that each AREC registrant is either busy or lazy (a pretty safe assumption), returns are much more likely to be received from a questionnaire of this sort.

Thirteen SECs reported for the month of July, representing 5282 AREC members. This represents fewer reports but more AREC members. We are still ahead of 1954 but behind 1953 in our reporting records.

### RACES News

Things got fairly exciting around Battle Creek when the Federal Civil Defense Administration decided to move there in the fall of 1954; but it wasn't until Region IV Headquarters, FCDA, moved to the same building that the hams really got fired up. John A. Schuerger, Warning and Communications Officer for FCDA Region 4, with the assistance of several hams in the Calhoun Area Radio Club, developed a RACES plan for use as Radio "back-



up" service for the Region IV wire service which is already in operation. W8YAN was appointed Region IV RACES Radio Officer and W8PYQ was appointed his alternate. The plan calls for operation on RACES portions of the 160-, 80-, 75-, 10-, and 2-meter bands between State Civil Defense Headquarters in the eight state region and the main control center located at Battle Creek. The eight states are: Michigan, Illinois, Indiana, Wisconsin, Minnesota, North Dakota, South Dakota and Iowa. This regional RACES plan is the first such plan submitted to the FCC, and it is hoped that other regional RACES groups will initiate similar plans in the near future.

The RACES Radio Officer plans to use about 40 of the amateurs in the area in the operational and training program to be set up. Equipment will be set up in FCDA Region IV Control Center at Battle Creek.

Here is another late report of participation in the June 15th-16th Civil Defense "Operation Alert, 1955." W9KCW reports that the Watch Dog Net in the Chicago area had

### NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C. W.		'PHONE	
3550	14,050	3875	14,225
7100	21,050	7250	21,040
28,100		29,640	

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050, 14,060; phone — 3765, 14,160, 28,250 kc.

10 mobiles and 14 fixed stations operative during the test. W9RPII, mobile and portable from Soldiers Field, and W9HIO in Skokie acted as net controls at different times during the drill. The exercise, conducted entirely on two meters, was entirely unplanned. Although little traffic was handled, the drill served a purpose of checking the range of the stations from different locations. Several out-of-town stations also participated.

### NET DIRECTORY

This list includes all nets registered up to and including Sept. 16, 1955. Registrations received after that date will be included in the January QST listing if received prior to Nov. 15th. If you have not yet registered your net, please send us the data requested on page 72, September QST.

Nets are registered in the ARRL Net Directory only upon request, and upon receipt of the minimum basic information given below. The complete cross-indexed directory will be available in December.

Name of Net	Freq.	Time	Days
Ala. Emerg. Net (phone) (AENP)	3955	1800 CST	Daily
Ala. Emerg. Net B (AENB)	3575	1900 CST	Daily
Annisson (Ala.) Emerg. Net (AENQ)	29,560	1900 CST	Mon.
Azalea Emerg. Net (Ala.) (AENG)	29,680	1945 CST	Sat.
Barnyard Net	3924	0700 EST	Mon.-Sat.
Birmingham Emerg. Net (AENR)	29,560	1300 CST	Sun.
Cape Cod and Island Net (Mass.)	3912	0730 EST	Mon.-Fri.
Colo. Slow-Speed Net	3570	1715 MST	Mon., Wed., Fri.
Colo. Weather Net	3945	0800 EST	Daily
Delaware Emerg. Net	3905	1830 EST	Sat.
Delaware Valley 2-Meter Traffic Net	144,540	1930 EST	Daily
Early Bird Transcontinental Net	3845	0445 CST	Daily
Earlybird Teenage Traffic Net (ETTN)	3980	0700 CST	Mon.-Sat.
Eastern Penna. Net	3610	1730 EST	Mon.-Sat.
Fifth Regional Net (8RN)	3530	1945 EST	Mon.-Sat.
Empire Slow-Speed Net	3590	1800 EST	Daily
First Regional Net (1RN)	3605	1930 EST	Mon.-Sat.
Florida 'Phone Traffic Net (FPTN)	3945	0700 EST	Mon.-Sat.
Gadsden (Ala.) Emerg. C.W. Net (AENC)	3735	1300 CST	Sun.
Gadsden (Ala.) Emerg. Net (AENH)	29,560	1900 EST	Wed.
Georgia State Net (GSN)	3590	1900 EST	Mon.-Fri.
Hi Noon Net (HNN)	3945	1200 EST	Mon.-Sat.
Huntsville (Ala.) Emerg. Net (AENS)	3825	1400 CST	Sun.
Indiana Fone Net (IFN)	3910	1830 EST	Mon.-Fri.
Interstate 'Phone Net	3970	1500 EST	Mon.-Sat.
Kansas C.W. Net (QKS)	3610	1830 CST	Mon.-Fri.
Lee Co. (Ala.) Emerg. Net (AENX)	3885	1330 CST	Sun.
Maritime Net	3750	1900 AST	Daily
Minnesota Section Net (MSN)	3595	1830 CST	Mon.-Sat.
Montgomery (Ala.) Emerg. Net (AENK)	3940	1400 CST	Sun.
Mountain Dew Novice Net	3703	0900 EST	Sat.
Nebr. Slow-Speed Net (NSS)	3750	1700 CST	Daily
New Mexico C.W. Net	3633	1900 MST	Mon.-Sat.
North East Texas Emerg. 'Phone Net (NETEN)	3970	0800 CST	Sun.
Northwest Texas Emerg. Net	3950	0800 CST	Sun.
North Texas Emerg. Net (NTEN)	3930	0800 CST	Sun.

North Texas-Oklahoma Net (NTO)	3960	1730 CST	Daily
Northern Texas Section Liaison Net	3960	0730 CST	Sun.
North Texas C.W. Net (NTX)	3770	1845 CST	Mon.-Fri.
North Texas Emerg. C.W. Net	3770	0800 CST	Sun.
Oklahoma Traffic Net (OLZ)	3682.5	1900 CST	Mon.-Sat.
Oregon State Net (OSN)	3585	1830 PST	Mon.-Sat.
Pony Express Net	3920	0830 MST	Sun.
Red Cross Amateur Radio Net	3925	2000 EST	1st Mon.
Rhode Island Intercity Net	29,260	1930 EST	Mon.-Fri.
Rhode Island Traffic Net (RIN)	3540	1000 EST	Mon.-Sat.
Rockingham Co. (N.H.) Emerg. Net (RCEN)	3850	1300 EST	Sun.
Second Regional Net (2RN)	3690	1830 EST	Mon.-Sat.
Second Regional 'Phone Net	3980	1030 EST	Mon.-Sat.
South Dakota C.W. Net	3615	1900 CST	Mon., Wed., Fri.
Southwest La. Emerg. Net	3850	1400 EST	Sun.
Southern Md. AREC Net	3745	2100 EST	Mon., Wed., Fri.
Teen Agers' Net (TAN)	3630	1830 EST	Daily
Teen-Age Radio Net	3720	1830 EST	Mon.-Sat.
Thirteenth Regional Net (TRN)	3535	1945 EST	Mon.-Sat.
Totem Emerg. Net (TEN)	29,000	2000 PST	Tues.
United Trunk Lines (UTL) (Central)	7130	1900 CST	Daily
	3565	2000 CST	Daily
(Eastern)	3565	2015 EST	Daily
(West)	3570	1915 PST	Daily
Valley Emerg. Net (Ala.) (AENI)	3910	1330 CST	Sun.
Virginia Fone Net (VFN)	3835	1900 EST	Daily
Washington Section Net (WSN)	3575	1900 PST	Mon.-Fri.
Westfield (Mass.) RACES Net	29,640	2000 EST	Mon.
Western Mass. Net (WMN)	3590	1900 EST	Mon.-Sat.
Winfield Emerg. Net (AENL)	3945	1730 CST	Wed.
Wyoming Weather Net	3925	0700 EST	Daily
"YO" C.W. Net	3620	1830 EST	Daily

### BRIEFS

W9VBZ, age 17, was named the "ham of the year" and will receive the Milwaukee Radio Amateurs' Club "Irwin Kreis" Memorial Trophy. W9ONY suggests that such presentations are worthy promotional events for any of the more than 800 affiliated ARRL clubs. In the case of MARC, the club announces some 30 items of amateur work on which points are granted and from that the best ham is picked.

When I was young and in my prime,  
I knew a thing or two,  
And sometimes on occasion  
Even sent a QRQ.

But now that I am old and gray,  
Things are quite a mess;  
I usually start the evening with  
OM PSE QRS!

— J. S. Bourne, USCG

Mobiles in the vicinity of Keene and Lake Placid, New York, wishing to aid communications during the Great American Mountain Rally Endurance Run in November are urged to contact Mr. Robert S. Grier, President, Motor Sports Club of America, Inc., 184 East 93rd Street, New York 28, N. Y.

At a combined get-together of members of QKS, QKS-SS and QKN in Manhattan, Kansas, on May 15th, the Novice net members got together to have this picture taken. Left to right (standing): KN0AOQ W0FEO (NCS) WN0ZNO WN0ZNP WN0ZPS WN0WSZ W0RXM W0UAT KN0ADV WN0YVM. That's W0NIY sitting, in background.

November 1955



## TRAFFIC TOPICS

We were pleased to note that during the recent flood emergency several traffic nets became active spontaneously as the need for their services arose. This is quite in line with the maxim that every traffic net is an emergency net.

Some time ago (August, 1953, to be exact) we introduced into this column some thoughts on message precedences. This has always been a touchy subject, if not a sore one. During our day-to-day operations, we can do very well without considering it, because when conditions are normal amateur radio is not a vehicle for handling emergency-type traffic. Commercial facilities are available and much more reliable, generally speaking. During the recent emergency, we saw and felt a great deal of confusion regarding message precedences. Some stations set themselves up on a lofty pinnacle to handle "official" traffic only, even though there wasn't enough of this to keep them 100 per cent busy. Others were interested in handling traffic only for some specific agency. Still others seemed to have no conception of precedences, responding to the pressure of the moment regardless of the seeming importance of message content.

Perhaps what we really need at every emergency station installation is a "classification officer," one who determines the importance of any message filed so it can be handled accordingly. This is seldom possible, especially in small installations or in mobiles. To a great extent the classification of messages is up to us. The thoughts presented in August 1953 *QST* (page 66) were intended to suggest some basic principles on which such determinations can be based. We think that a review of this subject may be appropriate at this time.

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The Early Bird Net made a traffic count of 432 in August, according to W8AMH. W2JOA reports that the Teenagers Net (TAN) made a traffic total of 271 in 31 sessions; W3WZL was the winner of the TAN contest. The North Texas-Oklahoma Section Net reports 31 sessions with 721 check-ins during August and a traffic total of 221. The New York State Emergency and Traffic Net reports a traffic total of 229 in 65 hours of operation during August. The Transcontinental 'Phone Net (1st Call Area section) registered 578 messages with fifteen stations participating. The Second Call Area reported 783 messages handled by eight stations.

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*National Traffic System.* We have been encouraged by indications that some of the NTS section and regional nets are reinstating the late session as a part of regular operation. Some of the regional nets never relinquished this feature, but the going has been tough because of late-evening propagation difficulties. In the hope that the climb to better propagation conditions for traffic work is more rapid than the decline to poorer and poorer conditions which we have experienced in the last few years, we would like to see more NTS nets have another crack at the late session as per the original NTS setup — which isn't as impractical as some of its critics think.

August reports:

Net	Sessions	Traffic	Rate	Average session	Repre-
1RN	27	454	0.46	16.8	85.7%
2RN	26	169	0.50	6.5	91%
3RN	37	146	0.33	3.9	86.5%
RN5	36	464	0.75	10.0	46.4%
RN6	22	103	0.33	4.5	28.8%
8RN	31	76	—	2.4	53.3%
9RN	27	617	0.53	22.9	100%
TEN	73	1255	—	17.2	62.7%
TEN	15	27	—	2.0	64.4%
EAN	24	618	—	25.7	88.8%
CAN	24	953	0.75	39.7	97.2%
Sections*	416	2004	—	4.8	—
TCC (Eastern)		123	—	—	—
TCC (Pacific)		286	—	—	—
Summary	768	7295	RN5/CAN	9.0	9RN
Record	768	7295	0.80	14.8	100%

\* Section nets reporting: CN & MCN (Conn.); WVN (W. Va.); Tenn. Summer; MON (Mo.); AENB & AENP (Ala.); N. Dak. 75 'Phone; MSN (Minn.); KYN (Ky.); NTX (N. Tex.); QKS, QKS-SS & QKN (Kans.); CVN (Callt.); W8N (Wash.).

Late reports:

CAN (July)	21	722	0.43	34.3	100%
MSN (Minn.) (July)	26	298	—	11.0	—

Considering the time of year, reporting has held up very well. Don't forget that these reports have to reach us by the

15th of the month, otherwise they will wind up in the "late" column.

We congratulate the following sections (or section nets) on being represented 100 per cent in their respective regions during the month of August — no mean accomplishment: Connecticut (in 1RN); North Texas (in RN5); Northern California Net (in RN6); Ohio (in 8RN); Wisconsin, Illinois, Indiana and Kentucky (in 9RN — a 100 per cent region); Ontario (in TRN).

W2ZRC is the new manager of 2RN, and has gone right to work. 3RN operated on an emergency basis as Hurricane Connie approached on August 12th; liaison was maintained with the Virginia Net. RN5 resumes winter schedule on September 19th, and manager W4OGG has extensive plans for a bang-up season. RN6 certificates have been issued to K6DQA, W6CMA, W6AIT and W6TTX; manager W6ZRJ is busily publicizing NTS on the West Coast. W4KKW, 9RN manager, is proud of his net's performance during August and gives full credit to W9DO for a wonderful job; Art is the first recipient of a 9RN certificate issued by the new manager. TRN has gone back on winter schedule, two sessions per night six days per week, effective September 26th. W9JUI has resigned as CAN manager and Central Area TCC Director; Peggy reports that the greatest difficulty on CAN is in procuring net control stations. How about some of you fellows in the central area lending a hand?

The Transcontinental Corps has accumulated quite a number of holes during the summer months, as was to be expected. W8UPB has promised a complete reorganization of Eastern Area TCC. W8KQD is taking over as Pacific Area TCC Director and has big plans in store. The Central Area TCC Directorship is still vacant at this writing.

### BRASS POUNDERS LEAGUE

Winners of BPL Certificates for August traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3WJQ	43	731	793	96	1663
W9DO	41	732	712	61	1546
W0CPL	11	689	607	62	1349
W2KEB	72	505	405	280	1262
W9NZZ	348	450	0	444	1242
W3CTL	89	572	431	135	1227
W0BDR	39	573	550	2	1164
W2KRV	24	586	406	100	1116
W188	21	487	463	24	995
W3PYF/3	42	442	78	364	926
W4PRJ	8	407	395	13	823
W7PGY	49	369	333	34	785
W7BA	23	380	335	25	763
W0SCA	10	363	350	2	725
W2JOA	61	270	175	64	570
W0PZO	2	263	256	5	526
K4AKP	262	205	35	17	519
W7VAZ	14	248	218	30	510
W9TT	8	270	228	2	508
Late Reports:					
K4AKP (July)	269	256	16	17	558
W3CVE (July)	68	231	194	37	530

### More-Than-One-Operator Stations

KH8AJF	174	1089	1022	61	2346
K0WVB	81	550	487	52	1170
W1AW	112	411	395	158	976
KH6QU	26	285	168	117	596
K5FFA	11	269	257	22	559
K5FFB	29	222	238	15	504
Late Report:					
W4LEV (July)	24	55	479	510	1068
K4WAR (July)	31	402	388	14	835

BPL for 100 or more originations-plus-deliveries:

KP4WT	174	K4ASU	120	WRDAE	103
K2DEM/2	172	W4HDR	115	W4CGE	101
K2KXZ	146	W3ZRQ	114	W4OGG	101
W4VJ	142	K2GHS/1	111	Late Reports:	
W0NTY	132	W1BDI	107	W6MBW (July)	159
W0HUX	121	VE7ASR	106	W8NOH (May)	118

### More-Than-One-Operator Stations W3VPR 122

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K4ASU, W9SAA.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.

## BRIEFS

The Indiana Radio Club Council presents an annual award to the leading Indiana club based on Field Day work. ARRL FD rules apply except that club reports must be based on that portion of the score related to the performance of one of its transmitter groups. The Michiana Amateur Radio Club (South Bend) is the second time IRCC FD plaque winner. The IRCC also sponsored a mobile-contact contest, certificate winner being W9ZTD with 143 QSOs on three bands from May 1st through June 15th. WN9HHN won the IRCC certificate for the 1955 Novice Round-up.

Sacramento Valley SCM W6JDN reports that much of the success of the two-day August Stockton-to-Redding (California) river race, a 316-mile marathon, was due to efficient communications provided by W6s AK DHI DTW ETT FTQ HGW HNL IQF JEQ KUI KYO LLR MAP MWR OPY PJF QJD QYQ RQJ SIG SXF TKE UCO UFR, and K6s AKF BJV BMU BQU BYS CBY DHI EPJ EPK FAV FR GIB KPG.

The next Novice Round-up will be scheduled from February 4 through 19, 1956. The change will avert the possibility of a pile-up of this with other contest reports. It will also remedy a common complaint from past participants that the contest competes with final examinations. Such operators will now have more time to devote to the N-R. See rules in January QST.

### W1AW OPERATING SCHEDULE

(Effective October 30, 1955)

(All times given are Eastern Standard Time)

W1AW will return to its Fall-Winter operating schedule with the return to Standard Time. General operation covers all amateur bands on which W1AW has equipment. Novice periods include both early and late operation on 3.5 and 7 Mc. (see Footnote 2 in box). Master schedules showing complete W1AW operation in EST, CST or PST will be sent to anyone on request.

#### Operating-Visiting Hours:

Monday through Friday: 1500-0300 (following day).

Saturday: 1900-0230 (Sunday).

Sunday: 1500-2230.

Exception: W1AW will be closed from 0300 Nov. 24th to 1500 Nov. 25th in observance of Thanksgiving Day.

General Operation: Use the chart below for determining times during which W1AW engages in general operation on various frequencies, 'phone and c.w. Note that since the schedule is organized in EST, certain morning operating periods may fall on the evening of the previous days in western time zones. W1AW will participate in all official ARRL operating activities, using scheduled general operating periods for this purpose if necessary.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules:

#### Frequencies (kc.):

C.w.: 1885, 3555, 7125, 14,100, 21,010, 52,000, 145,600.

'Phone: 1885, 3945, 7255, 14,280, 21,350, 52,000, 145,600.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibration purposes.

#### Times:

Sunday through Friday: 2000 by c.w., 2100 by 'phone.

Monday through Saturday: 2330 by 'phone, 2400 by c.w.

Code Proficiency Program: Practice transmissions are made on the above listed c.w. frequencies, starting at 2130 daily. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately ten minutes of practice is given at each speed. Exceptions: On Nov. 16th W1AW will transmit a special Frequency Measuring Test and on Nov. 18th and Dec. 12th W1AW will transmit ARRL Code Proficiency Qualifying Runs instead of the regular code practice.

### 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 November 18th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 355, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run from W60W/P only will be transmitted on November 5th at 2100 PST on 3590 and 7138 kc.

Any person may 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. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. 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 get sending practice, hook up your own key and buzzer and attempt to send in unison with W1AW.

#### Date Subject of Practice Text from September QST

- Nov. 1st: Solarized QSO, p. 11
- Nov. 4th: The "2B3" Superheterodyne, p. 12
- Nov. 7th: Upper-Air Conditions. . . . , p. 16
- Nov. 10th: The Little Shack, p. 18
- Nov. 15th: The S-FS Indicator, p. 19
- Nov. 22nd: A 28-Mc. Civil Defense Package, p. 23
- Nov. 28th: Amateurs in Operation Alert, 1955, p. 50
- Nov. 30th: June V.H.F. Party Summary, p. 56

### W1AW GENERAL-CONTACT SCHEDULE

(Effective October 30, 1955)

W1AW welcomes calls from any amateur station. Starting October 30th, W1AW will listen for calls in accordance with the following time-frequency chart:

EST	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0020-0100 <sup>1</sup>	.....	.....	3555 <sup>2</sup>	7255	3555	7125 <sup>2</sup>	3945
0100-0200	.....	.....	3945	.....	3555	1725	.....
0200-0300	.....	.....	7255	3945	7125	3945	7255
1500-1600	.....	.....	14,280	21/28 Mc. <sup>3</sup>	14,100	.....	.....
1600-1700	.....	14,280	21/28 Mc. <sup>3</sup>	14,100	21/28 Mc. <sup>3</sup>	21,350	.....
1700-1800	.....	14,100	14,280	21,010	14,280	14,100	.....
1930-2000	.....	7255	.....	7125	.....	7255	.....
2020-2100 <sup>1</sup>	.....	7125	3555	7125 <sup>2</sup>	3555 <sup>2</sup>	7125	.....
2110-2130 <sup>1</sup>	.....	3945	52 Mc.	145.6 Mc.	3945	3945	.....
2230-2330	.....	3555	3945	7125	1885	3555	.....
2340-2400 <sup>1</sup>	.....	3945	1885	3945	1885	3945	.....

<sup>1</sup> General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0000 and 2000 on c.w. and at 2100 and 2330 on 'phone. Starting time is approximate.

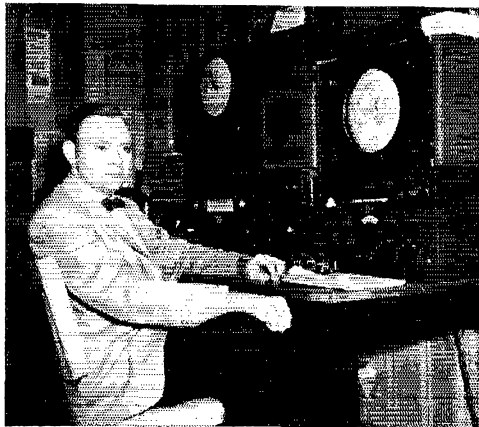
<sup>2</sup> W1AW will listen for Novices (on Novice band indicated) before looking over the band for other contacts.

<sup>3</sup> Operation will be conducted on one of the following frequencies: 21,010; 21,350; 28,060; 28,768 kc.

## MEET THE SCMs

Albert H. Hix, W8PQQ, who recently began a new term as SCM of the West Virginia section, has been a ham since 1936; he also has radiotelephone first- and radiotelegraph second-class licenses. Having operated in France, Monaco, and Andorra, he has held the calls F7AR, 3A2AC, and PX1AR, and was one of the operators of 7B4QF.

SCM Hix is an ardent contest participant and has been section winner of Sweepstakes, W-VE, and DX Contests. A former ARRL Official Observer and Official Bulletin Station, he presently holds the posts of Assistant Director, Official Relay Station, and Official Phone Station; he is past-president of the Tri City Amateur Radio Club. Public



Service certificates have been issued to him as a result of his work in the 1952 West Virginia forest fire, the 1937 Ohio River Valley flood, and the 1950 Petersburg, W. Va., flood. He also possesses A-1 Operator, Code Proficiency, and DXCC certificates.

Transmitting equipment in W8PQQ's basement recreation room consists of a Federal 167-B exciter, a p.p. 304-TL amplifier for 14 Mc., a p.p. 250-TH amplifier for 7 Mc., a p.p. HF-300 amplifier for 3.5 Mc., and an HT-9 for net operation. For reception an HRO and a Collins 75A-2 are used. Antennas are a 40-ft. vertical for 3.5, 7, and 14 Mc., a 3.9-Mc. doublet, a 7-Mc. ground plane, and three-element 21- and three-element 14-Mc. wide-spaced rotaries.

Al is connected with the Carbide and Carbon Chemicals Corporation as instrument engineer. His pet sports are swimming and chasing DX on 14 Mc.

## BRIEFS

Alberta radio amateurs provided the radio link between a Lake Newell float and Kinbrook Island Headquaters during the August 10th Brooks Regatta and Sports Day. Regatta information and communications of an emergency nature were well handled by VEG's AD AM HV PK UK.

The Wichita Amateur Radio Club and Central Kansas Radio Club sent four of their members on a "Top of the World" radio expedition recently. In a trailer equipped with all the comforts of home, including a kw. mobile rig, W0's ILB MBH SIG and YMG journeyed to 2-mile-high Berthoud Pass on the Continental Divide in the Rocky Mountains. Under the call K6AST/mobile the group made more than 300 contacts on 40 and 75 meters. Each station worked has received a "Top of the World" certificate.

W5VVH sends word of another group that participated in the March of Dimes drive (see page 73, July QST). The East Texas Amateur Radio Club set up W5ZJM's station in the studio at KLTW and operated it 22 hours in the Warm Springs Foundation telethon last March. Contributions from 10 counties and 280 messages were handled.

## DXCC NOTES

We are pleased to make announcement of the following additions to the ARRL Postwar Countries List: Laos (XW8), Cambodia (3W8) and Viet Nam (F18). DXCC credit will be given starting February 1, 1956, for creditable confirmation of contacts made on or after July 20, 1955,

with these countries. Confirmations made for DXCC credit for any of these countries prior to February 1, 1956, will be returned without credit. (Your attention is called to the fact Cambodia (3W8) and Viet Nam (F18) are still on the "banned list" and credit cannot be given for these countries.)

As of July 19, 1955 credits will no longer be made toward the listing shown as French Indo-China (F18) on the ARRL Countries List. Credits for French Indo-China (F18) will still be given for confirmations showing the contact date to be prior to July 20, 1955 with the exception of contacts made during the period when French Indo-China (F18) was on the "banned list."

In future ARRL DX Competitions, claims for DXCC credit in accordance with DXCC rules may be made for contacts now permitted with amateur stations located in Laos (XW8), also additionally with Cambodia (3W8) or Viet Nam (F18) should they be taken off the "banned list."

## DX CENTURY CLUB AWARDS

### HONOR ROLL

W1PH .....	260	PY2CK .....	251	G2PL .....	248
W6VFR .....	256	W6MX .....	250	W2BXA .....	247
W6AM .....	254	W4NBK .....	250	W3KT .....	247
W3BES .....	252	W0YXO .....	250	W5MIB .....	246
W6ENV .....	251	W3CHD .....	249	W6MEK .....	246
W6SYG .....	251	W6SN .....	249	W7AMX .....	246
W8HGW .....	251	W2AGW .....	248	W9NDA .....	246

### Radiotelephone

PY2CK .....	243	W1MCW .....	219	W8HGW .....	214
W1PH .....	233	W1NWO .....	217	W9NDA .....	213
VQ4RR .....	233	W3JNN .....	215	W5RGP .....	212
ZS6BW .....	229	XE1AC .....	215	W9RBI .....	210
W1JCX .....	219			SM5KP .....	210

From August 15, to September 15, 1955 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

W2JT .....	221	W7DAA .....	104	W3ROB .....	101
W2GT .....	219	W7GWD .....	104	W3SWV .....	101
W7ADS .....	147	W3MWC .....	103	JA1CF .....	101
CH8BX .....	145	W6VYX .....	100	W6VYX .....	100
Y13EU .....	121	DU78V .....	103	W3VOS .....	100
ZS6WJ .....	112	W6CEC .....	102	W6QNA .....	100
I1NT .....	109	SV0VL .....	102	DJ2BC .....	100
G3DMG .....	106	W3COK .....	101	F7BO .....	100
W2RXM .....	104			GW6FN .....	100

### Radiotelephone

W2JT .....	157	W8EMZ .....	103	ON4LJ .....	102
W7ADS .....	147	W2HQJ .....	102	HH9BB .....	101
V66J .....	129	GC6FG .....	102	W5CDP .....	100
SM5ARL .....	122	OE5JK .....	102	W6MEL .....	100
4X4BL .....	107			ON4DH .....	100

### ENDORSEMENTS

W6CQU .....	240	W5DMR .....	170	W5PZL .....	133
W6ELA .....	236	W9DXE .....	162	G278N .....	133
W6PKC .....	222	W1ZW .....	161	W0EU .....	130
W8DAW .....	220	W6BYB .....	161	W4NBV .....	125
W6MHB .....	212	G2IO .....	161	OZ5PA .....	121
W3OP .....	211	W0QVZ .....	160	K2FDL .....	120
W3JTK .....	200	G3CBN .....	156	W2FBS .....	120
W5MFW .....	200	W1TYQ .....	152	W6VYX .....	120
G3YF .....	200	F8EJ .....	152	W5ABY .....	120
W4HA .....	193	W2HSZ .....	151	G3ESY .....	120
W6LDJ .....	193	W1BIL .....	150	EA8BC .....	119
W4LZF .....	191	W1BGA .....	150	I1BLF .....	119
SM5CO .....	191	W7HQC .....	150	W8SQP .....	114
E12AB .....	190	ON4CP .....	150	W6QBA .....	112
W7GBW .....	187	ZL1AH .....	150	DL4ZC .....	111
W2HRV .....	180	VK3YL .....	143	W2STJ .....	110
ZS1BK .....	178	W5HDS .....	140	W4KKG .....	110
PA0VB .....	172	PY4AJD .....	140	W7FB .....	110
W2ZV8 .....	170	W1PKW .....	137	KP4TF .....	110

### Radiotelephone

W5EFC .....	190	W8VDJ .....	150	CX3BH .....	123
W4NBK .....	184	CR6EX .....	140	EA9 .....	121
PY4VX .....	165	ZP5CF .....	140	W5GXP .....	120
W0NCG .....	160	ZL1KG .....	131	W4NBV .....	114
YV5EC .....	150	W5DMR .....	130	KL7AON .....	114

### W/VE/VO Call Area and Continental Leaders

W4BPD .....	241	VE5QZ .....	140	VO6EP .....	190
VE1HG .....	150	VE6GD .....	103	4X4RE .....	210
VE2WU .....	181	VE7HC .....	209	ZS6BW .....	235
VE3QD .....	210	VE8AW .....	160	ZL2GX .....	240

### Radiotelephone

W2APU .....	202	W7HLA .....	181	VE3KF .....	183
W2BXA .....	202	W0A1R .....	191	VE7ZM .....	140
W4HA .....	189	VE1CR .....	120	OD5AB .....	170
W6D1 .....	207	VE2WW .....	102	ZL1HY .....	196



## Section Emergency Coördinators of the Amateur Radio Emergency Corps

The Section Emergency Coördinator is appointed by the SCM to take charge of the promotion of the Amateur Radio Emergency Corps organization throughout the Section. He acts as the SCM's executive in the furthering of provisions for emergency amateur radio communications in every community likely to suffer in case of a communications emergency. One of the duties of the SEC is to recommend the appointment of Emergency Coördinators for the various communities in his Section. Does your town have an EC? If not, recommend the name of a likely prospect to the SEC. The SEC invites your questions concerning the status of the AREC in your Section.

<b>ATLANTIC DIVISION</b>			
Eastern Pennsylvania	W3NNT	Douglas Morick	510 Hickory St.
Maryland-Delaware-D. C.	W3PKC	John Campolonicio	629 McCabe Ave.
Southern New Jersey	W2ZVW	Edward Hart, jr.	51 Washington St.
Western New York	W2IUTG/FRL	Henry A. Blodgett	515 Victor-Holcomb Rd., Rt. 1
Western Pennsylvania	W3GEG	Alfred C. Heck	515 Cedar Ave.
Bethlehem			Baltimore 12. Md.
			Phillipsburg
			Victor
			Sharon
<b>CENTRAL DIVISION</b>			
Illinois	W9HOA	A. B. Brand	1211 Harlem Blvd.
Indiana	W9I7I	J. Herman Barnett, jr.	20 Meridian Pl.
Wisconsin	W9OVO	Clayton Carby	
Rockford			Indianapolis 5
			Sawyer
<b>DAKOTA DIVISION</b>			
North Dakota	W0ZCM	Mark M. Tollefson	Rte. 4
South Dakota	W0GCP	Wilbur Simantel	113 E. 10 St.
Minnesota	W0GTX	George P. Lord	P. O. Box 8
Hebron			Mitchell
			Alexandria
<b>DELTA DIVISION</b>			
Arkansas	W5TNM	Newell N. Shaw	RFD 7
Louisiana	W5IUG	E. B. Hazlewood	6990 New Hammond Hwy.
Mississippi	W5PFC	S. Ferguson, sr.	407 Douglas Ave.
Tennessee	W4RRV	S. B. DeHart	227 S. Purdue
Fayetteville			Baton Rouge
			Oak Ridge
<b>GREAT LAKES DIVISION</b>			
Kentucky	W4CDA	W. C. Alcock	155 St. Mildred's Court
Michigan	W8GJH	Francis E. Gary	620 Thayer St.
Ohio	W8UPB	Dana E. Cartwright, sr.	2979 Observatory Rd.
Danville			Westbury
			Cincinnati 8
<b>HUDSON DIVISION</b>			
Eastern New York	W2RTE	Theodore L. Buley	191 Vassar Rd.
N. Y. C. & Long Island	W2ADD	Maurice Mulligan	Box 134
Northern New Jersey	W2IIN	John J. Vitale	57 Sayre St.
Poughkeepsie			Westbury
			Elizabeth 3
<b>MIDWEST DIVISION</b>			
Iowa	W0DDV	Stan R. Ball	1227 - 10th St.
Kansas	W0PAH	W. G. Schrenk	444 Westview Drive
Missouri	W0VRF	O. H. Huggins	3605 E. 72nd St.
Nebraska	W0JDJ	Francis B. Johnson	820 S. 44th St.
Nevada			Manhattan
			Kansas City
			Lincoln 8
<b>NEW ENGLAND DIVISION</b>			
Connecticut	W1LKF	Peter R. de Bruyn	1853 Main St.
Maine	W1TVB	Chester A. Dykeman	RFD 1
Eastern Massachusetts	W1BL	Raymond E. Boardman	53 Thurston Rd.
Western Massachusetts	W1RRX	William F. Ham	197 Whitney Ave.
New Hampshire	W1BXU	William E. Goldthwaite	24 Franklin St.
Rhode Island	W1TOW	Robert H. Rothman	710 Elmgrove Ave.
Vermont	W1SIO	Carl M. Anderson	9 West St.
Newington			Gray
			Newton Upper Falls 64
			Holyoke
			Concord
			Providence
			Brattleboro
<b>NORTHWESTERN DIVISION</b>			
Alaska	KL7TI	James Heav	Box 1238
Idaho	W71WU	Alan K. Ross	2105 Irene St.
Montana	W7KUH	Walter R. Marten	3021 6th Ave., So.
Oregon	W7WAT	Glynn P. McCready	7323 North McKenna
Washington	W7PQT	Vern C. Shafer	319 Talcott
Juneau			Great Falls
			Portland
			Sedro Woolley
<b>PACIFIC DIVISION</b>			
Hawaii	KH6AS	John Keawe	714 Ocean View Dr.
Nevada			
Santa Clara Valley	W6NVO	Edward T. Turner	2837 Fernwood
East Bay	W6VGM	Jay Amaro	199 Harrier St.
San Francisco	W6NVI	Saul C. Van Liew	215 Knowles Ave.
Sacramento Valley	W6IEQ	L. B. LaDue	5400 Carmel Way
San Joaquin Valley	W6EBL	F. E. Robinson	P. O. Box 713
San Mateo			Vallejo
			Daly City
			Sacramento
			Sonora
<b>ROANOKE DIVISION</b>			
North Carolina	W4ZG	Roy C. Corderman	780 Pine Valley Road
South Carolina	W4DX	Ben L. Team	Route 3 Box
Virginia	W4RTV	Hughes L. Motley	121 South Holly Ave.
West Virginia	W8GEI	Basil B. Bennett	Athens Star Route
Winston-Salem 5			Camden
			Highland Springs
			Princeton
<b>ROCKY MOUNTAIN DIVISION</b>			
Colorado	W0MMT	Marie Ellis	531 Cowan
Utah	W7JOE	John Tempest, jr.	1599 Orchard Dr.
Wyoming	W7ACG	Carter A. Ross	1152 S. Willows
Fort Collins			Salt Lake City
			Casper
<b>SOUTHEASTERN DIVISION</b>			
Alabama	W4TKL	W. W. Varnedoe	Rt. 4, Box 135
Eastern Florida	W4LYT	Andrew C. Clark	41 Lenape Drive
Western Florida	W4PLE	Landon L. Hoyt	29 Elliorts Rd.
Georgia	W4CFJ	William F. Kennedy	459 Fairway Hill Dr., S.E.
West Indies (Cuba-P.R.-V.I.)	KP4JM	Jose E. Saldaña	calle Llorens Torres 420
Canal Zone	KZ5WA	P. Alton White	Box 82
Huntsville			Miami Springs
			Fort Walton Beach
			Atlanta
			Hato Rey, P.R.
			Gamboa
<b>SOUTHWESTERN DIVISION</b>			
Los Angeles	W6QJW	Howard F. Shepherd, jr.	127 So. Citrus Ave.
Arizona	W7VRB	George G. Schluichter	713 E. Stella Lane
San Diego	W6VFT	Ben S. Hamilton	8447 Denton
Santa Barbara	K6KPU	Donn C. Hannah	507 West Pueblo St.
Los Angeles 36			Phoenix
			La Mesa
			Santa Barbara
<b>WEST GULF DIVISION</b>			
Northern Texas	W5RRM	Cecil C. Cammack	3750 Brighton Rd.
Oklahoma	W5KCV	Robert D. Reed	439 So. Peoria
Southern Texas	W5OEM	Roy K. Eggleston	1229 Dunn Lane
New Mexico	W5KCV	Verl A. Coleman	418 Kathryn St.
Fort Worth			Tulsa
			Corpus Christi
			Santa Fe
<b>CANADIAN DIVISION</b>			
Maritime	VE1RR	Holland H. Shepherd	15 Flin St.
Ontario	VE1KM	P. W. Clarence	2278 King St., East
Quebec	VE2BR	A. George Brewer	4334 Montrose Ave.
Alberta	VE6MJ	Sydney T. Jones	10706-57th Ave.
British Columbia	VE7DI	William J. Emerson	693 Sixth St.
Fairview, N. S.			Westmount, Montreal
			Edmonton
			Nanaimo
			Vancouver Island, B. C.
Yukon			
Manitoba			
Saskatchewan	VE5LU	Lionel O'Byrne	Rowatt

• 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, RM: AXA, PAM; TEJ, E. Pa. Nets: 3610 and 3850 kc. August was a busy month for the Eastern Pennsylvania gang with the event of the Diane floods in the section. Almost every amateur active on the bands did something to help. One of the biggest operations was the trip, by helicopter, of SEC NNT and ZOM to the Milford, Pa., area to set up communications for a full week. In that time they were the only means of communications out of an area which had almost 20,000 people in vacation resorts. Their 18-hour day schedules with OK gave the national Red Cross complete coverage. TEJ reports that 135 stations were active on 3850 kc. during the operation. In the Stroudsburg Area, UCY acted as net control on 3910 kc. for traffic from that area. The picnic at Hershey Park saw the gathering of 72 amateurs and their families. The picnic, sponsored by the PFN, was a combined effort of the PFN, AN, EFA, and EBTCFN. The North Penn ARC furnished two-way radio communication for the Lansdale Jr. Chamber of Commerce Soap Box Derby on Labor Day. EU reports that Wilkes-Barre, c.d., soon will sport a new Viking II because of the efficiency of amateurs in that area during the floods. The Lancaster Transmitting Society had an outing at DYT's cottage. GGT spoke on 2GT meter antennas. During a trip to Block Island, R. I., RKN made 37 contacts on 2 meters during a 5-hour plane trip with VBI at the controls. BES is giving code practice to 3 prospective Novices. BUR has a 1000-ft. long wire antenna. BNR, stranded in Phillipsburg, N. J., during the flood, helped 2ZVW in traffic-handling. The Philmont Mobile Club did a terrific job in Bucks, Montgomery, and Philadelphia Counties during the disaster. Nine mobiles from Berks, Montgomery, and Lehigh Counties went into the Stroudsburg Area to aid in traffic-handling during Aug. 21-22. They include MLY, BN, IGW, CNO, YJM, URU, KCG, QZO, and BYF. Six members of the Delaware-Lehigh ARC travelled to Milford to aid NNT and ZOM. They include ELH, TNC, ZBE, LCL, QMW, and VSB. MAC lost all his equipment during the flood. KJJ, active in the Tamaqua Area emergency, passed his 35-year mark on Sept. 22nd. He was licensed Sept. 22, 1930. Traffic: W3CUL 1227, PYF/3 926, YDX 385, OK 262, TEJ 253, WUE 168, BFF 149, BNR 147, ZRQ 131, VYX 69, YOS 52, G1Y 48, BUR 43, UWP 30, BBX 25, YYT 21, ELI 16, TTW 16, BHJ 15, PYF 15, YUO 13, UOE 11, DUI 8, BHC 6, LEZ 6, CKD 5, JNQ 4, AMC 3, OML 1, YGX 1.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA**—SCM, John W. Gore, W3PRL—The Maryland, Delaware, and D. C. amateurs again performed valiant service during Hurricanes Connie and Diane. The MEPN functioned during each of the periods of the emergency and during "Diane", the following stations acted as net control at least once: JZY, FWR, OMN, GFF, PPY, VZZ, LUV, PRL, BM, AVL, and CBW. During Hurricane Connie the Delaware Emergency Net, operating on 3905 kc., functioned in continuous session from 12 noon Fri. until midnight. Twenty Delaware amateur stations and three c.d. stations provided state-wide coverage on the Net. The Blue Hen 10-meter mobile group was prepared to provide a highway inspection service for the State Police. Direct communication with Red Cross Headquarters in Wilmington was established on 2 meters. Activities consisted of handling traffic for the Red Cross and relaying weather information. Among those taking part were DOG, DQZ, FEG, HGA, IYE, KET, KI, NKK, K3NRH, PVO, SPZ, SRE, TFG, TCQ, UVT, UWO, VQA, WLO, ZNE, CCE, JDP, OWE, KAT, 4ANL/3, TRM, UO, PCZ, SQV, EEB, YOB, YLZ, TDU, FFF, TGE, UMV, KIH, SAT, WN3BXX, WN3BWC, and STS. The Delaware Emergency Net meets each Sat. at 1830 on 3905 kc. In the Hagerstown Area Hurricane Connie found many amateurs monitoring frequencies from Aug. 9th through 11th assisting in the handling of

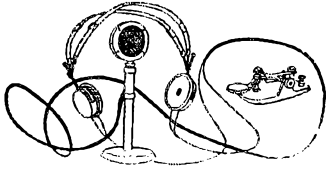
traffic when called upon. Those participating were OYX, OXL, RAH, TJV, VAM, and YRK. The above procedure also was followed through during Hurricane Diane. The Antietam Radio Assn. held its hamfest on Aug. 28th at Carapon State Park, W. Va. In addition to the Hagerstown group there were a number from the Baltimore and Winchester Areas. Starting Sept. 19th for six days the ARA set up a station in operation at the Hagerstown Fair using the club call CWC. WAF is operating 10-meter phone and also is mobile. PZA (the Red Cross Station in Washington) has been put into operation by the Washington Radio Club with EEP as trustee. Located in the D. C. Chapter House of ARC, the station is Collins-equipped. During Hurricanes Connie and Diane PZA operated primarily on the National Emergency frequencies 3550 and 3875 kc., handling traffic for the D. C. chapter and the Hagerstown Area ARC and was manned by BKE, CJT, ECP, OQT, WAG, VBP, and RYX. WN3DCO is a new Novice in D. C. and is on the air with a Heathkit AT-1 and AR-2 receiver. WN3BXM passed his General Class code test. The Washington TVI Committee handled 126 complaints during the year ending June 30, 1955, about 50 per cent. as many as were handled during the previous year. HIN is building a new home in Kensington and expects to resume activities soon. VBP has entered American University as a freshman and will be associated with WAMU, the campus carrier radio station. BUD, St. Marys County EC, has formed a combined emergency and traffic net for AREC training on 3745 kc., clearing traffic through MDD and UTL. Because of a shift in his hours of work QCB will try to explore the 20-meter band in the morning to determine what his 30-watter will do. EEB reports a lot of fun in the CD Party from a vacation camp in Vermont, working portable. PRL gave a talk to the CARC on Aug. 8th, on "Mobile Antennas for all Bands," and RVL of the JHU Radiation Lab., gave a talk on "Band Pass Amplifiers for R.F." to the same club on Aug. 22nd. Traffic: (Aug) W3WV 439, VPR 122, PQ 25, ECP 24, PRL 24, RV 18, SPL 18, NNX 16, K2ES 11, W3RCP 11, OHI 10, PKC 8, JZY 4, FY 2, OYX 2, (July) W3CWE 530, K3WBJ 212, W3BUD 72, NNX 16.

**SOUTHERN NEW JERSEY**—SCM, Herbert C. Brooks, K2BG—SEC: ZVW, PAM: ZI. Full details of the activities during the Delaware River flood emergency have not been received. YRW, Delaware Valley 2-meter Traffic Net manager, submitted a fine report of the Net's activities. MOM, KN2KVE, K2TTP, 3KBG, 3WQL, and 3YDX handled emergency traffic on the Net. ASG also handled relief messages. K2BWR has been working plenty of DX on 160 and 40 meters. Ex-K2CEF is now W40M1 in Memphis. QLB is back on 2 meters with a ten-element flip-flop. We are indebted to K2AML for the SCARA news. DZU lost both of his 50-ft. towers in the recent wind storm but expects new ones soon. The Burlington County Radio Club is now affiliated with RRR. The Club meets the first Fri. night of each month. The J-P Net was alerted during the recent flood. The Net consisted of several fixed stations and six mobiles. KN2OOK, the son of RC (Area 1 Radio Officer), has been operating at Pennsauken, C. D. Headquarters. W2UA and K2BG attended a recent RACES communications meeting at Trenton. ADA is erecting a 70-foot tower, assisted by K2GIT. ZNB operates the Delancey 2-meter rig at C.D. Headquarters. SDB is doing a fine job promoting DX activities at SJRA, K2CPR, W3VMX, and W2LS (Official Observer) continue to do a very good job in reporting discrepancies. A report of your club activities will be greatly appreciated, especially in connection with emergency and RACES nets and drills being held. Traffic: (Aug.) W2RG 127, YRW 72, ASG 50, IIDW 23, VMX 11, K2CPR 3, (July) W2YRW 6.

**WESTERN NEW YORK**—SCM, Edward G. Graf, W2SJV—Asst. SCM: Jeanne Walker, 2HTB. SEC: UTH/FRL. RM's: HUF and ZRC. PAMs: TEP and NAI. NYS C.W. meets on 3615 kc. at 6 p.m. and 6:30 a.m.; NYSS on 3595 kc. at 5:30 p.m.; NYS Phone on 3925 kc. at 6 p.m.; Teen Age Net (TAR) on 3720 kc. at 4 p.m.; NYS C.D. on 3509.5 and 3993 kc. at 9 a.m. Sun.; TCPN 2nd Call Area at 7 p.m. on 3970 kc.; SRPN on 3970 kc. at 10 a.m.; ISN on 3980 kc. at 3 p.m. Picnics were held in August by NYS Phone at Green Lakes Park, the RARA at Churchville Pk., the Northern Chautauqua Club at Ft. Gratiot, the Early Bird Net at Hersey Pk., NYS C.W. at Ithaca, the RAGS at Pratt's Falls, the Elmira Club at Newtown Battlefield Pk., the KBT at Alexson Pk., the ARATS at Ellicott Crk. Pk., and the SRPN at Sccharie. 4EBF, formerly of Buffalo, visited in Western New York. ZRC is mgr. of the 2nd Regional Net. K2KTR is starting a teen-age net to meet on 3720 kc. at 4 p.m. Mon. through Sat. SB is c.d. HO for

(Continued on page 70)

## AT YOUR SERVICE



**H**ALLICRAFTERS spends thousands of dollars yearly in our inspection and quality control departments to maintain the high standards of our engineering and design; but like other complex pieces of electronic equipment, our products are subject to shipping hazards and component parts failures.

**S**INCE service and satisfaction of performance are so important, Hallicrafters warrants that its products are free from defective material and workmanship and agrees to remedy any such defects.

**T**O back up this warranty policy, in addition to our factory service laboratory we employ a network of over 300 Authorized Service Centers strategically located throughout the country to give qualified local service for your convenience and saving of time and shipping expense.

**T**HESSE appointed Authorized Service Centers use precision test equipment, skilled technicians and good workmanship to supply service representative of factory standards.

**T**RAVELING service engineers are continually assisting and checking product performance in the field. Their reporting and on-the-spot analysis can have a direct bearing on future design or betterment of present products.

**W**E CAN proudly say that sometimes our service laboratory looks like a museum by the presence of old time models we produced 10, 15, 20 years ago . . . Old favorites like the SX-28, S-20R, SX-16, still giving many hours of long faithful use until they have become a sentimental piece and have come back home for a well earned overhaul.

**O**UR Service Department's interest in old, new and future products involves correspondence of over two thousand letters a month covering many varied subjects, dispersing information and service on inquiries from all over the world. Our customers' comments and constructive criticisms are most welcome, and this information is compiled and channeled to responsible departments for a guide in design and production.

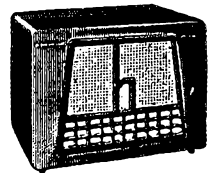
**M**AY we be of service to you?

— W. H. Shaw, W9UIG

W. J. Halligan W9AC

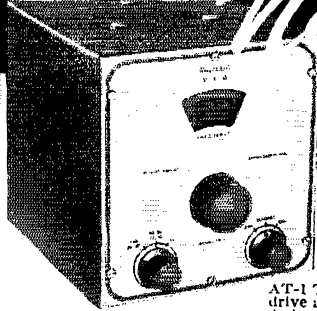
Basil Halligan Jr.

for **hallicrafters**



# New

# Heathkit VFO KIT



MODEL VF-1

**\$1950**

Ship. Wt. 7 lbs.

- Smooth acting illuminated and precalibrated dial.
- 6AUG electron coupled Clapp oscillator and OA2 voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, T60 through T0 meters, from 3 basic oscillator frequencies.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical features at a low kit price. Good mechanical features at a low kit price. Good mechanical features at a low kit price.

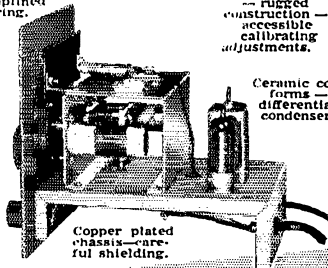
and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at 45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard 1/4" crystal holder. Construction simple and wiring is easy.

Open layout—easy to build—simplified wiring.

Smooth acting illuminated dial drive.

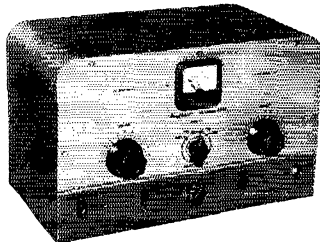
Clean appearance—rugged construction—accessible calibrating adjustments.



Ceramic coil form differential condenser.

Copper plated chassis—careful shielding.

# Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

**\$2950**

Ship. Wt. 16 lbs.

### SPECIFICATIONS:

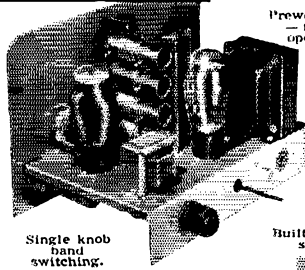
Range 80, 40, 20, 15, 11, 10 meters.  
6AG7 Oscillator-multiplier.  
6L6 Amplifier-doubler.  
5U4G Rectifier.  
105-125 Volt A.C. 50-60 cycles 100 watts.  
Size: 8 1/2 inch high x 13 1/2 inch wide x 7 inch deep.

Crystal or VFO excitation.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

Rugged, clean construction.

Prewound coils—metered operation.



52 ohm resistal output.

Single knob band switching.

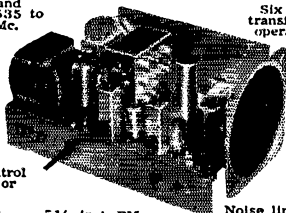
Built-in power supply.

# Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Stable BFO oscillator circuit.

RF gain control with AVC or AVC.



5 1/4 inch PM Speaker, Headphone Jack.

Six tube transformer operation.

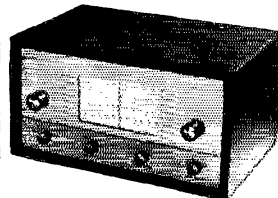
Electrical bandspread and scale.

Noise limiter—standby switch.

### SPECIFICATIONS:

Range.....535 Kc to 35 Mc  
12BE6 Mixer-oscillator  
12BA6 I. F. Amplifier  
12AV6 Detector-AVC—audio  
12BA6 B. F. O. oscillator  
12A6 Beam power output  
6X3GT Rectifier  
105-125 volts A.C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.



MODEL AR-2

**\$2550**

Ship. Wt. 12 lbs.

### CABINET:

Proxylon impregnated fabric covered plywood cabinet. Ship. weight 5 lbs. Number 91-10, \$4.50.

**HEATH COMPANY**  
BENTON HARBOR 9, MICHIGAN

*New* HEATHKIT  
DX-100

# PHONE AND CW TRANSMITTER KIT



MODEL DX-100

Shpg. Wt. 120 lbs.

**\$189.50**

Shipped motor freight unless otherwise specified. \$50.00 deposit with C.O.D. orders.

- R.F. output 100 watts Phone, 125 watts CW.
- Built-in VFO, modulator, power supplies. Kit includes all components, tubes, cabinet and detailed construction manual.
- Crystal or VFO operation (crystals not included with kit).
- Pi network output, matches 50-600 ohms non-reactive load. Reduces harmonic output.
- Treated for TVI suppression by extensive shielding and filtering.
- Single knob bandswitching, 160 meters through 10 meters.
- Pre-punched chassis, well illustrated construction manual, high quality components used throughout—sturdy mechanical assembly.

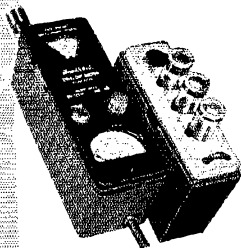
This modern-design Transmitter has its own VFO and plate-modulator built in to provide CW or phone operation from 160 meters through 10 meters. It is TVI suppressed, with all incoming and out-going circuits filtered, plenty of shielding, and strong metal cabinet with interlocking seams. Uses pi network interstage and output coupling. R.F. output 100 watts phone, . . . . . 125 watts CW. Switch-selection of VFO or 4 crystals (crystals not included).

Incorporates high quality features not expected at this price level. Copper plated chassis—wide-spaced tuning capacitors — excellent quality components throughout—illuminated VFO dial and meter face—remote socket for connection of external switch or control of an external antenna relay. Performed wiring harness—concentric control shafts. Plenty of step-by-step instructions and pictorial diagrams.

All power supplies built-in. Covers 160, 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Panel meter reads Driver Ip Final Ig, Ip, and Ep, and Modulator Ip. Uses 6AU6 VFO, 12BY7 Xtal osc.-buffer, 5763 driver, and parallel 6146 final. 12AX7 speech amp., 12BY7 driver, push-pull 1625 modulators. Power supplies use 5V4 low voltage rect., 6AL5 bias rect., 0A2 VFO voltage reg., (2) 5R4GY hi voltage rect., and 6AQ5 clamp tube. R.F. output to coax. connector. Overall dimensions 20 $\frac{1}{8}$ " W x 13 $\frac{3}{4}$ " H x 16" D.

*Heathkit*

## GRID DIP METER KIT



MODEL GD-1B

**\$19.50** Shpg. Wt. 4 lbs.

The invaluable instrument for all Hams. Numerous applications such as pretuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

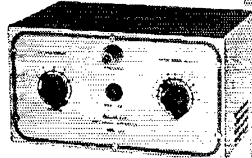
Covers 80, 40, 20, 11, 10, 6, 2, and 1 $\frac{1}{2}$  meter Ham bands. Complete frequency coverage from 2—250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial

with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

*Heathkit*

## ANTENNA COUPLER KIT



MODEL AC-1

**\$14.50** Shpg. Wt. 4 lbs.

Poor matching allows valuable communications energy to be lost. The Model AC-1 will properly match your low power transmitter to an end-fed long wire antenna. Also attenuates signals above 36 Mc, reducing TVI. 52 ohm coax. input—power up to 75 watts—10 through 80 meters—tapped inductor and variable condenser—neon RF indicator—copper plated chassis and high quality components.

*Heathkit*

## ANTENNA IMPEDANCE METER KIT



MODEL AM-1

**\$14.50** Shpg. Wt. 2 lbs.

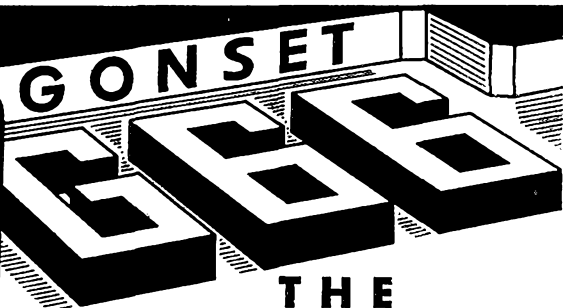
Use the Model AM-1 in conjunction with a signal source for measuring antenna impedance, line matching purposes, adjustment of beam and mobile antennas, and to insure proper impedance match for optimum overall system operation. Will double, also, as a phone monitor or relative field strength indicator.

100  $\mu$ a. meter employed. Covers the range from 0 to 600 ohms. Cabinet is only

7" long, 2 $\frac{1}{2}$ " wide, and 3 $\frac{1}{4}$ " deep. An instrument of many uses for the amateur.

# HEATH COMPANY

A SUBSIDIARY OF DAYSTROM, INC.  
BENTON HARBOR 9, MICHIGAN



# THE MOBILE RECEIVER

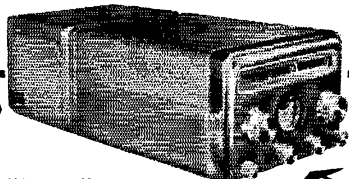
*with all the answers!*

Now . . . one complete receiver gives you everything you possibly want for superior mobile reception. Six bands, including standard broadcast . . . each amateur band individually calibrated, each spread across the easy-to-read slide rule dial scale. An important economic consideration lies in the fact that, while your present car may have a 6 volt battery, next year's car may have a 12 volt system.

A separate "Three way" power supply takes care of this contingency, operates from 6 volts, 12 volts and . . . 115 volts AC! G-66 can also be removed from the car and put into operation on AC power mains. The performance of G-66 can be compared favorably to an excellent communications receiver, one that is equally effective with AC or DC power sources.

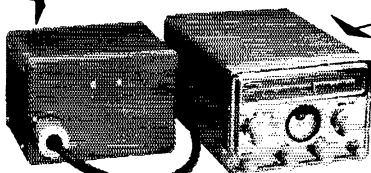
*at your fingertips*

**Panel antenna trimmer—panel "S" meter—panel BFO pitch control—slide rule dial with rotating drum exposes only band in use—40:1 tuning ratio—automatic noise limiter—AVC.**



"3 way",  
power supply  
and speaker unit . . .  
4 3/4" deep.

4 1/2" high,  
6 1/2" wide,  
9" deep.



4' patch cable

*all the answers*

Provides outstanding operation on all reception modes . . . AM, CW, SSB with a new high order of stability for CW and SSB reception now made possible by stabilized HF and BF oscillators and by the use of a crystal controlled second conversion oscillator.

Double conversion, (2050 kc 1st I.F.) and double input tuning, (3 tuned circuits) on higher bands for very high image rejection.

265 kc 2nd I.F. with 8, high "Q" tuned circuits gives 3.5 kc bandwidth at 6 db down, together with steep "skirt" selectivity.

*pertinent data*

6 bands: 540-2000 kcs.—3500-4000 kcs.—7000-7300 kcs.—14-14.35 mcs.—21-21.45 mcs.—28-29.7 mcs.

8 tubes plus OB2 voltage regulator.

Front panel and chassis slip readily in and out of outer housing which may remain permanently mounted in the car.

"Three way" universal power supply and speaker unit attaches and plugs into rear of receiver as a cabinet extension. May also be mounted separately and connected with patch cable. Terminals are provided for external speaker, also for receiver muting.

**G-66 receiver less power supply . . . 169.50 net.**

**"3 way", (6V-12V-115V AC) universal power supply and speaker unit . . . . . 39.95 net.**



**GONSET CO.** 801 SOUTH MAIN STREET, BURBANK, CALIF.

# THE CASE OF THE BANTAM

There is indeed such a case but there's nothing mysterious about it. This case contains the high "Q" coil assemblies, the "Heart" of the widely acclaimed, 15 and 20 meter Gonset Bantam Beams.

No flimsy, crushable cardboard here. Instead, a sturdy wooden case with interior supports to which the assemblies are firmly secured by wood screws. With this case, "Pre-tuned at the factory" remains a valid claim even after the inevitable shocks and jars of shipment. This exceptional Gonset packaging entails no extra cost to you, is absorbed in a selling price that would still offer full and excellent value if the assemblies were merely wrapped in paper! Just one of the many reasons why you should make your choice a "BANTAM".

## Features

*Performance in all kinds of weather*  
approaching that of a full-length 20 meter array.

EXTREMELY COMPACT . . . ONLY 16½ FEET,  
TIP-TO-TIP . . . . .

LIGHT IN WEIGHT . . . ONLY 27 POUNDS

EASILY ROTATED BY TV-TYPE ROTATOR

EXCELLENT FRONT-TO-BACK RATIO . . . .

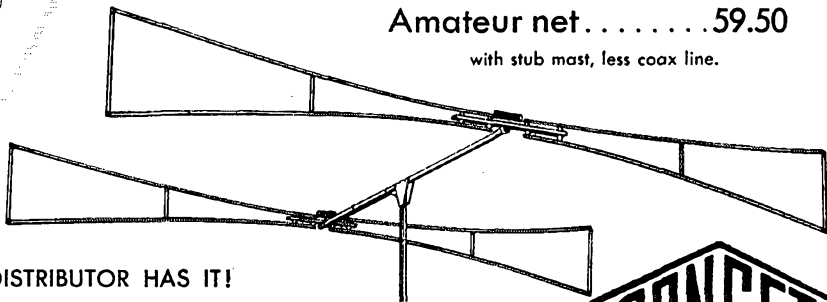
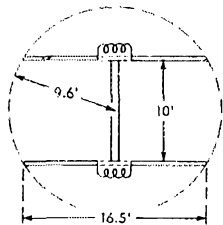
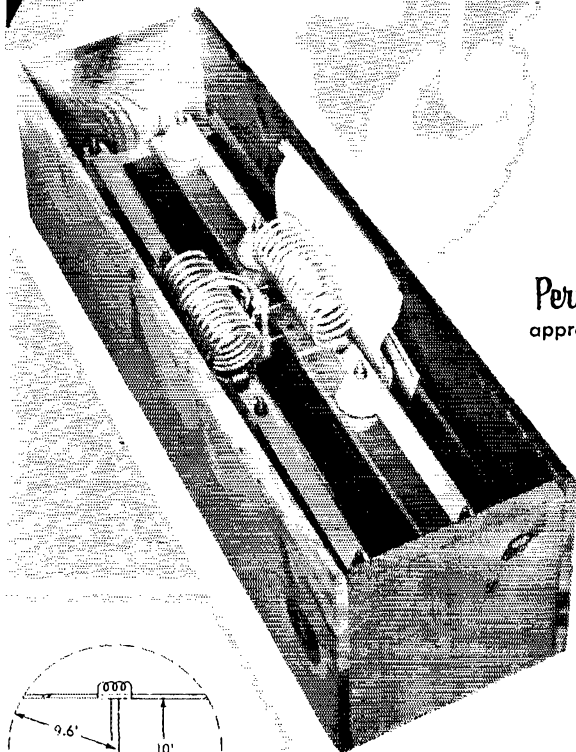
LOW STANDING WAVE RATIO . . . . .

SINGLE COAX FEED . . . FULLY BALANCED  
SYMMETRICAL . . . . .

FACTORY TUNED . . . NO SUBSEQUENT COIL  
OR LENGTH ADJUSTMENTS NECESSARY .

Amateur net . . . . . \$59.50

with stub mast, less coax line.



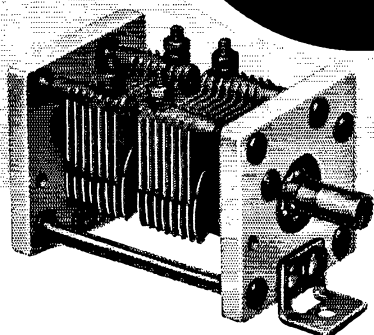
YOUR GONSET DISTRIBUTOR HAS IT!

**GONSET CO.**

801 SOUTH MAIN STREET, BURBANK, CALIF.



Ever  
look  
**INSIDE**  
a capacitor?



Isn't very much to see — just base, plates and things. It's what you *can't* see that's important — the inside story behind the capacitor. How is it made? How long will it last?

The inside story of Hammarlund capacitors can be summed up in relatively few words—

- ✓ *Quality beyond requirements*
- ✓ *Every one uniformly perfect*
- ✓ *Each one dependable*
- ✓ *No waivers on performance*
- ✓ *Priced fairly.*

These five points explain what independent studies show — Hammarlund capacitors are preferred over any other make.



For a free copy of the Hammarlund Capacitor Catalog, write The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, N.Y. Ask for Bulletin C-11

**HAMMARLUND**

*Since 1910*

(Continued from page 64)

Chautauque Co. RUF vacationed in VE3-Land. ZRC and K2DSR visited ZLT and ZRC purchased ZLT's kw. as he has a new KW51. K2DSR, ZRC, RUT, WS, and K2DYB renewed ORS appointments. NAI is c.d. RO for Sooharie Co. The Niagara Mobile Net meets at 11 A.M. Sun. on 3885 kc. The Niagara Radio Club conducts code classes Tue. and Thurs. at 1900 at the club rooms, 620 Cayuga Drive, with I.C.P. DRN, and K2GAL instructing. BTB renewed OPS appointment. New officers of the Northern Chautauque Club are K2IHZ, pres.; CDX, vice-pres.; SB, secy.; ABC, bldg. fund chairman. EMW is on 6 meters. RQF was mentioned on WCNY TV for traffic-handling in the flood disaster. The Eleventh Annual Hamfest and Ladies' Nite, sponsored by RXW, was held at Oneida Sept. 22nd. K2DYB is an OO and also c.d. RO for Oneida, with DSS as alternate. UTH is looking for 2-meter contacts in Maryland and Delaware. The Syracuse V.H.F. Roundup was held Oct. 15th with RMA, of G.E., as principal speaker on "Low Noise Front Ends." SPU built 14-tube dual conversion super for 6 meters. V.h.f. enthusiasts in the vicinity of Phelps are requested to contact K2DYC for the purpose of organizing a v.h.f. club. PYC renewed as EC. K2GHG is now an OO. KIR is a new OBS. QLI has a new Elmac. K2OAR has a new 6-meter Gonset converter. VS and TWN demonstrated and spoke on their new "REYCO" 7-Mc. traps as used in all-band antennas at the RARA meeting. K2CEI is on s.s.b. The Rochester communications truck was used to assist 400 volunteer c.d. evacuees to Palmyra, keeping in contact en route with stations at strategic points as well as the C.A.P. CNT and TXB obtained their 200 DXCC stickers. Traffic: (Aug.) W2RUF 343, ZRC 316, K2LSF 180, DYB 103, AMZ 44, W2ZLT 44, OE 42, K2DSR 40, W2GBX 30, FEB 20, WS 18, RQF 14, RUT 14, K2GWN 11, KIR 6, W2EMW 4, RJJ 4, (July) W2WS 59.

**WESTERN PENNSYLVANIA** — SCM, R. M. Heck, W3NCD — SEC: GEG, RM's: UHN, NRE, NUG, and GEG. PAM's: AER and LXE. We wish to welcome to Western Pennsylvania former Nebraska amateur F. J. Wengrzyn, now 3DPC in Orrstown, Pa., and now the Emergency Coordinator for Franklin County. Anyone interested in AREC work in that area may write him at P. O. Box 46, Orrstown, Pa. ZEG and ZEW are now on 20-meter c.w. and reports QSOs with G, GM, EI, F, KH6, LU, KV4, VP1, VP9, and JA6 stations. DL4OR recently visited VKD, who reports his antenna farm is now taking shape. Newly-elected officers of the McKeane County Radio Club are LOD, pres.; ZFA, vice-pres.; ZMF, secy.-treas. The RAE members have approved the disposal of their communications trailer and the acquisition of a more modern and versatile piece of equipment. New Novices in the Erie Area are Joe Spiteri, WN3DJH, and Al Anderson, sr., WN3CSM, father of VNB, who at present is preparing to operate from Scott Air Force Base where he is now located. Ex-Novices are BOW, ZNY, and DJA. Visitors were KOZ, 5WQN, and Howie Becker, formerly OJF, now 4HNF of Louisville, Ky., and on the low end of 80 meters on c.w. On TV during the recent C.A.P. drill were NXX, STK, YKE, and YDE. A new steel tower has been erected at the PSI QTH. We need more activity reports here. I hope the month of August was just a temporary lull, so let me hear from you. Traffic: W3WJQ 1663, ZEW 76, WHD 44, ZEG 36, SJJ 22, UHN 21, KNQ 20, AEV 8, VKD 4, LOD 3, NMJ 1.

#### The F. Dawson Bliley (W3GV) Memorial Trophy

A 21½-inch trophy, donated by John F. Wojtkiewicz, W3GJY, will be awarded to the highest scoring Western Pennsylvania amateur in the 1955 Sweepstakes contest. Either 'phone or c.w. may be used, but input power of 100 watts or less must be employed.

The final score tabulations in QST will determine the winner. Upon announcement of the results, the trophy will be engraved with the call, name and year won, and forwarded to that person.

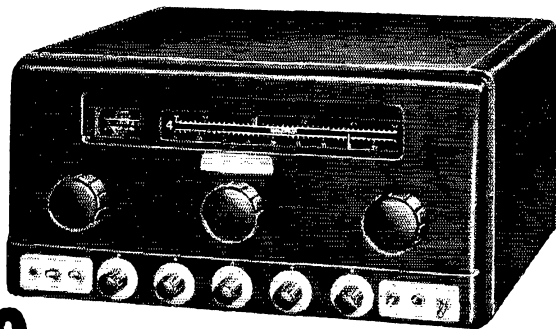
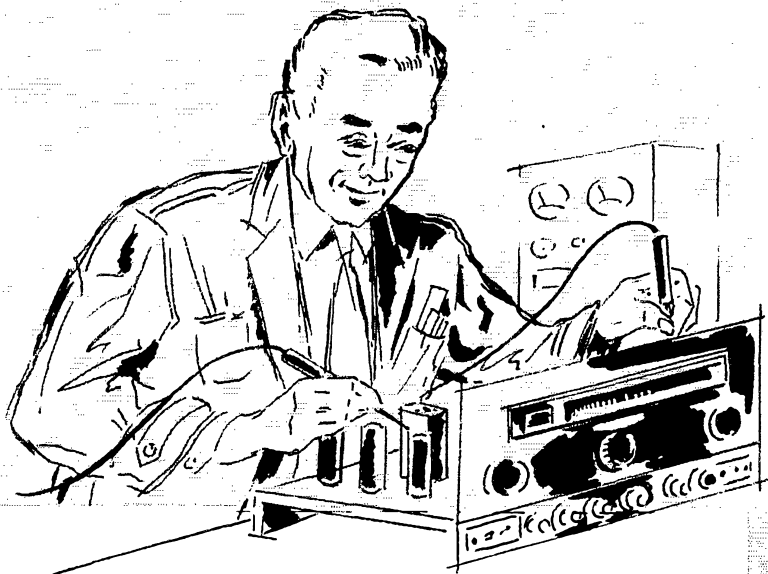
Trophy donor W3GJY expects to compete in the SS but will not be eligible for the trophy.

#### CENTRAL DIVISION

**ILLINOIS** — SCM, George Schreiber, W9YIX — SEC: HOA, RM's: BUK and MRQ, PAM: UQT, Cook County EC: HPG. Section nets: ILN, 3515 kc., Mon. through Sat.; IEN, 3940 kc. CLH put up a 20-meter beam and was "rewarded" with 58 DX contacts with only 65 watts. AGU put up a 15-meter beam, but didn't report results. IDA says that the house-painting chore cut his August traffic total. PVD enjoys mobile with his new station wagon. HUX now has his rig "completely recovered from having been struck by lightning." HPJ and NTU got together at

(Continued on page 72)





## PRO-310

AFTER 3 YEARS... *The Last Word!*

Three years ago, Hammarlund set out to design and build an amateur receiver that would provide absolutely the last word in performance. And here it is—the *NEW* PRO-310.

This rig was designed with performance in mind. We've not cut corners. Frequency readings can be read to 1 part in 5000; the bandspread can be continuously calibrated *over the entire range*; it is exceptionally stable; construction is sectionalized, many other features are built in to give one thing—top performance.

If you've longed for a receiver that would perform better than the others you've operated, you want a new PRO-310. Look it over at your dealers'. Get specs and other information either from him or by writing The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, N. Y. Ask for Bulletin R-11.

THE *Heart* OF THE

### PRO-310

Newly developed front-end with three tuned circuits but only one RF tube amplifier provides remarkable selectivity and ultra-high signal-to-noise-ratio.



Since 1910

# HAMMARLUND

the APCO Convention in New Orleans and the battle between c.w. and 'phone was on again. KLD installed a five-element beam on top of his car for 144 Mc. instead of vertical whip and was astonished at the results. He says he is used to the staves. BUK, on the other hand, has been having bad luck with 2-meter beams on top of his 60-foot tower. Every time he puts one up (twice now) the tower buckles. WZV gave up his old rig because of TVI and is rebuilding. ICF got his new Heath DX-100 going and enjoys IEN. The Joliet Amateur Radio Society, which was instrumental in licensing 35 Novices since the first of the year, again has started its code and theory classes. The Club named DO as the amateur of the year at its banquet on Sept. 24th. DKN would like more company on 430 Mc. He keeps daily skeds there with ZQT and AGM. JMIG regrets that work keeps him off ILN, but he has to keep the trains rolling from the dispatcher's office. A new General Class call is NPF. SQP has fun with QRP; with only 6 watts on 20 meters into a folded dipole he sends in a good DX list. STZ comes up with what sounds like a good idea for a simulated emergency drill for ILN. Hope RMs BUK and MRQ, as well as HOA, take it up. A new OO is TOE. Congratulations to SXL who was promoted to supervisor in his plant. Although TZQ has been off the air for the summer he writes he has been blamed for all of the TVT in Waukegan. YLU and ASK have returned from prolonged vacations and are ready for the fall season. PGW installed a mobile rig in his new car. A new Novice is AHA, the husband of JCX and father of ZOU. NN was heard on the DX bands after a summer lapse operating what his friends laughingly call his death ray, and ATH appears at times snatching a few away from him. BBU reports he's getting out fine from the new QTH at Wayne. KHJ will display a pocketful of DX cards with very little urging. KJ's new kw. dims all the lights for blocks around in Park Ridge. Other new General Class calls are JZQ and EWU. BA and QDM are sporting new rigs with PB signals. END is in a building mood, having put an 813 on the air and then started another rig. UZ became a grandfather on Sept. 15th. We are engaged in bringing field organization appointments up to date in the section. Please look at the date on yours and if ancient, mail to us for new authentication. Traffic: (Aug.) W9DO 1546, OR 183, IDA 169, CSW 148, EHS 123, YYG 98, FAX 93, YXK 87, CTZ 44, MRQ 35, STZ 23, VHD 22, VSW 22, SME 20, VER 18, CZB 16, UBI 16, LL 15, LXX 10, SXL 9, PHE 5, JMIG 4, KLD 4, CWH 2. (July) W9LI, 10.

**INDIANA** — SCM, George H. Graue, W9BKJ — The Central Division Convention to be held in South Bend Oct. 15th and 16th will be the opportune time to meet your newly-elected SCM. TARS had a very successful hamfest Aug. 28th. The Kokomo Club likewise on Aug. 21st. CAEN and other mobile nets headed by PAS assisted in emergency communications at the Standard Oil Co. fire at Whiting. Points covered by mobile units were Socony-Mobil, Standard Oil, A&E Bldg., Red Cross, American Legion, and Ambulances. The Indianapolis Radio Club station, JP-9, was in operation at the Indiana State Fair grounds, soliciting traffic and representing amateur radio in Indiana. The Lilly Radio Club's call is SFS. ANH reports that several IFN members were copied June 24th while cruising in the Mediterranean Sea aboard the USS *Towaw*. FMJ received the A-1 Operator Club award. N9BAP is new at Noblesville. NZZ has a new 75A-4. AB's latest addition is an HRO-7. CTF has gone 75-meter mobile. ALL is making plans for on-the-air code practice. EQO is the new net manager for IFN. EJC and IMB have new DX-100s on the air. The IARA has new club rooms. AQR recently broke both legs in an accident at his place of employment. The Marion Club will hold its first c.d. drill on 147.3 Mc. NTA reports IFN traffic as 54 sessions with a total of 249. CAEN had 22 sessions with a traffic total of 55. WWT reports RFN had a traffic total of 62. Traffic: W9NZZ 1242, TT 508, ZYK 293, BHZ 149, UQP 140, WBA 89, NTA 78, QYQ 76, WRO 70, PQA 60, AB 56, WWT 50, ZRP 50, CTF 37, TQC 37, WUH 35, BKJ 34, DEJ 31, JBQ 29, SVL 28, JYO 27, ALI 18, GX 14, HSG 14, QR 14, DKR 13, SWD 13, EQO 12, BBE 11, YB 11, DGA 10, RZS 10, LGD 9, NH 8, PYH 8, CMT 7, BAJ 6, DOK 6, KDH 6, EHY 5, AQR 2, AYD 2, YVS 1.

**WISCONSIN** — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: ESJ and GMY. RMs: IXA and RTP. Nets: WIN, 3685 kc., 7 p.m. daily; BEN, 3950 kc., 6 p.m. daily; WPN, 3950 kc., 1215 Mon.—Sat., 0930 Sun. Wis. Mobile and C.D. frequency: 29,620 kc. CXY reported into WPN several times, but kept one hand on his bug so he wouldn't feel completely out of his element. SAA is on s.s.b. with a DeLuxe Phasemaster, jr. KN9AYN is new in Green Bay. JEF got a card from Arizona to complete his WAS. AJU has an 8P-400X receiver now. W9NHE worked Oregon on 80 meters with 15 watts to a 6V6GT. GHT is using a Viking Adventurer and an 8X-43. SZR is QRT to attend U. of W.; he needs only Asia for 80-meter WAC. RQE worked an EA2 on 80 meters, and will be looking for Wisconsin this winter from 2ZQ. AFR received his General Class ticket and is on 75 meters with a Globe King. Our best wishes to CCO, who left for the Navy Sept. 15th. CXY received EAN and A-1 Operator certificates. WWJ got his 80-meter antenna back up. RTP would like

representation on WIN from the larger cities, as well as from the northern and western part of the State. MRAC's new officers: RH, pres.; LJU and MOT, vice-pres.; CUW, treas.; HDH, secy.; ONY, MDG, NLY, FDX, VBZ, RXS, and LSK directors. IUQ replaces CFN as secy. of W9RA (Wausau), with CFN leaving for Lawrence College. SDK was in New Jersey and California this summer. CBW, operating on 7000.3 kc., had his 420th QSO with 4V4K, and is building an oven for his 100-c. crystal. SQM put up a 4-Mc. "V" beam fed with RG8U, and is working on a new exciter and 813 kw. final. The Blackhawk Club conducted a drill with the C.A.P., with LJL, YNO, YLE, NUC, QIQ, KBT, KLL, YLG, HEG, YLR, IEP, and KJL participating. WN9UAMK is building a new final with a pair of 1625A. IAG's other is now TIN, KXK, RKP, GIL, FDX, RBL, and LNM attended the DXCC meeting in Chicago Sept. 17th. Traffic: W9CXY 430, SAA 120, KJJ 100, RTP 52, YZA 40, RTP 27, BVG 26, GMY 18, JEF 18, SQM 18, RQM 14, FFC 13, AJU 12, GHT 7, W9NHE 6, W9DIK 5, RQK 4, SZR 4, CCO 2. (July) W9CXY 252.

## DAKOTA DIVISION

**NORTH DAKOTA** — SCM, Elmer J. Gabel, W0KTZ — SEC: HVA. RM: FVG. I hope individual station activity reports will pick up with cooler weather. After a couple of weeks leave ECG has gone back to Cherry Point for his last year with the Marines. Ken keeps a regular sked with his dad, RCF, every Wed. night on 20 meters from club station K4BUJ. We all missed that potent signal from SWB while he was visiting the West Coast and British Columbia. QWZ is receiving nice reports on his new Viking KW. DM finally got his vertical up. KLP now hears them all when NC5G is the 'phone net in Sat. night QRM with his new SX-96. OAL has a new Ranger. HNV is building a VFO bandswitching rig with a 4D32 final and expects to be on 6 meters again this fall. Traffic: (Aug.) W0VCQ 67, KTZ 47, FVG 29, HVA 16, IUBG 9, OWY 8, BFM 7, K0ATE 4, W0GJJ 4, HNV 4, KLP 4, PIC 2. (July and Aug.) W0DM 26.

**MINNESOTA** — SCM, Charles M. Bove, W0MXC — Asst. SCM: Vince Smythe, 0GGQ. SEC: GTX. RMs: DQL and KLG. PAMs: JIE and UCW. NBW is back on the air on 75 meters after a long layoff. An old-timer also is back on the air with the call CXX. Kelly used to be quite active back in the spark days. He has been heard on 75 meters also. HFY now is going to school in Winona. 1BUD was a visitor to the Twin Cities. 5PUG now is located in St. Paul. CO has a new Collins KWS-1 transmitter and a new Collins 75A-4 receiver. EG has been out at CO's shack building up a matching unit for the output of the KWS-1. QJV purchased BUO's mobile rig for 10 meters. HUX made BPL in August. QNY is working on a converter for RTTY and will be using that type of emission this winter. BP has sold his holdings in Illinois and will be back on the air in Minneapolis. TUS has moved to a new QTH at Hackensack, Minn. MIG is now living in Minneapolis and is attending the U. of M. YTN and BHY are out of the hospital and well on the road to recovery. QVR and QVQ have new beams on 10 and 20 meters. They are a husband-and-wife team and they check in regularly into the Mutual Aid Area Emergency Net, which meets on 29,080 kc. at 8:00 p.m. on Tue. and Fri. QVQ is active on the Pi Net for YLs and the MSN 'Phone Net. QDP has received a WAC certificate. Thirty-nine stations now check into the MSN. Traffic: W0TUS 366, KLG 212, HFY 151, BTY 144, HUX 139, VTZ 116, VEP 100, WMA 90, KFN 73, SYD 70, IUN 60, RLQ 58, KCU 56, QNY 54, EHO 36, IRJ 34, MVJ 29, BUO 25, LUX 24, RVQ 22, QDP 21, GTX 19, QHS 19, HFY 16, QVQ 16, NTV 12, LST 10, VOA 10, VXO 6, VEZ 5, MXC 4, OPA 2, QVR 2, YNY 2.

## DELTA DIVISION

**ARKANSAS** — SCM, Owen G. Mahaffey, W5FMF — Vacation time is about over and we can settle down to the business of handling traffic again. The 'phone net is going along in fine shape under the direction of HEE, the PAM. The c.w. net, under the direction of SXM, the RM, is in need of some new members as well as some old ones. If you think your code speed is a little slow you are the one we are looking for. We were all slow once and we will be glad to help you get started in one of the most fascinating branches of our hobby, so check in at 7 p.m. on 3790 kc. Mon. through Fri. and listen for CQ 0ZK. WUM is building a mobile rig and is about ready to go on the air. New hams in Clarksville are FRG and K5BUQ. Traffic: W5VAA 55, IAI 9, CWC 6, FME 5, WUM 2.

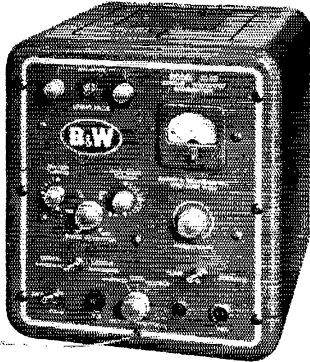
**LOUISIANA** — SCM, Thomas J. Morgavi, W5FMO — Operation SNAFU finally was disclosed at the New Orleans Hamfest Dance with the presentation of a colonel's commission from the Governor of the State, a scroll with the names and calls of all participating in the operation, a pen desk set suitably engraved and a matching desk and chair to EVZ for his untiring efforts in making possible our calls on license tags and his processing of our applica-

(Continued on page 74)

# QUALITY PRODUCTS

BY

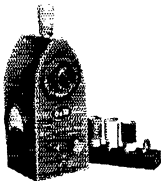
**B&W**



## SINGLE SIDEBAND GENERATOR

Get sparkling single sideband transmission by adding the 51SB generator to your present B&W, Collins, or Johnson transmitter. Complete bandswitching from 80 to 10 meters . . . output frequency control presently in your transmitter . . . voice control operation on SSB . . . speaker deactivating circuit. Completely self-contained and furnished with detailed instructions for easily modifying your transmitter.

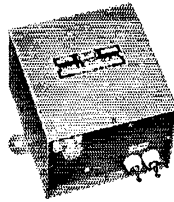
## DIP METER



This indispensable instrument serves as a sensitive grid dip meter, signal generator, absorption wave meter, or signal monitor from 1.75 to 260 mc. Saves time in transmitter tuning, neutralizing, antenna loading, etc. Color coded 5 band dial matches five coils supplied.

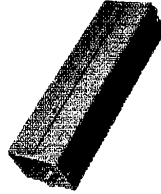
ALL OF THESE FINE B&W products are available at leading distributors' everywhere.

## 1 KW BALUNS



Fill the gap between unbalanced feed lines and balanced antenna loads, provide maximum transfer; low power line radiation on transmission; high signal-to-noise ratio on reception. Models for rotary beam, folded dipole antennas.

## LOW PASS FILTERS



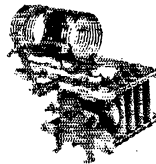
Fight TVI by attenuating undesirable harmonics and spurious radiation by a minimum factor equal to 17,780 to 1 with this new B&W low pass filter. Wave Guide principle and novel multi-sectional construction mean more attenuation in less space at lower cost.

## MATCHMASTER



Three valuable instruments in one, the Matchmaster can be used as a dummy load, direct-reading r-f wattmeter, and an integral SWR bridge, for fast measurements on coaxial feed lines, antennas, and transmitting equipment.

## JUNIOR AND HEAVY DUTY BUTTERFLY VARIABLE CAPACITORS



Heavy duty units offer increased efficiency, better L.C. ratios at high frequencies with beam power tubes. Junior units have 25% the frontal area of the heavy-duty types, provide peak efficiency, more power, in less than normal space.

## INDUCTOR MATERIAL



Stock 10" lengths easily cut to size for buffer and final tank coils, antenna loading coils, line noise filter coils, etc. Available in 2" and 2 1/2" diam., 6, 8, or 10 turns/inch.

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tions for new tags each year. Alan Herbert, an aspiring ham, won the SX-99, UES won the NC-88, UKQ won the SX-77A, and HJG won the Simpson Meter. K5FFA made BPL again. ONM is mobile with a 2520 running 25 watts. YSN is building an 813 final. PYZ is active on s.s.b., 75 meters. The Ark-La-Tex Teenage Net met in Shreveport with FVS and FYU as host. Sixteen attended, including BMD, AIE and HAS are awaiting General Class licenses. DJU has 42 states toward WAS. YCO is director of communications for Shreveport C.D. The committee for Operations SNAFU was BV, GXO, IMT, PDP, SFZ, and UJK. MQQ continues as top traffic station in New Orleans. KHX is active on 20 meters with a Mini-beam. MAV is net control of the Delta 75. CEV attended the police communications convention in New Orleans. BSR is on s.s.b. with a 10A exciter and linear final. The s.s.b. dinner held in New Orleans Labor Day week end included BSR, HHT, UJK, ZNI, BV, ABS, YEU, IMT, EVZ, EKY, VAQ, BYU, 9APY, IMU, QIA, EDE, JHS, DHT, and JR. Check the expiration date of your appointments and forward certificates to the SCM for renewal. Check with the SCM for appointments in your locality. Traffic: K5FFA 559, W5MXQ 151, NDV 60, EA 22, YSN 12.

MISSISSIPPI — SCM, Julian G. Blakely, W5WZY — It's Sweepstakes time again. Three stations participated in '53; 5 stations in '54. According to the grapevine it's going to be a Mississippi "free-for-all" this year, so get the old bucket of bolts lined up for a full 40 hours of contest on all bands. The Jackson Hamfest proved to be bigger and better than ever and we are already looking forward to the next one. The Hurricane Net went into action in early Aug. at the threat of a hurricane headed for Pass Christian. AKY, of Pass Christian, called for stations and had 28 sign in. Coverage was had from the Highway Department in Montgomery, Ala., to the Red Cross station in New Orleans. Stations participating were EZN/5, BES, QPS, ECT, AVZ, EKG, RNB, VFP/5, IZS, ABJ, GZR, PNA, WPZ, NRR, YXZ, EWE, LVG, HJG, and EDE; also W4A NZM, CSA, AAN, AKM, HKK, CAU, and RKH, and 9NMI/5. Traffic: W5RIM 89, JHS 65, ART 27, WZY 10, GDW 7.

TENNESSEE — SCM, Harry C. Simpson, W4SCF — SEC: RRV, PAM; PFP, RM; WQW. Congratulations to VJ and OGG on making BPL under trying conditions. RM WQW reports his NCSs on TN are VJ, HHH, TYU, SJ, IV, and UVS. Mon. through Sat. His many friends will be happy to hear that CXY has announced his candidacy as Delta Division Director. An idea for other section nets: PFP is custodian of a net fund for get-well cards, flowers, etc., for ailing members. Congratulations to HQM and K4ATU on their splendid service in rapidly locating an urgently-needed drug. Their promptness saved the life of a six-weeks-old infant, and their fine publicity in the *Jackson Sun* is a boost for amateurs everywhere. HQM is the new Humboldt ARC president; IGW is vice-pres.; CLS, secy.; KN4BBO, treas.; and WCI, TVI committee chairman. This very active club is building a transmitter and has a new club call, K4DYE. OEZ reports that 6-meter activity is increasing in the Nashville Area. RFR has 35 states on 6 meters. AY has 17, VFC 6. A nice report was received from the Bays Mountain ARC, whose Aug. 20th picnic was a grand success. PVD is keeping regular skeds with son WNSHSW, in Kingsville, Tex. IIB worked 24 states on 6 meters, and turned in some fine publicity on work done by the Chattanooga ARC in providing communication for doctors, nurses, pharmacists, etc., at the Camp for Diabetic Children. No telephone service was available, for the entire two-week period! The three Harrys all have protégés to report: FLW introduces KN4EVI, AEE presents KN4EFV, and SCF reports KN4DJO. Traffic: (Aug.) W4OGG 313, HHH 229, VJ 185, TZD 155, IIB 150, UWA 100, PFP 55, HLR 53, SCF 39, YMB 29, BAQ 6, HUT 4, TZB 3, OEZ 2, PVD 2, VNE 2, FLW 1, HSX 1. (July) W4IIB 102, OEZ 2.

## GREAT LAKES DIVISION

KENTUCKY — SCM, Robert E. Fields, W4SBI — SEC: CDA, PAM; YVI, RM; KKW. Please note that we now have a new PAM, Earl Jagoe, YVI. However, for the most part he operates NIZ. He reports 30 sessions, 509 total call-ins, 16.9 stations per session, 81 total traffic, 2.7 messages per session. The following earned Section Net certificates: GZ VJV, HOJ, and OEE. The Net has been moved up 30 minutes and now meets at 1300 CST. RM KKW reports the following: 53 sessions, 36 active stations, 196 traffic total, 3.7 messages per session average. RYL earned a Section Net certificate. OMW has his modulator going for the big rig, a pair of 811As in Class B, and can run about 350 watts to the 814s in the r.f. end. ZCI finally received a QSL from Nevada to make his WAS. RPF has a BC-669 now, and expects to have it on MARS as soon as he can build a power supply. IAY is attending Georgetown College this year. JUI has a new beam for 144 Mc. 60 ft. high. The Hardin County Amateur Radio Assn. (HCARA) is growing. Three new members joined in August. HJG got a Gonset Final for 2 meters, and quickly got a new state. Now that hot weather is over most of us can get back in the shack to DXing, handling traffic, and rag-

chewing. Traffic: W4QCD 195, KKW 127, UWA 100, RPP 65, SBI 46, CDA 41, ZDD, 41, ZDA 36, NTZ 28, ZCI 27, K4AIT 23, W4KRC 23, ZLK 13, SZB 12, HOJ 8, BZY 6, WMF 6, JUI 4, LAY 1.

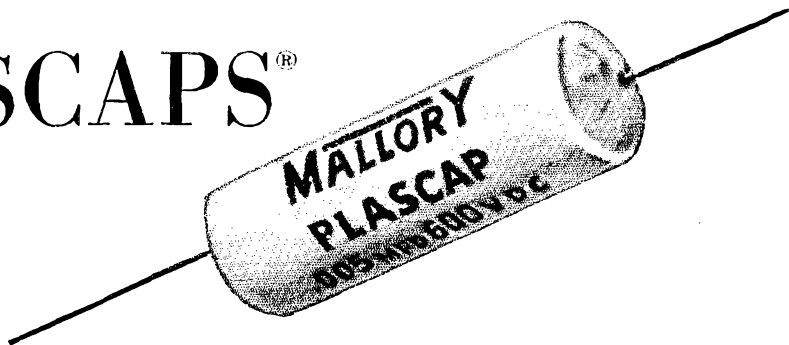
MICHIGAN — SCM, Thomas G. Mitchell, W8RAE — Asst. SCM: Phone: Bob Cooper, 8AQA; Asst. SCM C.W., Joe Beljan, 8SCW. SEC: CJH. Here we are with another Sweepstakes Contest near. Let's hope that conditions are as favorable as they were for Field Day this year. The response to the appointment renewal notices that were sent out in September was most gratifying and the appointment file is very much up to date. League members in this section are urged to apply for appointments suited to their particular likes. HKT and NOH were both engaged in training duty at Great Lakes Naval station during August and early September. LO operated K9USN while there and piled up a very respectable traffic total that had to be reported through the Illinois SCM. Too bad we couldn't include same in our total. Lou, PHA is back at his home stand after a summer of active duty at Ft. Campbell, Ky. Both NOH and PHA received belated BPL certificates for their May traffic. MGQ finds time to participate in Frequency Measuring Tests with good results. DED has moved to the country and still is in the QSL printing business. EDN, Kalamazoo County EC, stopped in for a visit recently and reports that he is joining the s.s.b. gang. DLZ was QNI TCRN for both hurricane emergencies and wonders where the other Michigan stations were. We were needed and missed. FGB has put up a new 137-ft. vertical for 160-meter work and says that the St. Joe-Benton Harbor Area is getting active on 51.3 Mc. He seems to be working both ends of the spectrum against the middle. FX is cleaning house for an anticipated move to a more quiet and QRM-free QTH. In line with the housecleaning, he is getting some OT wireless gear ready for a permanent display in the State Museum at Lansing. This may mean the end to the spark demonstrations at the Grand Rapids conventions. Traffic: (Aug.) W8LPL 133, PDF 99, NUL 90, PHA 69, SCW 62, ZLK 56, IUJ 49, FX 41, QOQ 41, NTC 36, RVZ 26, RAE 19, SRK 19, IV 17, HSG 16, SJF 16, DLZ 11, WXO 7, NOH 6, PHM 5, OQH 4, QIX 4, FGB 3, DSE 2, FSZ 2, MSK 2, TIC 2. (July) W8SRK 41, SHP 26, DLZ 15, OQH 8. (June) W8OQH 7.

OHIO — SCM, John E. Sringer, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF; and E. F. Bonnet, 8OVG. SEC: UPB, RMs: DAE and FYO. PAMs: EQN and HUX. New appointees are NAF as OES, PLQ as OBS, and MYV and QXH as OOs. On the other hand, numerous appointments were cancelled because of non-reporting. DAE, BN chieftain, was awarded a BPL card for August traffic. Ohio was represented 37 times in 8RN, according to DSX, net manager. RO has withdrawn as a candidate for SCM. WN8UTX is the newest amateur in Urbana. WAB was appointed Radio Officer for Seneca Co. AMH, secy. of the Early Bird Net, tells us that Ohio was well represented at the Net's annual get-together in August at Harrisburg, Penna. BUM is presently visiting in California. JDN has entered Ohio State. DG is retiring from Frigidair on Oct. 31st. The Springfield Club furnished communications between the scoreboard and the golf course during the recent country club tournament. MQQ is operating 160-meter mobile. The West Park Radios are scheduled to hold down a large booth at the hobby show in Cleveland. AEU will serve as chairman. RBX, TRC secy., reports that the October meeting will be a pot-luck supper, and that the Wood Co. Radio Club had a station set up at the county fair. OVG, Asst. SCM, informs us that 300 amateurs attended the DARA picnic. ZOF will serve as chairman for the 1956 (April 14th) Hamvention; OVG started his beginners' classes on Sept. 27th, and KOM and NFU are being transferred away from Dayton. The Cincy *Mike and Key* mentions that WN8UPH has 30 states worked toward WAS. AJW received the third WAOC award, with CTZ appearing to be next in line. BM and FSP are the 1955 CWA horseshoe-pitching champs. According to Q-5, 7NXD, AIG, and UTX were visitors at the August club meeting. The OVARC *Ether Waves* states that the club has purchased a new generator. This publication still is doing nicely with its timely DX column. We understand that traffic is picking up on BN, the official section c.w. net. Phone traffic has reached a new high on 3860 kc. with the Ohio Phone Net supplementing the Dog House and Ohio Emergency Nets. The Columbus *Carascope* reports that the CARA picnic at Blacklick Woods was well attended; JDK has a new 10-over-20 antenna; TIF's s.s.b. rig is currently working out to the West Coast on 75 meters; OMY has qualified for WAS; and 2- and 6-meter activity has picked up in the Columbus Area. Eastern Ohio *Ham Flashes* states that KAO is well on his way to DXCC; PIK has gone mobile; USP has moved to Warren; EAK is the newest General Class licensee in Niles; BTK, BVJ, and BTQ, all protégés of PS, are new Novices in Hubbard; and SRW has a new 60-foot tower. 20/9 is the name of the new Youngstown radio club. Officers are SVY, pres.; STD, vice-pres.; SZN secy.; and USP, treas. Traffic: (Aug.) W8DAE 434, MVJ 266, IIR 154, AMH 104, FYO 103, VTP 86, HPP 65, AL 55, CTZ 50.

(Continued on page 76)

# MALLORY HAM BULLETIN

When paper capacitors grow old  
replace with new  
**PLASCAPS<sup>®</sup>**



Long before a paper tubular capacitor arrives at the point of complete failure, it can cause considerable trouble in your communications receiver. The general symptoms can be gradual loss of IF gain, occasional RF or IF instability, audio distortion, or sluggish or erratic signal level meter operation.

The reason behind this trouble is that as a capacitor ages, it develops leakage. Instead of being a pure capacitance, it begins to act like a capacitor shunted by a resistor. In coupling capacitors, d-c going through this "phantom" resistor pushes grid voltages positive; in by-passes, it drops applied voltages below rated values.

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MQQ 46, QXH 44, RO 37, GZ 34, AJW 29, HNP 28, WNSWTO 25, W8HUX 22, JFD 22, ARO 17, AJH 15, HFE 15, ET 11, JMD 10, USU 10, RN 8, BEW 7, DG 7, JDN 7, STR 7, AQ 6, LZE 6, BPE 5, EEQ 5, LZR 5, MGC 5, HZJ 4, LMB 4, ZAU 4, BUM 3, OPX 3, WYL 3, DCJ 2, WON 2. (July) W8MQQ 79.

## HUDSON DIVISION

**NEW YORK CITY and LONG ISLAND**—SCM, Harry J. Dannels, W2TUK—SEC: ADO. PAM: NJL. RM: VNJ. It is with great pleasure that I start my first year as SCM. It is my sincere desire to see this section continue to grow and further the fine principles of amateur radio. Your continued cooperation is very necessary to accomplish this end. The August hurricanes brought out our AREC/RACES nets for stand-by operation. Our section was well represented in providing communications support for the stricken areas in our neighboring states. Traffic-handlers BO, JOA, KEB, KFV, MUM, K2GXL, and others spent long hours at their rigs in assisting with traffic relay. Brookhaven EC, OQL, was alerted by c.d. officials and the following stations responded: DFX, EBT, EHA, INT, JAT, JFU, LDO, LRJ, PDU, TPZ, K2s AKM, DEH, DIX, 1BMH/2, and club station, K2BEL, manned by IVX and MUL. Nassau County's 2- and 10-meter AREC groups were alerted and supplied the Red Cross with reports on possible flood areas. All participants, traffic and AREC stations, are to be congratulated on their efforts. KEB received an A-1 Operator's certificate. KFV reports into nets and handles traffic via his Viking mobile. K2KXZ made BPL and also received an FCC certificate. Other BPLs for the month are KEB, KFV, JOA, K2DEM/2, and K2GHS/1. JGV/1 operated with the Massachusetts C.D. Net., assisting with emergency traffic. K2GXL and his XYL, KN2IBI, welcomed a new son to the family. K2CQP added a two-element Telrex "mini-beam" on 14 Mc. and worked an LU on his first call. K2HYK is now RACES-affiliated. LGG is off to Purdue U. IQC increased power to a kw. on 14 Mc. RDK now is 8JSU. QMO also is in W8-Land. KN2PHT, 12 years old, joins his dad, IHE, and brother, K2ABW, 15 years old. NJL finds that working 75 meters with 6 watts mobile is harder than working DX. New Tu-Boro RC members are KN2JVQ and K2OYJ. IVA is off to M.I.T. K2DDK now uses an AT-1 with VFO on the low frequencies and Lettine 242 with Telecraft converter on 144 Mc. K2KLL dropped the "N." K2CRH is building a 120-watt rig for all bands. K2IEG has a new 40-meter ground plane. K2ECN returned from a trip to XE-Land; ditto K2GZE and his dad, KN2LDL. BIV used his Communicator from the hospital while recovering from eye surgery. JCA spent almost the entire month monitoring 14 Mc. for commercial stations in the band. KGN with his Globe King plus a two-element beam needs one more country for DXCC. K2CMV is building a 6-meter converter. The Levittown RC is sponsoring a 6-meter mobile building program and invites other interested clubs to contact it for details. KN2MNS has a Gonset Communicator on 2 meters. KN2OON worked 33 states and Cuba in two months on 40 and 15 meters. K2JNE has a new 6146 rig on the air. K2GWW/1 worked a YU3 while using only 5 watts on 7 Mc. K2G8I, 9 years old, dropped the "N." QBS/3BRG is off to KAM-Land for six months. All clubs and individuals are invited to contribute to this "activities" column. Send in your reports at the end of each month. See you in the Sweepstakes! Traffic: (Aug.) W2KEB 1262, KFV 1116, JOA 570, K2KXZ 301, DEM/2 283, W2JGV/1 220, K2JEB 212, CXL 193, CQP/2 167, HYK 162, GHS/1 143, W2TUK 88, WFL 86, K2EQH 55, W2MUM 39, K2ABW 28, W2VDT 20, NJL 18, CLG 16, LGK 14, PF 10, EC 5, OBU 5, AZS 4, K2DDK 3, W2IVS 3, CRH 2. (July) K2GWW/1 53, DEM/2 39, CQP/2 13, CRH 8, CMV 1.

**NORTHERN NEW JERSEY**—SCM, Lloyd H. Manamon, W2VQR—SEC: IIN. PAM: CCS. RMs: NKD, EAS, and CGG. CVW has a new ham shack completed at the new QTH. CJX has been laid up because of illness. EWZ is back from active duty with the Army Reserve at Ft. Monmouth. While there he met the following amateurs: IHYS, ZAHN, BSK, HTX, LJQ, LRW, MQG, NAE, K2ELN, KN2OMT, 4HGQ, and ex-5JLN and 6CXJ. K2GBP is back at Union College for the fall term. K2DOX has gone to Detroit University and K2CCI to Northeastern. K2EKO is at Navy boot camp at Bainbridge, Md. K2JPV went back to college at Fairleigh Dickinson. K2EUN has moved to Long Beach, Calif. The Irvington Radio Amateur Club has resumed meetings for the season. Officers of the club are K2BYB, pres.; EFJ, vice-pres.; ZMH, secy.; OIH, treas.; and EFJ, chief op. K2KJT and K2IOU are sporting new General Class tickets. The Monmouth County RACES group, under RO ENM, is to assist the Ground Observer Corps with experimental communications set-up. If successful the system will be expanded to cover the State. NIE is rebuilding the antenna farm for a good winter of operating. RACES groups made plans for the New Jersey Test Alert to be held the last week in October. All units will be activated for this test. K2IPR is on 144 Mc. with a new Gonset linear final.

K2DHE is sporting a new car less the mobile rig, but give him time. The summer season has caused a considerable let-down in activities, but all indications point to a marked increase in activities. Club secretaries are invited to send in news items of interest for this column. KQJ also is back after a summer of hard work at the business QTH. Congrats to all who did such an excellent job during the August floods. Reports received are far too numerous to list them all here. OUS puts out excellent local weather reports on 144 Mc. each evening at 1905. This was of considerable interest during the hurricane season. Traffic: W2EAS 139, K2BWP 77, W2CCS 44, K2BWW 37, GFX 25, DSW 8, JYS 4, W2NY 4, CFB 3, CVW 3.

## MIDWEST DIVISION

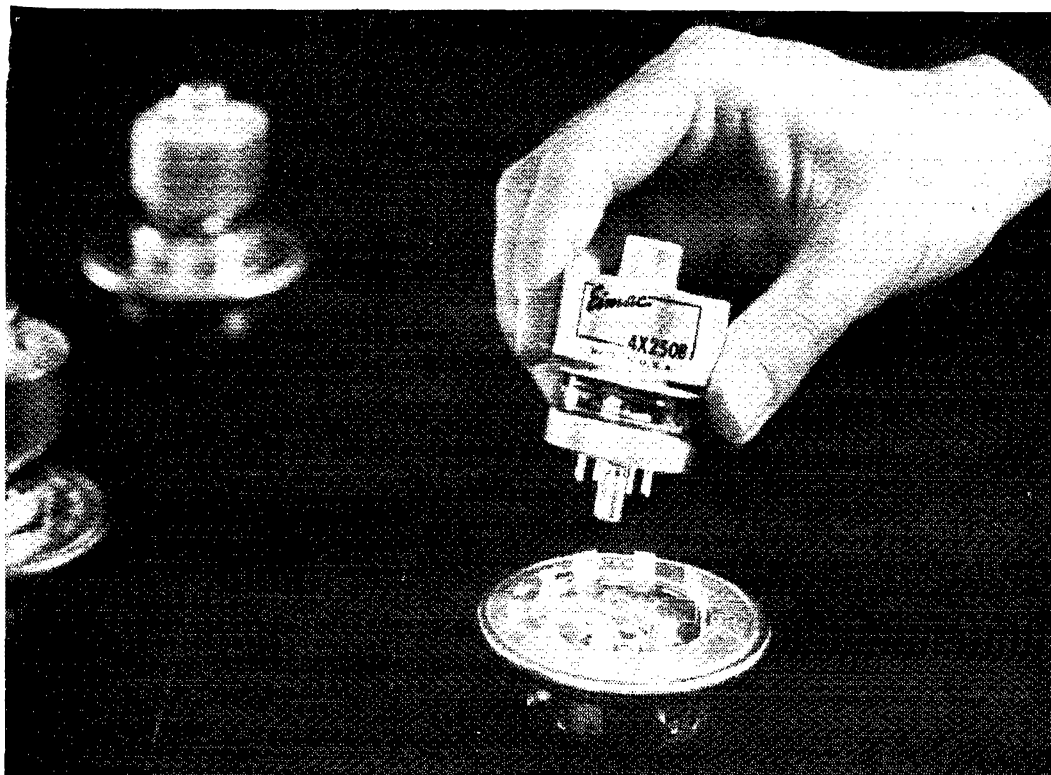
**IOWA**—SCM, Russell B. Marquis, W8BDR—New appointments: HSV, NWX, IHC, EHH, SRQ, and PIO as ECs; PAN and LGG as ORAs; BSG as OPS. Endorsement: LCX as ORS. TLN Section Net certificates went to PAN, PKT, SQE, UCE, and UTD. NWX worked PIO and GJT from his mobile for 2 hours on 80-meter c.w. BSG completed a new Ranger. DGV has a new vertical on 80 meters. The Davenport Club held its annual picnic at Crystal Lake. USQ has worked 37 states in the past few weeks on 6 meters. The IARAC at Burlington supplied field communications for a local C.A.P. practice air search and rescue mission on Aug. 7th. PTL vacations in Alaska while his YL keeps the home fires burning. WPM and LGJ are new TLN members. BFW has a new "V" beam after the old one got mixed up with an airplane. PZO vacationed in North Carolina. SLC lost his 20-meter beam to the wind. New Novices in Burlington are KN9CJF and COP. BLH is trying hard for VI WAS. GJT has a new Pontiac to go with his new Elmac mobile. SCA and his XYL returned from a Kansas vacation ill with food poisoning. Doc's traffic shows the effects. SQE has a homebrew signal monitor. K6BLJ moved from Waterloo to Sioux City. LGG has a 30-w.p.m. Code Proficiency certificate. UCE has an NC-183. UTG enjoys working DX on 15 meters with a Cubical Quad. Traffic: W8BDR 1164, SCA 725, PZO 526, CZ 254, LGG 132, LIW 127, SQE 115, QVA 80, BLZ 71, PAN 70, UCE 55, NGS 19, FDM 13, WPM 12, JDV 11, PKT 11, UTD 9, NYX 6, VXO 6, NWX 5, SLC 5, SRQ 5, UEG 5, AEH 4, PIO 4.

**KANSAS**—SCM, Earl N. Johnston, W8ICV—SEC: PAH. PAM: FNS. RM: KXL/NYX. News is very limited again this month. Perhaps everyone is as busy as I have been. IFR, of Chanute, enthusiastically reports on the 2-meter work in Kansas. Duffie has worked Kansas, Missouri, and Iowa stations recently. Those worked in Kansas are ZJB, ZJY, OZK, EZK, FRK, IRE, LPA, GLN, YCT, MOX, and IJ. He advises they are on 0600 to 0630 and 2100 to 2200 daily. HAW, of Morrill, has finished junior college and plans to finish up at Greenville College in Illinois. He is going mobile this year with a TBS-50 and probably will set up a club station at school. RXM has a Heath VFO that works very FB. LXA reports that the CKRC had a stag night at the Warren hotel recently. The Club plans to put on the Wouff Hong at the Midwest Division Convention. Traffic: (Aug.) W8NY 289, MXG 210, BLI 167, FNS 86, QGG 74, FEO 62, PDJ 31, TNA 26, YVM 24, WWR 22, FCE 19, VGE 17, ECD 16, SAF 16, RXM 15, UAT 12, YFE 12, ICV 10, DEL 6, LOW 6, WJB, 6, ASY 5, LBJ 5, HAW 3. (July) W8ICV 12, LBJ 3.

**MISSOURI**—SCM, James W. Hoover, W8GEP—SEC: VRF. PAM: BVL. RMs: OUD and XQO. SAK is a cadet in the Civil Air Patrol. CPI is adding an s.s.b. slicer and Q-multiplier to his receiver. VTF received a certificate for TEN. OMM received her Traffickers 1000 Certificate. WAP lost an antenna mast but will be back on as soon as his heavy summer work schedule lets up. PME is back in full operation and has applied for ORS and OO appointments. OUD's antenna has been raised several feet. The Suburban Radio Club is instituting a half-hour technical talk during one meeting each month. RXG has a new 20-meter beam. BZK has a new antenna and modulator. KA has been off the air because of transmitter trouble. The Northwest St. Louis Amateur Radio Club reports that the new Viking Ranger stood the test of Operation Alert and Field Day. Many areas of the section have no AREC Emergency Coordinator. Those interested in an EC appointment should contact the SEC or SCM. Traffic: (Aug.) W8CPI 1349, GAR 274, GBJ 233, VTF 214, SAK 205, OMM 111, BVL 92, RTW 53, KTK 44, OUD 44, BLZ 35, KA 29, CKQ 25, IIR 24, VPQ 21, HUI 20, ECE 15, GEP 13, GEU 12, BUL 11, IJS 10, EBE 9, RTO 3, MFB 2, TCF 1. (July) W8ECE 7, IJS 7, GEU 2. (June) W8IJS 11. (May) W8IJS 10.

**NEBRASKA**—SCM, Floyd B. Campbell, W8CBH—Asst. SCM: Tom Boydston, 8VYX. SEC: JDJ. PAM: EUT. DDT has modified his Viking as per article in June 2ST and shoots a nice signal out to North Platte. A late report was received from JDJ with points of interest seen on his vacation. The Barb Wire Net is a new net with 23 members on roll call. The Net gives Western Nebraska very

(Continued on page 78)



## **Eimac 4X250B and air-system socket — the easy approach to a modern transmitter**

SSB, AM or CW, the ideal combination for the modern high power, all-band amateur transmitter is the new Eimac 4X250B radial-beam power tetrode and Eimac air-system socket. With an Eimac air-system socket, full stabilization and cooling advantages of the 4X250B are realized. A high quality, minimum inductance, silver mica screen grid by-pass capacitor is a built-in feature of the socket. This custom-made socket, together with the inherent low inter-electrode capacitances of the 4X250B, make stabilization of the amplifier stage easy. Additional circuit simplicity is possible through the low driving requirements, enabling the

use of standard receiver-type tubes in low level stages, permitting easy filtering of TVI producing harmonics. A pair of 4X250B's in modern, compact space-saving equipment permit a kilowatt input in SSB or CW operation. A new integral-finned anode minimizes the forced-air cooler requirements of the 4X250B. In fact, during stand-by periods no blower is necessary if convection air is properly provided. For ease of design, transmitter versatility and on-the-air reliability, investigate the incomparable combination of an Eimac 4X250B and air-system socket.

*The 4X250B is unilaterally interchangeable, in nearly all cases, with the famous 4X150A. For further information and a free copy of the 20 page Application Bulletin No. 9, "Single Sideband," write our Amateurs' Service Bureau.*



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good coverage with stations in South Dakota, Wyoming, and Colorado reporting in. The Net meets Mon., Thurs., and Fri. on 3850 kc. at 12:30 P.M. MST and Sat. on 3680 kc. same time. AIN now has 9 rooms from which to pick out his "shack." K0ACZ has a new jr. operator and is building a 250-watt all-band rig. V.G.K. is interested in getting some activity going on 6 meters. L.R.K. has a new (home-brewed) two-element beam for 15 meters and claims it even works on 20. K.X.D. has a new home-brewed two-element, also. The Nebraska 75-meter phone net has 84 active members with QNI of 43 for August. D.D.T. and Z.J.T. relay traffic on phone and c.w. HTA recently suffered damage to his rig by lightning. I.O.S. has a new Johnson KW and 75-A4 with unbelievable results. F.T.R. really was mobilizing on his vacation. The Wheat Belt Radio Club puts out a very nice paper. Appointments are open for EC, ORS, OPS, OBS for you Nebraska members of WBRC. We're proud to correct the clerical error below: Z.J.F.'s June total was 166. Traffic: (Aug.) W0DDT 158, ZJF 147, K0BDF 29, W0FXH 28, HTA 26, NIK 26, FRs 25, EGQ 19, ERM 18, MAO 18, QOU 12, K0WBF 12, W0PNS 10, QHG 10, TIP 10, LZL 9, KLB 8, FMW 7, C.H. 6, GVA 6, VRE 6, KDW 5, FBY 4, HXH 3, SZL 3, VYX 3, ZNI 3, K0APQ 2, W0CBH 2, DDP 2, DJU 2, IBA 2, NHS 2, OOX 2, PQP 2, UJI 2, UJK 2, VGH 2, ZOU 2, ZTE 2, AGP 1, BOQ 1, LEF 1, NGZ 1. (July) W0VYX 4. (June) W0ZJF 166.

## NEW ENGLAND DIVISION

**CONNECTICUT** — SCM, Milton E. Chaffer, W1EFW — SEC: LKF, PAM: LWW, RM: KYQ, MCN and CN 3640 (0645 and 1845), CPN 3880 (1800), CTN 3640 (Sun, 0900), CEN 29,580 kc. Traffic highlighted August activity centering around the flood. Several reports of emergency activity have been received but we know they represent only a small portion of those participating. At Ansonia, V.P.U. was NCS with IAI, WFM and his XYL, WFN, AKG, YKU, YMY, VGP, and VQH. PGW, EQE, and WN1EYJ assisted in handling outside traffic. WHO and ULY teamed up at Rockville to maintain contact with Torrington on 10 meters. OTL and UZ were active from Winsted, with assistance from RGB and others. J.J.L. headed Torrington RACES with URM, TZO, and Meriden assistants IFQ, QMG, TZH, PTG, WEE, ZJF, YAZ, ULL, HJK, and FYG plus EFW, VQH, VCQ, YON, and ZQZ/M. In other places local RACES groups functioned and were assisted by groups from Manchester, Stamford, and Hamden. Meeting at AW on Sept. 10th, members of CN-CPN-MCN discussed operations in detail to determine improvements needed. New OBS: YNP. New OPS: ULY. YCQ and ZPV sent along first monthly reports. TD and GIX handled OBS schedules. BVB and RFC sent in OO reports. UIZ now is working at Lancaster, Pa., and reports activity on 2 meters in that area. WHL returned from a Southern tour in time for flood activity. Hamden challenges Manchester (Aug. QST), claiming 1 ham per 610 population. HYF has a new jr. operator. UJG is doing electronic research for the New Haven Railroad. F.V.Y. is a new Novice at Windsor Locks. Traffic nets CN, MCN, and CPN proved capable of handling a volume of flood traffic during the emergency. The only net reports received fail to show the real volume but details are incomplete. CN: 157 in 26 sessions with QNI honors to LV, YNC, and RGB. MCN: 94 in 24 sessions with IBE, RGB, and RFJ most QNI. Since much traffic was not formal the record doesn't tell the whole story, but nice going all around. Traffic: (Aug.) W1AW 976, GIX 291, YBH 230, BDI 161, YNC 108, RGB 95, KYQ 78, ULY 71, LV 68, YON 61, EFW 59, WHO 40, RFJ 36, WHL 27, TYQ 26, RRE 21, UED 23, KV 12, GVK 8, BVB 7, ZPV 4. (July) W1KYQ 60.

**MAINE** — SCM, Allan D. Duntley, WBPI/VYA — SEC: TVB, PAM: TWR, RM: EFR. The Barn Yard Net meets Mon. through Sat. at 0800-0930 on 3960 kc. and is now under the able management of YVN. The Sea Gull Net is back on its winter sked on 3940 kc. Mon. through Fri. at 1700-1800 under the guidance of TWR. Look for WN1GWF, Louise Wright, on 3746 kc. Louise deserves a lot of credit for getting on the air as she is one of our sightless friends. Also, our hat is off to UZR for the time and effort given toward helping Louise and to WBM, of Dover, for his assistance in erecting various antennas. Your SCM no longer has the distinction of being the only ham in Casco. He now shares the band with Barb Morton, WN1GWC. So you guys looking for VL contacts get on and give these gals a call. Hope you all saw the fine article on BBS, Kate, of Freeport in the *Portland Sunday Telegram*. Would like to hear from you fellows who are experimenting on the higher frequencies. We have plenty of U.H.F.-V.H.F. Experimental certificates. Is EOP in the fertilizer business or the chicken business? We understand ZE is now a land-owner on Heartbreak Ridge. TVB now sports two Nashes, both mobile equipped. FNT is now mobile. UZR now has a Pine Kar call in the C.A.P. Look for BYR from his new QTH in Woolwich, Maine. Congrats on getting on 75 meters. CGB has chopped off the "N." Traffic: W1LKP 141, ZME 74, UDD 68, QUA 38, BX 35, BBS 33, BPI 30, NM

24, TWR 22, BAD 19, OTQ 16, JIS 14, LYR 10, ZMK 7, BDP 5, RGR 5, SNE 4.

**EASTERN MASSACHUSETTS** — SCM, Frank L. Baker, jr., W1ALP — New appointments: ZSG as EC for Bedford; KIUSA as OO, OBS, and OPS; EGZ as EC for Harwich; THO as PAM for the 6-meter band. Appointees endorsed: MBQ Vineyard Haven and OLP Walpole as ECs. KIUSA is the new call of K1WAB at Fort Devens. They have a 100-ft. steel tower with a 20-meter three-element beam. Sorry to have to report the death of LFF from polio. IPA now is in Winthrop and is the 75-meter station for the Boston Red Cross. PO, Hanover, is on 75 meters. ZWQ moved to Squantum. VTT moved to Lowell. WN1GVA is ASG's XYL. JOJ has resigned as QSL Manager and is on 2 and 20 meters. Sorry to hear that VKR is in the hospital with polio. A speedy recovery to you. DJP, who operated K1WAB and did a great job, is now in Paris. FSW, a new ham in Whitman, is on 40, 80, and 15 meters with a Heath AT-1. MBQ is building a new house. FZJ, WLZ, FZZ, VMD, MB, ECG, and ZQO are on 2 meters. Norfolk County Radio Club members have a new QSL with all of the calls on it. EQM and EPF are on the air some. AWO says WWU, VVY, NUH, KVQ, and PIM work at C.B.S. in Danvers. RSY has resigned as EC for Bedford. He did a nice job in building up the communications part of c.d. in that town. Ed Maguire is in Portugal for awhile. The T-9 Club held a meeting at TJP's. Hum Kennedy was in the hospital. At this writing it would be impossible to list all of the calls of those who helped out in the recent storm that hit Massachusetts, Connecticut, and Rhode Island, but the various nets did a swell job. The New England Emergency Net was on almost continuously. UKO received a WVT award. UTH is going to Bowdoin College in Maine. QLT is going marine mobile again. BY is busy painting the house. BPW is on 75 meters. LM went to Maine. The Framingham Club Net was on during the storm. ZOP, BSO, MEG, RCJ, ZEN, MHC, HPB, JUL, MQU, QFD, WLJ, FMH, YEJ, and SRG were on. YJI is on the air. VX took a trip to California. The Braintree Radio Club held a meeting. DXQ, LZB, and ZHC went up to Pack Monadnock with some gear and were on 10 and 20 meters. DXQ is moving to Quincy. The South Shore Club August meeting was not held because of the storm. GSK is a new ham in Weymouth. ATX is operating at Mattapoisett and on the EMN. OEX spoke at Radio Amateur Open House on "Stable Receivers." CTR is off the air and working long hours because of the flood. FGD, BVP, and AAI are keeping DOU active on 2 meters. YTA is trying for 2nd-class commercial radiotelegraph license. CLF says he had one of the most hectic months in his 40 years as a ham, with storm traffic, etc. Traffic: (Aug.) WISS 995, EPE 354, CLF 340, UKO 174, AVY 109, UTH 58, TY 54, ATX 41, BB 24, WU 10, BPW 7, BY 7, QLT 7, LM 3, AY 2, SRG 2, ALP 1. (July) W1UE 38, EMG 32, TY 22, BY 16, NUP 12, ATX 2.

**WESTERN MASSACHUSETTS** — SCM, Osborne R. McKeaghan, W1HRV — SEC: REX, RM: BVR, PAM: QWJ. The WMCW Net meets on 3560 kc. Mon. through Sat. at 1900 EDT. The WM Phone Net meets on 3870 kc. Wed. at 1800 EDT. New Novices in Athol are FZY and FIO, both active on 80 and 40 meters. BHC now is General Class. AJV is putting up a 10-meter beam. HRV, SER, and ZWZ are setting up a RACES program for Easthampton. Ex-KA2DY, Dick, is now back in the States, and will shortly be on as W3WTW/1. The Berkshire County Amateur Radio Assn. held its first meeting Sept. 9th in Dalton. Meetings will be held the first Fri. of each month. Reports of activity during the recent flood are coming in slowly. Our section was hit hard by the rains and flood waters. The amateurs, as usual, did a splendid job of emergency communications wherever possible. Many were without power or had equipment damaged by water or humidity. Cities and towns with active RACES programs and nets were right on the job. Russell, Mass., was isolated for 5 days and the only communications outside was by ham radio. MSN, of that town, with a generator borrowed from a nearby construction project, provided the only means of communication during the emergency, maintaining contact with the Westfield C.D. Net, mobiles at Westover AFB, and VKR in Springfield. WCC put in many hours as net control of IRN, with assists from HRV, WEF, and others. Southbridge, one of our hardest hit towns, was kept in communication by beams from 0300, Aug. 19th, to 2400, Aug. 26th, continuously, by the heroic efforts of EES, CJL, IBY, LLT, PQZ, QFJ, and TTK. Also participating were YZR, YQC, ZD, WN1BGN, and 2JGY/1 using mobile and emergency power. Traffic: W1WCC 129, ZUU 126, BVR 102, BYH 55, DVW 34, WCG 29, BKO 26, HRV 26, TAY 23, MNG 13, AJV 8, JAH 3, FZY 2, JYH 2.

**NEW HAMPSHIRE** — SCM, Harold J. Preble, W1HS — SEC: BXU, RM: CRW and COC, PAM: CDX. The New Hampshire C. W. Net is back on a five-day-a-week schedule. FZ's traffic report for August was portable 1. Wells Beach, Me. TTT has a new jr. operator. UZI, formerly of Manchester, is now 4KTJ. New appointees are ARR as OPS. DYE as OO. Please check your certificates and send

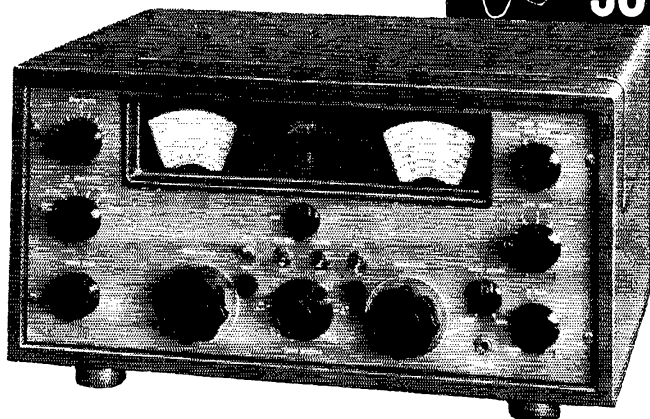
(Continued on page 80)



.....about this **ALL NEW** receiver



Complete receiver - Amateur Net \$395<sup>00</sup>  
Matching Speaker \$16.00 extra



Our Engineering Department has been developing the GPR-90 for over two years and during that time many prototypes were produced. Our objective was to produce a good receiver, rugged enough to last a long time, sell at a reasonable price and maintain a high resale value.

**Noise** • Many people judge a receiver by the amount of noise it makes when it is turned on. We think the idea is to hear signals, not noise and with this in mind, we reduced the noise to a minimum, so that for one microvolt of sensitivity, the receiver has a 10 db signal to noise ratio. In simple terms this means that the signal plus the noise, is 10 db above noise alone. So when you turn the receiver on and it appears to be too quiet, remember, it is still very sensitive.

**Intermodulation** • We use a modified grounded grid front end in this receiver, about which there may be some concern with regard to intermodulation (sum and difference spurious carriers.) The front end of the GPR-90 was specially designed to employ a TMC ferrite input transformer, a product designed and produced exclusively by us. The grounded grid stage, used on bands 3, 4, 5, and 6 (where it does the most good), is preceded by a high pass filter which virtually eliminates intermodulation caused by strong broadcast carriers—for example, a 5.88 mc. spurious carrier produced by a 55,000 mv signal at 880 kc. and a 55,000 mv signal at 5000 kc. will be down 92 db. Moreover, the grounded-grid stage always has either AVC applied or is on the RF gain line.

**Calibration** • Dial Calibration with high degree of accuracy is not easy to attain in a general coverage receiver, but it can be done. It is much simpler to provide highly accurate calibration and tracking over the amateur bands only, but this "specializes" the receiver. The GPR-90 is calibrated to communication accuracy, over its entire

six bands. In our case the primary factors in calibration were oscillator drift and condenser curves. We believe that we have adequately taken care of these items and produced a well calibrated receiver.

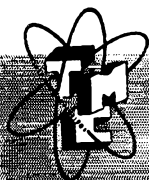
**Audio Selectivity** • We think you will like our exclusive audio selectivity and audio spread features. They are usable on CW, phone, and SSB. In the sharp position the peak of the audio curve (exalted 6 db) is approximately 50 cycles wide, and a CW signal peaked at 1200 cycles will actually seem to leap out of the noise, when properly peaked by the B . F . O.

**S. S. B.** • The GPR-90 will receive SSB signals as well as any communications receiver not specifically intended for SSB. It has adequate stability, rf and audio selectivity, generous B.F.O. injection, which can be raised if desired and the AVC can be used with B.F.O. on. However, we do not feel that the average ham is rushing madly to all-out SSB operation—at least not right away. SSB is a very efficient form of communication but is slightly complicated for the average ham. However, an ideal combination for SSB is the GPR plus a signal slicer and the GPR-90 provides for such insertion of a "signal slicer" between the 455 kc I.F. and the audio output, on the rear deck. TMC will produce such a slicer in the near future in a matching cabinet.

**XTAL Calibrator** • when the question of a crystal calibrator was raised, it was decided that it came in the category of an accessory and would raise the cost unnecessarily. For those who wish, a kit will be available for simple installation either at home or the factory.

The success of any product is its acceptance by the user. Advertising claims will sell the product but only the product can keep itself sold. If you like the GPR-90 it will be around a long, long time.

Bulletin 179B-Q for complete details.



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them in for endorsement when due. The Port City Radio Club reports its Novice members are becoming fine operators and the Club is proud of them. WBM is putting lots of mileage on a new Plymouth and working mobile on 2 meters. YED has received his private pilot's license and should be aeronautical mobile soon. Let's get going on a New Hampshire phone net. Contact CDX. New Novice Class licensees in New Hampshire are FRV, FRW, FSR, FTZ, FUA, FUG, FYY, and GBF. How about more news items with your activity reports? Traffic: (Aug.) WIARR 81, GMH 54, COC 50, IP 43, QGU 27, FZ 10, CDX 6. (July) W1HOU 10.

**VERMONT** — SCM, Robert L. Scott, W1RNA — SEC: SIO. PAM: RPR. RM: OAK. VTPN meets on 3860 kc. Sun. at 1000; VTN on 3520 kc. Mon. through Fri. at 1830; GMM 3860 kc. Mon. through Sat. 1200-1300; Vt. C.D. nets 3993 and 3501.5 kc. Sun. 1000-1100. Traffic should be on the upswing by the time this is read. More fellows will have the time to check into nets. Please remember most nets operate on a time limit. Be a good "netter" and listen. If conditions are rough from QRM, QRN, or a heavy traffic load do not add to the confusion by busting in with a QRU, unless net control asks for such, just for the reason of checking in. Know your net, your net control, and band conditions. This can be learned by *listening* — listening before yelling! UGW reports he expects to spend about a year on the West Coast. From the number heard on the various nets there should be more traffic reports and comments. Traffic: W1AVP 67, UEQ 43, RNA 26, BJP 19, IT 6, UGW/2 4.

## NORTHWESTERN DIVISION

**ALASKA** — SCM, Dave A. Fulton, KL7AGU — A fire in the portal of the Whittier tunnel on Aug. 2nd disrupted all communications to the Port of Whittier. During this period DD, AZK, ASG, and BJK handled all emergency communications for the Alaska Railroad, for which they received a letter of commendation from the General Manager of the Railroad. Members of the Anchorage Amateur Radio Club returning from their annual picnic encountered a three-car accident. ASQ and BJL hearing the mobiles calling for aid, called Anchorage and PJ responded. Mobiles assisting at the scene of the accident were CP, AMS, AUV, MF, and AGU. PJ, on receiving the information, called the Territorial Police and the City of Anchorage Fire Dept., which dispatched three ambulances and police cars to the scene of the accident, eighteen miles south of Anchorage. Remember, 3986 kc. is a mobile and emergency frequency. Please pause and listen frequently when using that frequency.

**IDAHO** — SCM, Alan K. Ross, W7IWU — St. Anthony: ZLO is the new EC for St. Anthony and Fremont County; he has had 5 years with the USMC in communications. We need ECs for Rexburg and Idaho Falls now. Lewiston: GMC checks into WARTS and RN7. He has a new Viking Ranger, and is building a new mobile rig for his new car. Kellogg: RQG checks into RN7 but can't make GEM at present because of work schedule. Smeltville: WHZ checks into Montana, WARTS, and PARM Nets. Boise: The Gem State Amateur Radio Club will hold meetings indoors from October through May the 2nd Fri. of each month. IWU has Motorola 5V (f.m.) on the local net frequency of 145.44 Mc. Timely topic tip: If you can't pick up WWV on mobile receiver because of restricted frequency coverage, try for "Dominion Observatory Canada" on 7335 kc. — time beats with time announcements every minute. Traffic: W7RQG 54, WHZ 49, GMC 26.

**OREGON** — SCM, Edward F. Conyngham, W7ESJ — Off-the-air activity was strong in August with BLN working over the shack to improve operating. FRT building a new s.s.b. transmitter, RQJ getting on with a new s.s.b. rig. RVM getting a new pole up, WHE building a new rig, TIR and VBF building 2-meter rigs, PPQ building a new home, UJL wiring a Heathkit DX-100, THX completing a new beam installation, and ESJ building supply for ART-13, also wiring a new Ranger kit, SEZ, LI, and BDU are spending more and more time on 2 meters as many of the Willamette Valley hams are moving to that frequency. PGB has been working on ARC5s for 80-meter c.w. RIM has returned from electronics school at Ft. Monmouth and is back at Oregon State College using the call K7WBB. WAT still is attending electronics school. LNG, who is newly-married, still is on the air. DIE is off on a vacation and calling on hams at each stop during the trip. UZU, with a quarter-mile antenna, reports the static pick very good. HVX is chasing TVI for others. NPF is spending his time at c.w. to increase speed. ADX, PON, BUS, BVH, BDU, PGB, QCL, LI, LT, FPD, QWZ, QEI, JRU, OJA, and FQI showed some high MARS operation. LT shipped out to sea for a quick run to KL7-Land. The loss of TWM to Silent Keys was felt by all for he was very active. The Oregon State Net reported a QNI of 181 in 27 sessions. This is a big increase over past years for the month of August. Traffic: W7QKU 65, HDN 56, BLN 44, PRA 28, BVH 27, TIR 26, UJL 21, ESJ 8, FNZ 8, OMO 7, BDU 2, VBF 2.

**WASHINGTON** — SCM, Victor S. Gish, W7FIX — BPL was made by PGY, BA, and VAZ. BA has a new 75A-4 and is waiting for the KWS-1 to use on his new Telerex twin beam 10 over 20. TMO had an antenna-raising party (a Radcliff 10-20) with KZP, OEX, PGY, RAQ, BA, and others helping. CCL had KZ5BE and W0BLI as visitors. Hams with the United Air Lines at SeaTac are OOA, KQX, OQO, FNA, and KV. OE is getting "kit happy"; he finished Heathkits AR-2 and SG-8. FLX had 9BKJ (SCM Indiana), VE7ASR (Mgr. RN7), RXH (Mgr. WSN), and TH among his list of visitors during August. NYJ was on WSN 100 per cent for August. EHH is checking in on FARM, WARTS, and Montana nets. AHV went mobile for a 4300-mile trip but still likes c.w. best. AIB, on Coast Guard inspection trips during August, is due to retire to permanent hamming on Feb. 1, 1956. 1VB was under the doctor's care for a while but is better now. TIQ is checking in on OSN, WSN, RN7, and MARS nets. YAQ built a Heathkit VFO after dropping the "N." UKI is building a new rig. TWQ, YHR, VAN, UKI, and possibly YGL are going mobile. AVM reports hearing 1HL on 2 meters but was unable to raise him. K7WAT expects to be on the traffic nets regularly from Fort Lewis. YJE reports the "Royal Order of the Hoot Owl" meets Sat. at midnight on 50.4 Mc. and has new six-element 6-meter beam and 6-meter mobile. GVV is moving to Port Angeles from Tacoma. SLB constructed a transistorized "Little Gem" wavemeter. CMQ operated portable and mobile in northern Idaho. PUA has a three-element Gotham 6-meter beam. HZA, PEG, RAL, TKQ, and VHM covered the sports car races in Ellensburg Aug. 14th. AHQ is going after DX with a 50-watt Globe Scout. HVM reports the rig is back in the "hospital" again. CKT is building a.s.b. JWJ and QGP are doing good jobs as director and net manager of WARTS. WAH has a new Heathkit VFO, checking in on WSN, RN7, and MARS. ZTJ is on 2 meters and awaiting an AREC membership card from VVX. The Washington section is looking for a volunteer for the Section Emergency Coordinator post. RCM must resign because of illness in the family. Traffic: (Aug.) W7ECY 785, BA 763, VAZ 510, CCL 345, FRU 160, OE 97, USO 62, NYJ 46, UVL 33, FIX 32, RCM 30, RXH 24, APS 23, EHH 22, WAH 22, AHV 21, DDD 12, AIB 11, WQD 11, PZB 9, 1VB 7, TGO 6, GAT 5, TIQ 2, YAQ 1, (July) W7FRU 152, K7WAT 88, W7GAT 2. (June) W7GAT 4. (May) W7YJE 1.

## PACIFIC DIVISION

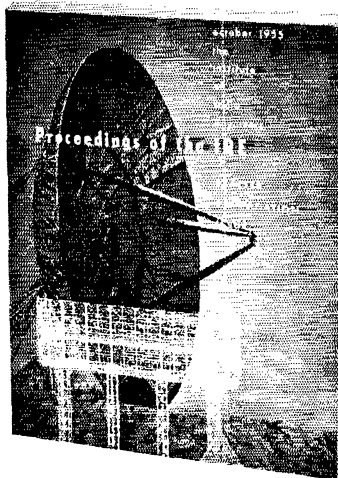
**HAWAII** — SCM, Samuel H. Lewbel, KH6AED — W2UK, Thomas, has arrived in town and is setting up a 2-meter kw. rig. W6YEQ, Les Sebald, while vacationing in Honolulu, addressed a meeting of the 2-meter gang. Take-moto, KH6KC, the EC for the Honolulu Mobile Club, reports six new AREC members signed up during the month. The mobile RACES frequency is 29.55 Mc. The Leeward Oahu Amateur Radio Club now is an ARL affiliate and has a club station with the call KH6MOP. Honolulu single-sideband enthusiasts have a dinner meeting each month and can be heard any evening after 8:00 HST on about 3810 kc. KH6s ZP, KS, TD, BCX, AXS, EZ, CT, and AED are the regulars. Traffic: KH6AJF 2346, QU 598, KP6AK 76.

**NEVADA** — SCM, Ray T. Warner, W7JUJ — SEC: WVQ, ECs: PEW, PRM, TVF, TJY, and ZT. OPSs: JUO and UPS. ORSs: MVP, PEW, and VIU. OBSs: BVZ, YRY has made WAC with 65 watts c.w. after three months on the air. TVF, who has been QRL jumping from band to band, now is preparing for any openings on 6 meters. 6CMW is the latest newcomer to settle down in Las Vegas. BJY and BVZ both received their Armed Forces Day certificates. TKV, after a short siege in the hospital, lost no time in returning to the air. SXD has gone all-band mobile with a new Elmac. VIU and WN7YNO, of Elko, are settled in their new QTH in Winnemucca. VIU is awaiting his YLCC certificate. VK2ARZ advises he hears many WN7s on 40 meters. Dig into the noise level, you Novices! Those 75-watters are doing better than you think. Appearances: Remember, an activity report is expected every month.

**SANTA CLARA VALLEY** — SCM, R. Paul Tibba, W6WGO — Asst. SCM: Roy E. Pinkham, 6BPT. SEC: NVO. PAARA members learned about radio-controlled airplanes at the last club meeting. The SCCARA, at its August meeting, tried using some of its own members to furnish the program for the evening. Short discussions were carried on by three members on three different subjects. This stunt could be used by any of the clubs, thus giving its members more activity and stimulating more interest by a larger number. MMG reports the arrival of a jr. operator on July 26th. He also reports that the September 1st edition of the *North County Express* carried a front-page article about Elizabeth Deck, KN6MTQ, eight years old. We believe that she is the youngest ham in the section. AIT still is trying to get that increase in power so much needed for his work on the traffic nets. K6GID, mgr. of NCN in Northern California, is doing an FB job whipping  
(Continued on page 88)

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4. "On the Scattering of Radio Waves by Turbulent Fluctuations of the Atmosphere", by F. Villars and V. F. Weisskopf
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35. "The Use of Angular Distance in Estimating the Median Transmission Loss and Fading Range for Propagation through a Turbulent Atmosphere over Irregular Terrain", by K. A. Norton, P. L. Rice and L. E. Vogler

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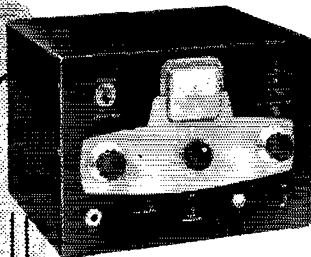
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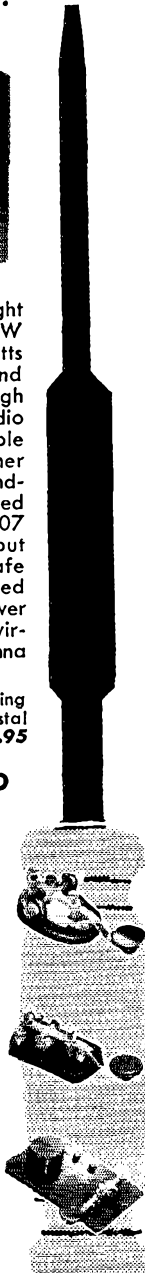
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**EAST BAY**—SCM. Guy Black, W6RLB—Asst. SCMs: Harry T. Cameron, 6RVC; and Oliver A. Nelson, jr., 6MXQ. PAM: LL. RMs: EFC, JOH, and IPW. Jay Amaro, our SEC, has moved to 28134 Cole Place, Hayward, where he lives in a house recently vacated by USO. Jay now is in a better position to sparkplug the AREC in the southern part of the East Bay. The most recent crop of AREC applicants, Jay, includes K6EHQ, K6ERF, KN6IXB, and KN6KLM. Another new Hayward resident is 7FTR from Ogden, Utah, who plans to run more than his present 70 watts to an 803 as soon as he can get the rig fixed up. ZRH reports seeing VSV at the I.R.E. show in New York. The East Bay Radio Club attended the WPCON show in San Francisco, after having dinner in the city. VPC and FJJ were active in organizing a dinner for AEE during the show, at which time first steps were taken to form a Northern California RTTY Society. Merrill brought word that the Southern California RTTY Society would help in any way possible. KFO and EHS showed the SARO through their neon-sign and crystal-grinding plant. EY has returned from a tour up the Alcan Highway, from which he kept in touch with the Bay Area via 40-meter c.w. SXK has been turning in very regular and very interesting reports of hearing 2-meter signals hundreds of miles out to sea on the SS *Maorian Rancher*. His earlier results reported in this column, are thereby proved to be not at all a freak. K6CCQ reports building a new rig with a 4-65A. K6FDG is getting back into the swing of traffic after a quiet spell for rebuilding and reorganizing. KN6KOY would like help in reducing harmonics. K6GID, the new manager of NCN, is putting on a drive for more members. How about it, you traffic-handlers? JZ is negotiating with MARS for an AFSK MARS net on 2 meters. Traffic: (Aug.) K6EPC 24, (July) K6EPC 62, W6LL 53, K6FDG 12, W6YDI 3, (June) K6EPC 14, W6YDI 8, K6CCQ 6.

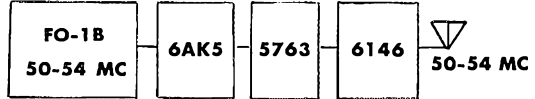
**SAN FRANCISCO**—SCM, Walter A. Buckley, W6GGC—Asst. SCMs: William T. Nakahara, 6GHI; and Fred H. Laubscher, 6OPL. Following are the list of appointments in this section. SEC: NL. PAM: KZF. ECs: KNZ, ZUB, LOU, SLX, and UOQ. OBSs: CXO, MWF, and NCK. OESS: NAC, GQK, and JAA. OPSs: CXO, QMO, and CBE. OOs: CXO, GQA, WB, and RBQ. ORSs: CXO, GQY, OPL, BIP, GCV, CWR, FYJ, RBA, NL, and PHT. The San Francisco Radio Club had EFT, Robert Bunce of the Robert Dollar Co., as guest speaker at its August meeting. His topic and display was on 2-meter transmitter design. The San Francisco Shipyard Club held its annual picnic in August with a large attendance of members, XYLs, and junior operators. All enjoyed a steak dinner. The 29ers had its monthly hidden transmitter hunt on 29 Mc. Net control was EJY. About fourteen mobiles joined in the fun. The Central California Council presented ACN with a plaque in appreciation of the good work he did for the Council and California amateurs in lobbying for the license plate bill to become a permanent law in the 1955 legislature. The HAMS combined its August meeting with a wienie-roast at one of the local coves and had a dandy turnout. Plans were made to have another outing. 6-meter boys held their first 6-meter transmitter hunt with five cars scouting San Francisco hills for the net control hidden transmitter. It is planned to have hunts each month from now on. The Humboldt Radio Club now has a son-and-mother ham combination, 13-year-old KN6KGI and his mom, who is KN6MNV. The National Guard Company in Eureka has its own ham call now, K6WEX. K6CNU and K6DVV are members of the Guard. The San Francisco Naval Shipyard Club has started a new idea of holding one meeting each month at a different member's home QTH and hopes to stimulate interest of the XYLs. The Tamalpais Radio Club was well represented at the August roundup of "MARS" held at Inverness, Calif. All enjoyed a swell roast beef dinner. Many prizes were given out and a dandy rachew was had by all. QMO now is a civilian radio operator at the Presidio in San Francisco. She is busy on all nets for A6USA and has requested information on joining the National Traffic Net. K2HID/6 is settling in San Francisco and expects to be very active on the nets also. He put in early application for appointment in the San Francisco section so he would not miss out on the October CD Party. CBE reports that a new YL put in her appearance at his QTH on Aug. 19th. Congratulations to all. Ron. GQA says OO activity was slow for the month of August. WB reports that he is busily getting fellows on the ball for activities in the National ARRL Convention to be held in San Francisco in 1956. With ATO as his chief helper, the Convention promises to be a great one. Sorry to report to his many

(Continued on page 84)

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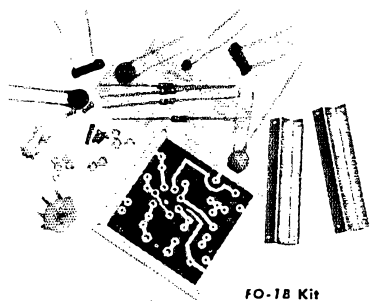
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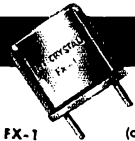


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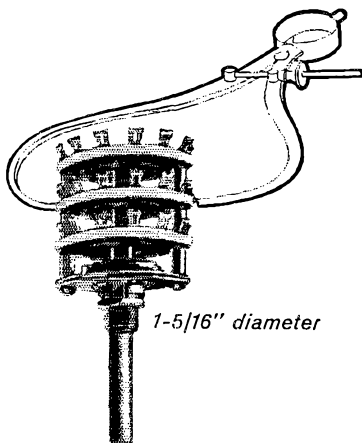
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**SACRAMENTO VALLEY** — SCM, Harold L. Lucero, W6JDN — The next meeting of the Council of Amateur Radio Clubs will be held Sept. 30th. K6ER turned in a fine OO report. JDN attended the Tehama County Amateur Radio Club meeting Sept. 9th. Your SCM also attended a get-together of the Chico, Redding, and Marysville hams. Our OBS, SBH, hasn't been on much because of the illness of his brother, KXX, EC for the Yuba-Sutter Club, reports 12 full AREC members. KN6LVW, 12 years old, is a new ham in the Chico Area. GUDC moved to San Francisco. EII is working on a radio exhibit for the State Fair. EJU is a new MARS member and is active on 75 meters. MYT, Frequency Measuring king of the Sacramento gang, is on 75 meters. 9HTB/6 is going back to Nebraska and will be discharged from the Air Force. NFH completed a new 813 mobile rig. HSV and ETY have put up now verticals. SDB moved to 6 meters. AK is completely sold on his new 75A-4. AIS is having trouble with the new final using a pair of 4-400As. ESZ now is on s.s.b. with new 20A exciter and is building grounded grid 803s final. KN6IOJ is a new Novice. K6MGD, a new ham in Sacramento, is active on 75 meters. LLR is active on MARS and has completed a new VFO and can now QSY. CIS has a new portable with him in Los Angeles and is building a new all-band job with 829Bs. JN skeds AY and OKQ nightly on 3812 kc, and has a BC-610! CLV, known as the "flea power king," is building a new miniature transmitter and receiver. ILZ built a new portable. RNR, new Sacramento Radio Club president, is active on 20 meters. ZF is on s.s.b. with a new exciter. Traffic: W6CMA 223, JDN 7.

**SAN JOAQUIN VALLEY** — SCM, Ralph Saroyan, W6JPU — SEC: EBL, EC: PSQ, I would like to take this opportunity to thank the fellows who showed up at Pinedale C.D. Headquarters every Mon. night for their very fine cooperation and extra time that was put in, in helping to turn out 14 Novice and 4 General Class hams. It was very fine and unselfish work. K6KAQ now is General Class. KN6MHC, the daughter of JPS, makes much QRM in the same shack. DVL is rebuilding. TTX is back to the college grind. GIW vacationed in the High Sierras. QOS is working out FB mobile. GFV is communications engineer for WYT. NTV is running the limit on 420 Mc. K6BGJ has his eye on a 16-ft. inboard. K6BGE got the bugs out of his mobile. K6HTG, W6NTK, K6EDX, W6MGN, ONK, BNP, and NAS were heard on 2 meters. K6EDX has an FB ground plane for 2 meters. KN6LLF is rebuilding the receiver. K6EVM is fighting forest fires and hasn't much time for hamming. UJU has a new Mercury. K6BGO is Asst. EC in Coalinga. Appointments are open around these parts. If any of you are interested, drop me a card. We would like some Official Observers and Official Phone Stations here in Fresno. How about some reports, fellows? Traffic: (Aug.) W6TX 357, (July) W6ADB 37.

## ROANOKE DIVISION

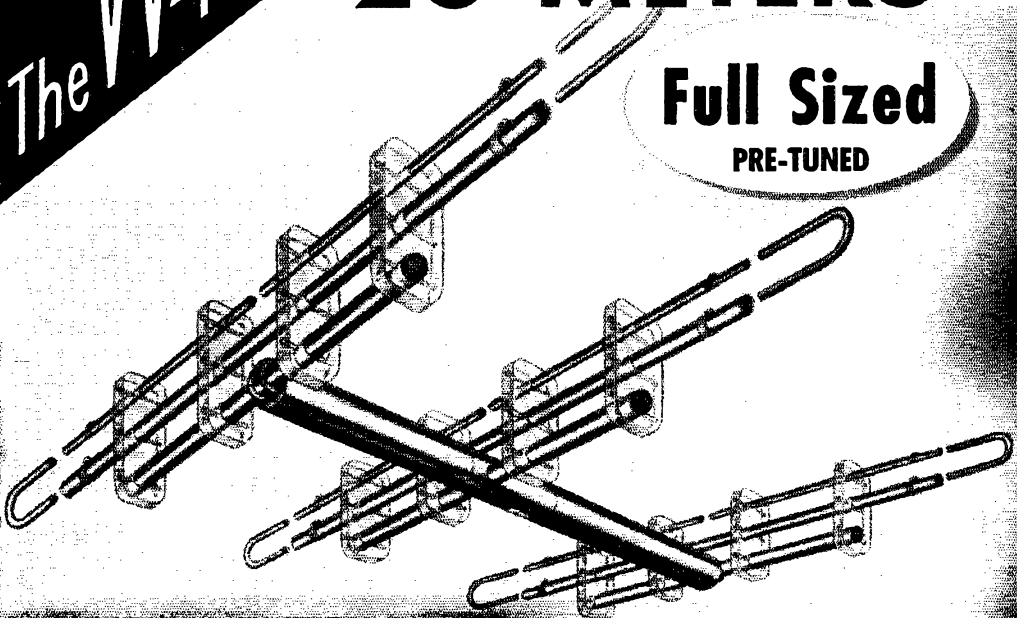
**NORTH CAROLINA** — SCM, Charles H. Brydges, W4WXZ — SEC: ZG, PAM; ONM, RM; VHH, Congrats to LEV on making BPL in July. CVX is on 75 meters mostly. JOS has returned to Virginia. New Technicians are GHR and HAY. JZQ is a new OO. The North Eastern North Carolina Amateur Radio Club put on a program for the Rotary Club on amateur radio. During the hurricane the Seaboard Railroad let TLA, Rocky Mount EC, use \$3800 worth of storage batteries as emergency power. State C.D. Director Griffin sent letters to North Carolina amateurs stating that he, as well as the Governor and his staff, appreciated our work very much during Hurricane Connie and Diane. The Tarheel Emergency Net also received a hearty round of thanks from amateurs all over the Eastern Seaboard for their swell work in the emergency. GNF, the club station in Greensboro, served as NCS most of the time. The Charlotte C.D. Net frequency, 3825 kc, was used as an auxiliary net for the handling of welfare traffic and weather information. ZQB, Charlotte and Mecklenburg EC, set the net up on the frequency earlier, and later it was turned into a state-wide net to help keep unnecessary break-ins off to the emergency frequency of 3865 kc. BUA is building frequency measuring equipment and will apply for OO appointment. AWQ is putting up new antennas after the wind blew his down. KN4EUC, a new Novice in Charlotte, is using an Eldico TR-75TV and an S-40 receiver. CZR has been working lots of stations on 40-meter 'phone. FAR has moved to Florence, S.C. QC has a new 1-kw. gas engine generator and several rigs he can operate on emergency power. ANU is working on 20-meter beams for DX. BHV is trying to up his power from 35 to 150 watts. Traffic: (Aug.) W4RRH 94, WXZ 12, QC 9, CZR 6, BUA 4, EJP 4, TLA 4, (July) W4LEV 1068, CVX 42, SOD 9, WXZ 4.

**SOUTH CAROLINA** — SCM, T. Hunter Wood, W4ANK — FM has finished a 40-watt modulator for his portable rig. JGM has a new Telrex 20-meter beam. VAM is building a new exciter using a pair of 6146s to drive a kw. TSU has a new wide-spaced Mini-Beam on 20 meters. (Continued on page 86)

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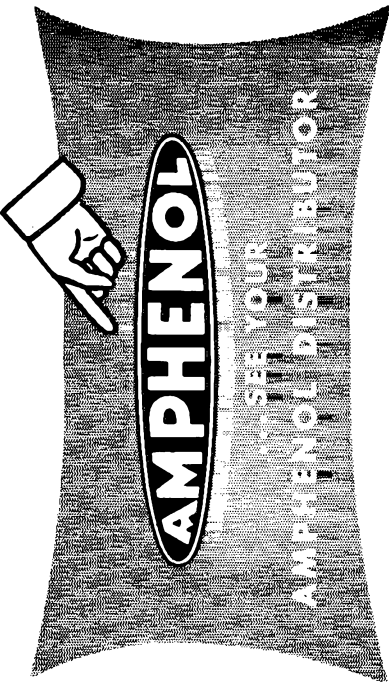
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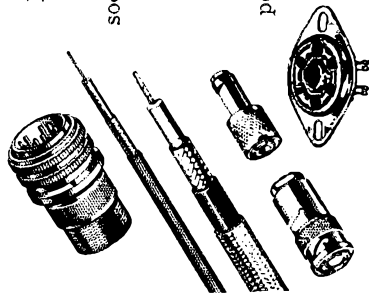
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AUL has an EX model shifter to go with his new 500-watter. FXG is on 20-meter c.w. and reports good band conditions. LXX has a new 20-meter ground-plane antenna and can supply dimensions of the antenna for 14,050 kc. KN4EFR, in the Antioch section near Camden, age 11, is believed to be the youngest ham in the section. DX soon will be on 2 meters with an SCR-522. K4AB reports for the Greenville Club, which is now in new quarters in a two-room club house located 3 1/4 miles from town. K1AWB, W1LQ, ASD, and others in Greenville are enjoying 2 meters. They have tied in with the Greenville c.d. and have obtained a bus and the hams are installing mobile equipment therein to be used as a control center. 2KXR has moved to Greenville and KA9MF is home from the service and has applied for a W4 call. NYK has been renewed and soon will be on the air. A separate report is being submitted but special mention goes to K4FA1, W4TPE, ULH, VFN, SWT, and RCR for taking their mobiles into the disaster area to provide important communications during Hurricane Connie and Diane. Traffic: W4HDR 154, FFH 127, ZIZ 61, K4ADO 17, W4ANK 16, FM 4, DX 3.

VIRGINIA—SCM, John Carl Morgan, W4KX—SEC: RTV. Congrats to the Tidewater Area boys on a mighty swell convention, Hurricane Connie arrived, without having registered on Friday night, but fortunately left in time to allow hams manning emergency nets to attend. By this time the net season will be in full swing. Congrats to net mgrs. YVG, PXA, and TFZ on an FB job of summer operations despite punk conditions. All who think they've earned net certificates should contact the appropriate net mgr. Newcomers are cordially invited to report into the various nets. VFN meets nightly at 1900 EST on 3835 kc.; VSN (slow speed) and VN meet Mon. through Fri. on 3680 kc. at 1830 and 1900, respectively; ODN at 1300 Mon. through Sat. on 3845 kc. 3WDP, of K4MC, urgently requests that I unshackle his reported marriage. Seems it was K2KNN, the other K4MC operator, who committed matrimony. Tsk! Tsk! BPL is getting to be an old story for PFC and K4ASU. The latter made it the hard way, as did CGE, his first time. Sorry to lose YKB, transferred to Rhode Island, but glad to welcome back CVO from that State. K4BCT is West Coast bound. YE, YZC, and KN4CAX are in their new Fairfax QTH. LW also is newly nested. FV reports burgeoning activity in the Appomattox Area among YTD, IEF, CLW and XYL CLX, KN4AJS, and KN4BAZ, the latter two awaiting news on their General Class licenses. JUJ collected another certificate, WASM. Here's another blanket invitation to all interested to apply for ARRL appointments appropriate to your interests. Don't be basifful, drop me a card per page 6. Hope to get my rig unshuffled in time for the Virginia QSO Party and see all of you. Traffic: W4PFC 823, K4ASU 215, W4CGE 192, K4MC 173, CJA 46, W4AAD 38, FV 37, CFV 35, TFZ 33, BLR 24, RJW 22, YVG 22, TYC 14, K4DBC 12, CQA 10, W4CZB 10, GSF 9, APM 7, K4ACZ 5, NCP 3, W4JHK 1.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—SEC: GEP, PAMs: FGL and GCZ. RMs: DFC, GBF, HZA, and JWJ. The W. Va. 'phone and c.w. nets started off with a bang Sept. 6th. Let's all try to support the nets and make them even more efficient than last season. The following attended the Roanoke Division Convention in Old Point Comfort: AHF, BOK, BWK, HZA, JWJ, NYH, PQQ, PZT, REN, and WN8SNG. REU walked off with the 75A-2 prize at the Convention. IWB is on with a Ranger. With the beginning of the new season it is requested that all active hams submit activities reports to the SCM, and AREC information on a monthly basis to the SEC, GEP. This information should be sent so as to arrive by the 2nd of each month. New hams are PBO Weston, IVD Wheeling, WN8EYP and WN8FCU of Beckley. Glad to have you with us, fellows. Thanks to TAP for assisting the two Novices mentioned above. It is good to hear ONZ on again. FMU has a new rig using p.p. 813s which packs a wallop. KBT is working a lot of DX on 14 and 21 Mc. It is requested that all hams who are in a position to do so register in the AREC program with the SEC. We should prepare ourselves to render communications assistance in the event of an emergency. Congratulations to the daughter of PZT, who now has her General Class license with the call TGS. Traffic: W8HZA 22, BWK 15, TGL 14, PZT 12, PQQ 7, NYH 5.

## ROCKY MOUNTAIN DIVISION

COLORADO—Acting SCM, Carl L. Smith, W0BWJ—SEC: NMT, RM: KQD, PAM: IUF, OBSs: 1ZY and QAZ. Appointments for a second RM and OPS are pending acceptance. Appointments are open as OPS to anyone interested in work above 50 Mc. BLB has moved to Tulsa, Okla., and OZR has taken over EC duties for the area. VP3JM visited the Denver Radio Club and gave an interesting talk about his experiences as choice DX. Thanks to AGU for his help in getting two new operators active in Salida. KQD has caught up on her sewing for the family, and is back on her heavy traffic skeds again. Orchids to the operators at K0WBW for their fine work in NTS. New operators as well as old-timers are welcomed to the CSSN.

(Continued on page 88)



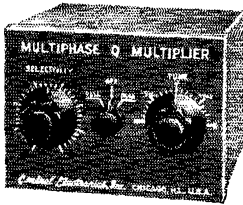
# NEW MULTIPHASE "Q" MULTIPLIER

- Peaks Desired Fone or CW Signal
- Nulls Out Interfering Carrier up to 50 DB. No Loss in Speech Intelligibility

- No Insertion Loss — New Two Tube Circuit
- Special High "Q" Pot Core Inductor



**MODEL A Q**



**MODEL DQ**



**MODEL B SLICER**

## CONVERTS MODEL A SLICER

Plugs into Model A accessory socket, converting it into a Model B. New front panel and controls provided. Enjoy all the advantages of "Q" Multiplier selectivity on CW, AM & SSB with your present Model A Slicer.

Wired.....\$29.50  
Kit.....\$22.50

## FOR AM, CW, SSB OPS

Desk Model "Q" Multiplier for use with any receiver having 450 to 500 KC IF. In attractive, compact case with connecting power-IF cable. Power supplied by receiver. Also provides added selectivity and BFO for mobile SSB or CW reception.

Wired.....\$29.50  
Kit.....\$22.50

## BUILT-IN "Q" MULTIPLIER

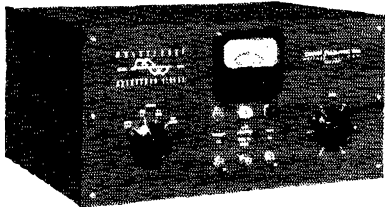
Upper or lower sideband reception of SSB, AM, PM & CW. For use with any receiver having 450-500 KC IF.

Wired.....\$99.50  
Kit.....\$69.50

## MODEL A SLICER

Same as Model B but less "Q" Multiplier  
Wired.....\$74.50  
Kit.....\$49.50

## A NEW CONCEPT IN LINEARS



## MULTIPHASE 600L

### BROAD BAND LINEAR AMPLIFIER

### NO TUNING CONTROLS!

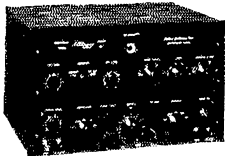
### SINGLE KNOB BANDSWITCHING 10-160 METERS

- Single 813 in Class AB<sub>2</sub>. Approx. 2 watts effective or 4 watts peak drive for 500 watts DC input.
- New band-pass couplers provide high linear efficiency: 60-65%.
- Designed for 50-70 ohm coaxial input and output.
- Built-in power supply. Bias and screen regulation. Automatic relay protection.
- Exclusive metering circuit reads grid current,

watts input, RF output, reflected power from mismatched load — switch to any position while on the air!

- Completely shielded — TVI suppressed. Free of parasitics! Low intermodulation distortion.
- Choice of grey table model (17 $\frac{5}{8}$ "W, 8 $\frac{3}{4}$ "H, 13"D) or grey or black rack model.

Wired, with tubes.....\$349.50



**MODEL 20A**

- 20 Watts P.E.P. Output SSB, AM, PM and CW
- Bandswitched 160 — 10 Meters
- Magic Eye Carrier Null and Peak Modulation Indicator

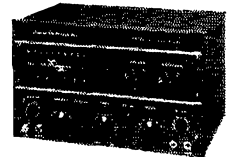
Choice of grey table model, grey or black wrinkle finish rack model.  
Wired and tested.....\$249.50  
Complete kit.....\$199.50

## MULTIPHASE EXCITERS

*Check These Features*

### NOW IN BOTH MODELS

- Perfected Voice-Controlled Break-in on SSB, AM, PM.
- Upper or Lower Sideband at the flip of a switch, with 40 DB. suppression.
- New Carrier Level Control. Insert any amount of carrier without disturbing carrier suppression adjustments.
- Talk yourself on frequency.
- Calibrate signal level adjustable from zero to full output.
- New AF Input Jack. For oscillator or phone patch.
- CW Break-in Operation.
- Accessory Power Socket.



**MODEL 10B**

- 10 Watts P.E.P. Output SSB, AM, PM and CW.
- Multiband Operation using plug-in coils.

Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.  
Wired and tested.....\$179.50  
Complete kit.....\$129.50

MULTIPHASE  
EQUIPMENT

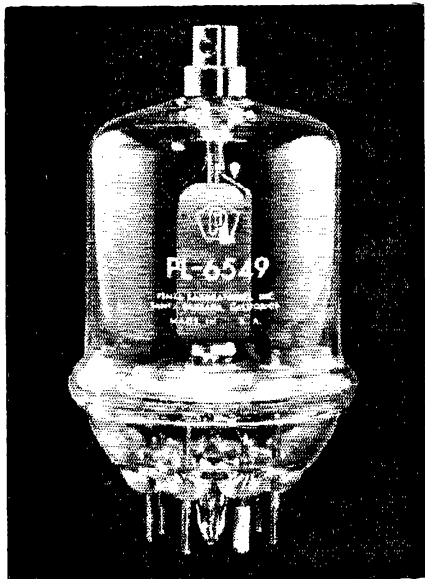
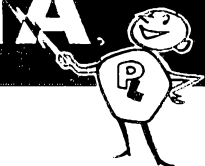
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WRITE FOR LITERATURE ON THE COMPLETE MULTIPHASE LINE

# PENTA



## PINT - SIZED POWERHOUSE!

Here is Penta's new PL-6549 beam pentode, a compact power package which is daily finding new applications where reliability, high efficiency at low and medium voltages, low driving power, and excellent linearity are required.

For r-f output of 50 to 250 watts, or audio output up to 325 watts, the PL-6549 outclasses all other transmitting-type tubes. The beam pentode construction improves linearity—provides distortion-free high peak power output in audio or linear r-f amplifier service.

### RATINGS

Filament—Thoriated Tungsten (quick heating)	
Voltage .....	6.0 volts
Current .....	3.5 amps
Plate Voltage, Max. ....	2000 volts
Plate Current, Max. ....	150 ma.
Screen Voltage, Max. ....	600 volts
Plate Dissipation, Max. ....	75 watts

A four-page technical data sheet giving suggested operating conditions and application information is available. Ask for data file No. 901.



**PENTA LABORATORIES, INC.**  
312 NORTH NOPAL STREET  
SANTA BARBARA, CALIF.

High Noon, and Colorado Emergency Phone Nets. Active net participation will demonstrate to the public that we DO operate in the "public interest, convenience, and necessity." It is time to check the antenna, empty the ash trays, and make sure there is plenty of coffee and sandwiches for the Sweepstakes Contest again this year. Join in the fun. KØWBB made BPL. The High Noon Net handled 270 messages in 27 sessions with a total of 437 stations reporting. ENA/Ø handled over 200 messages originating from the Colorado State Fair grounds. A weather net has been organized to meet Mon. through Fri. at 0800 MST on 3945 kc. Check in with the weather report for your area. Traffic: KØWBB 1170, WØKQD 268, BWJ 48, YMP 36, AGU 34, SWK 14, LEK 7.

UTAH—SCM, Floyd L. Hinshaw, W7UTM—CCC still is commuting between California and Utah. Ted is using a Viking Ranger in California and is doing a nice job with it. Watch for Ted in the October CD Party, as he will be in Utah at that time. SAZ says that LQE and VTJ have returned from visiting friends and relatives in Florida. NAY is back from a trip to Canada where he operated mobile in VE-Land. LRP won the most recent transmitter hunt held by the Ogden Club. A new OES appointee is QDJ. Vic is actively working 6 and 2 meters and assembling parts for a kw. final to cover 6, 2, and 1 1/2 meters. He made an expedition to Bountiful Peak (9700 feet) for the September V.H.F. Party. VHS and RNW are on 2 meters in Ogden. Traffic: W7CCC 25.

WYOMING—SCM, Wallace J. Ritter, W7PKX—The Wyoming Weather Net still is going strong with full support of the U. S. Weather Bureau. Eastern Wyoming amateurs held their own hamfest at Custer, So. Dak., and made plans for a combined Wyoming-South Dakota hamfest next year. Newcastle has E17A as a resident now. Father O'Connor is awaiting a U. S. call. YJG now is living in Cheyenne, operating mobile mostly. JFN is going off the travelling job and settling down at Laramie. The U. S. Selective Service requested the Pony Express Net to furnish volunteer stations for emergency communications as required. KUB was designated for the job in Cheyenne with several others in Casper, etc., expected. NII, at Jackson, has been having mike and rig trouble but still manages to get weather through. The "YO" C.W. Net on 3620 kc. expects to get started for the winter soon. Your SCM requests more news and volunteers for OO appointment in the section. Traffic: W7HDS 224, PKX 93, YSF 91, AEC 35, TZK 34, AXG 28, PAV 21, IDO 8, NMIW 5, JFN 3, MNW 2, NVI 2, VCP 1.

### SOUTHEASTERN DIVISION

ALABAMA—SCM, Joe A. Shannon, W4MI—SEC: TKL, PAM: WOG, RM: KIX. Two clubs have announced new officers: Anniston—GCV, pres.; HZT, vice-pres.; and OAO, secy.-treas. Auburn: CAH, pres.; BFFY, vice-pres.; YWD, secy.-treas.; HTP, corr. secy. K4BVG is looking for skeds on 160 meters. CFI works mostly during the wee small hours on 40 and 15 meters and reports his activity is restricted to a few hours each week. He has added a Q multiplier to the S77A. PWS has an XYL now, and has been moving and revamping the final. VUO is a new OES and reports good hunting on 2 meters using an 829B, with plans for a sixteen-element beam to replace the present twin five. A new teen-age net has been organized with AVX as net manager. Those desiring to participate in this net are asked to contact Herb on the air or by postal card. K4AVA and K4ARD have Conditional Class licenses now. K4CTC has his General Class license. All hail from the Florence Area. TXO is back on with his store teeth working perfectly. Tuscaloosa has two new Novices, KN4DSR and KN4EOL. ILX, in Brent, has a brand-new General Class license. The Southern Belles ask that all gals interested meet with them each Fri. at 0830 on 3920 kc. Traffic: W4HKK 159, KIX 100, WOG 82, AVX 34, ZSQ 30, RIG 21, DTT 20, EJZ 12, ZSH 12, RTQ 10, OAO 9, K4BSV 6, BVG 5, W4DXB 1.

EASTERN FLORIDA—SCM, Arthur H. Benree, W4FE—SEC: IYT, Dade County: The Florida Hurricane Net (FHN) was activated in July and is performing well. YJE is net manager with EGB as assistant. All interested are urged to affiliate. PBS has been appointed Communications Officer for Zone 3, and NVF for Zone 4. Interest in 6 meters is building up. Gainesville: TJU has moved to Pittsburgh. We will miss you, Doug. DFU has a three-element 20-meter beam. Okechobee: AYD now is located here. Lake County: VDY is a new EC. The LARA is holding a three-month operating contest for members over the club station, YKY. Plans are well under way to place the local emergency net on 6 meters. Lake City: K4EEQ has received his ticket. ZIR has a new 32V-3 and a new 75A-3. AHZ has recovered from broken arm and ribs. Moral: Stay off old ladders. Lovey, EHW has a reel-type antenna for 40, 20, and 10 meters which works. Traffic: W4ZIR 71, WS 51, IYT 47, YJE 35, PZT 23, LMT 20, FWZ 18, AIJZ 14, FE 12, IM 11, YNM 9, PBS 2. (July) W4WEO 75, ELS 48, EIW 11.

WESTERN FLORIDA—SCM, Edward J. Collins, W4MS/RE—SEC: PLE, ECs: Mfy and HIZ. KN4EEQ

(Continued on page 90)

*"Worked 87 foreign countries, all continents and 30 zones" with a Gotham Antenna and 35 watts.*

**READ THIS AMAZING LETTER: How an inexpensive FULL SIZE Gotham Rotary Beam made it possible to "work the world!"**

Gotham Hobby Corp.  
107 East 126th St.  
New York 35, N. Y.

Florida, 1955

Gentlemen:

I'd like to express my enthusiasm and satisfaction regarding your 20-meter rotary beam antenna. I purchased one of your standard two-element units in February of this year. Prior to this time I had been using a collinear array about one wavelength above ground. The transmitter feeding this antenna had a power output of about 35 watts, and results were quite discouraging.

When my Gotham arrived, it was easily assembled in a couple hours. The same transmitter was used to excite the Gotham antenna, using the same power as before. Results have been quite gratifying, and it is interesting to note that in the three months since using the Gotham antenna, I have worked 87 foreign countries, all continents, and 30 zones.

I am able to keep schedule with amateur radio —\* in the Cape Verde Islands every week. *It was impossible to even hear this station before using the Gotham beam.*

Extremely high winds are prevalent in this part of Florida. The Gotham beam has withstood blows in excess of 50 miles an hour without failure.

The elements bend almost double in these high winds, but readily return to their original configuration when the wind abates. I feel that this is an extremely important feature of the Gotham antenna.

I have enthusiastically recommended Gotham to all the hams who ask what type I am using (and most of them do, when I tell them the amount of power I'm using). I wish you every success with your product, and feel that it is well worth the modest price.

Yours very truly,

(Names and \*call letters upon request.)

**EVERY FULL-SIZE GOTHAM ROTARY BEAM IS ENGINEERED FOR SIMPLICITY, STRENGTH, PERFORMANCE**

Your Gotham comes to you completely fabricated, made (except for the polystyrene insulator) entirely of new, rustless, first-quality mill stock aluminum. You'll find no link coupling, no complicated mounts, no tuning stubs. You get good, solid aluminum tubing—and more of it, in both length and thickness (the only true gauge of \$ value)! No flimsy wire, no wood to rot or weather-proof.

Easy assembly, simple and quick matching of line to antenna. Yet Gotham's price is 25% to 75% lower than the "toy" midget beams which Gotham so easily out-performs.

**GOTHAM HOBBY CORPORATION  
107 E. 126th ST. NEW YORK 35, N. Y.**

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.)

Name.....

Address.....

City.....Zone.....State.....

**MAIL THIS COUPON TODAY!  
10-DAY MONEY BACK GUARANTEE**

**HOW TO ORDER:**

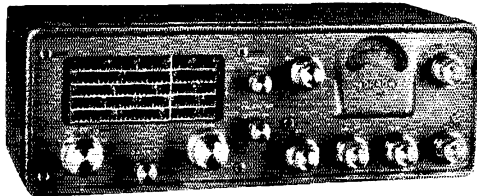
Send coupon with check or money-order to your local distributor or direct to Gotham. Immediate shipments via Railway Express, charges collect; foreign shipments sent cheapest way.

See sample beams and literature at these Gotham distributors

- Alabama: Curle Radio Supply, 406 Meridian St., Huntsville.  
 Arizona: Kennedy Radio, 4511 N. 8th St., Phoenix  
 California: Offenbach & Reimus Co., 1569 Market Street, San Francisco.  
 Florida: Kinkade Radio Supply, Inc., 402 W. Fortune St., Tampa.  
 Indiana: Graham Electronic Supply, 102 S. Penn St., Indianapolis.  
 Iowa: Radio Trade Supply Co., 1224 Grand Ave., Des Moines.  
 Iowa: World Radio Labs., 3415 W. Broadway, Council Bluffs.  
 Kentucky: Universal Radio Supply, 533 S. 7th St., Louisville.  
 Louisiana: Radio Paris, Inc., 807 Howard Ave., New Orleans.  
 Michigan: M. N. Duffly & Co., 2040 Grand River, Detroit.  
 Michigan: Northwest Radio, 435 Tamarack St., Leavitt Arbor.  
 Michigan: Purchase Radio Supply, 605 Church St., Ann Arbor.  
 Minnesota: Law Bonn Co., 67 South 12th St., Minneapolis.  
 Mississippi: Swan Distr. Co., 342 No. Gallatin St., Jackson  
 Missouri: Henry Radio, Butler.  
 New Hampshire: Evans Radio, Concord.  
 New Jersey: Radio Electric Service, 513 Cooper St., Camden.  
 New York: M. Schwartz & Son, 710 Broadway, Schenectady.  
 No. Carolina: Allied Electronics, 411 Hillsboro St., Raleigh.  
 No. Carolina: Johannesen Electric Co., Inc., 312N. Eugene St., Greensboro.  
 N. Dakota: Fargo Radio Service, 515 Third Ave., North, Fargo.  
 Ohio: Mytronic Company, 2145 Florence Ave., Cincinnati.  
 Ohio: Selectronic Supplies, Inc., 1320 Madison Ave., Toledo.  
 Ohio: Srepec, Inc., 135 E. 2nd St., Dayton.  
 Pennsylvania: Radio Electric Service Co., 7th & Arch Sts., Philadelphia.  
 S. Dakota: Burghardt Radio Supply, Inc., Watertown, Aberdeen.  
 Tennessee: Curle Radio Supply, 439 Broad St., Chattanooga.  
 Virginia: Radio Equipment Co., 819 W. 21st St., Norfolk.  
 Virginia: Radio Supply Co., 3302 West Broad St., Richmond.  
 Wisconsin: Harris Radio Corp., 289 No. Main St., Fond du Lac.  
 Canada: Louis Desrochers, P.O. Box 688, Amos, Quebec.

# MORROW

## MOBILE OR HOME STATION RECEIVER MBR 5



All the fine workmanship and dependability of MORROW engineering and manufacturing are built into this new receiver to offer better performance and more value than anything offered to amateurs before. COMPARE MORROW!!

**HIGH SENSITIVITY**— $.5$  microvolt on all amateur bands.

**100 KC CRYSTAL CALIBRATOR**—Built in to make it possible to read exact frequencies.

**SSB AND CW RECEPTION**—Fully temperature and voltage compensated for inherent frequency stability of BFO and mixer oscillators.

**SQUELCH AND NOISE LIMITER**—The exclusive new MORROW Noise Balance Squelch completely eliminates interstation noise but will readily open on weakest signals. The improved series gate noise limiter is extremely effective in eliminating pulse noises.

**ILLUMINATED "S" METER**—Measures incoming signal strength and used as a field strength meter for adjusting mobile transmitters to maximum output. A must for mobile amateurs.

**NO SPURIOUS RESPONSE**—Excellent RF design eliminates images and spurious responses.

**HOME STATION OR ANY AUTO**—Choice of DC (6-12 volts) or AC (120 volts) pack with receiver. Alternate pack available as an accessory. Companion transmitter MB560 also available at \$189.50.

**TUBE LINE-UP**—6BZ6 RF — 12A7 mixer osc. — 6BJ6 IF — 6BE6 mixer, crystal osc. — 6BJ6 IF — 6T8 det., BFO — 6AL5 noise rect. — 6AL5 noise limiter — 12AX7 audio amp., squelch — 6C4 audio amp. — 6AQ5 audio output — 6BJ6 crystal calib. — 12A7 noise amp., "S" meter.

**ECONOMY PRICED**—\$224.50 complete with 6-12 volt DC power supply, MORROW SH type PM speaker, operating instructions and mounting hardware. Physical size: 4 inches high, x  $11\frac{3}{4}$  inches long, x  $6\frac{1}{2}$  inches deep.



Canadian Office: 801 Dominion Bldg.  
Vancouver B. C., Canada

is getting out nicely with low power. HBK lives directly back of GMS, who is busy building beams and towers. CCY is awaiting a 75A-4. NJB is getting back on. HJA is asking more questions about a.s.b. BGG is fighting the antenna problem. KN4DQB is the new secretary of the Crestview Club. IAQ is on 75 meters with low power. KN4DGY, KN4DGG, and KN4DQB keep 80 meters hot from Holt. CQX is hoping for a kw, and big antenna at the new QTH. ADM is building a kw. rig, K4BKU and K4BNA are leaving for college. K4BKP has gone to the Air Force. COD has returned to Freeport. MS is enjoying a.s.b. low power for DX work. MUX is QRL c.d. work. DDD is exercising his new General Class ticket. K4CRK, UCY, and ex-PN (who is awaiting his ticket) work within a 20-foot radius. K4AGM is eyeing the 50-Mc. rig in his dad's station. KN4ADY now has an XYL and will be operating from a trailer while at FSU. AXP is working 7 Mc. 7SWC is a newcomer to Pensy. KN4ECP is wiring up the Adventurer. OOW is off the sick list. QK is working 75 meters and hi-fi. DAO/DEF is enjoying 75 meters. PHQ spends time with his first love (c.w.). Traffic: (Aug.) K4AKP 519. (July) K4AKP 558.

**GEORGIA**—SCM, George W. Parker, W4NS—SEC: CFJ. PAMs: ACH and LXE. RMAs: MTS and OCG. Nets: Georgia Cracker Emergency Net meets on 3995 kc, Sun. at 0800 (note change of time) and Tue. and Thurs. at 1900 EST. The Georgia State Net (GSN) meets on 3590 kc, Mon. through Fri. at 1900, the Atlanta C.W. Net on 7040 kc, Sun. at 2100. New appointment: YST as Cobb County EC. All appointees are urged to check the dates on their certificates and send them to the SCM for endorsement if over one year old. A crop of new Novices recently licensed in Macon includes KN4s EHK, DNK, DPL, DOM, and EHK. W4DMF and K4AIV are now General Class. Macon now has two nets going, a Novice at 3735 kc. nightly at 2200 and a General net at 3922.5 kc. on Tue. at 2100. KN4ANZ, in Moultrie, has a new Globe Scout. 2 meters is getting active in the Atlanta Area, with over 24 active stations and several others on the verge of opening up. Heard nightly on the band are GIS, LRR, LNG, and EGX. CFJ has a new kw. final using WE357-Bs. KN4DKM, at Quitman, has a long wire 560 feet long and is doing all right with it, too. FZO is on with an 813 and is getting a new receiver. New officers elected at the Georgia Cracker Club and Net meeting were Net Manager ACH, Sun. N.C. CFJ, Tue. N.C. YEK, Thurs. N.C. ZDP, secy-treas. MZO, historian NS. Thanks to those who included some news with their reports this month. Traffic: (Aug.) W4OCG 261, PIM 171, ZUF 106, CFJ 69, K4BAI 68, W4HYV 38, BYJ 12, NS 10, BXV 6, BWD 2, IMQ 2. (July) K4WAR 835.

**WEST INDIES**—SCM, William Werner, KP4DJ—SEC: JM. 2NIJ and 9YIS, ex-KP4DW, are visiting KP4. GN moved to a new QTH in Guayama. EE has a new antenna on 75 meters with a strong signal. UH is active on the 3559- and 3925-kc. Nets. WP4ACW runs 12 watts on 3735 kc., ACQ is on 3749 kc. Also heard on 3.7 Mc. are ABA, ABI, ACN, ADK, ADM, AAM, US, KD, and CC. Winners of the KP4/WP4 QSO Contest were KP4CC and WP4AAM. CX operated FAD at N.G. Camp. Novice Net PRNN meets Fri. at 7:30 p.m. on 3735 kc. NCS AAM will tune 3700-3750 kc. for calls until all stations have 3735-kc. crystals. WQ, assisted by WR, put up a 20-meter three-element beam. WT works 20-meter 'phone now but still guards 3925 kc. 7:30 a.m.-10 p.m. RD is adjusting the 20-meter beam. MC, Caguas, is back on 75 meters with new equipment. ES shipped the p.p. 810 final to Spain and now uses 32V-3 and B&W a.s.b. generator. SM5LL is the first SM station to receive a WPR25 certificate. CN8FQ and KL7AIZ now are at KP4UH. The PRARC plans a Christmas dinner and dance. ACG has DX-100 transmitter and Mini-Beam. ACH blew the plate transformer on the DX-100. ADI uses an 807, ACN uses an 807 and an 8-38. ADM uses an 807 and an 8-38. ACW uses a 6L6 at 12 watts and a BC-348. AAA is practicing code to get his General Class license. QR gave up the Mon-key for a Vibroplex and made changes in the Viking for better keying, as per QST. AZ uses a  $2\frac{1}{2}$ -element beam as one-half of the director blew off. Traffic: KP4WT 285, DJ 10.

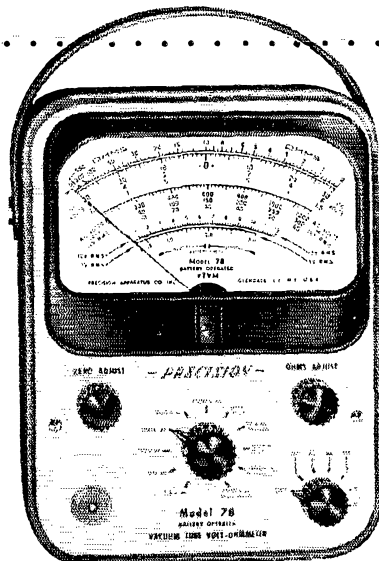
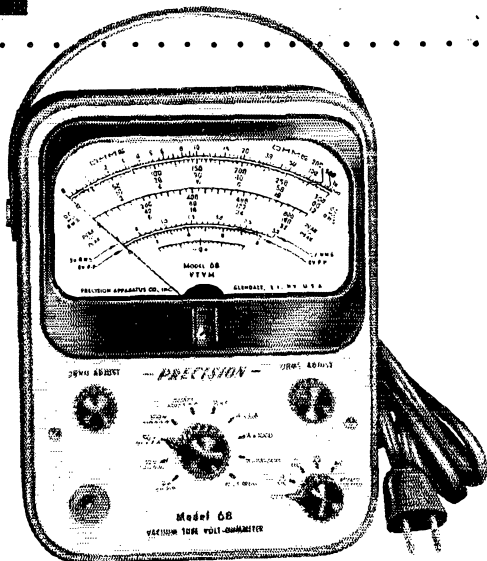
**CANAL ZONE**—SCM, Roger M. Howe, KZ5RM—EP lost his 10-over-15-over-20 array in a recent storm. WA and his XYL are proud grandparents these days. News of the birth of a granddaughter reached them via amateur radio within a few hours after it happened in Houston, Tex. AE and QA have moved to Gamboa. Both are on the air from their new QTHs. Sis. AE, has a new rig, a single 813. An SWL who signs himself "Yehudi" has been amusing members of the CZARA with his very interesting newswy letters. He always manages to mail one to the club post office box just before a meeting. We herewith invite him to join our club and revive the *Bulletin* which the club used to publish. We even will pay his dues for him. Danny Weil, VP2VB, who is on his way around the world in the 40-foot sloop YASME, gave a very interesting account of his journey across the Atlantic at a recent CZARA meeting. Traffic: KZ5VR 94, AX 23, BR 16.

### SOUTHWESTERN DIVISION

LOS ANGELES—SCM, William J. Schuch, W6CMN  
Continued on page 92.

# 2

## NEW VTVM's by *PRECISION* METAL CASED • MODESTLY PRICED • 5 1/4" WIDE-ANGLE METER



### Model 68 AC OPERATED VACUUM TUBE VOLT-OHMMETER

The Model 68 is a wide range, AC OPERATED, general purpose electronic multi-range tester, especially developed in response to field requests for a modestly priced instrument completely FACTORY-engineered, FACTORY-wired and FACTORY-calibrated.

The Model 68 conforms to every *PRECISION* standard of quality, workmanship and value. Recommended for general electronic service-maintenance, in the shop and field.

- ★ 5 (+) Plus DC Voltage Ranges: (Left-Hand Zero) 13 1/2 Megohms constant input resistance. 0-3-12-60-300-1200 volts.
- ★ 5 (-) Minus DC Voltage Ranges: (Left-Hand Zero) 13 1/2 Megohms constant input resistance. 0-3-12-60-300-1200 volts.
- ★ 5 Wide-Spread Resistance Ranges: 0-1000-100,000 ohms. 0-1-100-1000 Megohms.
- ★ 5 High Impedance RMS AC Voltage Ranges: 0-3-12-60-300-1200 volts.
- ★ 5 Peak-to-Peak Voltage Ranges: 0-8-32-160-800-3200 volts.
- ★ 5 Stabilized Zero-Center Reference Ranges for FM discriminator balancing, voltage polarity determinations, etc.
- ★ High Frequency Probe Facilities available through use of accessory crystal probe Model RF-12.
- ★ One Coaxial, 3-Way VTVM Probe serves all functions except that of High Frequency Probe RF-12 above.
- ★ 5 1/4" Wide-Angle PACE Meter: 400 microamperes sensitivity, ±2% accuracy.
- ★ 1% Multipliers and Shunts: Wire and deposited-film types.
- ★ Deep-Etched, Heavy-Gauge, Satin-Brushed Aluminum Panel.

Model 68: In rugged, blue-grey ripple-finished steel cabinet, size: 5 7/8" x 7 3/4" x 3 1/2". Complete with tubes, internal ohmmeter battery and detailed instruction manual.....Net Price: \$49.50

### Model 78 BATTERY OPERATED VACUUM TUBE VOLT-OHMMETER

The Model 78 is a wide-range, stabilized, BATTERY-OPERATED electronic test set, especially developed in response to field requests for a modestly priced instrument that will provide reliable VTVM performance with complete freedom from power line connection.

The features and ranges of the Model 78 are ideally suited to application in the fields of radio-telephone communications, electronic control, television, geophysical electronics, etc.

- ★ 6 True-Zero Center DC Voltage Ranges: 13 1/2 Megohms constant input resistance. 0 ±1.5 ±6 ±30 ±150 ±600 ±1500 volts.
- ★ 5 Wide-Spread Electronic Ohmmeter Ranges: 0-1000-100,000 ohms. 0-1-100-1000 Megohms.
- ★ 5 Extra-High Impedance RMS AC Voltage Ranges: 0-3-12-60-300-1200 volts. 8 Megs. input resistance; 67 mmdf. input capacity.
- ★ High Frequency Probe Facilities available through use of accessory crystal probe, Model RF-12.
- ★ One Coaxial, 3-Way VTVM Probe serves all functions except that of High Frequency Probe RF-12 above.
- ★ Complete, Self-Contained, Battery Operation: Special circuit engineering and optimum operating parameters provide a new high in long-lived battery performance and instrument stability.
- ★ Built-In Battery Compartment: All batteries conveniently replaced via removable cover plate.
- ★ Battery Requirements: Uses Standardly Available Commercial Batteries: One No. 477-67 1/2 volts\*, Two No. 950-1 1/2 volts\*, One No. 964-1 1/2 volts\* (\*Eveready or equal).
- ★ 5 1/4" Wide-Angle PACE Meter: 100 microamperes sensitivity, ±2% accuracy.
- ★ 1% Multipliers and Shunts: wire- and deposited-film types.
- ★ Deep-Etched, Heavy-Gauge, Satin-Brushed Aluminum Panel.

Model 78: In rugged, blue-grey ripple-finished steel cabinet. Dimensions: 5 7/8" x 7 3/4" x 3 1/2". Complete with tubes, one set of batteries and detailed instruction manual.....Net Price: \$57.50

#### Accessories Available for Models 68 and 78

Model RF-12: High Frequency Crystal Probe complete with low capacity x10 multiplier head. Frequency range to 250 Mc.....Net Price: \$10.95

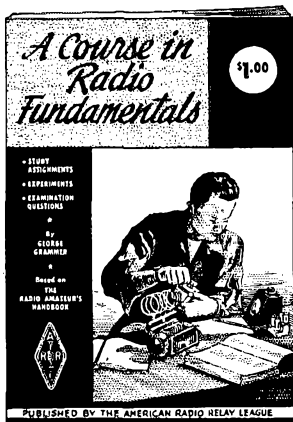
Model TV-4: Super-High Voltage Safety Test Probe with x100 cartridge for ranges to 60 kilovolts DC.....Net Price: \$14.75



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— Asst. SCM: Albert F. Hill, jr., 6JQB. SEC: QJW. RMs: W6BHG and K6DQA. OAY writes from KL7-Land saying he will be there for at least two years and has applied for a KL7 call. LPV is back on the air with a Viking II and a 75A-3. USY has been vacationing on his yacht. K6EA is leaving for W9-Land soon. BEG keeps more skeds than anybody. GYH reports traffic from the East is picking up. NYJ is in his new home now. BUK is back on the air. WT writes from W7-Land where he is having a whale of a time. K6GHU now has his General Class license and is competing with his XYL, K6KCL, on the air. K6HBA finally broke into the traffic ranks. Variations sure cut down on reports. K6IQF has a new NC-125. K6HOV has a new antenna and is working DX. K6LYF has a new DX-100 and is checking in on SCN. NJU has a 60-ft. tower with a 14-Mc. beam on it. K6ELX, K6ELL, K6EVR, and K6JHR made a trip to Mexico and worked under the calls XE1PAC and XE1PAD. K6GUZ has a new keying system. GJP is back in town and moving into the new shack. The Rio Hondo Radio Club has a code class. Contact them at P. O. Box 25, Whittier, Calif. That's it, gang! If you don't send it in we can't print it. Traffic: (Aug.) W6GYH 196, K6COP 72, W6BHG 64, K6EA 62, W6USY 46, K6GUZ 36, W6TDO 32, K6KCI 28, HOV 24, W6CMN 15, K6HBA 15, W6CAK 14, K6IQF 14, IYF 6, BWD 5, ELX 4, W6NJU 4, K6LTA 2. (July) W6NBW 178, K6BWD 12.

SAN DIEGO — SCM, Don Stansifer, W6LRU — The SCM takes this opportunity to thank those who worked so hard to make the recent convention the huge success it was. Because of the resignation of ELQ as Route Manager of the section, the SCM is open for suggestions and applications for this important job. The Convair Club made a tour of the Silver Gate Gas and Electric plant, and held a picnic. K6EBH won the Coronado Club perpetual DX trophy. K6AQO has left for Tokyo. BKZ, P.M.J., LRU, and SYA vacationed in the High Sierras near Bishop. A farewell dinner was held when Ney Landry, local FCC engineer, left for another job in San Francisco. A good group turned out and wished Ney success in his new job. KYG now is settled at his Poway Rancho and again active working DX. OME vacationed in San Francisco. K6DAM is now teaching in the San Diego schools. The Orange County gang continues to hold transmitter hunts on 29,360 kc. at 8 p.m. each Wed. K6BEC is now at M.I.T. as a freshman in electrical engineering. Your SCM wishes to thank those who nominated him for another two-year term. As has been mentioned on nets and in QST, the only way news can be obtained for publication in this column is by calling, seeing, or writing the SCM. This section needs more ORS, OPS, OBS, OO, and OES appointees. If eligible and interested, please call AC 22933, or write me at 4427 Pescadero, San Diego 7, Calif. With over 1500 amateurs in this section it seems a shame we can't find enough news to use our section's full space in QST. Traffic: W6IZG 199, K6DBG 68.

SANTA BARBARA — SCM, William B. Farwell, W6QIW — This report is being written by Betty Wilson, REF, the RM, while QIW is confined to the hospital following a stroke suffered Sept. 4th. Bill's condition is serious but not critical. EGC is visiting in Chicago. FYW has the Ranger just about ready to go. ENR has joined the Mission Trail Net. The Tri-Counties Net (3820 kc.) and the Peanut Whistle Net (3860 kc.) are going strong at noon daily. SBN's activity was nil for the summer. Let's get in and pitch this fall, fellows. The Net meets on 3600 kc. at 1845 PDT Mon., Wed., and Fri. John Reinartz, K6BJ, gave a talk to the Ventura County Amateur Radio Club Sept. 23rd. Publicity on the visit was given in the local Oxnard paper and over the local station owned by JXW. REF is QNI the MTN and SCN and is QRL as secretary. MTN is publishing the MTN monthly *Blazer*. Please send cards to Bill at his home QTH. Traffic: K6NBI 67, W6HUT 12.

#### WEST GULF DIVISION

NORTHERN TEXAS — SCM, T. Bruce Craig, W5JQD — SEC: RRM. PAMs: PAK and IWQ. RMs: PCN and QHI. UXW lost her mother. IOZ and ILO have joined the Texas YL Roundup Net. DJC and her OM visited ARRL Headquarters and Canada, making a 6500-mile trip with plenty of mobile operation. EGD has worked Switzerland. LGY is having rig trouble. RLM and his XYL visited LGY. AJA was injured seriously in a car accident. OPV's son was hurt in a car accident. ATG and his XYL attended the East Texas Teachers' Workshop in Commerce and visited LGY. BNK was in 13 states in 13 days. GZU and VYY visited in Oklahoma. RJM has a new rig. RLM has a new s.s.b. rig. The Dallas Amateur Radio Club met Sept. 6th. A swap session was an added feature. ESR lost his antenna in a windstorm at Breckenridge. ATE/M, ATA/M, and LIO/M have been assisting the Cleburne police in combating recent burglar activities. BSX, in Burleson, cooperated. The Texas YL Roundup Net will celebrate its first birthday Nov. 18th. WXY is NCS with TTU as West Texas alternate and ZPD South Texas. The youngest members are IOZ and ILO, each ten years old. The Net meets on 3880 kc. Thurs. at 0830. It is exclusively YL with 35 or more members. New hams in Mineral Wells  
(Continued on page 94)

# ELECTRICAL ENGINEERS or PHYSICS GRADUATES

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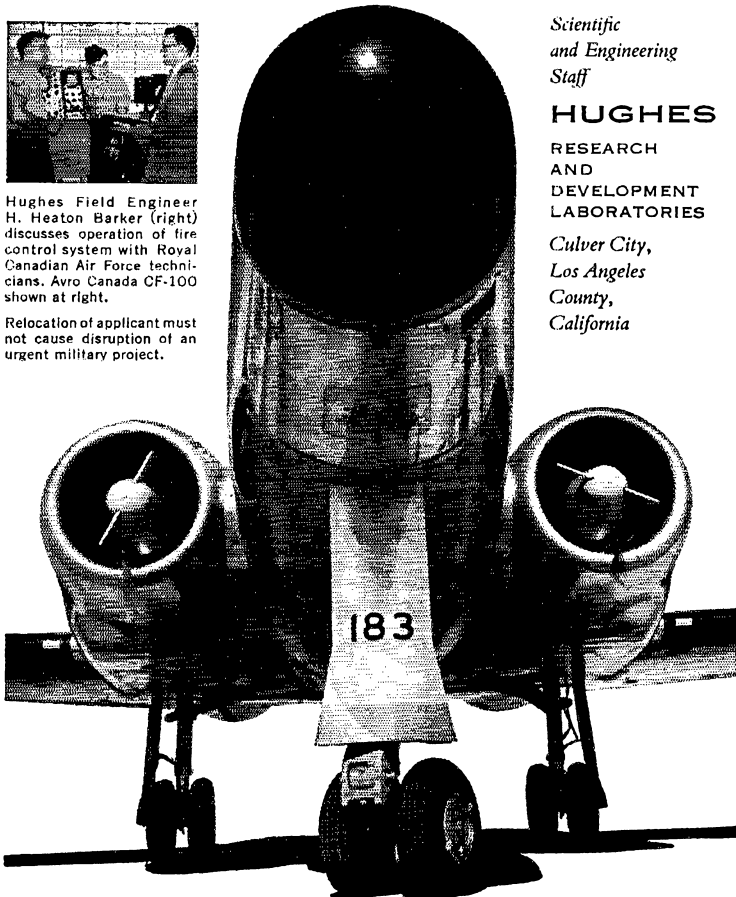
olved, including the most advanced electronic computers. With this advantage you will be ideally situated to broaden your experience and learning more quickly for future application to advanced electronics activity in either the military or the commercial field.

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Hughes Field Engineer H. Heaton Barker (right) discusses operation of fire control system with Royal Canadian Air Force technicians. Avro Canada CF-100 shown at right.

Relocation of applicant must not cause disruption of an urgent military project.



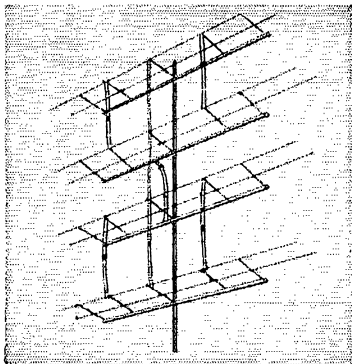
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are KN5BCE and BCX, also W5G1HU, and in Weatherford KN5BBG and BDB. TFB is going to A.G.M. WN5HHK took his General Class exam. TFP is the new net mgr. of the NTO Net. SKZ and ABO have new mobile rigs. YLJ is building a 'phone patch. EOZ reports 47 states QSL toward WAS. HKF has a new 813 rig. Waco: The Central Texas Amateur Radio Club, meeting at C.D. Hq., had classes in Aug. for about 20 new hams. Licenses now coming up. Traffic: K5FPB 504, W5DTA/5 361, BKH 206, KP8 177, AHC 170, CVA 113, BTH 98, PAK 54, FCX 35, TFB 35, CF 26, TFP 23, AWT 13, ASA 12, OCV 5.

**OKLAHOMA** — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 5GIQ. SEC: KY, RM: GVS. PAMs: PML, SVR, and ROZ. Traffic should increase with the coming of cool weather. Some good news is the prospective closer coordination with the State c.d. and probable appointment of our SEC as acting communications officer. Prospects seem good for a revival of the Oklahoma City Club through the efforts of CXE, VZX, and others. More power to them. The Oil Capital Mobile Club has received word of its affiliation approval from ARRL. The Tulsa Central High Club, K5BLL, is reported fourth in the nation in its category for a Field Day score. Oklahoma Army MARS had a swell time at the Ft. Sill Picnic Sept. 4th with plenty of surplus prizes for all. Eyes sure did bug at the 3-kw. mobile that Bob Keiner and his gang brought down from Tinker Field. It uses a 610 for an exciter (not on the ham bands). A good time and good attendance was reported at the Robbers Cave State Park Picnic in Eastern Oklahoma the same day. Requests are coming in to have it a yearly affair. It's Ok by me. New officers of the North Fork ARC are UCK, pres.; ZDI, secy.-treas.; FRB, custodian. New hams reported: KN5CDE Enid, K5CEJ McAlester. KN5CBA Edmond. KN5BPX Sulphur, KN5BSF Tisomingo. Traffic: W5CBY 41, GVS 37, FEC 26, CFG 23, KY 22, GXH 16, PML 13, PNG 13, TNW 12, SVR 7, SWJ 7, EHC 6.

**SOUTHERN TEXAS** — SCM, Morley Bartholomew, W5QDX — SEC: QEM. Official ARRL Bulletins are being transmitted by ES, El Paso, at 8:30 p.m. Mon., 29,600 Mc.; 8:00 p.m. Wed., 3,575 Mc.; 10:30 p.m. Fri., 7,242 M.; 9:00 a.m. Sun., 14,245 Mc. The El Paso ARC conducts code and theory classes Mon., Wed., and Thurs. nights. If interested, contact JEN. Fifteen El Paso stations will get you a WAE certificate. SQM, KBP, UBN, ZQJ, JEN, MXY, YWF, JSJ, SGA, MEMI, YGP, HPQ, PGD, BQU, KOK, RUC, FSH, PSX, QOS, W4SSS, 0FZZ, 0LV5, and KN5AAV all provided continuous watch and communications throughout the El Paso flood. Another YL joins our ranks. She is KN5CBL. JHW amassed the highest total points in a series of transmitter hunts by the HARC. The Houston ARC dedicated its new club house Aug. 28th. Congressman Albert Thomas, guest speaker, paid tribute to hams for their emergency work and cited us as good-will ambassadors. Approximately three hundred attended a get-together the night before the dedication. The CCARC, in conjunction with the American Red Cross, held a simulated emergency drill in Corpus Christi Aug. 21st. All fixed stations were on emergency power. They were MS/5, HQR/5, DQQ, QKF, and MX. Mobiles participating were POC, HJM, EVL, INN, CRO, PNW, EV, SYS, BOY, GEL, BRZ, QEM, and K5BRE. DSY operated 6-meter mobile. QFA was in constant contact with TYT in Alice. THU, WXT, LVE, KQG, LUU and his XYL, OIK and his XYL, and FNG and his XYL attended RSD's XYL's birthday party at Lytle. KSY and TQL are in the service. Traffic: W5MN 91, URW 10.

**NEW MEXICO** — SCM, Einar H. Morterud, W5FPB — RM: JZT. 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 0700-0830 MST; the NM C.W. Net meets on 3633 kc. daily at 1900 MST. The Albuquerque amateurs were busy during the eight flash floods. NSV is the new c.d. director for San Juan County. CIN is Radio Officer for the City of Farmington and San Juan County. There is no news this time as the SCM was on a three-week vacation in Wisconsin. Traffic: (Aug.) K5FHU 116, W5BZB 21, JZT 12, RFF 6. (July) W5JZT 5.

## CANADIAN DIVISION

**MARITIME** — SCM, Douglas C. Johnson, VE1OM — Asst. SCMs: Fritz A. Webb, 1DB; Aaron D. Solomon, 1OC. SEC: RR. New appointees are ABT and VC as OPS. WL as EC for Halifax. Vacationists heard operating portable were DW and OM at Hubbards, GA at Highland Village, RR in Cape Breton, WL at Stillwater, and DQ at Grand Lake. Recent visitors to Halifax were VE1FR, VE3EV, and VE3PZ. WB, re-elected president of the NBARA, is active from the St. Stephen Area. Active hams in the Bridgewater Area are QLE, XI, and IR. AV is putting out a good signal from his new Halifax QTH. LY is back on with a 300-watt rig. ZZ is knocking off the 80-meter DX with a new 700-watt. UL has gone on 75-meter 'phone. VE2AJE is stationed at HMCS Cornwallis. I.S puts out a good signal on 80-meter c.w. P.E.I. hams note: Please put your rigs on 20 and 40 meters and give those enthusiastic seekers of WAVE some contacts from your hard-to-work

(Continued on page 96)



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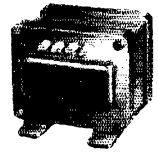
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### CHICAGO

Type S & SX. Drawn steel case

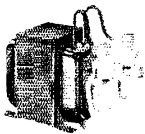
D.C. Volts	DCMA CCS	ICAS	Plate Transformer	Choke No. 1	Choke No. 2
400/500	250	325	P-45	R-63	R-103
600/750	250	325	P-67	R-63	R-103
1250 and 400	150	200	P-1240	R-63	R-63
	200	260		RS-8200	RS-12200



### CHICAGO

Type FS. Heavy duty cast frames

D.C. Volts	DCMA CCS	ICAS	Plate Transformer	Choke No. 1	Choke No. 2
2100/2600	500	700	P-2126	R-65	R-105
2500/3000	500	700	P-3035	R-65	R-105
3000/3500/4000	600	800	P-4353	R-67	R-67



### STANCOR

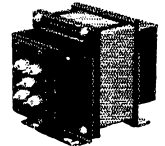
Type PT & C. Plate leads out of top on type PT.

D.C. Volts*	DCMA CCS	ICAS	Plate Transformer	Choke
1000	225	280	PT-8311	C-1412
1000	325	405	PT-8312	C-1414
1500	225	280	PT-8314	C-1412
1750	200	250	PT-8315	C-1646

\* For single-section, reactor-input filter with full-wave mercury-vapor rectification.

### STANCOR

Type FS. Formed steel frames with ceramic terminals



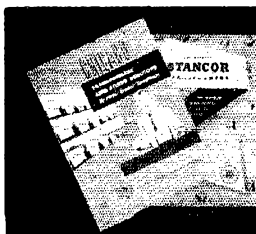
D.C. Volts	DCMA CCS	ICAS	Plate Transformer	Swing-ing Choke	Filter Choke
1000/1250	300	375	P-8026	C-1403	C-1413
1250/1500	500	625	P-8029	C-1405	C-1415
1750/2000	500	625	P-8033	C-1405	C-1415
2000/2500	500	575	P-8035	C-1405	C-1415



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## LIFE STORY of a Rig



Joe Ham took its design from the ARRL Handbook. When this dream rig didn't function right off, an inquiry of the ARRL Technical Information Service brought Joe the dope on just where he had "goofed" — and he was on the air. League membership brought him *QST* monthly; from its many articles he added a new keying system, improved his v.f.o. stability, licked TVI with a high-pass filter. For several years the rig served Joe well, in the ARRL's DX contest and Sweepstakes, and in the Nth Regional Net of the ARRL National Traffic System. Then from a *QST* article he built a u.h.f. converter; but Joe was converted, too, and the old must make way for the new to provide funds for a u.h.f. rig. Ol' Faithful is up for sale with a Ham-Ad in *QST*.

All through his ham career, Joe Ham has relied on the League, made use of its varied services. Practically all amateurs have. Of, by and for the amateur, its full-time job is to make your hobby more useful, more instructive, and more enjoyable.

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West Hartford 7, Conn.

province. KZ has been the leading light in this respect. VO2G and VO2AW have left VO-Land. VO6AH has made BPL three times this year. Has your town an Emergency Coördinator; and an Emergency Corps? Contact the Section Emergency Coördinator, VE1RR, on 75-meter phone for details on AREC. Traffic: (Aug.) VE1FQ 2:7, VO6AH 94, VO6U 52, VE1DW 48, WK 44, UT 38, YO 27, ME 25, VO6AM 19, VE1KZ 17, BL 14, DB 4, LY 3, VC 2. (July) VE1YO 24, VO6AF 16, VE1AEB 4, PF 4, BN 1.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — CA reports VKs again coming in on 20 meters and he worked them the latter part of August. He also attended a hamfest in New Haven, Conn., during June. SS has a new RAXI receiver and is back in Sherbrooke after a summer in St. Sylvestre. AEV has just completed a trip to the East Coast during which he worked considerable on his "Mighty Mo" mobile. The St. Maurice Valley Net meets daily at 0830 and 1300 EDST with EC, AEM, KJ, UB, and AGP. AGI and ADU did FB portable work at the Boy Scout camps at St. Edouard, St. Alexis des Monts, and at the Jamboree at Niagara on the Lake. ANH is back on 75 meters. AUH has been working good DX on 20 meters. AKF has a new rig with a 6146 on the air. II still is mobile at Lake Wallace. MW, the Molson emergency unit, spent a week at the Sherbrooke Fair. AKO has a new 813 rig on the air. AUY is a newcomer in Lennoxville with Heathkit equipment. PQN is picking up somewhat with the return of cooler weather. Traffic (Aug.) VE2DR 79, ATQ 12, EC 12, PL 10, CA 9, GL 7. (July) VE2EC 39.

ALBERTA — SCM, Sydney T. Jones, VE6MJ — PAM: OD, RM: XG, IZ says he is all set for the duck season. WL reports the Calgary AREC gang took part in the Sept. 21st evacuation exercise. XG vacationed at Banff. EY is rebuilding the frequency meter. YE, the one-man Board of Trade of Jasper, has had many visitors during the summer vacation season. JP has a mobile unit under construction. NX still is chasing the DX. BV has returned from a visit to England. AS is sporting a 28-Mc. mobile phone rig. LS is testing the new mobile rig. HM still is handling great gobs of traffic for the boys in the North. Traffic: VE6HM 163, OD 32, VE7HD 30, VE6YE 28, WC 6, IZ 4.

BRITISH COLUMBIA — SCM, Peter M. McIntyre, VE7JT — The last two reports were missing because of holidays and the lack of news other than station activities, which we received from the few regulars. From the comments heard, the hamfest at Osoyoos was a rousing success. If there is any doubt, ask Pinky. With the fall and winter season in the offing club activities will be getting back into full swing. Cleanings from the activity reports and the bands: AIO has been tied down by house repairs, rig repairs, holidays, and QRN. QC is commuting from Lytton to Merritt in a new buggy. US still is active on and promoting single sideband and says there are 13 rigs about ready for operation. BK, of Ganges, invaded the city and with ALW did it up right. FB/M has been meandering around the interior. AUF and her OM visited Vancouver and way points on a month's holiday. AP mobiled to the old stomping grounds in VE5-Land. DD/M vacationed around Lac la Hache and points. Pinky and crew have taken over Cultus on the week ends. What's the attraction, Pinky? In the next report we will try to give you a list of all the clubs, their meeting times and dates, and their mailing addresses. Traffic: VE7ASR 320, QC 242, AUF 70, JT 64, DH 40, AIO 34, ZV 12, FS 10.

MANITOBA — SCM, John Polmark, VE4HL — The biggest event of August was the Dauphin Hamfest. We would like to thank the hamfest committee for allowing us time to hold an ARRL meeting. A new amateur is Glenn Manning, of Claavilliam, who was officially initiated by HP at the Dauphin Hamfest. KG finally is going to make it mobile after a long tough struggle. EO is back from his holidays with a new car. Hope to see you mobile soon, Bob. XW, our flying ham, had a narrow escape. Glad to hear you're OK Al and back on dry land. Congratulations to KN on being initiated into the "Royal Order of the Wouff Hong." Greetings to VE7BV, who hopes soon to take up residence in Brandon. PE arrived back from a trip to the States working mobile c.w. in time to get to the Hamfest. Traffic: VE4AI 61, GE 18, KL 10, QD 10, HC 8, XP 7, YR 7, HL 6, NW 6, OB 4, AN 2, AY 2.

### ARE YOU LICENSED?

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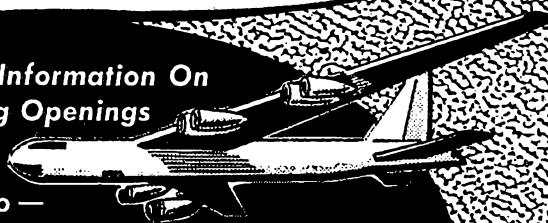
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## 144-Mc. Tetrode Rig

(Continued from page 16)

25-watt potentiometer is connected in the grid return lead. This is readjusted to permit running the same value of grid current, whether or not the VR-tube bias arrangement is in use.

Three different makes of 4-125As have been used in the new final amplifier, Eimac, GE and Amperex. The Amperex tubes, also known as 6155s, are quite different in design from the other two makes, but except for a slight difference in final plate tuning they seemed to work identically with the others. This uniformity of operation with different tubes is of interest, because the earlier model required markedly different adjustments with the same three sets of tubes to achieve anything approaching stable operation.

The new rig has been in use at W1HDQ for several months, during which we've had ample time to iron out bugs in its design. Its principal features have also been incorporated in a similar set-up built by W1VNH, Agawam, Mass., who reports it as being the most stable and satisfactory tetrode rig he has had on 144 Mc.

## 50-Mc. Mobile Converter

(Continued from page 20)

instance, you are strictly a low-end-of-the-band operator. In any event, it is advisable to obtain a grid-dip meter for use during the alignment.

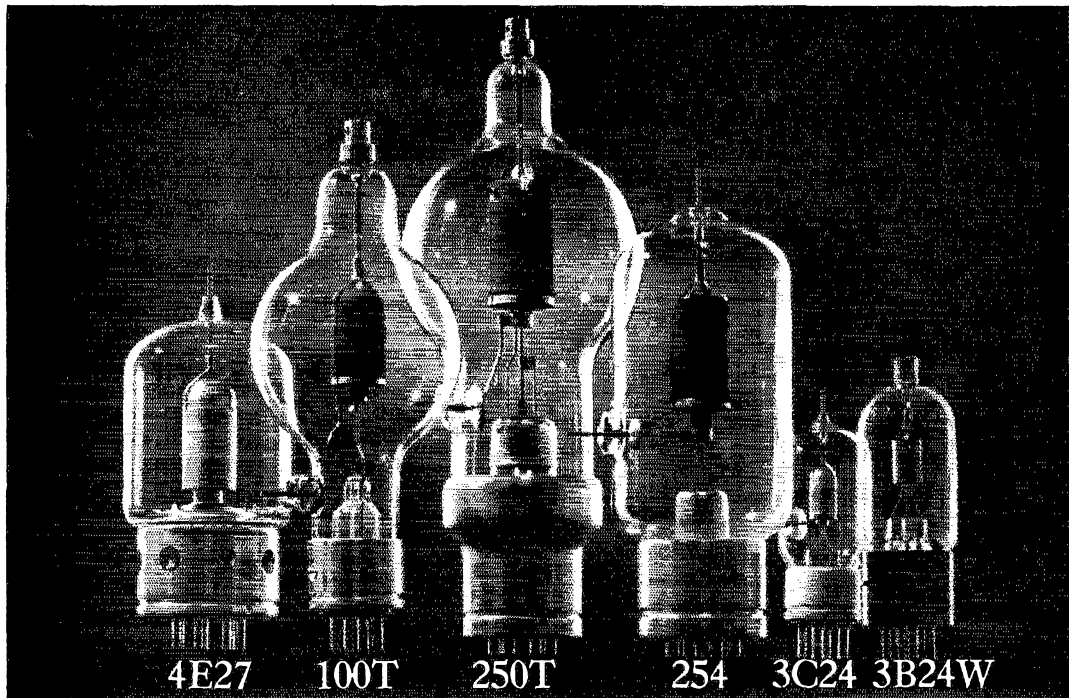
The simplest alignment (for peaked response at one end of the band) is accomplished by first checking all tuned circuits for resonance as indicated by the grid-dipper. The general operating range for each circuit is shown in Fig. 1. Resonate the circuits between the r.f. amplifier and the mixer at about 0.5 Mc. inside the band limit of interest, and then adjust the mixer-converter coupler for resonance at either 7 or 10 Mc., depending on which end of the 50-Mc. band is being favored. Of course, peak the couplers at 52 and 8.5 Mc., respectively, if most of the operation is to take place at the center of the 6-meter band.

Normal operation of the crystal oscillator may be determined by several means. One method requires tuning a receiver (with b.f.o. turned on) to the various crystal frequencies. A second system uses the grid-dip meter, switched over as a rectifier-type r.f. indicator, to check for the presence of r.f. around the crystals, oscillator tubes, coils, etc. Naturally, either current or voltage measurements may also be used for checking oscillator performance.

A 50-Mc. signal should now be fed to the converter and a means for making relative output measurements should be provided. The latter may be the S-meter if a standard communications receiver is serving as test equipment. A

(Continued on page 100)

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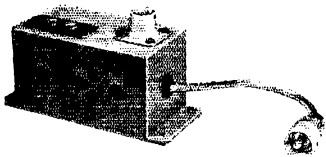


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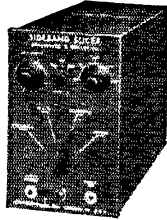
### Central Electronics Model DQ

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unit such as the S-FS Indicator<sup>3</sup> will be of assistance if the car b.c. receiver is serving as the tunable i.f. amplifier. Of course, a fair job of circuit peaking can be accomplished merely by listening as the various tuned circuits are tuned through resonance. The over-all response of the converter will be broadened considerably if the various tuned circuits are now stagger tuned.

Alignment of the interstage coupler for band-pass characteristics is a somewhat more complex task. Each half of each coupler must be independently resonated at the center of its range. This means that  $C_5L_3$  and  $C_6L_4$  must each be peaked at 52 Mc. and that  $C_8L_5$  and  $L_6$  must both be resonated at 8.5 Mc. Resonant frequencies may be checked with a grid-dip meter providing one half of a coupler is not allowed to interact on the other half during the adjustments and measurements. Interaction between circuits is prevented by first disconnecting  $L_4$  from  $C_6$  while  $C_5$  is being resonated and by disabling the  $C_5L_3$  combination while  $C_6$  is being adjusted. It is not necessary to disconnect either  $L_5$  or  $L_6$  during adjustment of the mixer-converter coupler provided that capacitor  $C_{10}$  is removed from the circuit.

After the couplers have been resonated, the converter should be spot checked through the entire 50-Mc. band to make sure that the over-all response is fairly flat. This is the type of job that may be accomplished most conveniently and quickly if a signal generator is available and should be done with the converter connected to the car receiver that is to be used in the actual mobile installation. When testing the receiver-converter combination, use the antenna trimmer on the b.c. set and the converter output coil,  $L_7$ , to flatten the response throughout the 0.55- to 1.55-Mc. i.f. range. Very slight adjustment of  $C_5$  and  $C_6$  may improve the response curve of the 50-Mc. coupler and the capacitance of  $C_{10}$  will determine the spread of the 6.5- to 10-Mc. bandpass circuit. A capacitance of approximately 25  $\mu\mu\text{f.}$  is optimum for the circuit and this may be obtained by tightening up on the trimmer adjustment screw about 6 turns from the minimum-capacitance position.

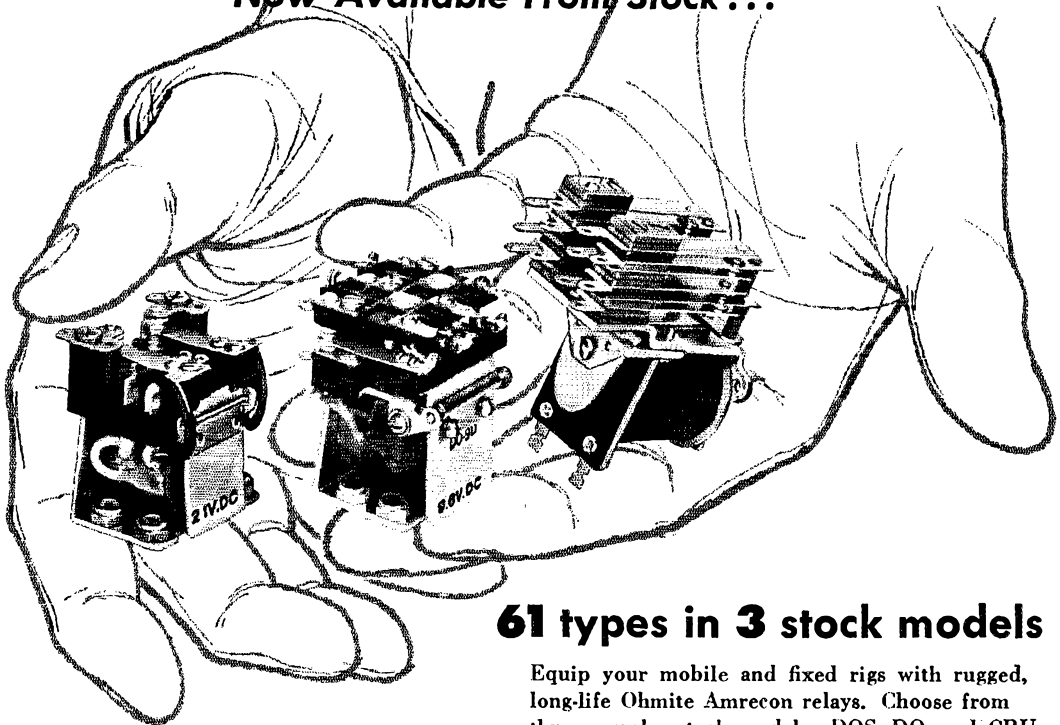
After the alignment has been completed, the subassembly may be mounted in the chassis and the permanent wiring of the input circuit,  $S_1$  and  $Y_2$  completed. The small copper shield shown in the rear view of the converter may now be bent into shape and mounted on the mounting foot of  $C_1$ . In making a final bench test of the unit, Fig. 1 may be referred to for typical voltages. The values shown on the diagram were measured with a vacuum-tube voltmeter and a d.c. plate input of 150 volts.

Antenna coupling is an important consideration in an efficient mobile receiving system. The section devoted to this subject in a previous article<sup>2</sup> deserves reading by those who intend to use this converter.

<sup>3</sup>Chambers, "The S-FS Indicator," *QST*, September, 1955.

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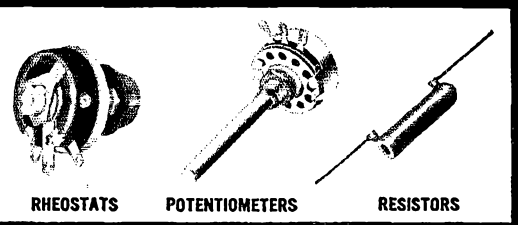
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## BC-610

(Continued from page 81)

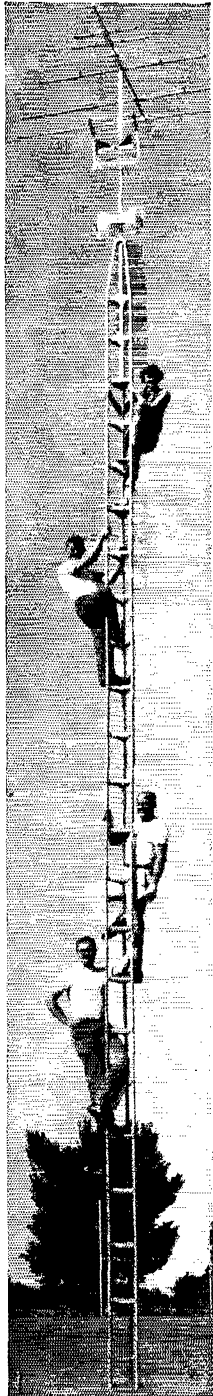
circuit to reduce peak excitation and to stabilize the 807s. This is not to be considered as a "swamping" resistor from the standpoint of stabilizing the 807 input resistance, as the 807 operates Class A and, theoretically, maintains a constant infinite input resistance. Consideration was given to the addition of "swamping" resistors across the 250-TH grid circuit, but we lacked the necessary noninductive resistors capable of handling the output of the 807s. The rig was tried without them, and it has worked satisfactorily despite the omission of the resistors. However, there was far too much drive to the 250-TH, and the rig was ready to break into wild parasitics at any moment. One 807 was removed, and both difficulties vanished. Using this set-up, the 807 ran at zero grid current, and the plate current was about 50 ma. with no drive, dropping to 45 ma. at full drive. Maximum 250-TH grid and plate currents were 35 and 320 ma., respectively, at 2500 volts. Resting plate current was again set at about 80 ma. Good reports were received with this set-up, but we were suspicious of the fact that plate current off resonance ran much higher than at resonance, and of the fact that our peak flattening occurred at about 225 ma. with voice input. The variable link on the 250-TH plate coil was already set for maximum loading, so we started adding small mica condensers across the output link. With 150  $\mu\text{f.}$  across the coil, the plate current ran over 500 ma. with sine-wave input. At 2500 volts, the legal 400 ma. could be expected on voice peaks before flattening occurred.

A few pertinent items should be noted here. First, the 250-TH filament voltage should be at rated voltage or higher. We run about 5.25 volts. Dropping this to 4.75 volts results in a 100-ma. reduction in peak input before flattening occurs. Next, inputs being run are in excess of the ratings for the 250-TH. However, on s.s.b. this isn't too serious because of the intermittent nature of the overload. Finally, resting plate current on the 250-TH is somewhat higher than is normally recommended for Class B operation. This is deliberate. Reducing the resting plate current to 20 or 30 ma. results in a considerable increase in distortion products and consequent increase in splatter and decrease in sideband suppression. While keeping the resting plate input at this level results in a somewhat higher average plate dissipation, it has been found worth while in this and other s.s.b. transmitters.

The rig works nicely this way. Reports on both quality and strength have been good, and we were running daily trans-Pacific relay schedules when I left KA2EC. The BC-610 has also been used as an amplifier for the 10-B's other functions, and is satisfactory with all these. Of course, it can't be used in the old plate-modulated arrangement without remodification, but for consistent 'phone communication that is not a handicap.



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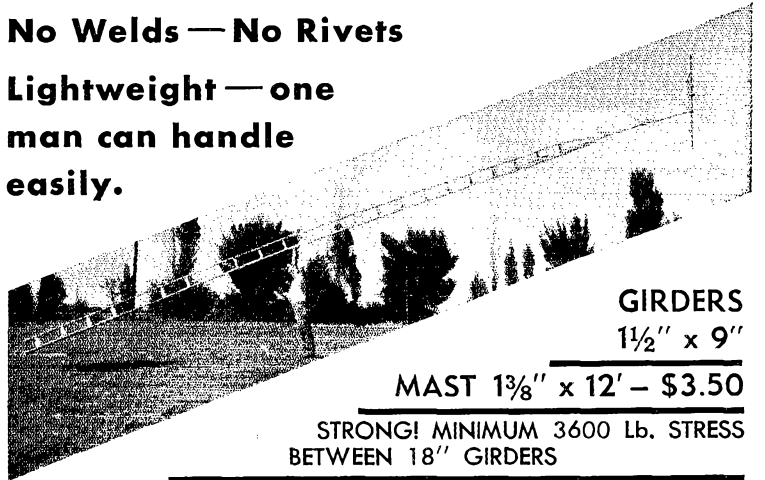


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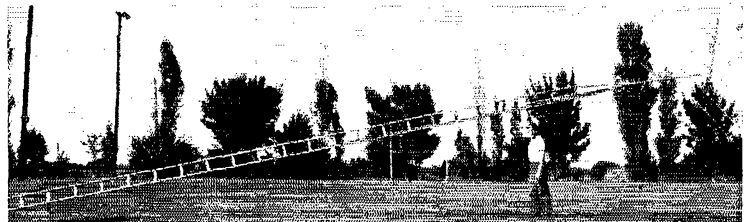
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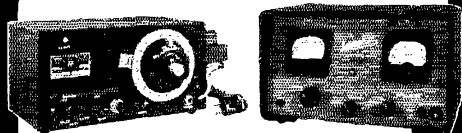
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## Design Curves

(Continued from page 29)

Example: Power amplifier tubes, two 4-250As.

Plate voltage 2500 volts

Plate current 400 ma.

Operating  $Q$  15

Antenna impedance 52 ohms.

$$\text{Then } R_1 = 500 \frac{E_b}{I_b} = 500 \times \frac{2500}{400} = 3125 \text{ ohms.}$$

From Fig. 3,  $X_{C1} = 210$  ohms.

From Fig. 4,  $X_{L1} = 285$  ohms.

From Fig. 5,  $X_{C2} = 53$  ohms.

From Fig. 6,  $X_{L2} = 144$  ohms.

Then at 3.5 Mc. we have the following:

if  $X_{C1} = 210$  ohms, then  $C_1 = 220 \mu\text{f.}$ ;

if  $X_{L1} = 285$  ohms, then  $L_1 = 13 \mu\text{h.}$ ;

if  $X_{C2} = 53$  ohms, then  $C_2 = 875 \mu\text{f.}$ ;

if  $X_{L2} = 144$  ohms, then  $L_2 = 6.5 \mu\text{h.}$

### Equations Used for Charts

For pi networks:

$$X_{C1} = \frac{R_1}{Q}$$

$$X_{C2} = R_2 \sqrt{Q^2 + 1 - R_1/R_2}$$

$$X_{L1} = \frac{QR_1 + R_1R_2/X_{C2}}{Q^2 + 1}$$

For L networks:

$$X_L = \sqrt{R_2R - R^2}$$

$$X_C = \frac{R_2R}{X_L}$$

where  $R$  is the resistance (higher than  $R_2$ ) to which both the pi and L are matched.

### References

Klippel, "Design Considerations for Class C Power Amplifiers," *CQ*, May, 1950.

Pappenfus and Klippel, "Pi Network Tank Circuits," *CQ*, Sept., 1950.

Pappenfus and Klippel, "Further Notes on Pi and L Networks," *CQ*, May, 1951.

Grammer, "Pi-Network Design Curves," *QST*, April, 1952.

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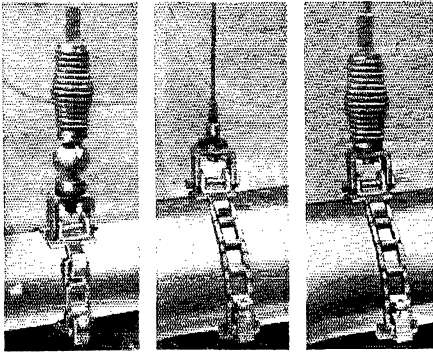


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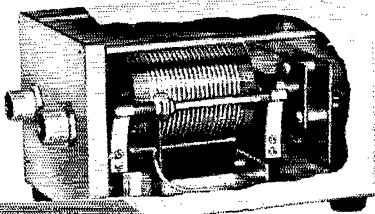
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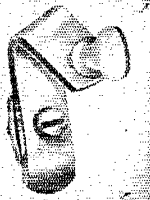
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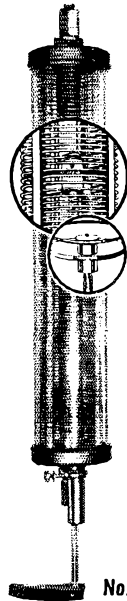
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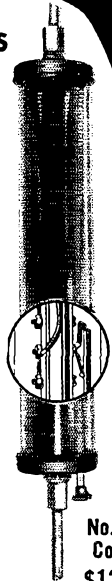
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- Silverplated single turn contact, positive spring.
- Eccentric cam contact, easy selection of turn.
- Automatic lock prevents damage to coil.

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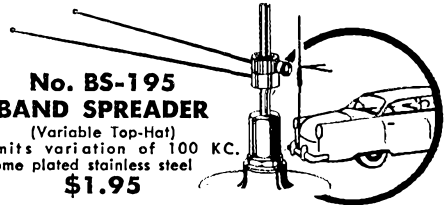
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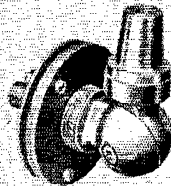
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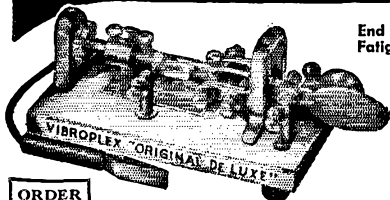
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**THE VIBROPLEX CO., INC.**  
 883 Broadway New York 3, N. Y.

106

## Control Unit

(Continued from page 33)

audio by returning one side of the speaker to ground through this contact. The four leads to the base of the relay should be made somewhat longer than necessary, before mounting the relay in place on the spacers.

Two Cinch-Jones 200 $\mu$  type terminal strips serve as tie points and support for the remainder of the parts. The 20- $\mu$ f. capacitor is placed between the terminal strips. The transistor is wired in place by its own leads. When soldering these leads, hold them with a pair of pliers to conduct damaging heat away from the body of the transistor.

The battery is composed of four penlite cells wired in series. This assembly is wrapped with electrical tape to prevent the possibility of a short against the side of the Minibox. The battery is held in place by mounting it between one of the terminal strips and the back of the potentiometer. It is wedged in place by a small piece of cardboard between the terminal strip and the battery. Further to hold it in place, the 500- $\mu$ f. capacitor is mounted from the front panel directly over the battery. When mounting the parts, be sure to allow for spacing between the components and the sides of the Minibox.

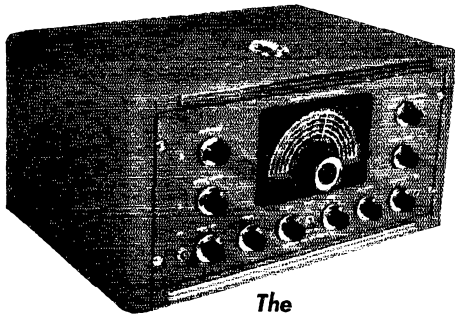
A set of three patch cords using shielded lead should be made up to connect the gadget to its sources of input and to the device it will operate. Switchcraft's Tini-Jax plug type 740 will fit the input jacks.

## Adjustment

As mentioned previously, the unit is adjusted primarily for voice-controlled break-in. The procedure for this is as follows: The relay should be adjusted with  $\frac{1}{32}$ -inch spacing between the relay core and armature. The contacts are adjusted to allow a minimum of travel of the armature (about 0.003 inch). The spring should be set so as to allow the relay to close with a current of 1 milliamperes and open at about 700 to 800 microamperes. The Sigma 4F relay meets these requirements very nicely, although any sufficiently sensitive plate relay could be used.

Connect the speech-amplifier input to the plate of a stage of audio amplification in the speech amplifier where the audio level is 4 to 6 volts. Connect the receiver input to any convenient source of audio, such as the speaker terminals, in the receiver. Insert the meter leads of a 0-5 high-resistance voltmeter in the pin jacks provided. Tune in a strong station with the receiver running wide open. With the microphone in its usual operating position and the speech amplifier turned on, adjust the balance pot until a reading of zero volts is observed on the meter. It is as simple as that. This is the correct setting for voice control. This setting need not be touched when the gadget is used for purposes other than voice control. Audio from the receiver will cancel itself at this setting, but audio from the speech

(Continued on page 108)



The  
**ELENCO "77"**

# 300 WATTS

Instantaneous Peak Envelope  
Power Input

AM-SSB-CW Complete

**IMMEDIATE DELIVERY**

## CHECK THESE OUTSTANDING FEATURES

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Enough to—

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**ELENCO "77" complete, \$695.00**

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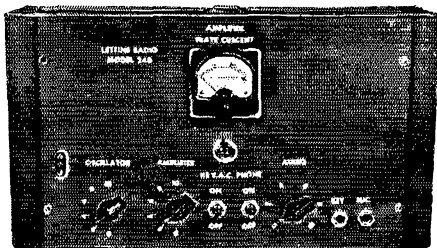
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**MODEL 130 FOR 120 TO 130 WATTS—\$199.50**  
807 osc., 2-807's final, 6N7 xtal. mike amp., 807 AF driver, 2-807's mod., 2-866A's rect., 6L6 clamper. Wt. only 47 lbs.

**MODEL 242 FOR 2 METERS—45 WATTS INPUT—6146 FINAL.** Complete with mobile connections, A.C. power supply, tubes, xtal. Xtal. mike input. Uses 8 mc. xtals. Swinging link matches 52 — 300 ohm antennas. Same cab. as 240. \$89.95. Also 6 meter model.

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amplifier, either superimposed on this balance or from the speech amplifier alone, will cause the relay to trip.

When using the unit as a code keyer, it will be found possible to over-drive the transistor with the tape recorder. This will be evidenced by the code characters "sticking" or flowing together in a jumble. On the other hand, if the gain is not set high enough, the characters will be too short and choppy. The proper gain setting is easily found, however, as there is considerable leeway between these two extremes.

One last word. This device was made portable so that it might be used in conjunction with many pieces of gear in the author's shack, but the circuit can be used in a permanent piece of equipment if a constant-current source of 6 volts is provided.

If you feel adventurous, you might try sending c.w. while mobile in motion, as the author did with this gadget. Merely saying the code characters in dit-dah fashion into the microphone will do the trick. However, it is best to do this with the car windows up and no one in the car — for obvious reasons!

## Circuit Diagrams

(Continued from page 40)

plicated a pictorial diagram would be if it described a multistage bandswitching transmitter. The builder would be thoroughly frustrated just trying to interpret such a drawing. That's the main reason we use schematics to illustrate circuits. They are easy to follow, and furnish the reader with a compact picture of how the circuit is connected.

So far as construction and layout of a particular unit are concerned, always study the photographs and description of the unit. Until you acquire enough experience to lay out your own rig, you're much better off following the instructions of the author or designer of a piece of gear. Presumably, the unit he's describing has all the bugs worked out, so you should stay out of hot water by following his advice.

## HAMFEST CALENDAR

**LOUISIANA** — The Caravan Club of Louisiana will hold its hamfest on November 20th in Shreveport. Advance tickets at \$2.50 and \$1.00 for children; at the door \$3.00 and \$1.50. Dinner included. Plenty of fun and a well-planned program for all who attend. Write Caravan Club of Louisiana, 1521 Lash Street, Shreveport, La.

**NEW MEXICO** — The Totah Amateur Radio Club of Farmington, N. M., will hold its annual dinner and get-together on Sunday, November 6th. Preregistrations, including dinner, are \$2.50 each and may be sent to Carl E. Black, W5POI, P. O. Box 783, or Leonard N. Norman, W5CIN, 903 North Butler Ave., Farmington, N. M. Registration after November 1st is \$3.00, including dinner. Mobiles will be monitored on 3980 kc.



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## Happenings

(Continued from page 47)

power limit will be 50 watts plate input rather than 50 watts peak antenna power. The W5 petition also requested that the February 1958 expiration date (in another part of the rules) for the use of our band by the aeronautical navigation service be changed to 1956; however, the Commission has now deleted the expiration date, thus setting no limit on how long we must share the band.

### F.C.C. DISTRICT CHANGES

FCC has recently made several changes in its regional engineer set-up, and we publish below the current list of regional offices together with the district offices under their jurisdiction:

#### F.C.C. FIELD ORGANIZATION

REGION	INCLUDES DISTRICTS
1	1. Boston 2. New York 3. Philadelphia 4. Baltimore 5. Norfolk, Va. 20. Buffalo 24. Washington, D. C.
2	6. Atlanta 7. Miami 8. New Orleans 9. Houston 10. Dallas 22. San Juan, P. R.
3	11. Los Angeles 12. San Francisco 15. Denver
4	13. Portland, Ore. 14. Seattle 23. Anchorage
5	16. St. Paul 17. Kansas City 18. Chicago 19. Detroit
6	
P.O. Box 1142 Lanikai, Oahu, Hawaii	21. Honolulu
832 U. S. Courthouse Chicago 4, Illinois	

### EXAM SCHEDULE CHANGES

Apparently as a result of the comparatively new system where amateurs themselves act as supervisors of examinations for most classes of license, personal appearances at some FCC points have dropped to an extent that the Commission no longer finds it practical to continue the examination schedule in some cities. Effective October 1st, Manchester, N. H., and Springfield, Mo., are eliminated as annual examination points; instead of semi-annual dates for the Texas cities of Amarillo and El Paso, and the Hawaiian cities of Hilo, Wailuku and Lihue, these points will henceforth be visited by an FCC engineer only once each year.

(Continued on page 112)

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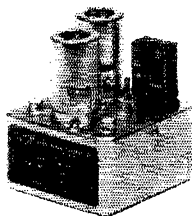


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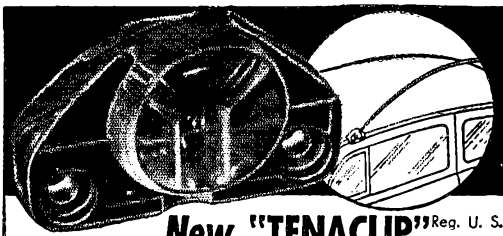
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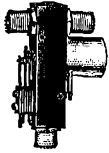
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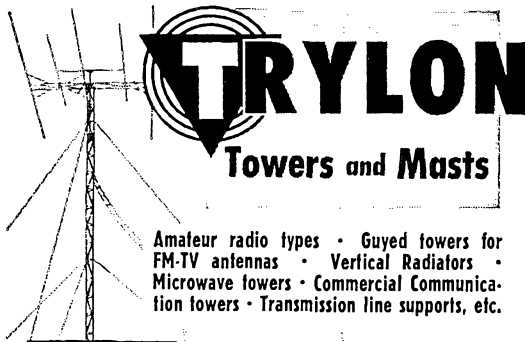
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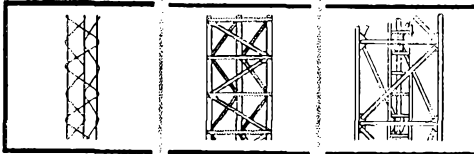
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## RTTY CHANGE PROPOSED

Pursuant to instructions from the ARRL Board of Directors, the League's General Manager petitioned the Federal Communications Commission to permit frequency shifts of 900 cycles or less in amateur radioteleprinter communication, rather than the present 800-900-cycle limit. FCC has now proposed rule making to this end, with November 28th as the final date for filing comment. The text:

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington 25, D. C.

In the Matter of  
Amendment of Section 12.107 of  
Part 12, Rules Governing Amateur  
Radio Service, concerning radio  
teleprinter transmissions.

DOCKET NO. 11501

### NOTICE OF PROPOSED RULE MAKING

1. Notice is hereby given of proposed rule making in the above-entitled matter.

2. The Commission has received a petition from the American Radio Relay League requesting that the present lower limit of 800 cycles on the frequency shift used for amateur radioteleprinter transmissions be removed.

3. In support of its petition the League pointed out that "... the use of a lesser frequency shift will accomplish a reduction of interference," and expressed belief that the proposed amendment "... will permit more extensive experimentation with radioteleprinter communication, will result in an improvement in and simplification of teleprinter techniques, and thereby will provide a more reliable means of communication."

4. Believing that there is sufficient reason to warrant proposed rule making in this matter, the Commission is proposing amendment of Sections 12.107(c) and 12.107(d) of Part 12 as set forth in the attached Appendix.

5. Authority for issuance of the proposed amendment is vested in the Commission by virtue of Sections 4(i) and 303(e), (g), and (r) of the Communications Act of 1934, as amended.

6. Any interested person who is of the opinion that the proposed amendment should not be adopted, or should not be adopted in the form set forth herein, may file with the Commission on or before November 28, 1955, written data, views, or arguments setting forth his comments. Comments in support of the proposed amendment may also be filed on or before the same date. Comments in reply to the original comments may be filed within ten days from the last day for filing said original data, views, or arguments. No additional comments may be filed unless (1) specifically requested by the Commission, or (2) good cause for the filing of such additional comments is established. The Commission will consider all such comments prior to taking final action in this matter, and if comments are submitted warranting oral argument, notice of the time and place of such oral argument will be given.

7. In accordance with the provisions of Section 1.764 of the Commission's Rules and Regulations, an original and four copies of all statements, briefs, or comments filed shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION  
Wm. P. MASTING,  
Acting Secretary

Released: September 22, 1955

### APPENDIX

AMENDMENT OF SECTION 12.107 OF PART 12, RULES GOVERNING AMATEUR RADIO SERVICE, IS PROPOSED AS FOLLOWS:

Amend paragraph (c) to read as follows:

(c) When frequency shift keying (type F-1 emission) is utilized, the deviation in frequency from the mark signal to space signal, or from the space signal to the mark signal, shall be less than 900 cycles per second.

(Continued on page 114)

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## JOHNSON KILOWATT, AM—CW—SSB

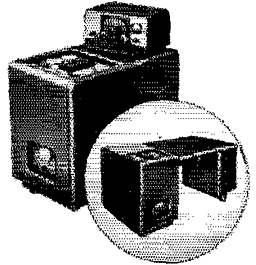
Packed with power! Check these features! Low power or maximum legal input selected with the flip of a single switch. Continuous tuning 3.5 to 30 mc.—no coil change necessary. Excitation requirements: 30 watts RF and 15 watts audio for AM, 10 watts peak for SSB. Key operated main switch. All operating controls readily accessible. Wired and tested, complete with tubes .....

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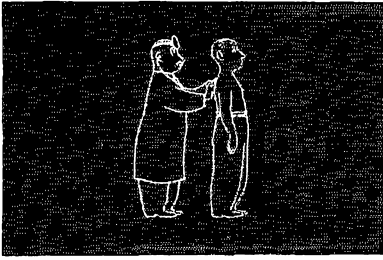
73,

Stan Burghardt W0BJV

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Amend paragraph (d) to read as follows:

- (d) When audio frequency shift keying (type A-2 or type F-2 emission) is utilized, the highest fundamental modulating audio frequency shall not exceed 3000 cycles per second, and the difference between the modulating audio frequency for the mark signal and that for the space signal shall be less than 900 cycles per second.

### FEDERAL COMMUNICATIONS COMMISSION

Washington 25, D. C.

PUBLIC NOTICE  
September 12, 1955

#### INTERNATIONAL AMATEUR RADIOCOMMUNICATION

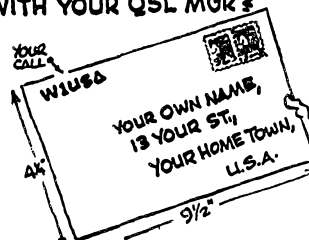
The following recapitulation of the International Radio Regulations (Atlantic City, 1947) concerning communication between amateur stations and transmission of third party traffic by amateurs is published for the information and guidance of amateurs in the United States:

Article 42, Section 1. "Radiocommunications between amateur stations of different countries shall be forbidden if the administration of one of the countries concerned has notified that it objects to such radiocommunications." Information available as of September 1, 1955, indicates that Cambodia (F18, XU), Indonesia (PK, YB-YH), Iran (EP-EQ), Korea (HL-HM), and Viet Nam (F18, XV, 3W) have so notified. Amateur service has not yet been organized in Jordan (JY) and Roumania (YO-YR). Laos (XW) and Thailand (HS) no longer prohibit amateur radiocommunication.

Article 42, Section 2. "(1) When transmissions between amateur stations of different countries are permitted they must be made in plain language and must be limited to messages of a technical nature relating to tests and to remarks of a personal character for which, by reason of their unimportance, recourse to the public telecommunications service is not justified. It is absolutely forbidden for amateur stations to be used for transmitting international communications on behalf of third parties. (2) The preceding provisions may be modified by special arrangements between the countries concerned." Such arrangements permitting third party communications have been effected between the United States and the following countries only: Canada, Chile, Cuba, Ecuador, Liberia, and Peru. Only amateur stations identified by properly authorized call signs having a one- or two-letter prefix beginning with "W" or "K" are authorized by the United States, and third party communication is presently permissible with all such stations except those identified by prefixes KA2-KA9, inclusive.

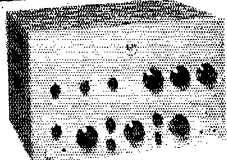
[Editor's Note: The only change embodied in the above announcement is the removal of Thailand from the banned list of countries.]

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Wired..... **\$249.50**

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Permits selectable SSB reception on any receiver with 450-500 kc IF. Cuts QRM and reduces interference from 15 kc TV harmonics. Has built-in power supply and 'Q' Multiplier. Switches from SSB to normal.

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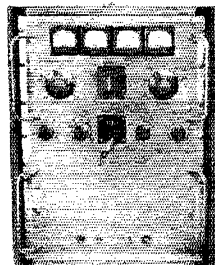
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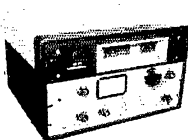
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The "talk power" of a 1 kw conventional AM transmitter in one compact package. Full bandswitch power amplifier covering 80 to 10 meters that's easy to drive, highly stable, extremely versatile, and engineered to Hallcrafters' world famous quality. Power input—500 to 510 watts. Power output—330 P.E.P. on 80 with slightly less on 10 meters. Continuous frequency coverage from 3.4 Mc to 30 Mc. The input system is designed to be fed from a 50-70 ohm unbalanced line and requires a maximum of 10 watts drive on 80 meters. Balanced-grid tank circuit provides all-band neutralization. Continuously variable pi-network output tank circuit provides a high degree of harmonic suppression.

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Model  
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New

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Model SX-100..... **\$295.00**

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## B & W Model 51SB SSB GENERATOR

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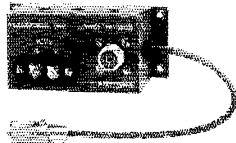
Complete with tubes..... **\$279.50**

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Model  
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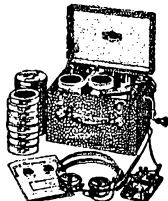
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## How's DX?

(Continued from page 54)

healthy tans . . . . . VR2AA got back on 20 after a four-year abstinence and finds his Fiji QSOs as much in demand as ever.

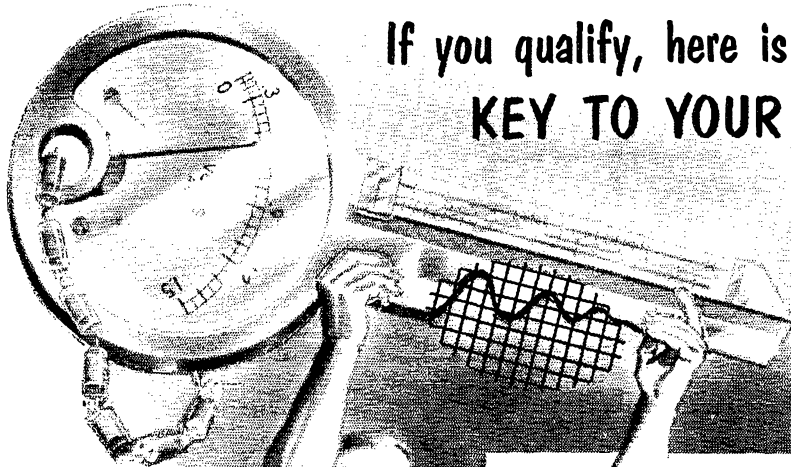
Europe — YUIFR favors us with a rather detailed history of Yugoslav amateur radio, a manuscript calculated to strike response among old-time DXers who recall such celebrated prewar catches as YU7UU and YU7KF. Space deficiency precludes reproducing the entire tale at this time although it's sufficiently cloak-and-daggerish to provide entertaining reading. Tima emphasizes that "The evolution of Yugoslav amateur radio was not a simple matter. That is true not because amateur radio got under way late in this country — radio amateurs cropped up as early as 1925 — but for the curious fact that prewar Yugoslav authorities did not have the slightest understanding for such activity." Of approximately sixty prewar undercover Yugoslav amateurs, most of whom were rarely active DXwise, only three are active today. They are YUIFR himself (ex-YU7BJ), YU2AN (ex-YU7XU) and YU3AB (ex-YU7LX). Six hundred Yugoslav and foreign hams attended this August's livewire hamfest held in Ljubljana, so YU amateurs hold their own these days . . . . . Belgian jukebox repairman ON4LJ does very well on 'phone DX bands when not busy boosting bass response on the boom-booms. He now holds one of the few ON4 radiotelephone DXCC memberships around. W1WPO passes along ON4LJ's layout as p.p. LS50s at 150 watts, a 14-Mc. ground-plane and an HRO . . . . . The advance tip-off on this one is so short we doubt if even the most avid certificate-chasers can make the grade. Anyway, for what it's worth, here goes: On the 14th of this month Radio Barcelona, EAJ-1, celebrates its 31st anniversary as the oldest h.c. station in Spain. In commemoration the station's staff is issuing Diploma Radio Barcelona awards to amateurs located outside Europe and North Africa who confirm communication with live Province of Barcelona EA3s worked between August 2 and October 31, 1955. Check your QSL files for five such QSLs and mail immediately to Emisora Radio Barcelona, Certificate XXXI Anniversary, P. O. Box 5041, Barcelona, Spain, to arrive no later than November 11th. Also include one of your own cards for EAJ-1's souvenir applicant file.

South America — Brian Weeks, who popped at VP8BE, defines the status of outpost VP8s in general. "The Falkland Islands Dependencies Survey is maintained by civilian personnel and consists of a chain of meteorological and other scientific stations operated throughout the Dependencies. At Port Lockroy, where ionospheric observations are carried out, a staff of five men maintain the base and are isolated from civilization for ten months of the year. Thus it can easily be understood why amateur radio is such a prominent VP8 hobby! In 1954 we had three active stations at Lockroy — VP8s AA AZ and BE. In ten months we made over 3000 contacts and really put Port Lockroy 'on the map,' although very few people seemed to find our QTH on their maps, hi!"

From W6AM we learn that HK0AI is off the air, evidently because his DXing activities were misinterpreted by Colombian licensing authorities. Most of Victor's QSOs are in English, of course, which unduly worries monolingualistic government monitors. Such a state of affairs seems too absurd to continue for long — here's to a very short vacation for HK0AI.

Hereabouts — W8YIN, with 188 on the wall, decided to avoid becoming a split personality in trying to determine whether to fire up on 'phone or c.w. each day. You'll find Mickey using A3 on odd-numbered days of the month, A1 on the evens . . . . . K2DGT foiled his hawk-eyed landlord with an antenna of No. 30 magnet wire and reached the 101-country mark before returning to Queens College for another semester. . . . . W2RDK, 7-Mc. DX connoisseur of long standing, moved from Levittown back to Columbus, Ohio, where he'll pulverize DX once more under his old W8JSU label. A brand-new kw. ensemble will ensue . . . . . Reminder: FCC-licensed amateurs are permitted third-party traffic work with but six countries — Canada, Chile, Cuba, Ecuador, Liberia and Peru. DL and KA (except KA0) now are included in the no-traffic category . . . . . W1YOU, with over seventy hard-earned-via-QRP countries on 20 'phone, swapped the hills of Connecticut for New Jersey where he hopes to become K2YOU . . . . . W1SWX is ready to try Maine DXing after wheeling P7EH to high finishes in several recent DX tests. . . . . DXers in many East Coast spots were put out of commission by fall floods, some shacks succumbing 100 per cent. Our regrets, fellows, and here's wishing you a rapid return to the air . . . . . W8SYC is back at his dials again upon switching to the night bread-and-butter trick. Clint finds that being inactive for a few months brings one back to a totally new crop of DX cream to be skimmed. . . . . VE0NA tells W8KAK he represents half the VE0s licensed as Canadian seagoing hamshacks.

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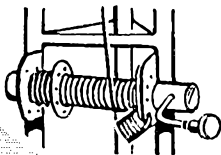
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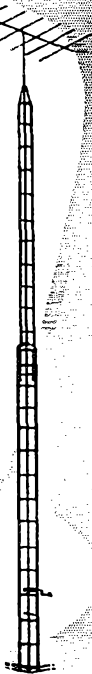
The answer to your prayer — crank it up or down. Used by hundreds of hams — testimonials available. Stop it at any height 20 to 40 ft. Lower it for storms. Hinged bottom. Install it yourself. SPRING LOADED RACHET WINCH can be padlocked. Good looking, husky, yet light. 3/4 in. aircraft steel. Hoist cable tested for 920 lbs.

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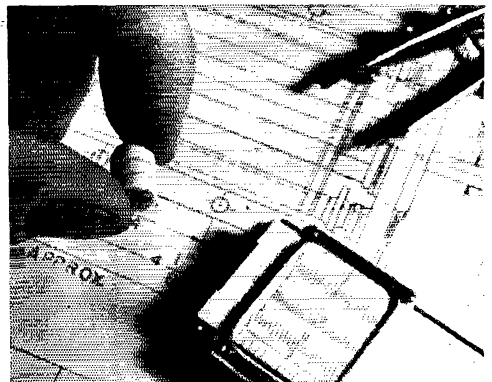
**New Apparatus**

*U.H.F. Ceramic Triode*

A completely new type of triode, designed particularly for use in the u.h.f. range, was announced recently by the General Electric Company. Designated the 6BY4, the new tube uses ceramic construction in place of glass, making the tube almost impervious to heat and vibration.

As may be seen from the accompanying photograph, the ceramic tube is the smallest thing in vacuum tubes yet developed, rivaling the transistor in this respect. This micro-miniature approach to vacuum-tube design brings on some problems in manufacturing, but it makes possible a tube that will deliver exceptional performance in the u.h.f. range.

The 6BY4 has been tested at 900 Mc. in a grounded-grid r.f. amplifier stage, in which service it provides a gain of 15 db. with a noise figure of 8 db. This considerable improvement over what is possible with currently-available miniature tubes indicates that the ceramic triode should make possible further improvements in amateur



The new ceramic triode 6BY4 is probably the smallest thing in vacuum tubes yet produced. It has interesting possibilities as an r.f. amplifier in the ultra-high-frequency range.

receiver design at 420 and 1215 Mc., and possibly higher frequencies where we have not yet used r.f. amplifier stages.

A photograph of the tube alone would convey little impression of its tiny proportions, and even its dimensions (5/16-inch diameter, 3/8 inch long) may not seem impressive until the tube is pictured alongside of familiar objects for scale. Note the comparison with the man's thumbnail in the photograph.

The 6BY4 is the first in what will eventually be a complete line of tubes employing ceramic design. They will be of especial value in applications where tube heating and mechanical vibration have been problems in the past with conventionally constructed vacuum tubes.

—E. P. T.

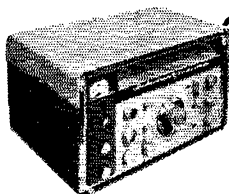


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Viking II kit	27.95	13.84	279.50
Viking II wired	33.70	13.65	337.00
Viking KW	159.50	78.95	1,595.00
Adventurer kit	5.50	2.72	54.95
Hammarlund HQ140X	26.45	13.09	264.50
Hammarlund Pro-310	59.50	29.45	595.00
Hallicrafters S85	12.00	5.94	119.95
Hallicrafters SX99	15.00	7.42	149.95
Hallicrafters SX96	25.00	12.37	249.95
Hallicrafters SX100	29.50	14.65	295.00
Hallicrafters HT-30	49.50	24.50	495.00
Hallicrafters HT-31.	39.50	19.55	395.00
National NC-98	15.00	7.42	149.95
National NC-300	35.00	17.32	349.95
National NC-183D	39.95	19.78	399.50
National HRO-60	53.35	26.41	533.50
B&W 5100W	46.75	23.14	467.50
B&W 515B	27.95	13.83	279.50
Central 10B	12.95	6.41	129.50
Central 20A	19.95	9.88	199.50
Central 600L	34.95	17.30	349.50
Gonset Super 6	5.25	2.60	52.50
Gonset Commander	12.45	6.16	124.50
Communicators	22.95	11.41	229.50
Morrow 5BR-2	7.35	72.80	73.45
Morrow MBR-5	22.00	10.89	220.00
Morrow MB-560	18.57	7.52	185.70
RME DB-23	4.95	2.45	49.50
MON-KEY	3.25	1.27	32.50
H-W T90	17.95	8.89	179.50
H-W R9	14.95	7.40	149.50

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## JOHNSON TRANSMITTING CAPACITORS

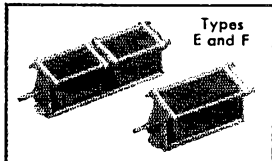
Types C and D

Designing and building your own gear? Compact Johnson transmitting capacitors provide more capacity per cubic inch. Mounting brackets furnished for normal or inverted mounting—shafts extend both front and rear for design flexibility. Available in single and dual types.

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**TYPE C and D**—For high voltage—high power applications. Maximum capacities from 50 to 500 mmfd. Breakdown ratings from 3,500 to 11,000 volts. Stealite insulators, aluminum end frames, 1/4" cadmium plated shafts. Panel space required: Type C, 5 1/2" wide x 5 3/4" high; Type D, 4 1/4" wide x 4" high.

**TYPE E and F**—For medium and low power transmitters. Maximum capacities from 35 to 500 mmfd. Breakdown ratings from 2,000 to 4,500 volts. Aluminum plates .032" thick, aluminum end frames and tie rods. Stealite insulators, rotor contacts are cadmium plated phosphor bronze. Panel space required: Type E, 2 3/4" square; Type F, 2" x 2 1/4".



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## • Technical Correspondence—

### SIMPLIFIED UNITS FOR L AND C

3317 Linnet Road  
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Technical Editor, QST:

Everyday work on resonant electronic circuits might be made easier if the units of inductance and capacitance were simplified. Since

$$X_L = \omega L \quad X_C = \frac{1}{\omega C}$$

where  $\omega = 2\pi f$ , then

$$L = \frac{1}{\omega} X_L \quad C = \frac{1}{\omega} \cdot \frac{1}{X_C}$$

If the units were so defined and incorporated into the manufacturers' ratings, then we could be quit of the continual bother of handling "ω." By proper choice of units, adding  $\mu$  and  $m\mu$  to our present units also would be unnecessary, and much work would be eliminated.

Assume that the unit for both inductance and capacitance is defined as one ohm at one megacycle and called the "omeg." The word "omeg" is supposed to bring to mind, by its sound, that it means one ohm at one megacycle. It could be written like "omega" upside down:  $\omega_L$  for inductance and  $\omega_C$  for capacitance. Then at any given frequency

$$X_L = \omega L f_{Mc.}$$

and

$$X_C = \frac{\omega_C}{f_{Mc.}}$$

At resonance,  $X_L \approx X_C$ , so

$$f_{Mc.} \omega_L = \frac{\omega_C}{f_{Mc.}} \text{ and}$$

$$f^2_{Mc.} = \frac{\omega_C}{\omega_L}$$

Really,  $f$  would be the ratio of the actual frequency to the basic frequency of 1 Mc. and could be expressed as a simple number. Thus 3.75 Mc. would enter as just 3.75.

As an example: 25  $\mu\mu\text{f.}$  and 76  $\mu\text{h.}$  resonate at 3.65 Mc., where both have a reactance of 1740 ohms. Then

$$\omega_C = 1740 \times 3.65 = 6350$$

$$\omega_L = \frac{1740}{3.65} = 477$$

Let's check the ratio:

$$f^2_{Mc.} = \frac{\omega_C}{\omega_L} = \frac{6350}{477} = 13.3, \text{ and } f \text{ ratio} = 3.65$$

For resonance the square of the frequency (ratio) is equal to the omeg ratio.

There is a quick change from omegs to ohms at any frequency, and all the present transfer to henrys and farads and back could be eliminated. Furthermore, any junior op should quickly get the ohm-omeg relation with frequency.

— Charles W. Eldridge

### THE VACKAR VFO CIRCUIT

2346 Clover Lane  
Northfield, Ill.

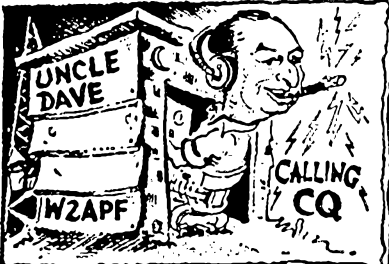
Technical Editor, QST:

The Vackar variable-frequency oscillator appears to have some advantages over the usual Clapp circuit.<sup>1</sup> In the latter, the output amplitude varies greatly with frequency. In the Vackar circuit, the output varies only a little with frequency. The useful frequency range of the Clapp circuit is about 1.2 to 1; in the Vackar it is about 2.5 to 1. The first of these advantages should be of interest to amateurs.

My friend and colleague, Mr. James B. Ricks, W9TO, has pointed out that the 6AG7 is not the best tube to use for a series-tuned VFO; indeed the several papers originally describing these circuits invariably show triodes. The best

(Continued on page 122)

<sup>1</sup> Clapp, J. K., "Frequency Stable LC Oscillators," Proc. of the I.R.E., Aug., 1954, Vol. 42, No. 8, page 1295.



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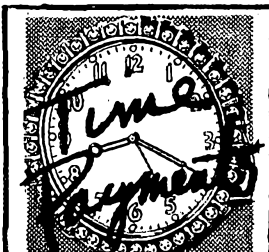
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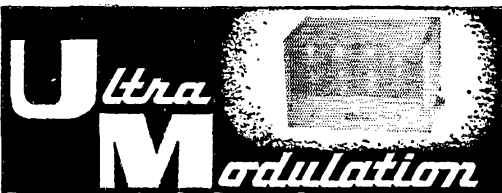
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tube is that one which has the lowest ratio of change of input capacitance to its mutual conductance. The operating mutual conductance for the cathode, control grid, and screen grid of a 6AG7 (as typically used as an oscillator) is low, despite its high value for the normal grid-to-plate circuitry. Also, it has a high input capacitance and high heater and plate power inputs. In consequence, this tube is not ideal for the purpose.

A small dual triode, the 12AT7, offers higher oscillator  $\mu_m$  in one triode section, lower input capacitance, and about one third the heater and plate power inputs required by the 6AG7. In consequence, it is a superior tube for series-tuned oscillators. The output voltage will be lower for the 12AT7, naturally, but a tube should not be evaluated for VFO use on the basis of power output.

W9TO has adapted the Vackar circuit to an amateur VFO with output on 80 meters using the 12AT7 in the circuit of Fig. 1. The first triode unit and its associated components form the oscillator proper; the other triode unit is a cathode

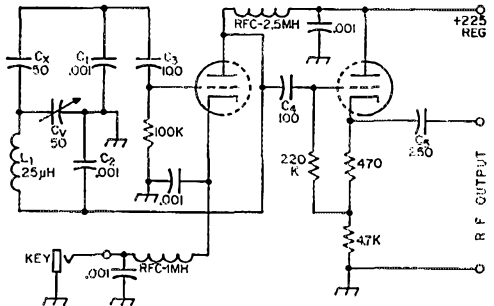


Fig. 1 — Vackar series-tuned VFO circuit at W9TO. The tube is a 12AT7 dual triode. R.f. output from the cathode-follower second section is 1.2 volts r.m.s.

C<sub>1</sub>, C<sub>2</sub> — Silver mica.

C<sub>3</sub>, C<sub>4</sub>, C<sub>5</sub> — Mica.

C<sub>x</sub> — APC air variable.

Other capacitors are ceramic.

follower which reduces loading effects on the oscillator frequency. Two of these VFO units have been made and tested; their frequency stability is excellent, and they key well. The output r.f. was measured at 1.2 volts r.m.s. using a General Radio v.t.v.m. The total current from the 255-volt regulated B supply was 16 ma., key down.

In series-tuned oscillators of the Clapp or Vackar type, the characteristics of the series capacitor C<sub>x</sub> are critical if the oscillator is to be keyed. An annoying chirp, slight but detectable, was finally traced to imperfection of this capacitor, even though it was a low temperature coefficient silvered mica one. Several silvered micas of good make were tried; they all produced slight chirp, some less than others. A so-called zero temperature coefficient (NPO) ceramic capacitor gave less chirp (very little, in fact), but the chirp was eliminated by using an APC air trimmer for C<sub>x</sub>. Apparently, there is enough r.f. current through C<sub>x</sub> to cause dielectric heating and a small resulting change in capacity even in these high-grade capacitors. This was confirmed indirectly by using for C<sub>x</sub> a negative temperature coefficient (N750) ceramic capacitor. The chirp was tremendous!

Of course, the series capacitor is not the only possible cause of chirp; poor plate voltage regulation or a long time constant in the keying circuit might also contribute. To avoid this, the plate supply should be regulated, and series resistances and shunt capacitances in the keying circuit should be kept to a minimum.<sup>2</sup>

The circuit shown will key cleanly without chirp; with the constants shown it will be somewhat clicky, due to turning on and off rapidly; this makes it very desirable for use in a differential keying system in which the oscillator is turned on before the amplifier, and the amplifier is turned off before the oscillator.

— Hubert Woods, W9IK

<sup>2</sup> The chirp discussed in the preceding paragraph evidently is a slow one attributable to temperature effects. A chirp of the "dynamic" type often manifests itself as a click when the time constant of the keying circuit is very short, becoming observable as a chirp when key-thump elimination methods are used. — Ed.

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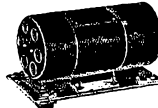
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## World Above 50 Mc.

(Continued from page 49)

Maine. This is a 1530-foot rockpile on an island in the Acadia National Park. It looks right out over the ocean, and there's nothing else like it from Nova Scotia to Florida. W1HDQ/1 was set up and ready to go at 1400 EST. There was no real point in being ready at that hour, of course, for everyone knows that tropospheric openings occur only in the morning or evening hours; *never* in midafternoon.

What happened? The contest summary, in a later *QST*, will tell the full story, but for now we'll let it go with reporting that contacts were possible on 144 Mc. over distances up to 500 miles right at the start of the party. It never happened before, in the experience of the hundreds of v.h.f. operators who enjoyed the bedlam it produced.

Any other time but a v.h.f. contest afternoon and the whole thing might have been missed entirely. Nobody normally looks for band openings at that time of day!

Superstition Number Two: In all the years we've worked on 56 and 50 Mc., experience has "shown" that 400 miles is the limit of tropospheric DX in that region. But the night of September 17th saw VE1QY, Nova Scotia, working W3KX/3, near Scranton, Pa., 525 miles. W3OJU, Washington D. C., was in S8 for hours at W1HDQ/1, 575 miles. He was worked solidly on voice, with 5 watts output and a 2-element beam at the writer's end — over a distance 40 per cent in excess of anything in our previous experience!

V.h.f. contests are always fun, but the September party was much more. It could be of lasting importance in showing us that we should never take our previous experience too literally. More listening and calling, in all directions, at all times, could make our v.h.f. work much more productive than we've ever yet realized.

### Here and There on the V.H.F. Bands

The September V.H.F. Party week end was used by the West Coast 2-meter gang to pull off the first International V.H.F. Relay, as planned. The complete routing of the messages is not available as we write, but it is known that the northbound message originated by K6AM, Chula Vista, Calif., reached VE7FJ, New Westminster, B. C., at 2250 PST. A return message from VE7JG, Duncan, B. C., made the circuit back to K6AM. As with the successful transcontinental relay of 1954, the groundwork for the International Relay was laid by the Two Meter and Down Club of Los Angeles.

What is probably the first Iowa-Texas 2-meter contact was made on August 14th by WØEMS, Adair, Iowa, with W5CUA, Decatur, Texas. A partial contact was made with W5ATW in Waco. WØGUD, Conway, Iowa, worked the same two stations, and WØUOP, Des Moines, worked W5AJG, Dallas. These are distances of 650 to 700 miles. An apparent skip effect was noted, according to WØGUD, who says that stations in the Kansas City area, almost directly along the line, were hearing nothing unusual at the time.

W7UPF, Tucson, Ariz., reports reception of the 2-meter signals of W6WSQ, Pasadena, Calif., fairly frequently. No two-way contact yet over this 450-mile mountainous haul. Don would like to see some good 2-meter activity from the area around El Paso. Good-sized antennas and a fair amount of power should make El Paso-Tucson 2-meter work possible regularly, as the distance is around 260 miles. Any takers?

(Continued on page 186)



Leo. I. Meyerson  
W0GFQ

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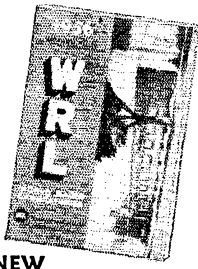
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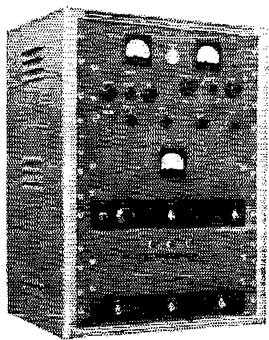


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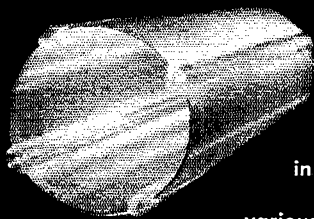


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W0CJS . . . . . 48	W4BEN . . . . . 35	
W5AJG . . . . . 48		W9ZHB . . . . . 48
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W1CGY . . . . . 46	W5PXN . . . . . 38	W0TKX . . . . . 47
W1LSN . . . . . 45	W5LIU . . . . . 37	W0KYM . . . . . 47
W1DJ . . . . . 41		W0WKB . . . . . 47
W1RFU . . . . . 41	W6WNN . . . . . 48	W0JOL . . . . . 46
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	W6TML . . . . . 45	W0TJF . . . . . 44
W2MEU . . . . . 47	W6IWS . . . . . 31	W0URQ . . . . . 44
W2AMJ . . . . . 46	W6ABN . . . . . 35	W0BIF . . . . . 43
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K2AWQ . . . . . 32	W7DYD . . . . . 45	VE3AVY . . . . . 42
	W7JRG . . . . . 44	VE3ATB . . . . . 35
W3OJU . . . . . 46	W7ACD . . . . . 43	VE1QZ . . . . . 34
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Calls in bold  
face are holders  
of special 50-Mc  
WAS certificates  
listed in order of  
award numbers.  
Others are based  
on unverified re-  
ports.

The 145.1-Mc. signals of W7OYF, Tucson, were heard at 12:50 PDT, Sept. 6th, by W600A and KN6IHC, of Los Angeles.

Operation Big Stick, involving the use of large TV station arrays on 144 Mc., turned out to be quite a success. As the result of much publicity by W0ZJB, Wichita, Kansas, several TV antennas were pressed into service in an all-night session that got under way at 0045 Sept. 11th. Vince was using the Channel 10 array of KAKE, a 12-bay affair that is 1075 feet above ground. It appeared to have a gain of around 11 db. at 144 Mc., which is considerable, at that height and in all directions! W0VEY/8 was on the array of KOLN, Lincoln, Nebr., and W5IOW/5 was tied to a similar big stick at Ada, Okla., both of them designed for Channel 10. W0DMH was airborne over northwestern Kansas, and W0LJV made listening checks while mobile in the Wichita area. Many home stations were on for the party, using their regular equipment.

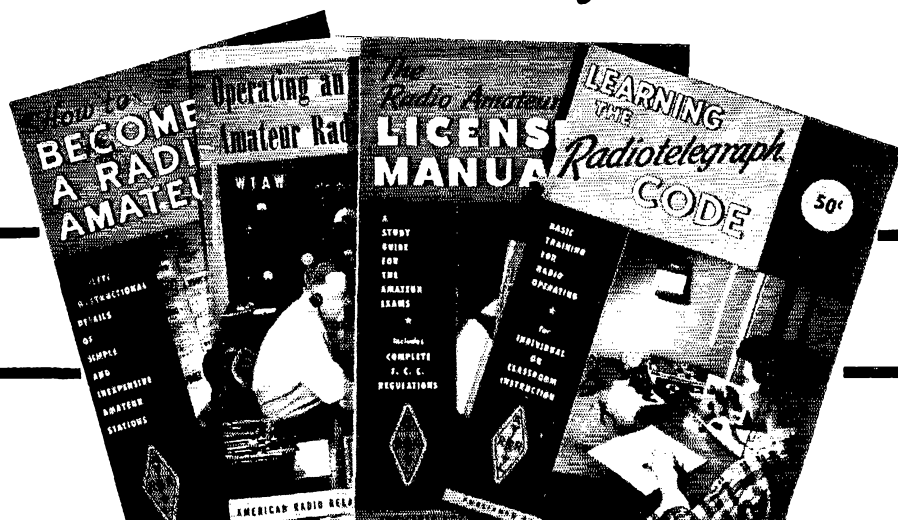
Conditions were generally poor, but contacts within a 300-mile radius were made with ease by the stations using the big TV arrays. W0ZJB/8 worked 35 stations in 8 states, and received heard reports from as far as Waco and Palmer, Texas, and Adair, Iowa. Home stations with similar equipment were having their troubles working paths of 100 miles or so, indicating that the TV arrays could provide very wide coverage. W0LJV reported that the signal of W0ZJB/8 was solid anywhere within a 100-mile radius of Wichita, while listening under mobile conditions. A considerable o.d. potential appears to lie in the use of these TV station arrays for emergency communication on 144 Mc.

A 4-way QSO on the 1215-Mc. band is reported by W6MMU, president of the Two Meter and Down Club. W6DJ/6 was on Mt. Lee, a distance of about 13.5 miles.

(Continued on page 128)



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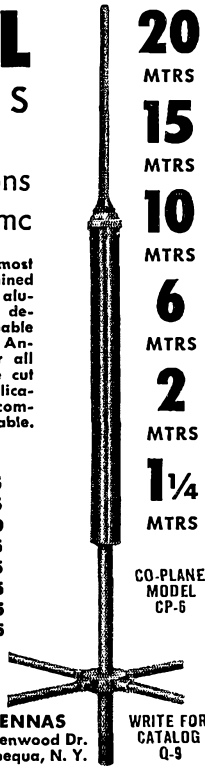
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and other participants were K6KHD and W6VYK. Don has also worked crossband with W6DQJ from their respective home locations. This was impossible when both were using modulated oscillators, but with W6DQJ using the 2C39 tripler described in July *QST*, and a crystal-controlled converter (also by W6DQJ) at W6MMU signals are copied successfully. There is marked fading, and the signal is weak, sounding much like the reception of W7LEE on 144 Mc. The tripler was keyed for c.w., resulting in a solidly-readable signal. Is this the first use of c.w. on 1215 Mc.?

In the mountains of northern New England you'll find few hams who think there's any chance of working stations on the v.h.f. bands, but experience of W1RMH and W1TUT indicates that some of the remote territory may not be so impossible for v.h.f. as it looks. These fellows spent a vacation at the Connecticut Lakes, near the Canadian border in northern New Hampshire. Taking along a Communicator and Linear Amplifier and a 16-element array, they set up for business despite much head-shaking on the part of some of the few hams of the region.

Their elevation was around 1750 feet, but the Presidential Range rose up to more than 6000 feet in the direction they wanted to work. Despite this, morning and evening schedules were kept daily with W1AZK, Chichester, N. H., some 135 miles to the south. Though signals were generally weak, with considerable fading, the boys feel sure that a more selective receiver, higher power and a higher antenna would make possible enough contacts to keep life interesting for a v.h.f. man operating under those conditions.

From all over the country come reports of increased 6-meter activity. K5BEL, Dallas, writes of the Fort Worth-Dallas 6-meter net, operating each Tuesday at 1900 CST. Frequency is 50.55 Mc. To encourage the friendly rivalry between the two areas, the name of the net will be switched around, with the name of the city having the largest representation appearing first. Fort Worth, with 12 stations on the first night to Dallas' 4, clinched the name as it appears above, for the time being. Stations also report in from Arlington, Sherman and Pottsboro, and any others within range are welcomed.

An attempt to promote interest in v.h.f. in Colorado is being made by K9CIQ of Boulder. Ken was one of the prime movers in the aurora work at Cornell University, as W2ZGP, for several years. He is now set up with 150 watts on 144.125 Mc. at North Boulder. So far he has worked W9URG in Ellicott, near Colorado Springs, about 95 miles, and has heard faint traces of signal from W0UXN in Pueblo. K9CIQ operated from Mt. Evans, one of Colorado's highest peaks, in the September party, about which more later. Schedules of the DX variety will be welcomed, and will be kept subject to occasional interruptions for travel in connection with Ken's work at CRPL.

Six-meter men who use the band principally for DX, particularly those in Channel 2 TV areas, will be interested in the results W20HJ has had with a vertical beam. The cross polarization cuts down TVI potential markedly, but seems to work well in sporadic-E DX work. John used a vertical coaxial dipole, around which a reflector and director were rotated. Local coverage was very poor, in work with horizontally polarized stations, but there was only slight discrimination where a skip path was involved.

Even in the face of the Channel 2 problem, 50-Mc. interest is picking up all around the New York area. K2JDY, Oceanside, L. I., reports that 6-meter men in Nassau County meet at 1930 and 2330 on 50.25 Mc., with crystals furnished by K2KRR. Transmitter hunts are being conducted on 50 Mc., and more stations are appearing on the band right along.

The W2QCY/8 expedition to West Virginia came off Labor Day week end as scheduled. A scouting trip was made two weeks previously, at which time a site known as Berkley Heights, near Boyd's Gap, was selected. The three-man crew of the Nevada-Utah trip was supplemented this time by K2CBB. They were joined later by W2IDZ and family, and W2WKL. Both 50 and 144 Mc. were used this time and two days' operating netted 137 contacts with 98 different stations, from Rhode Island to Ohio. The best DX worked on 144 Mc. was W1AJR, Middletown, R. I., about 350 miles. W1RFU, Wilbraham, Mass., the only W1 heard or worked on 50 Mc., is just short of this distance. W2QCY reports that the period between now and next spring is to be spent in perfecting details of his portable station set-up for 50 and 144 Mc., with a view to promoting greater effectiveness in 1956 expeditions.

(Continued on page 130)

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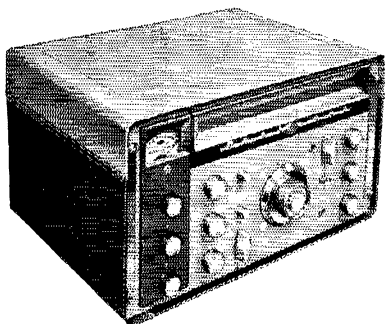
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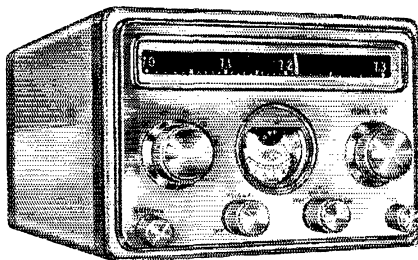
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Activity on 144 Mc. in Mississippi and surrounding areas is growing, according to W5FYF, Starkville, Miss. Steve lists W5JTI, Jackson, W5RCI, Marks, K5AEH, Greenwood, W5BSE, Carthage, W5DWY, Lyon, all Mississippi, and W4TLV, Demopolis, W4HCY, Tuscaloosa, Ala., W4WCB, Memphis, Tenn., and W5HQC, Rayville, La.

A directory of v.h.f. stations is being compiled by W6SBZ. He already has information on more than 700 stations, and would like to make the file as complete as possible. If you are a v.h.f. regular, and plan to remain so, he would like data on your station. Send him your name and call, address, telephone number, bands operated, types of emission, power, polarization and primary frequencies. Jeff would also like anything you can send on v.h.f. nets in your area, such as operating schedule, nature of the net (c.d., ragchew or traffic) and other pertinent information. He wants this as soon as possible, with a deadline set for Feb. 1st for having it in final form. Send it to Robert K. Jefferies, W6SBZ, 44043 N. Fern Ave., Lancaster, Calif.

Attention 420-Mc. workers in W1, 2 and 3: W4VVE, Phoebus, Va., would like to line up some contacts for his nightly schedule. Chic calls CQ on 435.54 Mc. nightly at 2200 EST, aiming northeast. Other stations in the Norfolk-Hampton area include W4SCJ and W4NRB, both on 434.16. The latter won a 4X250B and socket at the Roanoke Division ARRL Convention in August, so he should be all set.

W4TLV, Demopolis, Ala., has been getting through on 432 Mc. to W5RCI, Marks, Miss., receiving Rex on 144 Mc. for crossband work. Barry has an 832 with about 2 watts output, feeding a 36-element array 35 feet above ground. W5RCI has an 882 and a 4X150 tripler, with which he has been working W5JTI at Jackson and W4WCB, Memphis. There is considerable enthusiasm for 432 developing as a result of this successful work with low power.

Perhaps this would be as good a point as any to call attention to the new regulation regarding power on 420. The new order, mentioned elsewhere in this issue, clears up the ambiguity of the old rule by limiting input to the final stage to 50 watts, regardless of the type of emission. Enthusiasts on the 420-Mc. band will not welcome this change. It exacts a penalty from the fellows who want to use c.w. or f.m. techniques, and reduces the amount of power we can radiate while using a frequency multiplier, such as the 4X150 or 4X250. We have only one consolation in connection with the new order — it gives us something we can measure, to tell if we are complying with the regulations.

**OES Notes**

*K2DYC, Phelps, N. Y.* — New 6-meter activity locally provides nucleus for v.h.f. club.

*W2UTH, Victor, N. Y.* — Still looking for Maryland and Delaware on 144 Mc. Would welcome sked with stations in either state. Currently working with W3BNC, Hagerstown, Md., but no results yet. Checks on 50 Mc. to be made with W1HDQ at 0800 through fall and winter.

*W3UJQ, York, Pa.* — Getting good reports with 6-meter mobile (10 watts to 2E26 in final) over distances up to 25 miles. Now have about 10 6-meter stations in York County.

*W4GIS, East Point, Ga.* — 2-Meter net in Atlanta area operates Mondays at 2000. Activity on increase, and contacts being made with several Alabama stations. Would like to hear from South Carolina 2-meter operators.

*W4HHK, Collierville, Tenn.* — Regular skeds with W9WOK, near Chicago, continue on 144 Mc., with some sort of contact always being made over the 500-mile path.

Somewhat better signals are received from W4PCT, near Cincinnati, 425 miles. W4WNH, near Louisville, 375 miles, who runs only 100 watts on c.w., is also a regular. First 50-Mc. check with W1HDQ, 1040 miles, brought promising results. The A1 signal was audible about 75 per cent of the 10-minute test period. Band was dead at the time, indicating that meteoric and ionospheric scattering were responsible, and that the feat may, therefore, be duplicated.

*W4FLW, Dresden, Tenn.* — Running 50-Mc. skeds with stations in Nashville, 130 miles, to check reliability of path.

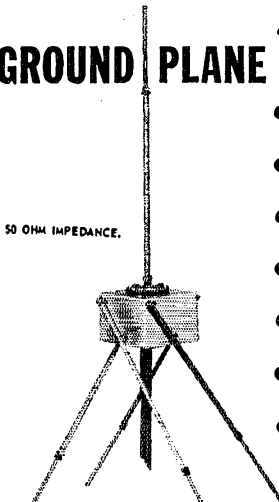
*W4UIW, Miami, Fla.* — First 2-meter contact with Cuba from Miami area made by W4KQG and CO2CT. Distance about 250 miles.

*K6CHR, Sherman Oaks, Calif.* — Worked with K6HWW in 2-meter mobiles providing communication in connection with fire in the Santa Monica Mountains.

*W6SXX, Oakland, Calif.* — Listening skeds on 144 Mc. being kept with W6s while on the run to Hawaii aboard SS *Hawaiian Rancher*. Reception of K6GWE, 330 and 440

(Continued on page 138)

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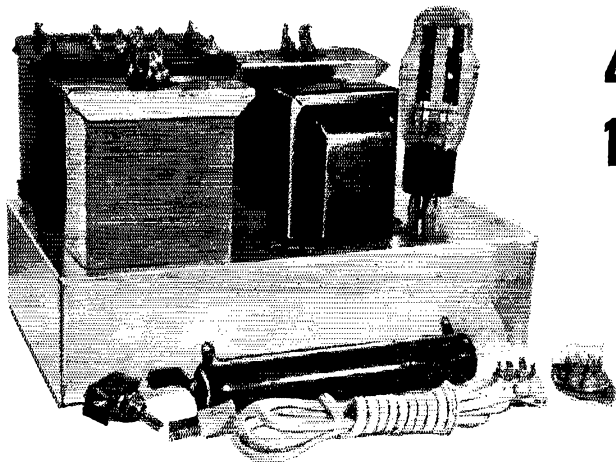


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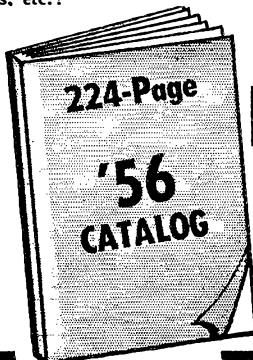
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miles, W6SMB, 453 miles, W6DQJ, 470 miles, show something of the possibilities of work out over the Pacific, if regulations permitted maritime-mobile work on 144 Mc. Activity in Hawaiian Islands is increasing, the list of KHGs worked at the western end of the run now totaling 21.

W7QDJ, Clearfield, Utah — 2-meter nets operate in Ogden, 145.35 Mc., and Salt Lake City, 145.6 Mc., each Monday night. Built 6-meter rigs for W7s VHS and RNW, who are now active. A 6-meter net for Friday nights is in prospect.

W8ZCV, Waynesville, Ohio — Recently completed five months during which at least one v.h.f. contact was made every day.

## Hints & Kinks

(Continued from page 55)

supply will usually be most satisfactory. Since very little current is drawn, a high-resistance bleeder can be used. In the version at W0SOL, the source is the junction of two 100K resistors across the 240-volt receiver power supply.

The components of the audio oscillator are small and can be located wherever convenient, either within the receiver, if space permits, or in an external match-box-size housing, or even simply wired together and taped to the leads to the relay bulb.

— Preston B. Tanner, W0SOL

## Silent Keys

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

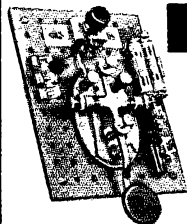
- W1LET, Arthur Anderson, Everett, Mass.
- W1VKR, David J. Mills, South Weymouth, Mass.
- W2AFO, Stanley Kado, Bronx, N. Y.
- W2BLR, Gerald Marshall, Ocean City, N. J.
- W2CKK, Wayne Seeley, Gloversville, N. Y.
- W2GA, Frederick W. Miller, Woodside, L. I., N. Y.
- W2JK, Jerome F. Colligan, Brooklyn, N. Y.
- W2ONH, Walter F. Curtis, Corinth, N. Y.
- W2TAO, John A'Hern, Greenwich, N. Y.
- W3EBZ, William R. Smith, Brentwood, Md.
- W3YUD, Theodore Chop, Baltimore, Md.
- W4BOD, Melvin W. White, Lakeland, Fla.
- W4BWL, Richard V. Cook, jr., Nashville, Tenn.
- W4DES, Herman J. Evenhouse, Tampa, Fla.
- W4MFM, William N. Ashbey, Albany, Ga.
- W4VEE, John C. Muller, St. Petersburg, Fla.
- W5BTM, John M. Stovall, West Point, Miss.
- W5FJT, Kenneth W. Caldwell, Gallup, N. M.
- W5SNR, R. M. Mills, jr., Edgewater Park, Miss.
- W6CX, Berthold E. Stedinger, Oakland, Calif.
- W7AIG, Clifford A. Parr, Milton, Ore.
- W7TWM, Philip G. McEwan, Beaverton, Ore.
- W7UAH, Emmett L. Hart, Phoenix, Ariz.
- W7YLT, Gus Batches, Tucson, Ariz.
- W8SKS, Herman B. Vorgang, Columbus, Ohio.
- W9KWW, Curtis Meadors, Joliet, Ill.
- W9ORC, Homer R. Tate, Vandalia, Ill.
- JA1AJ, Kiyoshi Taniguchi, Nerima, Tokyo
- JA1GD, Yoshio Shibuya, Minamitama, Tokyo
- JA1SS, Hiroshi Kato, Meguro, Tokyo
- JA1AAH, Toshio Ohike, Meguro, Tokyo
- JA2FZ, Noboru Kuroda, Nakagawa, Nagoya City
- JA3AI, Shigeo Tajii, Higashinada, Kobe City
- JA5CO, Ryoichi Noso, Kawasima, Kagawa
- JA7AC, Shozo Segawa, Morioka City
- ON4BO, Henri Boels, Hainaut, Belgium
- ZL2AAC, L. J. Patterson, Gisborne, N. Z.

# LAFAYETTE

Leads the Field in

# TRANSISTORS

Circuits Kits & Components

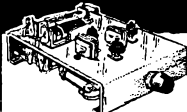


## TRANSISTOR CODE PRACTICE OSCILLATOR KIT

For those interested in mastering the international code, an audio tone oscillator is essential. The circuit of this transistorized feedback oscillator has the simplicity of the neon glow, the signal strength of the vacuum tube, and requires only two penlight cells for weeks of service. It may be used for solo practice, or two may send and receive with the same unit. Kit comes complete with Transistor Graph Rev, Resistors, Condensers, Masonite Board, etc., and Schematic Diagram.

KT-72 ..... Net 2.99  
Cannon ECI—Single Headset ..... Net 1.13

## 3 TRANSISTOR PUSH-PULL AUDIO AMPLIFIER FOR SPEAKER OPERATION

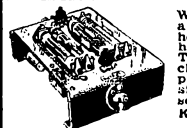


With the New Lafayette KT-69-Kit you can now build a self-powered, push-pull Class "B" transistor, audio amplifier for speaker operation having a frequency response of 100-8000 cps. The Argonne Transistor transformers were especially designed for transistor circuits. Kit comes complete with 3 transistors, push-pull input and output transformers chassis 3"x4"x1", condensers, resistors, battery holders, etc., schematic diagram.

KT-69 Complete with batteries.....Net 17.95

NOTE: Input impedance 1000 ohms. For high impedance inputs matching transformer is needed (AR-100) for magnetic input use preamp (KT-71)

## TWO TRANSISTOR PREAMP KIT



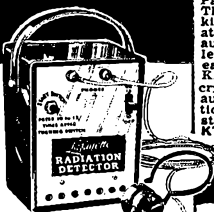
With the Lafayette KT-71 you can now build a simple transistor preamp in a matter of hours. The overall result will be a noiseless, humless and virtually distortion free amplifier. The complete unit is mounted on an aluminum chassis size 3"x4"x1". The Kit comes complete with two transistors, condensers, resistors, battery holders, batteries, etc., and schematic diagram.

KT-71 Complete Kit .....Net 8.95

## LAFAYETTE GEIGER COUNTER KIT WITH HIGH SENSITIVITY VICTOREEN TUBE 1B85

Lafayette Geiger Counter Kit with High Sensitivity Victoreen 1B85 tube, makes this one of the most outstanding kit buys in the country. This tube is used only in the most expensive equipment. Easy to build, at only a fraction of the price, of commercial instruments of this type. Just turn it on, flip the high voltage switch and listen to the clicks. Kit includes all parts, tube, carrying case, 22½ and 1½ volt Batteries. Complete instructions for quick assembly. Shpg. wt., 1½ lbs.

KT-75.....Net 14.95



A new light weight Dynamic Ear Phone.



Fits right into the ear. Excellent sensitivity of 85 db. Ideal for use with miniature sets, hearing aids, transistor pocket radios. DC resistance 2000 ohm, impedance 5000 ohm with 3 ft. of plastic cord.

MS-72 ..... Net 1.95  
MS-100 Impedance 8 ohm for Silent Radio or TV viewing.  
Net..... 1.95

## MINIATURE CRYSTAL MICROPHONE



Here's a typical Lafayette special for the experimenter, student or dealer. An extremely sensitive and small crystal microphone used in hearing aids and other small apparatus. Can be used as lapel mike—miniature transmitter mike for concealed locations, etc. Its size and performance gives it joint versatility. Brand new. Size only 3/8" Diam. x 5/16" deep. Imported to save you money.

MS-108 .....Net 1.95

## NEW POCKET AC-DC VOM MULTITESTER 1,000 ohms per Volt



AC-DC MULTITESTER. An ideal portable unit that meets the need for a compact, yet rugged test instrument. Uses sensitive rectangular meter with large easy to read scale. Uses 1½ transistor resistors. Level

eled D'Arsonval microamp meter movement. Ranges: AC-DC and output volts 5-50-250-2500; DC current 0.1-0.10-0.100; MA; Resistance 0-10K and 0-50K ohms; 1/4" and 1/2" leads and batteries. Shpg. wt. 2½ lbs. Model RW-27C complete — Singly, ea. 7.95

## TRANSISTOR TYPE 2N107



P-N-P \$1.25

## TIMER-SWITCH SALE 3.95

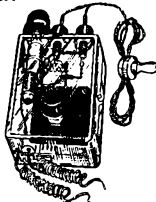
Automatically turns on radio, television sets, toasters, coffee makers, etc. — at any pre-set time within 12 hour period; also in 15 min. requires 1/2" diameter round hole. Depth behind dial face 2¼". Shpg. wt. 1¼ lbs. MS-62, for 110V/60 Cy AC

## TRANSISTOR POCKET RADIO RECEIVER KIT

Utilizing One Transistor and Crystal Diode Detector with New Miniature 365 mmf Variable Condenser.

Here is an ideal low cost transistor pocket radio kit for students, hobbyists and the experimenter, who desire to obtain a practical knowledge of transistorized circuits. The circuit utilizes a Ferrit-Loopstick and a specially designed miniaturized 365 Variable Condenser permitting the entire receiver to be built in a plastic case size 3"x2"x1". The 1N64 Crystal Diode is used as a detector, the transistor is connected in a common emitter amplifier. This receiver with a 50 foot antenna and good ground will bring in good reception over a 50 mile radius. The kit comes complete with Transistors, crystal diode, battery holders, batteries, condensers, resistors, plastic case, etc., plus a 115 page book, showing more than 30 practical transistor circuits and How-To-Do-It-Instructions.

KT-80 Complete Kit (less earphones) ..... 4.95  
1 Miniature Crystal Ear Receiver MS-111 ..... 1.49



## TRANSISTOR TELEPHONE PICK-UP AMPLIFIER KIT TWO CAN LISTEN ON SAME PHONE CONVERSATION

With this ingenious Kit you can build a tiny transistorized telephone pick-up amplifier, with which two people can listen in on telephone conversations without the need of an extension phone. Also serves as a tape recorder, for recording telephone conversations. Can also be used as a high gain amplifier with crystal microphone and matching transformer when desired. The circuit utilizes a transformer coupled audio for high gain and two B-C coupled stages. Kit comes complete with 2 Transistors, Transistor Audio Transformer, Condensers, crystal diode, battery holders, plastic case, etc., and Plastic Case. Size: 2¼" x 1½" x 3¼"

KT-76 Complete Kit ..... Net 9.95  
MS-16 Telephone Pick-Up ..... Net 2.95  
MS-72 Miniature Dynamic Ear Phone ..... Net 1.95



## 2 TRANSISTOR POCKET RADIO KIT

Packed into a 2¼"x3¼"x1¼" plastic case. This Two Transistor plus crystal diode radio kit offers many surprises, utilizing a regenerative detector circuit with transformer coupled audio stage, gives you high gain and excellent selectivity. Put in distant stations with ease with more than ample earphone volume. Kit comes complete with two transistors, crystal diode, loopstick, Argonne transistor audio transformer, resistors, condensers, plastic case, etc., including schematic and instructions.

KT-68 Complete kit with Miniature Dynamic Earphones ..... Net 13.75  
Less Earphones ..... Net 11.80



## CRYSTAL MICROPHONE

COMPARE IT WITH ANY MIKE AT 2 TO 3 TIMES THE PRICE

A quality crystal Microphone for PA systems, house recorders, etc. Frequency response 30 to 10,000 cycles. Output level — 22 db. Provides ample output for use with low gain amplifiers. Complete with 3 ft. of shielded cable. Shpg. wt., 3¼" lbs.

PA-24 — in lots of 3, each only 3.95 singly, each ..... 4.25



## TRANSISTOR 455 KC I.F.

Specially designed for transistor circuits. Only 1/2" square by 3/4" high. MS-126 — In lots of 10, each 79¢ Single Each ..... 89¢



## RAYTHEON TRANSISTOR

CK722 P-N-P \$1.25



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**50 KC. MARKERS  
FROM A 100 KC. CRYSTAL**

Each EL-100 crystal must work perfectly in our frequency standard (built just like the one in the article\*) before it is sold. EL-100 only **\$5.95**

\*Send for free reprint of July, 1954 QST article

FT243 fundamental frequencies in 3, 7 & 8 Mc. band still . . . . . \$2.00 postpaid


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"RED ROOM" DISPLAY COACH K0AST

## Contacts vs. Multipliers

(Continued from page 48)

of thought. What if W1JYH (Western Mass.) applied the formula to his '54 SS results, 119,340 points on 663 QSOs in 72 sections:

$$\frac{663}{72} + 1 = 10$$

Could be it's rougher to get 10 new contacts late in the SS than to spend a half hour chasing that golden 73rd!

A brief glance at the illustration will give you an idea how the ratio changes. At the point marked *A*, 460 QSOs, 50 sections, it takes 10 QSOs to equal (in points) what 461 QSOs and 51 sections would bring. At the point *B*, 460 QSOs, 60 sections, it would take about 9 contacts to achieve the score made with 461 QSOs in 61 sections. At point *C*, 460 QSOs, 70 sections, approximately 8 give the same point total as 461 QSOs in 71 sections.

Oh, well, there must be more complicated ways to pursue this perennial problem, but for now anyway I'll settle for QSOs divided by sections plus 1 and let the "ifs" fall where they may!

## YL News and Views

(Continued from page 50)

in the Capital. . . . W3TSC, Camille, worked all but five states for her WAS on 7046 kc, with no prearranged skeds. . . . W8QOM, Anna, believes she is the first person to work all 83 Michigan counties on 'phone (75) in less than a year. . . . At the second annual picnic of the Northwest YL Operators Network, in Ellensburg, Wash., the members present, W7s FWR, QYN, SYF, ULK, WMS, and YAR, decided to rotate as NCS each month for experience. . . . KZ5AE, Sis, is keeping her new rig, 150 watts to a single 813, busy on 10, 15, and 20. . . . Proof of confirmation for the "Lads 'n Lassies" certificate, issued by the Los Angeles YLRC, should go to the new "Queen of the Clan," Helene J. Leonard, W6QOG, 1205 S. Edris Drive, Los Angeles 35.

### Decision by Default

Young Lady, eX Young Lady, Married Young Lady, Single Young Lady, Lady Ham, Mother Ham, Hamette, Hamess, Lady Amateur, Lady Operator, Single Lady Operator, Married Lady Operator, Old Girl — take your pick, milady. These are some suggestions offered in our running discussion of what to label women amateur radio operators and women who don't have their tickets, too. In July '53 the possibility of supplanting the popular but often confusing YL and XYL terms was first broached, with additional notes in our Sept., Oct., Nov. '53 and Jan. '55 columns. Comments have been aired, with the majority emitting conspicuously from the OMs. We weren't exactly "snowed" with pleas for a complete change, though, so we are moved by lack of feminine opinion to retain the status quo. YLs and XYLs we remain, for a while at least. (Now watch the mail bag strain with cards of protest!)

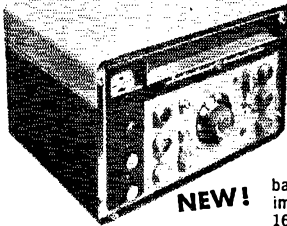
(Continued on page 136)



# A BETTER DEAL ALL-WAYS!

# Terminal Radio

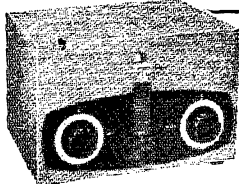
COMPARE! SAVE MONEY ON ALL STANDARD RADIO, AUDIO, TV, HAMGEAR AND SUPPLIES!



## National NC-300 "Dream" Receiver

**NEW!** No greater sensitivity in any ham receiver at any price! Dual conversion — better than 50 db primary rejection on all amateur bands; more than 60 db secondary image rejection. 10 dial scales — 160 to 1 1/4 meter coverage. Extra-long slide rule dial easily readable to 2 kc without interpolation up to 21.5 mc. • Super Selectivity — optimum band width for CW, phone, phone net or VHF operation • Separate linear detector for single sideband • High-speed, smooth inertia tuning dial with 40 to 1 ratio • Giant, easy-to-read S meter. Finished in two-tone gray enamel. Complete with tubes.

Net \$349.95



## NEW! JOHNSON KILOWATT "MATCHBOX"

- Bandswitching • Self-contained
- Performs all transmission lines matching and switching functions required in the high power station
- Loads and matches balanced and unbalanced lines over wide range of antenna impedance at kilowatt level
- Single knob bandswitching, front panel tuning and matching — no coil changing or tapping necessary • May be used with any transmitter up to and including 1,000 watts. Completely assembled in fully shielded maroon and gray cabinet.

Net \$124.50

## JOHNSON PROFESSIONAL ROTARY INDUCTORS



229-203                      229-202                      229-201

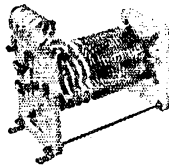
Adjust L/C ratio for top performance at any frequency!

For peak efficiency from pi-networks and other tank circuits! Two new models, variable pitch, wound with heavy #12 wire — for AM transmitters operating up to 500 watts, or for SSB transmitters up to full kilowatt. Windings mounted on grooved stearite form — contact wheel is spring loaded for smooth, reliable inductance throughout entire range.

New 25UH                      New 15UH                      10UH (#14 Wire)  
229-203 Net \$11.50                      229-202 Net \$9.75                      229-201 Net \$8.95

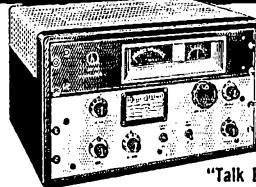
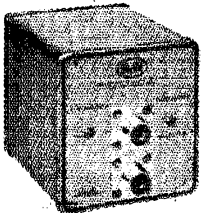
## B&W 1 Kw Pi-Network TANK COIL With Full Bandswitching

ALL IN ONE COMPACT UNIT! Maximum efficiency from 80 through 10 meters • For Class "C" or linear operation using triodes in conventional or grounded grid circuits • Positive-acting, high current r-f switch • Output impedance: 50 to 75 ohms • Input: 1 kw with plate voltages from 2,500 to 3,000 volts d-c. Net \$35.00



## B&W AUTOMATIC T-R ANTENNA SWITCH

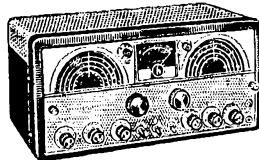
FULLY AUTOMATIC electronic antenna changeover from receiver to transmitter and vice-versa. Suitable for all powers up to legal limit. Ideal for voice-operated SSB-AM phone and break-in CW — all with one antenna. No tuning, no adjustments. Power loss on transmission almost immeasurable. Net \$23.70



## hallicrafters LINEAR POWER AMPLIFIER Model HT-31

"Talk Power" equivalent to 1 Kw. AM!

**MORE COMPLETE** — Engineered with a wider range of antenna impedance — 50 to 600 ohms. **MORE RUGGED** — Components surpass even the most rigid commercial specifications. Heavier transformers for less heat, and a Hallicrafters feature, a blower to further reduce heat! **MORE RELIABLE** — On-the-air factory tests assure dependable performance. **COMPACT** — full band switch power, covering 80-40-20-15-11-10 meters. Easy to drive, highly stable, extremely versatile. **SPECIFICATIONS:** Plate Power Input — 500-510 watts. Power Output — 330 P. E. P. on 80 meters, with slightly less on 10 meters. Drive Power for 80 meter input 10 watts P. E. P. maximum on lowest frequency. Grey and black steel cabinet, and brushed chrome control knobs. Piano hinge top. 10 3/4" x 19" relay rack panel — overall size 20" W x 12 1/4" D. Shipping wt.: 100 lbs. approx. Net \$395.00



## hallicrafters SELECTABLE SIDE BAND RECEIVER Model SX-100

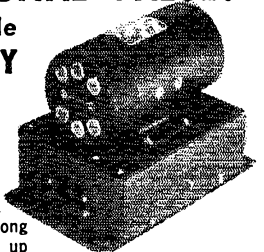
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Hallicrafters 22 years of production know-how plus the advice of over 1,000,000 field experts combine to bring you this outstanding new receiver! Selectable Side Band Operation. "Tee-Notch" Filter provides non-regenerative system for rejection of unwanted heterodyne, and also produces effective steepening of 50 KC i. f. pass band; further increases effectiveness of advanced exalted carrier type reception. Notch Depth Control for maximum null adjustment. Antenna Trimmer. Net \$295.00

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## PIONEER Mobile POWER SUPPLY

This 6 Volt Mobile Power Supply has one of the finest and most effective filter systems of any we have had the pleasure to offer. The top-quality Pioneer Dynamotor and rugged commercial construction, along with the low price adds up to VALUE PLUS! The filter section contains three husky iron core chokes and two RF chokes, all with seven oil condensers to effectively filter both A and B, and RF hash. There are absolutely no electrolytics used. Input and output are terminated in a standard 6-prong Cinch-Jones S406AB socket. At the nominal input voltage of 5.5 Volts DC, it delivers 400 Volts at 175 Ma. Continuous duty; 250 Ma. easily at intermittent use. With storage battery up to snuff and husky A leads, output runs about 440 Volts. Base — 6" x 9 3/4" and 17" high.



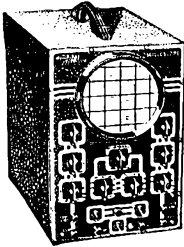
ALL NEW — QUANTITY LIMITED Special \$29.95  
Jones P406CCT Plug, if required ..... .80¢

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# Get The Most Out Of Your Rig With....

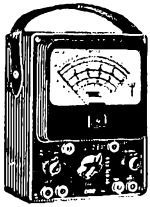
## EICO Model 425



EICO new 5" push-pull oscilloscope. Laboratory-precision scope for checking of modulators & speech amplifiers. A must for tuning up SSB equipment. Push-pull amplifiers. Multivibrator sweep 15-75 KC. Complete with tubes. 115 volts, 60 cycle AC. 8 1/4" x 17" x 13". Shpg. wt. 29 lbs.

Model 425 (wired) ..... \$79.95  
 Model 425-K (kit) ..... \$44.95

## EICO Model 565



31 ranges. 20,000 ohms/volt. DC/AC/Output V.: 0-2.5, 10, 50, 250, 1000, 5000. DC Current: 0-100  $\mu$ a; 10, 100, 500 ma; 10 amp. Ohms: 0-2000, 200 K, 20 meg. 5 DB Ranges: -12 to +55.

Model 565 (wired) ..... \$29.95  
 Model 565 (kit) ..... \$24.95

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W6UHA is a call well-known to 20-meter DX stations. Several certificates, including DXCC for 206 countries confirmed out of 224 worked, and a roomful of trophies, indicate that DX is her special talent. The XYL of W6TS, Maxine has received much praise for her recent service as General Chairman of the YLRL First International Convention.

## Miscellany

Two additional YLRL nets are reported by YLRL Vice-President W9YBC:

C.w.: 3610 kc., Wed., 9:30 P.M. EST, W1WPX NCS  
 Phone: 3838 kc., Tues., 9:00 A.M. CST, W0KJZ NCS (Pi-Net)

W6PCA, Opal Jones, Box 180, Route 1, Esparto, Calif., has been appointed custodian of the YLRL WAC-YL award.

W1VYH, Betty Wood, 53 Main St., Topsfield, Mass., and VE6MP, Maude Phillips, 1330 Crescent Road, Calgary, Alberta, have been appointed YLRL Chairmen for New England and Canada respectively.

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# HALLICRAFTERS HEADQUARTERS

540-1630 Kc. plus 4 s/w; 2.5-31 Mc. and 48-54.5 Mc. Elec. bandspread 0-100 logging scale. Mc. calib. for 48-54.5.

Ham net S-53A  
 \$89.95



S-53A

**C & G Radio Supply Company**

2502 Jefferson Tacoma 2, Wash.

Phone BR 3181

## Recent Equipment

(Continued from page 43)

thoroughly-adequate instruction manual is furnished with the unit, and the toughest job encountered during installation was getting the adapter chassis out of its case, which will give a rough idea of how much of a technical expert you have to be to get it going.

No modification of the receiver is required, although it is necessary to add an i.f. signal take-off at the last stage if one isn't already provided. This is a simple job involving only taking the receiver out of its cabinet (or removing a bottom cover) and making a connection to the plate of the last i.f. tube.

As mentioned earlier, the unit is designed to improve the selectivity of a receiver with an i.f. in the 450-500-kc. range. This means that it can't be hung on a double-conversion receiver having an i.f. of 50 or 100 kc., but those receivers already have selectivity of this general order. For receivers that don't have the necessary selectivity, but have the right i.f., gain and a decent tuning knob, it should really boost the performance. The selectivity of the filter shows up on c.w. as well as 'phone reception, of course, and it gives excellent single-signal c.w. reception.

The Model 370 Single-Sideband Receiving Adapter is manufactured by Barker & Williamson, Inc.

— B. G.

# NEW!

## 100 KC CRYSTAL CALIBRATOR

Provides accurate check points for transmitting frequency or for calibrating receivers and VFO's!

Extremely compact, this tiny crystal calibrator provides accurate 100 kc. check points to 55 mc. High quality, hermetically sealed military type crystal is superior to those usually found in a unit of this type. Circuit uses a 6BH6 tube and has an adjustable ceramic trimmer condenser for exact zero beating of the crystal to WWV or other standard.

Measuring only 1 5/8" x 2 1/2" x 1 1/2", the chassis may be mounted inside receiver cabinet or in any convenient spot. (Overall height to top of tube is 3 3/8".) Power may be taken from your receiver or other source—requires only 6.3 volts at .15 amps. and 150 to 300 volts at 2 ma. Special clips are provided for tube prongs of equipment furnishing power take-off. Power cable and extension leads are included to permit remote mounting of switch. Furnished completely wired and tested with tube.

Cat. No. 250-28 CRYSTAL CALIBRATOR

**\$17.25**  
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Be a Radio Ham or Commercial Operator. Pass FCC code test in few weeks. Fascinating hobby. Good pay, interesting work in Commercial field. Same system used by radiotelegraph specialists. FREE book explains how Amateurs and Operators learn code and develop amazing skill and speed. Gandler System Co., Dept. 4-M Box 928, Denver 1, Colo., U.S.A. and 52b, Abingdon Rd., Kensington High St., London W.8, England

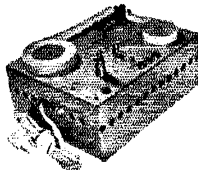
## NEED PARTS?

### CURLE RADIO SUPPLY

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### What Is This Thing Called the "Hump" in CODE?

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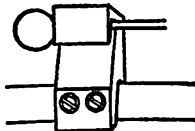
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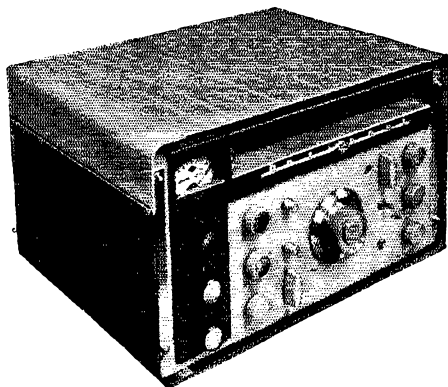
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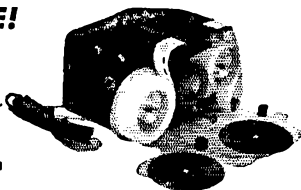
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## NEW BOOKS

Basic Electricity, Volumes 1 to 5, by Van Valkenburgh, Nooger & Neville, Inc., published by John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y. 6¼ × 9 inches. Price, \$2.00 each. Paper covers.

"Basic Electricity," together with "Basic Electronics" (yet to be published), constitutes a course prepared for the Navy for training electronic technicians, and now released by the Navy for general use. As is the case with many such service courses, much emphasis is placed on visual aids; the larger part of the total page space is occupied by illustrations, with the text written around the pictures rather than the more common textbook method of using illustrations to supplement text. Vol. 1 covers current flow and magnetism; Vol. 2, d.c. circuits, Ohm's and Kirchhoff's Laws; Vol. 3, a.c. inductance, capacitance, reactance; Vol. 4, impedance, a.c. circuits, resonance, transformers; Vol. 5, rotating machinery and power control.

28 Uses for Junction Transistors, a manual of practical applications, Sylvania Electric Products Inc., 1740 Broadway, New York 19, N. Y. 43 pages, 6 × 9¼ inches. Price, 25 cents.

After an introductory chapter on elementary transistor theory, there are four chapters covering transistor applications in amplifiers, oscillators, control devices, and instruments. Circuits of particular interest to amateurs include a 100-ke. crystal oscillator, field-strength meter, keying monitor, and code-practice oscillator.

### FEED-BACK

In the article on simple preamplifiers by W6RET in the September issue, the control grid (No. 1 grid) should be connected to Pin 1 instead of Pin 7, as shown in Fig. 1, page 36.

It should have been pointed out in "The '2B3' Superheterodyne" (September) that the headphones have plate voltage on them, as does the headphones jack when the 'phones are plugged in. Consequently, one should not use headphones with exposed terminals or a metal-cased 'phone plug with this receiver, to avoid the risk of electrical shock. If such 'phones or plugs must be employed, transformer or impedance output coupling should be used.

In the formula given in Fig. 2 on page 43 of September *QST* ("Ripple on the S.S.B. 'Scope Pattern") there is an unwanted factor 2 in the denominator. How it got there is something of a puzzle, since the patterns were plotted from the correct equation, which is

$$\text{Desired/Spurious ratio} = 20 \log \frac{X+Y}{X-Y} \text{ decibels.}$$

"Little Oskey" (October *QST*, page 34) won't work too well with one of the values erroneously shown in the schematic. The resistor between the rectifier and the 20-μf. input capacitor in the high-voltage supply should be 22 ohms, not 22,000 ohms as shown. Further, to behave exactly as described, switch  $S_2$  should be in the lead from the ungrounded side of the 0.01-μf. capacitor to the + side of the 20-μf. capacitor — the inner contact of the key jack then running to the ungrounded plate of the 0.01-μf. capacitor.



# Hiatus

A Latin scholar would define HIATUS as a slight pause. That's why we're using such a fancy word to describe a condition which might create a bit of inconvenience for some of our friends. As most of the country knows, we had a severe flood here in Southbridge. This flood hit us below the production line in the basement where we kept our stock of components, special parts etc. to make T-90 Transmitters, R-9 Receivers and their associated equipment. This stock was completely destroyed. But the production line UPSTAIRS did not suffer — the various pieces of equipment were finished and shipped to your distributors.

Now comes the "HIATUS" we mentioned. Since a completely new stock of components had to be ordered for making more equipment, a gap in our production has been created. This HIATUS will occur about a month from the time you read this issue of QST. If at that time you can't get your Harvey-Wells Bandmasters, please be patient. We're doing our best!



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R-9  
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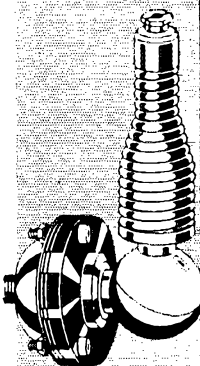
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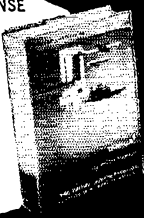
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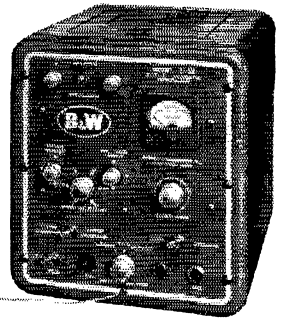
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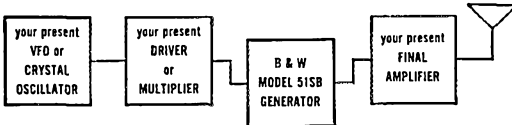


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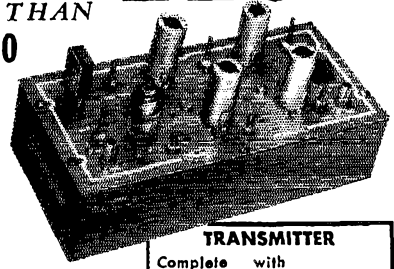
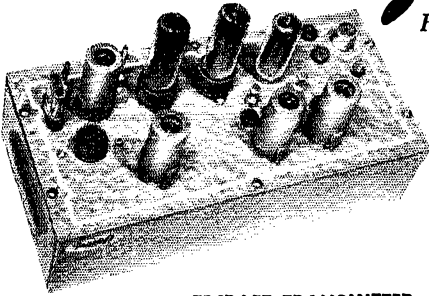
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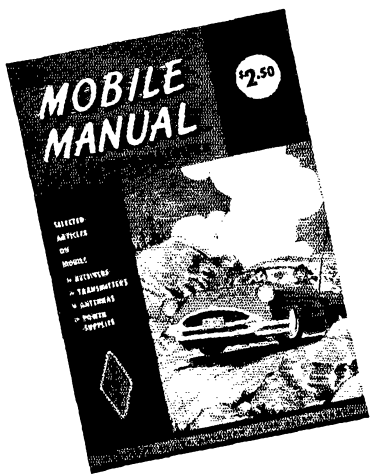
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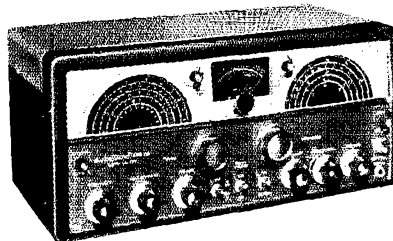
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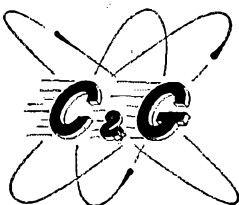
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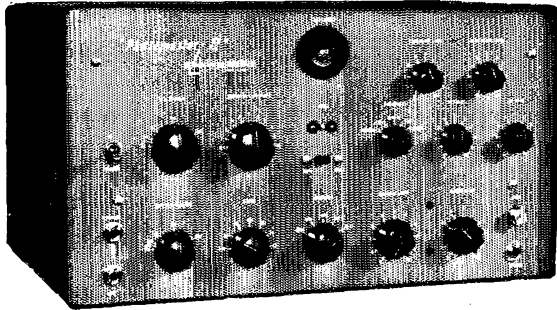
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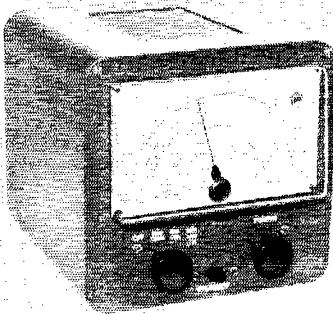


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25 Assorted FT-243 45 Assorted FT-241A  
15 Assorted FT-171B 15 Assorted CR-1A

**100 Crystals \$8.95**

Assorted.....Regular value \$66.00

### PACKAGE DEAL No. 2

FT-241A Crystals for Single Sideband  
370 KC—538 KC

**35 Crystals \$3.49**

Assorted.....Regular Value \$14.00

### PACKAGE DEAL No. 3


HAM BAND CRYSTALS—FT-243

For operating on 80, 40, 20, 15, 10, 6 and 2 meters—on either fundamentals or harmonics.


**25 Crystals \$6.95**

Assorted.....Regular Value \$20.00


**FT-243 RANGE**  
1015 KC  
—8733 KC




**FT-241A RANGE**  
370 KC  
—538 KC



**FT-171B RANGE**  
2030 KC  
3995 KC



**CR-1A RANGE**  
910 KC  
—7930 KC



INDIVIDUAL CRYSTALS • Indicate 2nd choice—Substitution May Be Necessary

Low Frequency—FT-241A for SSB, Lattice Filter etc., .093" Pins., .486" SPC, marked in Channel Nos. 0 to 79, 54th Harmonic and 270 to 389, 72nd Harmonic. Listed below by Fundamental Frequencies, fractions omitted.

49¢ each—10 for \$4.00

370	393	415	484	507	530	400	462
372	394	416	485	508	531	440	463
374	395	418	487	509	532	441	464
375	396	419	488	511	534	442	465
376	397	420	490	512	536	444	466
377	398	422	491	513	537	445	469
379	401	423	492	514	538	446	470
380	402	424	493	515		447	472
381	403	425	494	516		448	473
383	404	426	495	518		450	474
384	405	427	496	519		451	475
385	406	431	497	520		452	476
386	407	433	498	522		453	477
387	408	435	501	523		455	479
388	409	436	502	525		457	480
390	411	438	503	526		458	
391	412	461	504	527		459	
392	414	483	506	529		461	

79¢ each—10 for only \$6.50

CR-1A	FT-171B	RC-610				
SCR 522- <sup>1</sup> / <sub>2</sub> "	Banana Plugs, 1/2" SPC					
Fin. 1/2" SP						
5910	7350	2030	2220	2360	3202	3945
6370	7380	2045	2258	2390	3215	3955
6450	7390	2065	2260	2415	3237	3995
6470	7480	2082	2282	2435	3250	
6497	7580	2105	2290	2442	3320	
6522	7810	2125	2300	2532	3510	
6547	7930	2145	2305	2545	3520	
6610		2155	2320	2557	3550	

FT-243—.093" Dia.—.486" SPC

49¢ each—10 for \$4.00

4035	5397	5973	6775	7641	7940
4080	5437	6206	6800	7650	7950
4165	5485	6225	6825	7660	7975
4190	5500	6240	6850	7673	8240
4280	5660	6250	6875	7675	8250
4330	5675	6273	6900	7700	8273
4340	5677	6275	6925	7706	8280
4397	5700	6300	6950	7710	8300
4445	5706	6306	6975	7725	8306
4450	5740	6325	7450	7740	8310
4490	5750	6340	7473	7750	8316
4495	5773	6350	7475	7760	8320
4535	5775	6373	7500	7773	8325
4735	5780	6375	7506	7775	8630
4840	5806	6400	7520	7800	8683
4852	5810	6406	7525	7806	8690
4920	5852	6425	7540	7825	
4950	5873	6673	7550	7840	
5030	5875	6675	7573	7841	
5205	5880	6700	7575	7850	
5295	5892	6706	7583	7873	
5305	5906	6725	7600	7875	
5327	5925	6740	7606	7900	
5360	5940	6750	7625	7906	
5385	5955	6773	7640	7925	

79¢ each—10 for \$6.50

1015	6140	6575	7306	8225	8600
3655	6150	6600	7325	8350	8625
3735	6173	6606	7340	8375	8650
3800	6175	6625	7350	8380	8680
3990	6185	6640	7375	8383	8700
6000	6200	6650	7425	8400	8733
6005	6440	7000	7440	8425	
6025	6450	7025	8000	8450	
6040	6473	7050	8025	8475	
6042	6475	7075	8050	8500	
6050	6500	7100	8100	8525	
6073	6506	7125	8125	8550	
6075	6525	7140	8150	8558	
6100	6540	7150	8173	8566	
6106	6550	7250	8175	8575	
6125	6573	7300	8200	8583	

**SUN**  
PARTS DISTRIBUTORS, LTD.

514 TENTH ST.  
N.W., Wash., D. C. Dept. Q.

## 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. 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, and is placed and signed by a member of the American Radio Relay League. 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, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply. To expedite handling of your copy please state whether you are a member of ARRL.

(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., 438 66th Ave., New York City 16, N.Y.

**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, 9VIV, Troy, Ill.

**WANTED:** Early wireless gear, books, magazines and catalogs. Send description and prices. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

**CODE** slow! Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

**SUBSCRIPTIONS.** Radio publications. Latest Call Books, \$4.00. Mrs. Earl Mead, Huntley, Montana.

**URGENTLY** need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

**ANTENNA** for bandwitching transmitters up to 300 watts input, approx. 120 feet long, centered with 75-ohm line, 70 feet included, low SWR, tunes 80-40-20-10 meter bands, U. S. Patent 2,535,298. Each one tested for resonance on all bands. Send stamp for details. \$18.95 each. Lattin Radio Laboratories, 1431 Sweeney St., Owensboro, Ky.

**MICHIGAN HAMS!** Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. NOrmandy 8-8696. NOrmandy 8-8262.

**WANTED:** All types aircraft & ground transmitters, receivers, ART-13, KT18/ARC1, R5/ARN7, BC610E, BC221 mounts and parts wanted. Fairlest prices possible paid. Dames, W2KMU, 308 Hickory St., Arlington, N. J.

**LEECE-NEVILLE** 6 volt system, 100 amp, alternator, regulator & rectifier, \$45.00. Also Leece-Neville 12-volt system 100 amp, alternator, regulator & rectifier, \$85.00. Good condition. H. A. Zimmerman, 570 Jamaica Ave., Brooklyn 8, N. Y. Ulster 2-3472.

**NEW** and used Motorola, Link, RCA, G-E, etc., FM commercial communications equipment bought & sold. Allan M. Klein, W2FOU Communication Assoc., 138-17 Springfield Ave., Springfield Gardens, L. I., N. Y.

**WANTED:** ART-13 transmitters. Write B. Spivey, 3117 Rolling Road, Chevy Chase, Md.

**NEED** ARC/3s. S. Gabriel, 4908 Hampden Lane, Washington 14, D. C.

**PANORAMIC Adapter AN/APA-10** Tech. Manuals, \$2.75 postpaid in U. S. A. Electronicraft, 27 Milburn St., Bronxville 8, N. Y. QPD? Use Stick-Tack. See page 134, The Radio Stationers.

**SELL:** Collins 75A-2, \$295; 310C, \$125.00; Dumont #241 scope, \$225; 32V2, \$395.00; 12,000 ohm relays, 110 VAC dpdt, \$1.75; Teletype equipment, Collins 30-J, \$275.00; Want: APR-4 receiver and tuning unit, AKN-7, ART-13, Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

**HARVEY WELLS** T-90 Bandmaster, used one month; \$165.00 or best offer. Will ship prepaid. L. Samuel, W2AYK, Fairways Apt., Pelham Manor, N. Y.

**DX-O-GRAPH.** The DX man's guide for band conditions. Know when, where, and what band. Foremost DXers use it. \$2.50. Request flyer. Box 4596, Winston-Salem, N. C.

**COLLINS:** 32V3 transmitter with Johnson filter, \$425.00; Collins 75-A2 receiver with calibrator, \$290.00; \$700 for both. Equipment is in A-1 condition. C. Leverington, W0YZO, 5076 Arlington Ave., St. Louis 20, Mo.

**QSL?** State-map? Rainbow? Cartoon? Modernistic? Largest variety samples 25¢ (refunded). "Rus" Sakkars, W8DED, P.O. Box 218, Holland, Mich.

**QSL-SWLS.** Meade W0KXL, 1507 Central Avenue, Kansas City, Kans.

**QSLs, SWLS.** America's Finest!!! Samples 10¢. C. Fritz, 1213 Briar-gate, Joliet, Ill.

**QSLs-SWLS.** 100, \$2.85 up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

**QSLs.** Nice designs. Samples. Beseparis, W3QCC, 207 S. Ballet St., Frackville, Pa.

**QSL Specialista.** Distinctive. Samples free. DRJ Studios, 1811 No. Lowell Ave., Chicago 39, Ill.

**DELUXE QSLs**—Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

**100 Free QSL cards** with order. Samples 10¢. World Printing, 166 Barkley, Clifton, N. J.

**QSLs-SWLS.** Samples free. Bartinoski, W1VHD, Williamstown, N. J. QSLs of distinction!!! Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

**QSLs.** Samples free. Albertson, W4HUD, Box 322, High Point, N. C. QSLs "Brownie," W3CJF, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

**QSL-SWL cards.** Sensational offer. Bristol stock 500 1 color \$3.95, 2 color \$4.95, 3 color \$5.95. Super gloss \$1.25 extra. Rainbow cards. Samples 10¢. QSL Press, Box 71, Passaic, N. J.

**QSL samples.** Dime, refunded. Roy Gale, W1BD, Waterford, Conn. QSL-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

**QSL's.** Beautiful blue, silver and gold on glossy cards, \$3.85 per 100 or \$7.50 for 200 postpaid. 2 day service. Satisfaction guaranteed. Order and get pleasant surprise. The Constantine Press, Bladensburg, Maryland.

**QSL's.** Western states only. Fast delivery. Samples 10¢. Dauphinee, K6JCN, Box 60009, Mar Vista 66, Calif.

**UNUSUAL!** Vivacious!!! Illustrated QSLs, typolithographed. Free samples. WAT Box 128, Breckville, Ohio.

**DELUXE QSLs.** Samples dime. M. Vincek, W2LNT, 117 Center St., Clifton, N. J.

**QSLs.** Samples dime. Printer, Corwith, Iowa.

**WOODY's** (Formerly Rossdale Press QSLs). Box 164, Asher Sta., Little Rock, Ark.

**QSLs.** New designs, 2-call and photo cards. Star Printing, 130 S. Glenoaks, Burbank, Calif.

**QSLs.** Taprint, Union, Miss.

**QSLs.** Postcard brings samples. Fred Leyden, WINZJ, 454 Proctor Ave., Kevere 51, Mass.

**QSLs, SWLS.** High quality. Reasonable prices. Samples. Bob Teach-out, W1FSV, 204 Adams St., Rutland, Vt.

**QSLs-SWLS.** Cartoons, colors, others. Reasonable. Samples 10¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

**QSL-SWLS.** Samples free. Backus, 5318 Walker Ave., Richmond, Va.

**QSLs:** Attractive, samples free. Jones, W3EHA, 840 Terrace, North Hagerstown, Md.

**QSLs-SWLS.** Cartoon, Rainbow, others. Reasonable! Samples 10¢ (refunded). Joe Harms, W1GFT, (W2JME), Plalstown, N. H.

**REASONABLE** prices on specials for clubs and individuals. Graphic Crafts, Route 12, Ft. Wayne, Ind.

**QSLs!** Modern designs. No "bargains." Samples 10¢. Tooker Press, Lakehurst, N. J.

**RECEIVERS** repaired and aligned by competent engineers, using factory standard instruments. Hallcrafters, Hammarlund, National, Collins authorized service station. Our twentieth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

**CHROME** Zippo lighter, your all engraved Lifetime guarantee, \$4.50 postpaid. Nice Xmas gift. Sharp Gifts, 129 W. Main, Ardmore, Okla.

**ART-13** Wanted: W4VHG, 4908 Hampden Lane, Bethesda, Md. IFO Patrol data. W5CA.

**NEW ICA deluxe Signatone** Code Oscillator (Reg. \$15.75). Special \$7.95. Key, \$1.35 extra. Surplus RG-8/U cable, 100 ft., \$5.95, 250 ft., \$13.25, 500 ft., \$25.00. Free Bargain Bulletin. Visit store for unadvertised bargains. Lectronic Research, 719 Arch St., Philadelphia 6, Pa.

**WANTED:** Amateur and aircraft receivers, transmitters, direction finders. Especially APR-4, APR-5, ARN-7, ARC-1, ART-13, BC-610, BC-939, BC-348, teletype, BC-221, 32V, 75A, test equipment. Cash or trade for New Johnson Viking, Ranger, Central Electronics, Hammarlund, International, B&W, Conset, Elmox, Harney-Wells, Morrow, Telrex, Fisher Hi-Fi, etc. Write: Altronics, Box 19, Boston 1, Mass. Richmond 2-0048 (Stores: 44 Canal, Boston; 60 Spring, Newport, R. I.).

**FOR Sale:** Perfect working condition: TVI-suppressed, commercially built 500 watt phone/c.w. xmitter, complete with 8666 splatter suppressor, variac controlled power supply, modulator (pair 811As); Miller 90991 final (812As); Miller 90860 exciter, all in new deluxe 6 ft. locked door Far-Metal cabinet with rack on casters. Plug-in coils, all bands, also Collins VFO 310C2 with built-in power supply. Stromberg-Carlson speech amplifier and Harrison 500 watt antenna tuner with all coils. First bid \$460 or over takes all. Single package. Phone DEcator 2-4119, W1UWB, Julian Sobin, 83 Arnold Rd., Newton Center 59, Mass.

**FOR Sale:** Hammarlund SP-400X in like new cond: \$250. Dr. Stephen R. Fromm 35 Revere St., Boston 14, Mass.

**KILOWATT Transmitter:** VFO, AM, CW, all-band xmitter. Complete 6AB7, 6AG7, 6A67, 6L6, 807, PF #13a. With all power supplies. Cpldy relay operated. In 4 ft. rack cabinet. Need money for school. W9QXR, 1447 N. Sedgwick, Chicago 10, Ill.

**FOR Sale:** Browning freq. meter, excellent, meets FCC reg. Model S-4; Triplett tube-checker, Mod. 3413-A, like new, 6 V.A. batt. eliminator, Heath; Solorite cond. Checker, never used. Make me offers or what do you have to trade. Need a good all-band receiver. W9JZP, 1506 Sunset St., Albert Lea, Minn.

**SELL:** 813 xmitter, power supplies, 1952 Handbook, any part separately. Crystals, xfmers, condens, etc. Write for price lists. WIZOP, Connor, 65 Suffolk St., Worcester, Mass.

**FOR Sale:** BC-610E with BC614 speech amp, and BC639 ant. tuner. (No trades, please.) All in perfect condx. Price: \$450.00. F.o.b. Cleveland, Ohio. F. Hiley, W81G.

**WE** have a very substantial quantity of new, unused, dry-charged government surplus, 14 volt storage batteries, 15 amp, hour at 1/2 hr. rate. Dimensions: 10.5" long by 4 1/2" wide by 8 1/2" high. D. E. Gaare, 1868 Ford Parkway, St. Paul 5, Minn.

**TRADE:** complete 8 mm movie outfit. New condition. Kodak camera, Revere projector and all moving accessories. Want: mobile gear, commercial equipment, surplus or? Will trade with HQ-129X for Collins receiver. Send inquiries to W0TWL, Jon Brim, Republic, Mo.

**FOR Sale:** Precision S-200-C signal generator, \$50.00; Heath 09 scope with probes, \$50.00; Eico battery eliminator, \$25.00; Hickok 540 tube tester, \$45.00; Knight VTVM plus probes, \$20.00; Echo-phone EC-1A, \$25.00; 3-6 Mc. ARC'S, \$5.00; Weston 799 laboratory meter, \$65.00. All in new condition except tube-tester and ARC'S. O'Keefe, 16 Long St., Huntington Stn., N. Y.

**CONVERTER/RETTE** 10, 15 or 20 mtrs., \$8.50 ea.; Preselector 10, 15, or 20 mtrs., \$6.00 ea.; Grid dip 1 to 100 Mc., \$8.50; 80-40 mtr. Novice transmitter 6V6-6L6, \$10.50; 6V6-6BQ6, \$10.50; 6L6, \$6.00; 40W PH-CW trans 40-15 mtrs., \$22.50; 80 mtr. converter, \$6.00; 40 mtr. converter, \$6.00; 10 mtr. 10 w. mobile trans., \$10.00; 100W 81 tube amplifier, \$12.00. All capacity and K.F. and H.V. and P to P probes; Simpson 488 field strength meter. W. J. Futch, RD #3, Wyoming, Penna.

**SELL:** New Balun coils, wired, tested, eight tubes. WNI2FZ, Werner, 384 Woodland St., Manchester, Conn.

**FOR Sale:** Meissner 150-B transmitter, 250W, 813 final; 1.5 to 12.5 Mc. converted to cover 10 m. and 20 m. bands; TVI-suppressed; single switch on front panel changes to 250W SSB final. Hear it on 75 mornings and week-ends. Price: \$240 with VFO, mike, key and spare parts. J. Taylor, W2OZH, Stanwood Rd., Mt. Kisco, N. Y.

**FREQUENCY** Standard, Meissner, new surplus, original crate, 10 Kc. 20,000 Kc. crystal control, \$24.95. Penobscot Auto Co., Inc. R #1, Bangor, Maine.

**SELL or trade for 6-meter equipment;** Heath Kits, assem. unusual scope, switch, sweep gen. signal gen., VTVM, porcelain tube checker, TV pic tube adapter, demod. and all capacity and K.F. and H.V. and P to P probes; Simpson 488 field strength meter. W. J. Futch, RD #3, Wyoming, Penna.

**MALLORY and Radiart** emergency Vibrapacis 6VDC 100 Ma., like new, \$12.50, painted, \$9.00; PE101-C dynamotors, \$6.90. Gallagher's Service, Boiceville, N. Y.

**FOR Sale:** 32V3, 75A1, 3-2d. 20 meter beam. Will take best offer. C. H. Buchanan, W8RWZ, 1737 Fairway Dr., Springfield, Ohio.

**FOR Sale:** RCA 3 in. scope, W057B, \$60.00 l.n.; RCA Master Voltohmmist, \$60.00, l.n.; pair BC611 Handie-talkies with batteries, \$100; Geiger counter, complete, \$95.00. Fred Probat, 5819 Willows Ave., Phila., Penna.

**SELL:** SX-99 receiver, in excellent condition: \$120.00. Alan Steger, K2JVH, Box 97, Huntington Station, N. Y.

**ULTRA** Compact rotary, seventeen ft. flat top on twenty, twelve, on thirteen. Attractive appearance. No coils or wire. Performance positively equals conventional beams. Cheap to construct. Conventional feed. Details: \$1.00. Specify band. D.X.E.R., Ferguson, 8253 Santa Monica Blvd., Hollywood 46, Calif.

**FOR Sale:** Eico VTVM, in gud condition, \$17.00; Bogen P410C HIFI amplifier, new, \$15.00; Premier test oscillator, in excellent condx, \$22.00; complete parts for 250-watt xmitter, including table, cabinet and panels, many meters, resistors, condensers, volume control, power transformers, etc. Mostly new, or in perfect condition. Send stamp for list. Must clear house, have no room. Morris Stutz, 240 West End Ave., New York City.

**75 WATT** Novice transmitter, \$50; 6-volt dynamotor 600 v. at 150 Ma., \$20.00; 6 volt dud Vibrapak 500 volts at 150 Ma., \$17.50; new 4-125A tube, \$15.00; 1952 through 1955 IRE Proceedings run. W4BIW, Lindsey, 751 San Antonio Dr., N.E., Atlanta, Ga.

**SELL:** Carter Gen-E-Motor, 6v. inp. 400v. 375 Ma. outp.; Leach starting relay, \$25.00; Gonsel Triband, clipper, mount, \$30.00; PE101-C filter, relays, 12 volt operation, all mounted in base: \$20.00. Make offer on following: Kenyon modulation transformer \$3.00; 88W 6V6 TV coil, Cardwell condenser, X290KS transformer 6.3V ct. 6.5A, 5 at 3 amps, 5 at 6 amps, 1100 volts at 250 Ma.; 175 VAC bias tap, Gerard Moor, WI0GY, 53 Garland Ave., Cranston, R. I.

**ICA** Signatone w/speaker, \$9.00; Ameco Novice code records, \$5.50. K4ARP, Box 278, Roseboro, N. C.

**WELLS** Gardner BC348-O receiver. In perfect condx. 110V. \$75.00. T. F. Heath, Deerfield Beach, Fla.

**SWAP** new \$47.50 Elgin "Carlsbad" 17 jewel wristwatch won in contest, for mobile transmitter or other ham gear. W5BYK, Batesville, Miss.

**WILL** Trade RME-D20 Preselector for Heathkit AT-1 transmitter, Jimmy Bryant, Box 363, Corbin, Kentucky.

**SELL:** 10-meter Mobile rig; Gonsel Triband conv. 30 watt trans. dynamotor, whip ant., control box and mike, complete: \$65.00; SC852 trans., metered, rack mount with xtals, \$30.00; Mark II tank set, complete, \$25.00. power supply 800V, 300 Ma. and 250V, 200 Ma. Wall filter, \$30.00; dynamotor 12v inp., 1000V, 350 Ma. outp., relayed, filtered, \$17.00; also assorted components, power supplies, relay racks, etc. O. Saalborn, W2BT1, 200-18 33rd Ave., Bayside, N. Y. N. Y. Tel. BA 9-6032.

**SELL:** Speech clipper RME-100; \$20.00; Turner Mod. 80 mike with stand, \$7.50. A. H. Hardwick, W2YQ, Orange, N. J.

**JOHNSON** Viking II, \$200.00; Heath 01-S scope, \$20.00; Eico VTVM, \$20.00; Eico 360 sweet generator, \$25.00; EY 911 mike \$10.00; Johnson SWR bridge, \$7.50. Fred S. Eggert, 11833 Wisconsin, Detroit 4, Mich.

**NEW** Ham will trade the following for good ham receiver and other ham equipment: one Omega D-2 photo enlarger, like new, one Victor 60, sound-on-film 16 mm projector, in gud condx, also 5 (five) South American chinchillas. Contact William Riner, K4AXO, P.O. Box 52, Wiese, Va.

**W2BFD** RTTY Converters, autostart panels. W3MKZ, 87 College Ave., Annapolis, Md.

**SELL**, excellent condition, Supreme AF-100 xmitter, 150 w., VFO-CW 'phone, TVI-suppressed, \$175.00; W3WCW, 30 Glenwood Rd., Baltimore 21, Md.

**FOR Sale:** Viking Adventurer and Eldico AM-40 modulator in A-1 condition. \$100.00. W0ZF0, Yount, 323 Yoakum Ave., Chaffe, Mo. WANTED: Collins KW-1. E. Grufith, Box 494, Auburn, Calif.

**WANTED:** SSB exciter and linear amplifier, prefer factory-built job. State condition and lowest cash price. VE3AWP, H. Barber, 25 Gladsmore Cr., Rexdale, Ont., Canada.

**SELLING Out:** Viking II, \$220; NC-183D, \$255; Heath VFO, \$15; Johnson LP, \$11; D-104 plus stand, \$11; AC Instructograph plus 10 tapes, \$33. All equipment in excellent condition. All less than one year old. Station completely wired for push-to-talk. Will sell separately or \$525 taken, all plus accessories: coupler, key, phone, K2HKC, Dave Lifton, 140 B. 135th St., Rockaway Beach, N. Y. Tel. NEptune 4-3173.

**FOR Sale:** QSTS every issue July 1923 through 1954, also one copy June 1916 and March 1922, first class condition. Make offer. W2CET, 81 Maple Avenue, Bethpage, N. Y.

**SELL** Viking I with VFO, TVI suppressed. In perfect condx, \$200. John Gillen, 912 South 57th St., Philadelphia 43, Penna.

**VIKING I** and VFO for sale, in excellent condition, precision wired. Satisfaction guaranteed: \$150.00. Dr. W. F. O'Rourke, Weller Building, Scottsbluff, Nebr.

**SELL:** SX-42 receiver, or SX-71 receiver. Either one with National speaker, \$40 ea. are in excellent condx. W2ZHE, Philip Schwebel, Jr., Alcovy, N. Y.

**SALE:** SX42 receiver with matching speaker and tilt base, \$175; BC342M with AC power supply, \$65; BC221 frequency standard with AC power supply, \$65; 1eleered frequency standard, \$15; components for kilowatt power supply, \$50; 600 watt modulator with 3 meters and Thordarson multimatch modulation transformer, \$50. Col. M. B. Chatfield, Ordn. Corps. Redstone Arsenal, Huntsville, Ala.

**SALE:** Good, used NC-33; \$25; 90800, coils 80-10, \$20; BC348P AC power supply, \$55. F.o.b. W3QOS, Box 20, Big Run, Penna.

**SALE:** Novice 80, 40 meter 50w. xtal xmitter, 5U4, 6CS, 807. Compact small steel cabinet. Plate meter and TVI suppressed; \$62.00. W4CNS, Gleason, 2820 Salisbury Blvd., Winter Park, Fla.

**WANTED:** BC603 or BC923 receiver, any shape. Also BC205 or BC xmitter for 2 meters. Sellwood, W2RHQ, 129 Dell St., Syracuse, N. Y.

**SELL or swap:** Have 500 feet new 3/4" copper coaxial cable worth \$1.10 per ft., 300 mm Code Beacon for tower, complete, worth \$385 new; have 85 watt output 500 Mc. land station in gud condx worth new, \$875; steel cutting lathe nearly new, with tools, motor, etc., worth \$230. Want good communications receiver or cash offers. Arnold, K4AET, Gwynn, Va., Tel. Richmond 4-6071.

**FOR Sale:** Turner 34X xtal mike, \$6.00; Sylvania modulation meter, \$7.50; Vari-Iran 0-130 5 amp xirmer, \$7.00; two 0-500 and one 0-20 DC milliameters, 3/4" rectangular, \$4.50 ea.; one 0-10 and one 0-8 antenna ammeters, \$3.00 ea.; one 8ud, 2500 v filter condenser, one 2ud — 5000 V filter condenser, \$8.00 each; two 400 Ma. filter chokes, \$3.00 ea. 1 wo filament xirms 5V-13 amp, \$3.00 each. One 4-125A tube, \$9.00. A. G. Waack, R #5, Barrington, Ill.

**MULTIBAND** antennas. As designed by W4DZZ. See QST March 1955 and Radio & TV News for Dec., 1949. Write for details now! Frederick Tool & Engineering Corp., 414 Pine Ave., Frederick, Md.

**WANTED:** Modulator that will modulate Millen 90881 500-watt final (812a or 812As). Vahder Merritt, W9KVC, Plainview Place, Campbell, Missoua.

**RCA** KRK-35 VHF-UHF tuner for sale. Never used, in original box, perfect condx: 6BQ7 cascode RF, IN 82 mixer, 6BQ7 cascode IF. Ideal for ham 54-144-220-440 converter. Paid over \$95. Will offer for \$55.00. Alen Gordon, W3RCJ, 4609 N. Broad St., Phila., Penna.

**SALE:** Viking I TVI-suppressed, 122 V.F.O. in gud condx: \$175. W2PLV, E. Sockwell, 488 Irving Ave., Bridgeton, N. J.

**HRO-60** with coils A,B,C,D in excellent condx as it left factory: \$380. .30 ft. tower in three sections, with small propeller pitch motor, deluxe direction indicator, shielded 7 conductor cable, \$100. Oak desk 60" x 36" x 30" with oak chair: \$15. Wm. Baxendale, 2026 Kimball, Brooklyn, N. Y. Will not ship.

**SELL:** Lysox 60u, in gud condx, \$50. Steavenson, 71-B Hilltop, Manhattan, N. Y.

**SELL:** New NC88 #98; new TBSS0D and power supply, \$110; used TBSS0D, \$80; MC35 converter, \$45; 20A with 5 band VFO and QTL #220; General Electric FM tuner, \$20. Many parts. Lamb, W3VDE, 1219 Yardley Rd., Morrisville, Penna.

**FOR Sale:** Barker & Williamson Butterfly condensers, types CX45B, CX34B, JCX50E, JCX100E, UTC power transformer S48, also bias transformer PA315 driver transformer 238 AX push pull Parrel 2A3 or push pull 6L6 or 845. Stancor clipper filter SA403A, Barker & Williamson BV1 coils and swinging link jack-bar. Pair of Johnson condensers 100D70. Triplet meters filament and milliammeter. Wm. H. Martin, Fife Road, Rd #2, Bridgeville, Pa.

**VIKING II** VFO filter. In excellent condition. \$235. G. N. Burwell, 9 Fairview Place, Morristown, N. J.

**SWAP:** 32V2 TVI-suppressed; 75A2; custom built 800W final, original cost \$700; Johnson 10-20 beam; 40 ft. Vee DX tower; prop pitch motor; Kreco 20M. mobile with Gonsel converter; all or in part for camera equipment, 35mm; movie; 4X5 view camera, etc. W2RLX, Saper, 881 Cambridge Road, Woodmere, L. I., N. Y.

**FOR Sale:** Brand new Hallicrafters SX-96 receiver with matching speaker. Perfect condition, used less than four hours: \$250. W3KYP, Carl J. Wiuhide, 1033 Ridge Ave., Sharpville, Penna.

**MEISSNER** EX Shifter, A-1 condx, \$35.00 or will swap for gud 21 meg. converter. Jim Mitchell, 621 Palisade, Pasadena, Calif.

**FOR Sale:** HQ-140X, Best offer over \$175. BC-453, QSer with power supply, \$12.00. W7QXD.

**HALLCRAFTERS** SX-88, \$450; Viking I, VFO 10 xtals. LPF, \$225; 2KVA 220 volt Variac, \$20; Wilcox F-3, \$25; Central Electronics signal slicer, AP-1 adapter, \$50. G. H. Goldstone, W8MGO, 25416 Parkwood, Huntington Woods, Michigan.

**BARGAINS:** WITH NEW GUARANTEE: S-38A \$29.50; S-40A \$69.00; S-47C \$59.00; Lysox 600 \$89.00; S-27 79.00; SX-43 \$129.00; S-76 \$149.00; SX-71 \$169.00; SX-42 \$159.00; HRO-50T1 \$299.00; Collins 75A3 \$425.00; Sonar VFx 680 \$29.50; Eldico TR75TV \$35.00; Heath AT-1 \$24.50; Meck 760 \$39.00; HT-17 \$29.95; EX Shifter \$39.50; Globe Trotter \$49.50; HT18 \$69.50; Harvey Wells sr.

\$69.00; Elmac A-54H \$89.00; PSA 500 \$27.50; Viking I \$159.00; Viking II \$209.00; SS-75 \$139.00; Globe King 275 \$249.00; Globe King 400A \$299.00; 32V1 \$365.00; 32V2 \$425.00; 32V3 \$525.00; and many others. Free trial. Terms financed by Leo, W8GFO. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

WANTED: HRO60, 50T1, 183D or SX-88 for 3/4 x 4K current model Pacemaker Speed Graphic outfit complete in carrying case. Guaranteed perfect. R. Long, 933 East Broadway, So. Boston, Mass.

WANTED: McMurdo-Silver xmitter. Model 701, also the best receiver that \$75 or less will buy. Love, 62 Gaston St., West Orange, N. J.

HAMMARLUNDS, Nationals and Hallicrafters bought, sold and traded. 15 on hand. Phila., Marcy, Turner, 6-4007.

FOR Sale: Complete 10 M mobile installation, Subraco MT-10X xmitter, Carter 450V Gen-I-Motor, Gonset Tri-band converter and noise clipper, mike w/push to talk operation, whip, mount and all cables. Fat Luciferiano, K2AKC, 20 Hyatt Ave., Yonkers 4, N. Y.

SELL: Latest Model Sonar SRT120P, includes power supply, VFO 120, spare 9003/5894. Excellent condition. All for \$150. K2KZP, Lt. Navarro, Box 77, Griffiths AFB, Rome, N. Y.

FOR Sale: SX-71, Sonar SRT-120 trans. W/VFO. D104 mike and Balun coils; gud condx; \$250. K2EIO, H. Segal, 2101 Tiebout Ave., Box 57, N. Y. Tel. SE 3-8355.

FOR Sale: "Net Control Mobile". A complete mobile home with 110 volt (1000 watt) lights, hot and cold running water, complete bathroom facilities, sleeps six. This bus in in first-class mechanical condx and is capable of going anywhere. For further details, see the descriptive article in May Q.C. (page 48) and write Paul M. Kersten, M.D., W9WWT, 1235 Fifth Ave., South, Ft. Dodge, Iowa.

WANTED: S40B in gud condx for Masonic shud-in. Pse be reasonable. Blum, 1587 Kent St., Columbus 5, Ohio.

CANADIANS: A-1 Kw xmitter for sale. Commercially built. RF-P3304TH Driver-81, 2KC 807, xtal-VFO-807, 6C6 multiplier, 2-VR150 and Variac; power supply: 2-872, 2-866, 2-805 plate mod. with self pw. supply; speech ampl. 25w Stromberg. Make an offer. Receivers or desk type xmitters as trade in will be accepted. Details & picture on request. VE2OU, P.O. Box 23, Riviere du Loup, Quebec, Canada.

COLLINS 75A-1 with Q-multiplier but no speaker: \$225. In gud condx, recently realized. WR1WD, Box 1832, New Haven, Conn. Will sell S40-B, \$60; BC-348 with AC pwr, \$65; 6V Dynamotor, 450V 175 Ma., \$30.00; Dave Hynes, Box 112, Lake Pleasant, Mass.

WANTED: Measurements Model 80 signal generator. State price and condx. G. W. Swartzlander, W8EPT, 1220 Stillwell Ave., Fremont, Ohio.

SALE: Sonar mobile receiver, 20-15-10-80-75; cost \$89, used 4 hours: \$50.00; Sonar SRT 120 100w power 120w c.w. In new condx. VFO filter and antenna relay including power supply, \$185; Mallory VP-552 Vibropack with filter; needs vibrator, \$7. Herbert Holzberg, W2FC1, 125 Hobart Ave., Kutheriord, New Jersey. Tel. WvEsteb 9-1101.

FOR Sale: Late 32V2 xmitter with 35C-1 low-pass filter. Like new, \$195. Gordon Spensler, WB2BR, 567 Michigan Ave., Mansfield, Ohio.

TRADE: PMR-64, guaranteed; for A54, A54H or AF67 plus cash. Or sell. W2DPZ, 5009 N. Stearnson, Oklahoma City, Okla.

TRADE: matched pair Smith & Weston 22 and 38 calibre pistols with bone handles, heavy duty 38 calibre cartridge belt with double holsters; 32 nickle plated Colt automatic with side and shoulder holsters, all above in new condition. Want high powered rig. W4ESV, Box 211, Southport, N. C.

TELETYPEWRITER: Model 26, printer and keyboard. Recently overhauled by qualified telephone repairman. In excellent condition. Best offer over \$150.00. Art Jackson, 309 Whitney Ave., Louisville, Ky.

WANTED: Collins 310 B-3 or 310 B-1 with coils and instructions. State price and condition in first letter. Joseph Ferenc, W3TVB, 68 Linshaw Ave., Pittsburgh 5, Penna.

\$55 takes all this: New 813, Johnson 100D90 variable condenser, 813 socket and filament xformr, UTC-PA302 high voltage xformr, 0-500 Ma. Weston meter, Johnson 23G45 neutralizing condenser, 300 Ma., filter choke, 2-4 μfd 1200v. filter condensers, 100 feet new coax, 2 — 500 Ma. R.F. chokes, 3 mica hi-voltage by-pass condensers, 2 — 866 sockets and plate caps. W8QKU, 2748 Meade St., Detroit 12, Mich.

LEAVING Ham Radio until the kids get a little older. Viking Ranger and HQ-120 plus Heathkit scope and signal generator, new Weston meters, (2) 4-125A, many other items, will send list if interested. WQZYM, Paul Patrick, 5251 South Pennsylvania, Cudahy, Wisconsin.

FREE List: xmitter parts, etc. W2AKC, 139 South Ave., Penn Yan, N. Y.

COLLINS 32V-2 in perfect condx, \$375.00. W4FLS, 220 No. Howell, Chattanooga, Tenn.

JOHNSON II, factory-wired, nearly new; Johnson VFO, NC-125 receiver, D-104 mike. Best offer above \$355 takes all. W9KXL/6, 8075 Golden Gate Ave., Riverside, Calif.

GIVE away — free: Transmitters, receivers, test equipment, tools, junk box, etc. Needed for high school radio club. Notify Father Jerome E. Gerum, W9GPT, Regis High School, Eau Claire, Wis.

2-meter beams: 6 element, horizontal or vertical, all seamless aluminum. \$6.95 prepaid. Wholesale Supply Co., Lunenburg, Mass.

PACKAGE deal: govt. surplus, entirely unused, unmodified, original cartons: ART-13 speech amplifier, ART-13 modulation transformer, 2 RCA 811s, 3 RCA 813s, plus copy 12th ed. Radio Amateur's Handbook containing modulator schematic, pr 811s to 813. \$40.00 F.o.b. A. Gorshick, 1207 Wadsworth, North Chicago, Ill.

HAVE quantity of transceivers, easily converted to 6 or 10 meters. Also have Sigma 4F-8000 ohm sensitive relays SPDT, \$3.50 plus postage. SP6RA, 37-10 33rd St., L. I. C., N. Y.

OUTSTANDING ham list revised monthly. Our prices on trade-ins are realistic and down to earth. We feature Johnson, National, Collins, Hallicrafters, Gonset, Elmac, Harvey-Wellis, Morrow, Central Electronics and all leaders. We trade easy and offer time payments tailored for you. All leading brands of equipment in stock. Write today for latest bulletin and a copy of our new catalog just released.

Stan Burghardt, WB2JV, Burghardt Radio Supply, Inc., Box 746 Watertown, So. Dak.

40 WATT xmitter 160-10 cw-fone xtal mike, \$40; 160 meter VFO \$10; 35 watt xmitter, c.w., \$25. Write for full details. W8PFW, Degraft, Ohio.

TRADE: 9 ft. Wingspan gas model airplane with motor, suitable for radio control; 12 volt dc 10 volt inverter, 125 watts; horizontal photo enlarger. Need: receiver, transmitter, mobile equipment, beam antenna. B. Pivnick, VE3AOA, 15 Calvin Ave., Willowdale, Ont. 1, Canada.

WANTED: KP8I receiver, state price, condition, etc. W9JFB, Chester Benson, 311 South 5th St., Richmond, Ind.

SAMPLES from largest used equipment inventory in the East: Eldico MR-2 \$39.95, TR-75TV \$59.95; Electro-Mechanical VX-101 Jr. \$29.95, deluxe \$59.95; Ilenco BSM-3 \$50.00; Hallicrafters SX-16 \$69.95, S-20K \$44.95, S-2R \$39.95, SX-25 \$69.95, SX-28 \$124.95, S-29 \$44.95, S-38 \$29.95, S-40A \$69.95, S-41 \$69.95, SX-42 \$179.95, S-53A \$69.95, SX-62 \$250.00, S-76 \$139.95, S-82 \$34.95, S-10 \$39.95, R-46 \$12.95, HT-17 \$39.95, HT-18 \$59.95, Lycoo 500 \$79.95, 600-S \$129.95, 650 \$69.95, B-129 \$9.95, A-180 \$9.95; Millen 90281 \$49.95, 90700 \$19.95, 90800 \$19.95, 90881 \$69.00; Morrow 3BR \$34.95, 5BR \$49.95, FT-8 \$71.95, FW-6 \$17.95. For latest complete list write Carl, WIBFT, Evans Radio, Concord, N. H.

NEW Crystals for all commercial services at economical prices; also regrounding or replacement crystals for broadcast, Link, Motorola, G.E. and other such types. 20 years of satisfaction and fast service. Seud for L-7 catalog. Edson Electronic Company, Temple, Texas.

FOR Sale: NC-125 and speaker, \$110.00; Super-Six converter with steering mount, excellent, \$35.00; Elmac A-54-H, matching PS-500 A.C. power supply, \$110.00. PE-103 Dynamotor, \$20.00. W5VRO. TV exciter, 150 Mcs., complete, \$35.00; Bendix TA12 transmitter, \$35; 1/4 in. electric drill, new, \$20.00; new mobile antenna with mount, \$10.00; Gonset converter, \$22.00; police receiver, \$25.00; precision tube tester, \$30.00; RME-70 receiver, \$65.00. Wanted: Gonset Communicator; Motorola 169-20A, outdoor speaker; Hignley, 82 Lower Main, Matawan, N. J.

HRO model 7, 50, or 60 wanted, with coils. State condition, availability for inspection, and terms. WIDPY, Robert R. Kalloton, Lenox, Mass.

FOR Sale: Viking mobile, complete with mike, \$70; Gonset Tri-band Deluxe, \$24.00; whip with Master Mobile all-bander coil & mount, \$17.00; 6 VDC dynamotor 600 w/h at 350 mills, \$13.00; 12 VDC dynamotor 600 w/h at \$13.00. J. P. Bernd, W8QCH, 1201 Mills Ave., No. Muskegon, Michigan.

RUBBER Stamp with your call letters, name and address: \$1.50; stamp pad 35¢. El Kay Stamps, Box 5-WF, Toledo 12, Ohio.

NOVICES: Run the legal CW limit now. Add phone in future. 75 watt bandswitching (160-10) transmitter kit: \$69.95. Modulator: \$19.95. Details free. Hart Industries, 467 Parke, Birmingham, Mich.

SALE: 75A-1 receiver, excellent condition, \$225.00; Amertran transformer, input 110v output 6200V 700 mills easily center-tapped, \$40.00; two new Elmac 4-250 tubes, never lit, \$30.00 each. All prices F.o.b. Beverly, N. J. W5ALC, Millis, 105 Hendrickson Ave., Beverly, N. J.

FOR Sale: Two Navy walkie-talkies, 28 to 80 Mc.; tubes, mikes, four antennas, net vibrator supply, manual, wait for \$70.00. SW54, like new, \$35.00, S-38B, \$27.00; UTC-LS 141 trans., new, \$10.00. Want S-53 and 6 ft. rack cabinet. W2HJ, John A. Scherbel, 111 W. Hoffman Ave., Lindenhurst, N. J.

FOR Sale: SX-16 revr xtal, new tubes, lab aligned this month, top condx. \$55.00; new freq. calibrator, complete with RCA 100 Kc. xtal, \$11.00; Brand new BC-453 recvr (190-550 Kc) sealed carton, \$34.00; 750 watt broadcast modulation xformr radio, \$4, \$18.00; S-CR-522 separate recvr xmitter tank parts and nut tubes intact, like new, \$4.00 for either, \$7.00 set. PL-94 new, \$2.00. Sturdy chrome mike stand 42" to 73", \$4.00. New hi-quality telephone handset, butterfly switch, perfect mobile \$5.50; new Shure hi-ft tape recording playback-erase head, \$4.00. First check buys, others returned. S. Tucker, W2HLT, 51-10 Little Neck Parkway, Little Neck 62, N. Y.

UHF equipment bargain! Navy type SFT-6 UHF transmitter; 300 to 1400 Mcs; 9 watt minimum output at 1400 Mcs; complete with tubes, AM modulator, and 110 VAC 60 cycles power supply, \$400.00. F.o.b. San Francisco, write Vic Poor, KH6AXV, Quarters 203-1, NAS Navy 128, c/o FPO, San Francisco, Calif.

SALE: Collins 75A-1 recvr, \$250 and Viking II transmitter with VFO, \$250. NYC and vicinity. M. Katz, W2KPE, 147-11 76th Ave., Flushing 67, L. I., N. Y. (Tel. BO 8-0672).

WZESC cleaning house. Metropolitan area hams write for list or phone Gramercy 3-0292.

TRANSMITTER Viking Kilowatt, new, uncrated but not fired, \$1375.00 F.o.b. Wash., D. C.; Unecrated receiver, AR88, broadcast & ham bands, in excellent condx, \$200 F.o.b. Wash., D. C.; Single sideband slicer, model A, in excellent condx, with AP1 adapter. Cannot be told from new, \$60.00 F.o.b. Wash., D. C.; Gonset Tri-band converter, in gud condx, \$25.00; F.o.b. Wash., D. C. Reasonable offers on all above will be considered. Sigmund Aedes, W3WQN, 9700 Marshall Ave., Silver Spring, Md.

REAL Bargains: new and reconditioned Collins, Hallicrafters, National, Elmac, Johnson, all others. Completely reconditioned with new guarantee. SW54 \$25.00; NC57 \$59.00; NC125 \$129.00; NC183D \$299.00; HROSOT1 \$299.00; HRO60 \$389.00; Collins 75A2 \$299.00; 75A3 \$399.00; 32V1 \$349.00; 32V3; HQ129 \$169.00; HQ10X \$219.00; S58 \$29.00; S40C \$79.00; S88 \$89.00; SX99 \$19.00; SX1 for 20 75M; SX62 \$179.00; TBS-C69, 99 A.C. Elmac receivers and transmitters; Viking Ranger \$179.00; Viking II; many others. Shipped on approval. Easy terms. Satisfaction guaranteed. Write for free list. Henry Radio, Butler, Mo.

MOVING: Must sell 400W SSB transmitter; Central Electronics 10R exciter W/QTT unit, linear amplifier PR/811 1350V 500 Ma power supply. BC458 VFO coils for 20/75M with spare tubes, all rack mounted. \$350.00. 15W linear amplifier in cabinet w/ pwr supply, coils for 20/75M; SX62 \$179.00; TBS-C69. Central Electronics SSB slicer, factory-wired, \$50.00; 2 meter station 522 transmitter, Terafort converter, pwr supplies and Hallicrafters Sky Chief revr, \$75.00; Herbrand, mechanics cabinet and tool box with some tools, \$50 or will trade on mobile unit. J. Godfrey, W12ZF, 126 Churchill St., Fairfield, Conn.

SELL: Viking II TVI-suppressed, VFO, Matchbox, \$250.00; HQ129X, \$150; VHF152A, \$45.00. Won't ship. W2WTB, Wells 8-0396. Plainville, N. Y.

FOR Sale: Hy-Lite beam 20 m. 3-element, \$30; 3 ten ft. sect. steel tower, new, \$25.00; Viking Mobile \$60.00; crystal calibrator Model 111, Measurements Corp. \$50.00; 10 m. Gonset; 630A Triplett multi-meter; Hickox vacuum tube voltmeter; Lambda power supply \$25.00; Precision, Signal generator E-20-C; Malloy charger BK310; UTC; CVP-1; CG-59AX. Many other parts, transformers, tubes, meters, relays, etc. Fred Williams, W2WZT, 546 Washington Ave., Nutley, N. J.

WANT small printing press. Will swap ham gear. W9QFZ, 2318 Second Ave., Council Bluffs, Iowa.

MUST Sell: Heathkit AR-2 receiver. Recently aligned. In excellent condition. \$30. Robert Champlin, K2BKX, 131 Bryant Ave., Springfield, N. J.

FOR Sale: One automatic telegraph printer, used; \$28. Relays: Advance, 115 BR-1 coaxial \$21.00; also 115 volts AC DPDT antenna changeover, \$1.50. Jay Sewell, East 14th Ave., Belton, Texas.

SELL: New York City area: Viking I, VFO, low pass filter, spare 4D32, factory wired, TVI-suppressed, perfect condx. Also filament and low voltage power transformers, crystals, microphones, 4  $\mu$ d, 1000 v. filter condensers, relays, earphones, etc. W2EQS, O'Brien, 48 Prospect, Westwood, N. J.

FOR Sale: Completely TVI suppressed BC610 and BC614E on casters, with external VFO and power supply, 10, 1 meter coils, spare 2500 Hz. internal generator E-20-C, Malloy charger BK310, tubes, W2BYF, George Mack, 71 Tuttle Road, Briarcliff Manor, N. Y.

FOR Sale: All new RCA813, \$10; 814. \$3.00; two 829Bs, \$7 each; BC-375 var. Ind., \$10; new ART-13 Sp. Amp., \$12, new Thordarson chokes; two T-20C56, \$4.00 each; two T-20C54, \$2.50 each; Westinghouse 4HY, 350 Ma., \$3.50, 10" PM speaker and cabinet, \$5.00; RC-453 converted w/pwr supp., \$10.00; power supp. 1200V, 250 A., \$12.00 National, 151 A Valley Ave., Birmingham, Ala.

SELL: NC173 w/speaker, \$130. Eico eliminator, \$10.40; Heath TC1P, Millen angle drives, new, \$3.50. M. Marshall, 455 Washington Ave., Dumont, N. J.

SELL: Elmac PMR6A, like new, with Vibrationpack. \$107; partly wired, W2AEF mobile all-band 50 w. xmtr with tubes and AC pwr supply for xmtr and PMR6A \$50 complete mobile ant. Vaero all-band coil, \$18.00; 6V dynamotor, 425v-280 Ma., \$8.00; 522 xmtr, \$6.00; BC-375 Roto-coil, \$4.00; Eimac 4-1000A, \$35; RCA-715C, \$7.00; Thordarson T22R35, \$5.00; T20C56, \$3.25; Merit P-2943 8430 Hz filter conds. D. Gardner, W2GSS, 209 Knapp Rd., Syracuse 4, N. Y.

FOR Sale: Heath AT-1 and AC-I coupler, both in excellent condition, \$35.00. Alan Steger, K2JYH, Box 97, Huntington Sta., L. I., N. Y.

FOR Sale: NC-125 receiver, excellent condx, \$115; Millen 90810 transmitter, excellent condx, with tubes, coils for 2, 6, 10 mtrs., xtal for 2 mtrs: \$65.00. Three 829B tubes, new, \$5 each. L. Hoover, W9MEN, 321 Park Ave., Clarendon Hills, Ill.

HALLICRAFTERS SX-96 receiver and R46B speaker, one month old, with FCC-90 bandedge marker, \$290.00 value for only \$220.00 F.O.B. Also National SW-54 receiver, K2MQQ, 130 East End Avenue, New York City 28.

FOR Sale: New and used Gonset mobile equipment, Communicators, two and six meter linear amplifiers, six meter converters, etc. Trades-in accepted. All type of ham gear bought, sold, exchanged. Graham Company, R. Graham (W1KJT), Stoneham, Mass. Tel. ST 6-1966.

PERFORATED aluminum sheet, .051, 5/64" OD holes, 1/4" centers, \$1.20 sq. ft.; cut to size. Radcliffe's, Fostoria, Ohio.

SELL or swap: Millen #90810 xmtr for 2, 6 and 10 meters, SW-54 rcvr, BC375E xmtr with tuning units, Command xmtr, SCR522, 2 meter xmtr & rcvr; 6 meter beam, ART-13 freq. standard (200 Kc.); BC-946 rcvr; transformers, meters, relays; oil & mica cond. mica items, etc. Many old type receiving tubes. Want: Supreme 542 tester, meter, new, not good. SX-24 or SX-25. Free list. W9ZOB, Box 273, Coleraine, Minn.

SELL: Drake low pass filter 52 ohm and heavy duty DPDT ant. relay 110VAC Automatic Mfg. Co. Both slightly used. Both for \$10.00. W9NUI, Box 171, Henderson, Minn.

HAMMARLUND HQ-129-X for sale, perfect electrical physical and mechanical condx., \$125.00. Geo. K. Hudson, W2BHZ, R 42, Pine City, N. Y.

HRO-60, late model, with four coils: \$400; Collins 32V3, \$550; Collins 310B3, complete, like new, \$200; BC-348H, in spotless condx, \$65; Collins BR-1 xtal calibrator for 75A2/3, \$15.00; Jennings Vacuum Variables, 10-200  $\mu$ d, 10 KV \$35; \$45  $\mu$ d 17 KV, \$25.00; new, unused Eimac 4-65As, \$25.00 pair, new Westinghouse 0-800 MADC 3/4" round milliammeters, \$3.00; 250 watt Class B modulator 811As, completely wired, \$50; Associated speech amplifier and bias supply, \$20.00; SX-71 receiver with speaker, \$165; used Bud 66 in. xmtr cabinet; won't ship, \$20.00. All F.O.B. Elmhurst, Ill. W9AMU, John Huey, 390 Hill.

SWAP or sell: Johnson Viking II and VFO, perfect, \$250 or trade for mobile and standard P110X with pwr supply, \$150; Gotham 3-element 20 meter beam, new, prop pitch motor, trans., selsyn, Write John Harley, Jr., K2HHY, 730 - 54 St., Brooklyn. Tel. GE 5-1263.

WANTED: HRO-5 coil unit covering 500 Kc (600 meters). G. Pearson, Little Lane, Haverford, Pa.

500 watt cw/fone/FM, 813 final, Class B modulation, TVI-suppressed, Variac plate 0-2300V, 7 meters, 25 tubes, coax antenna relay, grip-to-talk, clipper (Handbook) speech amplifier, BW-TVL coils, black 7" cabinet/pans, decals, one year old, designed around signal shifter, request details, \$375; Signal shifter, EX, PMK, panel mounted for above \$45; Mobile rig, 25 watt, 75 meter, 6L6 modulators, xtal receiver converter, dynamotor 6V/390V/200 Ma., Master whip and mount, Master all-band coil, used 2 months, complete, \$75; Generator, gasoline, 115 VAC, 1380 watt, Homelite, \$70; Variac, \$10; 4-125A, \$10; Selsyns, 110 VAC, \$10; Hickox 531 tube tester, \$18. W4CHO, Lanett, Ala.

GLOBE Scout 40A bandswitching 160 through 10 fone/cw xmtr, \$85.00; Hallcrafters SX-99 receiver, \$15.00; Heathkit WF1-1 wired, calibrated with separate power, \$20.00; Astatic D-104 microphone, stand, \$12.00; above positively like new, almost unused, will take \$195.00 as group. Bud Codemaster CPO-128, \$12.00; Heathkit VFO-1 factory packaged kit, with power supply kit, \$20.00; Vibro-

plex "Lightning" bug, \$9.00; Balun coils, \$4.50; Advance 115 volt coaxial relay, \$7.50; Code oscillator, built-in key, speaker, \$6.50; National NC-183 receiver, \$165.00; Hallicrafters S-85 receiver, \$95.00. F.O.B. Indianapolis. Guaranteed perfect, request detailed list. W9DPI, Howard Severide, 2431 E. Riverside Dr., Indianapolis 23, Indiana. Tel. W4LNU 4-2184.

WANTED: 400 and 800 cycles motors and frequency meters; Telescope tools, and reperfector; repeater TG30; 75A2; 75A3; M209 converter; BC342 manual; books on acoustics, noise, sound. John Longley, W2ANB, Slingerlands, Alb. Co., N. Y.

NEED space: Complete 80 thru 10 xtal-VFO 300 w. phone-w/ 813 rig; TVI-suppressed, \$ale \$150.00 or swap for Viking Ranger, F.O.B., stamp for details. W4UUB, Box 2163, Sta. A, Spartanburg, S. C.

SELL: National general coverage receiver, NSD100, \$40; mobile transmitter Subraco MT15X, \$35.00; Hallicrafters receiver S-36, excellent, \$95; Millen exciter, \$20; window neon sign, replaceable letters, wonderful and very rare, \$65.00; Ilea power mobile Lyso transmitter for 75 meters, \$15.00 with tubes; wide carriage accounting typewriter, Underwood, \$45.00; Stancor tabletop 100 watt c.w. transmitter all bands, \$50.00 bargain; tape recorder and playback Brush Model BK401, excellent, \$95.00; Collins 32V2, \$425. Contact Paul Revel, 129 Midland Ave., Glen Ridge, N. J.

CRYSTALS Marine, new, airmailed, Transmitting \$2.95, receiving \$2.50. Specify holder pin dimensions. Crystals since 1933. C-W Crystals, Box 2065, El Monte, Calif.

KW roller coil, \$10; Johnson 500E20 cond., \$5; 500 Kc xtal calibrator \$10.00; 6A7, 6L6, 829B Novice xmtr, \$60; 75 watt Bud C.T.C.L. with 100  $\mu$ d cond., \$7.50; 35 watt National C.T.C.L. with 100  $\mu$ d cond., \$5.00. Robert Clough, W2PCI, 172 Blvd., Pompton Plains, N. J.

SELL: Gonset Super-Six converter in original condition. Best offer. Millen Variam VFO for \$5.00. C. H. Willard, W2E2B, 2023 Baker Ave., Utica, N. Y.

GENERAL Electric aircraft sighting station, loaded with selsyns, beautiful high-speed optical system, gadgets galore. New, untouched, in original crating. Weighs 300 lbs. First \$100 takes it FOB. This is a rare baby, Govt. cost \$9,000. Sam Goldish, W5TVG, 3830 South St. St. Louis, Tulsa, Okla.

SELL: Millen 90810 bandswitching exciter, 6146 final, with tubes, \$40.00. A. H. Hardwick, W2YQ, Orange, N. J.

SELL: ART-13 (ATC-1) model unmodified on original TCZ cabinet power supply with selenium rectifier instead of M.G. set for low voltage, variac controlled, line filtered, \$385; SCR-522 new, with cond. coils, plug-in dynamotor, \$67.50; BC-474 80 cw 75 fone xmtr and rcvr, \$40. W6CBF, 3535 Brunell Drive, Oakland 2, Calif.

HALLICRAFTERS SX-28 receiver with speaker; \$100; Vibroplex key, like new, \$10.00. Some other gear, reasonable. M. D. Welch, 2749-49th S.W., Seattle 16, Wa.

VE Hamel Selling 250-watt cw., 125 watt fone; \$100 or trade gun, camera, VE30I, Belle River, Ontario.

FOR Sale: Light plant 600-700 w. 110 A.C. 60 cyc. gasoline engine, belt-driven unit. Engine can be used for other power driven appliances. WIBNB c/o Advent Camp grounds, P.O. Plainville, Ct.

BEST offer takes Viking Adventurer, new BC459A, 40-watt modulator, 522 transmitter-receiver, new 829B, home built SS super het. W2HWN.

LETTINE VFO, Instructograph wanted. Carlisi, Box 381, 25 South St., New York City.

SELL: Brand new: 2 Kw. Variac, 0-135 volts, 15 amps, \$29.50; Chicago plate zirms 4700 volt c.t. at 350 Ma., 115 volt primary, \$21.50; filter chokes 6 henry, 400 mil; 19 K.V., ins., \$4.75; oil condenser, 2  $\mu$ d 4000 volt D.C. 2 for \$5.00; dynamotor 12 volt, 600 volt at 225 mills with spare brushes, \$11.75; 12 volt dynamotor 500 volt at 400 mills with filter box and relay, \$17.95; panel meters G.E. 0-4 amp. R.F., 2 for \$6.50; 0-300 Ma., \$3.75 0-500 Ma. \$3.75; 6 volt dynamotor 400 volt 300 mills, used but OK, \$12.95. W2JDR, 252-73 Leeds Rd., Little Neck, L. I., N. Y.

NEON-GLO desk alt signs: \$2.00. Write Hulvey, W9PLW, 4325 Johnson, Gary, Ind.

WANTED: Teck manual or schematic diagram for Navy LM-7 freq. meter. Paul Barrett, W1PW, St. Johnsbury, Vt.

WANTED: Complete home and mobile station or any part. 500 to 1000 watts; 20-15-10 meter beams, rotator, indicator, tower, receiver. Dr. M. Gordon, W2UKV, 201 Barberry Lane, Haddonfield, N. J.

FOR Sale: Collins 75A-3; includes speaker, crystal calibrator and extra mechanical filter. Receiver in brand new shape. Price \$400. WIDBS, John Savonis, 11 Dwight Ct., New Britain, Conn.

HALLICRAFTERS SX-42, with R42 spkr, in gud condx, \$160. Also S-38B, \$20.00. Police-Armory 30-50 Mc FM, \$30. Ray Ketcham, 1607 Park Ave., Plainfield, N. J.

FOR Sale: Mobile radio complete, Elmac transmitter, Sonar MR3 receiver, Mallory dual vibrator, relays, etc. \$175 or best offer. H. B. Pearson, 98 21st St., Brooklyn 32, N. Y.

ELDICO TR-75TV, wired, \$60; NC-57, \$65; BC-211 freq. meter, \$50. W3TBT, 92 Edison St., Wilkes-Barre, Pa.

FOR Sale: Used Heathkit AT-1 transmitter and AC-I coupler, with manuals, \$30. Prefer local transaction. Lou Tonik, 1505 No. Sixth St., Phila., Pa.

WANTED: Following copies of QST: Jan., Aug., Nov., 1947; Jan., Feb., June, July, 1948; Nov., 1951; Jan., 1952. Herbert A. Frank, 13 So. Colony St., Meriden, Conn.

\$13 Ameco Code Course used for 60 days: \$7.00. Alex Siegel, 1516 Shakespear Ave., Bronx 52, N. Y.

FOR Sale: Collins 75A2 with Hallicrafters SP-44 Panadapter, \$325. Johnson Ranger, \$180. Chatfield, Redstone Arsenal, Huntsville, Ala.

FOR Sale: Elmac mobile rcvr and pwr. supply; 6 volts, used 3 months, is as new, \$115.00. Also want good used HQ-129X. Ken Atkins, 405 Cedar St., Leaksville, N. C. W4WMP.

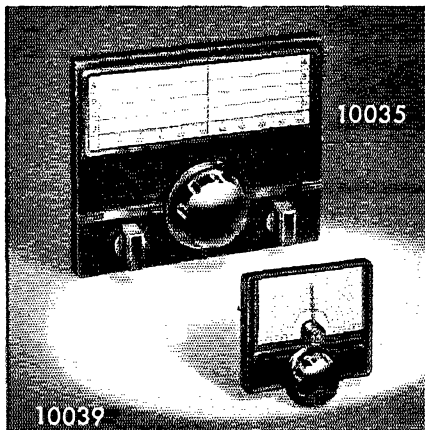
WANTED: ART-13, ARN-7, BC-221, ARC-27, etc. Also all types electronic tubes. Bob Sanett, 1524 S. Edris Dr., Los Angeles 35, Calif.

WANTED: Pointer coupons from Olson-Akron, Ohio. Cash or trade electronic or ham gear, any quantity. W4WT, Eubank, 1227 Windsor Ave., Richmond 27, Va.

# Designed for



# Application



### Nos. 10035 and 10039 Multi-Scale Dials

A pair of truly "Designed for Application" controls. Large panel style dial has 12 to 1 ratio; size, 8 1/2" x 6 1/2". Small No. 10039 has 8 to 1 ratio; size, 4" x 3 1/4". Both are of compact mechanical design, easy to mount and have totally self-contained mechanism, thus eliminating back of panel interference. Provision for mounting and marking auxiliary controls, such as switches, potentiometers, etc., provided on the No. 10035. Standard finish, either size, flat black art metal.

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40<sup>TH</sup> ANNIVERSARY  
NEXT MONTH!



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produced in its entirety and  
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issue.

The  
**FIRST**  
Issue...

we're trading

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at ALLIED



**why wait for that new receiver?**

**easiest terms  
only 10% down, or your  
trade-in as down payment**

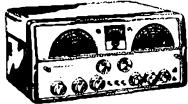
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select your new  
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top trade-in  
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and you'll see what we  
mean by "Trading High"**

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**Collins 75A-4.** Peak performance from 160 through 10 meters. Dual conversion, VFO, slow release AVC, 3.1 kc mechanical filter, etc.  
**98 SZ 767.** Net... \$595.00  
**97 SZ 776.** 10" speaker. Net.....\$20.00

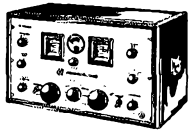


**Hallicrafters SX-100.** Dual conversion, selectable side-band receiver; 538 kc to 34 mc in 4 ranges; with 50 kc "T-notch" selectivity, etc.  
**98 SZ 769.** Net... \$295.00  
**98 SX 758.** 10" speaker. Net.....\$17.95



**Hallicrafters S-85.** Covers 540 kc—34 mc in 4 ranges. Bandsread, RF amp., dual IF's, BFO with pitch control, ANL, tone control built-in speaker, etc.  
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**Hammarlund HQ-140-X.** 540 kc—31 mc in 6 ranges. Crystal filter, ANL, 6 sel. positions, electrical bandsread, etc.  
**98 SZ 766.** Net.... \$264.50  
**97 SX 757.** 8" speaker. Net.....\$14.50



**National NC-98.** 550 kc—40 mc coverage. Crystal filter, S-meter, separate HF osc.  
**98 SZ 732.** Net.... \$149.95  
**NC-98SW.** As above, but with bandsread for 17, 19, 25, 31, 49 meter SW BC bands.  
**98 SZ 720.** Net.... \$149.95  
**98 SX 722.** Matching 6" speaker. Net.....\$11.00



**National NC-183D.** Dual conversion; 540-31 mc and 47-55 mc in 5 ranges. 3 IF stages, 16 tuned circuits, 4.4-55 mc.  
**97 SZ 666.** Net.... \$399.50  
**97 SX 663.** 10" speaker. Net.....\$16.00



**National HRO-60.** Dual conversion; 1.7-30 mc; bandsread on 80, 40, 20, 11-10 meters. 2 RF stages; ANL; S-meter, 6-step crystal filter, etc.  
**97 SZ 722.** Net.... \$533.50  
**97 SX 721.** 10" speaker. Net \$16.00

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100 N. Western Ave.  
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Here is the first receiver in history specifically designed to include all the features most hams want at the price most hams are willing to pay. To determine what hams really wanted, National conducted a world-wide contest, offering prizes for the best suggestions for a "dream receiver"—the receiver hams themselves considered to be ideal. In the NC-300, "the dream comes true"—for its design incorporates all of the most-wanted features submitted in National's contest by thousands of hams. No other receiver available is the result of such thorough searching among hams themselves to find out what they want most.



# HERE IT IS!

## the NEW NC-300 dream receiver

WITH ALL THESE "MOST-WANTED" FEATURES FOR ONLY \$349.95<sup>†</sup>

- Features a total of 10 dial scales for coverage of 160 to 1 1/4 meters with National's exclusive new converter provision with the receiver scales calibrated for 6, 2, 1 1/4 meters using a special 30-35 mc tunable IF band.
- Longest slide rule dial ever! Easily readable to 2 kc without interpolation up to 21.5 mc.
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- Separate linear detector for single sideband... decreases distortion by allowing AVC "on" with single sideband... will not block with RF gain full open.
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- Provision for external control of RF gain automatically during transmitting periods.
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- PLUS—THE NEWEST LOOK IN HAM RECEIVERS... "MASSIVE IN THE MODERN MANNER"... truly a "dream receiver" that can be used either as a table or rack model.

**FREQUENCY STABILITY**  
excellent as a result of using a newly developed high-stability capacitor plus regulated heater and plate supplies in the oscillator.

**SENSITIVITY**  
3-6 db noise figure, 160-10 meters

**SELECTIVITY**  
at 6 db down 500 cycles, 3.5 kc and 8 kc. Selectable from the front panel without additional accessories! Nothing extra to buy!

**CALIBRATION RESET**  
adjustable from front panel to provide exact frequency setting!

**DUAL CONVERSION**  
with better than 50 db primary image rejection on all amateur bands, plus better than 60 db secondary image rejection.  
1st IF FREQUENCY—2215 KC.  
2nd IF FREQUENCY—80 KC.

**WIDE RANGE TONE CONTROL**  
—for control of both low frequency and high frequency end of response curve!

**SOCKET FOR XTAL CALIBRATOR**  
plus accessory socket for powering converters and future accessories!

**CRYSTAL FILTER**  
at 2215 kc provides nothing plus 3 band width positions in addition to the 3 IF selectivity positions. No other receiver has this versatility.

**14 CONTROLS**  
RF gain and AC on/off  
Xtal calibrator on/off  
AF gain and RF tube gain switch  
Tone control  
AM-CW-SSB-ACC switch  
CW pitch  
Main tuning  
Calibration correct  
On/off limiter  
IF selectivity

**10 TUBES** (Plus 4H4-C current regulator, 5Y3 rectifier and OB2 voltage regulator)

**TUBE COMPLEMENT**  
6BZ6 RF  
6BA7 1st mixer  
6AH6 1st osc.  
6BE6 2nd mixer  
12AT7 1st audio and 8 meter amp.

**POWER CONSUMPTION**  
60 watts

**POWER OUTPUT**  
1 watt

6BJ6 1st I.F.  
6AL5 2nd I.F.  
6AL5 ANL and detector  
6BE6 CWO/SSB det.  
6AQ5 audio output

**POWER SOURCE**  
110-120 volts AC, 60 cycles

**ANTENNA INPUT IMPEDANCE**  
50-300 ohms

**OUTPUT IMPEDANCE**  
8 ohms

**TUNING SYSTEM**  
combination gear-pinch

**BAND DESIGNATION AND LENGTH**

160 Meters—	1.8 to	2.0 megacycles
80 Meters—	3.5 to	4.0 megacycles
40 Meters—	7.0 to	7.3 megacycles
20 Meters—	14.0 to	14.4 megacycles
15 Meters—	21.0 to	21.5 megacycles
11 Meters—	26.5 to	27.5 megacycles
10 Meters—	28.0 to	29.7 megacycles
6 Meters—	49.5 to	54.5 megacycles*
2 Meters—	143.5 to	148.5 megacycles*
1 1/4 Meters—	220 to	225 megacycles*

\*Usable with accessory converters

**FREQUENCY RESPONSE**  
200 to 3,000 cycles for communications purposes.

**SHIPPING WEIGHT**  
60 lbs.

**FINISH**  
two-tone gray enamel.

**DIMENSIONS**  
19 1/2" wide (19" rack out of cabinet)  
11 1/4" high  
1 1/4" deep

**NC-300 ACCESSORIES**

**CONVERTERS**  
NC-300C6 for 6 meter band. Coverage: 49.5-54.5 mc  
NC-300C2 for 2 meter band. Coverage: 143.5-148.5 mc  
NC-300C1 for 1 1/4 meter band. Coverage: 220-225 mc

**XCU-300 PLUG-IN CRYSTAL CALIBRATOR**  
**NC-300S MATCHING SPEAKER**

<sup>†</sup>Prices slightly high. West of the Rockies and outside Continental U.S.A.



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# National

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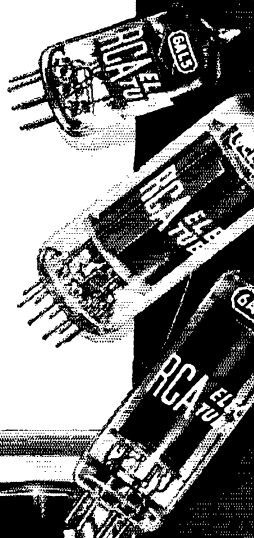
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Look inside the National NC-300! Designed and built by a manufacturer of high-quality amateur equipment for a generation, this receiver features modern circuitry throughout—including double IF conversion, new variable IF selectivity, voltage regulation, current stabilization!

Here are four reasons why RCA Receiving Tubes are preferred in amateur and commercial designs: (1) BACKGROUND QUIETNESS—for increased sensitivity through better signal-to-noise ratio; (2) LOW HUM FACTOR—to get more from the signals down close to the threshold; (3) HIGH UNIFORMITY—that makes tube replacing a "cinch"; (4) SUPERIOR STABILITY—for top performance despite normal variations encountered, even under adverse conditions.

If your present receiver is ready for "re-tubing", why not snap up the "hop" with a new set of RCA Tubes. See your RCA Tube Distributor for the types you need. And for tube data, write RCA, Commercial Engineering, Section K37M, Harrison, N. J.



**NEW  
NATIONAL NC-300  
Receiver for SSB,  
AM 'phone, and CW**

Tube	Function
6BZ6	RF Amp.
6AH6	HF Osc.
6BA7	1st Mixer
6BE6	2nd Mixer
6BJ6	1st IF Amp.
6BJ6	2nd IF Amp.
6AL5	Det. & Noise Limiter
6BE6	CW Osc.—SSB DET
12AT7	S-Meter Amp. & AF Amp.
6AQ5	AF Output Amp.
5Y3GT	Rectifier
OB2	Volt. Regulator
4H4C	Cur. Stabilizer

