December 1954
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QST

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amateur radio

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

THE STANDARD OF COMPARISON FOR OVER 20 YEARS

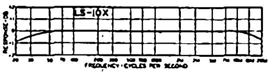
HIGH FIDELITY TRANSFORMERS

FROM STOCK... ITEMS BELOW AND 650 OTHERS IN OUR CATALOGUE B.

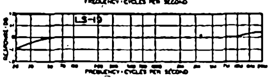
TYPICAL UNITS

LINEAR STANDARD series

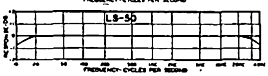
Linear Standard units represent the acme from the standpoint of uniform frequency response, low wave form distortion, thorough shielding and dependability. LS units have a guaranteed response within 1db. from 20 to 20,000 cycles. Hum balanced coil structures and multiple alloy shielding, where required, provide extremely low inductive pickup. These are the finest high fidelity transformers in the world. 85 stock types from milliwatts to kilowatts.



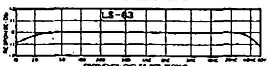
LS-10X Shielded Input
Multiple line (50, 200, 250, 500/600, etc.) to 50,000 ohms . . . multiple shielded.



LS-19 Plate to Two Grids
Primary 15,000 ohms.
Secondary 95,000 ohms C.T.



LS-50 Plate to Line
15,000 ohms to multiple line . . . +15 db. level.

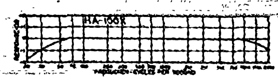


LS-63 P.P. Plates to Voice Coil
Primary 10,000 C.T. and 6,000 C.T. suited to Williamson, MLF, ul.-linear circuits. Secondary 1.2, 2.5, 5, 7.5, 10, 15, 20, 30 ohms. 20 watts.

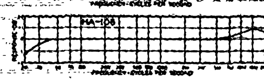
CASE	LS-1	LS-2	LS-3
Length	3⅛"	4-7/16"	5-13/16
Width	2⅝"	3½"	5"
Height	3¼"	4-3/16"	4-11/16
Unit Wt.	3 lbs.	7.5 lbs.	15 lbs.

HIPERMALLOY series

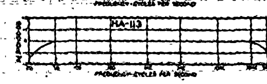
This series provides virtually all the characteristics of the Linear Standard group in a more compact and lighter structure. The frequency response is within 1 db. from 30 to 20,000 cycles. Hipermalloy nickel iron cores and hum balanced core structures provide minimum distortion and low hum pickup. Input transformers, maximum level +10db. Circular terminal layout and top and bottom mounting.



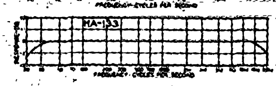
HA-100X Shielded Input
Multiple line to 60,000 ohm grid . . . tri-alloy shielding for low hum pickup.



HA-106 Plate to Two Grids
15,000 ohms to 135,000 ohms in two sections . . . +12 db. level.



HA-113 Plate to Line
15,000 ohms to multiple line . . . +12 db. level . . . 0 DC in primary.

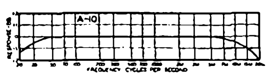


HA-133 Plate (DC) to Line
15,000 ohms to multiple line . . . +15 db. level . . . 8 Ma. DC in primary.

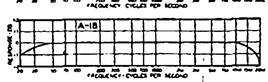
Case	[illegible]	[illegible]
Length	2¾"	3-9/16"
Width	1-15/16"	2-13/16"
Height	3¼"	3½"
Unit Weight	2 lbs.	[illegible] lbs.

ULTRA COMPACT series

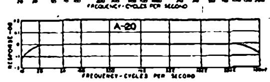
UTC Ultra Compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. The frequency response is within 2 db. from 30 to 20,000 cycles. Hum balanced coil structure plus high conductivity die cast case provides good inductive shielding. Maximum operating level is +7db. Top and bottom mounting as well as circular terminal layout are used in this series as well as the ones described above.



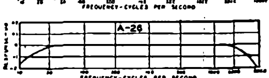
A-10 Line to Grid
Multiple line to 50,000 ohm grid.



A-18 Plate to Two Grids
15,000 ohms to 80,000 ohms, primary and secondary both split.



A-20 Mixing Transformer
Multiple line to multiple line for mixing mikes, lines, etc.

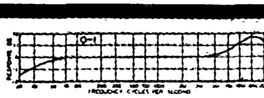


A-26 P.P. Plates to Line
30,000 ohms plate to plate, to multiple line.

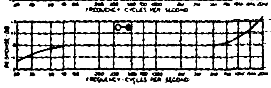
A CASE	
Length	1½"
Width	1½"
Height	2"
Unit Weight	½ lb.

OUNCER series

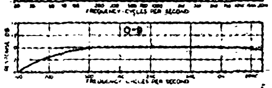
UTC Ouncer units are ideal for portable, concealed service, and similar applications. These units are extremely compact fully impregnated and sealed in a drawn housing. Most items provide frequency response within 1 db. from 30 to 20,000 cycles. Maximum operating level 0 db. These units are also available in our stock P series which provide plug-in base. The O-16 is a new line to grid transformer using two heavy gauge hipermalloy shields for high hum shielding.



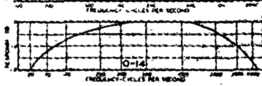
O-1 Line to Grid
Primary 50, 200/250, 500/600 ohms to 50,000 ohm grid.



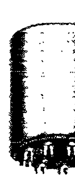
O-6 Plate to Two Grids
15,000 ohms to 95,000 ohms C.T.



O-9 Plate (DC) to Line
Primary 15,000 ohms, Secondary 50, 200/250, 500/600.



O-14 50:1 Line to Grid
Primary 200 ohms, Secondary .5 megohm for mike or line to grid.



OUNCER CASE	
Diameter	⅞"
Height	1-3/16"
Unit Weight	1 oz.

UNITED TRANSFORMER CO

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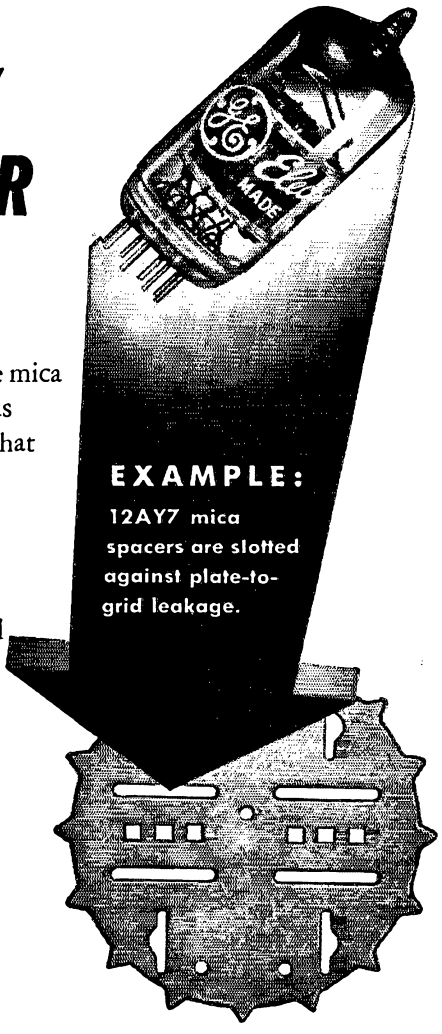
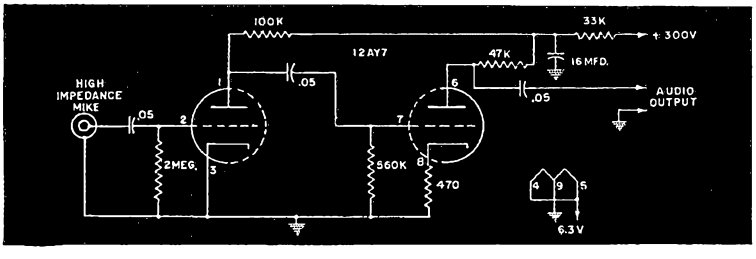
G-E TUBE QUALITY SHOWS IN SUPERIOR DESIGN DETAILS



THEY'RE special, the 4 slots that G.E. puts in the mica spacers of 12AY7 twin triodes. The slots act as barriers to plate-to-grid leakage, which can cause that baneful "egg-frying" noise in audio amplification.

You get a quiet tube in the 12AY7 because G-E designers made sure that every part is engineered for low microphonics. As with all General Electric tubes, 12AY7 high quality isn't merely determined by tests—instead, it starts at the drawing-board, is a product of many G-E design features that join to assure optimum performance.

See the 12AY7 at your G-E tube distributor's! Buy G-E tubes for every ham requirement! You can be sure your needs will be met by efficient types *designed-in-detail* for their jobs! *Tube Department, General Electric Company, Schenectady 5, New York.*



● Low noise level of G.E.'s 12AY7 enables this 2-stage amplifier to boost speech input with a minimum of hum and hiss. Build the device on a turret-type socket . . . it will take up only 1 square inch chassis space!

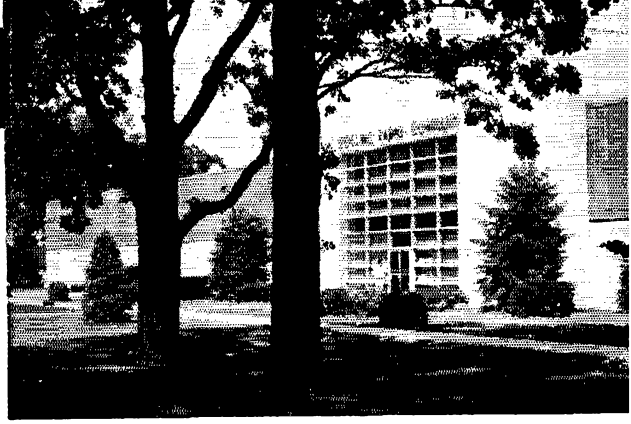
CQ . . . CQ . . . Have you nominated your Edison Award candidate?

Letters must be postmarked not later than January 3, 1955. If you haven't selected your candidate, please do so soon—then prepare and mail in your nominating letter. Instructions were given on this page in September. Trophy, gift, and national acclaim will go to the amateur who has rendered outstanding public service in 1954!

GENERAL ELECTRIC

166-186

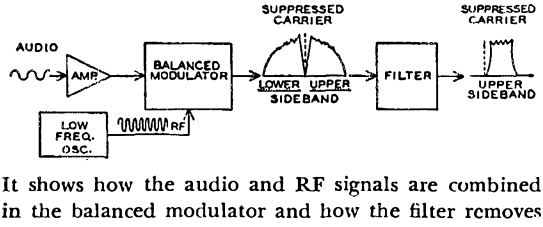
ENGINEERING NOTES



GENERATING SSB SIGNALS

The actual generation of the single sideband signal is perhaps the most important part of a SSB transmitter. In designing this part of the circuit, careful consideration should be given to the band width of the signal generated. Without careful design, this band width can be much greater than would be expected and can cause considerable adjacent channel interference on both sides of the desired signal. The most desirable performance characteristics of an SSB generator would be the ability to generate the desired sideband, completely suppress the undesired sideband and suppress the carrier. Practical design permits suppressing the undesired sideband and carrier by more than 40 db. Following is a discussion of one way that these performance characteristics may be obtained.

The block diagram below shows a "filter" type single sideband generator.



It shows how the audio and RF signals are combined in the balanced modulator and how the filter removes one sideband. If the balanced modulator is properly adjusted, the carrier can be reduced 40 db or more. Care must be taken in the design of any balanced modulator in order to prevent the RF output from coupling around the balanced modulator and being re-inserted in a later stage. This undesired coupling can be caused by stray capacitive coupling or by coupling through common power leads. Unwanted coupling around the balanced modulator will not allow complete suppression of the carrier.

The output of the balanced modulator contains both sidebands and has the RF carrier suppressed. All the modulation components passed by the audio amplifier will appear as sidebands in the output of the balanced modulator. In order to limit the transmitted bandwidth to only that required for a satisfactory communications circuit, it is necessary to restrict the passband at some point in the transmitter circuitry. This is most easily done by the filter following the balanced modulator. This filter is required to do several things. (1) It should pass the desired sideband. (2) It should limit the bandwidth of the desired sideband to that required for an intelligible communications circuit. (3) It should provide adequate suppression to the undesired sideband. (4) It should provide some attenuation to the carrier frequency. The Collins Mechanical Filter Type 455C-31 will satisfy the above requirements. It provides a transmitted bandwidth of 3100 cps. It does not require the use of any additional audio bandpass filters. It provides at least 60 db of attenuation to the undesired sideband. No manual adjustments are required to maintain this attenuation. It will provide between 12 and 18 db of attenuation to the carrier frequency, thereby reducing the requirement for a high degree of carrier balance in the balanced modulator.

The principal advantages of the filter type single sideband generator are its ability to maintain its performance characteristics indefinitely; there are no controls, such as the critical ones required by some systems for RF and audio phasing, to get out of adjustment, and there are no critical phase shifting or audio bandpass networks required. Optimum performance can be easily provided with a Mechanical Filter exciter. When operating SSSC, we should make sure that we are utilizing the advantages offered by the system and that we are operating with a single sideband, with the carrier suppressed.

QST

DECEMBER 1954

VOLUME XXXVIII • NUMBER 12

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OFFICES

38 La Salle Road
West Hartford 7, Connecticut

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- Highly stable VFO with full 100:1 ratio gear drive system built-in, calibrated in kc.
- Stability comparable to most crystals .009%.
- Full band switching.
- Ample gain for 55 db microphone. Hum and noise 40 db down.
- Full 50 watt peak power output.
- Complete built-in metering.
- Unwanted sideband at least 40 db down.
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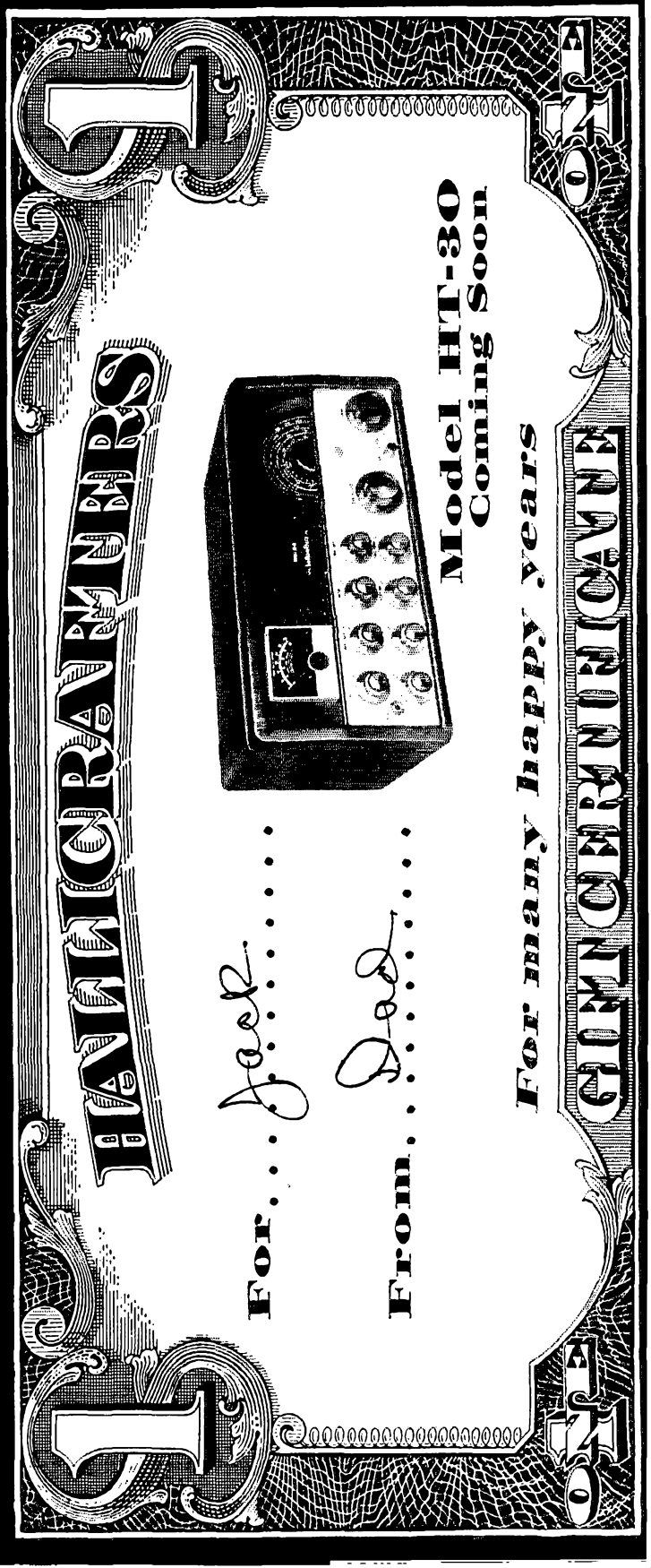

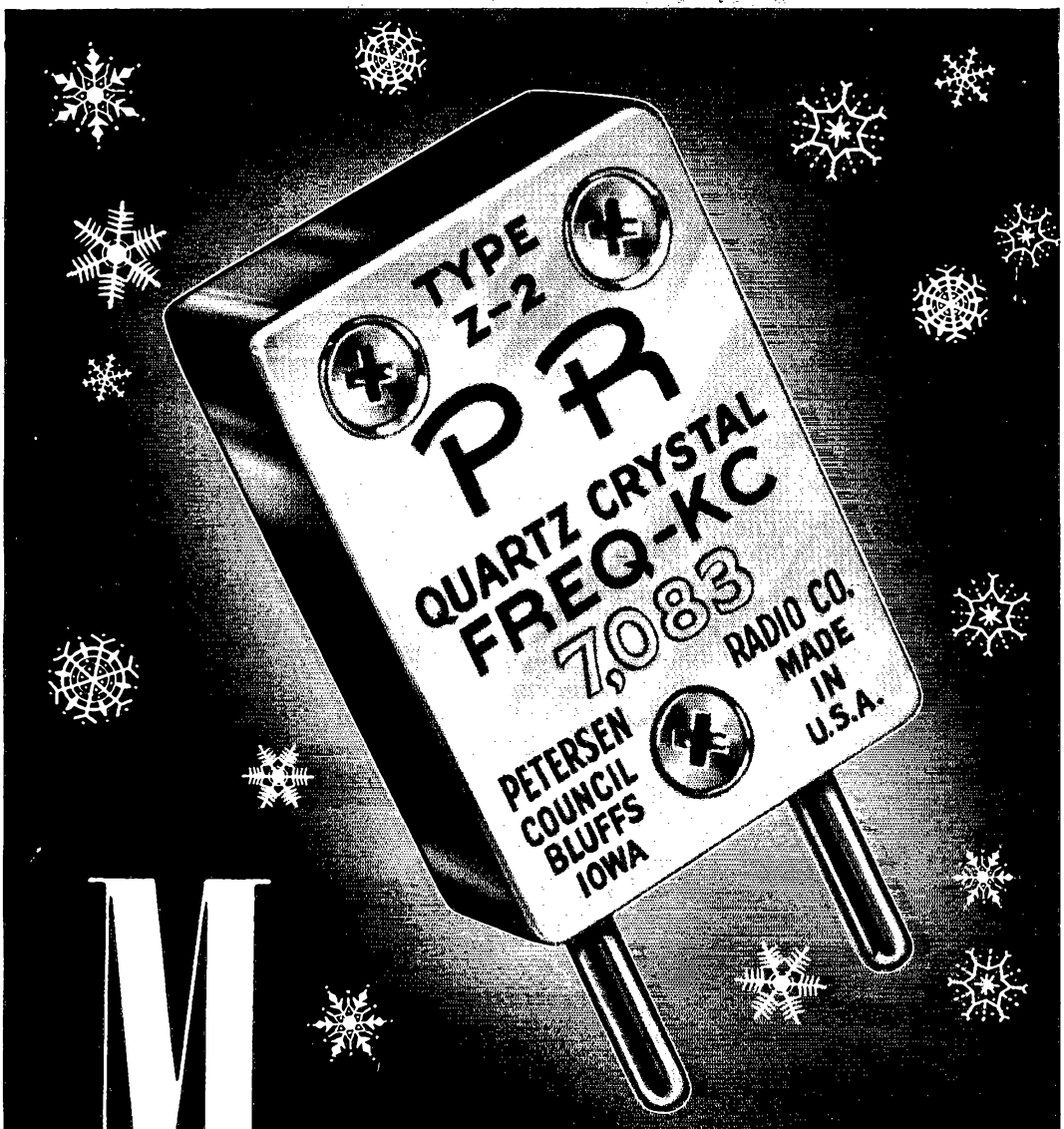

MERRY CHRISTMAS

BILL PETERSEN, WØJRY

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PETERSEN RADIO COMPANY, Inc.

2800 WEST BROADWAY, COUNCIL BLUFFS, IOWA

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

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- Covers Broadcast 538-1580 kc plus three S/W 1720 kc—34 Mc.
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THE AMERICAN RADIO RELAY LEAGUE, *INC.*,

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

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

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

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

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.

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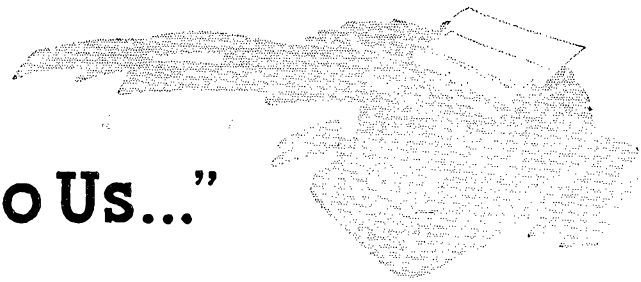


"It Seems to Us..."

TECHNICIAN PRIVILEGES

By decision of the ARRL Board of Directors, the League has filed with the Federal Communications Commission an endorsement of its proposal to open the 50-Mc. band to Technicians, and opposition to its proposal to open the 144-Mc. band to those licensees. Our correspondence indicates a lack of understanding on the part of many amateurs as to why the League has assumed what appears to them to be contradictory viewpoints.

We think the difficulty arises from a misunderstanding of the Board's basic objective in this whole matter. The objective is increased occupancy of the 50-Mc. band — especially by newcomers. Two years ago the Board, in the course of its annual survey of our affairs, noted with concern a decreasing interest on the part of newcomers in the 50-Mc. band, potentially one of our most valuable. At that time, in an endeavor to correct the situation, the Board voted to ask FCC to permit Novice licensees to operate on 50 Mc., in addition to the other Novice bands. It was hoped this would result in the desired newcomer interest in a mighty fine, but lately neglected, segment of our amateur territory.

However, this year FCC turned down this proposal, basing its decision largely on concern that because of the adjacency of the band to TV channels, serious TVI problems might result, inasmuch as FCC felt the Novice could not be expected to have experience and technique to cope successfully with such problems. The problem of 50-Mc. occupancy still remains, however, and continues very much in the minds of many amateurs, both on the Board and in the field. Recently, as a result of suggestions by Directors Crossley and Middleton, based on a petition filed with FCC by W5FXN, the Executive Committee carefully examined the possibility of the League also proposing to FCC the opening of the 50-Mc. band to Technicians, on the basis the Technician licensee meets the standards which FCC had indicated it felt the Novice did not. Again, the objective was primarily one of increased occupancy of that band, and the League agreed the proposal was a wise one in the long-term interests of the amateur service. During this process FCC separately initiated action on the W5FXN petition. The League's established view, then, was in support of the Commission proposal.

But the Commission additionally proposed that 144 Mc. be also opened to Technicians. This matter the Executive Committee then also examined carefully. The Committee could not agree to the Commission's supporting statement that "The Technician's value to, and participation in, civil defense communications through the Radio Amateur Civil Emergency Service would be considerably enhanced. . . ." This is for the reason that under the rules Technicians holding RACES permits can *already* operate in the 50-Mc. civil defense segments (or such segments on any amateur band), under RACES licensing. The Commission's proposal therefore does not appear to offer any practical advantage over present rules in extending the privileges of Technicians for civil defense participation.

More important, it was felt that opening 144 Mc. to Technicians would completely negate the action in opening 50 Mc. for their use. If both proposals are adopted, where will the Technicians drift? Why to 144 Mc., of course, where there is considerably greater occupancy and considerably greater variety of available equipment, both ready-made and surplus. There are on 144 Mc. more people to talk with, and the gear for that band is a simpler matter. (Under the same circumstances, isn't that where *you* would go?)

The fact is that the League's aim in proposing 50 Mc. for Technicians, and in opposing 144 Mc., is to accomplish, by regulation, greater occupancy of the 6-meter band. Amateurs of other classes simply have not made anywhere near as much use of 50 Mc. as can be made. While the League and *QST* have used every means we can think of to promote and encourage occupancy there, it hasn't worked out to the extent it should in our long-term interests. Particularly since the advent of the Novice Class license, which allows the newcomer to use part of the 144-Mc. band, use of 50 Mc. has been declining steadily. This, we believe, is largely due to the absence of beginners on the lower frequency. Thousands of Novices have broken into the game on 144 Mc. When they graduate to General Class the great majority of them stick with 144 Mc. for their v.h.f. work. To maintain its position, or to

develop more occupancy, any band must have a steady influx of beginners. The 50-Mc. band has gotten almost no new blood in the last few years. To open it to Technicians would almost surely help correct this situation.

For these reasons, then, the League view is that Technicians should be permitted on 50-Mc., as a means of obtaining greater occupancy and contributing to knowledge of propagation techniques at that order of frequency, but that Technicians should not be permitted simultaneous use of 144 Mc. because it would completely nullify the primary 50-Mc. objective.

OUR COVER

Almost four decades of good-fellowship has been written into the logs of amateur stations around the world since Harry R. Hick, 1ESS, a young but enterprising "spark" ham, created the cover design for May, 1916, *QST* (see reproduction on page 42 of our October, 1954, issue). Since that time, "HRH" has been *QST*'s senior draftsman and illustrator. We think it especially fitting, therefore, that during this holiday season Harry once more give of his talents, to help all of us at Hq. wish all of you . . .

A VERY MERRY CHRISTMAS!

December 1929

. . . *QST* now is fourteen years old and ARRL President Maxim's editorial looks back over the bustling years as well as forward to a bright future for amateur radio.

. . . "The Single-Control Transmitter," by George Grammer, is an encouragingly simple and effective one-tube set employing the Type UX-210.

. . . Incorporating several new and novel ideas, "The Receiver at W1AOF," by H. C. Wing and *QST* Assistant Editor Clark C. Rodimon, is of universal interest.

. . . Paul C. Oscanyan, jr., gives details on his observations of "Arctic Auroral Radio Interference" made while on an expedition to Greenland in 1927–1928.

. . . The UY-227 as a detector, push-pull antennas, a capacity bridge, and r.f.-choke notes are subjects that make up an interesting Experimenters' Section.

. . . The East Orange, N. J., station of D. C. Akers, W2FL, is featured in the last of a *QST* series depicting up-to-date amateur station installations.

. . . ARRL Secretary Warner defines the scope and activities of the newly formed international technical consulting committee in "The Amateur and the C.C.I.R."

. . . "Amateur Radio and the National Air Races," by Harry A. Tummonds, W8BAH, acknowledges hamdom's contribution to the recent Cleveland classic's success.

. . . W1AOZ's closing station was the occasion for "Seventy-One Rounds," a farewell-party rag chew which lasted thirteen hours and included 71 stations.

. . . "Coming Operating Activities," enumerated by F. E. Handy, includes announcements of two upcoming international message-handling contests.

. . . In addition to overseas societies reports, in IARU News we find G6ZR's interesting tabulation of "best times" for Europe-U. S. A. 20- and 40-meter QSOs.

. . . Among the usual voluminous information to be found in Communications Department pages is a listing of reported "high-quality" and "prehistoric" signals heard.

Strays

During the November elections, New York City members of the V.H.F. Teletype Society once more established amateur radioteletype circuits to report New York State election returns to broadcast station WNYC. Reports from upstate counties were relayed on 80 meters via W2EFU, W2BO, W2BTV, K2AVK, W2AEE, W2SZ, W2JNM, W2SRB and K2DVC, the network organization of Vin Kenney, W2BGO, communications officer, New York State Civil Defense. Reperforating this information on tape at the control center and retransmitting immediately to the radioteletype printers in the New York Municipal Building, via a 2-meter link, were operators W2QGH, W2VVP, W2LYZ, and W2BGO. Operators W2AKE and W2BFD handled the WNYC end. In spite of difficult 80-meter conditions and snowstorms upstate, there was such expeditious handling of the returns that all amateurs participating were warmly thanked by officials for the good service provided.

SINCE the war many countries of the world have set up currency restrictions which either prohibit the sending of money outside their boundaries or make it practically impossible. This has meant that hundreds of amateurs in other lands do not normally have the opportunity to renew their ARRL memberships and receive *QST* regularly. The situation is made more acute by the devaluation of many foreign currencies, for many of those who formerly were just barely able to get together the necessary American dollars now find it utterly impossible to do so.

At the end of the war ARRL did in numerous instances grant membership and *QST* to prewar members overseas on a credit basis, but of course we couldn't carry membership-subscriptions on that basis indefinitely and, in practically all cases, we have been regretfully obliged to discontinue these arrangements. It occurs to us that perhaps American amateurs and club groups might again this year wish to make a "care" package gift in the form of *QST* for Christmas, as many have done regularly in recent years. If it's something you'd like to do, we'll be glad to make necessary arrangements. The foreign membership dues are $5. If you have a particular DX buddy in mind, give us his name — *and complete address.* If you have no special name, we can arrange to apply your remittance to a membership-subscription for a foreign amateur who cannot send his own money but wishes to renew. We'll let you know what amateur we select. And of course we'll send the recipient of your gift an appropriate note to tell him who his American patron is. Address ARRL, 38 La Salle Road, West Hartford 7, Connecticut.

40 Watts on the 7- and 21-Mc. Bands

A Two-Band Rig with a Two-Band Antenna

BY LEWIS G. McCOY,* W1ICP

• A simple 7- and 21-Mc. combination makes real good sense for the Novice when it is combined with a two-band antenna for the same range. Here is a 40-watt transmitter for these two bands, using inexpensive components and a method of construction that should avoid any TVI troubles.

THE problem of TVI is not usually very serious when one is operating in the 3.5- and 7-Mc. bands, but on any of the higher bands it cannot be disregarded except in a few rare cases. Anyone planning to operate in the 21-Mc. band should realize that the 3rd and 4th harmonics from his transmitter fall in Channels 3 and 6, respectively. The transmitter should be enclosed in a shielded box to keep these harmonics from being radiated. The transmitter described here is built on a chassis *bottom* plate, and the chassis proper is used as a shielding case. This is an extremely simple method of construction and affords easy access to all of the parts.

As indicated by the title of the article, the transmitter operates on the 40- and 15-meter bands. An output circuit is provided that will work into any low-impedance line or into an antenna coupler, but we recommend using a half-wave 7-Mc. antenna fed with coaxial line. The transmitter will work nicely into this antenna system on either 7 or 21 Mc., without any additional coupling circuits.

* Technical Assistant, *QST*.

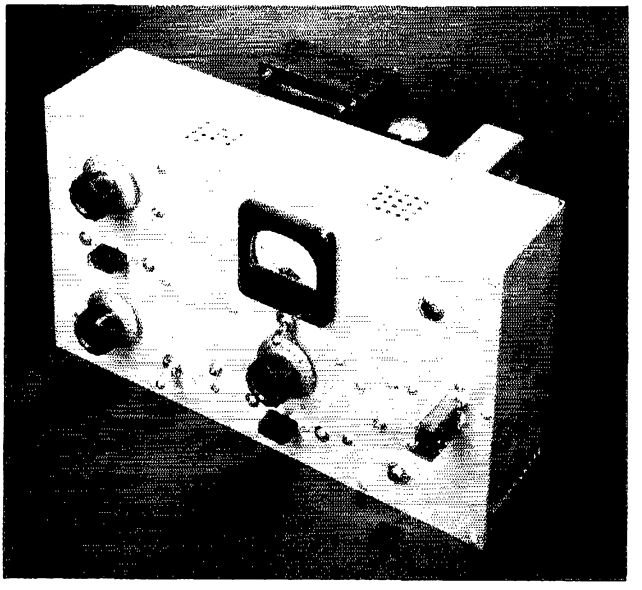
The Circuit

The circuit diagram of the transmitter is shown in Fig. 1. A 6CL6 grid-plate type oscillator drives a 6BQ6-GA amplifier. Either 80- or 40-meter crystals can be used in the oscillator. If 3.5-Mc. crystals are used for 21-Mc. operation, the oscillator output will be on 7 Mc. and the amplifier must triple in frequency to give output in the 21-Mc. band. This will result in considerably less output than if 7-Mc. crystals were used and the tripling took place in the oscillator. However, it should be pointed out that excellent contacts can be made with low power when the band is "open."

To change bands from 7 to 21 Mc., turns on the oscillator plate coil and the amplifier plate coil are shorted out by small jumper plugs.

A 0–1 milliammeter is connected as a voltmeter and the grid and cathode currents of the 6BQ6-GA are checked by measuring the voltage drop across R_4 in the grid circuit and R_6 in the cathode circuit. The double-pole double-throw toggle switch, S_1, is used to switch the meter to either circuit. When R_4 is in the meter circuit, the full scale reading is approximately 10 ma.; when R_6 is switched in, full scale reading is about 200 ma.

In addition to the shielding, extra TVI precautions were taken by installing C_{19} and C_{20} to by-pass the power supply leads and C_4 at the key jack to by-pass the key leads. On-the-air tests



Front view of the complete unit. The black squares between the two knobs on the left and below the knob in the center are the shorting plugs used in the 21-Mc. position. Note the holes in the top and side of the chassis box that furnish the necessary ventilation for the rig. The power supply is on a separate chassis bolted to the rear wall of the r.f. unit.

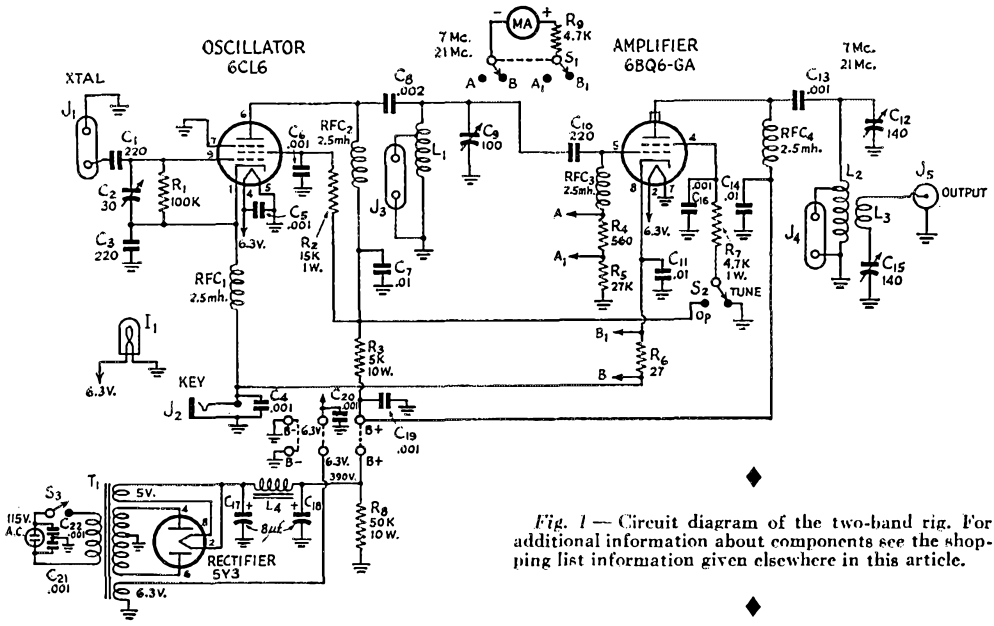


Fig. 1 — Circuit diagram of the two-band rig. For additional information about components see the shopping list information given elsewhere in this article.

showed that these precautions were sufficient for even weak-signal areas.

A single-pole double-throw switch, S_2, is used to ground the screen of the amplifier tube during tune up, protecting the tube against damage.

Construction

It may be that local suppliers don't stock aluminum bottom plates. If such is the case, most of the larger mail-order houses carry them as regular stock. Another source is a local sheet-metal dealer. A 7 × 12-inch aluminum plate is obtainable for less than one dollar.

The various components are laid out on the plate as shown in the photograph. There is nothing critical about the layout, but remember to provide a half inch of clearance around the edge so that the completed unit will fit into the chassis box. Mounting holes for the tube socket brackets should be measured with the tubes in the sockets to take care of the clearance problem.

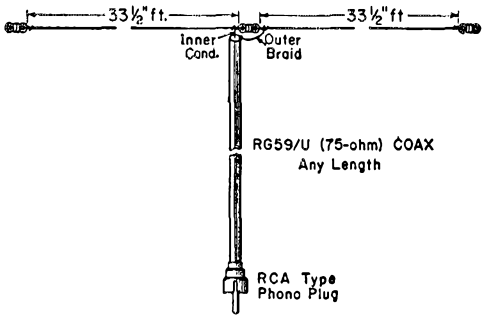


Fig. 2 — Drawing of a coax-fed 7-Mc. dipole antenna. The 67-foot length is figured from end to end. The two or three inches of wire needed to secure the antenna to the insulators is negligible in the over-all performance of the antenna. The end of the coax that attaches to the center of the antenna is made up by separating the outer braid from the inner conductor, far enough back to allow connections to the center insulator. The point where the braid enters coax covering should be weatherproofed by using black vinyl electrician's tape. Ordinary friction tape can be used but the joint should be coated with Glyptol or fingernail polish. An RCA phono plug is used at the transmitter end of the coax.

The $\frac{3}{4}$-inch stand-offs that support the coils are mounted exactly two inches apart. The crystal sockets, J_3 and J_4, which accommodate the 300-ohm line shorting plugs, are mounted between the coil stand-offs.

Four holes, large enough to take No. 6 sheet-metal screws, are drilled at the four corners of the plate and in the chassis box. In areas where one is likely to encounter TVI, the plate should be fastened to the box with screws set not more than three inches apart, to insure tight shielding.

The power supply is mounted on a 3 × 5 × 7-inch chassis which can be bolted to the back of the chassis box. Leads from the power supply are brought through the box wall to a two-terminal tie point.

Wiring

The power supply is wired first. In the supply shown in the photographs, the transformer power leads come off the bottom of the transformer. A $\frac{1}{2}$-inch hole will be large enough to pass all the leads. The two by-pass condensers, C_{21} and C_{22}, should be mounted at the point where the 115-volt a.c. line enters the supply. Two leads are brought through the side of the power supply chassis to a two-terminal tie point mounted inside the chassis box. One lead is the B-plus and the other the "hot" side of the 6.3-volt heater line. Both of these leads are by-passed to chassis ground at the two-terminal tie point by C_{19} and C_{20}. B-minus and the other side of the 6.3-volt line is the common ground connection obtained

by bolting the two chassis together. However, three leads are brought from the two-terminal tie point to the transmitter bottom plate, the B-plus leads, the 6.3-volt lead, and a ground lead which connects the chassis box to the plate.

After the heater and dial light circuit is wired, the rest of the transmitter, starting with the oscillator circuits, is wired.

The oscillator and amplifier plate coils, L_1 and L_2, consist of 22 turns of Barker & Williamson No. 3015 Miniductor stock. These coils are available in three-inch lengths and one length will be sufficient for both L_1 and L_2. L_3, the output link, is 24 turns of No. 3011 Miniductor stock.

The coils L_1 and L_2 are mounted in the following manner: A coating of Duco cement is applied to the ends of one of the coils' insulating strips. A soldering lug is then laid in the cement, with the large hole of the lug beyond the end of the insulating strip. The cement is allowed to dry and then another coat is applied.

The coils can then be mounted with $\frac{1}{4}$-inch 6-32 screws on the $\frac{3}{4}$-inch stand-offs. The oscillator plate coil is tapped down 4 turns from one end. The 3rd and 5th turns are bent in to allow access to the 4th turn. The tap is connected to one side of the two-prong socket and the other side of the socket is grounded. The same procedure is followed with L_2 except that the tap is on the 6th turn. The 300-ohm line plugs are used for shorting the unused sections of the coils when operating on 21 Mc. The plugs are made up by simply inserting a piece of bare wire through one pin of the plug and out the other and then soldering.

The link L_3 is slid inside L_2 and held in place by a small piece of cardboard or paper. Be sure that the link is positioned so that it doesn't short to L_2.

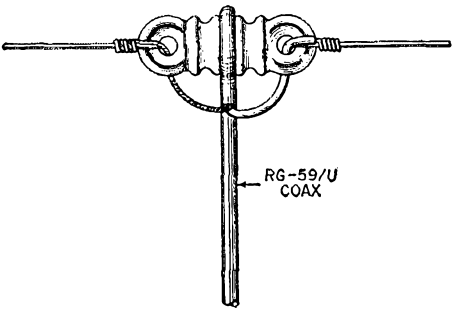


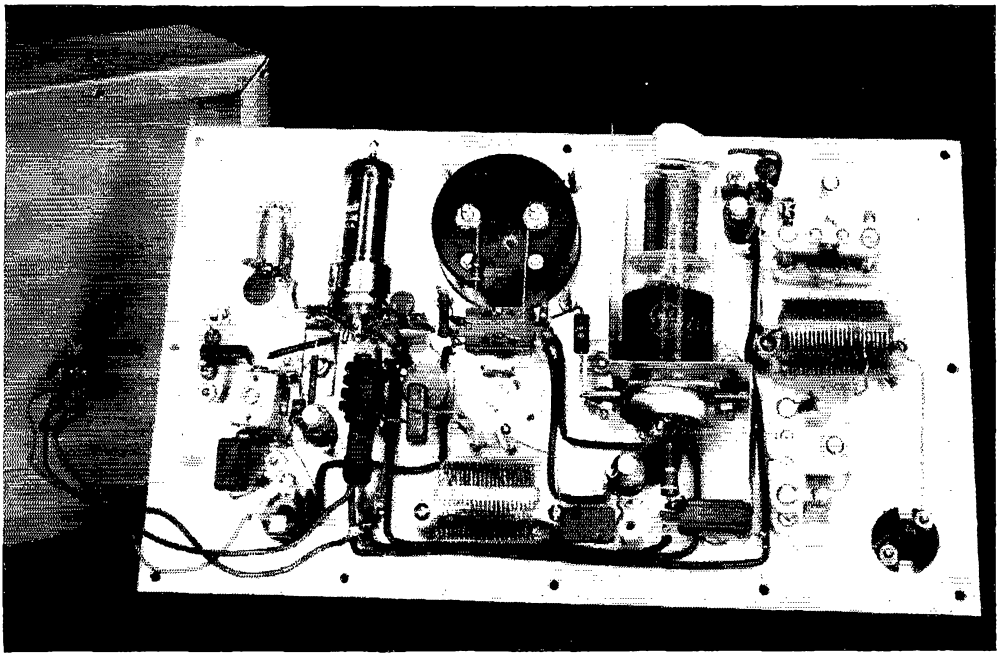
Fig. 3 — This drawing shows the method of connecting and supporting the coax at the center of the antenna. Because of the weight of the feed line, the coax should be looped over the insulator and then taped. This will take the strain off the conductors. The outer conductor should be separated from the inner conductor for a length of several inches. This will provide enough length for a drip loop.

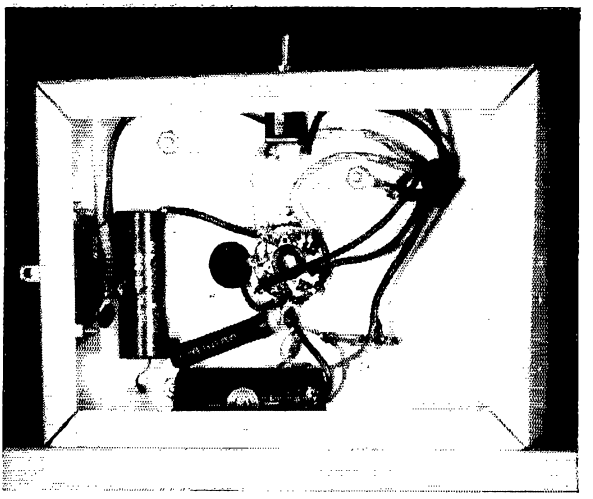
Operation

Before turning the transmitter on, carefully check the wiring job to make sure no mistakes were made. Plug a key into the key jack, leaving

This view shows the completed transmitter. The two-terminal tie point for the leads from the power supply is seen on the left side, inside the chassis box. The metal shield for the oscillator tube is not shown but should be put over the tube for actual operation.

The input circuit of the 6BQ6-GA is shielded from the output side by means of a metal plate which can be made from a piece of tin or aluminum. The piece of metal is formed as shown in the photograph and held in place by one of the tube-socket screws.





Bottom view of the power supply. The 115-volt a.c. input plug is visible on the left-hand side. The by-pass condensers, C_{21} and C_{22}, appear on either side of the plug, inside the chassis.

the key open. Turn the amplifier screen grounding switch, S_2, to the position that grounds the screen. This renders the amplifier inoperable and provides protection for the amplifier tube during tune-up. A 25-watt lamp bulb can be used as a dummy antenna. It should be connected between the output jack, J_5, and ground.

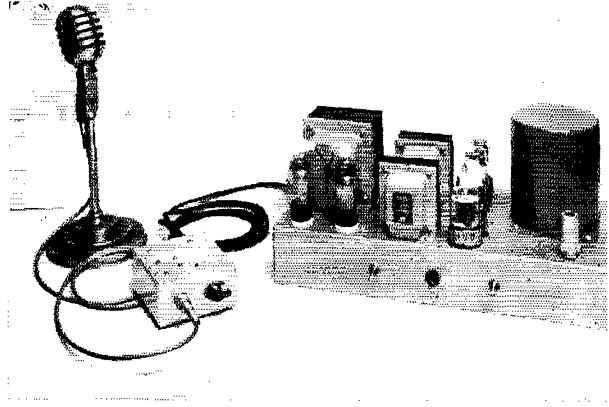
With a crystal in J_1 and the key open, the 115-volt switch is turned on. Allow a few minutes for the tubes to warm up. Switch the meter to read the grid current in the 6BQ6-GA, keeping S_2 set to ground the screen grid. On 40 meters, using either a 3.5- or 7.1-Mc. crystal, the meter should read 6 or 7 ma. when the key is closed and C_9 is tuned to resonance. Tune for maximum reading, open the key, and then switch the meter to read the plate current of the final amplifier. Set S_2 to its "operate" position, close the key and tune C_{12} for minimum current reading. This point will be resonance in the final amplifier tank circuit. The dummy antenna should show some light. If it doesn't, tune C_{15} until the lamp lights up. The plate current can be brought up to read 100 ma., or approximately half scale. Be sure to have C_{12} tuned to show minimum current or "dipped."

The same procedure can be followed for 15 meters. It may be necessary to adjust C_2 to obtain the maximum amount of grid current for a particular crystal. Some crystals oscillate better than

(*Continued on page 132*)

Shopping List for Novice Transmitter

9	0.001-μf. disk ceramic condensers (C_4, C_5, C_6, C_{13}, C_{16}, C_{19}, C_{20}, C_{21}, C_{22})
3	0.01-μf. disk ceramic condensers (C_7, C_{11}, C_{14})
1	0.002-μf. mica condenser (C_8)
3	220-μμf. mica condensers (C_1, C_3, C_{10})
1	3–30-μμf. trimmer condenser, compression type (C_2)
1	100-μμf. variable condenser (C_9) (Hammarlund HF100)
2	140-μμf. variable condensers (C_{12}, C_{15}) (Hammarlund MC140S)
2	8-μf. 450-volt paper electrolytic condensers (C_{17}, C_{18})
1	0.1-megohm resistor, ½ watt (R_1)
1	15,000-ohm resistor, 1 watt (R_2)
1	5000-ohm resistor, 10 watts (R_3)
1	560-ohm resistor, ½ watt (R_4)
1	27,000-ohm resistor, ½ watt (R_5)
1	27-ohm resistor, ½ watt (R_6)
1	4700-ohm resistor, 1 watt (R_7)
1	50,000-ohm resistor, 10 watts (R_8)
1	4700-ohm resistor, ½ watt (R_9)
1	3-inch length of B & W Miniductor stock No. 3015 (L_1, L_2; see text)
1	3-inch length of B & W Miniductor stock No. 3011 (L_3; see text)
1	10.5-hy. 110-ma. filter choke (L_4) (Stancor C1001)
1	6.3-volt panel indicator assembly (I_1)
1	6.3-volt bulb No. 47 or equivalent
3	Crystal sockets (J_1, J_3, J_4) (Millen 33102)
1	Open-circuit jack (J_2)
3	2.5-mh. r.f. chokes (RFC_1, RFC_3, RFC_4) (Millen 34102, National R100s)
1	2.5-mh. r.f. choke (RFC_2) (Millen 34300)
1	D.p.d.t. toggle switch (S_1)
1	S.p.d.t. toggle switch (S_2)
1	S.p.s.t. toggle switch (S_3)
1	0–1-milliammeter (MA)
1	Power transformer, 360 v. each side c.t., 110 ma.; 6.3 v., 3.5 amp.; 5v., 3amp., (T_1) (Stancor PC8410)
1	Nine-pin miniature socket with shield
2	Octal sockets, one isolantite, one bakelite
1	6CL6 tube
1	6BQ6-GA tube
1	5Y3 tube
4	One-inch right-angle shelf brackets (for mounting tube sockets)
1	Plate cap, ¼ inch (Millen 36004)
2	Transmission-line plugs (Millen 37412)
1	Phono jack (J_5) (RCA type)
4	Isolantite stand-offs, ¾ inch
3	One-terminal tie points
3	Two-terminal tie points
24	6-32 ½-inch screws
24	6-32 nuts and lockwashers
6	4-40, ¾-inch screws
6	4-40 nuts and lockwashers
6	Soldering lugs
1	3 × 7 × 12-inch aluminum chassis
1	7 × 12-inch aluminum bottom plate
1	3 × 5 × 7-inch chassis
	10 feet of hook-up wire
3	Knobs for C_9, C_{12} and C_{15}
12	No. 6 self-tapping screws



This Class AB_1 modulator is complete with all supplies, ready to be hooked to a Class C r.f. amplifier. Using two 6146s, it is capable of audio outputs up to 120 watts, depending on the plate voltage selected. The first two stages of speech amplification are built into a small box that may be used at the operating position while the main chassis is installed in any convenient location.

Components on the chassis are, left to right, power transformer and 816 rectifiers, filament transformer and plate filter choke, 6146s and VR tubes, modulation transformer and, in the right foreground, the 6C4 final speech amplifier stage.

♦

120 Watts of Audio Without Driving Power

Class AB_1 Modulator with 6146s

BY GEORGE GRAMMER,* W1DF

• Unlike most tubes, the 6146 will develop almost as much power output without driving power as with it. This article describes a complete modulator unit that takes advantage of this characteristic. Various power levels can be obtained, depending on the choice of power supply components.

The modulator includes a splatter filter, made from inexpensive components, that can be applied to practically any 'phone transmitter where the Class C plate current does not exceed about 300 ma.

THE rather interesting capabilities of the 6146 as a Class AB_1 audio amplifier do not seem to have attracted much attention in amateur circles, although it is a fact that a pair of tubes is capable of delivering practically the same audio power in AB_1 as in AB_2. Either way, it is possible to get enough power to modulate a Class C input of a quarter kilowatt. When a choice is available, it is hardly likely that anyone would select AB_2, with its driver regulation problems, in preference to AB_1 — especially when no-driving-power operation usually means that one less speech amplifier stage will be needed for the same over-all gain.

The modulator shown in the accompanying photographs uses a pair of the tubes in AB_1 and, with the exception of the preamplifier unit (which could easily have been included on the same chassis if it had been desired) is complete with power and bias supplies on a 7 × 17 × 3-inch chassis. The preamplifier was deliberately made into a separate unit in the thought that, while it is highly desirable to have the microphone input and gain control within easy reach at the operating position, there is no reason at all why the rest of the audio equipment should be in the same vicinity. The modulator and power supply have no controls that need be manipulated, nor do any of the tubes or components require watching during transmitting periods. This section can simply be tucked away in some spot where it won't take up room that might be used more profitably for other purposes.

The modulator-power supply unit includes one stage of speech amplification, and also is equipped with a splatter filter and an audio take-off for 'scope monitoring. It is easy to build in the latter two at the start, but somewhat messy to add them externally after it becomes appreciated that they should be classed as necessities rather than accessories.

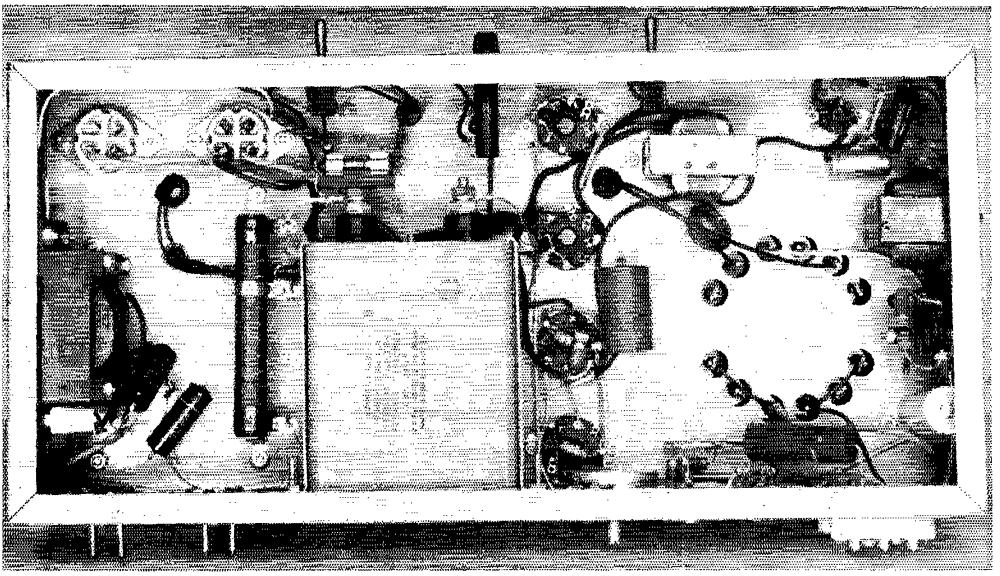
Tube Capabilities

The audio power that can be obtained from a pair of tubes is, of course, a function of the plate voltage used on them. The following table is illustrative:

Plate Voltage	*Power Output*	*Plate-to-Plate Load Resistance*
500 volts	84 watts	4200 ohms
600 volts	104 watts	5200 ohms
750 volts	134 watts	6700 ohms

The power output figures are calculated from data taken from the published tube curves, using a screen voltage of 200, and the actual outputs will be somewhat lower because of losses in the output transformer. These "theoretical" output figures cannot be compared directly with those given by the tube manufacturers in tables of typical operating conditions, partly because of somewhat different choice of load resistance and partly because the manufacturers' figures usually are based on the fundamental-frequency component of power output, with distortion components given separately as a percentage. The figures in the table above are more properly described as the average power in a sine wave having the same instantaneous power at the peak

*Technical Editor, *QST*



Bottom view of the modulator and power supply. The sockets at the upper left are for the 816s. The splatter-filter choke is mounted on the left-hand chassis wall, using small cone stand-offs as tie points for the high-voltage connections. The large resistor to the left of the filter condenser is the dropping resistor for the low-voltage circuit; the filter condenser is supported from the rear (lower, in this picture) chassis wall. The 6C4 speech amplifier circuit is at the upper right, with a shielded lead carrying the audio input to it from the four-prong socket, J_3, mounted on the rear wall of the chassis. T_1, the interstage audio transformer, is to the left of the 6C4 socket.

Bias-supply components, with the exception of the output potentiometer, R_1, are mounted on the right-hand chassis wall. R_1 is on the rear wall, near the lowest of the four sockets in a vertical line. The 'scope take-off circuit is at the lower right.

of an a.f. cycle as the waveshape actually considered — or, for short, "equivalent sine-wave power output." Since it is the *peak* power that counts in determining the modulation percentage, and all our discussions of modulator power use this same "equivalent sine-wave power" as a basis, we believe this kind of figure to be more useful in modulation calculations with voice waveforms.

Suitable sets of components for all three of the voltages listed above are readily available, so the power level can be selected to suit the Class C amplifier to be modulated. For purposes of estimating, measurements have shown that the actual power outputs to be expected are approximately 75, 95, and 120 watts for the 500-, 600-, and 750-volt conditions, respectively. The modulator shown in the photographs is set up for 600-volt operation, but sufficient chassis area has been assigned to the power and modulation transformers to accommodate the next larger size of the same style. Other than these two transformers, all other components are the same regardless of the voltage level.

The Preamplifier

The preamplifier circuit, shown in Fig. 1, is built in a 2 by 4 by 4 aluminum box. It uses a 12AX7 for two resistance-coupled triode stages. The circuit is quite straightforward, except for the fact that a 0.003-μf. condenser is used for coupling between the first and second stage. The object of this is to help taper the low-frequency response for more effective speech work. Comparatively, the time constant of the input grid circuit seems quite large, but the effective resistance from grid to cathode is much lower than the 2.2-megohm resistor would indicate because of the flow of "initial velocity" electrons in this circuit. This current flow provides the operating bias of about 1 volt. (It should not be confused with the grid current that results from rectification of an applied signal; there is no rectification of the latter type in this case.)

The 12AX7 is mounted on a small bracket fastened to one removable side of the box, as shown in one of the photographs. With the

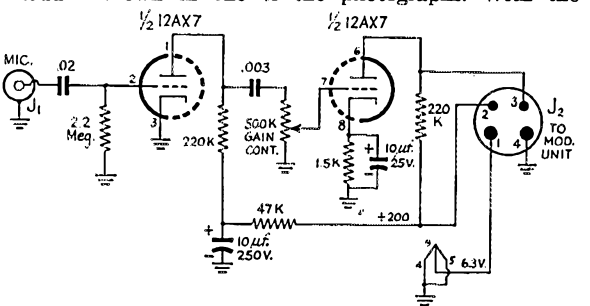


Fig. 1—Preamplifier circuit. Fixed resistors are ½ watt. Condenser capacitances in μf.
J_1 — Microphone connector.
J_2 — Four-prong connector, chassis mounting, male.

exception of the microphone connector and gain control, which are on one edge of the box, and the connector, J_2, on the opposite edge, all components are on this same plate, mounted between appropriate tube-socket pins and tie-point strips. Enough lead length is allowed from the components on the box itself to permit taking off the plate to get at the wiring. Rubber feet are mounted on the other removable side of the box, which becomes the bottom when the unit is in use.

The preamplifier is connected to the modulator through a 10-foot length of cable (Alpha Wire Co. No. 1242) having one shielded and two unshielded conductors. The shielded wire, connected to Pin 3 of J_2 in Fig. 1, is used for the audio output. The shield is the common ground connection through the cable. One of the other two wires is used for plate current and the last for filament current. The shielded wire in this length of cable has a capacitance of about 500 $\mu\mu$f., and since this capacitance shunts the output circuit there is considerable reduction of high-frequency response in the cable — about 4 db. per octave above 1000 cycles. This is compensated for in the modulator unit.

Modulator and Power Supply

The circuit diagram of the modulator and power supply section is given in Fig. 2. The "high-boost" circuit, consisting of the two resistors and 270-$\mu\mu$f. condenser associated with the grid of the 6C4 speech amplifier, compensates for the drop in highs in the cable coming from the preamplifier. Since low-frequency attenuation is desirable, an inexpensive interstage audio transformer is used for coupling the speech amplifier and modulator. The modulation transformer is a multimatch type delivering output to the load through a splatter filter, about which more later. The three 1-megohm resistors form a voltage divider for delivering about ⅓ of the total audio output voltage direct to the horizontal plates of a monitoring 'scope for forming a trapezoidal pattern without amplifiers in the 'scope. The resistor values can be varied, if necessary, to

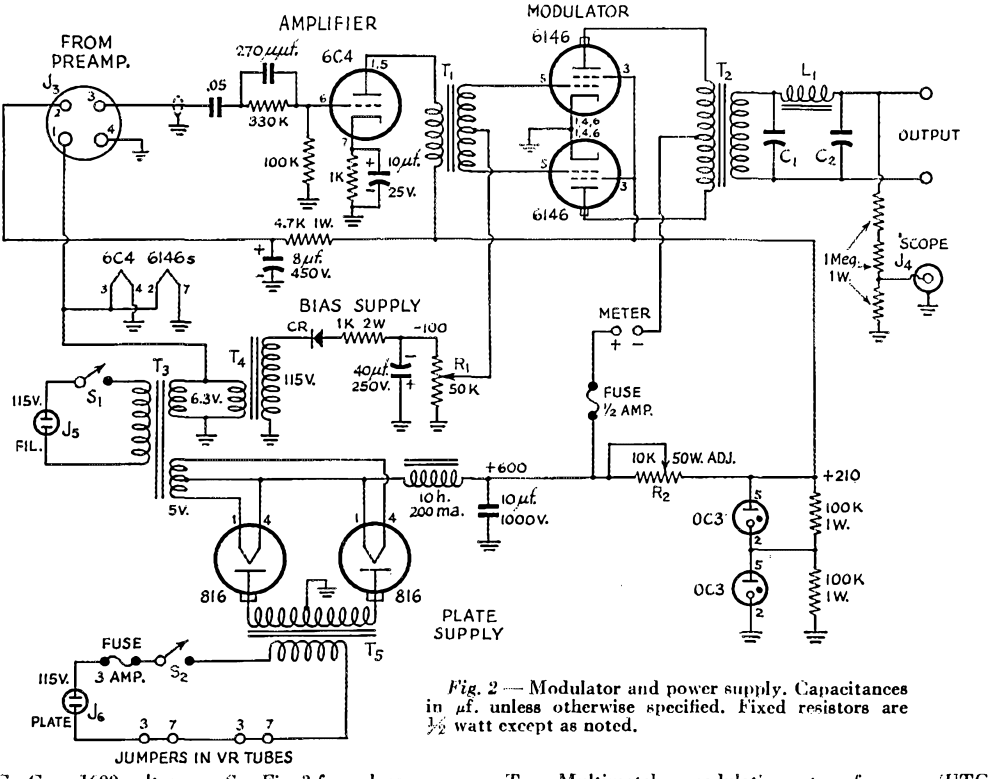


Fig. 2 — Modulator and power supply. Capacitances in μf. unless otherwise specified. Fixed resistors are ½ watt except as noted.

C_1, C_2 — 1600-volt paper. See Fig. 3 for values.
R_1 — (Bias control) 50,000-ohm potentiometer, preferably wire-wound.
R_2 — 10,000 ohms, 50 watts, adjustable.
L_1 — See Fig. 3 and Table I for values.
CR — Selenium rectifier, 20 ma. or larger, for 115-volt operation.
J_3 — Four-prong connector, chassis mounting, female.
J_4 — Phono connector.
J_5, J_6 — 115-volt connector, chassis mounting, male.
S_1, S_2 — S.p.s.t. toggle switch.
T_1 — Interstage audio, ratio 3:1, push-pull secondary (Thordarson T20A19).
T_2 — Multimatch modulation transformer (UTC CVM-2 or CVM-3, depending on audio output power level).
T_3 — Filament transformer, 6.3 volts at 8 amp.; 5 volts at 3 amp. (Triad F-30A).
T_4 — Filament transformer, 6.3 volts at ½ amp. (Triad F-14X).
T_5 — Plate transformer. For 500 volts d.c.: 1235 v. c.t., 310 ma. (Triad P-7A); for 600 volts d.c.: 1455 v. c.t., 310 ma. (Triad P-11A); for 750 volts d.c.: 1780 volts c.t., 310 ma. (Triad type P-13A).

secure the proper pattern width, although the total resistance should be maintained in the neighborhood of 3 megohms for a 0.005-μf. coupling condenser. This condenser should have a voltage rating equal to at least twice the d.c. plate voltage on the modulated amplifier; 6000-volt paper condensers in this capacitance are readily available and inexpensive.

Plate power for all tubes is supplied from one transformer. A single-section choke-input filter is used for the high voltage applied to the plates of the 6146s. This is dropped through a resistor and a pair of VR-105s (0C3) in series to provide a regulated voltage of 210 for the 6146 screens. This voltage also is applied to the plate of the 6C4 speech amplifier and, with further filtering by the 4700-ohm resistor and 8-μf. condenser, to the preamplifier tube plates through Pin 2 of J_3. The dropping resistor, R_2, should be adjusted to approximately 5000 ohms with a 500-volt supply, 7000 ohms for 600 volts, and 10,000 ohms for 750 volts. This adjustment can be checked when the modulator is in operation by observing whether the VR tubes go out on voice peaks. Enough current should be bled through the regulators so that they stay ignited at all voice levels.

A pair of terminals is provided for connecting a milliammeter in series with the plate lead to the 6146s. The meter itself can be placed in any convenient spot. If it is not used, a jumper must be connected across the terminals. This circuit is fused to protect the meter.

The bias supply uses a small filament transformer, T_4, operating from the regular filament transformer, T_3, to provide 115 volts for the bias rectifier and filter. Bias is adjusted to the proper value by means of R_1. This supply does not have to be "stiff" since no rectified grid current flows through it in normal Class AB_1 operation, but the resistance should be moderately low. If too much resistance is used in R_1, occasional peaks that do go into the grid-current region will cause a temporary change in bias through charging the bias filter condenser, which then cannot discharge rapidly enough through R_1. The values indicated have worked out well in practice.

Separate a.c. input connectors are used for the filament and plate supplies; when S_1 and S_2 are closed these can be controlled by remote switches. The bias supply goes on with the filaments, and since there is no time lag in the selenium rectifier the 6146s are always protected.

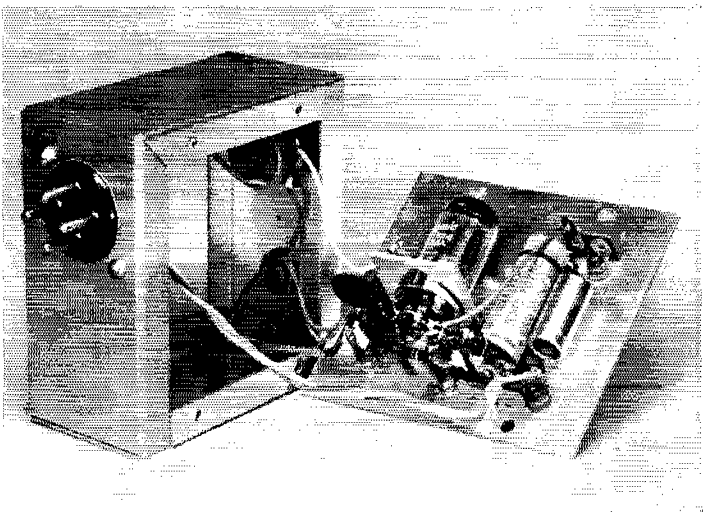
Clipping and Filtering

A high-level splatter filter can be built from parts that can be obtained quite inexpensively from practically any supply house that handles service components. The cost of the one incorporated in this modulator is only a little over three dollars.

The application of the filter is based on principles outlined in *QST* some time ago.[1] In brief, its purpose is to suppress audio components beyond about 3 kc. in the modulator output, particularly those generated by clipping that may take place, either intentionally or unintentionally, in the modulator. The legitimate high-frequency components of the average voice are seldom of any real consequence in causing unnecessary interference; the bothersome "splatter" is practically always the result of clipping, either in the modulator because of insufficient power output capability or overdriving, or in the Class C stage modulated stage itself. In the latter stage, the usual cause is overmodulation on down peaks, but improper operating conditions resulting in poor linearity also will result in splatter. No splatter filter can overcome imperfections in the Class C stage, nor can it compensate for the clipping that takes place when the plate voltage "hits bottom" on the down peaks of modulation.

In other words, the first step in splatter elimination is to adjust the modulated Class C amplifier for good linearity — that is, make sure that it is really capable of 100 per cent modulation. Next, steps must be taken to ensure that the

[1] Bruene, "High Level Clipping and Filtering," *QST*, November, 1951.



The preamplifier removed from its 2 by 4 by 4 box. Arrangement of components is not critical; in this case most of the unit is mounted on one of the removable sides of the box for ease in wiring and accessibility.

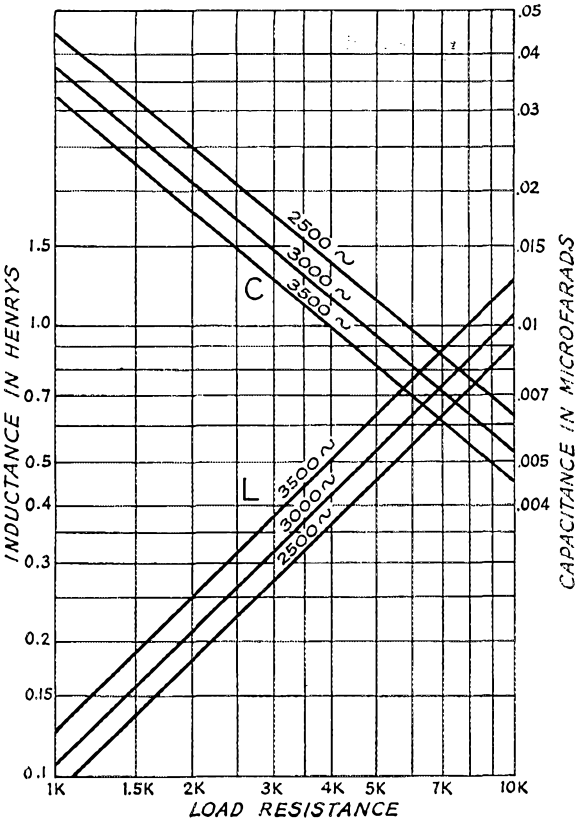


Fig. 3 — Splatter-filter design chart. Values should be taken from *L* and C curves marked with the same cut-off frequency.

applied modulation cannot exceed 100 per cent in the downward direction; this is the function of clipping. With a Class AB_1 modulator the clipping can take place either in the plate circuit, by adjustment of the load resistance as described by Breune,[1] or in the grid circuit by driving the modulator grids positive during the peak of the audio cycle. When the modulator grids are driven positive by a Class A voltage amplifier such as the 6C4 in this unit, the clipping is quite effective because of the poor voltage regulation of the driver when it is called upon to deliver power. Preferably, the modulator load resistance should be adjusted so that clipping in the plate circuit occurs simultaneously with clipping in the grid circuit, since if clipping occurs in one circuit before the other the power output is reduced below the maximum obtainable. However, the loss in output is negligible if the load resistance does not depart more than 10 per cent from the optimum value, so exact adjustment is not really necessary. In practice, grid-circuit clipping is likely to predominate, and the output amplitude will almost automatically be at the right level if the Class C plate input is adjusted to be at least twice the audio output of the modulator (assuming the modulator load resistance is near the optimum value). The system should be adjusted so that clipping occurs at a modulation level of 90 to 95 per cent; this ensures that the clipping will be done only in the modulator and not in the modulated amplifier where the splatter filter can do nothing about it.

This modulator was not designed particularly for intentional clipping, although there is nothing to prevent its being used that way to the degree permitted by the signal-handling capability of the circuits up to the grid of the 6C4. However, clipping is bound to occur in any modulation system unless special means such as automatic gain control are included for preventing it. Lacking such means, steps should be taken to prevent clipping from causing splatter. A splatter filter, plus the adjustment precautions outlined above, will do a good job of keeping the transmitted signal clean.

Filter Design

The filter used in this modulator is a simple one of the constant-*k* type. The inductance and capacitance required will depend on the Class C load resistance and therefore cannot be given in a single specification. The chart of Fig. 3 gives the design values for various loads from 1000 to 10,000 ohms, for three cut-off frequencies, 2500, 3000, and 3500 cycles. While a cut-off frequency of 3000 cycles is probably optimum, the additional curves are given for the purpose of estimating the effect of having to use available values of components, particularly fixed condensers. For example, if the Class C load resistance (plate voltage divided by plate current in amperes) is 4000 ohms, the chart shows that approximately 0.012 μf. should be used at C_1 and C_2. The nearest standard value in a single unit is 0.01 μf., and the chart shows that this is the proper value for a cut-off frequency of 3500 cycles. The inductance could be chosen accordingly (0.5 henry, from the chart) or, as an alternative, 0.01 and 0.002 units could be connected in parallel. Neither approach is quite as clean-cut as it

(Continued on page 118)

TABLE I

Measured inductance values for various air-gap spacings, "1-henry 300-ma." filter choke (Stancor C-2326) with 7 layers (approximately 30 per cent of turns) removed.

Air gap, inches	*Inductance, henrys*
0.003	0.71
0.010	0.62
0.020	0.48
0.025	0.46
0.050	0.36
0.075	0.31
0.100	0.28
0.125	0.26
0.15	0.24

Dual Regulated General-Purpose Power Supply

A Useful Adjunct to Any Station

BY VINCENT W. HANSEN,* W5RVD

• If you do any building or testing around the shack or workshop, there have undoubtedly been dozens of times when you could have used a versatile power supply. If you build a unit like the one described here by W5RVD, your troubles will be over. No more scrounging around for power supplies and dropping resistors — just twist a knob and set the supply at the output voltage you want.

MANY years of constructing experimental circuits and then finding it necessary to steal power for them from other equipment led to the conclusion that a good general-purpose power supply would be a valuable asset on our shelf of test equipment. Preliminary thinking on the subject indicated several basic requirements which such a supply should be capable of fulfilling. Perhaps the most important of these is that it should be extremely versatile. It might be desirable on one occasion to have a d.c. filament supply for a high-gain low-level preamplifier, and on another a husky bias supply might be required for a high-power r.f. amplifier. Generally, however, the supply would be used for the voltages and currents normally encountered with receiving tubes. In addition, it should be capable of supplying more than one output voltage at any time. In line with the modern trend, it should be as compact as practicable. With these requirements in mind, the dual regulated power supply to be described in this article was designed and constructed.

The Basic Principle

In order to understand the capabilities and limitations of the unit, a brief review of the operating characteristics of electronic voltage regulators is in order. A simple regulator of this type is shown in Fig. 1. The supply voltage, which comes from an ordinary power supply, is delivered to its load through a series tube, V_1, which is made to act like a variable resistor whose resistance is controlled by the voltage appearing at its output. V_2 and its associated circuitry constitute a high-gain d.c. amplifier to accomplish this. Resistors R_1 and R_2 are simply a screen voltage divider used to supply proper operating potentials to the screen. R_3 is the plate load for V_2, and the potentiometer, R_4, sets the operating

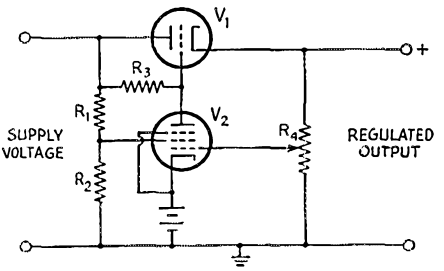
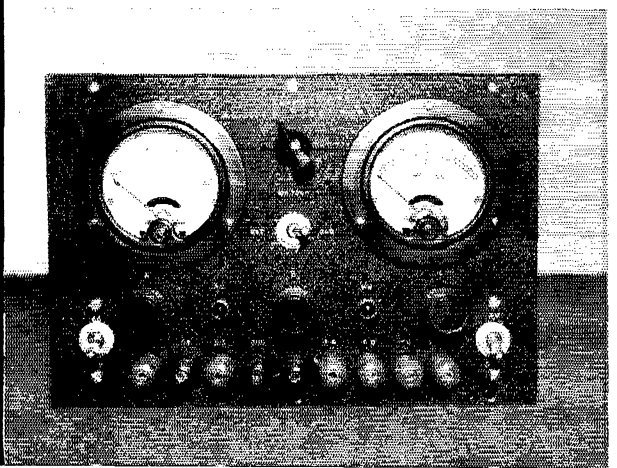


Fig. 1 — The basic circuit of a voltage-regulated power supply.

point. The battery in the cathode circuit provides a constant reference for comparison with that portion of the regulated output voltage appearing between the tap of R_4 and ground.

The plate of the amplifier tube is tied directly to the grid of the series tube, and the amplifier's plate voltage appears as bias on V_1. Since R_4 sets the operating point of V_2 and the plate voltage of V_2 appears as bias on V_1, R_4 will control the effective resistance of V_1 and thus the output voltage of the regulated supply. If, for any reason, the output voltage attempts to increase from this value there will be a proportionate increase in the voltage at the grid of V_2. Because the cathode voltage of this tube remains constant, this in-

*3216 A St., Box 23, Sandia Base, Albuquerque, N. M.



A regulated power supply is a handy thing to have around the shack or workshop. This unit is complete with meters, and can supply two different regulated voltages at any time.

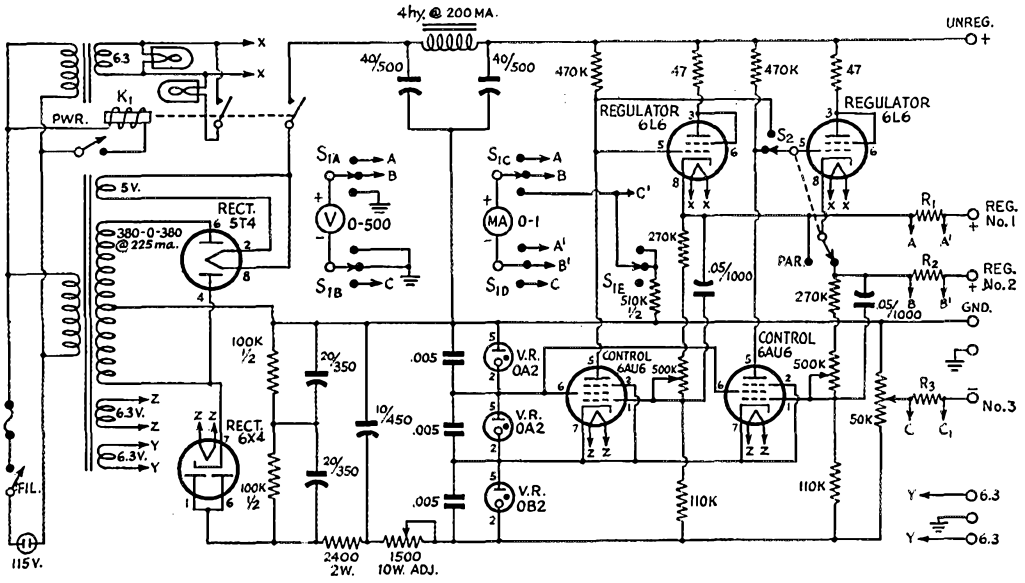


Fig. 2 — Wiring diagram of the dual regulated power supply.

R_1 — 200-ma. shunt for MA.
R_2 — 100-ma. shunt for MA.
R_3 — 10-ma. shunt for MA.
K_1 — 115-v. a.c. d.p.d.t. relay (Advance K-1500).
S_2 — 5-pole 3-position wafer switch.
All resistors 1-watt unless otherwise designated. All capacitators electrolytic, except 0.005-μf., which are ceramic.

crease in grid voltage will cause V_2 to conduct more heavily, resulting in a greater voltage drop across R_3 and an increase in the effective resistance of V_1, which will tend to return the output voltage to its original value. If the output voltage should drop, the opposite action takes place and again the voltage will be returned to its original value.

It is interesting to note that the regulator will compensate for practically any change in output voltage. Thus the circuit will tend to cancel out ripple as well as changes due to variation in load or supply voltage.

The Circuit

The supply shown in Fig. 2 was evolved from this basic regulator circuit. A standard condenser-input power supply delivers voltage to the two outputs through the 6L6 series tubes. To make the supply regulate down to zero output voltage, it is necessary to supply negative bias potentials on the 6L6 series tubes. To satisfy this requirement a negative source consisting of a 6X4 rectifier and an *RC* filter was incorporated. With the cathodes of the 6AU6 control tubes 300 volts negative the plate voltage swing can reach a point far enough negative to cut off completely the series tubes, resulting in zero output voltage from the regulator. VR tubes replace the battery in Fig. 1 as a means of supplying the constant reference voltages required. The small ceramic capacitors across these tubes prevent a tendency toward oscillation in this circuit. The regulated output voltages can be set from zero to 450 volts by adjustment of the 0.5-megohm controls. The 0.05-μf. condensers from the cathode of the series tubes to the grids of the control tubes provide a low impedance to any ripple voltage that may be present, resulting in even greater ripple reduction. Switch S_1 permits two modes of operation. In the position shown, two independent outputs are available. In the other position, the two series tubes are in parallel and both are controlled by the 6AU6 at the left. This makes one output of doubled current capacity available.

The $-C$ output can be set between the limits of zero and -300 volts. This output is intended only for Class A bias applications and has a capacity of about 5 ma. with poor voltage regula-

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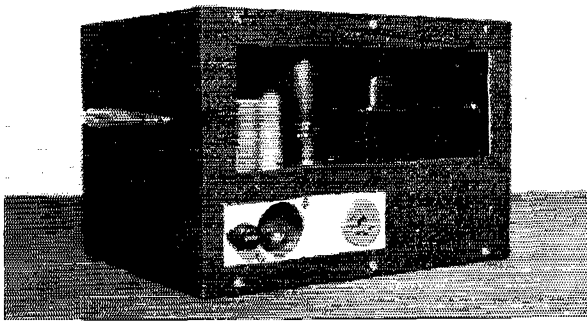
Adequate ventilation is insured by the large window in the rear of the cabinet.



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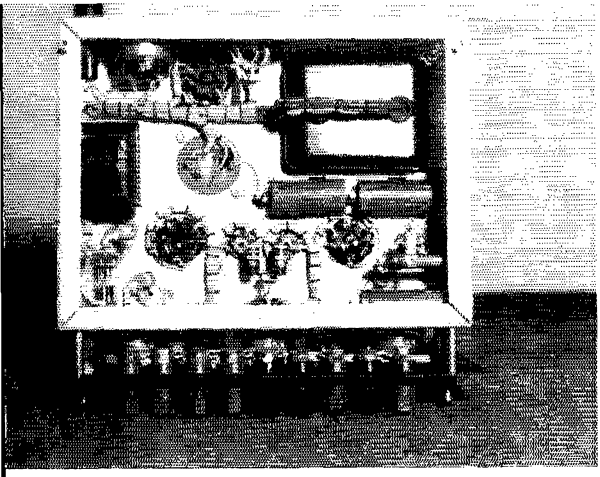


The panel is mounted away from the chassis, to provide room for the binding posts.

tion. At some settings of this control the current drawn by the meter circuit will cause a noticeable change in output voltage, so a 0.51-megohm resistor was added on the meter switch to replace the meter when it is switched to a different output.

A direct connection to the filter bypasses the regulators to the "Unreg" binding post. This can be used where high voltage is desirable or in conjunction with a series resistor to supply part of the current to a load that exceeds the capabilities of the regulator section. A 6.3-volt 8-amp. filament circuit and a floating ground binding post complete the outputs. Two chassis ground binding posts are also mounted on the panel. For the supply itself, two separate filament circuits are required to keep the filament-cathode potentials from exceeding the rated values by too great a margin. One of these circuits supplies the series tubes and the other the control tubes and negative rectifier. There should be no grounds on either of these circuits. A relay is used to switch the high voltage and to light a second pilot light when the power switch is closed.

Complete metering is provided by means of a 0 to 500 voltmeter and a 0 to 1 milliammeter with appropriate shunts. The meter shunts are connected permanently in their respective leads and the meter is switched across them. All outputs are brought out to binding posts on the front panel and also to an octal socket (not shown in Fig. 2) on the rear drop of the chassis. Use of the floating-negative arrangement makes it possible to ground either the plus or minus terminal of the supply, permitting its use as a high-current negative source as well as in the usual manner.

Construction

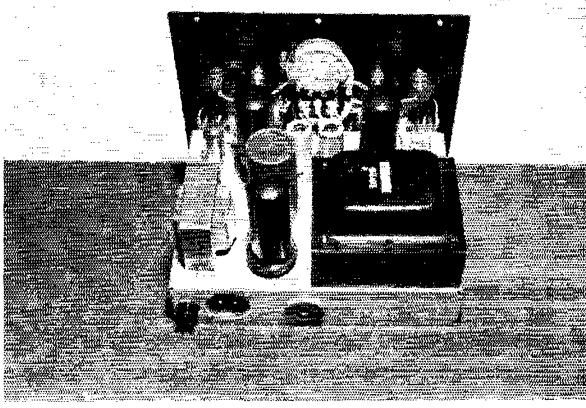
The supply is built on a $7 \times 9 \times 2$-inch chassis mounted in a standard $7 \times 8 \times 10$-inch utility box. While this is extremely compact for the amount of circuitry involved, sufficient clearances have been maintained to permit reasonable ease of construction and maintenance. The chassis is fastened to the panel by four 1-inch brass spacers. This brings the back of the chassis flush with the rear of the cabinet and allows clearance for the panel-mounted components in front of the chassis. Because the unit will be too heavy to be supported entirely by the panel, two 7/16-inch spacers are fastened to the bottom lip near the rear of the chassis, as can be seen in one of the photographs. The bottom of the cabinet has a row of seven ½-inch holes on a centerline one half inch back from the front edge. These permit circulation of air, to dissipate the heat generated. A 3×8-inch cutout on the rear wall is also provided for ventilation. The back wall has another cutout to provide access to the plugs and fuse on the chassis rear drop. Adding a pair of chrome-plated kitchen-cabinet handles completes the cabinetwork.

Wiring

With the exception of the grid circuits of the 6AU6 control tubes, wiring is not critical and no special precautions are necessary. However, these two tubes are very high gain amplifiers and any hum pick-up by their grids will appear, greatly amplified, at the supply outputs. For this reason caution should be exercised in placement of these leads, or shielded wires should be used. Cabling is employed throughout to make a neater looking package and to keep the large number of wires from getting out of hand. The meter shunts are wound with resistance wire on forms removed from small r.f. chokes. High-value one-watt resistors could also have been used. They should be wound originally with an excess of wire so that they can be trimmed to their correct values after the rest of the supply is complete. These shunts and the 0.51-megohm resistor should be mounted directly across the meter switch, S_1. A small resistor board mounted on the front drop of the chassis holds the 0.27- and 0.11-megohm resistors. The rest of the resistors and tubular condensers are mounted where convenient on the tube sockets, with the aid of a few small stand-off insulators. The relay and the filament transformer are mounted along the left side of the chassis.

The panel should be removed from the chassis and its wiring done first. When the wiring is complete, the chassis leads should be fed through the hole provided on the front drop and the panel secured to the chassis. The chassis cable lays along the front and left side with break-offs as required to pick up all components. A little study of the bottom-view photograph will suggest the best wiring procedure.

When the wiring has been completed and checked, the a.c. should be turned on and the



Components for the dual regulated power supply fit nicely on a 7 × 9 × 2-inch chassis.

1500-ohm resistor adjusted for about 20 ma. through the VR tubes. After this adjustment has been made, the high voltage can be turned on and the operation of the supply checked. If it appears normal, the shunts can be trimmed to their correct values. This can be conveniently done by using the supply as follows: With the meter switch, S_1, in the "A" position and S_2 in the parallel position, connect a 750-ohm resistor in series with a multimeter across the "A" output terminals. Then adjust the "A" voltage control to give a reading of 200 ma. on the multimeter. If a little extra resistance wire is wound on the form, the meter on the supply will read high, and the extra wire can be removed a bit at a time until the readings of the two meters coincide. The same procedure can be used with suitable resistors to adjust the "B" and "C" shunts to 100 and 10 ma. full scale, respectively. When this is done, the supply should be complete and ready for operation.

A voltage-*vs.*-current graph for the main supply section is shown in Fig. 3A, and an over-all performance curve of the regulated outputs in Fig. 3B. The latter is derived from Fig. 3A and the 6L6 plate curves with the maximum current set at 100 ma. per tube and the maximum plate dissipation set at 25 watts. This may seem a bit high for the 6L6s, but it appears to be quite common practice when they are used for this purpose. Referring to Fig. 3B, the drop-off at the low-voltage end is the result of the current being limited by the maximum plate dissipation of the tubes. The drop-off at the high-voltage end is dependent upon the supply voltage and the minimum voltage required across the series tubes to force the desired current through them. For the parallel mode of operation, use the 200-ma. scale on Fig. 3B. The area of regulation will be under the solid line, and the regulator will maintain control for any combination of voltage and current that lies in this area. For either the A or B output independently, use the 100-ma. scale and the area of regulation will lie under the dashed curve. When both outputs are supplying power, the upper limit of regulation for each will lie somewhere between the solid and dashed lines. The degree of regulation is determined primarily by the gain of the d.c. amplifier. For this unit it is about 2 volts between the limits of 0 and 200 ma. when using the parallel mode of operation.

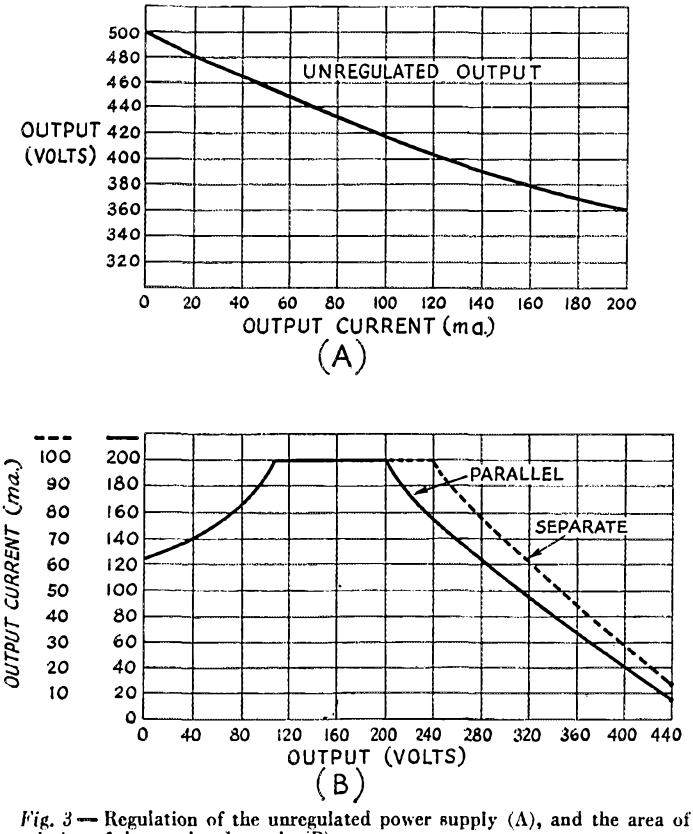
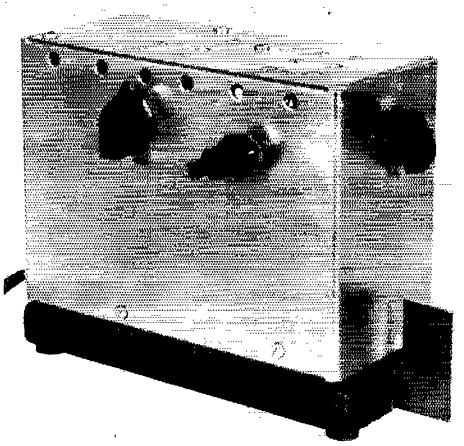


Fig. 3 — Regulation of the unregulated power supply (A), and the area of regulation of the regulated supply (B).



The completely-assembled electronic keyer. The weight control, R_9, is mounted on the front of the enclosure, above the keying paddle. Along the side, from right to left, are the speed control, R_3, and tune-up switch which shorts the contacts of K_1.

A Thyratron-Controlled Electronic Key

Simple Systems for Use with a Standard Bug

BY JACK D. GALLAGHER,* W5HZB

• Here is a simple electronic key that will operate with a conventional bug as the switching lever. It is of the self-completing type, and requires only a minimum of tubes and other components.

IN building the keyer shown in the photographs, the writer has incorporated some desirable features not usually found in electronic keying units. Although the photographs show a special key mechanism which was constructed beneath the bug base in an effort to reduce the space consumed by the usual switching lever and associated contacts, an ordinary bug (with the connection between dot and dash contacts broken) can be used. The key lever and contacts pictured were added as the result of conversations with other amateurs who had made their own switching assemblies. Either polar or nonpolar relays, adjustable or nonadjustable, may be used with equally good results. This feature is not usually found in the ordinary type of keyer.

* 5438 McCommas Ave., Dallas 6, Texas.

Circuit Operation

The operation of the keyer to be described can be followed easily by referring to the circuit diagram of Fig. 1. The pulse circuit consists of a 2D21 thyratron gas tube connected to a voltage-regulated timing circuit consist-

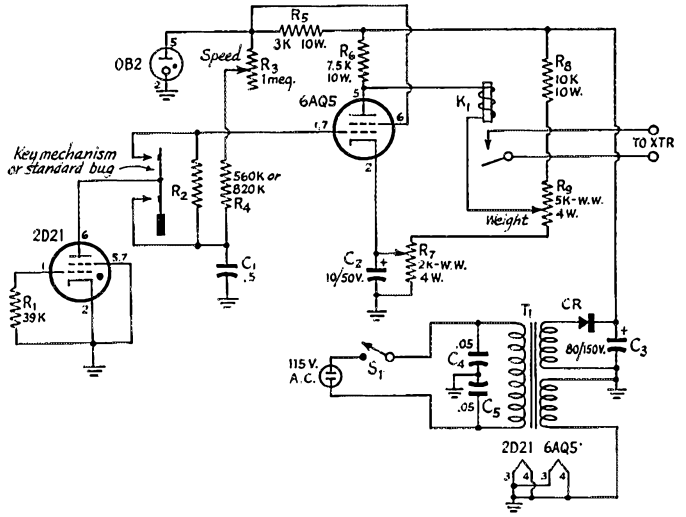
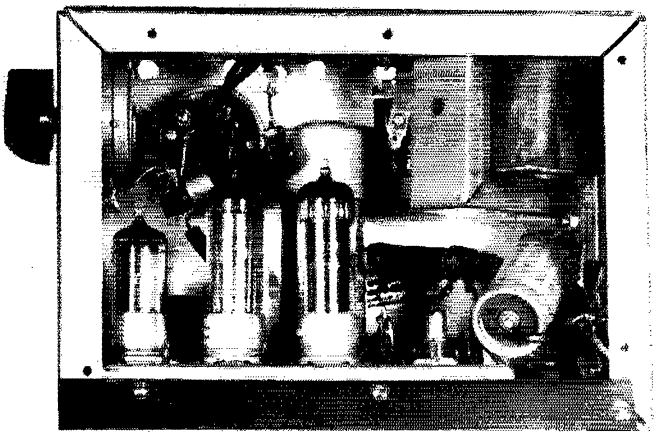


Fig. 1 — Circuit of the thyratron-controlled keyer suitable for use with either polarized or nonpolarized relays.
C_1, C_4, C_5 — Paper.
C_2, C_3 — Electrolytic.
R_2 — 100 to 2000 ohms, depending on circuit conditions.
R_3 — Linear-taper pot.
K_1 — See text.
T_1 — Power transformer: 125 v., 50 ma.; 6 v., 2 amp. (Stancor PA-8421 or equivalent).

All capacitances in μf. All resistors ½ watt unless otherwise designated.



Interior view of the thyratron-controlled electronic keyer, showing the mounting of the tubes, power transformer, and other components.

ing of C_1, R_2, R_3, and R_4, and the grid of a 6AQ5. When the key is in the neutral position, the timing circuit is kept charged by the supply voltage to a value equal to the 6AQ5 cathode voltage. In this idle condition, the weight control, R_9, is adjusted for zero voltage across the relay winding. Operating the bug lever to the usual dash position causes the following:

1) The supply voltage on the timing circuit fires the 2D21 and reduces the voltage to C_1 and the grid of the 6AQ5.

2) As the timing condenser is discharged, the voltage across the 2D21 decreases to the extinguishing point.

3) As the grid voltage of the 6AQ5 is momentarily reduced, the plate current is also reduced, causing the plate voltage to rise.

4) This change in voltage across the relay winding causes it to operate. As soon as the voltage across the 2D21 reaches the extinguishing point, the circuit tends to revert to its normal idle condition.

As long as the dash or dot contacts are closed, the 2D21 will continue to fire and repeat the operation. The same action takes place when dots are being made, except that the voltage discharged from the timing condenser is a different value because of the voltage drop across the ratio resistor, R_2. Since the timing condenser is not discharged as completely as it was in the case for producing dashes, the condenser recharges in a shorter interval of time.

The 0B2 regulator serves two purposes. First, it provides the timing circuit with a nearly constant voltage during key-down conditions. Secondly, it regulates the voltage changes in the 6AQ5 which results in better relay action.

Construction

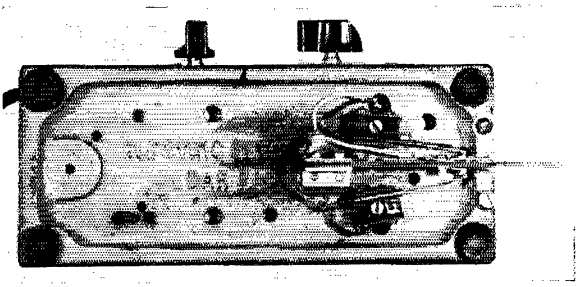
The photographs show the general construction of the keyer. In the front view, the weight control, R_9, is mounted in the top center of the $3 \times 5 \times 7$-inch aluminum chassis which serves as an enclosure. The speed control, R_3, is mounted on the left side, at the front, and to the right of a tune-up switch. This switch is not shown in the diagram, but it is merely an on-off switch connected across the relay contacts as an aid in tuning the transmitter.

In the photograph showing the interior view of the keyer, the weight control, R_9, can be seen at the upper left. The tube sockets were mounted along with the relay and R_7 on a sub-chassis which was made to fit inside the aluminum enclosure. The 2D21 is at the extreme left, with the 0B2 regulator and the 6AQ5 to the right. The screwdriver-adjusted potentiometer, R_7, can be seen to the right of the 6AQ5 and to the left of the 80-μf. 150-volt filter condenser. The relay is mounted directly behind the 6AQ5. The power transformer is mounted upside down in the upper right corner of the cabinet.

The bottom view of the keyer shows the simplicity of the key mechanism and the location of the ratio resistor, R_2. The dash and dot contact springs were taken from an old lever switch and mounted beneath the bug base as shown. A small piece of aluminum angle holds the end of the L-shaped paddle which was cut from a piece of fiberboard. The contacts mounted on the paddle were taken from an old relay. The swing of the paddle is limited by the two stops made from solder lugs mounted on the right end of the base. The contact spacing is about 0.004 inch.

Adjustment

A v.t.v.m. and an ohmmeter, or combination test instrument, can be used to advantage in adjusting the circuit for proper operation. First, the speed control, R_3, the weight control, R_9, and the cathode resistor, R_7, should be set about midway in their respective ranges. Connect the v.t.v.m. across the cathode of the 6AQ5 and ground, and adjust this voltage to 30 volts by the use of R_7. Remove the v.t.v.m. and connect an ohmmeter across the keying contacts of the relay and ground, and adjust the weight control, R_9, so that the average fluctuations of the meter when making dashes is about 78 per cent "make," or 78 per cent toward the zero-resistance end of



Although a standard bug can be used, this view shows a homemade paddle assembled underneath an old bug mounting base. R_2 is across the stationary contacts.

the meter scale. When making dots, the ohmmeter should average between 54 per cent and 60 per cent "make." However, when the keyer is connected to the transmitter, the weight control should be adjusted for the proper signal characteristic.

As a matter of interest, with 39,000 ohms in the grid of the 2D21, the current with the key closed before pulses start is about 31 microamperes. Without this resistor, or if a resistor of lower value is used, the nonpulsing current through the 2D21 will be higher. This will limit the lowest speed obtainable where plate voltages of 140 to 150 volts are used. The approximate resistance of the 2D21 in this circuit before pulses start is about 0.71 megohm.

Even though the circuit shown in Fig. 1 can be used with either polar- or nonpolar-type relays, Fig. 2 shows a circuit in which only the usual open-close, or nonpolar, type of relay can be used. The current drain in this circuit is about 15 ma., or the current through the regulator tube and cathode resistor. In the idle condition, the plate current of the second triode section is cut off, because the regulator tube holds the bias voltage on its cathode. The only adjustment required in this circuit is setting R_9 so that the relay remains open in the idle condition. This potentiometer is also the weight control and can be adjusted easily to provide the proper relay action during sending. With some relays, a 0.1-μf. condenser will be required across R_7.

Relays

In searching for a good relay to use with the circuit shown in Fig. 1, the writer has found a good, sealed, nonadjustable relay which is excellent for use in this type of circuit. It is a Western Electric type 276-G, and it is partly visible behind the 6AQ5 in the photograph showing the side view of the keyer. This is a sealed-in-glass mercury-contact relay. It is mounted on a small wafer-type octal base and housed in a metal shell about the size of a metal 6L6. It has a single armature, two separate back contacts and two separate front, or open, contacts. All contact surfaces are covered with a thin film of mercury. The pin connections from the bottom are as follows: *Pins 1* and *2* are the normally open contacts; *Pin 3* is the armature; *Pins 4* and *5* are the back contacts. A 3300-ohm coil is connected between *Pins 6* and *7*, and a 700-ohm coil is connected between *Pins 7* and *8*. Thus, a 4000-ohm winding is available by using *Pins 6* and *8*. *Pin 8* is positive with respect to *Pin 6*, and it is connected correctly in the keyer circuit with *Pin 8* to the plate of the 6AQ5. The normal operating current is from 5 to 6 ma. The relay can be purchased from the Graybar Electric Company.

Of course, other relays can be used in lieu of the expensive model described above, but they should be sensitive plate relays with a coil resistance of from 2000 to 12,000 ohms. All of the major relay manufacturers make relays which are suitable for either of the two circuits and, from the information given, it is an easy matter to select a relay which will be satisfactory.

Both of the circuits shown were designed for ease of adjustment and economy. Either should prove to be a valuable piece of equipment for the amateur.

The writer wishes to thank W5FRE for his coöperation in the design of the two circuits presented as well as in the construction of the electronic key shown.

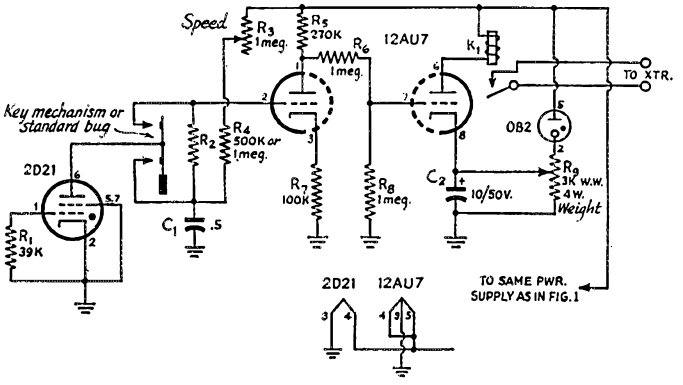
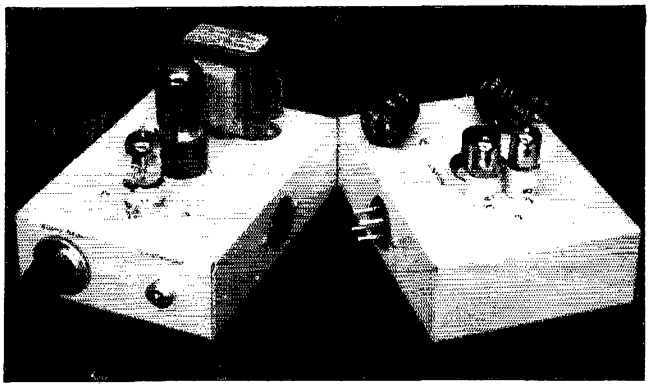


Fig. 2 — Circuit of thyratron-controlled keyer suitable for use with nonpolarized relay only.
C_1 — Paper.
C_2 — Electrolytic.
R_2 — 100 to 2000 ohms, depending on circuit conditions.
R_3 — Linear-taper pot.
R_7 — See text.
K_1 — See text.
Power supply same as Fig. 1. All capacitances in μf. All resistors ½ watt unless otherwise designated.



The simple transmitter for 220 and 420 Mc. is made in two parts. The modulator, *left*, may be retained for use with more advanced r.f. sections than the simple oscillator shown at the right. The two units may be plugged together or connected by a cable.

Technician Rig for 220 and 420 Mc.

A Two-Band Oscillator and Handy Matching Modulator

BY MASON P. SOUTHWORTH,* W1VLH

• "Those crystal-controlled dream rigs with the 25-dollar tubes are beautiful, but they scare me. How about something I can build for a few bucks to get some experience on 220 and 420 Mc.?" Here's an answer to this question, so often posed by v.h.f.-minded newcomers: a rig for both bands that is both simple and economical to build. The modulator portion can be used with any rig of similar power that you may build later on, after you've learned some of the ropes with the simple oscillator.

THIS rig was designed to make getting started on the two highest amateur bands now in regular use as simple as possible. It is thus made to order for the Technician licensee who wants to make use of his ticket. Even if you have more advanced equipment for 220 and 420 Mc., or expect to build it eventually, a rig like this is mighty handy to have around the shack. It will be useful in many ways, for antenna and receiver testing, and for local communication when you don't want to fire up those twenty-five-dollar bottles.

Although the serious work on 220 and 420 Mc. is being done with stabilized transmitters, there is still plenty of room for the modulated oscillator, so long as it is designed and operated with some care. In many sections of the country, development of activity is more important than getting stations on with the ultimate in quality gear. Crystal-controlled equipment described in recent years for these frequencies is fine for the fellow with some construction know-how, but its complexity tends to scare off those who are short on cash or experience.

This transmitter will never set any DX records, but it *can* be used for interesting short-range work. Its signal may not justify glowing reports of "broadcast quality," but if you keep the modulation level low it can be copied, even on the more selective receivers. Stability is better than with v.h.f. oscillators of bygone years, thanks to today's improved tubes and components. What's more important, building the rig is simple enough so that even the beginner should have no qualms about trying it.

The modulator portion of the rig can be considered as a long-term investment. Built as a completely separate unit from the oscillator, it can be plugged into any r.f. section of similar or somewhat higher power that you may want to build in the future. Only two tubes are used, but it has ample gain for a crystal microphone. It thus delivers good quality speech, with an output of 3 to 10 watts of audio, depending on the choice of modulator tube and the plate voltage available. It can be used to modulate equipment like the 2E26 rigs described recently,[1] for example, in either home-station or mobile service. With minor changes it could serve for control-grid or screen modulation of higher-powered stages.

To minimize the cost of getting started, a single oscillator is used for both bands. To change bands it is merely necessary to replace one jumpered plug with another, making the tank circuit either a quarter-wave line for 220 Mc. or a half-wave line for 420 Mc. The unit may be set up so that no retuning or frequency measuring is necessary in the band-changing process. Two 6AF4s or 6AT4s are used in push-pull. These tubes are cheap and readily available, and they are relatively efficient, having been designed for u.h.f. TV converter service. An input of up to 8 watts can be run on either band. A single 200-volt

* Laboratory Assistant, *QST*.

[1] Tilton and Southworth, "A Step-by-Step Station for the V.H.F. Man," *QST*, October, 1954, page 16.

plate supply is required, and it can be built from inexpensive power supply replacement parts. Total drain of the transmitter, with modulator, is about 75 ma., at 200 volts, so it can be run easily from a small vibrator-type power supply for portable use if desired.

How the Tank Circuits Work

A while back we mentioned "quarter-wave" and "half-wave" lines. These terms may be so much double talk to anyone not familiar with v.h.f. circuitry, so let's see what they represent. We know, of course, that any transmitter output circuit consists of inductance and capacitance in the proper amounts so that it will "tune" to the frequency we're interested in. Schematically, it looks something like Fig. 1A. This is the sort of thing we find in circuits for our lower amateur bands. The basic elements are there for all to see: a pair of tubes, a plate tank coil, L_1, and tuning condenser, C_1, and an output coupling coil, L_2. The tube capacitance and stray circuit inductance and capacitance are not important factors at frequencies up to 14 Mc. or so.

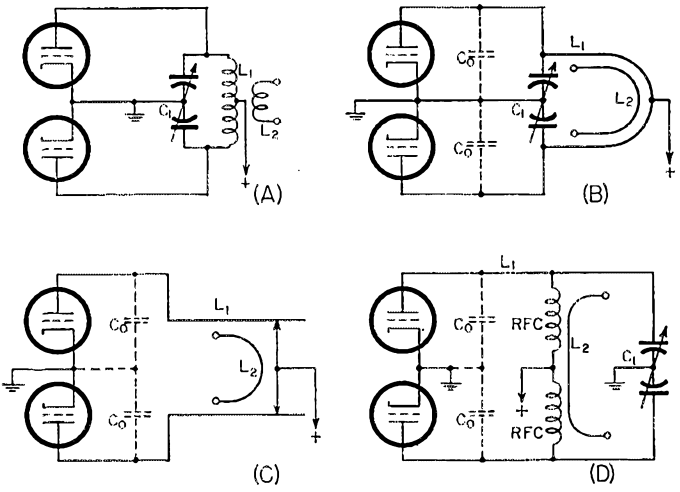


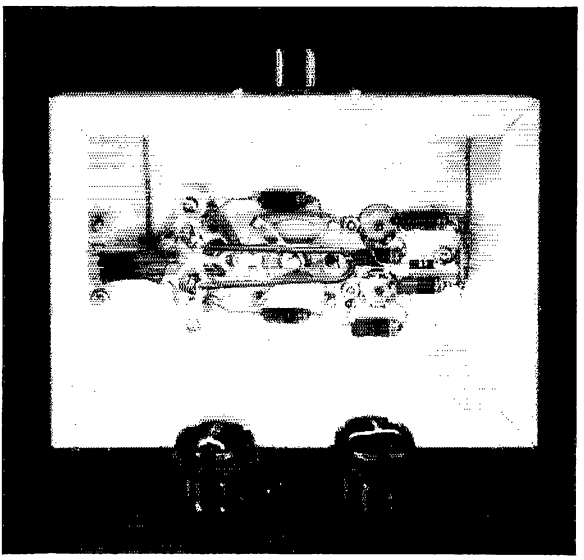
Fig. 1 — Evolution of quarter-wave and half-wave linear tank circuits.

But as we go higher in frequency the coils and condensers get smaller and smaller, until the tube and circuit capacitances become an appreciable part of the total circuit. The limit of the coil-and-condenser approach is seen at B. Here L_1 has been reduced to a short loop between the terminals of C_1. The output coupling is also a loop. We can make C_1 the smallest practical device for varying capacitance, and make L_1 a direct short across its terminals, but we still may not be able to get up to 420 Mc. because of the effect of the tubes' output capacitance, shown as C_δ in dotted lines. Tube designers can keep this small, but it's still a capacitive load across our tuned circuit.

We can connect C_1 part way down our tuned circuit to lessen its effect, and this is done in our tank circuit for 220 Mc. We can also eliminate C_1 entirely, as in the quarter-wave line, Fig. 1C. Here we adjust the tuned circuit by means of a shorting strap, leaving only the tubes' capacitance loading the line. This will get us a little higher in frequency, but it has the disadvantage of being rather difficult to handle, mechanically and electrically.

The upper limit of frequency is reached when L_1 is a direct short between the tube plates. The circuit may still work after a fashion, but it will be inefficient and difficult to couple to after L_2 ceases to have a loop form. We have one more trick, however, before we give up trying to go higher in frequency: the half-wave line, shown in Fig. 1D.

Here plate voltage is fed to the line at the point where the short was connected in C, but we use r.f. chokes so they do not load the line down ap-



Bottom view of the oscillator unit, showing the two-band tank circuit. The line terminations, with their protecting caps removed, are in the foreground. At the left is the 220-Mc. plug, with the 420-Mc. one at the right.

preciably. We continue the line out to the next r.f. voltage peak, and put our tuning capacitor there. Only the tubes' output capacitance loads the portion of the line between the tube plates and the r.f. chokes. The chokes are connected at the point of minimum r.f. voltage, so the line is effectively a quarter-wave long from tube plates to r.f. chokes, and another quarter-wave from r.f. chokes to tuning capacitance. We couple to the line with L_2, at the r.f. chokes, with the loop as shown, or on the other side of the chokes, with the open end of L_2 toward the tube plates.

This half-wave line dodge gives us a tank circuit that can be tuned conveniently and safely, yet its top frequency is considerably higher than is possible with preceding circuits. It works up to the point where the r.f. voltage null is right at the tube plate terminals, or even when it is part way down inside the tubes themselves. With the half-wave line, operation on 420 Mc. is possible with many tubes that will not go that high in frequency with the other circuits shown in Fig. 1. Keeping this explanation of the tank circuit techniques in mind will make the schematic diagram, Fig. 2, easier to interpret.

Other Circuit Features

The interesting part of our push-pull oscillator is the method by which the tank circuit is shifted from one type of line to the other. The line itself is made of two pieces of No. 12 wire, running from the tube plate pins to Pins 1 and 5 of a standard 5-prong ceramic tube socket, J_2. The line terminations, P_1 and P_2, are 5-pin cable connectors, with their pins connected as shown at the right of the schematic diagram. For 220 Mc., Pins 1 and 5 are joined, to short the end of the plate line. The plate voltage is fed to this short through an isolating resistor. This plug is seen at the left of the bottom-view photograph. At the right of the same view is the 420-Mc. termination. In this one, Pins 2 and 4 are joined and plate voltage goes to this junction from Pin 3. Looking at the schematic diagram, we see that this leaves the end of the line open, applying the plate voltage through the two r.f. chokes, as in Fig. 1D. A common coupling loop, L_2, serves for both bands.

The circuit is made to oscillate by keeping the heaters and cathodes of the tubes isolated from ground for r.f. by means of small hand-made r.f. chokes. Six of these are required. They are made by winding 12 turns of No. 28 enameled wire on 1-watt resistors of 10,000 ohms or more. The bottom view shows how they are placed.

The modulator uses a 12AX7 dual triode as a two-stage speech amplifier. The cathode of the second stage is left unby-passed, to introduce some negative feed-back. The extra gain obtainable by by-passing the cathode resistor is not needed. This stage is resistance-coupled to the 6V6GT modulator. The modulator is operated Class A, and is capable of up to 4.5 watts output

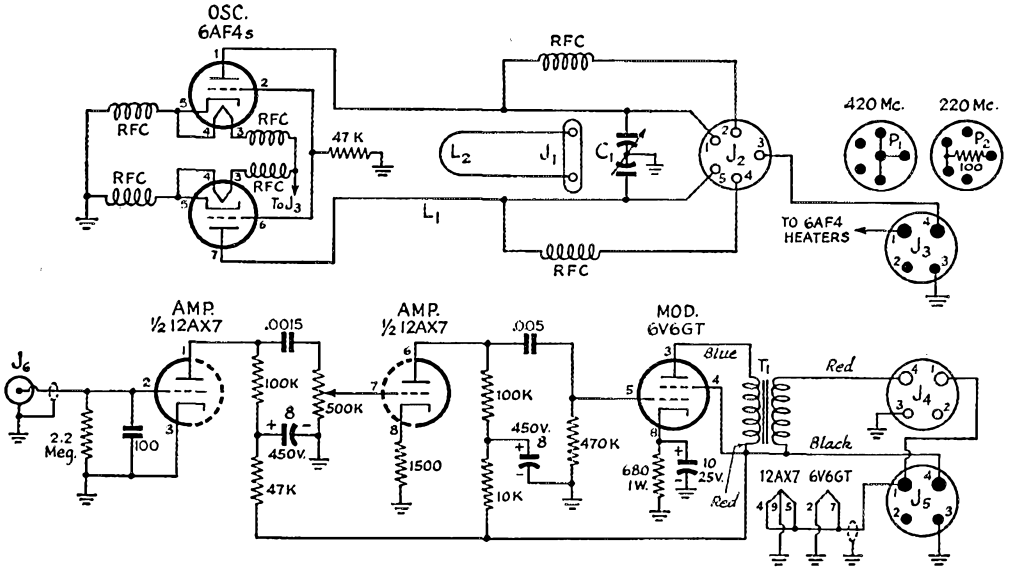


Fig. 2 — Schematic diagram and parts information for the two-band oscillator and modulator.

C_1 — 10.5-$\mu\mu$f.-per-section butterfly variable (Johnson 10LB15).

L_1 — 2 3½ inch pieces No. 12 tinned, spaced ½ inch. Bend down ¾ inch at tube end and ½ inch at socket end. R.f. chokes connect 5/8 inch from bend at tube end. Connect C_1 at 1 inch from bend at socket end.

L_2 — Hairpin loop 2¼ inches long and ½ inch wide, No. 16, covered with insulating sleeving.

J_1 — Crystal socket used for antenna terminal.

J_2 — 5-contact ceramic socket (Amphenol 49-RSS5).

J_3, J_5 — 4-contact male chassis fitting (Amphenol 86-RCP4).

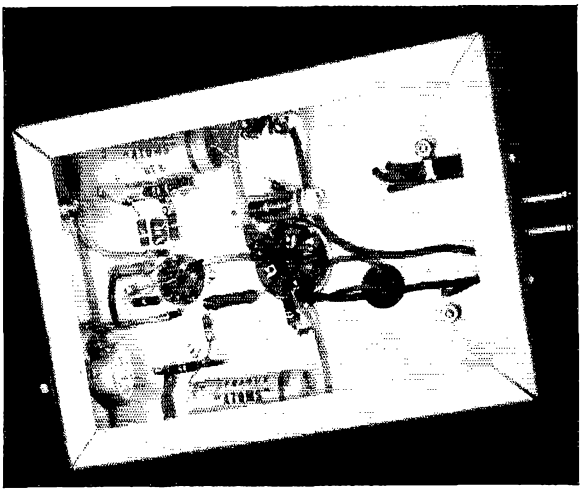
J_4 — 4-contact female chassis fitting (Amphenol 78-S4 or RS4).

J_6 — Microphone connector (Amphenol 75-PC1M).

P_1 — 5-contact male cable connector (Amphenol 86-PM5) with Pins 2, 3 and 4 joined together.

P_2 — Same as P_1, but with Pins 1 and 5 joined. Connect 100-ohm resistor between these and Pin 3.

RFC (6 required) — 12 turns No. 28 enamel close-wound on high-value 1-watt resistor.



Looking at the under side of the modulator.

with the 6V6GT. A 6L6 may be substituted to raise the output to about 10 watts, if the modulator is to be used with a higher-powered r.f. section.

Construction

Both the oscillator and the modulator are built on and inside 5 × 7 × 2-inch aluminum chassis (Bud AC-402). The input power fitting of the modulator is mounted on the rear edge of the chassis and the output fitting is on the right side. This is placed so as to plug directly into the input fitting on the oscillator and thus eliminate a connecting cable. The same pin connections are used for each fitting, allowing a power supply cable to be plugged into either unit. The blank pin (No. 2) may be used to supply unmodulated high voltage in case the modulator is used with a multistage rig.

The oscillator tuning condenser is centered on the chassis, and the tube sockets are mounted 1¼ inches away and 1 inch apart. The band-changing socket and the crystal socket which serves as an antenna fitting are 1½ and 3 inches from the condenser, respectively.

The plate lines are made from 3½-inch pieces of No. 12 tinned wire. They are bent down ¾ inch at the tube end and ½ inch at the socket end. The r.f. chokes are connected to the line about ⅝ inch from the bend at the tube end. The tuning condenser is connected at a point 1 inch from the bend at the socket end.

The antenna coupling loop is 2¼ inches long and ½ inch wide. It is made of No. 16 tinned wire covered with insulating sleeving, and fastened to soldering lugs which are mounted on ¾-inch high ceramic pillars. A short piece of 300-ohm line, or a pair of stiff wires of similar spacing, is used to connect the loop to the antenna terminal. The heater and cathode r.f. chokes should be mounted as close as possible to their socket terminals. The jumper plugs are made from Amphenol power connectors. They are shown in the bottom view of the oscillator, with the 220-Mc. plug on the left.

The modulator layout is not particularly critical, and exact duplication is not necessary. The gain control and microphone connector are mounted on the front, and the 12AX7, 6V6, and modulation transformer are laid out down the center of the top. Shielded wire should be used for the filament and 12AX7 grid leads to prevent hum pick-up. Two tie points are used to support the decoupling resistors for the speech amplifier stages. Any small modulation transformer having primary and secondary windings of about 5000 ohms will be satisfactory. If you get a multi-match unit like the one shown, the extra leads may be cut off short or curled up for future use.

Adjustment and Operation

The oscillator should be checked out first. Apply 6.3 volts and see that the 6AF4s light. Now connect a No. 47 (brown bead) pilot lamp across the antenna terminals, and insert the 220-Mc. plug. Apply 100 to 200 volts to the oscillator through a 50- or 100-ma. meter if one is available. The lamp should light if the unit is oscillating. Another check is to touch a pencil lead to the tube end of the plate line. (Use a wooden pencil!) If there is oscillation, the plate current will fluctuate as this is done. The frequency may be measured with an accurately calibrated grid-dip meter or wave-meter, or with a Lecher-wire system as described in the Measurements chapter of the *Handbook*.[2] The center of the band should fall near the middle of the tuning range. If it does not, bend the lines closer together to raise the frequency or farther apart to lower it.

Now operation on 420 Mc. should be checked. Insert the proper plug and again check for oscillation. The point of connection for the r.f. chokes should also be checked. Move a pencil lead along the line until the least effect on output and plate current is observed. This is the low r.f. voltage point, and the correct place for the chokes. Lecher wires will probably be necessary for frequency measurement on this band, since suitable wavemeters are not common. The frequency should be near the middle of the band with the same condenser setting as for 220. If not, the "tracking" may be adjusted by changing the point at which the condenser is tapped on the line. This should be set so that it is only necessary to switch plugs to change bands.

Now connect the power cable to the modulator unit, and plug the two chassis together. Connect

(*Continued on page 128*)

[2] Construction and operation of Lecher wires are also detailed in *QST* for November, 1953, page 38.

Using the B.F.O. as an Interpolation Oscillator

An Inexpensive Method of Checking Between 10-Kc. Points

BY R. R. CAMPBELL,* W4DFR

• While the idea of using the receiver b.f.o., or a similar substitute, for measuring frequencies in between 10-kc. multivibrator points is not new, it is a system that is too frequently neglected. It provides a means, at little expense, for the ham who does not need or have interest in measurement down to the last cycle.

IN MAKING accurate measurement of frequencies in the amateur bands, serious difficulty is seldom encountered in getting down to 10-kc. intervals, employing the usual 100-kc. crystal oscillator, and a 10-kc. multivibrator. It is only when an attempt is made to interpolate between 10-kc. points that high accuracy becomes hard and expensive to attain. A good audio-frequency oscillator covering a range of 5 or 10 kc. is both costly and difficult to build and calibrate. So, the average ham builds a VFO in the h.f. range, calibrating it at 10-kc. points with the multivibrator and interpolating between points. But it is seldom that high accuracy can be assured with this system because of the difficulty encountered in reading the dial accurately.

A much better interpolation oscillator, often overlooked, is the b.f.o. in the communications receiver. Most of the better present-day manufactured receivers can be depended upon to maintain good stability for a period of at least a minute or two, even without voltage regulation.

To use the b.f.o. for interpolation purposes, the b.f.o. is set in the middle of its tuning range. The receiver is then tuned to the signal whose frequency is to be measured. At this point, there should be three signals well within the audible range — the signal of unknown frequency, and a 10-kc. multivibrator signal on either side of it. Without touching the b.f.o. tuning, the receiver should be tuned to zero-beat the unknown frequency. Then, without touching the receiver tuning, the b.f.o. should be adjusted to bring the nearest multivibrator signal to zero beat. The change in b.f.o. frequency necessary to bring the multivibrator signal to zero is the difference between the standard and unknown frequencies.

As an example, suppose the unknown frequency is found between the 3550- and 3560-kc. multivibrator points. The unknown frequency can be compared with either of these two points, but usually the one having the lower beat note will be chosen because it will be stronger on a selective receiver and more easily identified. After tuning the unknown to zero beat with the receiver tuning control, the b.f.o. is adjusted to bring the nearest multivibrator signal to zero. If we find that it has been necessary to change the b.f.o. frequency by 3.27 kc., this will be the difference between the unknown frequency and the frequency of the nearest multivibrator signal. If the signal is found closer to 3550 kc., the unknown will be 3550 + 3.27 = 3553.27 kc. If it is closer to 3560 kc., the unknown will be 3560 − 3.27 = 3556.73 kc. It will usually be less confusing if, as soon as the unknown has been zeroed, it is cut off (by disconnecting the antenna, or turning off the unknown if it is locally-generated), and then zeroing the nearest m.v. signal.

To make such a reading, it is only necessary that the b.f.o. be tunable over a range slightly

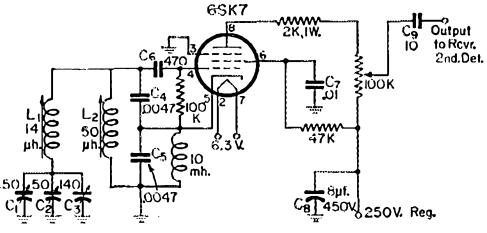


Fig. 1 — Suggested circuit of a b.f.o. interpolator for 455–465-kc. i.f. receivers.
C_1 — Zero-temp. fixed or trimmer.
C_2, C_3 — Air variable, heavy plates.
C_4, C_5, C_6, C_9 — Silvered mica.
C_7 — Disk ceramic.
C_8 — Electrolytic.
L_1 — Slug-tuned coil, 9–18 µh. (North Hills 120-D).
L_2 — Slug-tuned coil, 36–64 µh. (North Hills 120-F).

exceeding 10 kc., centered on the receiver's i.f. frequency, and be fitted with a good vernier dial accurately calibrated. The signal will always be within plus or minus 5 kc. of the nearest 10-kc. point.

Lacking other means, the b.f.o. can be calibrated from WWV's tone-modulated signal (see schedule in November, 1954, *QST*). First, with the b.f.o. dial set at the center-zero point, tune in WWV to zero beat with the 440-cycle sideband. (It is easier to do this if a crystal filter in the sharp position is used.) After marking this calibration on the b.f.o. dial, it should be possible to find a second weaker zero beat at 880 cycles, and perhaps a third, at 1320 cycles. When these points have been calibrated, the b.f.o. should be tuned to the other side of the carrier, and similar calibrations made against the opposite set of sidebands. Other points out to 1800 cycles either side

(*Continued on page 124*)

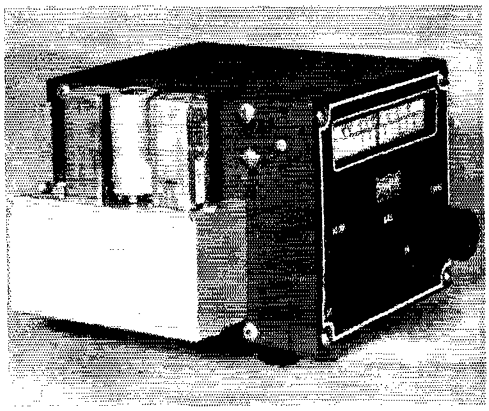
* Grand Theatre Bldg., Lenoir City, Tenn.

Double Conversion Attachment for 2-Meter Receivers

Outboard Modification for Improved Selectivity and Signal-to-Noise Ratio

BY M. K. BRETZFELDER,* W2JPX

MANY of the two-meter receivers available in the open market are being used under conditions for which they were never designed, to the detriment of good communications. A mobile v.h.f. receiver can well stand being unselective, in the interest of both easy tuning and the holding of a station under road shock conditions. The receivers in mind are those using single conversion and with a reasonably high intermediate frequency having from five to eight circuits tuned to this intermediate frequency. When such receivers are used at fixed locations, they leave much to be desired, especially if such locations are adjacent to heavily traveled highways, or in areas where 2-meter activity is heavy. Civil defense control centers are often so located.



The double-conversion unit mounted on the side of a Sonar SR-9 144-Mc. receiver.

Such a receiver, in a location overlooking a busy thoroughfare, will suffer excessively from ignition noise if it is too broad.[1] Also, in a c.d. net, such as is used in Westchester County, N. Y., a broad receiver is subject to bad adjacent-channel QRM from near-by towns when communication was attempted with a distant Central Control Station. The writer has had personal experience with the Sonar SR-9 and the Eldico MR2, both of which were designed for mobile use. He has examined the Robert Dollar 226 and suspects that it will perform similarly to the aforementioned sets. Using a Sonar SR-9 at Larchmont, overlooking the busy Boston Post Road, communication with County Control at White Plains, only 5 miles distant, was impossible except with a beam antenna and even then signals were washed out when the traffic lights changed. White Plains, using an Eldico MR2, could not operate generally around the county unless a near-by flashing neon sign was shut down. At both locations, a sharp receiver insured one hundred per cent communication.

Of course, the answer to adequate sharpness is a low intermediate frequency. This leads to image trouble so double conversion is required. A minimal change within the receiver to be improved is desirable. Putting most of the added parts and circuitry in an outboard box will simplify the job. An example of how this can be done is the following conversion of a Sonar SR-9.

Changes in the Receiver

The original circuit of the i.f. stages of the several converted Sonar receivers is shown in Fig. 1. Incidentally, this circuit is at some variance with the one shown in the Sonar Technical Manual. It was decided to keep one stage of i.f. at the original 10.7 Mc. and transform one stage to 455 kc. The converter circuits were built into a Bud CU 3002 Minibox, 4 by 2¼ by 1¾ inches in size, hung on the side of the receiver.

The last i.f. transformer was removed from the receiver and replaced with a similar-sized unit for 455 kc. Then the interstage coupler, consisting of L_1, C_1 and C_2, was removed. The resistors in the grid circuit of the second i.f. tube were left in the circuit so as to simplify the a.v.c. wiring. Except for the voltage-dropping resistor on the VR tube and a possible cathode resistor referred to in later remarks on stabilization, this constitutes the entire modification to be made inside the receiver.

Building the Conversion Unit

All of the components were mounted on one lip of the U-shaped section of the Minibox. The center section of the box goes against the left side of the receiver. The 10.7-Mc. i.f. can that was removed from the receiver was mounted toward the front end of this lip with the grid and B+ terminals next to the converter tube.

* 7 Glen Eagles Drive, Larchmont, N. Y.

[1] The author's statement seemingly is at variance with the well-known fact that noise limiters are less effective with selective receivers than with broad ones. However, a noise limiter can be effective only if the noise consists of short pulses, comprising only a minor part of the total reception time. When noise pulses become so closely spaced that they lose their impulse character and become a solid blanket of noise, as can happen when the ignition noise from many vehicles is picked up at once, a selective receiver will show a better signal-to-noise ratio than a broad one. —ED.

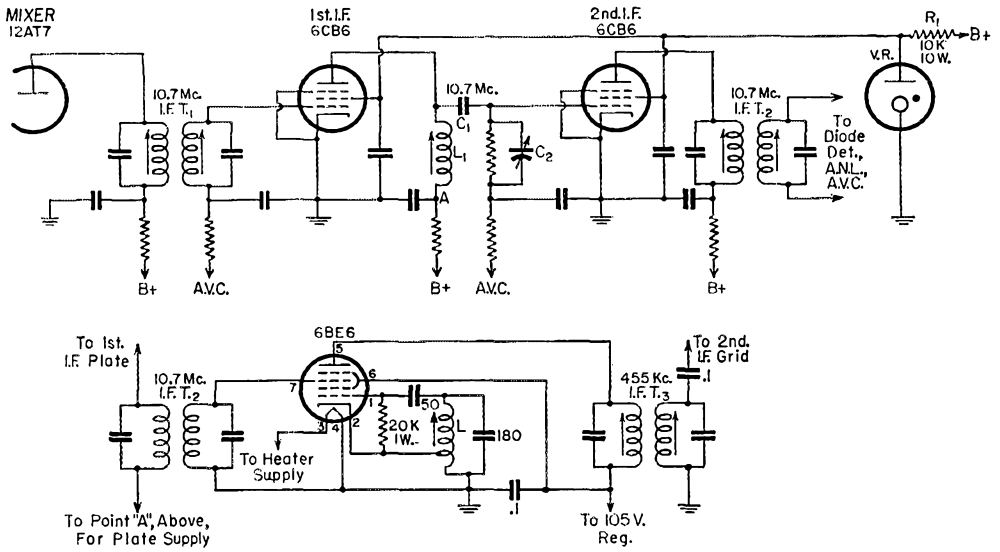


Fig. 1 — Original diagram of the Sonar SR-9 amplifier system, above. The first stage is left on 10.7 Mc. in the conversion process. The 6BE6 converter to 455 kc., below, follows, and the second stage is converted to a 455-kc. amplifier. The original output transformer, IFT_2, is used for the 10.7-Mc. input to the 6BE6. Other changes are described in the text.

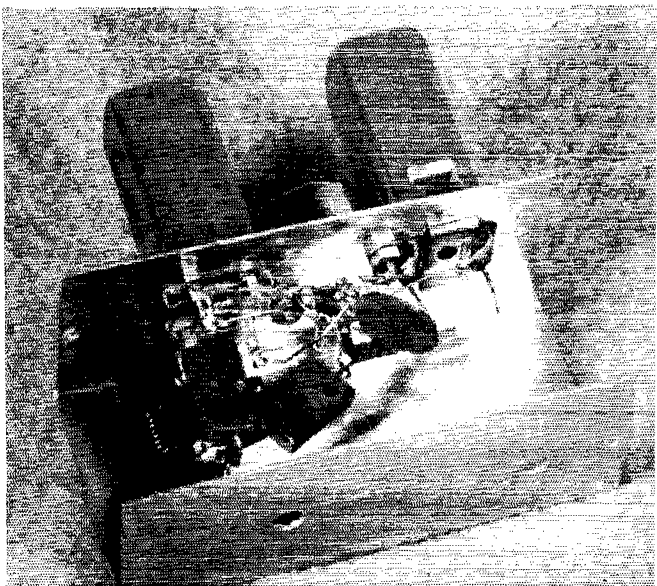
L is 7 turns ¾ inch long on a ⅜-inch slug-tuned form, tapped at 1½ turns. It resonates at 10,245 kc.

Next in line toward the rear comes the socket for the 6BE6 converter tube. Mount this so that Pin 7 can be soldered directly to the grid pin of the i.f. can. Next in line comes a 455-kc. i.f. can with the plate and B+ pins nearest to the tube. Beyond this is mounted the slug-tuned oscillator coil. In mounting all of these components be sure to allow clearance for the lips on the cover of the box. On the opposite lip of the box, drill a pair of ¼-inch holes in line with the centers of the two i.f. cans to accommodate an alignment tool for the bottom adjustments. The small parts can now be wired in place.

Two No. 33 holes can be drilled in the bottom of the U section to mate with the present chassis supporting screws on the left side of the receiver case. Locate these holes sufficiently far from the bottom edge so that there is room for the interconnecting wires to go into the set below the chassis lip. The outboard unit is now mounted and is right alongside the receiver i.f. amplifiers for short interconnecting leads. Through both boxes, drill five holes, about 3/16-inch diameter, to accommodate the interconnecting leads. These should have protectors of spaghetti where they pass through the walls of the boxes.

The plate lead from the 10.7-Mc. transformer goes nearest the front and connects to Pin 5 of the first i.f. tube. Then bring the B+ lead from this transformer to the terminal strip lug from which L_1 was removed. Then the grid lead from the 455-kc. transformer, with the coupling condenser in series, is brought to the grid, Pin 1 of the second i.f. tube. Keep the coupling condenser within the converter box. Inside the receiver dress this lead away from the leads to the 10.7-Mc. can. Farther rear, the hot heater lead

(*Continued on page 124*)



Interior view of the double-conversion unit.

Simple Crystal-Controlled Converters

Compact Units for Mobile or Fixed Stations

BY W. W. DEANE,* W6RET/KR6MO

• In the issue of *QST* for November, 1952, the author described a simple crystal-controlled converter for 10 meters. In response to many requests, this article tells how the converter can be altered to cover other bands.

IN the November, 1952, *QST* [1] an article was presented by the writer pertaining to a crystal-controlled 10-meter converter. The 10-meter band leaves much to be desired these days and, in response to many inquiries, it was decided to expand the original unit to cover any band from 75 to 10 meters.

Circuit

The circuit diagram is shown in Fig. 1. A 6AK5 operates as an r.f. amplifier, and a 6J6 serves as an oscillator-mixer. There are no tuning controls and, after initial adjustment has been completed, the converter can be mounted out of the way.

The original circuit has been modified slightly to improve the oscillator action (C_6) and eliminate some occasional oscillations generally resulting from high 6AK5 screen voltage (R_2). The layout of the components and general construction remain the same as originally presented, and as shown in the accompanying photographs. The converter is constructed on a 2¼ × 2¼ × 5-inch chassis-type box. The power is taken from the car or home-station receiver. The power-supply voltage should be limited to 175 volts by means of a series resistor in the high-voltage lead. The unit draws approximately 20 ma. RFC_1 and RFC_2 are made by breaking the leads between the second and third pies of a four-pie 2.5-mh. r.f. choke. This center-tap lead is connected to B-plus, and each end of the choke

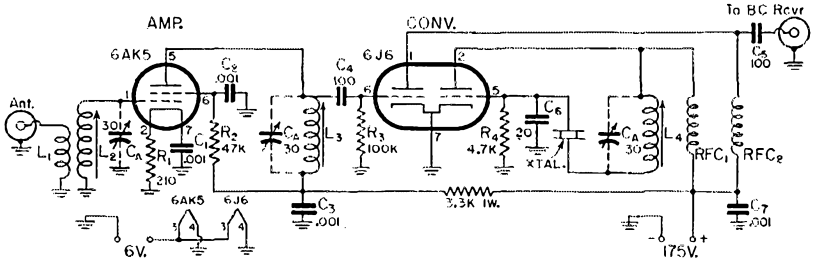
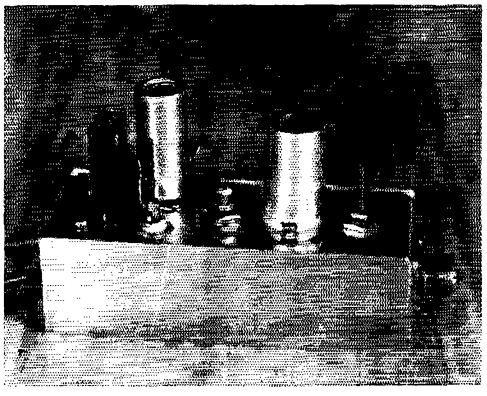
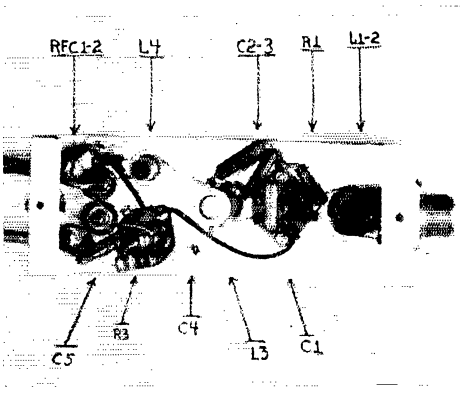


Fig. 1 — Circuit of the simple crystal-controlled converter. C_A is a 30-$\mu\mu$f. mica trimmer, used only with the coils indicated in Table I. All other capacitors are disk ceramic. Capacitance values below 0.001 μf. are marked in $\mu\mu$f. All resistors are ½ watt unless otherwise indicated. RFC_1 and RFC_2 are described in the text and in Fig. 2. Coil dimensions are given in Table I.

Top view of the simple crystal-controlled converter, showing tubes and crystal.



This bottom view of the crystal-controlled converter shows the distribution of small components.



* 4524 Fountain Ave., Los Angeles, Calif.

[1] Deane, "Simplifying the 10-Meter Crystal-Controlled Converter," *QST*, Nov., 1952.

Table I

Mc.	L_1	L_2	L_3	L_4	C_A	*Wire*
28	2 t.	20 t.	22 t.	26 t.	no	22 enam.
27	2 t.	22 t.	24 t.	28 t.	no	22 enam.
21	2 t.	22 t.	22 t.	22 t.	yes	22 enam.
14	4 t.	25 t.	25 t.	28 t.	yes	30 enam.
7	7 t.	45 t.	45 t.	none*	no	36 enam.
4	13 t.	100 t.	100 t.	none*	no	36 enam.

NOTE: All coils are wound on ¾-inch iron-slug forms (CTC LS-3). *Crystal connected directly to plate.

connects to one plate of the 6J6, as shown in the sketch of Fig. 2.

Special care should be taken to adjust the coils (see Table I) with a grid-dip oscillator so they peak in the band selected and not just close

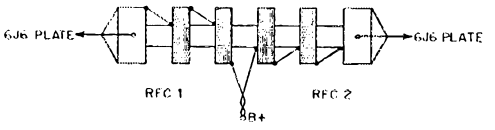


Fig. 2 — Sketch showing details of the construction of RFC_1 and RFC_2.

to it. This makes the difference between a so-so converter and a good one. To obtain the band coverages listed in the coil table, crystals must be selected as listed in Table II.

Table II

Xtal (Kc.)	*Osc. (Mc.)*	*Rcvr. (Kc.)*	*Band (Mc.)*
7000	28.0[1]	550–1550	28.55–29.55
6600	26.4[1]	550–1000	26.95–27.4
6800	20.4[2]	600–1100	21.0–21.5
6700	13.4[3]	600–1000	14.0–14.4
6400	6.4	600–900	7.0–7.3
3200	3.2	550–800	2.75–4.0

[1] Fourth harmonic of crystal frequency.
[2] Third harmonic of crystal frequency.
[3] Second harmonic of crystal frequency.

Alignment

Alignment is quite simple. The oscillator can be checked on any communications receiver covering the band selected. Plug in the crystal, and tune the receiver to the frequency listed in the second column of Table II, and adjust the slug of L_4, and C_A (when required) for maximum indication on the receiver S-meter. Inductances L_2 and L_3 can be adjusted for maximum noise or, if a signal is available, L_2 may be adjusted for maximum signal on the low end of the band, and L_3 for the high end.

Don't confine the unit strictly to mobile use. When operated with a surplus ARC-5 broadcast receiver, this makes a satisfactory unit for fixed-station operation.

M.A.R.S.

Major Flint Becomes Chief, MARS (Army)

Major Willard Flint (A4BNY), U. S. Army Signal Corps, has been assigned Chief, Military Affiliate Radio System (Army), with headquarters in Washington, D. C. Major Flint previously was assigned in the Communications Planning Branch of Army Communications Service Division, Office of the Chief Signal Officer.

Major Willard Flint, Signal Corps, Chief of the Military Affiliate Radio System (Army), inspects transmission tape of President Eisenhower's United Nations Day message to radio amateurs and short-wave radio listeners prior to the transmission from Army and Air Force joint MARS station at the Pentagon, Washington, D. C., on October 24, 1954.

A native of South Yarmouth, Mass., the new Chief, MARS, is a licensed amateur radio operator, W4BNY; he is also custodian of station K4USA, located on the concourse of the Pentagon Building, Washington, D. C.

Major Flint served during World War II as a Signal liaison officer with the Chinese Army. Assignments since the war have included such diverse duty as Signal Corps instructor, Reserve Officers Training Corps, at Oklahoma A. and M. College, Stillwater, Oklahoma, and Signal Corps liaison officer with the Turkish Army, with headquarters at Ankara.

As Chief, MARS (Army), Major Flint is responsible for the establishment and control of the Army program for training U. S. amateur radio operators who are interested in military radio communication, and in furnishing policy guidance for military commanders in the establishment and use of MARS radio nets for disaster or emergency communications.

Major Flint also will serve as Secretary of the MARS Advisory Committee, a policy-recomending body with representation from the Armed Services, Federal Communications Commission, Federal Civil Defense Administration, American National Red Cross and the American Radio Relay League.

Notes on Grounded-Grid R.F. Power Amplifiers

Circuit Details, Operating Conditions and Linearity

BY T. H. PUCKETT,* W5JXM/1

• The grounded-grid or cathode-driven amplifier is a useful type for triodes because it can be used without neutralization. Because the circuit has had relatively little use in amateur transmitters, most of us are not familiar with its other features — some of which differ greatly from what we are used to in conventional amplifier operation.

QUITE a few grounded-grid linear amplifiers are in use in single-sideband circles these days, but practically no information is available as to the operating conditions used and the circuit peculiarities observed. It was therefore decided to run some tests on a few tube types that seemed fitted for the purpose and see just what could be done, particularly along the high-power line. The four types tested were the 4-125A, 4-250A, 813 and 304-TL.

The Basic Circuit

For those unfamiliar with the grounded-grid circuit, the basic arrangement is given in Fig. 1A

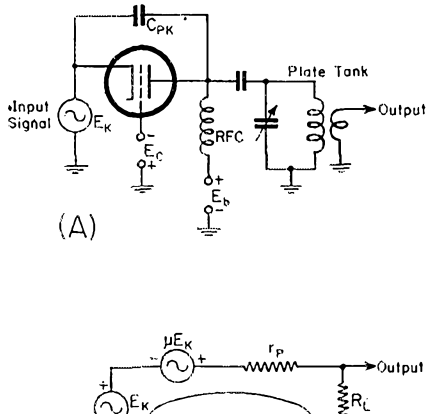


Fig. 1 — The grounded-grid amplifier circuit (A) and its small-signal equivalent circuit (B).

and the small signal equivalent circuit in B. The form of A is suitable for r.f. amplification. (The input circuit is not shown, but will come in for discussion later.) The driving signal is applied to the cathode of the tube, the grid terminal is grounded for a.c., and the output is taken from the plate circuit in the usual fashion. This may be compared with the conventional grounded-cathode circuit shown in Fig. 2. The primary advantage to be gained by using the grounded-grid circuit is that the grid acts as a shield between the input and output terminals of the amplifier

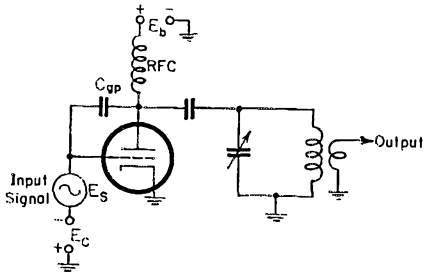


Fig. 2 — The grounded-cathode amplifier circuit for comparison with Fig. 1A.

(the cathode and plate of the tube, respectively) making the neutralization and stabilization problems much easier to handle. This may be seen by noting in the grounded-grid circuit that the primary coupling between the input and output is only the relatively small cathode-plate capacitance C_{pk}, while in the grounded-cathode arrangement the coupling is through the usually much larger (in triodes) grid-plate capacitance C_{gp}.

As a confirmation of the expected improved shielding, none of the tubes tested required any neutralization at all. It was necessary to eliminate the usual v.h.f. parasitic, but even this was easy, probably for the same reason. The methods of parasitic suppression are exactly the same as for grounded-cathode amplifiers.

Fed-Through Power

A feature of the grounded-grid circuit is that the output load current, which is also the tube current, must flow through the input signal source. This current is indicated as I_p in Fig. 1. It may be shown that this results in more power being required from the driver than for a comparable grounded-cathode amplifier. The driving power required commonly ranges from about one-tenth to one-half of the output power. However, there is some compensation in that most of the extra power from the driver simply passes through the amplifier and appears as useful power in the load.

This may be seen from Fig. 1B, if it is taken that the μE_k voltage is not present, which corresponds to the tube being present but having no

*Technical Department, ARRL.

amplifying action for some reason, such as reducing the plate voltage to zero, but leaving a continuous path for plate current to flow. The input voltage E_k will then act as plate supply of sorts, causing a current flow in the plate circuit even though the d.c. plate-to-ground voltage is zero. This current will act as a regular tube current, and give an output signal. Some of the input power will be dissipated in the equivalent plate resistance r_p, but the effective load resistance R_L is usually much larger than r_p and so will receive most of the input power. This of course neglects the losses at the grid of the tube, but these are usually small with respect to the amount of power fed through the tube, particularly for high-amplification tubes such as tetrodes which normally require only a small driving power as compared with their output power.

Input Coupling

In the practical application of the grounded-grid circuit, one other matter sometimes gives difficulty — just how to couple the driver power into the cathode. A simple cathode is indicated in Fig. 1, but in higher-power tubes this would actually be the filament. Or, if there is a separate heater, the heater-cathode capacitance would cause the heater to be at practically the same r.f. potential as the cathode. If the heater is to be supplied from a grounded source such as the regular 115-volt a.c. line, it is necessary to isolate it so that the driving source will not be grounded through the heater supply.

Probably the most obvious solution is that indicated in A of Fig. 3, in which the filament power is fed through r.f. chokes. (The tank circuit shown for coupling in the input signal is a common circuit, but any of the ordinary coupling methods, properly applied, should be satisfactory.) In this case, things are fine so long as not too much filament current is required. However, for the tubes under consideration here the filament current is large, and the wire size required to avoid excessive losses is embarrassingly big. The situation may be alleviated somewhat by using the filament chokes as the cathode tank inductor, but when using a tube such as the 304-TL, which requires 12.5 amperes, things may still be a little tough.

Another possibility is to use a filament transformer with a low interwinding capacitance, as indicated in B. The interwinding capacitance is shown as C_i. So long as this is less than the required tank capacitance, things will be fine. There were some of these transformers kicking around in surplus, from radar sets.

A third possibility is indicated in C. Here regular chokes are used, but in the input side of the transformer. The current will be stepped down in the same ratio that the voltage is stepped up, so a much smaller wire size may be used for the chokes. Of course, the transformer must be mounted so that its frame is insulated from ground. The capacitance of the transformer to ground will be added across the input, but this is usually pretty small. A filament transformer measuring about 3 by 3 by 4 inches was mounted ¾ inch off a large metal plate, and the measured capacitance was about 25 $\mu\mu$f. This method was used for these tests.

Although the data to be presented were taken on 80 meters, one run was made on 20 meters to see if anything unexpected would occur. In this case it was particularly desired to check if the method of driver coupling would be satisfactory on the higher band. The driver had a pi-network tank and was coupled to the grounded-grid amplifier by simply feeding the output of the pi tank directly into the cathode of the grounded-grid amplifier without a separate cathode tank of any kind.

This was initially tried as the simplest possible scheme, and worked beautifully. The impedance looking into the cathode seems to be in the vicinity of 50 to 100 ohms, since several lengths

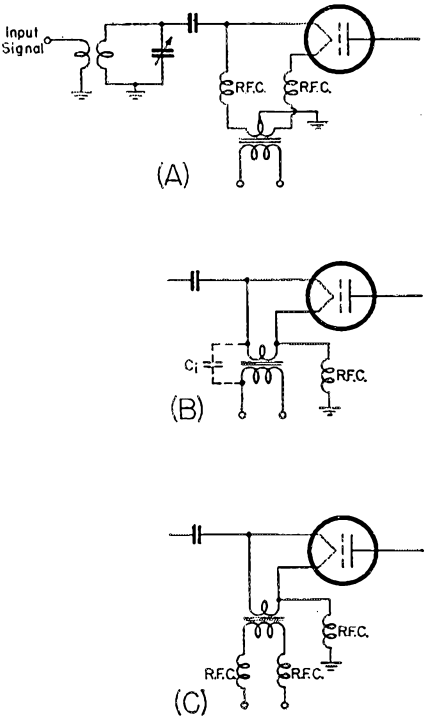


Fig. 3 — **Methods of isolating the filament or heater for r.f., to prevent grounding the hot side of the driving source.**

of 72-ohm coax were inserted between the driver and the amplifier without causing the least difficulty in loading the driver. This and the other features of the grounded-grid amplifier showed no particular change when the shift was made from 80 to 20 meters.

Tetrodes

The question arises as to what to do when the tube is not a triode as indicated in Fig. 1. In all cases, the extra grids were grounded for r.f., the same as the control grid, with any necessary bias fed in separately. Thus the extra grids of the

tube are driven along with the control grid.

If it is attempted to use a tetrode in the normal fashion, with the screen circuit returned to cathode, it is necessary to drive the screen grid along with the cathode. The screen-plate capacitance will then act as a coupling between the input and output, destroying the shielding action of the control grid. The same thing applies if the tube has a suppressor grid. Actually, the procedure of grounding all the grids just makes multigrid triodes out of the tubes.

Operating Conditions

No information is available from the manufacturers on grounded-grid operation of the power tubes commonly used by amateurs. However, such ratings as maximum allowable plate dissipation and maximum current and voltage still apply. The operating points to be given are ones which happened to be convenient, and, of course, are not the only ones which can be used. They are intended to indicate the possibilities more than anything else. Generally, the ratings from the tube manuals for grounded-cathode operation seem to be good starting points for grounded-grid operation. Simply set the amplifier up with the indicated voltages, and adjust the drive and plate loading for the desired results.

An unexpected bonus cropped up when it was found that the 4-250A and the 813 made excellent zero-bias tubes. That is, all the grids are directly grounded, and the plate voltage is adjusted to give the desired no-signal plate current. The plate voltage may be anything less than the value which results in rated plate dissipation. In linear amplifiers, it is probably desirable to keep the voltage high enough to give as much no-signal plate current as is safe. The drive and loading are then adjusted in the usual fashion.

Admittedly, adjusting the plate voltage is not always convenient. An autotransformer in the a.c. input to the high-voltage power supply is ideal. Another possibility is a small buck-boost transformer in series with the input. Luckily, the voltages required are about what is normally used on these tubes. Using this zero-bias mode requires more driving power, but against this may be placed the quite large convenience of not needing any separate power supplies for the grids. This is particularly advantageous in the case of the control grid, since for linear operation its bias must be well regulated.

The actual numerical data are given in Table I. These values were obtained using a modulated driving signal which had a low duty cycle, so that the average dissipation ratings would not be exceeded. These values may *not* be used continuously, as when plate modulating the grounded-grid stage. However, the values should be quite satisfactory for peak conditions when the stage is used as a linear amplifier in single-sideband work with speech input, since in this case the average signal is much less than the peak signal.

It was not possible to check the efficiency of the system directly, but observations of d.c. input, tube color and relative output indicated that the efficiency was in the normal region of 60 to 70 per cent.

Of the four tubes, the 4-125A was the only one which did not perform too well. As a zero-bias triode, it was not possible to get enough idling current through it, and the plate dissipation went up very rapidly with drive. It is possible that further investigation might turn up a more suitable set of operating conditions for this tube.

The 4-250A and the 813 performed about the same, within the limitations of the 813 maximum ratings. It is possible to run quite a bit more input than indicated to the 4-250A, but the required driving power increases pretty rapidly. It was necessary to be a little bit more careful about shielding the input and output circuits from each other with the 813, and it is recommended that the 813 base shell be solidly grounded by the use of metal spring clips or the like.

The 304-TL cannot be used as a zero-bias tube. The grid-bias requirement is a major difficulty, as the tube has such a low amplification factor that 150 to 200 volts bias is needed to keep the no-signal plate dissipation within reason when 2000 volts is used on the plate. In view of this and the filament current requirement, the thing that makes the tube of interest in this application is the fact that many people picked them up at low prices in surplus. Also, if driving power is available, the tube may be driven to very large inputs.

The 304-TL was the only tube of the four that needed more than a small v.h.f. inductor in the plate lead to suppress parasitics. A coil of 8 turns of No. 16 tinned wire, ½ inch in diameter and ¾ inch long, with a 100-ohm carbon resistor tapped across half of the coil, was used in the

(Continued on page 128)

TABLE I

	E_b Volts D.C.	I_p (No Signal) Ma. D.C.	E_c Volts D.C.	E_{scr} Volts D.C.	Driving Power Required Watts	Plate Input Watts	I_c* (D.C. Ma.)	I_{scr}* (D.C. Ma.)
4-125A	2000	15	0	0	150	330	100	60
4-250A	3000	50	0	0	540	1600	200	100
813	2500	40	0	0	450	1000	75	10
813	2500	40	—60	500	270	1000	5	40
304-TL	2000	50	—185	—	290	1100	75	—

* Approximate.

Hints and Kinks For the Experimenter

STARTING HARD-TO-GET-AT MACHINE SCREWS AND NUTS

WHEN the needle-nosed pliers are too cumbersome, and the fingers are too clumsy, try starting a machine nut as follows:

Press the eraser of an ordinary pencil momentarily against the barrel of a hot soldering iron. Stick the nut to the melted eraser and then use the pencil to poke the nut in place; a screwdriver will do the rest. — *Frank Joseph, WN9AOI*

—···—

WHENEVER difficulty is encountered in getting screws, washers and nuts into tight corners, it is possible to solve the problem by wrapping a couple of turns of masking tape, sticky side out, around the end of a pencil. Any small piece of hardware will stick to the tape long enough to allow completing the job on hand. — *Joseph J. Kosina, W2LGK*

"ALL-BAND" ANTENNA

FIG. 1 is a sketch of an "all-band" antenna system that I have been using with success for some time. The idea is not a new one, having appeared in *QST* at least 10 years ago. However, I feel that there are many newcomers since that time who would be interested in a simple system that can be fed with a single 70-ohm transmission line.

The arrangement consists of dipoles, cut for each band and connected in parallel at the center. Although I have not checked standing-wave ratios, the results seem to indicate that it gets out as well as a bunch of individually-fed doublets. If you haven't tried it, you're in for some surprises.

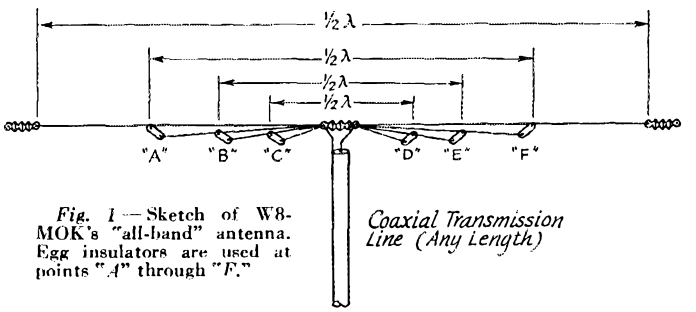


Fig. 1 — Sketch of W8MOK's "all-band" antenna. Egg insulators are used at points "*A*" through "*F*."

— *R. L. Cope, W8MOK*

[EDITOR'S NOTE: As with any system of this type, special care must be exercised in reducing low-order harmonic output, since any harmonic energy fed to the system will be easily radiated.]

USING THE SELECT-O-JECT AS A KEYING MONITOR

ANYONE who owns and operates one of the National Select-O-Jects may be interested in how the unit is used as a keying monitor here at WNØRVF. The stunt has worked out so well that earlier plans to build a more complex monitor have been given up. The system employs a Select-O-Ject keyed by a small neon tube as shown in Fig. 2. The r.f. voltage that is used to ignite the bulb is obtained by placing the tube in the r.f. field of the transmitter output amplifier. Lead length between the bulb and the S-O-J is not critical and unshielded wire has been used to date. However, r.f. chokes should be connected in series with the leads and should be placed as close as possible to the key terminals of the S-O-J. The frequency of the tone fed to the 'phones when the transmitter is keyed may be varied by means of the Select-O-Ject frequency control. My own experience with the monitor is that it follows keying without lag and reacts to bug keying much more favorably than some of the systems which employ relays to obtain the same effect.

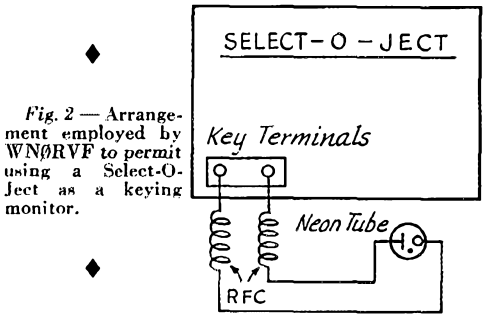


Fig. 2 — Arrangement employed by WNØRVF to permit using a Select-O-Ject as a keying monitor.

— *Tom Bakersmith, WNØRVF*

REMOVING HOT TUBES

THERE is probably nothing new about this idea but even so it can bear repeating. A simple method for removing hot tubes from "hard to get at" places is to wind a rubber band around each of the jaws of an ordinary pair of pliers. This makes an excellent tool for gripping and removing the tubes.

— *Lewis G. McCoy, W1ICP*

• Recent Equipment —

The 500-W Power Amplifier

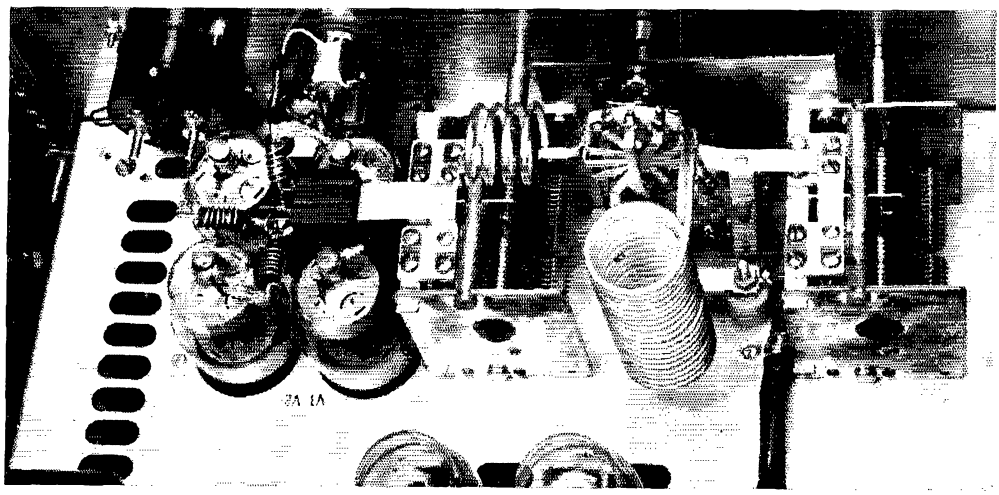
In the past, one was likely to think of an r.f. power amplifier as something that came as part of a complete transmitter he bought, or perhaps as something one built to boost the power level of an existing station. But the fashion is definitely changing, and you can now buy an amplifier as a separate unit, with or without power supply. The growth in popularity of single sideband is a prime reason for this change — many who got their s.s.b. feet wet on low-powered "barefoot" exciters want to increase the power level. Since the amplifier is of necessity a "linear" one, running in Class AB_1 or AB_2, there will be design features that did not appear in the earlier commercial r.f. amplifiers that ran only Class C. The Gonset 500-W Power Amplifier is an example of some of the novel features and engineering we can expect to see. It can be used for any mode of transmission: c.w., a.m., s.s.b., f.m. or f.s.k.

The linear amplifier is a complete package in a cabinet 23 inches wide, 13 inches high and 16½ inches deep, designed for a table-top location. It is bandswitching from 80 to 10 meters, with an "X" position on the switch for the optional 160-meter operation that is available. The single bandswitch knob controls both grid and plate circuits. Other panel controls include Grid Tuning, Grid Drive, Plate Tuning, Coarse Output Tuning, Fine Output Tuning, and power and meter switches. The Plate Tuning dial is marked directly for the various bands, to simplify resetting from one band to another without the need for referring to a chart. The Power switch is a three-position affair: Off, Fil and Plate — to permit warming up the rig before applying plate power. A green pilot lamp indicates when the filaments go on, and a red light is added when the switch is thrown to the "Plate" position. The meter switch allows metering of the cathode currents of the r.f. tubes individually, total grid current, and r.f. output voltage delivered by the amplifier. The output-voltage indication has two ranges, to allow for various output-impedance levels. Input and output jacks on the rear of the chassis are standard coaxial-connector fittings.

The 500-W uses *four* 807s in parallel, a feat that might be considered impossible by many amateurs who have struggled with only a pair of the little beasties. However, the problem was licked by a couple of constructional tricks that can be seen in the photographs and will be described shortly. The four 807s have a parallel-tuned grid circuit, with the input line tapped up on the coil instead of being connected to a separate coupling winding. The Grid Drive control is a switch that cuts in various amounts of "swamping" resistance across the grid circuit, as shown in Fig. 1. The plate circuit is the conventional pi-coupler arrangement, with the bandswitch determining the amount of inductance in the circuit. The output voltmeter uses a 9006 diode rectifier — the range is changed by inserting resistance in series with the meter.

As can be seen in Fig. 1 and one of the photographs, each 807 has a fuse in its cathode circuit, to protect the power supply and to allow operation without interruption in the event of a tube failure. Subsequent location of the bad tube is

The Gonset 500-W linear amplifier uses four 807s in parallel to deliver 250 watts peak envelope power. The individual suppressor resistors and chokes connected in the plate circuit can be seen here, as well as the heavy silver-plated straps used for low-inductance connections. Two of the four rectifier tubes can be seen in the foreground.



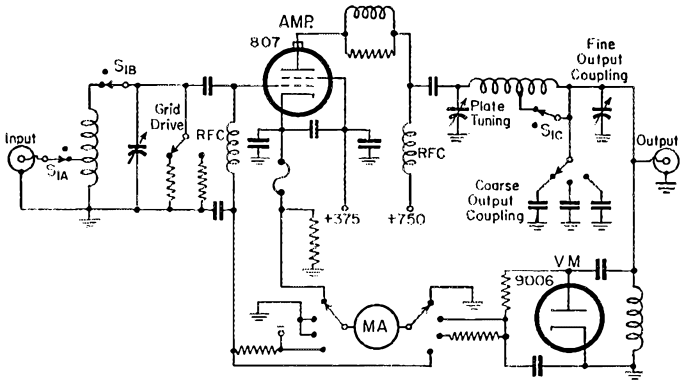


Fig. 1 — A simplified circuit diagram of the 500-W linear amplifier. Four 807s are connected in parallel, but only one is shown here. Each of the four tubes has individual screen and cathode by-passing. For simplicity, coils for all bands are not shown, but the grid circuit uses separate coils for each band (80 through 10 meters) and the plate circuit uses a tapped coil in series with a fixed (10-meter) coil. Notice the fuse in the cathode circuit and the output-level voltmeter.

simplified by the individual fusing. Another protective device is an overload relay in the common screen-grid lead to the power supply. When the total screen current exceeds 40 ma., as it might with light loading or excessive drive, the overload relay drops out, which increases the grid bias and also turns out the green pilot light. The increased bias will, in most cases, decrease the screen current sufficiently to let the relay fall back, and the result is "cycling" of the relay and a flashing of the green lamp, for as long as the overload condition exists.

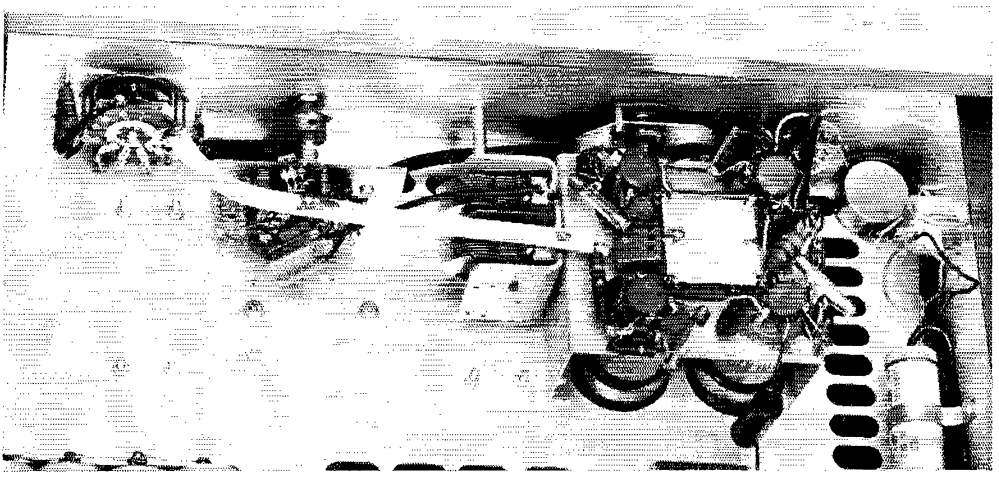
The power supply uses four 866 Jrs. in a bridge circuit, to supply 750 volts for the plates and 375 volts for the screens of the 807s. The 750-volt supply has an 80-μf. output condenser, and the screen supply has 160 μf. in the output. These high values of capacity are in keeping with current thinking about linear amplifiers, where the object is to build a high degree of dynamic regulation into the power supply. A selenium rectifier is used in the grid-bias supply.

For those who might wonder at the selection of four 807s in parallel for this amplifier, it should be pointed out that this results in the equivalent of a beam power tetrode having a plate dissipation of 120 watts, a transconductance of around 25,000, and full output at relatively low plate voltage. The constructional tricks, mentioned earlier, that permit this parallel operation without instability consist mainly of reducing the inductance of the common connecting leads. This was done by using heavy silver-plated connecting straps wherever necessary. And apparently another policy was "Don't spare the condensers," as can be seen by the generous by-passing at each socket. The currents of the 807s can run between 15 and 30 ma. without excitation, but they should match to within a 10 per cent spread at around 100 ma. with the tubes heavily loaded. Thus an important point in running four tubes in parallel is to match the cathode currents at full load and drive conditions, and ignore the wider variations in no-signal currents. If the four tubes do not match closely enough at full load, the errant tube is easy to replace. Tolerances on tubes permit wide variations but the low cost of 807s makes matching easy. Wide variations in tubes in the amplifier will degrade the linearity and reduce the potential output, so it is well worth while to match tubes.

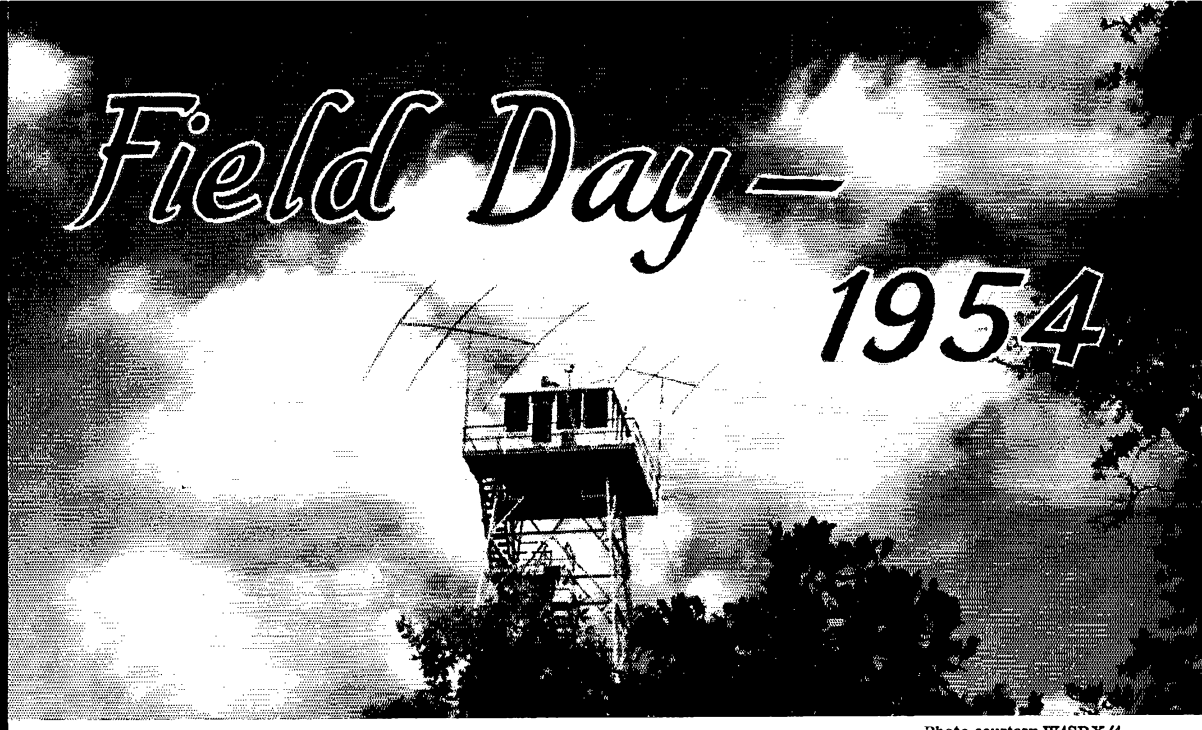
The amplifier is designed to work into 52- or 72-ohm coaxial cable having an s.w.r. of 2 or less, but it can handle them up to s.w.r. = 5 under most conditions of line length.

(*Continued on page 132*)

Attention-getters under the chassis are the components and connections at the tube sockets. The square plate and heavy strap is the common control-grid lead. Each tube is individually fused in the cathode circuit.



Field Day—1954



— Photo courtesy W4SRX/4

Number Participating Soars to 8380; 585 Clubs and Groups, 234 Portables and Mobiles Afield

BY PHIL SIMMONS,* W1ZDP

"Somebody fix 40 c.w.'s key clicks. We hear 'em all over 10 meters." . . . "Anyone gassed the generator lately?" . . . "Where's Joe Zilch? He's supposed to be logging at Position Two." . . . "Look alive, fellows, we're 50 QSOs behind this time last year." . . . "Quick, kill the gear! The line voltage is up to 140!" . . . "Now who went and sat on my sandwich!"

Such comments will ring a bell to anyone who's been on a Field Day outing. The grammar may not be impeccable, but these remarks typify that peculiar lingo which besets Hamdom every June as regular as clockwork. They reflect the joys and the woes, the trials and tribulations — they're part and parcel of every ARRL Field Day.

The first Field Day in 1933 wasn't exactly a howling success, it would seem. Just forty-one stations reported results. This was long before the advent of mobiles, of course, and the less stringent regulations for portable operation that presently prevail. And imagine trying to knock off 20 QSOs an hour using those Federal Radio Commission portable calls like W9ZZAO and W2ZZDI. At any rate, there was little evidence that Field Day would catch hold to the extent that thousands of individuals and clubs would bring about that annual ham-band cacophony.

Some groups lay careful plans for months in advance of the big day, others hold off until an hour before the opening gun. But whatever the means or degree of preparation, the emphasis is on the more serious aspect of Field Day, that of demonstrating that amateur radio is ready, willing and able to cope with a *real* emergency, be it flood or windstorm, hurricane or bomb attack. Judging from the quantity of newspaper clippings reaching ARRL, Field Day received a copious amount of "before and after" publicity — the kind that gains public support for amateur radio.

So hats off to every Field Day participant! Hats off to the boy with the 5-watt battery-powered peanut whistle who went up on the mountain and made five contacts all by his lonesome, and to the lucky mobileer who only had to climb into the family jalopy and call CQ FD. Hats off, too, to those multitransmitter installations with the club-owned generator and dozens of people helping out on the operating, maintenance, cooking, and what-have-you. Yes indeed, hats off to *every* Field Day participant for a job well done!

Like each of its predecessors, the 1954 affair smashed all previous records, with 8380 individuals in the field. Entries representing 819 portables and mobiles were received, and there were at least 2026 separate receiver-transmitter combinations operating independently of commercial mains. Those figures don't include the signals

* Communications Assistant, ARRL.

pouring forth from home stations, either. Yes, FD has proven once again that for sheer popularity it has no peer amongst ARRL-sponsored operating activities!

For purposes of our *QST* report, competition is considered to be among stations employing similar numbers of simultaneously-operated transmitters. Final scores are therefore tabulated according to the number of transmitters at each station. For purposes of geographical comparison in Class A, the following clubs and groups led in their respective licensing areas:

W1OC/1	9009	KL7CC/KL7	1195
W2LI/2	17,847	KP4ID/KP4	1500
W3PKV/3	12,177	VE1FO/1	3321
W4MK/4	7398	VE2NI/2	3582
W5SC/5	10,113	VE3BRR/3	7848
W6UW/6	11,874	VE5AA/5	1092
W7DK/7	5679	VE6NQ/6	1569
W4FU/8	14,355	VE7AQL/7	4038
W9AP/9	13,230	VE8GY/8	756
WØCET/Ø	5364	VO1X/2	1128
KH6WO/KH6	1764		

The Tri-County Radio Association of Plainfield, N. J., whose members have posted astronomical FD scores for years, did it again in '54, this time leading all entrants. With 30 watts or less to ten simultaneously-operated rigs, each of which used a 6146, an 807, a 1625, a 2E26 or

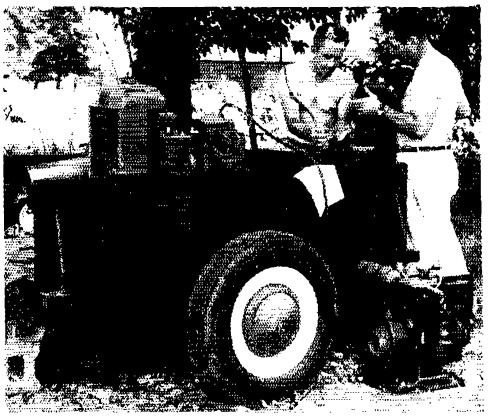
TEN HIGH SCORES

Class A		*Class B*	
W2LI/2	17,847	W2JBQ/2	5373
W2GSA/2	16,899	W5VRP/5	2916
W4FU/8	14,355	W6VIF/6	2903
W9AP/9	13,230	W4KUX/4	2835
W3PKV/3	12,177	KØWBB/Ø	2763
W6UW/6	11,874	VE3BCL/3	2547
W9IT/9	11,241	W6LDR/6	2538
K6BAG/6	11,065	W1RAN/1	2502
W2VDJ/2	10,917	W6RSU/6	2049
W9PCS/9	10,584	W3WPY/3	1980

832A final, thirty ops rolled up 17,847 points at Mountainside, N. J., under the call W2LI/2. Doublets were available for 3.5 and 7 Mc., a doublet and 2-element beam for 14 Mc., and 3- to 10-element beams for 21 through 144 Mc. Receivers were 3 HROs, 2 75As, 2 Super-Pros, and an SX-28, with converters on a Super-Pro and SX-28 handling 6 and 2 meters. A 6-kw. generator powered the gear. A breakdown of W2LI/2's 1958 contacts: 324 on 80 c.w., 304 on 75 'phone, 319 on 40 c.w., 185 on 40 'phone, 152 on 20 c.w., 128 on 20 'phone, 58 on 15 'phone, 238 on 10 'phone, 33 on 6 'phone, 217 on 2 'phone.

♦

These happy Hawaiians, flanked by the verdant scenery of Oahu, earned 1764 points in Class 1A at KH6WO/KH6, led all KH6 entrants. *L. to r.*: KH6DQ, KH6ARM, KH6RU, KH6AN, KH6WU keying, KH6AHO, KH6KC, KH6AS. The 100-watt p.p. 807s were powered by a 2-kw. generator.



An integral part of most Field Day excursions is gassing the generator. Here W9UIV obliges by doing the pouring as W9AIN assists. These and 23 other Hoosiers polled 2076 points with W9RDJ/9 in the one-transmitter category. The 3-kw. job on the trailer as well as the spare 500-watter at the right are the property of the Tri State Amateur Radio Society.

Honors for the second-highest score go to the Garden State Amateur Radio Association's W2GSA/2. Forty GSARA enthusiasts set up shop at Hazlet, N. J., earning 16,899 points and 1979 QSOs, tops in the contact department. Except for the 80-c.w. and 20-'phone installations, rigs were kept in the low-power bracket. The W2GSA/2 contact total by bands looks like this: 377 on 80 c.w., 236 on 75 'phone, 250 on 40 c.w., 190 on 40 'phone, 276 on 20 c.w., 158 on 20 'phone, 3 on 15 c.w., 54 on 15 'phone, 1 on 6 c.w., 48 on 6 'phone, 254 on 2 'phone. *Wow!*

Ohio Valley Amateur Radio Association, long renowned for its exploits in various operating activities, ran true to form in the Field Day, bringing home the third slot with 14,355 points and 1570 stations worked. Utilizing seven transmitter-receiver combos and the call W4FU/8, OVARA plowed all spectrum portions 80 through 2 (except 11 meters, which no one ever seems to tackle any more) and qualified for the 9 multiplier by employing generators and low power.

Moving to one- and two-operator stations, we find W2JBQ/2, aided and abetted by W2FBA, leading Class B with 5373 points and 373 QSOs on 20-, 40-, 80-meter A1 and A3. A VFO-2E26, a Super-Pro, a 14-Mc. ground-plane and a couple of folded dipoles comprised their modest set-up near Scottsville, N. Y. Storage batteries furnished

the juice. Other outstanding Class B scores: W5VRP/5 2916, W6VIF/6 2903.

Spearheading the record 167 mobile entrants was the 3551-point tally of K6ASK/6. On Mount Wilson near Pasadena, K6ASK and K6KBT worked 'phone exclusively, logged 238 contacts with the Harvey-Wells transmitter, Elmac receiver, and car whip.

Cleveland's Westpark Radiops, almost quadrupling their '53 showing, continued undisputed mastery of the mobile aggregate category, turned in 77,918 points. Top score of the 48 club members on the air from their individual mobiles was W8HFE/8's 3470 points. A prime reason for the success of these Ohioans is the fact that each station originates that FD message (worth up to 337.5 score points), and many receive and relay from 30 to 40 such messages. Standings of all clubs that entered the mobile aggregate classification appear in a separate tabulation accompanying this report.

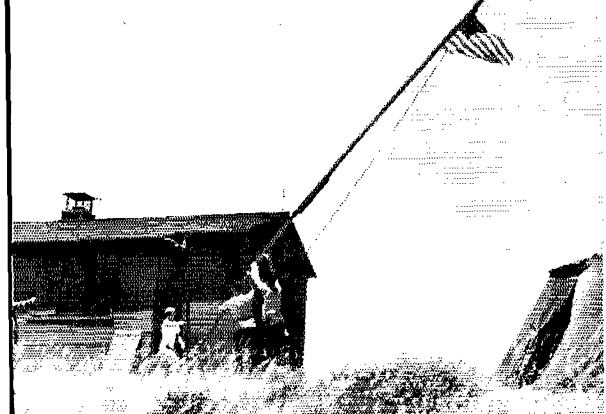
A half-dozen *QST*s could perhaps be filled with the interesting experiences and incidents which FDers recounted on their logs. ARRL is pleased to pass along as many of these sidelights as space will permit.

FD Quotes

"We expected some success from our quarter-wave 7-Mc. vertical but were really amazed at the performance of the odd-length (40-foot) vertical on 14 Mc. Eight or more radials were staked from the base of each vertical. DARC old-timers admit this was the club's most enjoyable FD. They *still* remember last year when at zero hour it was discovered that the generator ran off butane, and there was *no* butane!" — *Dallas Amateur Radio Club, W5FC/5.* . . . "We cured terrible QRN from the generator ignition by placing a 50,000-ohm resistor in the main distributor lead. Only one member had seen the site before we arrived Saturday A.M. to set up camp." — *Collingwood Amateur Radio Club, VE7DJ/7.* . . . "The 'phone team certainly came through when the chips were down. The c.w. ops not only lost prestige but now have to buy steak dinners for the participating 'phone gang." — *Narragansett Association of Amateur Radio Operators, W1SKT/1.* . . . "Our surplus generator was found to be full of rust in its gas tank and gas lines; plugs would not fire and the carburetor leaked. We fixed it up before FD, but what if it had been a *real* emergency! Clubs: See that your c.d. equipment is properly maintained and ready for action at all times!" — *Lima Area Amateur Radio Club, W8GYM/8.* . . . "Our score dropped this year, but we didn't do too badly considering we had over an inch of rain and an S9 noise level. We did work KA2IM, and we are proud of our operators for doing such a fine job under difficult conditions." — *Twin City Contest Club, WØHAM/Ø.* . . . "Our six ops went without sleep for nearly the full period. Atmospheric conditions were poor and it was necessary to change bands frequently, which caused us to lose valuable operating time." — *Midland Amateur Radio Club, W5QGG/5.* . . . "Our power source was a 1-kw. alternator belted to a 1951 Ford engine, with d.c. excitation for the alternator derived from a bank of storage batteries. We were off the air only briefly to replace two fouled spark plugs in W3IDQ's faithful buggy. Our site, Beach Haven on Long Beach Island, was chosen because of supposedly high ground conductivity as evidenced by RCA and other overseas transmitters in the near-by area." — *Beacon Radio Amateurs of Phila., W3DYL/2.* . . . "Despite bugs, heat, forgotten equipment and a sagging 750-feet-per-leg Vee of #12 soft-drawn copper wire (which had to be tightened five times), our club had a grand time." — *Northwest St. Louis Amateur Radio Club, WØBJT/Ø.* . . . "Surprised to work Falkland Islands via North Pole. A 100-foot lookout tower served as an ideal antenna support." — *Tualatin Valley Emergency Radio Club, W7OTV/7.* . . . "All our members in the military services obtained week-end passes and we planned our FD at the last minute, setting up all gear just prior to going on the air at 5 P.M. — no doubt the closest thing to an emergency operation we ever accomplished. We thoroughly enjoyed FD, disassembled the station by 5:30 Sunday, and within a few hours were all on our way to our various military posts." — *Abington Township Amateur Radio Assn., W3PSH/3.* . . . "Static charges were so strong during a local storm that it was a trick to attach a feeder without getting a jolt. Our ground-plane antenna was supported by two balloons when the vertical wire broke, but luckily no one was hurt." — *Society Radio Operators, W9NGI/9.* . . . "Heavy rains limited operations." — *Minneapolis Radio Club, WØWET/Ø* (II). . . . "All stations making any sizable number of QSOs should keep an indexed, alphabetical listing of stations worked to prevent repeats. We didn't but will certainly do so next year." — *Madison County Wireless Club, K2APT/2.* . . . "Our first participation as an organized club and we're already waiting to set up the equipment in '55. Excitement: a large moose stood 100 feet from our tent giving us the eagle eye but fortunately didn't investigate further." — *Anchorage Amateur Radio Club, KL7AA/KL7.* . . . "Believe we are the only FD entrants that operated from a defunct u.h.f. TV station. We used office space for the shack and tied our antenna to a 300-foot TV tower." — *Elmira Amateur Radio Assn., W2ZJ/2.* . . . "Weather was most uncooperative. At 1825, Saturday, operation was disrupted by a tornado. Within two minutes after the first warning was received the station was completely dismantled. Normal operation was resumed by 2000. On Sunday an electrical storm accompanied by driving rain again curtailed our operations for two hours. After a feverish 11th-hour attempt, we succeeded in relaying our message five minutes before the deadline. FD here proved a valuable lesson in emergency operation under decidedly adverse conditions." — *Maumee Valley Radio Association, W8HIF/8.* . . . "Viking and 32V rigs operate well at low power if primary of high-voltage supply is fed through variable autotransformer, resulting in plate voltage of 300-400 volts. 32Vs have connection on terminal board at the back for this; Vik-

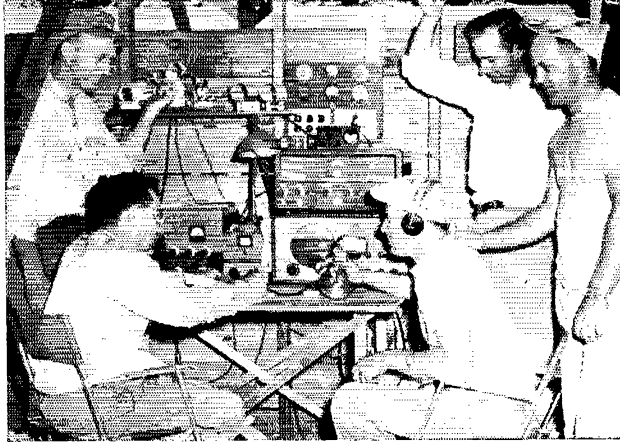
CLUB AGGREGATE MOBILE SCORES

Westpark Radiops	77,918
Norwalk Amateur Radio Club	19,849
Maryland Mobile Radio Club	12,802
Associated Radio Amateurs of Long Beach	11,842
North Seattle Amateur Radio Club	11,424
Mobile Amateur Radio Club of South Bend	6870
Wisconsin Valley Radio Assn.	2268
Lake Washington Amateur Radio Club	2079
Lockheed Amateur Radio Club	1311
Johnson County Radio Amateurs Club	752
Philadelphia High-Frequency Radio Club	635
Waltham Amateur Radio Assn.	356
Connecticut Wireless Assn.	252
Coffee Dunkers of Detroit	68



♦

It's "Alley Oop," Mount Suribachi style, in the Chino Hills near Pomona, Calif., as Aerojet Radio Amateurs Club members sedulously apply themselves to hoisting the 80-meter skywire for K6OCLZ/6.



'Though operating from a cow stall and beset by the stentorious moos of its bovine inhabitants, this team nevertheless milked 75 meters for 187 contacts. Left to right, we have Wls UEF WUJ LWA WQU and TRJ, of the Narragansett Association of Amateur Radio Operators. The club grossed 4461 points with W1SKT/1 in Class 3A.

♦

ings require connections brought out." — *W9ERU/9.* . . . "Forced to shut down for short periods due to lightning crashes around antennas. At one time six inches of water was running like a river through our tent. All in all it was a very good test under emergency conditions." — *Racine Megacycle Club, W9UDU/9.* . . . "We had to run special lines from the generator to our two electronic keys because the voltage drop was too great for them to work properly." — *Radio Amateurs of Erie County, W2EUP/2.* . . . "This event was the first for the newly-formed Radiation Lab Radio Club of Johns Hopkins University. We set up one tent on the parking lot of the famed Pimlico race track, and used a borrowed 750-watt Onan gasoline generator. The call used, W3SSF/3, was drawn from a hat. Many of the gang were Novice operators who gained valuable experience. This was my twentieth straight Field Day and I would not miss one for all the world!" — *W3LMC, club president.* . . . "A helium-filled balloon kept our vertical an average 100 feet above terrain." — *Dit-Happy Dash Hounds, W3FQR/3.* . . . "Our location was a hilltop adjoining the Baltusrol golf course where the National Open was in progress, and the path leading up the hill was completely blocked by parked cars. It took the help of the Springfield (N. J.) police to move them so we could get our heavy equipment up to the site." — *W2KGZ/3.* . . . "Complaint: Much

Field Day axiom: *Keep the signal on the air at all costs!* Above W8MQR does a hurry-up repair job on a temporary power supply for Sandusky Valley Amateur Radio Club's W8NCK/8.

time would be saved if FD voice operators would identify their stations properly. Most said 'W4XXX-slant-4' which is not even legal. Location given with call *is required by FCC* and would save many repeats." — *W4GLW/4.* . . . "If we could get a 0.001 multiplier for each chigger bite, our outfit would win hands down!" — *WØBYC/Ø.* . . . "We used ARC-5s which are handy and compact, and that single-dial control is the only way to move from place to place in a hurry. We've decided coax feed lines are a 'must' — the only time you hear the guy next to you is when you hit a harmonic." — *State Line Radio Club, W2DTU/2.* . . . "We used masts made by bolting 20-foot two-by-fours to 20-foot two-by-sixes, held fast by six guy wires. Our site was a cow pasture. At 3 A.M. we heard a terrific crash. A cow had 'spooked' at a flashlight and bumped into one of the masts, which fell and shattered into eight pieces. We finished the run with one 15-foot mast. P.S.: The cow is okay." — *Martinsville Amateur Radio Club, W9NTA/9.* . . . "We all got cherry-red sunburns and learned too late that it always pays to measure the antenna. From now on we won't just throw up a piece of wire." — *W6HJK/6.* . . . "Fine time had by all, 'though the county weed-cutter took down all our antennas Saturday morning." — *Central Texas Amateur Radio Club, W5ZDN/5.* . . . "Twenty operators, lots good food, FB weather, no technical difficulties, good band conditions. Who could ask for more!" — *Suburban Radio Club (St. Louis, Mo.), WØDCW/Ø.* . . . "Vertical antennas on the low bands seem to pay off but should be used judiciously. Early Sunday A.M. we heard on 40 meters many signals we couldn't work. The reason — we decided later when wide awake — was that the transmitter was on vertical and the receivers were on horizontal antennas." — *Columbus Amateur Radio Assn., W8TO/8.* . . . "Our Vee beam, 1000 feet each leg, was pointed at New York City where we knew FD stations would be thick as flies. We were told constantly that we had the strongest sig on the 10- and 20-meter bands. It was a real dream to cut through the 20-'phone QRM with 75 watts input. We cried like babies when it came time to take the Vee down." — *Oil Capitol Mobile Club, W5BRI/5.* . . . "The XYLs brewed up a huge beef stew which we demolished in an early supper just before H-hour. So fortified, the gang ran through the night with much vim and vigor." — *Falmouth Amateur Radio Assn., W1WNM/1.* . . . "The one big mistake we made was operating under one tent with all equipment crowded on three tables. Key clicks from our own equipment caused loss of many almost-completed QSOs." — *Andrews Electronics Assn., W8RV/3.* . . . "One of our rigs, running about 10 watts input and with practically no output, used a 63-foot wire which led to the top of the tent, was looped around the main support, and then laid in branches 6 feet off the ground for the rest of its length. This little bomb worked more than 1000 miles on 80 and 40. No wonder everybody likes FD!" — *Eagle Rock Teen Age Radio Club, W6QV/6.* . . . "The generator team required two men, one to fill it with gas and the other to ward off the rattlesnakes." — *Naval Air Station Radio Club, W4NEK/4.* . . . "Lost all antennas an hour before the start of FD in a sudden wind and rainstorm. We were using balloons that were guyed, but wind pressure forced the gas to the top of the balloons, which promptly blew up. What a mess! — *Coffee Dunkers of Detroit, W8AM/8.* . . . "We suffered from *lack* of: extension cords, outlets, ground rods, insect repellent, crushed ice, and operators from 0100 to 0800. We suffered from *excess* of: insects, generator hash, key clicks, tangled wire, warm beer, and operators from 0800 to 1800." — *Grand Island Amateur Radio Society, WØELJ/Ø.* . . . This club has never been a high scorer but we go all out for FD. Each year four large tents about 500 feet apart are erected in a city park. A centrally located 10-kw. gasoline generator feeds the tents, all of which are connected by field telephones. Our balloon-supported verticals attracted hundreds of visitors Sunday. We feel that the publicity ham radio receives is well worth the interference the visitors give our operators." — *Baltimore Amateur Radio Club, W3PSG/3.* . . . "We discovered at 0030 that our generator had been putting out 62-cycle a.c. and the electric clocks were gaining each hour. No more electric clocks for us!" — *Jacksonville Amateur Radio Society, W4DU/4.* . . . "A most wonderful time was had by all. An organized FD is a thing of beauty. Emphasis was placed on the training of our younger operators with a view toward offering some real competition in the future. Our rather unique 33-foot self-supporting vertical, located on a float in the lake and with its radials in the water, gave a good account of itself in 24 hours of 7-Mc. operation." — *Port City Amateur Radio Club, W1WQM/1.* . . . 'The 7th consecutive year our club has participated and highest score so far, but the first time we didn't get our FD message off the hook. We made an effort to pass it Sun-

Just across the Indiana border at New Paris, Ohio, W9EZB (foreground) and W9PSD keep things humming for the Richmond Amateur Radio Association's W9PSD/8. The soldering iron appears to be in readiness for that almost inevitable FD exigency.

day P.M. but we gave up after two stations politely refused." — *Paso Robles Radio Club, W6BRY/6.* . . . "Use of a 3¼ × 7½ IBM card for each contact proved beneficial in eliminating duplications. Cards for each band-log were filed by the call letter after the numeral. Tab cards for each letter facilitated rapid locating. The more the contacts, the better the system works." — *Mount Diablo Amateur Radio Club, W6LUF/6.* . . . "Tables with interchangeable legs greatly helped in setting up. Each table was equipped with a plug-in strip, a Variac, and an a.c. meter. Forty-foot extension ladders were used as antenna supports." — *Old Colony Amateur Radio Assn., W1WKN/1.* . . . "Biggest turnout we've ever had — 64 operators. The fellows worked hard for the event and enjoyed testing emergency-powered low-wattage rigs." — *Rock Creek Amateur Radio Assn., W3RCN/3.* . . . "We operated FD on an island about 1000 feet in diameter and were able to ground all equipment exceptionally well because of damp ground just under the surface. Interference between positions was therefore greatly reduced." — *San Antonio Radio Club, W5SC/5.* . . . "The following FD stations heard in Hastings, New Zealand, between 1430 and 1600 NZT, June 20th, on 14 Mc.: W2s FPY LV OPY, K2AA, W3s NA NKM, W4s VTU YZC, W5s KFD SC UAO, W6s BIP CG HJK IYY MBA MGJ OJ OT SFT TT UW, K6s BFI CKQ EBN, W8s CCO CGY, W9s FTI JP OFR RQM, W9s EWH FLA OHP SLP SX, KH6BFD, KP4ID, VE3BOG." — *ZL2ARL.* . . . "Greatest thrill was the excellent performance of our low-power transmitter. Our percentage of answers was close to 60 per cent, and average report received was 579X. The rig, designed by W2NCI and built by W2GNT, consisted of a dual-range e.c.o. with a 6AK6 covering 80 and 40 meters and a 6BK5 final doubling on 40 and 20. A bandswitching pi network provided excellent flexibility. Power input to the final was 12 watts, provided by storage batteries and a PE101-C. A 6-volt vibrator furnished hash-free power for the NC-88 receiver. The complete station, except for batteries, was placed on a 20 × 36 foot operating table, with room to spare." — *W2NCI/2.* . . . "Amid dust, rain and wind, I still say FD is tops of all ARRL activities. Already looking forward to next year." — *W9ESQ/9.* . . . "Dip stick vibrated out on generator and we lost lots of oil before noticing the trouble." — *W5WQN/5.* . . . "Up until two months before FD I had made no plans to participate. The last time I honored FD with my shaky fist was four years ago in VE1-land. However, a growing awareness of the real purpose of FD began to overtake me. Here was an opportunity to field-test equipment that might be called into use in an emergency. With mounting enthusiasm, plans were made and equipment readied. There are few amateurs in the vicinity, so with an eye to the future, four potential operators were dragged to the wilderness of the FD site. The result is that we now know exactly what technical work has to be done for the next test, we have four aspiring amateurs, and our alternate communications for civil defense are going to be efficiently set up." — *VE2QP/2.* . . . "As both SEC and SCM of Idaho, I request that next FD I be allowed 25 points credit for receiving FD messages addressed to me. How can I ever get 25 points credit for originating a message to myself?" — *W7IWU/7.* . . . "W1DHX/1 and I exchanged 'light signals' for about 15 miles. He copied our fire tower on Mount Ascutney and I read his car lights solid. Is this a FD record?" — *W1MMN/1.* . . . "Just before FD I installed in the car a heavy-duty Bosch generator which is capable of the full charging rate at very low speeds, with the result that the battery was at full charge even at the end of FD." — *W6OLC/6.* . . . "The XYL, W6EHA, and I were mobile in motion for the entire period of operation, traveling 306 miles through the valleys and mountains of Los Angeles section. We wonder how many other mobiles-in-motion took part in Field Day." — *W6EHB/6.* . . . "My 49 QSOs were made during a FD drive through Utah, Colorado and Kansas. Very enjoyable." — *W7NVY/7 and /Ø.* . . . "We used the identical set-up which netted us top listing in the '53 mobile category, but were plagued with more complications this year. Heavy static and a severe storm, which toppled 50 TV towers in town, forced cessation of operation for almost eight hours. All considered, it is still a source of great surprise to learn what can be done with low power and nothing but a whip on the back of the car." — *W9RQM/9.*

SCORES

CLASS A

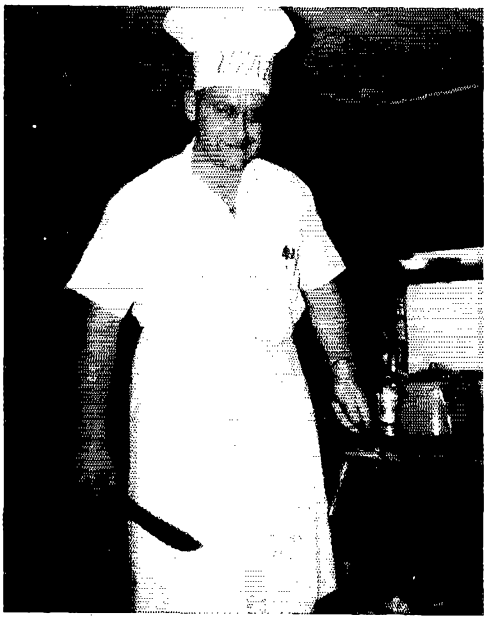
Scores are tabulated according to the number of transmitters operated simultaneously at each field station. The figures and letters following each listing indicate the number of contacts, the power or power inputs used, the number of participants at each station and the final score. The "power classification" used in computing the score is indicated by the letters A, B or C after the number of QSOs shown. A indicates power up to and including 30 watts (multiplier of 3); B indicates power over 30, up to and including 100 watts (multiplier of 2); C indicates over 100 watts (multiplier of 1). More than one letter indicates that at times power inputs fell within different classifications.

One Transmitter

W1BDI/1	Connecticut Wireless Assn.	560–	A–11–	5274
W1KXM/1	Central Connecticut Contest Club	500–	A–15–	4725
WØHAM/Ø	Twin City Contest Club	452–	A– 8–	4293
W5QGG/5	Midland Amateur Radio Club	418–	A– 6–	3987
WØDU/9	Egyptian Radio Club	389–	A– 6–	3726
W1EH/1	South Lyme Beer, Chowder and Propagation Society	308–	B– 7–	3204
W3DYL/2	Beacon Radio Amateurs	324–	A– 7–	3141
W6HGY/6	Whittier Radio 50 Club, (nonclub group)	298–	A–16–	2907
W8II/8	Northwest St. Louis Amateur Radio Club.	297–	A–10–	2898
WØBJT/Ø		297–	A–12–	2898

"Br-r-r-r," you say, and justifiably so. Far from the cry of the mosquito, this fur-clad quintet manned VE8GY/8, the world's most northerly Field Day station, near the Arctic Ocean on Yukon's north coast. *L. to r.:* VE3AAS, W3VYR, VE3BUO, VE1QJ, W2YJI. The portable hamshack in the background is a wanigan, or Arctic bunkhouse on runners. Each of VE8GY's 59 contacts was DX, there being no locals in these parts.

W7OTV/7	Tualatin Valley Emergency Radio Club	433-	AB-17-	2862
W8HQ/8	Tusco Radio Club	450-	B-19-	2850
W8CEA/8	Dayton Amateur Radio Assn. (one group of four)	346-	AB- 8-	2763
W3PSH/3	Abington Township Amateur Radio Assn.	279-	A- 6-	2736
W3EDI/3	York Amateur Radio Club	292-	A- 6-	2628
W8TOL/8	Aerial Radio Club	274-	A- 3-	2466
W8FZB/8	Muskingum Amateur Radio Assn.	401-	B-11-	2406
W8ODJ/8	Buckeye Shortwave Radio Assn.	346-	B-10-	2226
W8UMD/8	Treaty City Amateur Radio Assn.	371-	B-22-	2226
W9UC/9	Fort Wayne Radio Club	219-	A-20-	2196
W3GAG/3	Philadelphia Wireless Assn.	316-	A- 7-	2169
WØZWY/Ø	Sioux Falls Amateur Radio Club	329-	B-16-	2124
W9RDJ/9	Tri State Amateur Radio Society	321-	B-25-	2076
WØGM/Ø	(nonclub group)	319-	B- 5-	2064
W9NGI/9	Society Radio Operators	200-	A-11-	2025
W8OAJ/3	Mercer County Radio Assn.	198-	A-12-	2007
W8RTR/8	Canton Amateur Radio Club	190-	A-20-	1935
W2WUX/2	Utica Amateur Radio Club	206-	A- 5-	1854
W2LST/2	Hasbrouck Heights, N. J., AREC	179-	A- 9-	1836
W8GYM/8	Lima Area Amateur Radio Club	209-	AB- 6-	1836
W3RVC/3	Allegheny Kiski Amateur Radio Assn.	178-	A-14-	1827
W7SSF/7	Butte Amateur Radio Club	277-	B- 8-	1812
W8NCK/8	Sandusky Valley Amateur Radio Club	200-	A- 7-	1800
WØWET/Ø	Minneapolis Radio Club	172-	A-10-	1773
KH6WO/KH6	(nonclub group)	269-	B-12-	1764
W7VPA/7	Richland Amateur Radio Club	263-	B- 5-	1728
KH6BFD/KH6	Windward Oahu Amateur Radio Club	262-	B- 6-	1722
W8LJ/8	Dayton Amateur Radio Assn. (one group of four)	165-	A- 6-	1710
W2TIO/2	(nonclub group)	186-	A- 8-	1674
W6TTE/6	Fullerton Radio Club	183-	A- 8-	1647
W8FWQ/8	(nonclub group)	153-	A- 4-	1602
W2ICM/2	Oswego County Amateur Radio Assn.	152-	A-18-	1593
W8PHW/8	Dayton Amateur Radio Assn. (one group of four)	146-	A- 4-	1539
KØFAC/Ø	(nonclub group)	231-	B- 3-	1536
W5VVF/5	Winkler County Radio Club	169-	A- 4-	1521
W4GSV/4	Albany Amateur Radio Club	228-	B-12-	1518
W3PQX/3	(nonclub group)	251-	B- 3-	1506
W5DDL/5	Lafayette Amateur Radio Club	165-	A- -	1485
W5JFT/5	(nonclub group)	213-	B- 7-	1278
WØFX/Ø	Jamestown Amateur Radio Club	141-	A- 6-	1269
W4EM/4	Mid-South Amateur Radio Assn.	186-	B-20-	1266
W9NEV/9	Blackhawk Amateur Radio Club	206-	B- -	1236
K2BCI/2	Wantagh Amateur Radio Club	131-	A-14-	1179
W5WBH/5	Las Cruces Union High School Amateur Radio Club	180-	AB- 3-	1170
VE1JV/1	Pictou County Amateur Radio Club	104-	A- 7-	1161
W6WDR/6	(nonclub group)	189-	B- 3-	1134
WØFFN/Ø	(nonclub group)	164-	B- 5-	1134
W7SAA/7	Salem Amateur Radio Club	182-	B-12-	1092
VE5AA/5	Saskatoon Amateur Radio Club	242-	AC-14-	1092
W8MBM/8	Barry Amateur Radio Assn.	121-	A- 6-	1089
W1TLV/1	(nonclub group)	95-	A- 3-	1080
WØPUA/Ø	Lebanon Amateur Radio Klub	154-	B-10-	1074
W6QZT/6	Foothill Radio Club	91-	A- 6-	1044
K2APT/2	Madison County Wireless Club	115-	A- 8-	1035
W5TAK/5	(nonclub group)	167-	B- 4-	1026
WØAUQ/Ø	Cedar Valley Amateur Radio Club	171-	B- 4-	1026
W7RXQ/7	Jr. Division, Butte Amateur Radio Club	88-	A- 5-	1017
W4KEK/4	Peninsula Amateur Radio Club	144-	B-10-	1014
W7SWS/7	Snake River Keys and Mikes Club	144-	B- 8-	1014
KL7AA/KL7	Anchorage Amateur Radio Club	140-	B-16-	1002
W9CEA/9	(nonclub group)	102-	A- 9-	918
W6CNY/6	San Luis Obispo Amateur Radio Club	117-	AB- 6-	900
VE7VT/7	Penticton Amateur Radio Assn.	100-	A- 4-	900
WØDVL/Ø	Northeast Iowa Radio Amateur Assn.	97-	A-18-	873
W2ZJ/2	Elmira Amateur Radio Assn.	145-	B-10-	870
W9FLF/9	(nonclub group)	95-	A- 6-	855
VE3ADX/3	Stratford Amateur Radio Club	140-	B-15-	840
W9WWJ/9	(nonclub group)	83-	AB- 4-	837
W8PMV/8	Dayton Amateur Radio Assn. (one group of four)	92-	A- 4-	828
W5DHT/5	(nonclub group)	112-	B- 3-	822
W2CFY/2	Malone Amateur Radio Emergency Corps	111-	B-15-	816
W7QFQ/7	(nonclub group)	123-	AB- 3-	789
W3KYR/3	Boys Club of St. Marys Amateur Radio Society	87-	A- 5-	783
WØFLA/Ø	Crete Amateur Radio Club	87-	A- 4-	783
W2NRD/2	Rip Van Winkle Amateur Radio Society	86-	A- 5-	774
WØIER/Ø	Redfield Amateur Radio Club	129-	B-10-	774
W5BPM/5	East Texas Amateur Radio Club	102-	B- 9-	762
VE8GY/8	(nonclub group)	59-	A- 5-	758
W8SPN/8	(nonclub group)	80-	A- 5-	720
KL7FAJ/KL7	Elmendorf Amateur Radio Club	94-	B- 5-	714
W7QHT/7	(nonclub group)	52-	A- 4-	711



No, this isn't a 1954 Jack-the-Ripper. It's W7AZI, galley *charge d'affaires* for the Radio Club of Tacoma, preparing to serve up a toothsome repast to the hungry Radio Club of Tacoma crew. Roy's offerings must have been tasty indeed, as W7DK/7's 5679-point tally was tops for the W7 call area.

WØMUO/Ø	(nonclub group)	117-	B- 4-	702
W9VPD/9	(nonclub group)	76-	A- 4-	684
W7QXS/7	Astoria Amateur Radio League	71-	A-10-	639
W4JNB/4	Muscle Shoals Amateur Radio Club	103-	B- 4-	618
W5VQO/5	Pioneer Amateur Radio Assn.	68-	A- 3-	612
W9GHA/9	Central High School Radio Club	100-	B- 7-	600
VE5MA/5	Moose Jaw Amateur Radio Club	71-	B- 7-	576
W8DFK/8	Brass and Java League	63-	A- 3-	567
W9RQK/9	Marshfield Amateur Radio Club	37-	A-10-	558
K2BZC/2	(nonclub group)	35-	A-30-	540
W5YKE/5	(nonclub group)	60-	A- 3-	540
W9AIQ/9	Door County Amateur Radio Club	90-	B- 7-	540
VE7QM/7	North Shore Radio Club	60-	A- -	540
W2EFU/2	Schenectady Amateur Radio Assn.	268-	B- 7-	536
W2KYN/1	Knickerbocker Amateur Radio Club	64-	B- 4-	534
W8PZS/8	Ohio University Radio Club	61-	B- 4-	516
W4UHC/4	St. Augustine Amateur Radio Club	79-	B- 5-	474
WØZ8J/Ø	Mitchell Radio Amateur's Club	54-	B- 6-	474
W6NIK/6	(nonclub group)	51-	A- 3-	459
WØJAD/Ø	Clinton Amateur Radio Club	76-	B-12-	456
WØQBX/Ø	(nonclub group)	49-	B- 3-	444
W4BOW/4	Lakeland Amateur Radio Society	100-	B- -	380

W2AEE/2	Columbia University Amateur Radio Club.	164-	B- 5-		378
VE8YT/8	Frobisher Bay Amateur Radio Club	125-	C- 4-		375
W8YN/8	Calhoun Area Radio Club	61-	B- -		366
W5TNR/5	(nonclub group)	33-	B- 3-		348
W4YMU/4	Anderson Radio Club	57-	B- 5-		342
KN6DVT/6	Helix Kilocycles	27-	A- 3-		312
W8HIF/8	Maumee Valley Radio Assn.	3-	A- 6-		252
W9AML/9	Central Illinois Radio Club	36-	B- 4-		216
W6NWA/6	(nonclub group)	23-	A- 8-		207
WØECD/Ø	El Dorado Amateur Radio Club	76-	B- 5-		202
W7ROX/7	Gallatin Valley Amateur Radio Club	33-	AB- 4-		201
W9IAD/9	(nonclub group)	23-	C- 3-		69

Two Transmitters Operated Simultaneously

W3BES/3	Frankford Radio Club (one group of two)	983-	A- 6-		9072
W4MK/4	Richmond Amateur Radio Club	822-	A-30-		7398
W3KT/3	Frankford Radio Club (one group of two)	703-	A- 8-		6552
W1VB/1	Candlewood Amateur Radio Assn.	504-	A-16-		4761
W3NMR/3	Lancaster Radio Transmitting Society	527-	A- -		4743
W2JC/2	Bloomfield Radio Club	492-	A- 8-		4653
W3CKJ/3	Antietam Radio Assn.	609-	AB-30-		4335
W9ERU/9	(nonclub group)	438-	A-11-		4167
W2ODP/2	Irvington Radio Amateur Club	437-	A-25-		4158
W9UDU/9	Racine Megacycle Club	430-	A-20-		4095
WØSLP/Ø	Hutchinson Amateur Radio Club	414-	A- 8-		3951
W4SRX/4	Eglin Amateur Radio Society	405-	A-20-		3870
W8OFW/8	Bacral Radio Club	403-	A-10-		3852
W9REG/9	Tippecanoe Amateur Radio Assn.	538-	AB-20-		3609
VE2NI/2	(nonclub group)	398-	A- 8-		3582
WØVMU/Ø	South St. Louis Amateur Radio Club	527-	AB- 8-		3429
W6TO/6	Fresno Amateur Radio Club	352-	A-20-		3393
W2EUP/2	Radio Amateurs of Erie County	348-	A- 6-		3357
W4RLD/4	Middle Tennessee Radio Amateur Assn.	443-	AB- 8-		3336
K6CLZ/6	Aerojet Radio Amateurs Club	448-	AB-18-		3207
W1INM/1	Providence Radio Assn.	393-	AB-15-		3198
W4RSS/4	Norfolk Naval Shipyard Amateur Radio Club.	464-	AB-10-		3162
W3KX/3	Electric City Amateur Radio Club	346-	A-12-		3114
W4NC/4	Winston Salem Amateur Radio Club	501-	B-25-		3008
W2IQ/2	(nonclub group)	306-	A-12-		2889
WØUNT/Ø	Lawrence Amateur Radio Club	438-	B-12-		2778
W6KMY/6	Pleasant Valley Amateur Radio Club	276-	A-15-		2709
W9NTA/9	Martinsville Amateur Radio Club	270-	A- 9-		2655
W2ODV/2	Bayonne C. D. Amateur Radio Club	437-	B-10-		2622
W2EWT/2	KBT Radio Club	390-	B-19-		2565
W8MAA/8	Central Michigan Amateur Radio Club	416-	B-15-		2496
W4HHO/4	Charleston Amateur Radio Club	387-	B-15-		2472
W5FC/5	Dallas Amateur Radio Club	311-	AB-16-		2472
WØTIU/Ø	Central Iowa Amateur Radio Club	386-	B-10-		2466
VE2CB/2	Verdun Amateur Radio Club	384-	B- 9-		2454
WØOJY/Ø	Prairie Dog Amateur Radio Club	374-	B-16-		2394
W4UWS/4	Rappahannock Valley Radio Club	373-	B-14-		2388
WØMLB/Ø	Midway Amateur Radio Club	234-	A- 4-		2331
W6IKO/6	Tamalpais Radio Club	363-	B-12-		2328
W4MN/4	Palmetto Amateur Radio Club	378-	B-15-		2268
W1GB/1	New Haven Amateur Radio Club	316-	AB- 6-		2241
W7AQ/7	Yakima Radio Club	218-	A-20-		2187
W4ACA/4	(nonclub group)	358-	B- 3-		2148
W5UAO/5	Pittsburg County Amateur Radio Club	357-	B-10-		2142
W3SSF/3	Radiation Lab. Radio Club	211-	A-12-		2124
K2DIE/2	Cowanesque Canisteo Amateur Radio Assn.	207-	A-16-		2088
K2ELD/2	Mid-Hudson Amateur Radio Club	323-	B- 5-		2088
VE7DJ/7	Collingwood Amateur Radio Club	204-	A- 6-		2061
W8FT/8	Findlay Radio Club	247-	AB-17-		2031
W8CIA/8	Louisville Amateur Radio Club	216-	A- 8-		1944
W7LAB/7	Ogden Amateur Radio Operator's Club	224-	AB-30-		1923
W8RYI/8	Kalamazoo Amateur Radio Club	215-	AB-15-		1923
W9DKR/9	Kokomo Amateur Radio Club	291-	B-25-		1896
W4FA/4	Jackson Radio Club	235-	AB- -		1890
W4SUD/4	Owensboro Amateur Radio Club	453-	BC-16-		1842
W2GGN/2	Queens Radio Amateurs	278-	B- 9-		1818
W6BCY/6	Merced Amateur Radio Club	303-	B-15-		1818
W3FQR/3	Dit-Happy Dash Hounds	202-	AB- 6-		1671
W1HJL/1	(nonclub group)	198-	AB- 3-		1662
W3BYF/3	Allentown Mike and Key Club	225-	AB- 4-		1575
W6GRR/6	Bakersfield Technicians and Operators Club	235-	B- 8-		1560
W9OSD/9	Tritown Radio Amateur Club	254-	B-28-		1524
W7QII/7	Lower Yakima Valley Radio Amateurs	144-	A- 7-		1521
W2KGZ/2	(nonclub group)	202-	AB- 7-		1509
W5ABF/5	Mineral Wells Amateur Radio Club	179-	AB-13-		1488
W4UMV/4	Rock Hill Amateur Radio Club	201-	AB-25-		1478
W9GEY/9	Adams County Radio Club	237-	AB-12-		1425
W4LW/4	(nonclub group)	210-	B- 6-		1422
WØRFU/Ø	Band Hoppers Radio Club	180-	AB- 7-		1398
W5WIH/5	South Plains Amateur Radio Club	189-	AB- -		1380
W3MKA/3	West Philadelphia Radio Assn.	224-	B- -		1344
W5FGE/5	Hattiesburg Amateur Radio Club	198-	B- 7-		1344
WØEDA/Ø	Rolla Amateur Radio Assn.	199-	B-12-		1344
W4YKY/4	Lake Amateur Radio Assn.	192-	AB-15-		1341
W4SON/4	(nonclub group)	147-	A- 3-		1323
K6CKQ/6	Mountain View Amateur Radio Club	192-	B-12-		1302
W3DD/3	Haverford Township Emergency Radio Net	213-	B-14-		1278
W4CHQ/4	Piedmont Amateur Radio Club, Spartanburg, S. C.	149-	A-15-		1269
W6ZGA/6	(nonclub group)	141-	A- 5-		1269
W8KEG/8	Tri State Amateur Radio Assn.	137-	A-15-		1233
W7TFQ/7	Hughes Amateur Radio Club	177-	B-10-		1224
WØLIJ/Ø	Muscatine Amateur Radio Club	136-	A- 7-		1224
W7QDM/7	Davis High School Radio Club	173-	B- 6-		1200
KL7CC/KL7	(nonclub group)	173-	B- 5-		1195
VE1NU/1	Glace Bay Amateur Radio Club	124-	AB-10-		1157
K6CEF/6	(nonclub group)	101-	A- 3-		1143
KH6IN/KH6	Hilo Radio Club	161-	B-20-		1116
W8QLY/8	Mahoning Valley Amateur Radio Assn.	334-	AC-10-		1098
W9WHL/9	(nonclub group)	120-	A- 7-		1080
W7EKA/7	(nonclub group)	117-	A- 3-		1053
W9NNS/9	Point Radio Amateurs	115-	A- -		1035
K2BGQ/2	Schoharie County Amateur Radio Club	118-	AB- 7-		1017
WØCJI/Ø	(nonclub group)	140-	B-10-		990
W7TMZ/7	Shy-Wy Radio Club	74-	A- 9-		891
WØILO/Ø	Red River Radio Amateur Club	99-	A- 5-		891
W7AHQ/7	Skagit Amateur Radio Club	148-	B- 4-		888
W7TZ/7	Grays Harbor Amateur Radio Club	147-	B-10-		882
VE2APX/2	St. Johns Radio Club	122-	B- 8-		882
W2BXK/2	Polytechnic Institute of Brooklyn Radio Club	89-	AB- 7-		879
W1TYM/1	Malden Amateur Radio Assn.	114-	AB- 7-		873
W4GLW/4	(nonclub group)	144-	AB-13-		867

♦

The v.h.f. portion of South Jersey Radio Association's K2AA/2 racked up 245 QSOs on 144-Mc. 'phone. Shown (*l. to r.*) are W2JAV and W2EGP. Rig ran 30 watts to an 829-B and a 5-over-5 flop-over beam. Clubs that haven't already done so better fire up on 2 meters for a real score-booster! Competing in the four-transmitter class, SJRA got 972 contacts and 9099 points.

QST for

WØVQN/Ø	Tri-City Amateur Radio Club	104-	AB- 6-	837
WØOKA/Ø	Ottawa Radio Emergency Club	113-	B- 3-	828
W2SV/2	Sunrise Radio Club	247-	A-20-	816
W5ZYF/5	(nonclub group)	89-	A- 3-	801
VE7ASM/7	Fraser Valley Amateur Radio Club	88-	A- 6-	792
WØBYC/Ø	(nonclub group)	167-	ABC- 4-	786
WØIIK/Ø	Winona Amateur Radio Club	97-	B-14-	768
W9ZNA/9	(nonclub group)	83-	A- 8-	747
W9TWM/9	Kishwaukee Radio Club	114-	AB-10-	735
W3DUU/3	Delco Radio Club	175-	AC-15-	693
W4HSN/4	Huntsville Amateur Radio Club	53-	AB- 8-	684
W6BML/6	Mt. Shasta Amateur Radio Club	98-	B- 6-	684
W1VXL/1	Cranston Radio Assn.	72-	A- 8-	648
W4EXU/4	Piedmont Amateur Radio Club, Salisbury, N. C.	138-	BC- 4-	597
W8MOF/8	Mount Clemens Radio Club	189-	C- 9-	567
WØUTL/Ø	Sekan Radio Club	251-	A-20-	552
K2HJG/2	Harmonic Hill Radio League	173-	C-16-	519
K3WAS/3	(nonclub group)	56-	A- -	504
W9NXU/9	(nonclub group)	74-	B- 5-	444
W8ECU/8	Ashland Amateur Radio Club	68-	B- 8-	408
VE7SE/7	Thirteen Amateur Radio Club	17-	A-13-	378
W1WKM/1	Southeastern Massachusetts Amateur Radio Assn.	150-	B-12-	300
WØRA/Ø	St. Paul Radio Club	90-	AC-25-	288
W2FFY/2	(nonclub group)	85-	A- 5-	255
WØQVA/Ø	Iowa-Illinois Amateur Radio Club	41-	AB-23-	249
W7MRW/7	Newberg Amateur Radio Club	25-	A- 3-	225
W9ZMF/9	Greene County Radio Club	9-	B- -	18

Three Transmitters Operated Simultaneously

W21M/2	Sommerset Hills Radio Club	968-	A-20-	8955
W8HWA/8	Cleveland Brasspounders Assn.	811-	A- 6-	7524
W8ICS/8	Westpark Radiops	516-	A-40-	5751
W2MO/2	Livingston Amateur Radio Club	683-	AB-18-	5631
W2QYV/2	Niagara Radio Club	583-	A-15-	5490
W2DTU/2	State Line Radio Club	557-	A-14-	5013
K6FAV/6	McClellan Amateur Radio Society	632-	AB-18-	4782
W2NOO/2	Radio Amateur Club of Belleville, N. J.	491-	A-17-	4644
W2QW/2	Raritan Valley Radio Club	540-	AB-16-	4566
W5MUZ/5	Ouachita Valley Amateur Radio Club	481-	A-18-	4554
W8MRM/8	Motor City Radio Club	556-	AB-25-	4539
W7HZ/7	Valley Amateur Radio Club	471-	A-17-	4464
W1SKT/1	Narragansett Assn. of Amateur Radio Operators	618-	AB-25-	4461
W4CN/4	Amateur Radio Transmitting Society	459-	A-35-	4374
W6YK/6	Ventura County Amateur Radio Club	538-	AB-12-	4344
W9AB/9	Michiana Amateur Radio Club	508-	AB-17-	4242
WØERG/Ø	Sioux City Amateur Radio Club	465-	AB-25-	4152
W2CPN/2	Lockport Amateur Radio Assn.	477-	AB-28-	4056
W4SKH/4	Oak Ridge Radio Operators' Club	540-	AB-50-	3942
W6HJK/6	(nonclub group)	488-	AB- 4-	3796
W8HZA/8	Tri-City Amateur Radio Club	594-	B-20-	3714
W2PPY/2	Radio Assn. of Western New York	583-	B-60-	3648
W5ZDN/5	Central Texas Amateur Radio Club	519-	AB-27-	3639
W2GLQ/2	Nutley Amateur Radio Assn.	379-	A- 8-	3636
W2OR/2	Pompton Valley Radio Club	378-	A-20-	3627
VE1FO/1	Halifax Amateur Radio Club	329-	A-14-	3321
W5MPZ/5	Sandia Base Radio Club	391-	AB-15-	3309
W4PAY/4	Amateur Radio Club of Falls Church	380-	AB-15-	3243
W6HTR/6	North Bay Amateur Radio Assn.	434-	AB-12-	3243
W1COB/1	Willimantic Radio Club	500-	B-18-	3159
W5ABD/5	Westside Amateur Radio Club	497-	B-13-	3132
W5DXD/5	Temple Amateur Radio Club	482-	B-15-	3108
W9DUK/9	Delaware Amateur Radio Assn.	492-	B-15-	3102
W8BFH/8	Buckeye Shortwave Radio Assn.	514-	B-28-	3084
W9HRM/9	Milwaukee Radio Amateurs' Club	398-	AB-35-	3048
WØSXZ/Ø	Three Trails Radio Club	504-	B- 9-	3024
VE1GH/1	Sackville Amateur Radio Club	308-	A- 9-	2997
WØDCW/Ø	Suburban Amateur Radio Club	361-	AB-20-	2988
W3NEW/3	Capitol Suburban Radio Club	642-	BC-20-	2937
W4AY/4	Nashville Amateur Radio Club	350-	AB-20-	2925
W8TO/8	Columbus Amateur Radio Assn.	453-	B-26-	2868
W3RQZ/3	Phil-Mont Mobile Radio Club	382-	AB-30-	2862
W5IAS/5	Tulsa Amateur Radio Club	445-	B-12-	2820
W9YYJ/9	Elgin Radio Amateur Service Club	284-	A-11-	2781
WØEQU/Ø	Ak-Sar-Ben Radio Club	463-	B-20-	2778
W1SYE/1	Newport County Radio Club	277-	A-16-	2727
W1ORS/1	Stratford Amateur Radio Club	358-	AB-15-	2722
VE7ARV/7	Vancouver Amateur Radio Club	301-	AB-35-	2712
W9NZ/9	Swan Amateur Radio Club	301-	A-10-	2709
W1TRZ/1	Tri-County Amateur Radio Club	426-	B-20-	2700
K6CXI/6	Alexander Hamilton High School Radio Club	302-	AB- 6-	2691
W8UPN/8	Niles Amateur Radio Club	437-	B- 7-	2622
W7BG/7	Tacoma Amateur Radio Society	341-	AB-20-	2574
W8AKA/8	(nonclub group)	303-	AB-10-	2547
W9KA/9	Chicago Radio Traffic Assn.	292-	AB-14-	2523
W5BBI/5	Oil Capitol Mobile Club	393-	B-12-	2508
W6MSO/6	Inglewood Amateur Radio Club	386-	B-15-	2466
W2QCN/2	Rochester Amateur Radio Assn.	485-	BC-35-	2460
W2NH/2	Staten Island Amateur Radio Assn.	438-	AC- 3-	2457
W9CAF/9	Chicago Amateur Radio Club	248-	A-29-	2457
W5FQ/5	Meridian Amateur Radio Club	515-	AC-10-	2394
W1WNM/1	Falmouth Amateur Radio Assn.	238-	A-10-	2367
W2WQU/2	Walton Ham Group	263-	A- -	2367
W5ZZ/5	Coplah Amateur Radio Club	337-	AB- 9-	2364
W4BKM/4	Macon Amateur Radio Club	386-	B-20-	2316
W6SF/6	Stockton Amateur Radio Club	359-	B-29-	2304
W6ZUM/6	(nonclub group)	356-	B- 8-	2286
W1AQ/1	Associated Radio Amateurs of Southern New England	252-	A- 6-	2268
W4GNF/4	Greensboro Radio Club	378-	B-25-	2268
W3RV/3	Andrews Electronics Assn.	350-	B-10-	2250
WØRVG/Ø	Heart of America Radio Club	370-	B-12-	2220
W1WHF/1	Hamden Amateur Radio Assn.	325-	AB-20-	2163
W3VV/3	McKean County Radio Club	359-	B-15-	2154
W4PLB/4	Orlando Amateur Radio Club	358-	B-21-	2148
W5GWA/5	Northwest Arkansas Amateur Radio Club	358-	B-10-	2148
W9QFB/9	(nonclub group)	212-	A- 3-	2133
W6IN2/6	(nonclub group)	235-	A- 9-	2115
W7AIA/7	Clark County Amateur Radio Club	451-	AC-40-	2103
W6IQD/6	Ream Field Amateur Radio Club	325-	B-12-	2010
W1VPR/1	Hingham Amateur Radio Club	195-	A-14-	1980
W5PDO/5	Los Alamos Radio Club	245-	AB-10-	1929

Halifax Amateur Radio Club, 3321 points in Class 3A with the club-assigned call VE1FO/1, posed with this display of equipment while breaking camp at Glen Margaret, N. S. *Sitting (l. to r.):* VE1LY, VE1FQ, musician VE1SI, VE1SF, VE1EK. *Standing:* VE1RR, ex-VE3EA, VE1OM, VE1WL, VE1DB, VE1WD, VE1HJ, VE1ED. *(Photo by VE1LZ)*

In the 20-'phone tent logger W9PBJ puffs away as W9DDP consummates a FD exchange for Chicago Suburban Radio Assn. Note the headset that sports both mike and headphone, leaves hands free for switch-throwing and receiver-tuning. Under the call W9SW/9, CSRA wound up with 3933 points in Class 6A.

W2BFA/2	Custer Radio Club	226–	AB–	7–	1926
W6SFT/6	San Francisco Naval Shipyard Amateur Radio Club	265–	AB–	6–	1923
W9TRG/9	Mancorad Club	315–	B–17–		1890
W2IQO/2	Par-Troy Amateur Radio Assn.	287–	AB–	7–	1887
WØOHP/Ø	Lincoln Amateur Radio Club	313–	B–20–		1878
W6MWO/6	Los Angeles Young Ladies Radio Club	253–	AB–	6–	1866
W5TEB/5	Webster Parish Amateur Radio Club	281–	B–20–		1836
W6QV/6	Eagle Rock Teen Age Radio Club	202–	A–10–		1818
KØWAQ/Ø	Wichita Amateur Radio Club	301–	B–15–		1806
W4NSM/4	Central Virginia Amateur Radio Club	300–	B–10–		1800
W8RUM/8	Greater Cincinnati Amateur Radio Assn.	307–ABC–10–			1788
W2QME/2	Woodbridge Radio Club	244–	AB–10–		1767
W9WLZ/9	Green Bay Mike and Key Club	259–	AB–22–		1734
WØFKM/Ø	Tri-State Radio Society	287–	B–18–		1722
W1IWY/1	New London Civil Defense	286–	B– 8–		1716
W8SP/8	Mountaineer Amateur Radio Assn.	189–	A–15–		1701
K2HLL/2	Peekskill Communications Club	256–	AB–25–		1698
W1TBS/1	(nonclub group)	160–	A– 3–		1665
VE3BAC/3	Mohawk Amateur Radio Society	160–	A–11–		1665
W9AYR/9	North Eastern Wisconsin V.H.F. Radio Club	203–	AB– 3–		1659
W5CKN/5	Gulf Coast Amateur Radio Club	158–	A– 8–		1647
W1SBF/1	Meriden Amateur Radio Club	295–	AC–10–		1551
W5BGP/5	Texoma Amateur Radio Club	216–	AB– 9–		1542
W1ZLH/1	Middlebury Mike and Key Club	255–	B– 6–		1530
WØRUJ/Ø	Southeast Nebraska Radio Club	210–	AB–12–		1530
KP4ID/KP4	Puerto Rico Amateur Radio Club	225–	B–14–		1500
W7ETO/7	Apple City Radio Club	215–	B–10–		1440
W4LEN/4	Decatur Amateur Radio Club	204–	B–20–		1374
W5QDK/5	Pecos Valley Amateur Radio Club	251–	BC– 4–		1373
W8GMD/8	Morgantown Amateur Radio Club	151–	A–10–		1359
W2UBW/2	Mid-Island Radio Club	150–	A–10–		1350
W8MFB/VE3	(nonclub group)	224–	B– 9–		1344
W6IFZ/6	Richmond Amateur Radio Club	223–	B–	–	1338
K2HUN/2	Southern Counties Amateur Radio Assn., Atlantic Radio Club	197–	B–12–		1332
W4NEP/4	Paducah Amateur Radio Club	221–	B–10–		1326
W8CMA/8	Allegan Area Radio Club	114–	A– 6–		1251
W4VHU/4	Middlesboro Amateur Radio Club	204–	B– 6–		1224
W7SBC/7	Bainbridge Island Amateur Radio Club	136–	A– 7–		1224
WØTYL/Ø	Scott County Amateur Radio Club	198–	B– 6–		1188
W9MJL/9	Vermilion County Amateur Radio Club	168–	B– 7–		1158
W4AIB/4	Aiken Amateur Radio Club	131–	AB– 6–		1145
W4TLA/4	Coastal Plain Amateur Radio Club	189–	B– 7–		1134
W9PSD/8	Richmond Amateur Radio Assn.	125–	A–10–		1125
W2BRK/2	Astoria Radio Club	106–	A– 8–		954
W4NEK/4	Naval Air Station Radio Club	305–	C–15–		915
W2RCX/2	Batavia Amateur Radio Assn.	99–	A–14–		891
W8AM/8	Coffee Dunkers of Detroit	73–	A– 9–		882
W8HLD/8	Catalpa Amateur Radio Society, Cranbrook Radio Club	142–	B–13–		852
VO2L/2	Newfoundland Radio Club	93–	AB–13–		828
W5SRG/5	Riverside Radio Amateur Club	137–	B–12–		822
W8KTV/8	Cherryland Radio Club	268–	C– 8–		804
W8ZHO/8	Muskegon Area Amateur Radio Council	87–	A– 8–		783
W2DYM/2	U.H.F. Club of Jamaica	84–	AC– 3–		732
WØOUI/Ø	Denver Radio Club	117–	B–17–		702
W3PWW/3	Carroll County Radio Club	108–	AB– 8–		699
W8ZZ/8	Detroit Amateur Radio Assn.	90–	AB–15–		690
W1VPT/1	Arlington Amateur Radio Club	191–	A–10–		684
W4CMA/4	Cedar Valley Amateur Radio Club	47–	A– 7–		618
WØELJ/Ø	Grand Island Amateur Radio Society	75–	AB–15–		645
W9WFJ/9	Midway Radio Club	71–	A– 8–		639
W3FWZ/3	Philadelphia High Frequency Radio Club	60–	A– 4–		540
W1YFA/1	Walpole Amateur Radio Club	73–	AB– 9–		489
W1KVI/1	Portland Amateur Wireless Assn.	137–	AB–13–		486
W8KEA/8	Midland Radio Club	60–	B–15–		360
W9BOM/9	Kenosha Radio Communications Society	105–	C–11–		315
W9MTV/9	Anderson Radio Club	45–	B–11–		270
W9TCE/9	Pontiac Radio Club	132–	B–16–		264
W2BMW/3	Tu-Boro Radio Club	95–	AB–	–	211
W8VTD/8	Warren Amateur Radio Assn.	22–	A–12–		198
WØTKN/Ø	North Iowa Amateur Radio Club	7–	AB– 5–		45
W9ECP/9	Whiteside V.H.F. Radio Net	5–	AB– 3–		36

Four Transmitters Operated Simultaneously

W3PKV/3	Northeast Radio Club	1353–	A–	–12,177	
W6PD/6	Foothill Mobile Net	1425–	AB–30–		9576
W6MBA/6	(nonclub group)	991–	A– 5–		9144
K2AA/2	South Jersey Radio Assn.	972–	A–45–		9099
W1OMI/1	El-Ray Amateur Radio Club	827–	A–20–		7668
W2GTD/2	Ridgewood Amateur Radio Club	763–	A–20–		7092
W2JT/2	Passaic Valley Radio Club	747–	A–36–		6918
W2DAY/2	Northern New Jersey Radio Assn.	764–	A–49–		6876
W3OK/3	Delaware-Lehigh Amateur Radio Club	642–	A–25–		6003
W7AW/7	West Seattle Amateur Radio Club	582–	A–20–		5499
W6ZUU/6	Citrus Belt Amateur Radio Club	573–	A–20–		5382
WØCET/Ø	Kaw Valley Radio Club	855–	B–35–		5364
W6OFT/6	Palomar Radio Club	503–	A–30–		4545
W3PSG/3	Baltimore Amateur Radio Club	535–	AB–30–		4467
W6MHM/6	Bell Gardens Amateur Radio Assn.	462–	A–11–		4383
W2ZQ/2	Delaware Valley Radio Assn.	600–	AB–20–		4356
W4TRC/4	Kingsport Amateur Radio Club	684–	AB–18–		4324
W4DU/4	Jacksonville Amateur Radio Society	555–	AB–18–		4296
W3SIR/3	Amateur Transmitters Assn.	473–	AB–28–		4038
W7BB/7	Lake Washington Amateur Radio Club	462–	AB– 7–		4017
W5NW/5	(nonclub group)	633–	B–14–		3948
W1OSA/1	Pittsfield Radio Club	501–	AB–	–	3915
W4CUE/4	Birmingham Amateur Radio Club	636–	B–20–		3816
W5KC/5	Baton Rouge Radio Amateur Club	606–	AB–19–		3804
W8AW/8	Edison Radio Amateurs' Assn.	417–	AB–13–		3756
W9TCH/9	Rock River Radio Club	409–	A–	–	3681
W5LBZ/5	Central Louisiana Amateur Radio Club	383–	A–25–		3672
K2EN/2	Yonkers Amateur Radio Club	552–	AB–25–		3660
W4MOE/4	Asheville Amateur Radio Club	502–	AB–15–		3615
W3GUR/3	Pottstown Amateur Radio Assn.	443–	AB– 9–		3536
W7AH/7	Radio Club of Arizona	503–	AB–	–	3408
W4WNZ/4	Tidewater Mobile Amateur Radio Club	405–	AB–14–		3375
W9OFR/9	Joliet Amateur Radio Society	327–	A–18–		3168
W6FOP/6	San Diego Amateur Radio Club	411–ABC–19–			3045
W2GLO/2	Levittown Amateur Radio Club	311–	A–35–		3024
W3SJK/3	(nonclub group)	479–	B–12–		3024

(Continued on page 134)

The Novice Round-up

January 8th Through 23rd

ROUND-UP PERIOD

Starts	*Ends*
Jan. 8th	Jan. 23rd
6:00 P.M.	9:00 P.M.
Local Time	Local Time

THE invitation is out to all amateurs to plan participation in the January Novice Round-up, the beginning-of-the-year event tailored to the new operator. CQ NR! Novice or not, *your* presence is requested January 8th–23rd.

Novices may contact any stations and claim credit if full information is exchanged. Non-Novices will be out to make Novice contacts only. Don't hesitate giving the Novice your number and section even though you're not actively engaged in the Round-up. A few minutes of your time will help him in the competition.

A total of 40 hours is available for operation. Times used listening for calls, checking bands for WN stations, etc. are included in this 40-hour total. (Note the sample reporting form shown.)

Your final score is computed by adding the total number of contacts to the speed certified on your Code-Proficiency Award or endorsement sticker; this new sum is then multiplied by the number of *different* ARRL sections (see page 6) worked to obtain your claimed score. (No Code-Proficiency certification? See contest Rule 4 and Operating News this issue of *QST* — there's still time to qualify and gain the extra points!)

Novice entrants would do well to check the frequencies above and below the 3700–3750-kc. region for contacts with non-Novices. While the 100–200 watt stations can operate in the Novice segment without undue QRM to general operation, the higher-powered fellows will probably follow the past practice of calling WNs while outside the Novice band limits.

How To Take Part

Listening to a contest exchange by any of the top contest operators would indicate a pattern to guide you toward efficient activity. If KN6GTK (San Joaquin Valley Section) called CQ and was answered by WN1CKZ of Connecticut, their exchange would be an example of contest operating "know-how" if it approximated this form:

CQ NR CQ NR CQ NR DE KN6GTK KN6GTK KN6GTK K

KN6GTK KN6GTK KN6GTK DE WN1CKZ WN1CKZ WN1CKZ AR

WN1CKZ DE KN6GTK R HR NR 10 SJV BK

BK R HR NR 6 CONN BK

BK R TNX 73 SK WN1CKZ DE KN6GTK

Short? Yes! It should be both brief and brisk during a contest event. All information has been exchanged and acknowledged (by use of "R") and there has been no unnecessary repetition. Send the required information (number and section) keyed to *your* receiving ability; avoid repeating unless you're requested to do so and in short order you'll be in proper form for the '55 Sweepstakes!

To help minimize your paper work, convenient log sheets are available without charge from ARRL. Write today for these summary sheets and a poster-style U. S. map for your shack.

Rules

1) *Eligibility:* The contest is open to all radio amateurs in the ARRL sections listed on page 6 of this *QST*.

(*Continued on page 144*)

Sample of reporting form that must be used by all contestants.

STATION KN6GTK — SUMMARY OF CONTACTS
NOVICE ROUND-UP

Band	*Time on or off air*	*Date, Time of Contact*	*My NR Sent*	*My Section*	*His NR Rcvd*	*His Call*	*His Section*	*Number of each new Section as worked*
80	1801	Jan. 8						
		1807	1	S.J.V.	1	K6BPL	San Diego	1
		1820	2	"	1	K6CQT	S.J.V.	2
	1902	1850	3	"	2	WN7WKL	Mont.	3
40	1915	1920	4	"	10	W9BRD	Ill.	4
		1930	5	"	4	W9YXM	Ill.	-
	2020	2005	6	"	5	W1ZID	Conn.	5
15	1200	Jan. 9						
		1215	7	"	7	WN5FJS	S. Tex.	6
		1232	8	"	5	WN5FJM	S. Tex.	-
		1240	9	"	9	W1YNC	Conn.	-
		1258	10	"	6	WN1CKZ	Conn.	-
	1325	1312	11	"	16	K2EIU	E.N.Y.	7

Total operating time: 3 hours 31 min.
Bands used: 80, 40 and 15

No. contacts: 11
CP credit: 15
No. sections: 7

Claimed score: 11 contacts plus 15 CP = 26 × 7 (sections) = 182

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

Signature:.....
Address:.....

Happenings of the Month

RENEWAL FORM 405-A

FCC's amateur licensing unit continues to have occasional difficulty with improper or incomplete filling-out by amateurs of the "streamlined" renewal form 405-A. Let's go over the ground once again:

The regs say that renewal of an amateur license may be filed any time within the 120 days prior to expiration. If, during such period, you contemplate a change of address or taking the exam for a higher class of license, combine your renewal request with such an action and use the standard form 610. If, however, your application will be only for renewal, use form 405-A which you can also obtain from your district FCC office. This form consists of three joined cards, each of which must be filled out — in other words, in triplicate. Most of the questions are self-explanatory, but the various items under paragraph (4) sometimes cause confusion.

(4a) *Nature of Service.* Here insert the words "amateur operator and station," assuming you are renewing a combined license; if only one license is involved, such as a trustee-club station, so indicate.

(4b) *Class of Station:* Simply, "amateur."

(4c) *Call Sign:* Obviously, the call being renewed.

(4d) *File No.:* This is the confusing one. Leave it blank! (The question applies only to certain other services which also use this particular renewal form).

(4e) *License term ending:* This is the expiration date of your ticket being renewed; it is *not* the new expiration date five years from the present.

Then you have the form notarized (only the one card segment needs this action, as indicated) and mail the whole thing to Washington, not to your district office. It is not necessary to include your present ticket. FCC will process the application and mail back to you one portion of the form, authenticated, to serve as your renewal. Thenceforth you carry both your present ticket and your renewal "endorsement" as your license. Incidentally, don't rush to get in your renewal right at the 120-day mark. In the processing of such applications FCC doesn't get around to handling them until about 30 days before expiration anyway; so 45 or 60 days in advance of expiration date is a good time to apply.

SPECIAL ROANOKE ELECTION

To All Full Members of the ARRL Residing in the Roanoke Division:

A special election is about to be held to choose a vice-director for the 1955-1956 term, inasmuch as there was no valid nomination for this office filed in the course of the regular election now being completed.

Nomination is by petition, which must reach the Headquarters by noon of December 20, 1954. Ten or more Full Members of the Roanoke Division may join in nominating any eligible Full Member of that Division. The election procedures are specified in the By-Laws, a copy of which will be mailed to any member upon request. Or refer to the August and September *QST* election notices for general information. Full Members are urged to take the initiative and file nomination petitions immediately.

For the Executive Committee:

A. L. BUDLONG
Secretary

October 1, 1954

SIDEBAND SEGREGATION DENIED

Something over a year ago the Old Old Timers Club petitioned FCC to remove single-sideband operations from regular amateur voice subbands, claiming the two modes were incompatible. The request had the support of a number of individual southern California amateurs, whose argument

There are now 35 licensed amateurs among the crew at ARRL Hq., well over half the total staff personnel, with the addition in October of six new Novices shown here previewing a "bread-pan" wavemeter just completed for an up-coming issue of *QST*: Lorraine Brouillette, WN1CIM, secretary to the Treasurer; Gerald Pinard, WN1CIH, shipping department; Mrs. Muriel Roche, WN1CIJ, mail room; Connie Hegarty, WN1CIE, advertising department; Sam Cowles, WN1CKZ, traffic manager; Joan Mulligan, WN1CLC, circulation department. ACM-'Phone Ellen White, W1YYM, continues her noon-hour tutelage of these newcomers, now of course aiming for higher grades of license.

was that segregation was needed for proper advancement of the art. The Commission has now dismissed the petition, without any affirmative action, reporting that there is no evidence to show incompatibility, and stating further that it is contrary to policy to allocate additional subbands for special groups of amateurs and modes of emission.

CALL SIGN REQUESTS DENIED

Some amateurs recently have requested that FCC make some additional exceptions to its present hard-and-fast rules about the orderly issuance of call signs, to provide two-letter calls for holders of the old "Certificate of Skill" issued by the Department of Commerce, and to provide distinctive call signs to Extra Class licensees. The Commission has denied the requests, pointing out that the burden of processing such special requests would only have the effect of slowing down the entire amateur licensing operation.

GENERAL CLASS EXAM SCOPE EXPANDED

While for some years the old Class B and Class A written examinations remained pretty much the same in scope and, indeed, in precise questions, in recent years FCC has been following a policy of periodic revisions of the technical and regulatory material covered in the various written tests. Some time ago a few questions were added to the Novice exam. When the "restricted" 'phone bands were thrown open to General and Conditional Class amateurs, FCC upgraded the written exam for those classes to include more material on radiotelephone subjects. By the end of this year written examination papers for the General Class (and of course for Conditional and Technician Classes, since they are the same exam) will carry a number of additional questions on various technical subjects. The *License Manual* now being distributed from Hq. has complete data. For the information of those for whom the exam might be imminent, we publish herewith example questions to show the scope of the new material.

What is the reciprocal of resistance?

What is skin "effect"?

How may the shock hazard from high-voltage condensers, after the power supply is turned off, be reduced?

What precautions should be taken to avoid the danger of shock from high-voltage electrical circuits?

What are the undesirable effects of overmodulation in radiotelephony?

What effect does the Q of a circuit have on harmonic output?

What are the relative bandwidths of Type A1 and A3 emissions? Of single-sideband and double-sideband amplitude-modulated emissions?

What is the advantage of a high-pass filter at the input circuit of a television receiver?

In the event of harmonic interference to television reception, what is the advantage of a low-pass filter in the output circuit of an amateur transmitter?

What is the Q of a resonant circuit?

(*Continued on page 144*)

Walter E. Bradley

1910—1954

Walter E. Bradley, W1FWH, for nearly thirteen years an ARRL Hq. staff member conducting the Technical Information Service, passed away in Hartford on October 30th after a short illness. He was 44.

Born in Greenwich, Conn., W1FWH joined Hq. in 1942, bringing with him considerable experience in conducting radio classes in local schools. Handling the TIS, Walt Bradley became a friendly counselor to thousands of amateurs seeking advice on suitable rigs to build, or on technical problems once they had started construction. Perhaps to many, he *was* the League. And because his whole heart and soul were in his work, his warm and helpful letters of guidance won many staunch supporters for the League he loved so much. Despite the daily quantity of inquiries to be answered, he was never too busy to jot down a suggested wiring diagram or other sketch when he thought it would amplify the letter.

As an extra project, Walt handled with meticulous care the annual revision of the *Handbook* tube tables, and autumn evenings would regularly find the light in his office burning through the darkness so that he might meet the copy deadline.

As civil defense radio officer for Hartford, Walt contributed immensely in developing the RACES program of that city. An active amateur, he was also secretary of the Newington Amateur Radio League, and a mobile and Field Day enthusiast. His many friends will, with those of us at Hq., feel a keen sense of loss at his passing.

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

THE unique status of the YLs whose photographs appear on these pages is indicated by the habits they wear. We feel fortunate that they have graciously taken time from their busy lives as members of religious orders to tell us of their amateur radio experiences.

Here are excerpts from their letters:

Sister M. Charlotte, C.S.C., W7MUT.

W1HUH

As an Industrial Arts teacher, my work is entirely with boys. I teach woodwork and drafting in the Tyler Junior High School in Providence, Rhode Island. We have a pleasant shop which occupies the entire length of one-half of the building. Here the boys make the usual articles such as tables, cabinets, etc., and some not-so-usual articles.

All of this leads up to my introduction to amateur radio. Our foundress, Mother McAuley, wished the members of her communities to be alert to every new branch of learning and to keep up with the latest methods and developments. I happened, in my capacity as shop teacher, to meet one of the directors of the school who was an A-1 amateur. It was decided that it would be a good plan to give the boys an opportunity to see what an amateur station was and introduce them to the many opportunities that were open to them in the field of electronics. As a result, some have already chosen that field for their life work and have become amateurs.

I started to learn the code and prepare myself to take my Class B examination. In October, 1933, I went to the Customhouse in Boston and took the examination. Some years later I took the examination for Class A. So far as we have been able to find out, I was the first Sister in the world to receive an amateur license.

I have worked on the 75-, 40-, 20-, 10-, 2-meter and on the old 5-meter bands. At present I am on 75 with a Viking II. The hurricane demolished my antenna, which was attached to the cupola about 100 feet high. My shack was also flooded.

I guess I am just an ordinary ham. During the war, I was a member of the Providence Police Radio Patrol. I like to QSO both 'phone and c.w. My extracurricular engagements tend to break up my time so that I have never felt justified in joining a net, which I certainly would do otherwise. I have written a brochure on radio for *Youth Magazine*, and have had some very interesting and enjoyable contacts and have made some very fine friends.

There is nothing inconsistent in a religious being an amateur radio operator. I think the future will see many more religious women in the field, and then we who have pioneered will be glad that we have blazed the trail for them.

Incidentally, amateur radio provides an excellent means of keeping in touch with other religious members who are toiling in the foreign mission field.

I think ham radio is one of the most enjoyable hobbies that anyone can have, be he OM or YL. But it is more than a hobby; as for the youth of today, it can be a steppingstone to a very fascinating occupation. In no organization is a better spirit of fellowship manifested than in the amateur fraternity. I am very happy to belong to it.

W7MUT

When I came to Boise ten years ago, I had never heard of amateur radio, but in the capitol city of Idaho there are more hams than in most cities of the same size. I wanted to buy some war surplus material for my physics laboratory [St. Teresa's Academy — ED.], and that is how I came into the field. I told my Superior that I could not use a transmitter without an amateur license, so she told me to get one. In July, 1948, I called W7IWU on the telephone and asked him to help me get a license. In August he gave the exam, and in October I was on the air. A year later I passed the Class A and B exams.

Since that time I have worked most of the bands, but I like 10 meters best when it is open and, in the meantime, I use forty mostly. I used c.w. almost exclusively at first, but now I use 'phone, too. I have belonged to MARS for three years and was net control one summer. Occasionally, I check into the YL net on 20 meters and am able to give a number of Idaho contacts. I also belong to the Buzzards, Dog Catchers and Polecat Nets and have WAS and RCC certificates.

I think building would be my favorite phase of amateur radio, if I had more time. As a religious and as a full-time science teacher, my time is very limited.

My rig is really something to look at now, as some friends among the Buzzards of California built me a beautiful final, with 211s as modulators. I use Command transmitters to drive the 211s and so now have 300 watts on the air. My antenna on all bands is a Zepp, about 136 feet long, and for ten

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

Mother L. Lawrence, R.S.C.J., W9CLE, and students.

Sister M. Emiliana, R.S.M., W1HUH.

I have a three-element beam on top of the school. How I long for the ten-meter band to come back as it was when I first was on the air, and got my first big thrill when I heard Massachusetts giving me a call.

My ticket gave me a greater thrill than any accomplishment, and the joy of it has never faded. The amateurs I meet on the air make me know that the world is still a joyous place, and that it is a safer place because of the amateurs!

W9CLE

In 1948 or 1949, Mother Reilly, president of Barat College [Lake Forest, Ill. — Ed.] asked Don Hunnicutt, W9GAP, for advice in buying a receiver to enable us to listen to Vatican broadcasts. Mr. Hunnicutt, chief engineer of our broadcast studio (we have a wire direct to WKRS in Waukegan, Ill.) suggested a popular make. I don't know if any Vatican programs were heard, but in October, 1950, when I returned from studying at the Catholic University, the main interest was Mr. Hunnicutt's 500-watt transmitter. I was merely amused by the transmissions that were appearing on our public address system and all the telephones. It was the first portable he had built and I used to watch him tinker with it, never dreaming that someday I would be an operator myself. Mother Reilly wanted to set up a short-wave radio club for the students as soon as she found out how simple the procedure was. She set the example by using the code equipment she had procured, but the necessary time to devote to study was often lacking. After Mr. Hunnicutt moved to Champaign, Ill., the next step was to accept the proffered services of Chief Frank B. Ramme, USN, W9BWR, who is not only an ardent ham but also a fine teacher with equipment for group instruction. We organized the club at last in September, 1953, enrolling fourteen students. Mother Reilly and I took our Novice examinations early in December and by the end of the month, when the tickets came, we had our Viking II installed, complete with VFO, signal sentry, Matchbox antenna coupler, s.w.r. bridge, and — most important — TVI suppression. The antennas are an end-fed Zepp for 80 meters and a beam for 20. I hope to set up another for 40 and then perhaps for 10. We studied hard to take the examination for the General license during the Easter vacation, and as soon as the tickets came I was named trustee for the club and sent in an application for a license. The ticket came during the graduation ceremonies. A little late for me to capitalize on it for arousing more enthusiasm among the departed students, it was nevertheless appreciated. The call letters are W9HEH. Mother Reilly was transferred to Seattle in early June, where she has already interested several youngsters in her hobby. Her call is W9CLW. I do not know whether she has made application for a W7 call or not. She will not be able to set up a station where she is, so I fear she is lost to the ranks of active amateurs, but her interest is still in it. Chief Ramme is now on duty in the Pacific. He left with us an 80-meter station for the Novices to use: an Eldico TR-75-TVI transmitter, a Hallicrafters SX-28, and a center-fed half-wave antenna. We also have a two-meter Motorola rig on a fixed frequency.

I would be attracted to building if time were cheap. Communications will have to be our main concern. We have students from many foreign countries, and we are hoping to contact friends and families of theirs who have stations. We are also interested in civil defense, and hope to contribute some small share in the programs being worked out.

There is one lesson we are all learning from our hobby — that amateurs are a friendly group with genuine interest and ready service for other amateurs. This summer I taught three Dominican nuns and on the side found it easy to persuade them to start learning the code. It is so easy to arouse interest in amateur radio, and for anyone dealing with youth in extracurricular activities, it is an asset.

Little can be added to the stories given above — they certainly reëmphasize the appeal of amateur radio to people in all walks of life.

—•••—

The November 20th issue of the *Saturday Evening Post* features an article by Murray Hoyt entitled "Lovely Neighbor." Inspiration for the fiction piece with an amateur theme came from sixteen-year-old Judy Gage, W1YCU, of Worcester, Mass. (Judy's photograph appeared in the June column.)

Advance Notice!

The first International Convention of the Young Ladies Radio League will be held the week end of June 25, 1955, at the Hotel Miramar in Santa Monica, California. The Los Angeles Young Ladies Radio Club will be the hostess club. All YLs, whether YLRL members or not, are cordially invited to attend.

40-Meter 'Phone Net

The forty-meter 'phone net was omitted from the schedule of nets listed with the YLRL which appeared in the October issue. All YLs who operate on forty are invited to call in on 7215 kc. Thursdays at 1000 EST. W4SGD is NCS, with W8IIWX as alternate.

YLs You May Have Worked

A quick biography of one of the most well-known YLs of the Southwest.

She's Yetive Matthias, W5DRA, of Las Cruces, New Mexico. Her initial interest in radio sprung from a high-school physics class. Later, a course at a technical school

"Teev" Matthias, W5DRA.

prepared her for an amateur license in 1933. Her first rig was a jumble of home-built parts fastened to an old ironing board, in lieu of the usual breadboard, which held out for 38 contacts on 80 c.w. before the hand-wound transformer smoked. Out for a ride one evening, Teev spotted the call letters W5CFX on the tire cover of a Model A chugging along ahead. A few c.w. toots on the auto horn and both drivers stopped for a personal QSO. Result: the happy marriage of the two in 1936. Since then, Dick (now W5BIW) and Teev have enjoyed amateur radio together in a variety of ways. In May 1953, they took over the editing and publishing of the monthly State Radio News Bulletin *CQ New Mexico*, which was started in 1948 by W5NXE and his XYL W5RMH. Teev is publicity manager of the Mesilla Valley Radio Club. She operates on 10, 20, and 80; as A5DRA she participates regularly in the State YL MARS net.

Keeping Up with the Girls

Captain Kurt Carlsen's (W2ZXM) two young daughters are now KN2s ITV and JAT. WN1CDE is the call of twelve-year-old Marsha McCoy, daughter of OM W1ICP of Headquarters. Southwestern Division Director W6KW's XYL, Roxanna, has been licensed for several months as KN6ELO — thanks to W1YYM, Ellen, for the foregoing. . . . Not only have several of the young YLs featured in the June column gone on to General Class licenses of their own, but two, at least, have talked their fathers into licenses. K2DSL's dad is now KN2JID, and Merceda is coaxing Mom, too. W1YCU's dad recently came through with WN1BEN. . . . On Sept. 24th W1UBM, Norma, became the bride of W1YOC, Walt (see Sept. '52 YL column for picture of Norma). . . . Three additional YLRL appointments: District chairman for Africa: Joy Jones, ZS6MW, P.O. Box 400, Pretoria, Transvaal, So. Africa. District chairman of England and Europe: Louise (ten) Herkel, PAØZC, 163 Wassenaarseweg, The Hague, Holland. District chairman for Australia and New Zealand: ZL4GR, Myrtle Earland, 69 Albany Street, Dunedin, N.1. . . . WØLGG, Bertha, of Marshalltown, Iowa, is sending code practice on 80 six days a week. . . . After three years in Puerto Rico, KP4WI, Millie, plans to return to the U. S. in January. . . . When VE3DDA visited VE3AJR, Dell, recently, Eleanor stayed up so late working c.w. that she used Brylcream instead of toothpaste on her toothbrush the next morning! . . . OM W1KTU, operating maritime-mobile aboard the SS *African Endeavor*, reported fine contacts with ZS2JR, Helie; ZS2KZ, Eileen; ZS6AIQ, Theda; ZS7F, Paddy; and ZS8B, Mary. . . . The Los Angeles YLRC sent a delegation from its two-meter net to hear W1HDQ speak during the V.H.F. Editor's recent West Coast trip. . . . W1VBT, Cecile, announces the birth of her fourth jr. op, Marie, on Sept. 17th. . . . At one time last summer VE6MP, Maude, had nine hams with their families as her guests at her new mountain-side home in Calgary, Alberta. . . . Several new members have been welcomed to the L.A. YLRC: W6WQK, K6ELI, KN6s DPX ELO EXQ EXV GSU and HFF. . . . Culminating a courtship which began on 75 meters, on June 27th W6QYL, Martha Phillips, became the bride of W6RDQ, Noel Edwards. Martha, a L.A. YLRC member, was introduced to Noel via the Club's Southland Net by W6JZA, Elsa. Unfortunately, Martha became ill shortly after her marriage, and she will be confined to bed for some time. Her address is Cabin 90, Box A, Monrovia, California. . . . On Oct. 7th, W6UHA, Maxine, had a luncheon for visiting W5RZJ, Louisa. Other YLs present were W6s CEE EHA KYZ LBO MFP QOG and WRT; and on Oct. 8th, W6NAZ, Lenore, interviewed W5RZJ on her TV program. . . . Two new YLs in Glendale are KN6CMK, Alice, and W6DXI, Gladys. . . . The Long Island Unit of the YLRL voted to continue its work for the *Braille Technical Press*. . . . YLs who attended the New England Division Convention at Manchester were W1s BCU, BFC, FTJ, MCW, MVX, OAK, QJX, RLG, RYJ, SVN, TRE, UKR, UQA, VEP, VVS, VVT, VYH, YPG, YPH, YWT, YYM, ZEJ, ZID, W2s BTB, KYF, K2IWO, and VE2HI. W1VOS, Marge, YLRL chairman for New England, conducted the YLRL meeting. W1YPH, Leona, took the top prize, an SX88.

YL Expedition

Hail the fair sex! Indefatigable W9GME, Grace Ryden of Chicago (see this department, May, 1953), could well be the instigator of a new type of YL exploit — amateur radio expeditions "manned" exclusively by YLs!

On August 19th Grace journeyed by boat to Madeline Island, one of the twelve Apostle Islands in Chequamegon

W9GME/9 on Madeline Island.

Bay off the coast of northern Wisconsin. Discovered in 1665, the island still is inhabited almost exclusively by Chippewa indians, rare birds, deer, and big uncordial bear. After five hours of search for a good antenna sight, Grace found the spot, and while she hoisted a half-wave doublet, two Chippewas stalked through the bush and eyed the curious proceedings. Using a portable transmitter running 30 watts and a Command receiver loaned to her by W9CAJ, Grace contacted W9BCY in Ashland, Wisconsin, on ten 'phone, and originated three messages — one each to W1BUD, W9AND and W9YIX. Her Indian friends stood by, duly flabbergasted by the invisible voice blasting forth from the speaker. At dusk, thought of 1300-pound bear goaded Grace to depart sooner than she would have preferred. She's already planning future trips to each of the twelve Apostle Islands, with Otter Island next on her list. The State of Wisconsin will place a placque on the site shown in the picture, commemorating Grace's activities.

Inspired yet, girls? Think of the possibilities!

• On the TVI Front

21-MC. TVI

Good winter band openings bring about an increase in 15-meter operation. This often brings to light the presence of neighborhood TV receivers with 21-Mc. i.f. strips. If such is your interference problem, you might note the continued availability of the Kiser article "TV I.F. Interference." Reprints of this article, discussing the amateur operator, the doctor's dilemma, technician's role, manufacturer's duty, etc., are available from ARRL upon request. The *QST* TVI bibliography continues to be available, too, as are numerous other printed items tailored to your TVI troubles. Address all requests to the Communications Department.

A.R.R.L. TVI DEMONSTRATION VISITS DALLAS

It isn't every day that over 500 TV servicemen gather under one roof at the same time; however, such was the case during the Second Annual Radio and Television Service Clinic and Electronics Fair held in Dallas, Texas, on August 27th–29th. Officials of the Fair invited ARRL to present its now-famous TVI demonstration in order to instruct visiting servicemen on the causes and cures of TVI. The League was happy to accept the invitation, of course, and the show was presented at the Fair under the direction of Lewis G. McCoy, W1ICP, of the ARRL technical department staff.

As a result of numerous planned tours, the ARRL TVI demonstration has been witnessed by thousands of TV servicemen and amateurs in over 50 cities throughout the nation.

ENCOURAGING LETTER

Editor, *QST*:

I have just finished reading that Vermont will have a television station shortly. As one of the thousands who has gone through the same period and successfully weathered it, I would like to address an open letter to those W1s affected.

This does not mean the end of ham radio for you — not even on 10-meter 'phone! You don't have to give in to it, and you can live with your neighbors. Your hobby can aid thousands in a period of distress. Your hobby is an instrument of peace, helpfulness, and communication. . . .

But it does mean the end of some things: sloppily-constructed rigs, 3 turns on the antenna link, mismatches. But these things never aided you anyway, did they? And in the long run you will own a better, more efficient transmitter. . . .

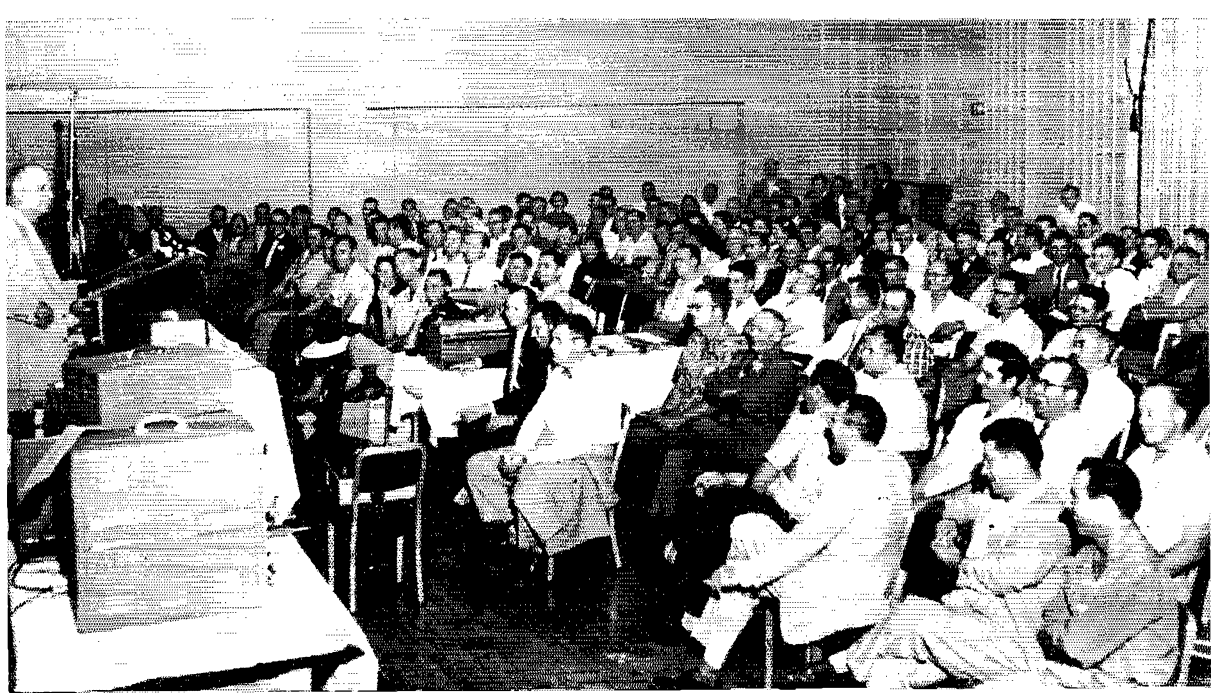
And since there may always be so horrible a television set that it could never reject TVI, why worry about any complaints that may result in your receiving a notice from the FCC? . . . The televiewer is instructed to solicit *your* coöperation, too! Try to coöperate. . . . Did you ever realize that when you reply to these complaints you are going on record as having a clean rig? The instant you clean up your rig so your *own* TV set utters no complaint, that's it. Nothing more is required. By staying off the air you do nothing in the right and much in the wrong. . . .

Phil Rand has spelled it out for you. Using his techniques, I have been able to operate a TBS-50-D on 10 'phone with the family TV, just ten feet away, tuned to Channel 2. . . .

So please, *please* do not stay off the air.

— *Charles F. Smith, jr., W8UJP*

Partial view of the audience at the Dallas TV Servicemen's Clinic and Fair



I.A.R.U. News

CALENDAR NOTES

The December Calendar has been prepared and will be in the hands of member-societies shortly. Among subjects discussed are the announcement of the readmission of the *Japan Amateur Radio League* as the member-society for Japan; acceptance of the proposal made by the *Radio Society of Great Britain* recommending the adoption of the RSM Code; and a proposal by Headquarters that the *Radio Club Boliviano* be accepted as the member-society for Bolivia. Mention is made of further implementation of the Atlantic City allocations in Hong Kong, due to effective liaison between the Postoffice and the *Hong Kong Amateur Radio Transmitting Society.* The following members have completed, this year, their 25th year as members of the IARU: *New Zealand Association of Radio Transmitters, Norsk Radio Relae Liga, Experimenterende Danske Radio-amatorer, Sveriges Sandareamatorer, Union Schweiz Kurzwellen Amateure,* and *Irish Radio Transmitters Society.* Another 25th anniversary: that of the *Calendar* itself!

A fine international convention was held by the *Savez Radioamatera Jugoslavije* in Ljubljana August 19th–23rd. Over 500 hams, from England, Sweden, Denmark, Austria, Italy, Germany and Yugoslavia, were present.

Also in the Calendar is the annual report of the Secretary, which reflected a fairly quiet year, with no major conferences. It showed moderate progress in the liberalization of operating restrictions in several countries; notably, Austria withdrew its objections to international communication by its amateurs, and DX restrictions in the Philippines were eased. Several new countries were put on the DX map by expeditions.

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as listed below. (**Bold-face** type indicates a recent change from previous listings.) *Do not send foreign cards to A.R.R.L. headquarters except those for which no bureau is here listed.*

For service on incoming foreign cards, see list of domestic bureaus in most *QST*s (page 56 of September) under the heading, "A.R.R.L. QSL Bureau."

Algeria: Via France
Angola: L.A.R.A., P.O. Box 152, Luanda
Argentina: R.C.A., Avenida Libertador General San Martin 1850, Buenos Aires
Australia: W.I.A., Box 2611 W, G.P.O., Melbourne
Austria: DVSV, Kierlingerstrasse 10, Klosterneuberg
Austria: QSL Bureau (U. S. Occupation Forces), APO 168, % Postmaster, New York, N. Y.
Azores: Via Portugal
Bahamas: C. N. Albury, Telecommunications Dept., Nassau
Barbados: VP6PX, Wood Goddard, Bromley, Welches, Christ Ch., Barbados, British West Indies
Belgian Congo: P.O. Box 271, Leopoldville
Belgium: U.B.A., Postbox 634, Brussels
Bermuda: VP9D, James A. Mann, The Cut, St. Georges
Bolivia: R.C.B., Casilla 2111, La Paz
Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro
British Guiana: Desmond Yong, 22 Sussex St., Charlestown, Georgetown #16
British Honduras: D. Hunter, Box 178, Belize
Bulgaria: Box 830, Sofia
Burma: B.A.R.S., P.O. Box 376, Rangoon
Canton Island: H. B. Johnson, KB6BA, U.S.P.O. 06–50000, Canton Island, South Pacific.
Ceylon: P.O. Box 907, Colombo
Chile: Radio Club de Chile, Box 761, Santiago
China: M. T. Young, P.O. Box 16, Taichung, Formosa
Colombia: L.C.R.A., P.O. Box 584, Bogotá
Cook Islands: Ray Holloway, P.O. Box 65, Rarotonga
Costa Rica: Radio Club of Costa Rica, P.O. Box 535, San Jose
Cuba: Radio Club de Cuba, QSL Bureau, Lealtad No. 660, Havana
Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol
Czechoslovakia: C.A.V., P.O. Box 69, Prague I.
Denmark: P. Heinemann, OZ4H, Vanlose Alle 100, Copenhagen
Dominica: Calle Duarte #76, C. Trujillo
East Africa: (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony
Ecuador: Guayaquil Radio Club, Casilla 784, Guayaquil
Eire: I.R.T.S. QSL Bureau, % EI5Z, 23 Orwell Gardens, Rathgar, Dublin
Fiji: S. H. Mayne, VR2AS, Victoria Paraed, Suva
Finland: SRAL, Box 306, Helsinki

(Continued on page 148)

♦

Dr. Edmundo A. Reyes, DU1OR, president of the Philippine Amateur Radio Association (*second from left*) learns the history of the Wouff Hong from W1BUD during a visit to Headquarters on August 10th. Looking on are W1BDI and W1DF.

♦

QST for

Correspondence From Members-

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

PROTECTIVE CIRCUIT

4420 Narragansett Ave.
San Diego 7, Calif.

Editor, *QST:*

I read with interest the article "A Protective Circuit for Transmitting Tetrodes" in October *QST*. The circuit described there is almost identical to the circuit that was published in *QST* for April, 1948, in the H & K section. The principal difference is that in my circuit the tube was protected against failure of the plate supply in case the screen is furnished from a separate supply.

This circuit is protected by U. S. Patent No. 2,572,832; however, I have no objection to the use of the circuit by an individual amateur for his own transmitter.

— *W. B. Bernard, K6EUS*

OPEN LETTER

Route No. 5 (Lafayette Pike)
Clarksville, Tenn.

Editor, *QST:*

Fellow Single-Sideband Operators — please don't let the action of so few double-sideband operators cause you to become "numskulls" also. We now have an s.s.b. traffic net on 3980 kc. each Monday and Friday evening — let's all let this net grow to become a "net standard." Remember this same frequency is shared with other nets on other evenings — respect these other nets. Remembering you hold the "big stick," why use it to destroy an old-fashioned d.s.b. net just because a few carriers bother you? If one remembers that die-hards learn everything the hard way you can see that the correct approach is to set up the Interstate Sideband Net as an example of s.s.b. at its best.

The point is that the action of a very few double-sideband operators in deliberately trying (if they only knew how helpless they are) to QRM the Interstate Sideband Net is causing a few single-sideband boys (mostly power-mad Yankees, hi) to "pay-em-back" by destroying the Trans-Continental 'Phone Net (3975 kc.) and the Tennessee 'Phone Net (3980 kc.). Knowing full well, through much experience, that you can't tell a d.s.b. die-hard anything, it is felt more will be accomplished by appealing to the s.s.b. numskull. Actually, there is very little difference between the thickness of either's skull, hi. See page 9, Oct. *QST* (spark-c.w. feuds of the Twenties). Think I'll go to u.h.f. until the above "mess" clears.

— *Conway L. Wilson, W4WQT*

FOXY

R. R. No. 2
Hagerstown, Ind.

Editor, *QST:*

A word for the hidden-transmitter hunters from one who has had the experience of being thought of as a spy.

On October 3rd I was the "fox" for the New Castle Amateur Radio Association's transmitter hunt. The rules stated I had to be on public property. I pulled into an old barn on the premises of the Wilbur Wright birthplace and started to transmit for the "hunters." I never gave a thought about it looking suspicious as the property is open to visitors to see Wilbur Wright's birthplace and is owned by the Indiana Department of Conservation. I noticed a car come, but thought it was visitors to see the place. However, when the first ham found me he discovered that the sheriff had been called, as there was "a car in there with the motor running." Being able to hear the radio at times they thought it might be some Communists using radio.

You can see how serious this might become. Hams in general might not know how suspicious they can look at times. In this case the deputy sheriff who investigated was a personal friend of mine so there was no trouble.

My advice would be always to get permission to use a place, even if it might not seem necessary, if you're off the road, and always make sure that any strangers around are informed as to what is happening. We as hams don't want to cause any trouble, so profit by my mistake.

— *Horace N. Smith, W9PPD*

THE LAST WORD

643 Oak Street
Las Animas, Colo.

Editor, *QST:*

It seems to me that every amateur who has voiced an opinion in *QST* has taken sides in the "codeless" license conflict.

It is my opinion that adequate space has been devoted to both sides and that the advocates of code have presented far the better case.

I hope we don't lose track of our main objectives, however. One of the outstanding virtues of hams is the ability to get something done as a group.

Frankly, I don't think the idea of a "codeless license" has brought about much except some differences of opinion.

If there is going to be something done, let's do it — as a group — and stop the individual debates.

— *William E. Stradley, WØBHK*

DX Century Club

The following list contains the call letters and countries totals of all holders of the Postwar DX Century Club award as of October 15, 1954. The calls of new members as well as those receiving endorsement credit during the period September 15 through October 15, 1954, are included in this listing.

252
W1FH

251
W8HGW

250
WØYXO

249
W6VFR

248
W3BES
W6AM

247
W6ENV
G2PL

244
W3GHD

242
W3JTC
W3KT
W6MEK
W6SN

241
W2AGW
W2BXA
W4BPD
W6SYG
G6RH
G6ZO
PY2CK

240
W9NDA
LU6DJX

239
W3GAU
W5MIS
W8NBK
PAØUN

238
W6MX
W7AMX

237
W3EVW

236
W1ME
W2HUQ
W2QKS

235
W3CPV
W3JNN
W5ASG

234
W8BRA
W9RBI

233
W1TW
W6TS

232
W6TT

231
W2WZ
ZL1HY

230
W1CLX
CE3AG
G4CP
ZL2GX

229
W6GRL

228
W8KIA

F8BS
KV4AA

227
W2DS
SM5LL

225
W3EPV

224
W2QHH
W6CUQ
W6ZBG
ZS6BW

223
W6RW

222
W3DPA
W9KOK

221
W6QJU
W6ZCY
W8DMD
W8JIN
VE4RO

220
W1ENE
W2NSZ
W3OCU
W5ENE
W5FNA
W5KUC
W6ADP
W6AMA
W6DZZ
PY1GJ
VK2DI

219
W9FID
WØDAE
PY1AJ
VK2ACX

217
ON4AU

216
W1ADM
SM5KP

215
W1HX
W5KC
W6TI
W6VE

214
FA8IH
PY1DH

213
W4TM
W9FKC
WØELA

212
W2YW
W8BKP
W8BTI
HB9X

211
W1BIH
W6SAI
WØFNQ
HB9J
ZS2X

210
W2AGO
W5EGK
W5JC
W7GUV
W8SYC
CE3DZ
DL7AA
GM3DHD
KH6IJ
VE3QD
4X4RE

209
W1GKK
W9LNM
WØNUC
G8IG
VE7HC

208
W4AIT

207
W2AQW

206
K2CPR
W4NNN
W5BGP

205
W5ADZ
W8DAW

204
W2HHF
W3IYE
W4MR
WØAIW
G2MI

203
W3OKT
W3GRF
W4OM
W8CDT
W9IU

202
W5FFW
W5JUF
W6DI
W6NNV
W7DL
W8JBI
CX1FY
PY4IE
TI2TG

201
W1JYH
W3OP
W4KFC
W5GEL
W6PQT
WØUOX
KH6BA
PY1AHL
VE7ZM

200
W1AXA
W3DRD
W4BRB
W5LXY
W5MPG
W6EPZ
W6GAL
W6IBD
W6MJB
W6MVQ
W6PB
W6RBQ
W8DX
ZL1BY
HB9EU
G5RV
G6QB
G6YQ
LU7CD
ON4QF

199
W2IYO
W6ANN
VK2NS

198
W2CYS
G8KP

197
W1CH
G3DO

195
W2TXB

194
W2CTO
W6UHA
W7PGS
KZ5CP

193
G4ZU
LA7Y

192
W1ZL
W2DSB
W2TQC
W4PN
W6BPD
W8HFE

191
W2ALO
W2HMJ
W6TZD
G3FNN
HKN
OQ5RA

190
W1HA
W2CNT
W2DKF
W2HZY
W2IOP
W3JKO
W3JTK
W4RBQ
W6GFE
W6KYG
W6NTR
W6MHB
W6OMC
W6UCX
W8UAS
W8WZ
W9HUZ
KH6CD
KP4KD
VO6EP

189
W2BJ
G3YF

188
W2CWE
W9IOD

187
W4CYY

186
W6EHV

185
W6LW
CM9AA

184
W4LZF
W7GUI
W7HIA
W8ACE
W9MXX
PAØGN

183
W1LOP
W2EMW
F8PQ
KL7PI
SM5ARP

182
W1AB
W1HRI
W2IWM
W4NNH
W5CKY
W6SRU
HB9CX

181
W1AEW
W1IAS
W2RWE

W2UFT
W4HA
W8MPW
W8UDR
W9AND
GM3CSM
OH2RY
ON4NC
VE2WW
ZS6FN

180
W1RY
W2IMU
W2PRN
W3KDP
W3LPF
W5ALA
W5CEW
W6EAY
W6EYR
W6GPB
W6RM
W7HXG
W8CVU
W8KPL
W9GRV
WØEYR
WØTKX
G2EC
G3BKF
G3HLS
KP4CC
ON4FQ
ON4JW
SM5CO
VE3AAZ
VE7VO

179
W2CSO
W2GWE
SM5WI

178
W2COK
W5LHP
CN8MI
CN8MM
G2WW
VK3BZ

177
W1WK
W2MLO
W3GHS
W4CYU
KG4AF

176
W1FTX
W2GUM
W3QJV
W4JDR
W5EFC
W6CYI
W9AEH
PY2OE

175
W2JVU
W3NOH
KH6QH

174
W8RDZ
W9TJ
HOJ
KH6VP
MF2AA

173
W3KQF
W6BUD
KV4BB
OK1FF

172
W3CGS
VE3IJ
VK4FJ

171
W2BRV

W2LJR
W2PWP
W2RGV
W3ALB
W4DKA
W5EB
W8FJN
EA2CA
PY1HX

170
W1DQH
W1MB
W2GFW
W2GVZ
W2REF
W3ALX
W5KUJ
W5LGS
W6LDD
W6KUT
W7ENW
W7GBW
W7KTN
W8EWS
W8SDR
W9ABA
W9TQL
G5VT
PY7WS
ZS6A

169
W1TX
W2PUD
ZL4GA

168
W3JYS
W6LRU
HAY
MI3AB

167
W3LVF

166
W1BLF
W3HRD
W5NMA
W7AH
OZ7PH

165
W3LBG
W9FJB
LA6U

164
W9VND
HAMU
KH6LG
ON4AZ

163
W8AJW
DL7BA
ON4GU

162
W1ATE
W1LZE
W2LSX
W2OST
W2WC
W5BZT
EI4X
G2AJ
G6BS
ZS2AG
ZL3CC

161
W1KFV
W2LV
W2RDK
W4VE
W6BZE
W6GHU
W6NGA
W6WKU
W8EYE
WØAIH
GM3AVA

HB9DO
OK1LM
OQ5LL
PAØNU
ZL3GU

160
W2ZVS
W3WU
W5FXN
W5NW
W6ATO
W6BVM
W6CIS
W6CTL
W6JK
W6VDG
W7DET
W8TJM
W8ZZU
CP5EK
G2FSR
HAIV
IS1AHK
KZ5WZ
ON4PA
OZ7BG
SM6HU
VE8AW
ZS2AT

159
W1DX
W4JFE
W5BNO
W6PZ
G3DOG
G6LX
GW3ZV
HIIR
HIXK
OK1HI
OK1VW
VK5RX
VQ2GW

158
W9BQE
OZ3FL
SM7QY

157
W1JNV
W2ITD
W4JXM
W6NIG
W6WO
WØTJ
PY4RJ

156
W2SAI
W6KEV
WØLLN
EI5F
OH2QQ
SM5WJ

155
FA8DA
G3DCU
G6GN

154
W1CUX
W2QCP
W8GLK
GI4RY
GM6MD
PAØVB
PY2NX

153
W1BFT
W1DEP
W1QF
W1ZW
W2AEB
W2BYP
W2GTP
W4HVQ
W4ZD
W5MET
W6MEL
W8YIN
W9ABB

HB9MQ
OH2NB
VE3ZW
CE3AE

152
W1MUN
W2MYY
W2UWD
W6JZP
W8WWU
DL1AU
G3COJ
PAØLB
SM7MS

151
W3FLH
W4AZK
W5CGC
W6VOE
W7AC
W8HUD
W8LAV
W8UPN
W9PGW
W9QIY
W9YNB
CX1BZ
G2AJF
GW3FSP
ON4TA
PAØRC
PY2AJ
PY7LJ
SM3AKM
SM3EP
SM5DZ
VE2BV
VK3JE
VK6SA
ZL3BJ

150
W1BGW
W1BOD
W2ADP
W2PJM
W3ADZ
W3LVJ
W3MLW
W5DML
W6BJU
W6DE
W6EAK
W6LVN
W6PBI
W9CIA
W9NZZ
G2IO
G2VD
G6GH
G6RC
GM3CIX
HB9AO
HK3CK
HP1BR
HIT
KH6MI
OK1MB
OZ7EU
PY1ADA
SM3ARE
VE1HG
VK4EL
YV5AE
ZC4XP
ZL3GQ
9S4AX

149
W1BLO
W2UEI
W4FVR
W8DEN
W9LI
ON4MS
PAØIF
ZL2QM

148
W7FZA
W8BWC
G8RC
HB9CE
SM5FL

147
W6LDJ
W9VIN

146
W3FYS
W3RCQ
W6LV
W6TXL
G6RB
OH2TM

145
W3FGB
G3BI

144
W2AZS
W6LMZ
F9RM

143
W5ACL
W7BE
W9PSR
F3MS
LU3DH
NY4CM
4X4BX

142
W1NW
K2BU
W4HQN
W4GMA
W4LYV
W5LVD
W9AHP
EI4Q
G2YS
G3CBN
G4JZ
G8GB
HCJW
KZ5IP
VP5FR
VP7NM
ZS5CU
4X4DK

141
W1AZY
W1IKE
W2ABM
W2GNQ
W3AYS
W4EPA
W5LV
W6NZ
W7AYJ
W9UZS
WØCU
DL1DX
G5LH
HJUA
ON4GC
TA3GVU
VS6AE

140
W1QXQ
W2GTL
W2OCI
W2OMS
W2ZA
W3AFU
W3AXT
W3IXN
W3MDE
W4LWO
W4IZR
W5IGJ
W5LGG
W6BIL
W6DBP
W6DUB
W6WWQ
W7RT
W8CXN
W8FJL
W8YHO
W9RQM
WØERI
WØGKS
WØOUH

DL1KB
DL1QT
EA4CR
F8CW
F9AH
G2AKQ
G3AKU
G5YV
G8KU
IS1FIC
JA2KG
KH6PM
ON4FL
VE5QZ
VE7VC
ZL1AH
ZS2CR
ZS3K

139
W2CWK
W2GUR
W2QKJ
W3FUF
W4DHZ
K6CU
G3AWP
G3EMD
G5FA
G6QX
HB9MU
LA5S
OK1CX
OZ3Y
OZ7CC

138
W2FXE
W6ETJ
W6FSJ
ZL3AB
ZL3LR

137
EA3CY

136
W1QPN
W4CKB
W4IUO
W8IB
W8MFB
W9ZPT
WØNTA
G3AH
G3RB

135
W1BAV
W1VG
W5OLG
W9FDX
W9GDI
G5OO
G6XA
SM5PA

134
W1JMT
W1ZD
W3JNM
W3LNE
W4CYC
W5CPI
W7KVU
G2BXP
G3LP
G5VQ
PAØGT
SM6ACO
VK3YL
ZE2JN
ZS5YF

133
W1CJK
W1KWD
W1PKL
W2AW
W2BUY
W2MEL
W3ECR
W4AAW
W5DMR
W6CAE

W6QDE
W9ERU
W9CYT
W9CYU
G3AIM
G5SR
KV4AQ
LA2B

132
W2ICO
W2PBG
W2TJF
W3KZQ
W3LMM
W3MFW
W4AIS
W4ML
W5AWT
W5RX
W6BYB
W6CEM
W6KEK
W6RRG
W8CLR
W8ZJM
CR7BC
DL1YA
G2FYT
G6UT
GM2DBX
HA4SA
PAØLR
SM5AQV
VK5KO

131
W2AFO
W2CDP
W2DSU
W2HSZ
W4EV
W6ID
W6MHH
W6RLQ
W7GPP
W8CKX
W8EKK
G8ON
G8PL
HIIZ
KH6PY
SM5VW
ZL4BO

130
W1BIL
W1DSF
W1JOJ
W1LQ
W1MIJ
W1RAN
W2ABS
W2ATE
W2BBK
W2CZO
W2EQS
W2IRV
W2LTP
W2YTH
W3ARK
W3HOX
W3MZE
W4IYT
W6APH
W6LER
W6OBD
W6WJX
W6YK
W8CED
W8NGO
W8NJC
W9EXY
W9JIP
W9KA
W9UIG
W9UXO
WØQVZ
DL3RK
EA9AI
F3FA
F3RA
F8SK
I9QU
G2BQC
G8FW
G8UG

II FO
II LT
II UB
II VS
LA SQ
OH2PK
OH4NF
VE3ADM
VE3SR
VE5JV
VK3YD
VQ2DH
VQ8AD
ZL1QW
ZS6CZ
ZS6EU
ZS6OV

129

W1APA
W1ODU
W2ESO
W1OJM
W3RNQ
W4BGO
W8OCA
W8ZMC
OK1SV
VQ4SGC
ZL1MR

128

W2BXY
W4TP
W7NKW
G6BB
G8VB
PA0JQ
PY2DV
SM7AKG
VK4RF
YV5BZ

127

W1RWS
W1RZD
W3CTJ
W3LXE
W4FIJ
W6YX
W9FKH
G5PP
II AOF
II RC/T
PA0DA
SM5ARL
ZS1FD

126

W1BDS
W5GZ
W6RDR
W7AHX
WØMKF
EI3R
FF8AG
G3BNC
G6VQ
VE1PQ
VP6CDI
ZC1CL
ZS6LW

125

W2BLS
W2LPE
W3EYF
W5KTD
W6MUF
CN2AO
II BEY
OK1WX
PY1HQ

124

W1KXU
W3KQU
W4QT
W6BAM
W6CEO
W6KYT
W8AE
CE7AA
DL1JW
G5VU
OK1SK
PAØXE
ZS6BJ

123

W1EOB
W1KKP
W1NLM
W3HER
W4AAU
W4ITR
W6UZX
W9GWK
W9NN
W9UX
DL3JV
PAØMZ
PY6DU
SM6AKC
VE1EX
VE2WA
ZL2HP
ZS6GI

122

W1ODW
W1QV
W2FBA
W2PZM
W3AS
W4EEO
W6ALQ
W6EAE
W6IFW
W9MQK
WØDXE
CY1SQ
DL4TL
G2AJB
G5IV
HZ1HZ
II ALU
LU9CK
OZ7SN
VE1EK
VE1PA

121

W2AFU
W2QCF
W3DGM
W3ZQ
W6FUF
W6XYV
W6ZBY
W7KWC
W9BRD
W9KXK
W9WFS
WØAZT
WØDU
CN8EJ
F9DN
G3BXN
KG6AI
OH3NY
PAØCP
PAØZL
SM5FA
SM5KX
VE3ADV
YV5AK
ZS2U

120

W1CKU
W1FTJ
W1PLW
W1MRP
W2CGJ
W2RQH
W2WPJ
W3AOO
W3DYU
W3EEB
W3EVT/1
W3MNO
W4DCW
W4HYW
W4LQN
W6YZU
W8DFQ
W9ALI
W9HQF
W3JUV
WØDST
WØFNN
WØGUV
CE4AD
DL1HA
DL3TP
F8VK
FQ8AP
G2HNO
G3BQ
G3TK
G5PQ
G6XX
HB9FE
KL7IT
KP4JE
LU3EB
OK1AW
OK1RW
OZ7KV
PAØCB
SM6DA
SM7ANB
VE3AGC
VE3TB
VK3NC
ZL1MB

119

W4GHP
W4OG
W4OSU
W9DGA
DL7AB
F9DW
G8DR
HB9P
KG6ABI
KG6DI
SM6ID
SV1RX
VE7KC
4X4DE

122

W1ODW
W1QV
W2FBA
W2PZM
W3AS
W4EEO
W6ALQ
W6EAE
W6IFW
W9MQK
WØDXE
CY1SQ
DL4TL
G2AJB
G5IV
HZ1HZ
II ALU
LU9CK
OZ7SN
VE1EK
VE1PA

118

W2ROM
W6PH
DL3GZ
EA4BH
VE4XO

117

W1BGA
W2PQJ
W4GOG
W6LS
W6SR
W9NRB
WØDGH
CX4CZ
F9DZ
G5JU
OZ7SM
SM7AVA
VE7ZZ
VK5LC
VO3X
ZS2EC

116

W1LQO
W2AGU
W2AUH
W3TIF
W5UCQ
W7BD
W8ZWX
OZ2PA

115

W2IJU
W2NFR
W4KL
W6JU
W6NKR
W9LNH
DL1BO
LU6AX
VE2CK
VE3BBR

114

W4NKQ
W5KBU
W6WVU
W9ELA
W9LVR
CT1DJ
DL1FE
DL7BK
G3AJP
OH1PW
VK4RC
ZS6HO

113

W1EFQ
W2CC
W2TUD
W9TKV
F8TM
G8OJ
GM3CMB
ON4SS
OX3MG
TF3EA
VE3ACS
VQ3HJP
ZS5BS
ZS6J
4X4CJ

112

W1AJO
W1MX
W3BEN
W4PHJ
W6AUT
W6BUO
W6JTB
W6YY
WØCDP
DL1CS
DL1HH
F9KQ
G2CDI
G2CNW
G4FN
GI6TK
GM3CFS
SM5AQW
VK5FM
4X4CR

111

W1AWX
W1CDX
W2MA
W2UAT
W3HUV
W3KEW
W3ZN
W4JUJ
W4LIM
W7BDW
W7JVZ
W7KWO
W8AAI
W8PNT
W8TTS
W8HRC
W9HUV
W9DUR
WØCAW
WØNLY
WØSBE
DL7AQ
EA1AB
F3SM
G2FFO
G2IM
G3CEG
G3VA
G4AR
G4AU
HB9IM
HP1LA
II PG
OH2VF
OZ8SS
PAØRL
SM2OS
VQ2AB
VU2JP
ZE3JP

110

W1APU
W1BTE
W1KQY
W2NOY
W2OKM
W2SAW
W2VRE
W3KDF
W3PGB
W3VZD
W4DPE
W4EXO
W4FID
W4FNS
W4KWC
W4LVV
W5KWY
W5VIR
W5VSS
W5WI
W6AAO
W6AOD
W6AX
W6DBT
W6MUB
W6UQQ
W6UYX
W6ZUI
W7BTH
W7CSW
W7PEY
W7WH
W8ERA
W8FGX
W9ESQ
W9HLR
W9IOP
W9MXP
WØBBS
WØDIB
WØGBJ
WØIDI
WØRIA
WØSRX
DL1VU
DL6HJ
F3CT
G2DPY
G2HKU
G3APN
G3CCO
G3CDG
G3CMB/A
G3CUG
G4QK
G5CW
G8IL
HB9AT
HB9FI
HB9GJ
IIADW
LA4KD
ON4JD
VE3HB
ZS1M
ZS2IW

109

W2AYJ
WØMCF/C1
CO6AJ
DL6IC
EA3FL
EI5C
F9ER
F9IL
FA3JY
FA8CF
FA9VE
G2DC
G2DHR
G3AMM
G8GP
G8IH
HB9BN
HB9EI
HB9KU
HB9KO
HZ1AB
LU8EN
PAØPN
VS1DZ
VS7NX
ZS1BK
ZS6DW
ZS6KK
ZL2CU
4X4BR

108

W1EZ
W2AOX
W6LGD
W6LN
W6PUZ
W6YMD
W7ASG
W8MKY
W9TLT
WØMJM
DL1LD
DL3BJ
EA6AF
G3ID
G3JW
G5US
G6CB
G6IC
G8QW
GI3AXI
GM6MS
GW3JI
HZ1AE
MI3ZJ
OH6NZ
OK2OS
OK2XF
OH3NA
PAØALO
PY1MK
VE3KE
VE6AO
VE7YR
VK2ADE
VK2PV
VK6DX
ZK2AA
ZL1RD
ZS6JZ
ZS6QF
ZS6SB
ZS6XQ

107

W1KLY
W1PDF
W3EFZ
W4AUL
W6CUL
W6PWR
W8BNA
W9CKP
DL1FK
DL1SO
DL3UE
F9RO
G3CSP
G8IP
G8QZ
JA3AA
KH6YL
ON4PZ
PJ2AA
SM7YO
VE1EP
VE1ZZ
YI2AM
ZL3OA
4X4CW

106

W2DPS
W2JB
W3HTO
W4CS
W4DXI
W4FPK
W5NUT
W6FOZ
W8RVU
WØVIP
CN8AF
DL1AV
DL1SC
DL1TM
DL4EA
F8BQ
F9FS
F9JZ
F9RS
G2CBA
G2HFO
G2ZF
G3CMT
G3DDK
G3ETU
G3QD
G8TD
HB9BJ
II AEG
II RY
KH6DQ
OK1CG
OK3SP
ON4HX
OZ3RO
SM5TQ
SM5UH
SM6DN
VE3AHV
VE3PK
VK5BO
VO1B
VQ2HW
ZB1AJX
ZC4IP
ZE1JI
ZS1FR
ZS5FS
ZS6RI

105

W1KMY
W1TS
W2KJZ
W2QXB
W4COC
W4DYM
W5LCI
W6CPL
W6DFY
W6DOT
W6KPC
W7AJS
W7HJC
W7PGX
W9DUY
WØFID
CR7AF
CT3AN
DL1SD
DL3BJ
EA6AF
G3ID
G3JW
G5US
G6CB
G6IC
G8QW
GI3AXI
GM6MS
GW3JI
HZ1AE
MI3ZJ
OH6NZ
OK2OS
OK2XF
OH3NA
PAØALO
PY1MK
VE3KE
VE6AO
VE7YR
VK2ADE
VK2PV
VK6DX
ZK2AA
ZL1RD
ZS6JZ
ZS6QF
ZS6SB
ZS6XQ

104

W1AFB
W1DF
W1NYA
W2BUV
W2RWN
W2TSL
W3IBT
W3NCF
W4AIX
W4AWS
W4FNQ
W4IPR
W5JSB
W5UX
W6DYP
W6EJA
W6KRI
W6MUC
W7FBD
W7KEM
W8ELL
W8JKG
W9GA
W9IHN
W9RYK
W9TFU
WØBAF
WØDSO
WØGYL
WØSQO
DL1EE
DL1PV
DL3ND
DL4IH
DL6YK
DL7FW
F8WK
G2CLL
G2FQP
G3APX
G3AZ
G3CQF
G3FJ
G3IDC
G6FB
G6VC
G8PW
GW3DOF
I1CZE
KG6GU
OH1QW
OH3RA
OK1NS
OK1PN
OK1OP
ON4TQ
SU1AD
TA3AA
TF3SF
ZL3HC
ZS5U

103

W1IAP
W2JJC
W2KMZ
W2MZB
W2PIN
W2PXR
W2UPH
W3EIV
W3KMS
W3LTW
W4DRK
W4KVX
W5DF
W5MMD
W6BAX
W6GHG
W6JWL
W6KUR
W6LMV
W6MLY
W6WB
W7DXZ
W7GEB
W8CLM
W9YFV
WØCFB
WØRBA
CE3CK
CM2SW
CN8MZ
DL1GU
DL4FS
DL7AH
DL7EN
EA5BD
EA9AP
F8DB
FA8RJ
G2KI
G2SA
G3DAH
G3EFY
G5JM
G8PP
G8VG
GC4LI
GM3AWW
GM3DZB
HB9HC
HB9KB
II AFM
II ARA
II NU
II UV
KP4HU
LA3Y
MD1D
MD5KW
OH2MQ
OH5NK
OH6OA
ON4JU
OK2SO
PAØNOL
PAØLY
SM5ADI
SM5HH
SM6AOU
SM6AWE
SM7VX
VE1BK
VQ2DC
VQ4HK
YU3AB
ZB1AH
ZE3JO
ZL3IA
ZS1BM

102

W1CEG
W1CNC
W1GDY
W1SU
K2BZT
W2GVP
W2HY
W2HQB
W2JA
W2JME
W3AFW
W3AZG
W3PA
W3TVB
W4EJH
W4INL
W4KKX
W4THZ
W5BDI
W5DGV
W6SIA
W6TGH
W8AVB
W8CEI
W8DUS
W8LYQ
W8SDD
W8VLK
W8YJE
W9AMU
W9FAU
W9GMZ
W9VW
WØFET
WØZDM
CE5AW
CX6AD
DL1AT
DL1EI
DL1IN
DL3BK
DL3HZ
DL3LM
DL7AP
EA1BC
EA3CK
EA8BF
EI6G
EI9J
F8DU
FA9RW
G3ABG
G3ATU
G3CFK
G3COL
G3CVG
G3EYN
G3FML
G3FPQ
G3HK
G3SCI
G6XS
G8FC
G8WF
GM2FHH
GM3EST
GM3RL
GM8CH
GW3AHN
HB9HZ
II ATO
II KZ
KG6GC
KG6GD
KS4AI
KZ5AU
LX1AS
OE1AD
OE1ZZ
OH2UD
OH2XK
OH2ZE
OK2EL
OK2MA
OK3AL
OK3DG
OZ2LX
PAØRU
PAØSU
PY1ANR
SM3FY
SM5AUP
SM7TQ
TA3FAS
VE1BV
VE1DB
VE3RM
VE6FK
VK5CC
VR2CG
YI3BZL
YU1CAG
ZL2BH
ZL3CP
ZL4DV
ZS2FH
ZS3S
ZS6VR
4X4CZ

101

W1FPS
W1GKJ
W1MLT
W1MTG
W1NAV
W1NHJ
W1NMP
W1ODY
W1RB
W2AXU
W2EQG
W2FBS
W2JKH
W2KXK
W2IYG
W2LWI
W2TNA
W2UVE
W3EIS
W3IL
W3KAT
W3OPM
W3TXQ
W4BPU
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W4GD
W4IKL
W4JV
W4LHQ
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W6POZ
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W8TAJ
W8TMA
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WØLWG
WØVBQ
WØVDC
CE3AX
CN2AP
CR6AI
DL1CR
DL1DA
DL1KV
DL1LZ
DL3SZ
DL6GB
CT1AS
CT3AA
CO2OM
DL1YQ
DL6CV
DL6SS
F8IW
F8PA
FE8AB
G2DM
G2DVD
G3AWL
G3BQR
G3CDC
G3CHW
G3CSE
G3EBH
G3GAF
G3HEP
G3GIQ
G4GI
G4GJ
G4LP
G5RM
G5UF
G6XY
G8CD
G8NV
G8TS
GW4CX
HB9BX
HB9NL
II ADX
II AFQ
II BCB
KH6EL
KH6LF
LA6O
OE3CC
OE5CA
OE8FK
OZ1W
PAØKE
PAØFD
PAØMOT
PAØTAU
PK6HA
PY1ARZ
PY3QX
TF3AR
VE1CU
VE1OK
VE6MN
VE6MZ
VK5MF
VP9OO
VQ8CB
VS7NG
ZL1PO
ZE4JC
ZL2GH
ZS6CT
ZS6OS
ZS7C
4X4DF

100

W1AW
W1BBN
W1BUX
W1COM
W1EIO
W1EQ
W1EYP
W1IOZ
W1JEL
W1NS
W1PEG
W1PPZ
W1RYJ
W1WPO
K2GFQ
W2ADQ
W2AWH
W2BWC
W2CBS
W2EGG
W2GSN
W2HAZ
W2HZN
W2JJI
W2LRW
W2NIY
W2QJM
W2RA
W2SGK
W2SUC
W2TJK
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W2ZGB
W2ZQW
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W3ANK
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W3ETD
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W3GRS
W3HA
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W3ORU
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W3RBF
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W4GXB
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W4KIT
W4KKG
W4KRR
W4POF
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W5CD
W5CTM
W5IX
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W5NTT
W5QLY
W5QN
W6BUY
W6CGP
W6DUC
W6EKC
W6GEB
W6GHM
W6ITH
W6MI
W6SQP
W6VBY
W6VZG
W6ZTW
W6ZZ
W7FMX
W7ITN
W7JUO
W7KEV
W7ONG
W7PZ
W8AL
W8CQ
W8DLZ
W8EV
W8FJR
W8HEV
W8HSW
W8ICC
W8ILG
W8IQS
W8IV
W8JGU
W8JM
W8LCN
W8LIP
W8NKU
W8OPG
W8PXP
W8SSI
W8YGR
W8ZIY
W9JNB
W9MZP
W9QLH
W9QLW
W9RKP
W9TMU
W9UAZ
WØARH
WØBFY
WØBMQ
WØFFV
CE6AB
CO2BM
CR9AG
CT1FM
CT3AV
DJ7BZ
DL7BS
DL7DC
DL1VR
DL3FM
DL3OO
DL3QQ
DL6TW
DL7CW
DL7DA
EA0AB
EI3S
F8PI
F8PM
FG7XA
G2AO
G2BJY
G2FXB
G2GM
G2ZZ
G3AAE
G3AAG
G3ACC
G3BDS
G3BNE
G3CSL
G3CWW
G3CWZ
G3FKM
G3FXB
G3TC
G3VW
G5CR
G5WC
G8JO
G8JR
G8UK
GI3BKG
GI4NU
GM3EDU
GM8AT
GW8UH
HB9DH
HC2KJ
HC7KD
II PL
KH6SO
KL7PJ
KL7UM
KZ5GF
OA4AK
OE1CD
OE1FF
OE1KF
OE5LV
OH2WM
OK1GT
OK1WF
ON4CY
ON4FP
OZ4KX
OZ4PA
PAØBK
PAØHG
PAØUV
PK4KS
SM3ACP
SM5IZ
SM7IA
SP1JF
VE1EA
VE1NE
VE2ADQ
VE2BK
VE2KZ
VE3ARS
VE3OR
VE3QB
VE3XY
VE7AAD
VE7CN
VE7SB
VK3RJ
VQ4BU
VQ4HJP
VQ4KRL
VS6BA
YS1O
YU3AC
ZL2FI
ZL4CK
ZS5KF
ZS5LA
ZS6IH
ZS6OW

(Continued on following page)

RADIOTELEPHONE

224
W1FH

222
VQ4ERR

216
ZS6BW

215
XE1AC

214
W1MCW
W8HGW

213
W1JCX

212
W1NWO

210
W9RBI

207
SM5KP

204
W9NDA

203
W3JNN
W5BGP

202
W2APU
GM3DHD

198
G2PL

197
W2BXA

196
W6AM

195
W6DI

193
W3BES

190
W2AFQ
W8BF
EA2CQ
ZL1HY
ZS6Q

187
W8GZ

184
CX2CO

183
CT1CL

182
G4ZU

181
W1MB

180
CE3AB
I1SM

179
G8IG

178
W3GHD
CM9AA

177
CN8MM

176
W9ROQ
HC2JR

175
W4HA
W7HIA
G3HLS
PK4DA

173
W5EFC
W5JUF
ZL2GX

172
W4EWY
G6RH

171
W1ADM
W1LMB
TI2TG

170
W3DHM
W4AZD
W9HB
EA2CA
G3DO

169
G3FNN
SM5ARP

167
W3KT
W4MKB

165
W5ASG

164
CT1PK
GSVT

163
VE3KF

162
W1ATE
WØAIW
G5RV
I1AMU
SM5LL

161
W1ENE
G2ZB
I1BIC
I1YJ

160
W3EVW
W6KQY
W6MBD
W7MBX
W9RNX
F9HE
LU4DD
PY1AQT
YV5AB

159
LU8CW

158
W3GHS
W5ALA

157
W4CYU

156
G6AY
PY4RJ

155
W8REU
F8PQ
HB9J
PAØNU

154
W8AJW
W4OM
OD5AB
ON4PJ
PY2AHS

152
W4ESP
W5NMA
PY4KL

151
W2QF
W3MAC
W8DMD
W8KML
F9HF
I1ASM
LU4MG
PY4CB

150
W9JJF
WØNCG
GM3AVA
HB9LA
KV4BB
LU4DMG
PY4VX
ZS6FN

149
W3BET

146
W1HKK
W1HX
W2AEB
W4DCR
G2MI

144
W1CLX
W2RGV
W2ZX
W5KUC

143
W2EOH
G2BXP
I1CAR
PY2JU
TI2RC

142
W1BEQ
W2VWN

141
F8EJ
F9RM
G3BID
KL7AFR

140
W1EKU
W2AKX
W6TT
W8HUD
WØPRZ
CE3AE
G6LX
I1UA
OZ7TS
VE7ZM
VP6SD
ZS1DO

139
CO2BL

137
W5KC
G2AJF

136
G2WW

135
W2ZKG
HC2OT
TI2HP

134
W1QPN
KH6OR

133
W6NIG
CE1AH
I1RM

132
W1KJU
W4AAW
W9IOD
ZS1KW

131
W1FFO
W2ZW
W6CHV
W6GVM
W6VFR
W9HP
W9UUN
G8QX
GM2DBX
PAØJA
VE3BDB

130
W1GKK
W1GOU
W1MMV
W2NHZ
W3DKT
W3UIP
W4HRR
W6WNH
W9BZB
WØANF
WØHX
WØPUE
WØVSK
CX4CS
CO2BK
CN8BA
F8CW
F8XP
G8KP
I1AXD
I1VS
ON4YI
SM5WJ

129
W2ZVS

126
ZS5CU

125
W1CJK
W8BKP
W8CLR
F8SK
ON4MS
PY1FR

124
W8NXF

W9FDX
WØEYR
I1RC

123
W4FBH
W8AUP
W9TJ
WØGKL
F9PH
ON4AR
PY5UG

122
W4GIO
W5HFQ
WØJRY
G2ALN
OQ5LL
OZ3Y
VE7VO

121
W4BOC
W4JCK
W9NLP
GC2RS
G3COJ
G8UG
OH2SE
PY4PI

120
W1RZD
W2JY
W2PRN
W2QKJ
W2SGX
W3BUX
W3DWA
W4AQR
W4DCQ
W4IYM
W4MB
W4NYN
W5CEW
W6IKQ
W6MJB
W8BIQ
W8TJM
HB9DY
I1CQD
PY1NC
VE1CR
VE3BNQ
VE4RO
ZS6FU
4X4DK

119
HK4DF
LU3DH
LU3PF
VK3BZ
VP5FR

118
W2VQM
W6TZD
WØTJ

DL7BA
OD5AD

117
W1HRI
W4KAE
W6YX
EA4CM

116
W5EB
W8NGO
F3WV

115
W2FXE
W2MFS
W3RIS
W7EMP
W8HRV
WØGUV
LA7Y

114
W1BLF
W6YI
W8ZMC
CX3BH
ET2LV
G3BNC
GM2UU
PY1AGP
TI2EV
ZS3G

113
W2PBI
W3MMH
G5PP

112
W1PST
W4MRA
W5JJA
W7EKA
W8AJH
W8LAV
G4JZ
I1BPW

111
W2PRF
W2UTH
W9CZC
I1CTE
MP4KAC
PY4AJD
VE7MS
YK1AC

110
W2BRV
W2GX
W2IUV
W2TXB
W2YYL
W3BYL
W3CGS
W3FGB
W3HUV
W3JNM

W5KBU
W6CHY
W8BFQ
W8DMJ
W8LJ
W8QAD
CT1DX
DL3EA
EI4Q
F8MY
G3YM
G5LN
I1FLD
LU3EB
OZ7SM
ZP5CF
ZS1GG

109
W1KWD
W4NDE
CO2OZ
DL4TL
EA4DB
HB9CX
HB9ID
ZS6Z

108
W1BAV
W2AOX
W2VYH
W3KTF
W3MWP
W4LIM
DL1LH
F9EZ
I1RLH
OZ5BW
ZS5GU

107
W2RUI
W2WZ
W4LZM
W4QT
W7HLB
W7PEY
WØJYW
EA3FG
F8LE
G4MS
GSOO
HB9JZ
I1AIJ
IT1AFS
OH5NW
ZS6DW

106
W1FZ
W3AER
W7AHX
W8MKY
W9DPI
DL1FK
G8VB
I1CWX
TI2OA
VK3JE
YN4CB

ZL2JB
ZS2IW

105
W2JJI
W2ONV
W6AED
W6UYX
W8JWV
G2MQ
KT1WX
SU1HF
VK2DI
ZE2JK

104
W1BPH
W2PPS
W4AHF
W8ACP
W8SDR
W9FHZ
W9LXQ
CE3AG
EA4CK
EI2L
F3OX
G6TA
G8QW
I1GZ
LX1SI
PY4PQ
PY5DF
ZD4AH
ZS6LW

103
W1JYQ
W1PDF
W2DPS
W2IZS
W2NQR
W2QWS
W3NA
W4AYF
W7AUS
W9EWC
W9ZPT
WØEHF
WØUQD
CR6BX
F8SE
G2AKR
GW3CDT
HK4FV
I1KP
IS1AYN
PY6CN
YK5LC
VP9G
VQ4SC
YS2AG
3V8BB

102
W2DYR
W2LV
W2PBG
W2QCP
W4BA
W4CWV

W4KYB
W5IWM
W5NZE
W6PWR
W6SHW
W7HTB
W8IWI
W9WXT
WØSQO
WØSUG
WØWSH
CO7GM
CT1FL
DL3DO
DL3TM
DL7AB
G2DF
G3CCO
GI6TK
HB9HM
I1AUH
KP4ES
PAØMDW
SM5FL
TA3GVU
VE2WW
VE3AUJ
VE7HC
VS9AH
XZ2SY
ZL3LR
ZS5G

101
W1RFE
W2LSX
W2RTX
W2UAT
W2WME
W3SFK
W4DEO
W4LPT
W5ZS
W6KPC
W6PKI
W7MBW
W8CYL
W8NML
W8ZOK
W9BVX
W9LQ
W9VND
WØMKF
WØNWW
CT1MB
CX3AA
F3PW
G6WX
HP1BR
I1ASO
I1KZ
I1NK
I1QQ
I1RB
I1WAL
I1ZV
KP4EZ
OH2OV
VE3AIU
VE3BQP
VS1AY
W4AD
4X4RE

100
W1CUX
W1FQX
W2DSU
W2KSN
W2MA
W2OR
W3AEV
W3AM
W3DYT
W3PA
W4BVX
W4CRI
W4DSC
W4DYM
W4ECE
W4EYG
W4GLR
W4LGG
W4NQN
W5ALB
W5DMR
W5ERY
W5GXP
W5GZ
W6ITH
W6OZE
W6SAI
W6UZX
W6YY
W6ZTW
W7ADH
W8ALC
W8BRA
W8DXO
W8EWB
W8FJX
W8VDJ
W9CKP
W9GZK
W9HMG
W9JUV
W9UJ
WØFUH
WØGSW
CT1QF
DL1SD
EA3GI
EA9AR
EI4L
GM3DZB
GW8BW
G2HIF
G2LS
G2VJ
I1AOF
KP4HZ
LU8FAO
LX1DC
OE5YL
OZ5KP
PAØQJ
SM5FA
SM6OE
VE3AOL
VE3TW
VP5AR
VQ5PBD
XE2KW

Hooper Trophy

The Eighth Naval District won the top three places in the first national competition among Naval Reserve electronics divisions for excellence in electronics training during fiscal year 1954.

Naval Reserve Electronics Division 8-12, Paris, Texas, came from behind to win the Hooper trophy (p. 73, November *QST*).

In third place in the Eighth Naval District competition at the end of May, a final score of 104.2531 carried NRED 8-12 to the top among approximately 125 electronics divisions. Cmdr. Paul H. Daniels, USNR, is commanding officer.

Naval Reserve Electronics Division 8-10, Tyler, Texas, commanded by Lt. D. Hudson, jr., USNR, was a close second with a score of 104.1999. Another Tyler division, Naval Reserve Electronics Division 8-14, commanded by Lt. W. J. Murdaugh, USNR, scored heavily in June to win third place with 101.7663 points.

Fourth place in the national competition went to Naval Reserve Electronics Division 12-6, Santa Rosa, Calif., commanded by Lt. Cmdr. A. R. Butz, USNR, with a score of 100.1308.

—···—

The Eighth Naval District was the first naval district to put all of its Naval Reserve training centers on the air as licensed amateur radio stations.

NFD at district headquarters in New Orleans was the first master control station with all of its stationkeepers and Naval Reserve supplement personnel holding amateur radio licenses.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Who?

In many respects, thirteen years is a long time. W2TNC agrees. We think you'll find the following excerpt from his recent letter quite interesting.

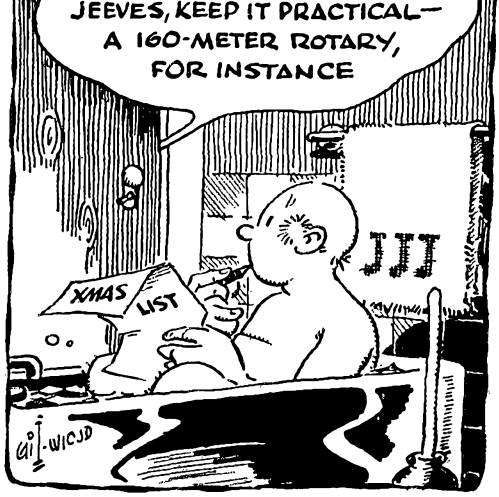
> . . . On the morning of December 7, 1941, at about 0700 Hawaiian time, [I was operating] K6SRZ at Fort Shafter on 14,200-kc. 'phone, working a station in the Colorado-Utah area. As you no doubt can well imagine, there came a bit of confusion around there at that particular moment. The operator of the mainland station heard some of the fracas in the background and asked us — Harry Longerich, W2GQY, and myself — what all the noise and fuss was about. We said QRX while we look outside and find out. I don't think we ever did come back to the guy. For all we know he may still be holding the circuit open, waiting for our reply.
>
> Inasmuch as he is one of the few Stateside persons who actually heard the commotion that morning, we now would like to establish his identity. Major Longerich recently was in the islands but was unsuccessful in locating the old K6SRZ logs for that period.

Hams, as a rule, are a patient lot. Yet we doubt that the other end of this K6SRZ QSO is still standing by waiting for the answer to his inquiry. Anyway, the ex-K6SRZ gang would like to find him. Can *you* enlighten W2TNC?

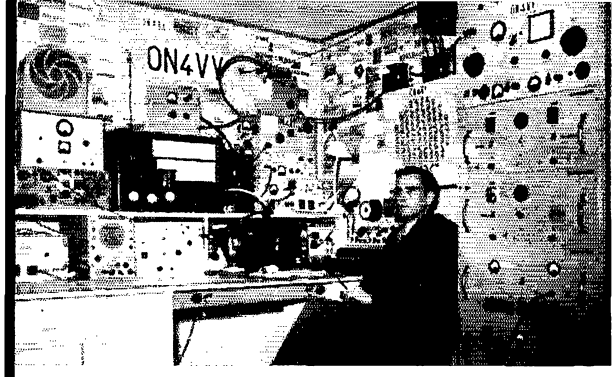
Where:

Don't overlook IARU News in this *QST* for it includes a revised tabulation of QSL bureaus throughout the world. KB6BA (ex-KL7CB-WØASN-KH6AMZ), who takes over the Canton Island bureau, expects to inhabit the KB6 area for at least two more years . . . . ET3S of Addis tells ZD6BX that stations he works should QRX for his cards before shipping their own QSLs Ethiopiaward . . . . Although Thailand — along with Cambodia, Laos, Viet-Nam, Indonesia, Iran and Korea — still is on FCC's ban list, for correspondence purposes you can reach HS1D, James D. Fry, jr., at JUSMAG, Box B, APO 74, c/o Postmaster, San Francisco . . . . From LeRoy Waite of NNRC we learn that LU9AH, Jose Guerra, Dpto. Com. Nav. MM, Buenos Aires, Argentina, acts as QSL bureau manager for LU "Z" stations . . . . VP8BE tells W6WKE he's shipping a batch of Grahamland pasteboards northward this month and expects to remain active until March . . . . Notes from W2MLO: (1) MP4BBL, a Bahrein mechanic, laboriously patches up homemade QSLs until an order of 2000 arrives. He vows 100-per-cent QSL although it may take some time to lick the zooming backlog. (2) SVØs WK and WL (K6AUU and W6ZID) who recently completed their Crete jaunt, desire stamped self-addressed envelopes be sent to them at APO 206, c/o Postmaster, New York, N. Y., by those Ws seeking deserved Crete confirmations . . . . Please bear in mind that none of the addresses to follow is necessarily "official" nor can we guarantee accuracy. Thanks to W1s RDV UED WPO WPR, K2GFQ, W2WZ, W3s SOH WPG, WN3ZOG, W4s UF YDT YZC, W5WQN, W6s GPB UJ, W8CED, W9CFT, F7BM, KR6OS, ZD6BX, NCDXC, NNRC, WGDXC and 200-DXC for this rundown:

AG2BR, Bill Roth, APO 209, c/o Postmaster, New York, N. Y. . . . . **BV1US**, MAAG, APO 63, c/o Postmaster, San Francisco, Calif. . . . . **CE2AN**, Casilla 3016, Valparaiso, Chile . . . . **CM2XZ**, Jorge Smith, 3A No. 8, Miramar, Havana, Cuba . . . . **CN2BA**, Ahmed, R.Y. Cajal 19, Tangier Zone . . . . **CN8ED**, L. C. Couchman (WØSTP), NCF, USNAF, Navy 214, Box 50, FPO, New York, N. Y. . . . . **CO2IP**, Dolores No. 10, Sta. Amalia, Havana, Cuba . . . . **EA9EB**, Box 662, Medilla, Sp. Morocco . . . . **ET2PA**, P.O. Box 379, Asmara, Eritrea . . . . ex-**F7AZ**-DL4BB, Maj. F. L. Ziegler, W3BTP/8, Box 365, Hq. AMC, Wright-Patterson AFB, Ohio . . . . **FB8BC**, Box 587, Tananarive, Madagascar . . . . **FB8BN**, Box 806, Tananarive, Madagascar . . . . **HC1LE**, Box 2229, Quito, Ecuador . . . . **HI8WA** (QSL to W4QV) . . . . **HR1JZ**, J. Zelaya, Tropical Radio, Tegucigalpa, Honduras . . . . **KA2KS**, Box 31, Navy 830, FPO, San Francisco, Calif. . . . . **KG6IG**, Navy 905, FPO, San Francisco, Calif. . . . . **LU7ABL** (also LU8ABL and LUØABL), Alberto O. Fernandez, Casilla 5197, Correo Central, Buenos Aires, Argentina . . . . **LU8DEV**, J. M Nobio, Rivadevia 620, S.I., Buenos Aires, Argentina . . . . **MB9BJ** (QSL via RSGB) . . . . **OQ5ZZ**, P.O. Box 377, Elisabethville, Belgian Congo . . . . **OX3AY** (QSL via EDR) . . . . **PJ1F**, 24 Jacob van Campenstraat, Heemstede, Netherlands . . . . **SU1MQ**, c/o ISWL, 86 Barrender Rd., London N. 10, England . . . . **TG9EA**, Rafael Arocha, P.O. Box 115, Guatemala City, Guatemala . . . . ex-**TI2TG**, Tom G. Gabbert, 1820 Poli Street, Ventura, Calif. . . . . ex-**VK1BA**, Brien Fiebig, 48 Blackburn St., Maddington, W. Aus., Australia . . . . **VK9OK**, Len J. King, c/o DCA, Norfolk Island, Australia . . . . **VQ4EG** (ex-MI3TM), Box 4383, P.O. Westlands, Nairobi, Kenya . . . . **VQ4EZ**, Box 1313, Nairobi, Kenya . . . . **VS1EW**, Box 1158, Singapore, Malaya . . . . ex-**VS9AW**, Cpl. H. J. Wheeler 3500323, No. 1 Revg. Stn., Chiakeng, c/o RAF Maintenance Base, Seletar, Singapore 28, Malaya . . . . **XE5PC/M** (QSL to W6MYC) . . . . **XZ2OM**, F/Lt Aung Myint, BAF, Box 1490, GPO, Rangoon, Burma . . . . **ZA1BB**, Box No. 2, Kurce, Albania . . . . **ZB1AUV** (QSL via RSGB) . . . . **ZD8AA**, T. Shepherd, Cable & Wireless Ltd., Ascension Island, So. Atlantic . . . . **ZD9AC** (QSL via ZS1FD) . . . . **ZE6JJ**, A. R. Evans, P.O. Box 846, Bulawayo, So. Rhodesia . . . . **ZP5GM**, c/o U.S. Embassy Asunción, Paraguay . . . . **ZS1RG**, T. A. St. Johnston (G6UT), "Hauptville," Constantia Rd., Wynberg,



* *New Mailing Address:* Effective immediately, please mail all reports of DX activity to DX Editor Newkirk's new QTH: 5833 North Kenmore Ave., Chicago 40, Illinois.



Left: ON4VY's installation is a good example of the more elaborate Continental hamshack. Rene operates most amateur bands and also performs duties as UBA society's secretary-general. – . – . – *Right:* OQ5ZZ showed up on schedule in early September, operated by UCAR personnel at the Commercial and Industrial Exhibition, Elisabethville. In the UCAR booth we find (l. to r.) OQ5s PU LY RU AJ and HG. OQ5ZZ had 276 QSOs on twenty meters, 54 on fifteen, 13 on forty, 2 on eighty and 1 on ten; all continents and 59 countries were worked. OQ5CP sat in to roll up 93 of these contacts. Specially designed OQ5ZZ QSL cards are on the way.

Cape, U. of So. Afr. _ . . . 5A4TS, P.O. Box, 372 Tripoli, Libya.

Whence:

Asia — XZ2OM, whose new address appears in "Where," operates regularly on (A3) 14,120, 14.240 kc.; (A1) 14.020, 14.050 and 14,100 kc. KR6OS finds him available daily between 1230 and 1600 GMT with 40 watts to an 807, a *dipole antenna and* an AR-88 receiver . _ . _ . _ Bad news for W1WPO and others: Ex-AP2N, according to friend W9FKC, hasn't been in Pakistan since last December. Norm now is in India and hopes to remain there permanently as a VU2 . _ . _ . _ KR6OS keeps losing antennas in Okinawan typhoons; an 8JK beam was the most recent casualty. "Have been disappointed by QSL returns— 64 countries worked and only 26 confirmed so far — but pleased with the fine W QSL return. Paths seldom open for Ws during my present operating period (1000-2000 GMT)." . _ . _ . _ KA9AH is an instructor in the 1st Calvary Division's Hokkaido radio school . _ . _ . _ "The Chinese Nationalist Government has assigned the local call sign BV1US to the MAAG MARS station AB1US. . . . Call sign BV1US will be used when operating on 7060, 14,050, 14,250, 21,200, 26,980, 28,100 and 29,050 kc." This from Co. W. B. Latta, USA. Thus the AB1US gang now can do business toward widely needed Formosa DXCC credits . _ . _ . _ In a note to W6SWG, CR9AF registers his expectation to become a CT1 sometime after next March.

Africa — A Mr. T. Shepherd, who penned the following excerpt to W6UJ, is about to fire up ZD8AA on Ascension Island. "This is to inform you that ZD8V is a pirate. We are being inundated with QSL cards and letters and our tiny P.O. is getting blocked with them." . _ . _ . _ W3SOH hears that a USAF detachment is setting up on Tristan da Cunha. More future ZD9s? . _ . _ . _ During his 6-month South African visit G6UT will be QSOing DX buddies behind the label ZS1RG . _ . _ . _ That fat 14-Mc. 'phone signal of ZS5NZ stems from an 814 100-watter and 3-el. squirter. He receives with an Eddystone 750.

Oceania — From G2RO, now touring Pacific areas with his fantastic 15-watter, we receive this tentative itinerary: Solomon Islands, Nov. 22nd through Dec. 7th; Gilbert & Ellice Islands (and possible near-by stops), Dec. 30th through Jan. 12th; Cocos Islands, Feb. 6th–8th; Mauritius, Feb. 8th–12th; Kenya, Feb. 12th–18th; and back in London by late February . _ . _ . _ From KB6BA re Canton ham doings: "With the departure for the mainland of KB6s AO and AY a few days ago our ham population now is down to two — KB6AQ and myself. KB6AO accepted a position with CAA in the Bay area and KB6AY is slated for Albuquerque, N. Mex." KB6s AQ and BA prefer 20 meters, A3 and A1, and the latter is rigging up a 60-ft.-high 3-el. beam while considering possible s.s.b. work. KB6BA anticipates no local VR1 activity in the near future . _ . _ . _ W6YY gleanings: VR2BZ/ZM7 knocked off 29 W6s, seven ZLs, four W4s, three W9s, two W9s, two KH6s, and single W5 W7 W8 KV4 VE6 and KL7 customers during his August Tokelaus escapade. Bari's present assignment calls for further visits to ZM7 areas — keep QRV with that QRO! . _ . _ . _ From ZK1BG: "Lately I have been receiving many QSL cards from European amateurs for 20-meter operation in July, 1954. . . . I have not been on 20 since before Christmas, 1953. There are two ZK1s very active on 20 — ZK1AB and ZK1BI — but I, myself, stick to 80. ZK1AB is consistently on 20 around 0400 GMT." ZK1BG regularly haunts 3512 kc. beginning at 0800 GMT.

Europe — 3A2AW (SM5ARP) made it to Monaco again this year but QSOd just one U. S. station — W2DOD on 40. Carl admits he was very QRL having fun at Monte Carlo. SM5ARP now has 183 countries confirmed, 169 on 'phone . _ . _ . _ PJ1F, school station at Haarlem Technical College, Netherlands, aims to QSO more W/VE/VOs in the future . _ . _ . _ CT1CL gives 75-meter 'phone a try every Sunday from 0500 to 0830 GMT on 3790 kc. . _ . _ . _ F7BM, formerly the call of W8DMZ, now is used by W9YTY in the La Rochelle, France, area. F7BM has 86 countries and 42 states confirmed toward DXCC and WAS trophies. Other Yanks in F7-land include W4YDF, W5VOK, W7WJV, W8SXL, WØJEY (F7DH), WØUPM, K2ICH, K2JCS and K6CDT (F7CZ) . _ . _ . _ Concerning the transatlantic crossing of British 61-foot lifeboat *Aries* (p. 58, June *QST*), W1RSC was of emergency assistance on July 22nd when the vessel's ship-frequency gear conked out. W1RSC, contacting the boat on 7 Mc., forwarded word of the predicament to the Coast Guard for relay to the British Admiralty, London. *Aries* made home dock okay on August 10th after 55 days and 8200 miles of ocean hardship.

South America—In QSO with W9HUZ, VP8AA confirmed the present absence of ham activity on South Sandwich and South Georgia islands. VP8s AA AZ and BE are very active from Grahamland; VP8s AQ and AX, South Shetlands; and VP8BC, Falklands, with an input of 0.2 watt . _ . _ . _ San Andres & Providencia Islands (HKØ) is a country newly added to the LABRE (Brazil) WAA-award list. Newfoundland & Labrador (VO) credit for WAA henceforth will be given only for QSLs confirming QSOs made before Dec. 31st, 1954.

HEREABOUTS — FM7WN still works toward an FG7 ham-style vacation, according to W6YY. John also found XE5PC mighty popular on 20 'phone, who turned out to be W6MYC mobiling in the higher mountain reaches of Mexico . _ . _ . _ W4HQN understands that his was the only 75-meter 'phone heard by the KC4AB gang on Navassa (and while operating mobile, at that) . _ . _ . _ Ex-VR2CD (VE7ASL) dropped in at ARRL Hq. on his mobile-style tour of the U. S. Chas successfully dodged windy YLs Carol, Edna and Hazel on a journey which ultimately will wind up in Hawaii . _ . _ . _ In addition to heavy editorial work on NCDXC's *DXer*, W6GPB managed to clinch a DUF-IV diploma . _ . _ . _ W6TI, chairman for the 6th annual DX Conference sponsored jointly by the Northern and Southern California DX Clubs and scheduled for January 15th-16th at the Fresno, Calif., Hotel Californian, is standing by for inquiries and reservations at P.O. Box 75, Oakland. DXers throughout the world are welcome . _ . _ . _ W5BDK blew into the Virgin Islands and W9NN did some Geiger-counting while in the Dakota hills . _ . _ . _ W8KBT lost his 10-over-20 and a 40-foot tower in recent breezes . _ . _ . _ Write Radio Club of Cuba, Lealtad

660, Havana, for information on their WWI (Worked West Indies) award, a certificate based on 24 QSOs with 20 Caribbean areas . _ . _ . _ Please note the new QTH of your conductor. Jeeves figured it was high time we got back to the Midwest and did something about that puny 123-confirmed W9BRD countries total!

What:

In the text to follow, frequencies (given in number of kc. above the lower band-limit) appear in parentheses, times without. E.g., (9) = 14,009 kc., if the paragraph deals with 20-meter work. Times are 24-hour time, zone or GMT specified, using the nearest whole-hour figure such as 7 for 0720 or 0650, 0 for 0015 or 2349. As a rule each DX call is mentioned but once per band.

Tremendous yankings on Jeeves' tortuous grapevine confirm October and November as the hottest North American DX months in years. Gaping breakthroughs intermittently cracked every DX band from 1.8 to 30 Mc. *wide* open.

Ten 'phone put on a show reminiscent of late-1940s performance with every continent but Asia reported pouring r.f. into the U. S. East Coast. W4NQM heard more darned DX than he had time to work but did raise **CR6BX** (200), **OQ5RT** (300), **VP**s **2MY 3LF** (495), **VQ2FU** (410), several ZSs and many South and Central Americans. Best times, between 1540 and 1730 *GMT* . _ . _ . _ W4NQM's 28-Mc. colleagues had a ball, too, as follows. *W3QYF:* **CE2**s HD HJ HN, a CR6, **CX1**s BV GG, **HC1RT**, **HK5ER**, **HP1FA**, **HR1LW**, fourteen LUs and ZS6OQ. *W3QMG:* a CE2, **HP1AC**, LUs, **PY3AES**. *W4ABU:* **CE3**s HN IT, a CR6, **CT1**s CL GW, 14 LUs, four PYs, **VQ2DT**, YV5s galore, ZS6s BW OP OQ UM ZO. *W4WRV:* a CE2, **CX**s 5CE 7BA, **HP1**s CN TS, **TI2RL**, **YV3BD**. *LU4AAR:* **CP5AB**, **EL10A**, **I1s** CGE CXJ, **KH6ARE**. *LU4AAT:* **CN8ML**, **CT1**s ER EV, **EA4**s DU EP ER ET EU, **F3YQ**, **KA2KC** . _ . _ . _ K2s AJD EFB, W3s ESE NUM OSF SLF, W4s WVM ZZA, **WØBJP** and **KP4QA** also were in there pitchin' . _ . _ . _ G3IDG reports much U.K. rejoicing at the behavior of 28 Mc. Heard or worked by Gs 2YZ 3HFJ 3IDG 5LB and 8SY: **CR**s 6BX 7IV, **CX4CS**, **LU3AQ**, **OQ5RU**, **PY1AGP** and **ZS6BW**.

One-sixty c.w., at the other end of the DX spectrum, continued production of transoceanic QSOs as begun in late September. W9FIM chatted with **ZL2BE** (97) 2 *CST* with the assistance of his new 125-foot vertical . _ . _ . _ W1s BB VDB and W3RGQ got across to Gs 3PU 5JU, while W3EIS also made the grade with G5JU . _ . _ . _ **EL2X** and **LU3EL** are reported active on 160. When the ZC4 gang gets fired up, 1.8-Mc. WAC possibilities will be assured . _ . _ . _ From W3RGQ we learn that **VQ4**s AQ CH FB RF, **VS**s 1FK 2EB 6CN 6CQ 6CZ. **ZC5VS**, **TI2BK**, **HK4DP** and **YU1GM** are looking forward to working 160-meter Ws this season. W3RGQ, together with over 30 interested top-band DX hunters, also has provided **VR3A**, **YV5DE** and others with 160-meter crystals. DX stations sincerely interested in top-band work, and whose only obstacle is lack of proper crystals, are invited to contact W3RGQ who offers his services as a center for the assembling and dissemination of 1.8-Mc. news. Between Shely and W1BB (see accompanying box announcement) this season's activity should be well nurtured and reported!

Twenty 'phone still looks good from the ARRL DXCC Countries List angle. DL4ZC helped himself to **EA8BX** 17 *GMT* and **HR1CB** 21, while W9EU raised **HH3DL** (180) 10 *CST* and **HI6EC** (176) 18 . _ . _ . _ Iwo's **KAØIJ** (235) 7, **KR6KS** (220) 7, **KX6AF** (230) 7, **VP2DN** (60) 15 and **VS2EB** (145) 7 answered W5UUK, times *CST* . _ . _ . _

160-METER TRANSATLANTIC TESTS

Plans for the 1954–1955 series of 160-meter DX tests, as arranged by interested U. S. A. and British amateurs, have been completed and all "Top Band" stations throughout the world are invited to participate. Conditions are expected to be good, for transatlantic and New Zealand-U. S. A. contacts occurred as early as October 9th. Regular nightly activity is anticipated and concentrated efforts are recommended as follows.

Dates: December 5th and 19th; January 2nd, 16th and 30th; February 13th.

Times: The period between 0500 and 0800 GMT is recommended. W and VE stations are urged to transmit on the hour for five minutes, listen for DX answers for five minutes, transmit for another five minutes beginning the tenth minute after the hour, etc., until DX contact is established. Transmissions by DX stations will commence five minutes *after* the hour and continue in like fashion. Take care to maintain time-piece accuracy! Use the call "CQ TEST" if desired. Contacts should be kept short to ensure maximum opportunity for all participants.

Frequencies: Look for G stations on their assigned band, 1825–1875 kc. ZLs will be using their 1875–1900 kc. segment. DX stations are urged to tune all W/VE sectors — 1800–1825, 1875–1900, 1900–1925 and 1975–2000 kc.

Reports: Stewart S. Perry, W1BB, 36 Pleasant Street, Winthrop, Mass., will appreciate reports from participating W/VE stations. DX stations can communicate their results to L. H. Thomas, G6QB, Forest Barn, Turkey Road, Bexhill, England. Good Luck!

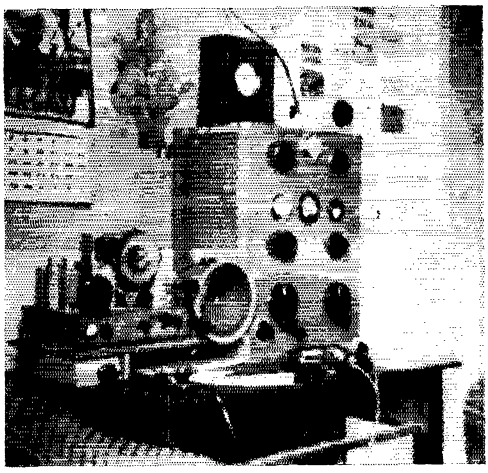
NOTE: See text for news of additional organized 160-meter activity sponsored by the Top-Band DX Club and W3RGQ.

For the "200" DX Club, W5KUC records the 14-Mc. radiotelephone availability of one **AC4NC** (100), **CR8GJ** (158) 14–17 *GMT*, **FR7ZA** (120), **FU8**s AA (200) 5, AB (200) 5, **HE1LAA** (103), **KC6**s AA (234), ZB (210) 14–16, **MP4QAH** (132–185) 15–16, **OY2Z** (145) 15, **PX1YR** (125), **LZ1**s KDP (120–150), KPZ (120–150), **VQ6LQ** (71), **VP8**s AA (148) 0, AK (125) 0, AQ (130) 0, BC (125) 0, **VR3A** (140), **VS**s 4HK (95–100) 15–16, 9AS (100) 18–19, **VU**s 2RX (160–190) 16, 5AB (140), **YA1AA** (198), **YK1AJ** (142), **ZA1BB** (165) 14, **ZC**s 1AC (165), 3AC (120) 10, **ZM6AT** (165), **4S7**s BR (105) 17, LM (105) 16–17, YL (95–190), **4X4DK** (207) and **9S4BS** (140) 16 . _ . _ . _ W5FXN, scribe for the West Gulf DX Club's *DX Bulletin*, specifies 20-meter A3 activity on the parts of **CR**s 6AC (111) 22 *GMT*, 6BX (113–148) 22, 6CS (32) 21, 7AR (150) 14, **EL2X** (190) 2, **ET2ZZ** (150–190) 16–18, **FQ8**s AK (114) 23, AQ (107) 21, AR (116) 23, AT (135) 20, **FY7YE** (300) 15, **GD3IBQ** (178) 15–16, **HE9LAA** (95) 14, **OQ**s 5AO (110) 19, 5FN (112) 20, ØDZ (139) 20, **ST2NW** (144) 20, **TF5SV** (107) 16, **VK9**s BS (193) 14, CR (140) 14, DB (191) 14, GV (124) 14, OK (164) 2, YT (201) 13, **VQ**s 2DC (125) 21, 2DI (160) 21, 2DT (120) 20, 3AV (130), 4EZ (137) 19, 4RF (187) 20, **VP**s 2DA (140) 14, 3LF (150) 22–23, **YU2DC** (152) 22, **ZB2A** (112) 18–19, **ZD**s 3BFC (107) 21, 4BL (113) 21, **ZE6JJ** (118) 21, **ZM6AL** (162), **3V8**s AN (210) 20–22, BB (195) 20–21, **4S7FG** 17 and **4X4GT** (131) 15 . _ . _ . _ *Newark News* Radio Club 20-'phone luck: **AG2**s AB BC, **CN2AD** (175), **CP5**s AQ/CP6 (230), AV EK ES, **CR4**s AD (135) 16, AL (125), **CS3AC** (321) 19 *EST*, **EA**s 6AW 6BS 8AP 15, 8BG 16, 8BL 8EE,

Shiekdom of Qatar station MP4QAH has been the object of high 14-Mc. pursuit for many months. The shack's exterior appears at left, designed to ward off Persian Gulf three-digit temperatures. The shack, at right, combines a commercial point-to-point layout with ham-band gear. (*Photo via G4ZU*)

EL6A 16, ET2LV 17, FM7s WN WU, FO8AB (160) 23, HZ1AB, IT1BXX, KG6AAY 16, KR6s AZ OY, KT1s NX PU (350), UX (95), KX6s AF BU, LX1s BU DG, MF2AA, OD5s AB 15, BA, OQ5s FO GM (170), VP, PJ2s AF AQ (160), SP3AK, SU1s MR SW 13–14, SV0WO, TAs 2EFA (200), 3AA, TG9s AB BA RV, VPs 1GG 1SJC 2AD 2DL 2DN 7NG 7NS 7NU 7NV, VQs 2FU (140) 14, 4NZK (135), VSs 1BT 1FP 1FS 2DS, YNs 1AFM 3ET, YS1s JR MS (185), 0, YU1GM, ZB1s CA CM (185), ZC5VR 15, ZD4BK (115), ZM6AC, ZS7C 17, 3V8AS, 4X4s AB AM, 5As 1TZ 2TZ (325), 3TC 3TE (115), 4TR (110), 4TS (95) and 4TU 15.

Twenty c.w. is still around, to put it mildly. W2WZ worked DU7SV (90) 13 *GMT*, FK8AO (39) 13, FR7ZA (18) 13, KM6AX (62–107) 2–20 on both paths, VK9OK (73) 2, VP8AA (51) 21, VR2s CG (17) 13, CY (19) 2–3, VSs 4HK (80–100) 13–16, 6CG (91) 13 and ZE6JJ (17) 12–13 . . . . . W9KXK concentrated on LU "Z" fellers: 1ZS (48), 4ZB (20), 7ZM (32), 7ZO (45), 8ZS (60) and FQ8AG (85), reaching 121 confirmed . . . . . W9HUZ, who still needs a few states for WAS despite 216 DXCC countries worked, bagged CP3CA (50), VK9AU (68), VP3FD (54), VQ3CC (70) and ZS9I (73) . . . . . CRs 6CS (80) 14–15 *CST*, 7LU (75) 15–16, CT2BO (5) 11, EA8BP (50) 14, F9QV/FC (36) 16, FQ8AX (52) 14–15, FY7YE (57) 17, HA7OL (49) 8, HR1MC (35) 17, LB8YB (37) 7 in Greenland, LUs 2ZC (30) 7, 4ZL (31) 16, LZ1KAB (77) 12, MD5FH (23) 8, OQ5s GU (41) 17, PE (83) 16, RU (86) 18, OX3UD (46) 14, VQ4s CV (28) 13, ERR (14) 14, FK (55) 16, YI2AM (25) 9, ZD2DCP (77) 15 and 4X4AM (62) 13–14 responded to W9EU. Alex still stalks FB8s BE (20) 13, ZZ (22) 13–14, HZ1AB (16) 8, VQ6LQ (58) 8, ZC7s BB (57) 14, AM (67) 15 and ZS7D (56) 13 . . . . . W5UUK did well with CR6AI, CT3AB (7) 19 *CST*, EA9s EB DF (78) 19, FM7WD (110) 7, Trieste I1YCV, IS1AHK, KX6BI, OD5LC (18) 17, SP3AN, TFs 3AB 5SV, ZD4BT (69) 19, ZPs 5GM (66) 18 and 9AY . . . . . DL4ZC raised FM7WP 20 *GMT*, FQ8AG 19, I5PP 18, VP8AO 20 and VS9AN 19 . . . . . DU9JO, ET3S. FB8s BC BN XX, MP4QAH, OD5s AV LJ LX, ST2s AR (30) 20 *GMT*, NG, SV1AB, VK1EG of Antarctica, VSs 1EW 1YN 9AS, VU2s CS RX, ZB1s AJX and BU were happy to land ZD6BX . . . . . Nifties snagged hither and yon, at *W2GVZ:* LZ1KSP, ZD6BX. *W3WPG:* ZB2A. *W4YZC:* a CR6, FQ8AF, SL3AG, an ST2. *W6GPB:* up to 199 with HI8WA (100) 13 *PST*, VK9RH (72) 19 of Norfolk. *W6UED:* LU1ZT. *W9APY/5:* CS3AC (45) 1 *GMT*, an EL2, JA6AK (80) 15, LU1ZL (85) 0. *KR6OS:* ZS3AH (25) 20 *GMT* . . . . . WGDXC recommendations for 20 c.w.: CE7AA (53) 0 *GMT*, EA8BF (38) 21, ETs 2PA (60) 20, 3R (60) 20, FF8s AJ (71) 22, AP (75) 21, FO8s AB (90) 3, AG (60) 2–3, FQ8s AA (51) 18–19, AR (71) 21, FW8AB (80) 3–6, I1YCA/Trieste (28) 19, LU9ZM (84) 0, MP4BBL (70) 15, OQ5BB (15) 20, OX3s EL (50) 17–18, UD (60) 15, SV1SP (100) 21, TA3AA (20) 13, TG9AZ (40) 20, VQs 2AB (66) 20–21, 2GW (65) 21, 4BNU (37) 19–20, 4EI (40–70) 19–20, 4EN (37) 20, 4EZ (20) 18–20, VS1BJ (80) 15, ZB1CH (47) 20, ZC4GF (40) 18, ZD4AQ (42) 21, 4X4s BX (18) 16, FA (37) 17 and 9S4AX (97) 16 . . . . . No. Calif. DX Club's *DXer* adds candidates C3AR (20) 21–22 *PST*, CN2BA (20) 13, CRs 6BW (70) 11, 7AF (50) 11, FF8GP (95) 13–14, IT1TAI (50) 10, KG6IG (60) 20–21 of Chichi, MF2AG (20) 8, ST2AC (22) 9–10, TA2EFA (45) 11, TF3AB (52) 10, VPs 7NG (10) 14, 8BA (68) 16, VR3A (51) 18–19 and ZM6AL (42) 19–20 to the 14-Mc. DX grab bag . . . . . HA5KBA (49) 13 *EST*, JAs 4AF 6AD 9CA (70) 19, YO3s RD RF and ZC4PB (50) 17 are among K2BZT's large collection . . . . . W8PCS accounts for CR4AL (65), GC2FZC (63), VQ2JN (75) and other goodies already mentioned.



EA6AW is good for a fast Balearics Islands QSO and QSL. A 28-watt rig and 5-tube super are served by a 68-foot inverted-L antenna. (*Photo via W5UUK*)

Forty c.w. treated Mississippi's W9APY/5 to EA8BF (20) 3 *GMT*, FO8AC (33) 6, HC1LE (30) 4, HR1JZ (20) 4, KG6FAA (47) 11, LUs 4ZB 6, 7ZO 7, SU1FA (20) 0, TG9AZ (30) 2, VP8s and many ZLs . . . . . CN8GG, EL2X (15) 7 *GMT*, LZ1KAA, ZD2DCP (12) 0 and ZE6JJ (30) 0 answered W3WPG. Harold's XYL WN3ZOG found CM7JA, KP4UE and WP4YD workable on Novice frequencies . . . . . W6s MPY OYS RW SA SWG VBY and VUP contacted ZD6BX around 1630 *GMT*. ZD6BX also hooked 7-megacyclers JAs 1XR/JAØ 3AA 5CP 6HK, VK1DY, VQ3s CC DR, VS2CR and VU2BY . . . . . CT2BO (18), CX6AD (15) 5 *GMT*, HKØAI (40) 3 on San André, KC6AA (10) 11, KM6AX (20) 7, LU2ZI (8), TG9AF (19), VK1GA (30), VP8s AA (45), AZ (18–40) 5, BE (3–20) 4–6, VP2SII (31), VR2BZ (31–45) 9, ZEs 3JO (12) and 5JJ (53) fattened W9HUZ's 40-meter ledger . . . . . According to 200-DXC advices, FR7ZA and VQ8CB schedule on 7007 kc. at 3 *GMT* . . . . . W7JLU nabbed FO8AK (25), HR1MC (50) 4–5 *GMT*, JA8AQ (35), LUs ZS (20), ZT (15) 8, TI2BX, VKs 1AC 9PF (5) 9, VPs 6GT 6PG 8AO (15) and others . . . . . 7-Mc. good fortune at this shack and that shack — *W2ESO:* HA5KBA, an HKØ, LZ1KDP (10) 21 *EST*, SU1WW (6), ZB1BV (28) 12. *W2QBB:* raised a CT2, heard PJ2CE (30) 20 *EST*. *W2WZ:* FR7 HKØ, LU9ZM (22) 7 *GMT*, VP8AE (16) 5. *W4YZC:* an EL VP8, FA8DA. *W8PCS:* a Grahamland VP8. *W9KXK:* a Macquarie Island VK1. *W9QBA:* VR2AS 8–9 *GMT*. *DL4ZC:* So. Americans and TI2PZ 23–0 *GMT* . . . . . The WGDXC boys annoted 7-Mc. items DU7SV (27–40) 8–10 *GMT*, FB8XX (20) 2, FG7XA (7) 3, FK8AB (22) 8, JAs 1FA (17) 10–11, 2BL (20) 12, ST2NG, VP3AT (3) 5–6, VQ6LQ (25) 15, VR2CG (18) 12, ZDs 3BFC (40), 4AB and ZM6AL (5) 7.

Forty 'phone was tagged for CO8s, KG4AE (207) 7 *EST*, KH6FAA (204) 7, TI2WZZ (265) 23, VK3ATN (135) 7, VPs 5DX (195) 6, 9BU (255) 18–19 and ZL1BY (150) 6–7 by W1APA . . . . . NNRC ears heard 7-Mc. A3ers

(*Continued on page 158*)

♦

HKØAI singlehandedly represents San Andres & Providencia Archipelago on the ARRL DXCC Countries List. Vic regularly is found on 40 meters where he enjoys his exclusive DX status and popularity.

QST for

CONDUCTED BY E. P. TILTON,* W1HDQ

ANY good v.h.f. man knows that September and October are the wrong months to be away from home. This was never more true than in 1954; your conductor was only two days out on a 7-week western tour that started Sept. 2nd, when things began popping. Since the early '30s Labor Day week end has marked the beginning of the fall v.h.f. DX season, but with our much-improved equipment and more widespread activity records toppled this year as never before.

Just compare the 2-meter states-worked box in November *QST* with the one appearing in these pages and you begin to get the idea. New states were being added everywhere; one operator reaching a grand total of 29! The 220-Mc. record was extended for the first time in two years and now stands at 700 miles. Two-way work was done on 144, 220 and 420 Mc. over many paths that would have been considered impassable to v.h.f. signals only a few years ago. It was a good fall!

Checking of the September V.H.F. Party logs, just being completed as we write, shows 373 reporting. This pushes the fall party just a few logs ahead of the spring affair, and that one set a record for participation and reporting. Growth of interest is particularly in evidence in the Middle West and in W6 and W7. Activity in our v.h.f. parties was once largely confined to the northeastern seaboard states, but it is no longer that way.

Proof: 155 contacts on 50 and 144 Mc. by W9WOK, Bensenville, Ill.; 131 on 144 Mc. alone by W9KLR, Rensselaer, Ind.; 196 in 17 sections on 144 Mc. only by W8WXV, Shiloh, Ohio. In Oregon, W7OKV worked 60 stations on 144 Mc., and W7UFE and W7PVZ/7 lead the Washington Section with 63 and 83 contacts on 2 meters, respectively. You had to do better than 100 contacts to rank near the top in most of the California sections. Reporting was way up from W6-land, particularly from the Los Angeles Section, where W6WSQ made 230 contacts on 50, 144 and 220 Mc. Contest details and scores next month.

September-October DX

The big doings of Labor Day week end are rather ancient history by now, but even at this late date some highlights are worth noting. W4UMF, Arlington, Va., reports Wisconsin and Michigan stations coming through on 144 Mc. as late as 1100 on the 4th, with the band opening again in a westerly direction about 2000. At 2055 EST Tom hooked up with W8BFQ, West Richfield, Ohio, on 144, shifting to 220 Mc. shortly thereafter, for what was probably the first Ohio-to-Virginia contact on that band. W2QED, Seabrook, N. J., also was busy on 220, working W8s SVI LPD DX BFQ and NRM, either two-way or crossband 220–144.

A big event for eastern stations was the appearance of (for most of them) their first Kentucky signal on 144 Mc. Working as fast as possible, W4PCT, Covington, provided contacts with his state for 2 Massachusetts, 6 Connecticut, 12 New York, 16 New Jersey, 1 Maryland, and 14 Pennsylvania stations between 1922 and 2330 CST. W8BFQ worked the same number of stations as W4PCT on 144 Mc., 52. Hers were divided between 6 W1s, 18 W2s, 8 W3s, 8 W4s, 4 W8s, 6 W9s, and 2 VE3s. Margaret also worked W4UMF, W3s SUK MRQ/3 LZD, and W2s QED FBZ DZA RFV, W8DX and W9OVL on 220 Mc. On 432 she worked W3RE, W3MRQ/3, W2QED, and was heard by W1VNH, Agawam, Mass. This last one would have been a new record if Harold had not had feeder trouble on his 432-Mc. beam, preventing him from making it a two-way.

Probably never before in v.h.f. history had there been such mass work over the Allegheny Mountains, but we suspect that this general success was more the result of improved equipment and polarization standardization than of exceptional fall conditions. These 400- to 800-mile contacts are being made increasingly often over mountainous paths, and getting both areas on the same polarization seems to have been an important factor in this. We feel reasonably sure

WØZJB	48	W5VY	48	W9ZHB	48
WØBJV	48	W5GNQ	46	W9QUV	48
WØCJS	48	W5ON8	45	W9HGE	47
W5AJG	48	W5JTI	44	W9PK	47
W9ZHL	48	W5ML	44	W9VZP	47
W9OCA	48	W5SFW	44	W9RQM	47
W6OB	48	W5JLY	43	W9ALU	47
WØINI	48	W5JME	43	W9QKM	46
W1HDQ	48	W5VV	42	W9UIA	45
W5MJD	48	W5FAL	41	W9UN8	45
		W5FRC	41	W9MFH	36
W1CLS	46	W5HLD	40		
W1CGY	46	W5HEZ	38	WØQIN	47
W1LL	46	W5FXN	38	WØDZM	47
W1GJO	45	W5LIU	37	WØNFM	47
W1L8N	44			WØTKX	47
W1HMS	43	W6WNN	48	WØKYF	47
W1DJ	41	W6ANN	45	WØJOL	46
		W6TMI	45	WØHVW	46
W2AMJ	46	W6IWS	41	WØMVG	46
W2MEU	46	W6OVK	40	WØWKB	45
W2RLV	45	W6GCG	35	WØTJF	44
W2IDZ	45	W6BWG	29	WØJHS	43
W2FHJ	44			WØPKD	43
W2GYY	40	W7HEA	47	WØIPI	41
W2QVH	38	W7ERA	47		
W2ZUW	35	W7BQX	47		
		W7FDJ	46	VE3AET	43
W3OJU	46	W7DYD	45	VE3ANY	42
W3NKM	41	W7JRG	44	VE1QZ	34
W3MQU	39	W7BOC	42	VE3AIB	32
W3OTC	38	W7JPA	42	VE1QY	31
W3KMV	38	W7ACD	42	VE3DER	27
W3RUE	37	W7FIV	41	XE1GE	25
W3FPH	35	W7CAM	40	CO6WW	21
W4FBH	46				
W4EQM	44	W8N88	46		
W4QN	44	W8NQD	45		
W4FWH	42	W8UZ	45		
W4CPZ	42	W8RFW	45		
W4FLW	42	W8CMS	43		
W4OXC	41	W88QU	43		
W4M8	40	W8BFQ	42		
W4FNR	39	W8YLS	41		
W4IUJ	38	W8OJN	40		
W4BEN	35	W8LPD	37		

Calls in **bold** face are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.

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

that the trend to horizontal polarization now showing in some western areas will prove equally beneficial to W6s and W7s who are interested in extended-range work.

October produced v.h.f. DX sessions at least equal to the best that September had to offer. On the morning of Oct. 8th W8BFQ found W4HHK, Collierville, Tenn., and W5RCI, Marks, Miss., coming through well on 144. Contact was made with W5RCI, for a switch to 220 Mc. Rex heard Margaret at once, but she was not able to read his 'phone. W5RCI then rigged a keying method and at 0910 EST they made it two-way on 220, for a new record of 700 miles.

The band remained open throughout the morning and into the afternoon. W8BFQ made her first contact on 144 Mc. with W5JTI, Jackson, Miss., and skeds were kept hourly. Tim got W5HQC, Rayville, La., on the air during noon hour, and this netted state No. 29 for W8BFQ. They worked solidly on voice at 1421 EST, over a distance of about 850 miles. Then followed numerous attempts at new states each way, but it being midday, activity was low. W8BFQ heard W5FSC, Houston, Texas, and W4UUF, Pensacola, Fla., weakly several times, but no contact could be made. W5JTI and W8EP, Terra Alta, W. Va., were also on the edge of a QSO but never quite made it.

Oct. 8th to 10th was good farther east, also. W3BNC, Hagerstown, Md., worked W4PCT, Covington, Ky., W9MUD, Decatur, and W9UED, Belleville, Ill., WØIHD, Overland, and WØETJ, Elsberry, Mo., on the night of the 8th, and WØYRX, St. Louis, the night of the 9th. This was a "pipeline" to the St. Louis area, with WØYRX running S8 to 9 for about 1½ hours beginning about 2215 EST.

This period netted three new states for W2BLV, Haddon Heights, N. J. George was hearing several W9s and Øs shortly after midnight of the 8th. At 1000 on the 9th, W4HHK was heard calling CQ, and later working W3AIR and W4AO. W2BLV raised him at 1045, at which time the signal of W4HHK was running about S2, with occasional S9 bursts. Paul was having trouble making contacts, as there was little activity to be found at that time of day.

WØIHD, Overland, Mo., used this session to catch W5HQC, W2UK and W3BNC, Louisiana, New Jersey and Maryland, bringing his states-worked total up to 24. Now that there is 2-meter activity in just about all areas east of the Rockies, openings of this sort begin to show something of the DX possibilities of the 2-meter band. A circle of 800 miles radius takes in a lot of territory!

RECORDS

Two-Way Work

50 Mc.: CE1AH — J9AAO
10,500 Miles — October 17, 1947

144 Mc.: W6ZL — W5QNL
1400 Miles — June 10, 1951

220 Mc.: W8BFQ — W5RCI
700 Miles — October 9, 1954

415 Mc.: W1RFU — W1VVE
410 Miles — June 12, 1954

1215 Mc.: G3QC/P — G8DD/P
100 Miles — July 26, 1953

2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947

5250 Mc.: W2LGF/2 — W7FQF/2
31 Miles — December 2, 1945

10,000 Mc.: W7JIP/7 — W7OKV/7
109 Miles — August 8, 1954

21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1946

Here and There on the V.H.F. Bands

While aurora contacts have been made now and then with voice on 50 Mc., modulation of any sort has been largely unintelligible on 144 Mc. in most aurora sessions. Usually, if you hear a continuous roaring noise on 144 Mc. during an aurora you can take it for granted that you're listening to someone trying to use voice, but W1YQI, Marblehead, Mass., had better luck on Sept. 14th. Coming across some strong aurora signals just before 0030, but having no provision for keying, Bill tried calling W8WXV on 'phone. Al came back, and later shifted to voice, also. Though the signals sounded "like someone shouting into an empty barrel on a moving freight car," they managed a two-way on voice, and W1RFU, Wilbraham, Mass., made it on voice shortly after. These distances, 600 and 525 miles, respectively, are the best we've heard of being worked on voice during a 144-Mc. aurora opening. High power (4–125As at both W8WXV and W1YQI) and the 64-element array 105 feet high at W8WXV undoubtedly had quite a bit to do with this.

The "mountain complex" is gradually being dissipated. As the result of numerous demonstrations of what is now known as "knife-edge refraction" (see October, 1953, *QST*, page 65) and greater familiarity with the scattering effects that come into play when high power and large antennas are used, more and more v.h.f. men are working out from "impossible" locations. A recent example is the work of W7VMP, Phoenix, Ariz. This station is manned by the Fenwicks, who first made the pages of *QST* (April, 1952) as amateur radio's first licensed triplets.

They now live in Phoenix, Ariz., where they have a kilowatt rig (pair of GL-592s in the final), a 32-element array and a Tecraft converter. With this set-up it was no time at all before W7VMP (they also hold the calls W7VMU VMQ) began working beyond the mountains, to points never before worked from Phoenix on amateur frequencies above 60 Mc. First came W7JU, Boulder City, Nev., a 240-mile shot, made first on Aug. 22nd. What is believed to be the first California QSO on 144 Mc. from Phoenix came on Sept. 5th, with W6BYE/6, on Santa Rosa Peak. New Mexico was added on Sept. 15th, with W5FAG/5, Mt. Withington. Perhaps the most significant contact was W6NLZ, Los Angeles, 357 miles, Sept. 18th. If there was ever a QSO to dispel the "impassable mountain" complex that has gripped western v.h.f. enthusiasts for a generation, this was it — home-station to home-station over mountains as rough as you're likely to find anywhere. And to prove that it was no one-shot proposition, another contact was made Oct. 20th.

Schedules are now being kept with W6QKI (ex-W3QKI) Sherman Oaks, Calif. (Los Angeles area), regularly. Beginning Oct. 15th, this sked was kept successfully 6 out of the first 7 days. Signals are weak, but in there regularly. Similar results are being achieved with W5VWU, Albuquerque, N. Mex., following a first contact Oct. 21st. This is a 330-mile hop over very mountainous terrain. Best DX to date: W6ZAT/6, Mt. Pinos, 417 miles, during the September V.H.F. Party. Interest in this sort of work is growing rapidly. W7KFS is also on with high power and doing well, and W7FGG will be in there shortly with high power and a 64-element array.

There have been scattered reports over much greater distances from both Arizona and New Mexico recently. W5VWU was heard during the contest by WØTJF, Bricelyn, Minn., nearly 1000 miles. John has 500 watts and a 32-element array. Meteor-scatter tests between W5VWU and W4HHK are producing some signals, though no communication-quality stuff as yet. W7UPF reports reception of an unidentified WØ on Sept. 20th, and has received information that WØUOP, Des Moines, Iowa, heard him at about the same time.

A fireball seen in the skies east of Albuquerque the night of Sept. 18th appears to have been responsible for several 144-Mc. DX heard reports, though the WØTJF reception (2110 CST) report is about a half hour ahead of the fireball observation. W5VWU saw the phenomenon, aimed his beam at it, and heard several fluttery signals but was not able to identify them. We'd like to collect more information on this one, including specific details on the report of reception of W7VMP by a station in Nebraska. Will anyone who was in on this (time: around 2130 CST, Sept. 18th) please fill us in on details?

Some rather extensive antenna rebuilding projects are under way along the Atlantic Seaboard as the result of the damage done by the several hurricanes that passed our way this fall. W2BLV gives a partial list of 2-meter antenna and/or tower casualties: W2s EH PAU GLV EDA YRW UCV QED FXT VX ZUL, W3IBH, W4s UBY and JCJ. These go a long way toward accounting for the quiet state of the 2-meter band we've noted since our return from the West.

2-METER STANDINGS

	Call	States	Areas	Miles
W1RFU		19	7	1150
W1HDQ		19	6	1020
W1CCH		17	5	670
W1IZY		16	6	750
W1AZK		14	5	650
W1MNF		14	5	600
W1BCN		14	5	650
W1KCS		14	5	540
W1DJK		13	5	520
W1MMN		10	5	520
W2ORI		23	8	1000
W2UK		23	7	1075
W2NLY		23	7	1050
W2AZL		21	7	1050
W2QED		21	7	1020
W2BLV		19	7	910
W2OPQ		19	6	—
W2UTH		16	7	880
W2PAU		16	6	740
W2DWJ		16	5	632
W2PCQ		16	5	650
W2LHI		16	5	550
W2DFV		15	5	—
W2AMJ		14	5	550
W2AOC		14	5	450
W2QNZ		14	5	400
W2BRV		14	5	590
W3RUE		23	8	950
W3NKM		19	7	660
W3BNC		18	7	750
W3EPH		18	7	—
W3KWL		16	7	720
W3LNA		16	7	720
W3IBH		16	5	570
W3GKP		15	6	800
W3TDF		13	5	570
W4HHK		26	8	1020
W4AO		22	7	950
W4PCT		20	8	—
W4JFV		18	7	830
W4MKJ		16	7	665
W4UMF		15	6	600
W4OXC		14	7	500
W4JHC		14	5	720
W4WCB		14	5	740
W4TCR		14	5	720
W4UBY		14	5	435
W4IKZ		13	5	720
W4JFU		13	5	720
W4ZBU		10	5	800
W4UDQ		10	5	850
W4TLA		7	4	850
W5RCI		21	7	925
W5JTI		19	7	1000
W5QNL		10	5	1400
W5CVW		10	5	1180
W5AJG		10	4	1260
W5MWW		9	4	570
W5ML		9	3	700
W5ABN		9	3	780
W5ERD		8	3	570
W5VX		7	4	—
W5VY		7	3	1200
W5FEK		7	2	580
W5ONS		7	2	950
W6ZL		3	3	1400
W6PJA		3	3	1390
W6WSQ		3	3	1390
W6BAZ		3	2	320
W6NLZ		3	2	360
W6MMU		2	2	240
W6GCG		2	2	210
W6QAC		2	2	200
W6EXH		2	2	193
W7VMP		4	3	417
W7JU		3	2	247
W7LEE		3	2	240
W7YZU		3	2	240
W7JUO		2	2	140
W7RAP		2	1	165
W8EFQ		29	8	850
W8WXV		28	8	1200
W8WJC		25	8	775
W8RMH		20	8	690
W8WRN		20	8	670
W8DX		20	7	675
W8BAX		19	7	655
W8EP		18	7	800
W8UKS		18	7	720
W8RWW		17	7	630
W8WSE		16	7	830
W8SRW		16	7	700
W9EHX		23	7	725
W9EVJ		22	8	850
W9EQC		22	8	820
W9KLR		21	7	690
W9HPV		20	7	1000
W9UCH		20	7	750
W9KPS		19	7	660
W9REM		19	6	—
W9LF		19	—	
W9ALU		18	7	800
W9JGA		17	6	720
W9WOK		17	6	600
W9ZHL		17	6	—
W9MBI		16	7	660
W9ROV		15	6	—
W9LEE		15	6	780
W9JNZ		15	6	560
W9DDG		14	6	700
W9FAN		14	7	680
W9QKM		14	6	620
W9DSP		14	5	700
W9UIA		12	7	540
W9ZAD		11	5	700
W9GTA		11	5	540
W9JBF		10	5	760
WØEMS		25	8	1175
WØIHD		24	7	870
WØGUD		22	7	1065
WØONQ		17	6	1090
WØINI		14	6	830
WØOAC		14	5	725
WØZJB		12	7	1097
WØWGZ		11	5	760
VE3AIB		20	8	890
VE3DIR		18	7	790
VE3BQN		14	7	790
VE3DER		13	7	800
VE3BPB		12	6	715
VE3AQG		11	7	800
VE1QY		11	4	900
VE2AOK		10	5	550
VEJFJ		2	1	365

S.s.b. on 144 Mc.? Some time ago we reported a WØ as being possibly the first user of s.s.b. on 144 Mc. This brought out the fact that W2JJC, New Market, N. J., has been on since March, his first contact being with K2BJP on the 27th of that month. At that time he had an output of only about one watt, from a 6J6. More recently, an 832A at 30 watts peak has been added. The signal has been received with excellent results by many users of crystal-controlled converters, including W2MIN, some 50 miles distant. The antenna up to now has been a temporary affair lashed to the boom of a 20-meter beam, but a better array is under construction. Arnold says he's heard that a Virginia W4 is also on 2-meter s.s.b. Any others?

Use of the 220-Mc. band for regular nightly rag-chewing is gathering momentum in a number of our metropolitan areas. WØOFZ writes that WØs OFY OFZ MUP ORZ HPS and PYC are active regularly in and around Minneapolis. WØOFY heard W9DRN recently. The boys would be glad to keep schedules with other 220-Mc. operators.

W4EUK, whose letter in September *QST*, "A Technician Speaks," stirred up quite a hornet's nest, says that it also brought him in contact with several fellows in the Atlanta area who were interested in 220. W4IJX, among them, has already been worked two-way on 220.

Anyone interested in 220 around Cleveland should check the band at 2130, as this is the standard meeting time for the six or more stations active on the band. This information is from W8NRM, who is net control for the Cleveland V.H.F. Club. On Monday evenings there is regular activity on 50, 144 and 220 Mc. at 2000 on all three bands. Novice interest in 144 Mc. is high.

There is activity on 144 Mc. in Singapore and Malaya. A report from VS1FP, now back in England, tells of 2-meter interest in VS1 and VS2. He and VS1FJ started the ball rolling, and were soon joined by VS1AG and VS1AD, first in crossband work with 20 supplying the other link. The first two-way work on 144 Mc. was done on October 11th by VS1FP and VS1AD. VS2EB was first worked on October 20th. Several others are in various stages of getting on 144 Mc., and prospects look good for some real activity. The locations are close to the Equator, and many interesting over-water shots should be possible if stations can be found to work in the right places. VS1FP reminds potential VS two-meter enthusiasts that the band there is 144 to 146 Mc.

H. E. M. Stevenson, W5DNN, HC2OT, CO2JF, W5BR

In the high m.u.f. years of 1946 to 1951, few amateurs did more to promote international DX on 50 Mc. than HC2OT, Guayaquil, Ecuador. Steve kept a constant check on the frequencies near the 50-Mc. band, and by comparing notes with men of like interest all over the world on 14 and 28 Mc., he missed few chances to make DX contacts on 50.

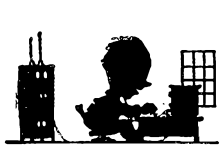
Such diligence paid off, and before the sunspot cycle petered out in 1951, HC2OT had worked more than 150 stations on 50 Mc., in 26 states and nearly every country of South and Central America where there was 6-meter activity. To commemorate these history-making QSOs, Steve created the Order of Tropical Tramps, sending beautiful Father Neptune certificates to all whose 50-Mc. signals crossed the Equator to work HC2OT.

In 1951 this famous station passed into history, when Steve's work with a construction firm specializing in large-scale projects in Latin America took him to Cuba. Soon he was on the air there, too, and as CO2JF gave many Ws their first 50-Mc. contact with that country.

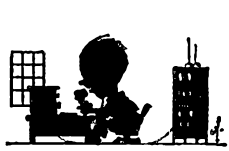
Then followed a short period on 10, 6 and 2 from Houston, Texas, under his old call, W5DNN, and later, W5BR. But before long he was off to Latin America again, this time to Northern Chile. Before he had a chance to get on the air as a CE1, Steve was transferred to Lima, Peru. There, as OA4DX, he worked principally on 14 and 21 Mc., but kept a watchful eye on his pet band, 50 Mc.

When we last heard from him he was in Colombia, filled with enthusiasm over his promising location, and hoping soon to be trying for 50-Mc. DX as an HK. This was not to be; late in the summer he came back to his home town for treatment of an old ailment, and on September 23rd he passed away in a Houston hospital.

Steve's ham activity began back in the spark days. In the years just prior to World War II he was active on 20, 10 and 5 meters as W5DNN. During the war he served as an officer in the Army Engineers in the China-Burma-India Theater. It was probably as HC2OT that he was best known. His cheery voice and competent fist will be missed by DX men as well as v.h.f. men, for he ranked high in both circles. With a rare combination of friendly relaxed manner, technical competence and operating skill, Steve made *friends*, as well as contacts, on whatever band he used.



Operating News



F. E. HANDY, W1BDI, Communications Mgr.
R. L. WHITE, W1WPO, Asst. Comm. Mgr., C.W.
PHIL SIMMONS, W1ZDP, Communications Asst.

GEORGE HART, W1NJM, Natl. Emerg. Coördinator
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, W1ZJE, Administrative Aide

CONSISTENT individual merit in traffic performance is receiving recognition in the awarding of ARRL Traffic Medallions. SCM reports of traffic handled in June, July and August indicate 28 operators first-eligible for the medallions. As we go to press we're awaiting the signed statements from medallion winners confirming "for the record" that the totals were run up at one's own station, reported on time to the SCM, and that operational work included was all done on amateur frequencies. Starting next month the calls of those currently receiving Awards will be noted on the same page as the BPL.

The numerous amateur nets, c.w. and 'phone, are now in high gear for dispatch of routine and emergency traffic throughout the U.S.A. and Canada. This is just to invite one and all to take *some* part in amateur traffic work; at the least why not gain the procedure know-how of the real communicator by starting a few messages in your section or local net? The latch-string is out. Just about *every* net welcomes reporters in its sphere of operation, especially if you come up with a message to be relayed. The SCM is reserving a BPL card for you, every month you can make it. *Consistent* work reporting into the basic section nets in NTS may put you in line for a medallion. See full rules with the announcement of this Award, page 64, August 1954 *QST*. Get started in traffic today; a radiogram to ARRL *asking* will bring a copy of *Operating an Amateur Radio Station* (booklet) with details on counting and checking traffic, and the QN signals used by nets.

Speaking of Service by Nets. Modest reports from VO6X and VO6N refer to the Labrador Net as meeting *nightly for over two years*, 3780-kc. voice work, regardless of summer or QRM or conditions. VO6N spends about two hours two nights out of three as NCS. "The net serves isolated points on the coast of Labrador. Hardly a week goes by without one or two urgent medical requests being relayed from the local RCAF Hospital or the Northwest River Hospital. The requests at times are vital in saving lives; we also handle traffic concerning evacuations of serious cases, cover frequencies in cases of lost persons or aircraft. Such happen fairly commonly here in the north. Most of us are low power and battery operated. May I say we receive a great deal of cooperation from the general public as well as the military and civilian authorities involved."

'55 Program. Have fun in the Sweepstakes? General operating activities will continue at high pitch this month. The New Year will be marked by a very full ARRL activity schedule as may be confirmed by a quick glance at the Activities Calendar. December offers a last chance to get those improvements in the operating arrangement, where you have been putting them off. Are you all set for operating with full fast break-in, the receiving set-up the best for maximum signals and noise ratio and general efficiency, impedances matched for top power transfer and 1:1 s.w.r? It's *not* too late to fix a rig for h.f. (if you have been on v.h.f. *only*) or a v.h.f. rig (for the v.h.f. SS Jan. 8th–9th) if up to now you have only experienced the low end of our spectrum! All Novices should get our free log form to be ready for Jan. 8th–23rd operation in the Novice Round-up, rules elsewhere in this issue. The DX-minded gang according to reports is already putting up new beams and kw. finals for the annual DX contesting time coming up in February. The story is the same; with the good midwinter conditions activities will come so hot and fast after the turn of the year you can't make them all unless the technical matters are finished now in December!

RTTY. The RTTY Society of Southern California held its second annual RTTY Sweepstakes, October 30th (9 P.M. EST) to Nov. 1st (3 A.M. EST). VE3GL reports working F7BM quite often. KA2WW and others overseas are getting operational according to reports. The East Coast RTTY Net meets each Wednesday 3620 kc. at 7 P.M. EST. W3PYW then clears with W9TCJ, NCS of RTNET Midwest meeting at a later hour. RTNET So. Cal. meets Tuesdays 8 P.M. PST on 147.85 Mc. with W6AEE having liaison through 7140 kc. schedules to the first mentioned groups.

Region I, Civil Defense Test. Federal Civil Defense Administration Headquarters has just written ARRL of tentative plans for a civil-defense test of stand-by radio planned tentatively for February, 1955. Plans call for a careful survey of the amateur facilities in the whole Region I area (New York, New Jersey, and New England). Results and conclusions should be applicable to all parts of the nation.

FCDA in asking the assistance and coöperation of ARRL in these plans has in view the maximum development of radio stand-by facilities and their integration at state and local levels . . . and expansion, testing and recruiting efforts looking to February. All ECs and SECs in Region I have been notified. Your monthly reports to ARRL as well as the special questionnaire put out on this test will indicate what this whole ARRL leader-

ship crew can accomplish, working toward a definite objective over the all-too-short period from now to February!

Throughout the nation FCDA is asking fullest participation of both the Amateur Radio Emergency Corps and every RACES group and the expediting of Radio Amateur Civil Emergency Service plans in all states and communities. *Monthly reports* by each EC and Radio Officer should cover training activities, radio drills, new members brought into groups, extension of plans and the like. When consolidated by the NEC these constitute the regional and national picture. It is essential we have these data so we at ARRL may be able accurately to convey to FCDA, FCC and others interested, the true public service potential as represented in our operational facilities.

We appeal to every EC and SEC to start a build-up. Be ready to meet any call or emergency requiring your communications. This will be directly preparatory to the over-all nationwide civil defense exercise (of which the February Region I test is a dry run) looking to about May, 1955!

A question to the *individual* amateur: Are you registered in the AREC or identified with a RACES group?

— *F.E.H.*

A.R.R.L. ACTIVITIES CALENDAR

Dec. 4th: CP Qualifying Run — W6OWP
Dec. 16th: CP Qualifying Run — W1AW
Jan. 7th: CP Qualifying Run — W6OWP
Jan. 8th-9th: V.H.F. Sweepstakes
Jan. 8th-23rd: Novice Round-up
Jan. 14th: CP Qualifying Run — W1AW
Jan. 15th-16th: CD QSO Party (c.w.)
Jan. 22nd-23rd: CD QSO Party ('phone)
Feb. 5th: CP Qualifying Run — W6OWP
Feb. 8th: Frequency Measuring Test
Feb. 11th-13th: DX Competition ('phone)
Feb. 14th: CP Qualifying Run — W1AW
Feb. 25th-27th: DX Competition (c.w.)
Mar. 5th: CP Qualifying Run — W6OWP
Mar. 11th-13th: DX Competition ('phone)
Mar. 15th: CP Qualifying Run — W1AW
Mar. 25th-27th: DX Competition (c.w.)
Apr. 1st: CP Qualifying Run — W6OWP
Apr. 13th: CP Qualifying Run — W1AW
Apr. 16th-17th: CD QSO Party (c.w.)
Apr. 23rd-24th: CD QSO Party ('phone)

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the .....
..... ARRL Section of the .....
Division, hereby nominate .....
as candidate for Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Yukon*	Dec. 15, 1954	W. R. Williamson	Mar. 17, 1949
West Indies	Dec. 15, 1954	William Werner	Aug. 15, 1952
Utah	Dec. 15, 1954	Floyd L. Hinshaw	Feb. 18, 1954
Nebraska	Dec. 15, 1954	Floyd B. Campbell	Aug. 15, 1954
Saskatchewan*	Dec. 15, 1954	Harold R. Horn	Dec. 15, 1954
Colorado	Dec. 15, 1954	Karl Brueggeman	Feb. 16, 1955
Sacramento Valley	Dec. 15, 1954	Harold L. Lucero	Feb. 16, 1955
Michigan	Dec. 15, 1954	Fabian T. McAllister	Feb. 17, 1955
Minnesota	Dec. 15, 1954	Charles M. Bove	Feb. 17, 1955
Missouri	Dec. 15, 1954	C. L. Arundale	Mar. 1, 1955
Oregon	Dec. 15, 1954	John M. Carroll	Mar. 1, 1955
Manitoba*	Dec. 15, 1954	Leonard E. Cuff	Mar. 2, 1955
Mississippi	Dec. 15, 1954	Dr. A. R. Cortese	Mar. 8, 1955
British Columbia*	Jan. 14, 1955	Peter McIntyre	Mar. 13, 1955
Western Pennsylvania	Jan. 14, 1955	R. M. Heck	Mar. 17, 1955
Md.-Del.-D.C.	Jan. 14, 1955	Arthur W. Plummer	Mar. 21, 1955
Los Angeles	Feb. 15, 1955	Howard C. Bellman	Apr. 12, 1955
Santa Barbara	Feb. 15, 1955	Vincent J. Haggerty	Apr. 12, 1955
Maine	Feb. 15, 1955	Bernard Seamon	Apr. 16, 1955
Southern Texas	Feb. 15, 1955	Dr. Charles Fermaglich	Apr. 29, 1955
New Mexico	Mar. 15, 1955	G. Merton Sayre	May 4, 1955
Wisconsin	Mar. 15, 1955	Reno W. Goetsch	May 12, 1955

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Arkansas	Owen G. Mahaffey, W5FMF	Oct. 15, 1954

In the Kansas Section of the Midwest Division, Mr. Earl N. Johnston, WØICV, Mr. Roy T. Harmon, WØIUB, and Mr. Walter L Bennett, WØWMH, were nominated. Mr. Johnston received 190 votes, Mr. Harmon received 67 votes, and Mr. Bennett received 57 votes. Mr. Johnston's term of office began Oct. 29, 1954.

W1AW OPERATING NOTE

A detailed schedule of W1AW operations appeared on page 77 of November *QST*. See that issue for full information on when and where to look for the ARRL Headquarters station.

SEPTEMBER FMT RESULTS

In the September ARRL Frequency Measuring Test, open to both ARRL Official Observers and other amateurs, entries were received from 147 participants who reported 541 measurements; 72 entries were submitted by Observers and 75 by non-OO entrants. Each entrant has received an individual report comparing the accuracy of his measurements of the special W1AW FMT transmissions with those made during the test by a professional frequency-measuring laboratory.

The standings of leaders in the test are given below. Decimal fractions are shown only to establish an order of listing, since the official readings can only be accredited to 0.4 parts per million. W4JUI, W2OUT, W8HB, W8CUJ and W8YCP were all within this 0.4 p.p.m. range of accuracy of the laboratory-umpire, and *all* therefore share top honors equally. In accordance with the announced rules, no entry consisting of a single measurement was considered eligible in the competition.

Observers	*Parts/ Million*	*Non-Observers*	*Parts/ Million*
W4JUI	0.0	W2OUT	0.0
W1MUN	0.5	W8HB	0.0
W2FE	1.6	W8CUJ	0.3
W9PBI	3.3	W8YCP	0.4
W1RLQ	3.5	W8GQ	1.3
W2AIQ	5.2	W5TVG	2.3
W8WAV	5.3	W9LZP	2.4
W5QHK	5.7	W2IWH	3.3
W2LS	6.5	W4ANK	3.3
WØZUX	8.5	W4MB	3.4
W6RW	8.7	W6LIY	3.7
W8GZ	9.0	W1QQO	4.4
KP4DV	9.8	W5KQD	4.9
W9RZS	10.7	W4TL	5.0
W3TFN	11.2	W4QN	5.4

The following ratings are based on a single measurement: OOs — W6DVI 2.3, W5QYZ 4.8, W1PXH 11.0. NON-OOs — W6AXV 2.5.

OPERATION ALERT

The nation-wide test of civil defense preparedness sponsored by the Federal Civil Defense Administration and conducted at federal, state and local levels in the U. S., its possessions and Canada, was not just a test of RACES (amateur) facilities, or even just of communications facilities. It affected every civil defense service. We amateurs took our place in the line-up along with all other civil defense volunteers, and the performance we turned in as amateurs did us considerable credit, as c.d. administrators throughout the country have recognized.

Prior to the test, 'way back last April, ARRL dispatched a bulletin to its ECs announcing the coming of Operation Alert and requesting all to get ready to participate to whatever extent possible. Some 381 ECs replied, 343 of whom indicated their intention to participate in the test, 38 saying they could not participate for one reason or another. After the test we received 189 reports of participation by 2568 amateurs operating over 1700 stations of which 857 were fixed, 126 portable, 738 mobile and 63 hand-carried. Sixty ECs reported participating under RACES, the others in AREC status in support of their local civil defense organizations. Along with these statistical data were volumes of detailed information on the test, probably of more significance than the data themselves. Browse with us a bit while we summarize some of the reports.

In Alberta, participating stations were divided into two groups: Key Stations in the larger cities, such as Edmonton (VE6HM), Grande Prairie (VE6RF and VE6FH), Calgary (VE6OD), Lethbridge (VE6PV and VE6EQ), and Medicine Hat (VE6JJ, VE6NA and VE6OE); and Stand-by Stations in the smaller communities of Camrose (VE6FF), Cowley (VE6YM), Olds (VE6YD) and Hines Creek (VE6OC), these latter to maintain radio silence until or unless called upon. VE6MJ assumed his station as C.D. Radio Officer for Edmonton at 1800, June 14th, and the Alberta Net was opened at 1900 MST. Although there was little traffic passed, civil defense officials were very much aware of the existence of the amateur net.

Although it at first appeared that Allegheny County (greater Pittsburgh), Penna., would take no formal part in Operation Alert, the gang out there suddenly came to life under the prodding of EC W3LMM. Sixty-two amateurs operated 47 stations, including 33 mobiles and two hand-carried units. The county set-up provides for a main control and five zone controls. Local amateur radio clubs have taken over responsibility for operation of four of the five zone controls, an individual (W3QJJ) operating the fifth. The clubs are the Amateur Transmitters Assn. of Western Penna., Steel City Radio Club, South Hills Brasspounders and Modulators, and the Mon-Yough Radio Club of McKeesport. Operation was on 10 meters with the band wide open, and very successful, proving that operation can be conducted under such conditions. Separation of main control frequency from zone control frequencies by at least 900 kc. provided for continuous monitoring, even when main was transmitting. Allegheny County civil defense communications has recently fortified its amateurs with $25,000 worth of equipment. Sorry, no room to name all participants, but W3LMM says one Novice participated very successfully and he has a place for any Novice in the RACES set-up.

The Birmingham (Ala.) Mobile Emergency Net established two fixed control stations and conducted its operation on the 10-meter band. The City Hall NCS opened at 0938 CST and zone controls were then called into operation in succession. The simulated attack occurred at 1111 CST, at which time each zone control transmitted two messages to the Jefferson County c.d. director, reporting fires, damages, casualties and injuries. Messages were received in reply at zone headquarters by 1210, at which time telephonic communication was assumed to have been re-established. A network was also active on 3955 kc., with its control at the same place, consisting of some 35 stations throughout the state and relaying traffic to national headquarters; it was reported that Birmingham was one of the first five cities to report to national headquarters. The state headquarters contact was with W4EW in Montgomery. The NCS on this frequency also secured at 1210. A total of 17 amateurs, all members of the Birmingham Amateur Radio Club, participated in the exercise with 15 mobile units available.

W7DSS reports that the Great Falls, Mont., gang was on deck, although there is no RACES there at present. Through the facilities of W7PCZ, traffic was handled from the State c.d. Director to the local director. Mobiles and other fixed stations were standing by in case they were needed. The local c.d. director 'phoned W7DSS to say he

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This trailer was the alternate Control Station for Norfolk during Operation Alert. Built by and for the Cavalier Amateur Emergency Radio Assn., it has been a major personal project of Norfolk EC W4NV for several years. Shown in the picture, left to right, are W4s HPC LCW TEL NV YJR and VVP. (*Photo by W4NV*)

♦

was pleased to note that the amateurs were on hand and ready to go except for getting RACES authorization.

Approximately 40 amateurs turned out in Norfolk, which was struck by a simulated atom bomb in the downtown area at 1004. The headquarters station was manned by W4s IPA OXG PAK OM DHZ RDI and WZS. The alternate control station, the mobile communication trailer of the Cavalier Amateur Radio Assn. (W4WNZ), was set up in the suburbs and manned by EC W4NV, W4s YJR LCW TEL VVP and HPC. On several occasions the control of mobiles was passed to the trailer, operation of which proved very successful. Across the harbor in Hampton, amateurs were active under EC W4AJA, in contact with Richmond, Norfolk, and other state points as well as with each other.

SEC W7IWU sends in a report from Idaho. The Boise gang drilled on 29.5 and 145.44 Mc., but the former was badly QRMd by short skip. Two meters worked out best for local communication. Statewide, the QRM on 3995 and 1995 kc. made operation all but impossible, says W7IWU.

W5MU reports for the North Little Rock, Ark., gang, which operated in full coöperation with the Little Rock AREC. He used his own station as NCS on 28,852 kc. A lower-powered rig was set up on 3885 kc. for transferring traffic from the 10-meter mobiles and fixed stations to the state control station in Little Rock. Excellent coverage of the entire area was available on 10 meters, and the net maintained excellent discipline.

Although civil defense authorities in the city of Louisville said no drill was needed and that no part would be taken in the national test, W4MFI reports that the Louisville AREC operated in coördination with the Third Mobile Support Group of Kentucky Civil Defense, the Louisville Chapter of the American Red Cross, Ky. Military District, State Highway Dept., Ky. State Police, CAA, the airlines and Fort Knox. Net control was W4RCC at the Red Cross in Louisville. Total traffic, about 500, with over 25 amateurs participating in the operation.

In Maine, amateurs were called upon to establish communication between state and county control centers. In addition, many counties used amateur radio for intracounty purposes, especially available portables and mobiles. SEC W1BYK reports a total of over 70 amateurs participating. The state network operated on 3961 kc. starting at 1020 on the 14th and ending at 1115 on the 15th. W1FRS was NCS at the State C.D. Control Center.

W1AVY and his gang were active in the New Bedford, Mass., area. Operation started at 0850 June 14th from control station W1WKM, operated by W1WGN, with W1AVY as stand-by station. The drill was conducted in an orderly fashion on ten meters, with neighboring towns also taking part. Contacts were 100 per cent throughout, with most stations observing strict radio silence unless needed.

At 2000 on June 14th, Pennsylvania's Ogontz Center activated its radio circuits comprising all the counties in the Eastern Area of Pennsylvania. Telephone lines were used to link the Center with the net control stations: W3BIP for c.w. and W3UKF for 'phone. Thirteen counties reported into the 'phone net and three into the c.w. net. Some 38 messages were handled, and radio circuits were secured at 2200. Radio Officer W3FBF held a critique after the test to pinpoint some of the shaky spots, but in general the test went off very well.

In Philadelphia itself, EC W3DYL of the county's Amateur Radio Division put the extensive and energetic Philadelphia gang through its paces. The yellow alert at 0930 found all five county control centers in operation. The mobile communications unit operated from a central location with W3WXC at the controls. Mayor Clark took part in the exercise, and at one point talked from one of the control centers to the mobile control unit, known as Trunk No. 500. That evening between 1900 and 2130 a drill of mobile facilities was conducted. Seven of Philadelphia's main "gateways" were covered by mobiles to report to responsible control centers, using ten meters. All of Philadelphia's c.d. officials agreed that the exercise was the most successful yet conducted in this city.

Tennessee State Radio Officer, W4AEE (formerly SEC) sent in a very complete report of Tennessee activities during the drill, via the present SEC, W4RRV. Since the state RACES network had not yet been organized, general amateur participation was requested through SEC W4RRV. In Memphis, the approved RACES plan went into operation, working into the state civil defense net from their control center station, W4EM. Although there was no organized amateur plan in Chattanooga, W4IIB arranged to provide communication from that city to state control. Memphis and Chattanooga were "bombed" as a part of the state exercise. The state NCS, W4DDF, opened up on 3993 kc. at 0800 the 14th. After checking with Georgia net control W4ZOC, it was agreed that the latter would move to 3996, with Tennessee moving to 3992. Later, as the QRM became worse in the 10-kc. RACES segment, all stations in the Tennessee net changed to 3980 kc., which was used from then on. Some 69 formal messages were originated, 25 received. Operation was completed at 0129 on June 15th. Over 60 stations were in the state net, representing all major cities and/or relaying when reception became difficult. The usual transmission and equipment difficulties prevailed, but the test was termed eminently successful by all concerned.

These are but a few of the more outstanding of the reports received — mainly those who gave us some details additional to (or instead of) the information on the card. Operation Alert, if it did nothing else, very strongly indicated to civil defense officials at all levels, throughout the United States and Canada, that amateurs are actively working in this thing, preparing to do a big job for their country in the event of need.

The following is a list of all the ECs who reported — hope we haven't missed anyone:

W1s ADW ALP AVY BB BDV BNO BXU BYK CQN CUH EFW FRL IBE IPZ JSM KEZ LKP MCR MD MEG MHF NFG OAX PJ RM RMT RNA RPX SIX SKN SPF VIN BYS.

W2s AJF ASY AWF COT FI FMG GNI HO HXG HXP IAG ILI JLH KVQ OZH PYC QGH RQI RZP SNN SVV VEY VKF YOK ZTZ K2s ASQ BUV.

W3s CJF DYL FBF JW LDD LMM OYX PRL RVS SPL UA WEK.

W4s AJA AJT GET HHK HHQ HUW IM IMQ IYI IYT JAR LMT MEM MFI NDE NV PAK PPR PVD PWS PZT RRV RWM SBI TAS TKL UHY.

W5s AAJ ADC AY KYC LEZ LGY MRD MU ROH UWA UXG.

W6s CER CQI EKP HKD IXJ JPU JWD NHP NTN QLB SLX UJ ZRJ.

W7s BDL COH DSS IOZ IRX IWU JRU KGF NLJ.

W8s AJH APF CPB CZR ERR FCP FUM HNP IVK JNR JWX SPU THI UGE VKC WAB.

W9s AYP BA BSZ EKR GMY HPG IHO LAG MCS RDJ UB VHA WLZ ZSC.

WØs GTX HDX HKF HRY HUI JDJ KQD KZR MXG PGX PNK RCE.

VEs 1EK 2KG 3YJ 4RP 6MJ.

*KV4*BD.

Thanks to the above and the other thousands of amateurs who participated for doing a good job for amateur radio.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C. W.		*'PHONE*	
3550	14,050	3875	14,225
7100	21,050	7250	21,400
	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.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

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

Emergency Coördinators often have to ask themselves of just what value a test or drill is, considering what would or might happen during an actual emergency, and they have to evaluate to what extent the performance during the drill betters, equals, or falls short of what the performance would be in a real emergency. No easy job, we admit. Let's look at some of the factors.

Assume the EC calls a test drill. About 40 per cent of his members will show up for it, more or less depending on whether it's planned for convenience or as a surprise drill. They'll have an exercise, perhaps in coördination with local c.d. authorities, and afterward a critique to decide among themselves if they did a good job or a lousy one. Quite often they'll kid themselves into thinking it was aces-high, especially if they get patted on the back by public officials, newspapers, radio stations or what have you — and they'll disband feeling that they're ready for anything. What is often forgotten is that those we serve are very much more prone to compliments than criticism, since our service being voluntary, to do otherwise would be like looking a gift horse in the mouth. It is necessary for us to *decide for ourselves* whether or not a good job was done, even though good publicity is of course desirable. Political encomiums are misleading and dangerous — never believe them.

In order to get some idea, then, of what would happen in a real emergency from what happened in a test emergency, we have to consider the following:

a) How many who participated would have been unable to participate if the test had not been planned, or accidentally worked out, to suit their convenience?

b) How many who did not participate failed to do so for personal reasons which would have been overruled if the emergency had been real?

c) To what extent could you figure on "picking up" some operators in a real emergency from local amateurs who never previously took any interest in emergency work?

d) What percentage of your operators would you lose to their employers or other obligations during a real emergency?

e) How would each of the above factors influence equipment availabilities, presuming most of the equipment is owned by individuals?

f) Considering that a real emergency might happen at any time of the day or night, what are the minimum and optimum times so far as your own personnel are concerned, and how do these compare with the time your test was held?

g) How about the time of year? A test held during the winter months may produce entirely different results from one held during the summer.

These and other things must be considered in evaluating your AREC tests and drills. Don't be misled into thinking that you're better off than you are, emergencywise.

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On August 20th the Great Falls (Mont.) AREC (see p. 66, Aug. '54 *QST* again) provided communications during a military aircraft accident, eight miles west of Great Falls. Providing communications from the accident scene were W7PCZ/M and W7VPY/M. On the other end were K7FCC and W7KUH/M. K7FCC relayed information to Great Falls Air Base authorities and W7KUH provided communication between the crash scene and the CAA control tower. Also assisting was W7DXK/M who directed traffic near the accident scene until military police arrived.

— *W7KUH, SEC Montana*

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On Friday, Sept. 10th, W7NOM was at the Hart Mt. (Ore.) game refuge for some archery hunting when a large range fire was reported out of control and threatening the refuge headquarters. There was no means of communication with the Forest Service in Lakeview, about 50 miles away, so a call was made on the Oregon Emergency Net frequency (3840 kc.) and W7QEI and W7SBS were contacted. QEI relayed to SBS who called the department and requested equipment be sent to the area. W7s QKU SD and FNZ were also there helping. In due time the equipment arrived and the fire put under control — thanks to OEN.

— *W7NOM*

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Even while the SET was being energetically worked by Indiana amateurs on October 9th–10th, the stage was being set for two catastrophic strikes that took "simulated" out of the picture and injected realism into the operations of the section emergency facilities. During Saturday night heavy rains poured onto northern Indiana and Illinois, causing flood conditions at Plymouth and other northern Indiana communities not unlike those encountered in Chicago at the same time. Then on Monday, October 11th, a tornado struck into the vitals of Franklin, Indiana, destroying thirty homes and injuring several persons.

EC W9AYP headed the group handling the Plymouth flood communications problem. Assisting him were W9GAD and W9JWI, all working mobile with stations in near-by South Bend, where EC W9UB headed an active group. EC W9KNM organized a group of mobiles to cover the Franklin tornado scene. They included W9s ALQ UGH and ZTN.

The Indiana Fone Net was called into session to handle the emergency with W9EQO as NCS. Stations assisting included W9s CDU CMT NTA ILU FWS EDE FYM AB CC MAM ZIB FUS, W2BQM and many others.

— *W9LZI, SEC Indiana*

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On Sunday evening, July 25th, the Sheriff's Department of Broward County, Fla., called Eastern Florida SEC W4IM requesting contact be made with one Leo Yob, W8KYY, who was operating mobile somewhere in Florida and advise him to call home due to an emergency. The Broward Emergency Net was immediately alerted for local coverage. Early Monday, July 26th, W4IM originated a message addressed to W8KYY/M which was passed to W4DRD for placement on the Florida 'Phone Traffic Net on 3945 kc.

It was ten-meter skip that finally did the job, however. One of the mobiles of the Broward Emergency Net contacted W1LGE on 29,400 kc. and just on chance suggested he give W8KYY/M a call, after explaining the circumstances. In this way the contact was made and W8KYY was notified of the emergency from Florida via relay through Connecticut while he was traveling in Georgia.

— *W4IM, SEC Eastern Florida*

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On June 13, 1954, six members of the Sidney (N. Y.) Amateur Radio Club provided communications for the outboard motorboat marathon starting at Alexandria Bay, past Clayton to Cape Vincent and return to Alexandria Bay, a round trip of about 60 miles. The six mobiles involved, operating on 29.6 Mc., were W2s GFD UPT JGJ MTB RZP and K2CVX. W2GFD and W2RZP set up a 40-watt station

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Dodge Division of Chrysler Corporation recently donated a Dodge Route-Van truck to the Inter County Amateur Radio Club, W8GIS, for use of the Detroit area AREC in emergencies. The mobile unit is equipped with a generator and three complete operating positions, including a 2-meter RTTY unit. Most of the radio equipment was donated by Elmac. In the picture, Dodge officials are thanked by radio by Assistant EC W8LSQ. That's W8CYL standing behind the van, and Detroit CD Communications Coördinator Al Thomas second from right.

on the dock at Alexandria Bay. W2JGJ operated at Clayton, K2CVX at Cape Vincent, with W2UPT and W2MTB operating at mid-point. A 110-volt gasoline-driven generator was kept on stand-by at the Alexandria Bay station. Operation lasted from approximately 1300 to 1700 EDST. Approximately 60 boats started and were officially checked off at Clayton and Cape Vincent. These check-off returns were transmitted back to the starting point in order for the boats to qualify. The boys managed to get the results in despite weak signals and high ignition QRN.

— *W2RZP*

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On Sunday, August 29th, the Atlanta Motorcycle Club held an endurance run from Mirror Lake to Alatoona Lake, a distance of about 75 miles. Amateur mobile units provided communications at various check points along the route. Mobile stations participating were W4s TJS RVH YFR NS IPL WRV PUM and MQN. Fixed stations who helped relay were W4s WWP LYG PMJ UUH KXT UMM and YEK. Several weak points were discovered in the emergency set-up and will be corrected by the time we have another drill or a real emergency.

— *W4OPE, SEC Georgia*

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Thirteen SEC reports hit the NEC desk reporting August activities, on behalf of 3229 AREC members. This represents an increase of one report over last year, and a slight increase of AREC members is represented. However, it's a decrease of three from August, 1952.

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 December 16th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 145,600 kc. The next qualifying run *from W6OWP only* will be transmitted on December 4th 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 step with W1AW.

Date	Subject of Practice Text from October *QST*
Dec. 2nd:	*"It Seems to Us . . . ,"* p. 9
Dec. 6th:	*An R.F. Assembly for Mobile. . . . ,* p. 11
Dec. 9th:	*A Step-by-Step Transmitter for the V.H.F. Man,* p. 16
Dec. 13th:	*The "Simple Squirt" Beam,* p. 20
Dec. 15th:	*Some Principles of Radiotelephony,* p. 22
Dec. 21st:	*An Improved Volume-Compression Circuit,* p. 27
Dec. 23rd:	*Re the "Tubeless VFO,"* p. 30
Dec. 27th:	*A Protective Circuit for Transmitting Tetrodes,* p. 33
Dec. 30th:	*Bandspreading the Clapp VFO,* p. 37

A.R.R.L. — AFFILIATED CLUB HONOR ROLL

It is with great pleasure that we here present the second section of our Honor Roll listings for 1954 in accordance with the Board policy for special recognition of all affiliated clubs whose *entire membership* consists of members of the League. Refer to page 69 of June *QST* for the earlier listing of additional active clubs with 100 per cent ARRL membership. Our honor list is based each time on analysis of data received in the '54 Annual Information Survey conducted to meet Board requirements. In early '55 a new form will be sent each active affiliate for the filings on which continued affiliation and new Honor Roll listings will be based. Very many clubs will now be engaged in mid-season activities, code and theory classes for newly-interested persons, civil defense, building and technical programs for members. The '55 survey will assist the nationwide compilation of our status and progress besides getting required ARRL information. The following clubs now will receive "100% ARRL Club" certifications following publication of this *QST*.

The Amateur Radio Transmitting Society of Louisville, Ky.
Athens Amateur Radio Club, Athens, Ga.
Dryden Radio Club, Dryden, Ont., Canada
The 50 Club of California, Inc., South Gate, Calif.
Fulton County Radio Club, Canton, Ill.
Gulf Coast Amateur Radio Club, Inc., Handsboro, Miss.
Helix Amateur Radio Club, San Diego, Calif.
Jacksonville Amateur Radio Society, Jacksonville, Fla.
Lower Columbia Amateur Radio Association, Longview, Wash.
Maui Amateur Radio Club, Maui, T.H.
Muskingum Amateur Radio Association, Zanesville, Ohio
Norfolk County Radio Association, East Walpole, Mass.
North Montana Radio Club, Montana
Palomar Radio Club, Escondido, Calif.
Reading Radio Club, Reading, Pa.
Rock River Radio Club, Dixon, Ill.
Southern Pacific Amateur Radio Klub, Eugene, Ore.
Valley Radio Club of Eugene, Ore.
Western Slope Radio Club, Grand Junction, Colo.

TRAFFIC TOPICS

The way one becomes accustomed to doing things is a very powerful influence in determining the way he *wants* to do things. This principle applies very strongly in handling traffic as well as in all other phases of amateur operating. Habit born of custom is probably the principal deterrent to adoption of standard operating practices. And when these non standard habits are spread, through personal influence, among newcomers to the game, we tend in the direction of make-it-up-as-you-go procedure, making our traffic handling that much more difficult.

Throughout many, many years, ARRL has been called upon to set the standards for procedure in handling traffic, and has endeavored to do so in as much detail as practicable. Yet, it has very seldom been possible to adopt the procedure preferred by the majority, because usually there is no such thing. We have tried to adopt procedure that is both logical and utilitarian to the maximum degree, and we have tried to make this the standard among amateurs, usually with success; sometimes it just hasn't taken hold.

We are a bunch of philosophers and stoics about such things, but at the same time want to point out to you the desirability of an *amateur standard* in traffic handling procedure, as outlined in the booklet Operating an Amateur Radio Station. The writer of this column personally does not agree that all the standards set up are the best. You will not agree, either, with all of them, in all probability. Yet that in itself is no reason to change them. Whether you or I agree with them or not, if we are to achieve an amateur standard we should follow them to the letter, squawking as we do so if it makes us feel better, until or unless the majority seems to prefer to do it some other way. Then we'll change the standard, and the squawking will then be on the part of the minority who liked the old way of doing it. Yes, there will always be someone dissatisfied. *C'est la vie.*

The type of person most to be admired, in our estimation, is the one who disagrees but goes along in the hope that he can correct or change those with whom he disagrees. It is easy (and natural) to pick up your marbles and play by yourself, and most of us, in the pursuit of our "hobby," follow the easiest and most natural path. But real progress is made by those who follow their natural instincts only after they have rationalized them.

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WØBVL and W8AMH report that the Early Bird Net had a traffic count of 759 messages during the month of September.

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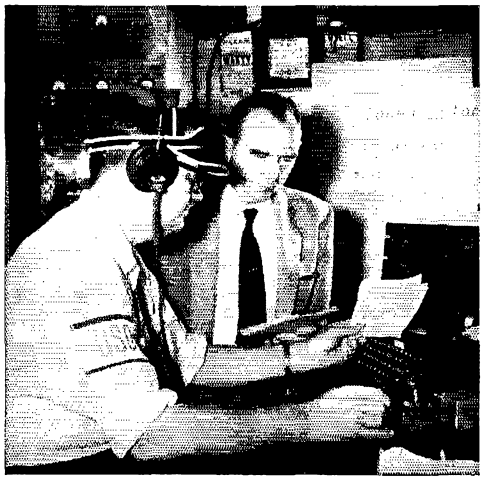
National Traffic System. We believe we have not yet chronicled changes in several NTS managerships. In the Sixth Regional Net, W6JOH took over from W6IPW some time ago, and VE3GI is the successor to VE3BUR on TRN;



One of the more prominent traffic stations heard daily on the forty-meter band is W3CVE, Conan W. "Red" Barger, manager of the Transcontinental Relay Net. Red is working out an agreement with the USO for handling servicemen's traffic, and is shown here with the local USO Director at the W3CVE operating position. (*Reni Photos*)

Walt has had a long and successful managership career in a tough net to handle, and he is remaining with the net but turning the reins over to Burt. In the Seventh Region, W7KZ has resigned but continues to act until the Pacific Area Staff recommends his successor — probably an accomplished fact by the time you read this. In the Fifth Region, W5KRX has resigned owing to the pressure of business, and a successor is being named forthwith. So the NTS turnover continues, and that about brings us up to date as of the middle of October.

September reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
EAN	22	655	1.20	29.6	94.7
CAN	21	519	——	24.7	100.0
PAN	21	600	——	28.5	95.2
1RN	22	291	0.46	13.2	87.0
2RN	36	183	0.30	5.3	79.6
3RN	22	219	0.40	10.0	95.5
4RN	48	177	0.76	4.0	30.6
RN5	27	260	——	9.6	60.2
RN6	44	283	——	6.4	——
RN7	50	442	——	8.8	31.8
8RN	20	182	——	9.0	91.7
9RN	40	349	0.47	8.7	——
TEN	70	1658	——	23.6	60.7
TRN	24	64	0.33	2.6	47.2
Section*	340	2033	——	6.0	——
Summary	737	7915	EAN	10.7	CAN
Record	737	7915	——	15.4 ('53)	——
Late Report:					
RN5 (Aug.)	26	182	——	7.0	46.2

*Section nets reporting: AENB and AENP (Ala.), QKS and QKS-SS (Kans.), Nebr. C.W., Tenn. Sec. and Tenn. Hi-Speed, WVN (W. Va.), Minn. 'Phone (Noon & Evening), WSN (Wash.), No. Calif. Net, So. Calif. Net; CN (Conn.).

W7NH reassumes control of PAN for the winter season; W6UTV was Acting Manager for the summer. W2LPJ reports starting early session of 2RN, but not much activity so far. W3ONB has congratulated MDD for having had someone on 3RN for seven consecutive months without a miss — 171 consecutive sessions. W7TGO has qualified for and has been awarded an RN7 NTS certificate. W8DSX says 8RN needs more help from Michigan and West Virginia; one station is carrying almost all the load in each of those states. W9UNJ reports that 9RN has been expanded to operate six days per week, and representation is improving, with Indiana showing signs of renewed life. W4KKW has done an excellent job of rejuvenating representation from Kentucky; what they need now is more traffic.

The Transcontinental Corps is also taking on new life, now that a new traffic season is under way. W6HC has taken over the Pacific Area TCC Directorship in order to give W6JZ more time for his ARRL Directorship, and reorganization is under way. W8UPB has almost all vacancies filled in the Eastern Area, but if you're available don't let that keep you from asking him. W9JUJ reports Central Area TCC getting reorganized. The new roster includes new calls K9FCA and WØBDR. Most of the Central Area stations are reporting directly into PAN, but hope soon to be lined up with Pacific Area TCC stations. WØSCA doing a stellar job.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for September traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	201	2193	1456	628	4478
WØTQD	8	1055	1036	19	2118
WØBDR	17	865	842	11	1735
W3WIQ	38	804	798	65	1705
W9JUJ	36	672	609	35	1352
W4PL	7	647	572	48	1274
WØSCA	6	630	544	79	1259
W2JOA	32	589	523	40	1184
W7BA	15	569	547	20	1151
W2KFV	25	440	402	38	905
W9DO	40	408	70	378	896
W6SWP	31	435	385	38	889
W6PHT	34	463	267	105	869
W9NZZ	247	305	1	302	855
W5MN	25	404	299	116	844
W7PGY	181	406	235	22	844
W4OGG	10	370	329	35	744
K6FCY	29	353	311	42	735
W4DVR	627	29	42	5	703
W5TFB	31	322	296	26	675
W2KER	24	319	234	77	654
W6QMO	38	310	243	60	651
W2BO	5	299	303	5	612
WØCPI	4	300	281	19	604
WØQXO	16	293	197	93	599
W9VBZ	88	255	226	29	598
K2DXV	11	285	271	12	579
W6YDK	18	269	223	54	574
W2LPJ	10	276	246	40	572
W8ELW	15	279	261	17	572
W7SFN	3	278	274	1	556
W6LYG	32	256	157	99	544
W9CXY	19	257	209	48	533
W7FRU	2	269	220	40	531
K6FAE	18	246	252	14	530
K2EP	5	251	256	8	520
W9JBQ	147	181	151	36	515
W2JZX	47	241	132	92	512
W6IZG	4	230	248	26	508
WØGAR	7	245	250	2	504
W8ZRJ	34	236	221	9	500
Late Reports:					
K2EP (Aug.)	7	325	339	4	675
K6FAE (Aug.)	13	251	233	11	508

More-Than-One-Operator Stations

KG6FAA	160	1897	1840	57	3954
W6IAB	91	1586	1483	103	3263
KA2USA	55	1557	1576	38	3226
KØAIR	38	869	817	50	1774
KØFDX	55	785	763	22	1625
K6FDG	90	638	588	38	1354
KA2AK	495	391	264	32	1182
K7FDB	15	374	323	9	721
K9FCA	80	276	325	24	705
WØFDL	31	308	294	14	647
W1AVY/1	33	288	12	276	609
K4WAR	116	159	221	30	526
K6CBT	16	245	242	7	510

BPL for 100 or more *originations-plus deliveries:*

K2FAV	231	W3CVE	128	W6CMN	101
VO6N	174	W1LYL	123	KA7JM	100
KA2HQ	173	VE3NG	122	Late Report:	
WØFQB	168	W4DRD	109	W3WV (Aug.)	100
K2CBD/1	164	WØKQD	107		

More-Than-One-Operator Stations

KA2GE	254	K4FCI	153	W1WKM	100
KA8AB	185	VE1FQ	152		

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.

• 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 — W. H. Wiand, W3BIP — SEC: IGW. RM: AXA. PAM: PYF. E. Pa. Nets: 3610, 3850 kc. With this, the last report of 1954, is a complete run-down of official appointees of Eastern Pennsylvania. OBS: BES, NNV, QGI, TEJ, UCY. OES: ELI, NNV, UGA, UQJ. OO: ALB, ASW, KFK, MLY, OCG, PDJ, QAG, QZP, SQW, UUA, TFN, VDE, VR. OPS: FPC, MAC, MWL, NNV, PYF, QOR, RSC, VDE. ORS: AD, ADE, AXA, BFF, CDT, CHU, CUL, DUI, EAN, ELI, EU, JNQ, NOK, OML, OZV, PDJ, PVY, QLZ, QV, UOE. The Abington ARC of Throop, Pa., and the North Penn ARC are now ARRL affiliates, bringing the total affiliated clubs to 25 in Eastern Pennsylvania. All clubs are invited to report club doings and activities monthly to this office. A five-car caravan bearing twenty members of the Northeast ARC motored to ARRL Headquarters Sept. 26th, where George Hart, 1NJM, conducted a tour of W1AW, the amateur radio museum, the experimental laboratory, and the editorial offices. DYL reports all had a wonderful time in spite of the heavy week-end traffic. DVB's 10-year-old son received his Novice ticket in July and won a prize for being the youngest licensed ham at the South Jersey Hamfest. Another youngster, 12-year-old Dale, VNJ, is the youngest member of PFN. VKW, a high school student of Hamburg, is NCS for AN every Fri. and also is active on PFN. DUI reports four more new Novices, WN3s ZMZ, ZOZ, ZQA, and ZQB. FXX's XYL advanced from Novice to General Class with the call YDY. A new Novice in the Pottstown Area is ZVY. FPC is looking for more after-midnight 10-meter activity. EAN, while in QSO with PY4PQ, made a tape recording of a former Philadelphia woman now in South America and played it to her folks in lieu of a 'phone patch. PYF reports OK is back on the air and now a member of the PFN. The old-timers will remember OK back in the days of the AARS, and even before that Ed was turning in a good traffic total each month. In closing this last report of 1954 yours truly wishes to extend to each and every one a very Merry Christmas and a Happy and Prosperous New Year. Traffic: W3CUL 4478, BFF 319, OZV 170, NOK 120, VNJ 98, AXA 88, PYF 68, UOE 61, TEJ 56, QLZ 53, TTY 51, TYU 41, GIY 37, RXW 33, DUI 21, VKW 20, UWP 18, PVY 11, YGX 9, YJM 8, OK 5, NNT 4, AD 2, BES 2, VPY 2, YAH 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Arthur W. Plummer, W3EQK — EQK recently received a query from Peter H. Short, 7 Ambush Street, Kensington, Johannesburg, South Africa, who is about to make a decision to move to the United States and would like information, especially on Baltimore, Md. Any Baltimore amateurs who would like to be of help are requested to inform him about house rentals, food prices, schools, medical services, furniture, places of worship, etc. Although he is not a ham, he also is interested in clubs and prices of ham equipment. WV has his 14-Mc. three-element folded dipole beam up again. CVE reports TCRN was on semi-alert from Sept. 5th to 10th and full alert on the 11th for Hurricane Edna with 44 stations participating. CQS visited BAK at Laurel, Del., Oct. 10th. DRD now has 40-ft. steel tower with 14-, 21-, and 28-Mc. beams. During a recent civil defense meeting at Delaware City, Del., Governor Boggs presented Awards of Commendation to the Delaware Amateur Radio Club of Wilmington, the Kent County Amateur Radio Club of Dover, and TCQ of Sussex County. 3PXM/4YQC advises that his new address is A/2c Daniel S. Murph, jr., AF14510147, Headquarters Squadron Section, AF Missile Test Center, Patrick Air Force Base, Cocoa, Fla. QCB expects to be back on the air soon with his surplus BC-669-C. MDD opened for traffic on Sept. 7th. A c.d. demonstration was put on in Hagerstown Sept. 9th sponsored by the C. & P. Telephone Co. CIQ and OYX attended. The Antietam Radio Assn. of Hagerstown had its message center in operation again at the Hagerstown Fair Sept. 20–25. Those who gave of their services were EHA, CSX, NZT, OXL, OYX, RAH, TJV, VAM, WTO, WWM, WYH, YRK, 8GPD, Jerry Reiling, and Harry Hager. Traffic was handled through 4BLR and the Old Dominion Net, 4YIA and the Virginia 'Phone Net, 3JZY and the Maryland Emergency 'Phone Net, 3QPQ and the Transcontinental 'Phone Net, the Pennsylvania 'Phone Net, K8FCJ and the Mike-Farad Net, 4PSC, and several others. CSX has traded his HQ-129X for an HQ-140X. Jack Davis, formerly 4X4CZ, and a newcomer to America, now is a resident of Baltimore and recently joined the Baltimore Amateur Radio Club. Reports from Cumberland say that WN3ZWG is just 11 years of age and WN3ZWV, of Cresaptown, is a junior in high school. The Capital Amateur Radio Traffic Club was organized Aug. 29th with a view toward promoting and expediting the handling of amateur radio traffic into and out of the Washington, D. C., Area. The Club is affiliated with TCRN. Officers are CVE, pres.; WV, secy-treas.; OHI, trustee. KLA reports high interest in the Sept. V.H.F. Contest. WN3ZAQ, WN3YSA, W3YQD, MPR, and QQO set up equipment on Spruce Knob, W. Va., and made 32 contacts on 2 meters. YPW is on 2 meters with a converted 522. WN3ZAQ is using a ten-element brownie and a 522. RRT will build a 2-meter converter this fall. UKM expects to complete a 2-meter rig by next spring. YQD is active on 222 Mc. with an 832 screen-modulated and a sixteen-element horizontal array. The Elkton (Md.) Radio Society's new president is VZZ and vice-president is GGR. The Cecil County (Md.) RACES plan is in the works and 2 meters is planned for the county net frequency. WYA is CDRO for Cecil County, while VZZ is Asst. K3WAS, of the MARS station at Aberdeen Proving Ground, holds code and theory classes Tue. and Thurs. at 7:30 P.M. 9DJR and 5UMO have moved into the Aberdeen Area. 5YWA moved to Arlington, Va. 9OKI has a new fixed station aside from his mobile Mercury rig. 3SZY bought an RME converter. LDD expects to tie in some 2-meter work along with the Cecil County gang. QZC reports a fine vacation as camp counsellor in Connecticut. K2CRG spent a week at the same camp with QZC. CDQ reports a new Viking II and a VFO in her shack. AYS tried the VE/W Contest with 30 watts and wound up with 64 contacts in all VE sections and a score of 17,000! Traffic: (Sept.) W3WV 418, CVE 414, JE 64, CQS 36, NNX 24, PKC 12, QQS 2. (Aug.) W3WV 472, CVE 126, ECP 10, HKS 6. (July) W3DRD 22.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brooks, K2BG — PAM: W2ZI. The SJRA Hamfest and Picnic held recently was bigger and better than ever, with a greater attendance and a fine planned program. K2AA, the club station, did a swell job of guiding the strangers to the picnic grounds. K2DZL now is mobile on 10 meters. BDA is doing a good job on 10 and 20 meters. BDK is reported on 2 meters. SUG has transmitter trouble and expects to do considerable rebuilding before he is back in business. Bill also has applied for MARS membership. The Burlington County Radio Club station is now completed, operating on 2 and 10 meters. K2ERC was first and K2FB second in the recent C.D. Party. ZQ did a swell job in Operation Alert, handling over 50 lengthy messages. VQR and ZI were the operators. PHN and WI are reported as new calls on 2 meters. The New Jersey Emergency 'Phone Net operates each Sun. at 9 A.M. on 3900 kc. ZQ is net control. HAZ has received his WBE certificate. Congratulations, Bill. NDO is moving to Camden County. K2EWS received his General Class ticket. The New Jersey C.D. Net (c.w.) needs representation in the southern counties. RG is net control on 3505.5 kc. every Sun. at 7 P.M. I would appreciate reports from clubs in the southern counties, especially Cumberland and Atlantic Counties. All nets in the section are urged to hold regular drills so that they will be better able to do a good job in case of an emergency in their communities. Traffic: W2RG 115, ZVW 33, ASG 26, K2BG 23, W2SUG 23, ZI 17, K2CPR 5.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — Asst. SCM: Jeanne Walker, 2BTB. SEC: UTH/FRL. RM: RUF. PAMs: GSS, NAI. NYS meets on 3516 kc. at 6:30 P.M., 3925 at 7 P.M.; NYSS on 3595 kc. at 8 P.M.; NYS C.D. on 3509.5 and 3993 kc. at 9 A.M. Sun.; TCPN 2nd call area on 3970 kc. at 7 P.M.; SRPN on 3970 kc. at 10 A.M.; ISN on 3980 kc. at 3 P.M. EMA visited LXE. W2-Land was represented at the S. Ont., W.N.Y. v.h.f. group at Oakville, Ont. We regret to announce the passing to Silent Keys of BAG. JPE is mgr. of the Erie Co. Emergency Net, 75-meter section. LXE and SJV attended the SJRA Hamfest at Camden, N. J. TBD won the 2-meter transmitter hunt. GBX is working DX with Viking II on 15 meters. OZR acted as relay station for emergency traffic during Hurricane Carol. RTB and K2CEH are working on 220

Mc. UTH worked Rhode Island, Kentucky, and West Virginia on 2 meters for 3 new states. New officers of the Ft. Stanwick ARA are SWN, pres.; IXR, vice-pres.; HAX, treas.; MSM, secy.; HWS, chief eng. K2s HWS and AQP, with a DL9 as a guest, took to the hills for the V.H.F. Party. K2GWP is working out FB with new 20-meter vertical antenna. K2AHH/2 is attending college. New officers of the CARS are DWC, pres.; EJO, secy.-treas.; K2DPT, vice-pres. D. Hamilton spoke on "A.C. Power" at an Elmira ARA meeting. KC4AB says QHH is the first "W" he worked on 3.5 Mc. QNA reports new officers of the Niagara ARC are LCP, pres.; CMV, vice-pres.; VE3IM, secy.; RVJ, treas. TVO has been appointed EC for Cayuga Co. and ZZG for Montgomery Co. JPE heads a committee to give Novice exams before each RAWNY meeting. VEP, asst. mgr. NYS 'phone net, is leaving for W7-Land. K2CUQ is giving code lessons to a local YL. CXM, Cornell U. station, is becoming active again with a Viking I, SP400-X, 129X, and HFS receivers. 2-meter as well as 420-Mc. gear, off-center-fed antenna for 40 and 80 meters up 100 ft., and three-element 20, four-element 10, 144, 420-Mc. beams up over 110 ft. The Oneida 'Fest was enjoyed by everyone in attendance, thanks to the excellent arrangements of RXW. RHQ reports that the 32-element 2-meter beam is working better since changing the distance between upper and lower booms. Renewals: CLX as EC for Saratoga Co., PYC as EC for Herkimer Co., ZRC as ORS, BTB as OPS. Appointments: WS as ORS, CZT and UTH as OPS. NYS net certificates were issued to IFV, CKK, ZZG, and K2ACA. Traffic: (Sept.) K2DXV 579, W2ZRC 260, QHH 238, K2FAV 231, W2RUF 224, K2BZC 182, DSR 108, W2BNC 103, RUT 31, COU 27, SJV 26. K2CUQ 10, W2GBX 9, CXM 8, RJJ 8, FEB 6. (Aug.) K2DSR 158, W2RQF 11, GBX 9, K2GDI 8, W2QLI 6, DVE 2. (July) W2WS 109.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — SEC: GEG. RMs: UHN, NUG, and GEG. PAMs: AER and LXE. The Western Pennsylvania Traffic Net meets Mon. through Fri. at 7:00 P.M. on 3585 kc. Washington County reports SUK still is operating the v.h.f., IDO is on 40-meter c.w. with the VFO at 60 watts while building an 813 final, USC is on 40-meter c.w. with a TZ-40, KHY is on 20 and 15 meters with a new rig, CRA is getting good DX on 20 meters, the jr. operator at NRE has built a one-tube receiver and is monitoring the 80-meter c.w. and 'phone bands, and NQM is thinking of changing from a.m. to s.s.b. The Radio Club of Erie is sponsoring code and theory classes at the YMCA every Tue. at 7:00 P.M. Classes began Oct. 5th. New Novice calls are ZNZ and XNY. NRL found conditions very good while working aeronautical mobile recently with many contacts locally and over into Ohio. Herb Johnson, formerly QKI, now is in Los Angeles with the call W6QKI and his XYL is now K6HOI. Herb still is planning 2 meters to the moon. The c.d. has ordered uniforms for the hams participating in the c.d. exercises. The Mon Valley Amateur Radio Club of Clarion, Pa., a newly-formed club, was host to the Western Pennsylvania Amateur Radio Club Council, which met Sept. 27th in the club house located on the W.S. Steel experimental farm high on the hilltop over the Monongahela River just east of Clarion. Club officers are AOX, pres.; RCQ, vice-pres.; MRZ, secy.; and NBJ, treas. UII is a new OO appointee. All clubs or groups of amateurs are invited to join in the important emergency work of the Amateur Radio Emergency Corps and c.d. For information contact your Section Emergency Coördinator, A. C. Heck, W3GEG, 515 Cedar Ave., Sharon, Pa. Traffic: (Sept.) W3WIQ 1705, LMM 216, QPQ 160, YA 84, LXQ 48, UHN 34, SIJ 32, TSY 31, KUN 24, UTR 12, NCD 10, NMJ 6, KNQ 4. (Aug.) W3GEG 97. (July) W3GEG 115.

CENTRAL DIVISION

ILLINOIS — SCM, George Schreiber, W9YIX — Nets: 1LN, 3515 kc., RMs BUK, MRQ; IEN, 3940 kc., PAM: UQT. SEC: HOA. Cook County EC: HPG. On Sept. 25th LARK started its third year with an installation of officers at a dinner. The new officers are YBC, Gloria, pres.; SYX, Peggy, vice-pres.; YXK, Rita, secy.-treas.; NYC, Gladys, publicity; IKS, Edna, editor, and TMZ, Rosemary, Novice representative. LZ and your SCM spoke. DW and DSO are trying to find the original members of the Ridge Radio League, one of the earlier Chicago Area clubs. Write them. The Society of Radio Operators entertained the XYLs and friends with an outdoor barbecue recently. ILW resigned as EC for Kankakee County because he moved; LCH has been appointed in his place. Other EC appointments are CZB, Winnebago County; KKG, Mason County; and VWJ, Montgomery. Is your county represented? The Chicago Suburban Radio Assn. held its first fall meeting recently with a "get-acquainted again" session. RQY spends a lot of time at OO duties and sends in an imposing report. ILN certificates were issued to VSN and WJQ. RLX has been appointed acting secretary of the Chicago Area Radio Club Council by HPG, the president, and is learning to copy code on a mill. ZRF sure gets around to club meetings and never misses a chance to put in a good word or two for RACES. Why don't you give him a hand and volunteer for service? A new ORS appointee is VTO. OBS appointees this month are SWO and HOS; OOs are EET and GDI. The ILN slow-speed session is really going good at 8:30 CST, 3515 kc. Give it a try, and brush up on your code speed. Congrats to SME and his XYL on the arrival of Susan. FBP writes an interesting letter from KL7-Land, where everything is DX. AA, who has been a ham for more than 40 years, recently plunged into traffic and enjoys ILN; he sold the BC-610 and puts out a good signal with 807s. DHX got General Class license and plans a mobile installation. NIU got up a 20-meter antenna and now wants someone to tell him where to get the time to use it. JNN is new MARS director at the 5th Army. SKR is trying to de-TVI a BC-459. BQC is attending Luther College at Decorah, Iowa, and gets on the air with a Viking Ranger. TAL finished a new all-band transmitter, 160 through 10 meters. PDH forecasts the completion of his house soon and then will, he says, be on the air. Among the student group at the University of Illinois this year are PLH, WFU, and YWU. The Twin City Radio Club, in its bulletin, promises an interesting fall and winter program, from technical talks to stags for the members to Christmas parties for the families. The Starved Rock Radio Club is tickled that QLZ has been elected as Vice-Director. On the sick list are AIO, EVV, and YNE. We wish them all speedy recovery. EU is doing yeoman work for the Illinois license plate bill in the Legislature. TLC burned up a plate supply, but managed to get back on the air. Traffic: W9DO 896, K9FCA 705, W9SME 172, USA 104, YIX 89, CEE 62, W6CIW/9 56, W9BUK 51, MRQ 46, VTO 38, RLX 32, STZ 19, USI 16, LXJ 12, AA 3, JMG 2, BQC 1.

INDIANA — SCM, George H. Graue, W9BKJ — Section Nets: QIN, 3656 kc. Mon. through Sat., 1600, 1830, and 2200 CST, OLX Net Mgr. IFN, daily 0900 and 1830 CST, NTA Net Mgr. RFN, Sun. 0800 CST, WWT Net Mgr. SEC: LZI. RMs: JUJ, WWT, OLX, and JBQ. PAMs: NTA and CMT. LQE is the most consistent OBS. Total traffic on QIN is 416, on IFN 197. WUH will QNI 9RN; TT and UQP for UTL. JP will be in operation at the Hobby Show. N9IMO is new in Warsaw. KLR has worked his 20th state on 2 meters. UTL has a Viking II and VFO. MARC has a Viking Ranger wired by ZGC. PAØGE visited WCE and MAM. SNF, MVZ, and AHS are active on 2 meters. EGQ had a Novice visitor. PUB has garnered the last few parts of the new rig. PNE is working DX on 160 meters. IOC is active on 2 meters. EAO now is on 75-meter 'phone. ZVS is new at Elizabeth. N9HRY is on with a Heathkit. N9IRT is new on 3.7 Mc. WWI is rebuilding. URS and his XYL, N9ICI, are on 40 meters. With sorrow I report PZM is among the Silent Keys. QYQ is back home after an operation in a Louisville, Ky., hospital. IRCC held its semi-annual meeting at Indiana U. Oct. 24th. EHZ has General Class license after 30 years as a commercial operator. RDJ has off-center antenna. New at Evansville are N9KJD, KEP, GSC, and KCU. N9JGI has a code class and is forming a c.d. section. KVE is recovering from a leg ailment. OVB has a new 813 rig as per January *QST*. RACES has been approved for Evansville. MVZ is having transformer troubles. KRJ is 160-meter mobile. AST is on the sick list. NRJ is a civilian again. JNZ is new at Rensselaer. N9JZU is new at New Castle. PPD has 1st-class telephone license. The Kokomo Club has a code class with 10 hopeful prospects and also has 20 c.d. rigs on 145.2 Mc. CC attended the ARRL Dakota Division Convention. SNT rebuilt the rig with a pair of 814s p.p. JUJ is on low power now; her big rig went haywire. Traffic: W9JUJ 1352, NZZ 855, JBQ 515, TT 349, UQP 148, SNT 105, SVL 78, OLX 62, VNV 55, NTA 51, TG 40, ZRP 40, WUH 36, YB 36, EQO 34, YIP 33, CMT 32, BKJ 31, UWU 31, WRO 31, CC 30, KDV 27, YWE 25, EHZ 21, AON 20, DOK 20, QR 20, DKR 19, STC 11, ZIB 11, AB 10, PPS 9, WBA 8, BDP 4, DGA 4, YVS 3, NTR 2, SKP 2.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: ESJ, GMY. RMs: LXA, RTP, UNJ. Nets: BEN, 3950 kc., 6 P.M. daily; WIN, 3625 kc., 6 P.M. daily; WPN, 3950 kc., 1215 Mon.-Sat., 0930 Sun. Mobile and c.d. frequency: 29,620 kc. VBZ cut back on traffic skeds because of school. CXY put up a new 14-Mc. antenna. UNJ reports the addition of Sat. operation to 9RN. VKR has his antenna back up. VZK has a new home-brew 200-watt final. ZAN received 20-w.p.m. CP sticker. KH6BBI is active from Milwaukee, where he is attending school. In attendance at the W9 DXCC meeting were CFT, EWC, KXK, RQM, LNM, RBI, RKP, FDX, and GIL. IQW is going s.s.b. FFC uses 600 watts to 813 final, while his mobile is a Bandmaster and Gonset 3-30 converter for all-band operation. New at Plainfield is VEN, who moved from Chicago. FXA is putting up a 20-meter beam. PBB is working on s.s.b. exciter. RQK has a new 75A-1. WWJ has worked 50 countries with a dipole antenna. The Mancorad Club's new officers are TRG, pres.; ZKB, vice-pres.; DKH, secy.-treas.; OVE, BZU, and JAW, dir. KXL donated a 25-ft. trailer to the Kenosha Club. YOX has a Viking II and HQ-129X. YOS operated the rig in the hidden transmitter hunt at Kenosha, with GRX the first to locate it. The MSOE Club has a kw. on 14 Mc. feeding a three-element beam 135 ft. high. ZCK built a VFO into his 2E26 rig. KG6ABD/9 has the rig on 3.5 and 7 Mc. 7SAY/9 operates 7 Mc. with a 6146 rig. FOY is interested in amateur TV. SCII has 28-Mc. transmitter-receiver for mobile and portable use. VCH is active in MARS. DSP received a citation for technical development and GDW was cited for public service at NWRC's annual banquet. Merit awards were received by KHO,

WISCONSIN SECTION QSO PARTY
December 12, 1954

All Wisconsin amateurs are invited to take part in a QSO Party, sponsored by the Milwaukee Radio Amateurs' Club in order to promote friendship and operating ability among the amateurs of Wisconsin.

Rules: 1) The Party will begin at 9:00 A.M. and end at 5:00 P.M. CST December 12th. 2) All types of emission and all bands may be used, but a station may be worked only once regardless of mode or band. C.w.-to-'phone operation is permitted but crossband work is not allowed. Stations are urged to work all bands from 2 through 160 meters to raise their scores. A station may compete as a c.w. or 'phone station or both, as desired. 3) The general call will be "CQ Wis." 4) Information to be exchanged in each contact will consist of the QSO NR, RS or RST report, County, and name of operator. Example: NR 1 589X MARATHON RENO. 5) Scoring: Count 1 point for such information sent and 1 point for such information received, for a maximum of 2 points per contact. Multiply the total contact points by the number of different Wisconsin counties worked to determine the final score. Only contacts with other Wisconsin stations can be counted. 6) Logs should include date and time of QSO, call of station worked, number sent, number received, RST reports sent and received, name, county, band, type of emission, power input. It is suggested that sheets from the ARRL Log Book be used for logging and reporting. 7) A traveling trophy will be awarded to the operator with the highest score, regardless of whether that score has been made *completely* on c.w., 'phone, or a *composite of both*. Certificates will be issued to the first, second, and third place winners among 'phone, c.w., and Novice entrants. 8) Send logs to Edward R. Buchholz, W9VBZ, 3648-A North 8th St., Milwaukee 6, Wis.

See how many of your fellow Badgers you can work during the 8-hour contest period. Get on the air December 12th and meet the gang!

LEE, and REQ. MMR and DDB moved to Wausau. SJL completed new TVI-proofed rig with multi-band tuners and 813 final. FPE's mobile now operates at ½ kw. on 80, 40, 20, and 10 meters with band-changing and antenna-tuning while in motion! Traffic: (Sept.) W9VBZ 598, CXY 533, WWJ 168, LSR 66, RQK 59, SAA 48, FXA 46, RTP 35, GMY 27, UNJ 20, IXA 16, FFC 14, RQM 11, IQW 10, SZR 10, IBF 6, RKP 6, RUB 3, AEM 2, OVO 2, VKR 2 SDK 1. (Aug.) W9UNJ 66.

DAKOTA DIVISION

SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — Asst. SCMs: Earl Shirley, ØYQR; and Martha Shirley, ØZWL. SEC: GCP. RM: SMV. PAMs: NEO and PRL. KXZ has volunteered as EC for Brookings County. GCP's report shows 64 full and 27 supporting AREC members with 14 official mobile units in the section. New General Class licensees: OOZ, RLA, EYB. NØVHB and NØVHC were issued to the daughters of VQC and BHP. NØVHZ received his ticket while working for VQC. GWS is attending State College and LXP is at Dakota Wesleyan. SCT received 15-w.p.m. Code Proficiency endorsement. The NJQ Net resumed operation Sept. 8th. 7CAK is in Custer Hospital. The Mitchell ARC is starting code and theory classes. GWL has a new bandswitching rig. The Redfield ARC has applied for ARRL affiliation. Officers are FOQ, pres.; IER, vice-pres.; and BAN, secy.-treas. SMV is running 350 watts on c.w. and f.m. 'phone. The C.W. Net reports 13 sessions, 83 QNI and traffic 35. Traffic: WØSCT 45, OJQ 39, MPQ 27, SMV 18, AYD 5, GWS 5, NEO 5, ZWL 4.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, ØGGQ. SEC: GTX. RMs: DQL and OMC. PAMs: JIE and UCV. K6EA was back in the Twin Cities and visited PKO. Army will operate portable from Bemidji. BHY has been busy building a new home in North St. Paul. The Dakota Division Convention was a big success. Minnesota was well represented by about 20 hams and XYLs from the Twin Cities. President Dosland, V.H.F. Editor Ed Tilton, and Director Al Gowan were there representing the ARRL. Highlight of the Convention was the big banquet, followed by initiation into that order known as the Royal Order of the Wouff Hong. A tour of Ellsworth Air Base and of the Black Hills and Mount Rushmore and a chuck-wagon feed of buffalo stew followed. RLQ now has his General Class license. ANU is temporarily off the air while building a new house. The Screw Ball Convention at Hayward now is history. It enjoyed an attendance of about 35 hams. Jean, IRJ, was elected Queen of the Screw Ball Convention. HY has been operating from Bay Lake near Crosby and working into the Cities with only 8 watts on 75 meters. IRD, of Duluth, recently was married. Her new name is Mrs. Alvin Feller. The marriage was performed at Chanhassen by JDO, Justice of the Peace. TJI now is holder of a General Class license and is operating mobile with an Elmac. KFN and EUI bought a new Olds 98 and will be mobile with an Elmac. WMA soon will be using a Viking Ranger. Traffic: WØKLG 214, WMA 152, UCV 82, MVG 80, KFN 58, EHO 39, KNR 36, IRJ 35, TKX 31, LST 30, LUX 24, GTX 16, OJH 16, RVO 15, BZG 13, IKJ 13, JIE 12, MXC 9, OMC 9, PBI 9, QZK 8, TUS 8, BUO 7, GWU 7, HAH 7, ALW 6, CID 6, GWJ 4, GGQ 3, TUO 3, OPA 1.

DELTA DIVISION

LOUISIANA — SCM, Thomas J. Morgavi, W5FMO — The Westside ARC is sponsoring a DX contest among its members with $100 in cash prizes. WQP's XYL had the banana tree in the back yard chopped down; she didn't know that the OM's guy wire holding up his 20-meter beam was tied to it. WQP is now off 20 meters. UXG and his XYL are vacationing on the West Coast. ETV now is General Class. After working 10 for about 20 years, HR has moved up to 20 meters. The New Orleans ARC's dance and picnic held over the Labor Day week end was lots of fun. SQI made WAC but still is waiting for Europe and Africa QSLs. A new OO is WQX. The Caravan Club of Louisiana held a hamfest near Shreveport on Nov. 14th. DAR is back from a European vacation. LV is off to sea again; so is SGH. KGM is working on all-band vertical. We hear that KTB expects to be on s.s.b. soon. The Greater New Orleans ARC has started its code and radio courses at Loyola University. Classes are held Mon. and Wed. nights and will continue through the rest of the school year. HUT, SPZ, and DVS are new mobiles in New Orleans. Please mail your reports in on time. Appointments in all departments are open over the State. Your attention is directed to ARRL Bulletin No. 465. All aspirants to monitor appointments with MARS are invited to make the new ARRL Frequency Measuring Test to check their gear and ability. Traffic: (Sept.) W5NDV 99, MXQ 70, EA 38, SQI 8. (Aug.) W5NDV 166.

MISSISSIPPI — SCM, Dr. A. R. Cortese, W5OTD — Looks like the fellows have run out of news. They don't send me any and I am much too busy to have to listen on the bands to find out what they are doing. So, if you hams are doing anything and want it in print let me have it before the seventh of the month. GEM is the mobile net on the Gulf Coast and meets each day on 29.6 Mc. at 1930. SRT is off the air; work got him. OTD has his new Ranger, thanks to the Jackson Hamfest. JIP, of Jackson, died Sept. 23rd. We'll all miss him. RCF is having trouble getting his mail. A Very Merry Christmas to all of you and may your signals be always Q5 and 9-plus. Traffic: (Sept.) W5EWE 95, VME 76, JHS 40, DRG 11, YHB 8, OTD 5. (Aug.) W5EWE 128, JHS 51, YBH 20, VME 16, OTD 4, DRG 2.

TENNESSEE — SCM, Harry C. Simpson, W4SCF — SEC: RRV. PAM: PFP. RM: WQW. PL is taking a well-deserved Mexican vacation and says he may run into a 'phone ham or two, south of the border. HHK worked 10 states on 2 meters during the V.H.F. Contest. WGI now is 5HEH. ETS is recovering from a recent illness. AKB has moved to Virginia. WQT moved to a new QTH, still in Clarksville. The Elizabethton-Johnson City Club now has been named the Watauga Radio Club, with VFL, BBD, and VDN as officers. Another father-son team is BVA-HLP. PAL takes to the air, literally; now is a partner in a plane. The Kingsport Club had an outdoor meeting, complete with a weiner roast. Thanks to UVS for an admirable job on the Crossville picnic pictures. HFA is a new active ham in Kingsport. VUA sends a nice newsy letter and suggests that local skeds for 75 meters be made early because of skip conditions. New Memphis 2-meter stations are BAO, GIS, and WN4s FRB, HMI, and HMJ. BAQ/UDI have auto calls installed on 2 and 10 meters. PVD now is up to 101 countries and is awaiting QSLs from 4 new ones worked this month. UWA reports the new Upper Cumberland Net is going along nicely, averaging 8 stations per session. MLL, LC, WQW, HEZ, and EXR report they were treated royally at the St. Louis Hamfest. COY, FQO, and GZC visited WQW. Traffic: W4PL 1274, OGG 744, TYU 190, PFP 166, HIH 129, WQW 128, IIB 96, BQG 78, SCF 51, UWA 50, TZD 40, OEZ 37, GZC 36, AKB 22, VJ 17, BMI 14, ZJY 14, RRV 13, UOA 13, PAH 10, PVD 9, RET 8, BAQ 6, RMJ 6, TSN 6, DCH 4, UIO 4, FLW 2, TIE 2, VVG 2.

GREAT LAKES DIVISION

KENTUCKY — SCM, Robert E. Fields, W4SBI — KKW turned in a very fine report on the KYN, and shows that activity is on the increase. There are 40 active stations on the net, with the following stations earning net certificates: IAY, GFG, HEA, SUD, ZDA, ZCM, and K4FBW. CDA still is building. His latest is a 100-watt transmitter for 75-meter 'phone. K4FBW is building a 100-watt final, plus a 2-meter rig. KKG is active only on 15 meters. MWX still is plugging away with KYN and UTL. RYM, newly-appointed EC, is reorganizing AREC and emergency activi-

(Continued on page 82)

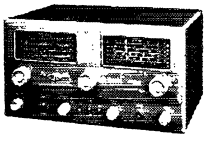
BECOME AN HONORARY

ANOTHER BIG

$1,000 HAM SHACK GRAND PRIZE

Just listen to this! Grand prize is a complete ham shack worth *one thousand dollars!* The shack includes the finest of all receivers — the world-famous HRO Sixty — with a matching speaker PLUS a deluxe transmitter, a semi-automatic key, a microphone and a rotary antenna!

NC-88 AWARDED MONTHLY



Even if you don't win the Grand Prize, you're eligible to win a monthly prize of a brand new NC-88 — a world-beater in receiver value! Features include calibrated band-spread for 80, 40, 20, 15, 11 and 10 meter bands, advanced AC superhet circuit using 8 miniature tubes plus rectifier, a tuned RF stage, two IF stages, two audio stages and a host of other features!

OFFICIAL RULES

1. Describe the features you would like in your "dream receiver." Suggestions can be as technical or non-technical as you like — anything from a circuit design to the style of a knob. Drawings or diagrams may be used. Please write legibly. Enclose your suggestions with a signed entry blank and mail to: Contest Department, National Company, Inc., 61 Sherman Street, Malden 48, Massachusetts.

2. You can mail as many suggestions with an entry blank as you wish. Be sure that a separate entry blank accompanies suggestions mailed at different times. You may file as many entry blanks as you wish.

3. An NC-88 will be awarded to the winner of each monthly contest. A grand prize of a $1,000 value ham shack will be awarded for the entry judged best from all winning monthly entries. A certificate will be awarded to each entrant, making such entrant an honorary National Company, Inc. engineer. The contest will continue through midnight February 28, 1955.

4. Anybody is eligible to enter the contest except employees of National Company, Inc., its advertising agency, and their immediate families. To be eligible an entrant must send a signed entry blank with his suggestions. To be eligible for any particular month's contest entries must be postmarked no later than midnight on the last day of the specific month. Winners will be notified by mail.

5. Entries will be judged by a three-man panel composed of competent technically qualified personnel of National Company, Inc., each exercising independent personal judgment. All decisions of the judges will be final and will be decided by majority vote.

6. All suggestions submitted in this contest, whether awarded prizes or not, become the exclusive property of National Company, Inc. and are not subject to being returned. Entrants grant to National Company, Inc. all rights to suggestions, including the right to patent and/or copyright the suggestion. National Company, Inc. has no obligation to entrants other than to award prizes in accordance herewith.

NATIONAL ENGINEER!

MONTHLY CONTEST...

Here it is! Another big month of National's exciting new contest for radio amateurs and shortwave listeners!

You've probably often thought of features you'd like included in your "dream receiver." Well, now's the time to put them down on paper! They may win you a brand new NC-88 or a complete $1,000 ham shack!

National's sole purpose is to find out what the *majority* of you want and don't want in a receiver. (Acceptance of your entry does not mean it will be included in future receivers and submission of an idea doesn't obligate National to use it.)

Whether he wins or not, each entrant will receive a certificate as an "HONORARY NATIONAL ENGINEER."

The entire contest closes on February 28. All entries must be postmarked no later than midnight of that date.

So, hurry, pick your official entry blanks at your National distributor.*

tuned to tomorrow **National** NC

NATIONAL COMPANY, INC., 61 SHERMAN ST., MALDEN 48, MASSACHUSETTS

** If there is no National distributor near you, write direct to the company, Attention Contest Department, for your entry blank.*

(*Continued from page 79*)

ties around the Town of Henderson. You should be hearing K2CYI from his home QTH now. SBI, your Section Communications Manager for Kentucky, invites you to send monthly reports of your activity. Traffic: W4KKW 122, K4FBW 96, ZLK 72, W4SBI 39, WNH 32, CDA 28, SYD 28, MWX 17, K2CYI 16, W4JCN 13, NIZ 10, AZQ 9.

MICHIGAN — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Joe Beljan, 8SCW; and Bob Cooper, 8AQA. SEC: GJH. RMs: URM and NUL. The traffic nets have started in earnest and we have noted a few NCSs on hand. You fellows who have taken over will never regret it. RJC has been off the air since early in September and ELW was the only one to make BPL this month. Incidentally, when your traffic totals put you in the BPL class don't forget to mention on your report whether your station was operated as a one-operator station, or a more-than-one-operator station. Remember, too, that the only traffic which may be counted is traffic handled on amateur frequencies. For instance, a message received and relayed on MARS counts "zero." If received on MARS and relayed on an amateur frequency it counts "one." It must be handled on amateur frequencies to count toward your traffic total. The THN Net is in operation again this year for you fellows who cannot check into the evening nets. Look for it at noon every weekday on 3663 kc. New officers of the Genessee County Radio Club are ITZ, pres.; QIC, OBM, and IFK, vice-pres.; JAX, secy.; and FNQ, treas. The Blossomland Club recently elected SCS, pres.; QPG, vice-pres.; QOD, secy.; and QBN, act. mgr. We recently saw an interesting article about the wildlife "lectures" given by NEJ/NEK. It seems that John and Marianne have been discussing their work at the Game Refuge in QSOs with several school radio clubs; and the clubs found it so interesting that they made recordings of the QSOs, playing them back during class periods. WXO will be working and teaching until after Christmas. SWG has his receiver in for a factory check-up, and dampness in the basement caused a blow-out of EGI's buffer power transformer. (We seem to remember the stunt of burning a low-wattage lamp bulb in the cabinet to keep the moisture out). SWF has a new folded dipole, and YKC is looking for a crew to put up his new 35-foot poles. The Edison Club loaned its emergency gas-engine generator to the Royal Oak General Hospital for emergency lighting in the delivery room during a recent power failure. During the September V.H.F. Party NOH made 48 contacts in six sections. Lou now has his sights on a 400-watt 2-meter rig! Traffic: W8ELW 572, ILP 169, NUL 121, FX 98, MLR 93, RTN 92, NOH 76, ZLK 46, QIX 43, JKX 31, WXO 31, PHA 24, AUD 21, HKT 21, SWG 20, IV 19, NEK 19, OQH 12, DSE 8, EGI 7, TQP 7, HSG 6, RJC 6, FSZ 4, PUV 3, SCW 1, WVL 1.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF. SEC: UPB. PAM: HUX. RMs: DAE, FYO. Although nobody made the BPL this month, traffic is definitely on the upgrade. ROX has been made an ORS and FJP an OBS. DAE took a trip to the Poconos early this month. QVJ, Central High Ham Club station, is on the air on 160-meter 'phone and 40-meter c.w. According to all reports UPB is doing his normally excellent job as SEC. There are very few amateurs in this section who do not know him personally. GZ is greatly pleased with the W8 QSL Bureau's super service. AQ has purchased a Ranger rig and installed a 45-foot vertical. BUM is visiting in W6-Land. LJ will move to Cleveland around Nov. 1st. ROX is rebuilding to a 4-250A. LZE has acquired a Viking II with VFO and Matchbox. LVF will spend a three-month duty tour at Fort Riley, Kans. The Cleveland North East Club sponsors Novice and Technician Class license exams on the 2nd and 4th Fri. at 18415 Nottingham. LCC is on 2 meters. OQT is working as a sales engineer for Bendix Radio. KYH now is on a.s.b. s.c. YMB succeeds RRA as Northeast's delegate to the CACARC. KYH is the new trustee of CCO. About 300 amateurs attended the Cuyahoga County c.d. meeting Oct. 1st which was conducted by LYD. IJZ and IWP have been the most consistent winners of the Cleveland Area hidden transmitter hunts, according to AJH, Cuyahoga County EC. The West Park Radiop Emergency Net, 29,520 kc., averages 25-30 stations Mon. at 10:00 P.M. The Cincinnati Stag Hamfest of Sept. 12th had an attendance of approximately 800 amateurs, one of the section's big events. On the same day the Findlay Hamfest produced a turnout of over 300 people, the largest crowd in several years. Winners in the Lucas County September hidden transmitter hunt were EDL on 10 meters and WIT on 160 meters. The *Fort Hamilton Bulletin* mentions that QLH has been called to service and HXB lectured on grid-dip oscillators at the last meeting. The Cleveland Wireless Assn. has reelected BXB, pres.; JNF, vice-pres.; and FSP, secy.-treas. The Dayton *RF Carrier* reports that OVG again is chairman of the club code and theory school. His assisting professors are KLM, PLV, and ZOF. The Springfield *Q-5* informs us that an informal antenna forum is held at the ENS antenna garden from 1:00 to 4:00 on Sun. afternoons. The Columbus *Carascope* states that FYW finally has gotten on 2 meters, LWE has received his General Class license, LND has gotten a 2nd-class commercial ticket; LVF and KMM have but to complete their graduation thesis to receive their PHDs, HUE has con-

(*Continued on page 84*)

structed a new 813 rig, and LWJ is active on 2 meters. Eastern Ohio's *Ham Flashes* relates that NXK is a baritone horn tooter in the Salem American Legion Band, CQZ is a new mobileer, ZAG is working for Bendix Radio in Alaska, PJK has increased McDonald's amateur population to two, OKC and LZR have new mobiles, and AUE has had his address changed to Fowler. Traffic: (Sept.) W8FYO 338, UPB 308, ARO 244, MQQ 179, REL 169, DQG 153, LHV 129, FPZ 125, DAE 86, RO 75, GDB 60, AMH 57, HNP 55, IJH 44, AL 42, DG 42, AJW 33, HIF 33, WE 28, ROX 26, HUX 20, LMB 16, GZ 14, APC 12, LZE 11, AJH 8, DMD 7, FJV 7, HXB 7, AQ 6, DL 6, EQN 6, KIH 6, OPU 6, RZ 6, ET 5, CSN 4, HPP 4, NQQ 4, PBX 4, LT 2, OQP 2, AYR 1. (Aug.) W8DQG 48, PBX 4.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RM: TYC. PAMs: GDD, JQI, IJG. I regret to announce the resignation of KBT as RM for this section and as manager of NYSS. Our sincere thanks to Carl for his long service and excellent record. Congrats to OPD of the Western New York section, who is the new manager of NYSS. WVS has a new Gonset VFO and a sixteen-element beam on 144 Mc. LWI has moved from Long Island to Pok and has an 829 final on 144 Mc. K2ANL has a 100-watt mobile on 144 Mc. K2BAR, K2DRV, and KN2HQN have built converters designed by RTE for 144 Mc. AIH will be in Boston for about one year and will be home week ends. He will be active from Boston on 3.9 and 144 Mc. K2JUS has returned from the Army and is active from Port Jervis. HQF and KN2HTT are new members of the Rockland County AREC-C.D. Net. ZBS and MHE have new converters for 144 Mc. OKI received his 15-w.p.m. sticker. K2BSD has a new Telrex short beam going on 14 Mc. and is handling long-haul traffic. 1DF, of ARRL, was well received at the SARA. A record crowd was on hand to enjoy his talk on "Impedance Matching." OAK has a new 4-125A final working on all bands using both A1 and A3 emission. 3FWT was a recent caller at EFU. The HHRL has resumed publication of *Zerobeat* and opened the first meeting of the season with a demonstration of closed circuit TV by K2HEF. AWQ and KN2HRQ were recent visitors at ARRL. It is with regret that we report the death on Oct. 9th of Harry C. Condon, W2JQL. A ham for twenty years, he was active on 2-, 10-, 75-, and 160-meter 'phone, was the originator of the Albany Amateur Association Directory and was one of the few honored by the Albany Amateur Association and given life membership. K2BAJ has left for Cal. Tech. and will operate portable from W6-Land. WRI is working with s.s.b. PCP and K2AEH are having fun with FSK equipments. NGQ has a new vest-pocket beam working on 144 Mc. Don't lose your appointment, check the endorsement date now. Traffic: (Sept.) K2BSD 257, W2LRW 64, K2BE 55, W2GDD 39, ILI 34, YXE 25, K2EOQ 15, W2SZ 13, TYC 5, APH 2. (Aug.) W2OKI 3.

NEW YORK CITY AND LONG ISLAND — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry Dannals, 2TUK. SEC: ZAI. PAM: JZX. RMs: VNJ, LPJ. Please continue mailing reports to TUK. Other mail for YBT should go to his new address, P. O. Box 1011, East Hampton. Congratulations to OBU on his reelection as Hudson Division Director. JOA again leads the list of BPL stations, but school slows down his activities. Ditto for IVS, IVU, K2s CQP, ABW, and DVT. School first, BPL second, that's the ARRL way! LPJ lost one week when his 4D32 went West, but still managed a BPL total. VNJ reports the NLI Net (3630 kc., 7:30 P.M. nightly) now is up to fall level, but outlets still are required in Suffolk. How about it, gang? K2JFZ, ex-8CTS, joins the gang at AEE. K2CRH requests interested Brooklyn 80-meter stations to join the BAREC Emergency Net on Sun. at 11 A.M. on 3755 kc. The Tu-Boro Club is celebrating its 20th anniversary this year. FKR is new Asst. EC in Queens. JBQ and his powerful 25-watter on 144 Mc. hit 12 sections in the V.H.F. Contest and accounted for W8s in Ohio, Michigan, and West Virginia in the band-opening. GP's antenna came down in Hurricane Carol, but Don is back in business. IN is another addition to the s.s.b. gang on 40 and 80 meters. K2CMV is planning early for next summer's mobile season with a low-power rig under construction. K2APZ, Brooklyn College station, returns to 75 meters. K2CYI is back from Army service and plans 75- and 20-meter mobile operation. EBZ invites all those interested in RTTY to contact him for information on the newly-formed Amateur Radio Teletype Society. KN2JAS and his AT-1 and S38-C need only W6 and W7 to complete all Novice districts. HQL, with 15 crystal-controlled watts, made WAS and WAC. JBP is due back from KG6-Land. KN2JGZ is a new Novice in Malverne. DLO reports hearing 8 stations on 420 Mc. during the V.H.F. Contest. His 420-Mc. transmitter will be ready for the next V.H.F. SS. K2HID and his Viking I picked up 5 new countries. JZX reports that Second District YLs meet the 3rd Thurs. on 3900 kc. at 9:30 A.M. New YLs in the section are KN2JHQ, the XYL of NJL, and KN2s IOI and IZC. K2HZB didn't take long to drop the "N." KGN, Brooklyn EC, reports the new shack at Boro C.D. Control is FB. K2GKQ, Amityville Memorial School, is active on the Novice bands with K2AMP as trustee. K2DOQ is

(Continued on page 88)

New Heathkit VFO KIT

MODEL VF-1

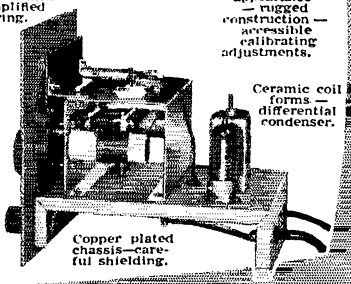
$19.50

Ship. Wt. 7 lbs.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 7 Band coverage, 160 through 10 meters—10 Volt RF output.
- Copper plated chassis—aluminum cabinet—easy to build—direct keying.

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 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 ¼" crystal holder. Construction is simple and wiring is easy.



Heathkit AMATEUR TRANSMITTER KIT

MODEL AT-1

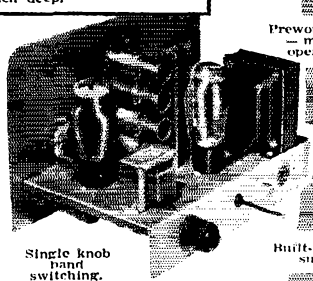
$29.50

Ship. Wt. 16 lbs.

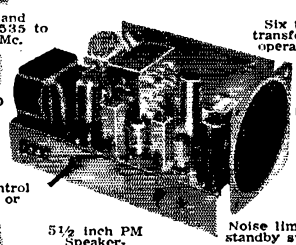
SPECIFICATIONS:

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: 8⅛ inch high x 13⅛ inch wide x 7 inch deep.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporaring 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.

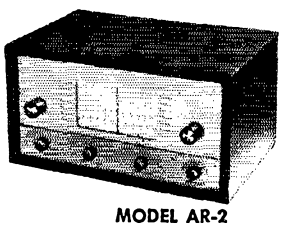


Heathkit COMMUNICATIONS RECEIVER KIT



SPECIFICATIONS:

Range.....535 Kc to 35 Mc
12BE6 .....Mixer-oscillator
12BA6 .....I. F. Amplifier
12AV6 Detector—AVC—audio
12BA6 ....R. F. O. oscillator
12A6.....Beam power output
5Y3GT .....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

$25.50

Ship. Wt. 12 lbs.

CABINET:

Proxylin impregnated fabric covered plywood cabinet. Shipg. weight 5 lbs. Number 91-10, $4.50.

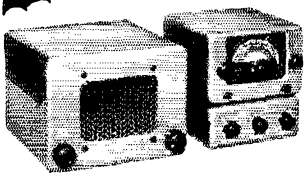
HEATH COMPANY

BENTON HARBOR 9, MICHIGAN

420-Mc. transmitter will be ready

A big red bow and a cheery Merry Xmas tag . . .

Simple, traditional Holiday-spirit additions to any piece of Gonset equipment . . . for the most enjoyable Xmas gift package anyone could desire.

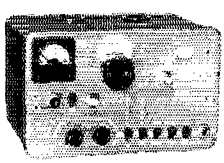


Super-ceiver

Super-ceiver in conjunction with any good quality amateur converter, such as Gonset Super-Six, provides a complete mobile receiver capable of outstanding performance on both phone and C.W.

Unit is xtal controlled for maximum stability and utilizes 8 tuned circuits at 262 kcs for high selectivity. Self-contained vibrator power supply furnishes voltage regulated power to converter and to BFO. Latter is highly stable with adjustable pitch control. Separate RF and AF Gain controls, adjustable squelch, effective noise clipper. Built-in speaker with connections for external speaker, if desired. Pertinent controls are on a small control head which mounts near the converter for "fingertip" operation. Connecting cables and plugs are supplied. Power pack is designed for quick conversion to 12V DC.

Net $119.50



Commander 60 watt Transmitter

An extremely compact, highly effective 60 watt transmitter for mobile or fixed service. Normally xtal controlled, may also be used in conjunction with external Gonset "tubeless" VFO. Highly flexible output circuit, readily shifted to pi network if desired.

FREQ. RANGE: 1.7-54 mcs continuous.

TUBES: RF-6AG7, 6146. AF-12AT7, two 7C5's.

POWER REQUIREMENTS: 300V-500V @ 200-225 ma (phone) and 6.3V, AC or DC @ 3.15A. Up to 60W input, phone or CW.

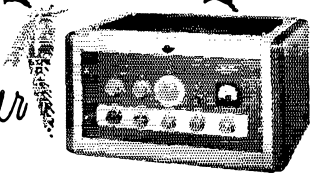
MODULATOR: Class AB2 tetrodes and integral hi-level speech clipping.

ANTENNA FEED: All conventional feed lines, Coax ribbon or open line or direct to Marconi antenna.

MICROPHONE INPUT: Any standard carbon or PA type hi-impedance dynamic or crystal.

Complete with tubes, less power supply, xtal and microphone. **Net ...$124.50**

RF Power Amplifier



Here is a true general purpose "Power Package" for SSB, CW, AM phone. It's self-contained with a husky, dual-voltage bridge power supply . . . has a highly flexible pi network output circuit. Provides full band-switched coverage of 10-11-15-20-40 and 80 with provisions for adding 160.

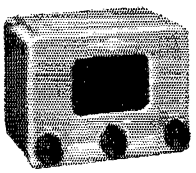
This is an ideal amplifier to follow any low-power SSB exciter. Its highly stable, linear (Class AB.) and has excitation control and complete metering to facilitate SSB operational adjustments. Operation is in no manner confined to SSB since AM phone with a few watts of modulated drive is readily possible. C.W. operation at substantial output is merely a matter of providing a low-power keyed RF input.

POWER OUTPUT RATINGS

SSB—250W (Peak envelope output)

CW—220-240W output. AM—80-100 watts carrier.

TUBES: 4-807's in completely unique electro-mechanical arrangement, stable, free from parisitic or self-oscillation. 4-866JR's in bridge. Dual output heavy-duty 80 mfd output filter for excellent dynamic regulation.



Monitone

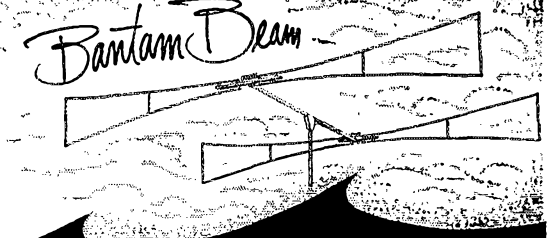
Use it for code practice at any time but . . . since it is also an excellent monitor for phone or C.W. . . . keep it in service as a permanent station fixture.

This unit can be used without danger of shock since the 115 volt AC power supply is isolated so that neither of the two external key or earphone leads are "Hot" to ground.

Audio tone and volume are individually adjustable and made audible on panel mounted speaker, (or external earphones). A small amount of Rf, (link-coupled from the transmitter) operates the unit when used as a monitor. The actual transmitted signal operates the internal audio oscillator for C.W. . . . the rectified audio component is made audible on speaker, (or earphones for "side tone") where utilized for phone operation. It's attractively finished, functional.

Net $19.50

Bantam Beam



A bit too large to fit under your Xmas tree but . . . there will be no difficulty in finding adequate roof space to contain its 16½ foot tip-to-tip element length. (Boom is 10') Light-weight too . . . easily rotated by any good TV-type rotator.

It's effective! Performance, in all kinds of weather, approaches that of a full-length 20 meter beam. High Q silver plated, copper tubing inductors, are self-supported . . . ensure unimpaired, wet weather operation.

Bow-tie, broad-banded elements . . . very low SWR . . . good F-B-R . . . 52 ohm line feed . . . symmetrical pattern.

Net $59.50

GONSET CO.

801 South Main Street Burbank, Calif.

(*Continued from page 84*)

building a 40-watt rig for all bands now that he has dropped the "N." KN2IYK used the W1AW Code Proficiency Run for the Novice code test. New members of the NYRC are 4EOJ/2 and KN2IMG. The Fordham Club gave exams to Novices JDM and JDR. IRY is moving to Lake Ronkonkoma. YBT has been elected an honorary life member of the Mid-Island RC. K2GZE is working on the TVI problem in an N.Y.C. apartment house. K2DDC, ex-secy. of Columbia University RC, reports from Ft. Dix where he is stationed with the Army. VNJ, the NLI RM, may have some competition if his son obtains his ticket. QBR, TUK, and K2GBZ are active at Naval Reserve station K2NRL, Freeport. With 1955 around the corner, let us endeavor to keep our operating at a high level. Traffic: (Sept.) W2JOA 1184, KFV 905, KEB 654, BO 612, LPJ 572, K2EP 520, W2JZX 512, IVU 329, K2CQP 264, W2VNJ 193, OMG 62, AEE 56, OME 39, EC 36, JGV 30, K2ABW 27, CRH 18, W2LGK 16, K2DVT 7, W2PF 7, IAG 6, IVS 4, JBQ 4, K2CMV 3, DDU 3, W2GP 3, IN 3, OKU 2, K2HID 1. (Aug.) K2EP 675, W2JGV/1 177, LPJ 144, VNJ 60, JBQ 3.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — Asst. SCM: Charles Teeters, K2DHE. SEC: IIN. PAM: CCS. RMs: NKD, EAS, CGG. Your SCM is pleased to announce the appointment of IIN as the new SEC for Northern New Jersey. John has had many years of experience in this field, having formerly been SCM and SEC. Please refer all AREC matters to him at 57 Sayre St., Elizabeth. IIN replaces NKD, who tendered his resignation because of pressing business commitments in connection with his new work assignment. The section extends its sincere thanks to NKD for his past efforts as SEC. All correspondence to your SCM should now be sent to 709 7th Ave., Asbury Park. Lloyd has a new house and also a stiff neck from looking up for a place to put the new sky wires. New officers elected by the Bloomfield Radio Club are K2ICN, pres.; W2ANG, vice-pres.; GC and K2BAY, secy.; W2SUX, treas. The Club holds meetings at 8:00 the 1st and 3rd Wed. of each month in the Community House, 82 Broad St., Bloomfield. New members are welcome. The section is saddened to hear of the illness of YVQ. Doc has been taken to the polio ward of the St. Elizabeth Hospital in Elizabeth. He has been given a Gonset for 2 meters and is on during the day, and from 7 to 10 P.M. on 145.5 Mc. during the evening. The gang in Linden has been working Doc regularly and we hope that everyone will pitch in and give him a call. If you are mobile on 2 meters drive past the hospital and give him a call. The Raritan Valley Club has lost its vice-president to Florida, but the Club is in the process of rejuvenating and has started winter meetings on Tue. nights in the club house on Wilson Road. The club house is in better shape because of the efforts of K2CHI and GAS. NQA is now a special police officer in his township. NIE has been off the air because of some serious fishing up in New York State. K2DDM is mobile on 2 meters and Luke also is on 2 meters from the home QTH. Excellent OO reports were received from TPJ, NIY, and K2BWQ. The Monmouth County 2-meter Net is back under OUS after the summer months. K2ICE is putting up a twenty-element beam for 2 meters, and HNA is trying sixteen elements. OFM certainly started something in Asbury Park. Henry's brother Bill is now K2ARQ, his wife Enis is KN2HIA, Bill jr. is K2DCI, and daughter Phillis is KN2HHQ. LRO is getting the bugs out of his 20-meter rig with one hand while building a 2-meter rig with the other. Congratulations to K2CTL on the arrival of a baby girl, his first. Traffic: K2BWP 277, W2EAS 129, K2BWQ 113, GAS 82, W2OXL 58, K2EUN 46, W2GVZ 12, BRC 11, OUS 8, CFB 2, NIY 2, K2BAY 2, GER 2, W2ZPD 1.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — This report was submitted by A. J. Ploog, ØSCA, Asst. SCM. PP is enjoying a short vacation. QVA had a session in the hospital but is now home. MGC and UIJ are new TLCN members. NWF, of Ames, moved to Arizona. Iowa is losing an FB traffic man. QJF and QQA, both of Mt. Pleasant, now have General Class tickets. LAC has a new Elmac mobile receiver. GZ has both an Elmac mobile receiver and a transmitter. BLH received his ORS appointment recently. TED is back in Waterloo after a hitch in the U. S. Air Force. PAN still is looking for 20 more states for his WAS. The Waterloo Club is very active in c.d. and hidden transmitter hunts. Blackhawk County now has emergency-powered stations in every town in the county, regardless of size. Fellows, please send in the reports of your clubs and stations. We can't print it if we don't get it. Iowa ranks second in our division in the amount of traffic handled but last in reports to the SCM. Even if you don't handle traffic your SCM would like to know what you and your club are doing. Thanks a million to those who did send in reports. Traffic: WØBDR 1735, SCA 1259, CZ 235, LJW 116, BLH 86, KJN 19, NGS 13, PUR 10, FDM 8, PAN 8, EHH 7, QVA 6, RMG 6, SWD 6, NYX 5, FNR 3.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. RM: KXL. PAM: FNS. The Lawrence Amateur Radio Club held a picnic Oct. 10th. The CKRC of Salina already is making plans for next year's Field Day. CKRC

(*Continued on page 90*)

This Christmas...

PICK YOUR POWER from these 4 feature-packed JOHNSON TRANSMITTERS!

VIKING RANGER

Desk-top beauty in a self-contained rig. Designed to serve as a transmitter or an RF and audio exciter for high power equipment, the Ranger represents the absolute in compact transmitter operation and convenience. Phone input 65 watts, CW input 75 watts. Covers all amateur bands from 10 to 160 meters. Built-in, extremely stable VFO, or may be crystal controlled. Pi-network antenna load matching from 50 to 500-ohms—no internal changes needed to switch from transmitter to exciter operation.

Cat. No. 240-161—Viking Ranger Kit, less tubes, crystals, key and mike.
Amateur Net **$179.50**

Cat. No. 240-161-2—Viking Ranger, wired and tested, less tubes, crystals, key and mike.
Amateur Net **$258.00**

VIKING "ADVENTURER"

Big transmitter features in a new compact CW kit. Single-knob bandswitching 80 through 10 meters. Rated at 50 watts input and effectively TVI suppressed, the "Adventurer" is engineered throughout for easy assembly and operation by novice or experienced amateur with a minimum of equipment wiring and operating experience. Self-contained power supply is wired for use as an "extra" station power source when transmitter is not in use. Clean, crisp break-in keying.

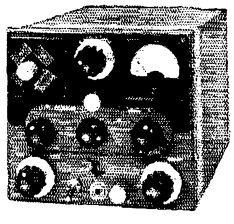
Cat. No. 240-181-1—Viking "Adventurer" Kit, with tubes, less crystals and key.
Amateur Net **$54.95**

VIKING II

Make every day seem like Christmas with the famous Viking II. 180 watts CW input, 150 watts phone. Completely bandswitching and self-contained, the Viking II is professional in appearance and design. TVI suppressed—all stages metered—covers amateur bands from 10 to 160 meters. Owned and operated with pride by thousands of amateurs everywhere, it's the perfect choice this Christmas season or any season.

Cat. No. 240-102—Viking II Transmitter Kit. Complete with tubes, less crystals, key and mike.
Amateur Net **$279.50**

Cat. No. 240-102-2—Viking II wired and tested with tubes, less crystals, key and mike.
Amateur Net **$337.00**



VIKING MOBILE

The "most wanted" mobile transmitter among discriminating amateurs, the Viking Mobile is easy to load and its powerful audio system packs that extra punch for sure mobile communication. Gang-tuned and bandswitching, it covers 75, 40, 20, 15 and 10-11 meters. May be wired for 6 or 12 volt operation—under-dash mounting—all controls readily accessible. Dynamotor power supply and external VFO for steering post mounting also available.

Cat. No. 240-141—Viking Mobile Kit, less tubes, crystals, microphone, power supply, accessories.
Amateur Net **$99.50**

E. F. JOHNSON COMPANY

2832 SECOND AVENUE SOUTHWEST • WASECA, MINNESOTA

CAPACITORS • INDUCTORS • SOCKETS • INSULATORS • PLUGS • JACKS • KNOBS • DIALS • PILOT LIGHTS

has acquired a 2½-kw. portable generator. AQZ has a new Viking Ranger. LBJ is working on a new 500-watt rig for all bands. DRB reports for the Olathe gang. His vertical ground plane works out FB. HCV also has a ground-plane antenna. DLE has mobile in the car now and also has built a rig for the high school where he is a math teacher. ZEH has a new Collins 32V-3. ECD, reporting for the Eldorado group, says SBL has a new Globe Champion. TDW operates mobile most of the time. ONI had his mobile whip stolen from the car. HPE is attending Wichita U. FTW is attending radio school in Kansas City. GQM has just finished a Viking II. UAT now has an RME-45 receiver. ONF, of Howard, plans to run code sessions on 75 meters soon. MOX, active on 2 meters from Lawrence, hears the Kansas City boys working 8s, 9s, and 0s. MOX is modifying his 75A-1 for coax input for his converter. VFF and WRC are two new 2-meter stations in Kansas City. KKF, of Topeka, is on 2 meters with Millen HFS using his Viking power supply and modulator to quite an advantage. The SeKan Radio Club picnic held Sept. 12th was well attended and all had a good time. Traffic: WØFDL 647, BLI 496, NIY 246, OHJ 80, WGM 63, FEO 35, GCJ 34, TOL 28, ABJ 21, FDJ 21, NFX 18, SVE 16, ONF 12, VBQ 12, DEL 11, ONC 10, ICV 8, KFS 8, TNA 8, YFE 8, LOW 7, MLG 6, QMU 6, FHT 5, QGG 5, BET 4, ECD 3, IFR 3, LBJ 3, LIX 3, UAT 3, MXG 2, NLV 2.

MISSOURI — SCM, Clarence L. Arundale, WØGBJ — SEC: VRF. PAM: BVL. RMs: OUD and QXO. The SMARC held its annual picnic in Springfield on Sept. 5th and a large crowd attended. A group of Kansas City 75-meter hams held a covered-dish picnic Sept. 24th at Harrisonville. A number of Kansas City mobile stations assisted in communications for the sports car races held early in September. VRF reports that LRU has been appointed Radio Officer in RACES and will be assisted by UBR, NDS, WHK, CBS, and VRF. CPI returned from his vacation in time to earn another BPL certificate. GAR and QXO again qualify for BPL. GAR finally got his bad interference cleared up so he can keep all his schedules now. KØFBO installed a 250TL in the BC-610E and now can run up to 950 watts input. The Rolla Amateur Radio Club has purchased a Viking I for its club station. BUL and his XYL recently had a bad car accident. HUI, while on an extended vacation trip to the West Coast, has kept a home schedule with EBE. We hear HUI is bringing a new Viking Ranger home with him. TCF has added a Heathkit VFO to his TBS-50D and also has received his General Class ticket. BUL now is the official Net Manager of the Missouri Emergency 'Phone Net. RTW had to replace the transformer in his S-40B. VFP is on the air with a Globe Scout and an S-40. SAK has received his Conditional Class ticket. Traffic: (Sept.) WØCPI 604, QXO 599, GAR 504, GBJ 112, ZLN 75, KØFBO 62, WØIJS 60, BZK 43, KIK 37, KA 35, EBE 22, OUD 19, ZWI 10, BUL 8, QBX 7, HUI 5, CKQ 4, RCV 4, SAK 4, EEE 3, CXE 2, QWB 2, TCF 2, LQC 1. (Aug.) KØFBO 132, WØBUL 5, BVL 3.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM: Tom Boydston, ØVYX. SEC: JDJ. TQD is working mobile, 'phone and c.w. RDN reports the new frequency for the Nebraska C.W. Net is 3525 kc. BDR and his XYL recently visited RDN. The Tri-City Radio Club has elected VQR, pres.; and QKR, vice-pres. CDL, VQR, and QKR are members of the Licensing Committee. WNØVIC is a new member of the Tri-City Club. BDQ and his XYL, of Lincoln, visited RDN while moving to Denver. WNØSPD is on 2 meters with Harvey Wells and VHF-152. UOV and UOW, out North Platte way, have dropped the "N" from their calls. WNs at North Platte are ULC, ULN, UTQ, VUB, WLO, and VEA. The North Platte Novice Net will be held Mon. at 6:30 P.M. with VUB as NCS and ULN as alternate. The frequency is 3735 kc. IJK is on s.s.b. and hoping for more power. IBA has a new Heathkit VFO and Globe Scout. EWK has a new Globe Scout. RIG is on with a 4-65 A. PDJ and OMH, of Hastings, are both using Viking IIs. AREC membership blanks are available from the SCM so let's get in those requests. FQB attended the International Municipal Signal Assn. Convention at Atlantic City. Traffic: (Sept.) WØTQD 2118, KØAIR 1774, WØZJF 354, RDN 212, FQB 194, MGC 87, AEM 47, KDW 46, FTQ 36, MAO 27, VYX 25, HTA 18, PDJ 14, LEF 12, BEA 11, ERM 11, HQN 10, KFX 8, QHG 7, ORW 6, KØWBF 4, WØNHT 3, PQP 3, CBH 2, DJU 2, KLB 2, LRK 2, RML 2, RRH 2, THX 2, AIN 1, EGQ 1. (Aug.) WØRDN 99.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC: LKF. PAM: LWW. RM: KYQ. CN and MCN: 3640 kc. CPN: 3880 kc. CEN: 29,580 kc. EOB is active again on CN and renewed ORS appointment. New Novices at ARRL Hq. include CIE, CIJ, CIM, and CLC among the YLs and CIH and CKZ among the OMs. UGG is at M.I.T. as a freshman, while his Dad, UJG, continues to work on 144 and 220 Mc. LIG again furnishes information on the Fairfield County gang, which is much appreciated by your SCM. WML and YVP are Bridgeport firemen. UKY seeks QSOs on 160 meters. ZLJ now is General Class on 40 and 80 meters. UAD moved to Devon and TYT to Woodmont.

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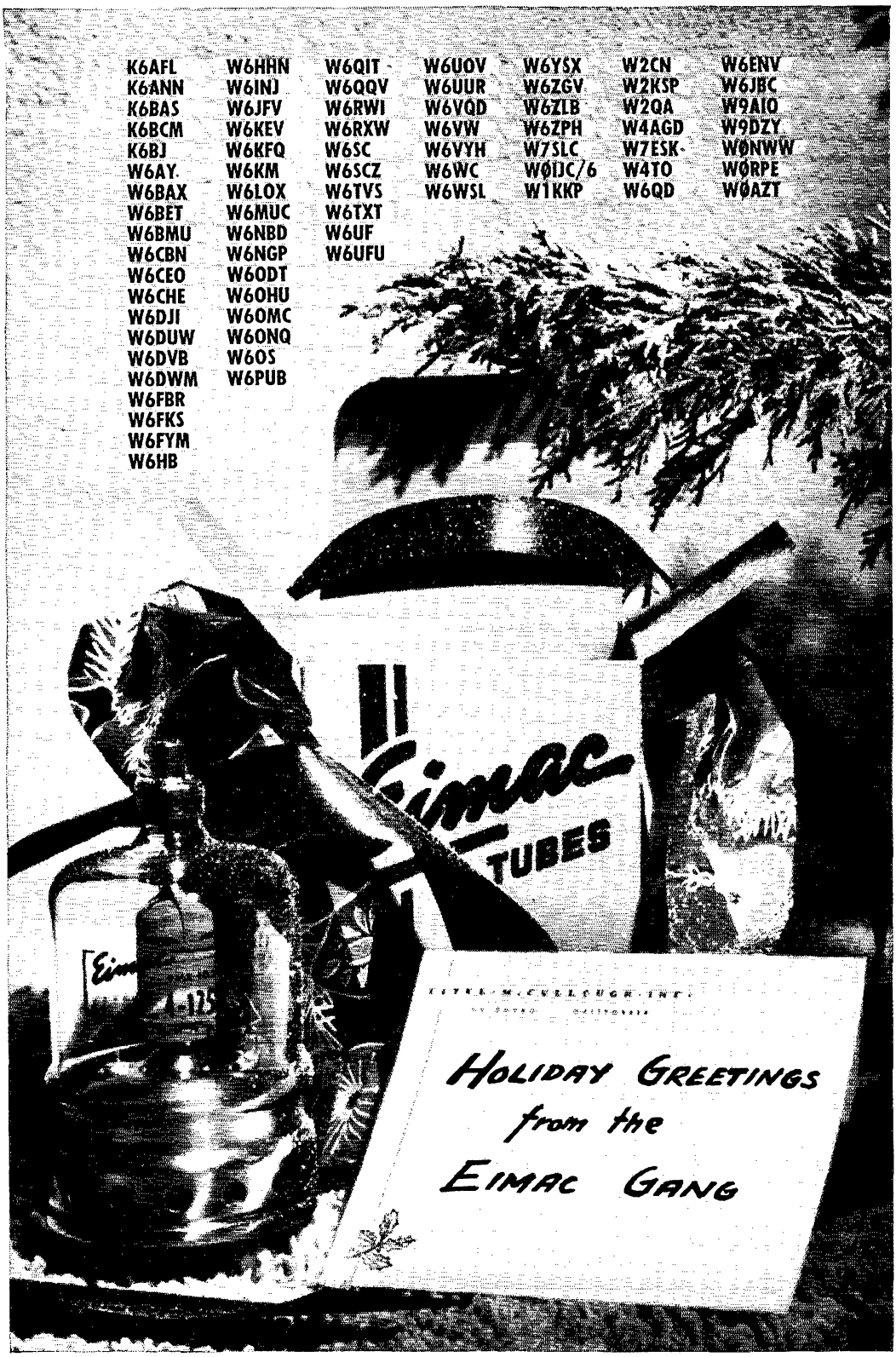
K6AFL
K6ANN
K6BAS
K6BCM
K6BJ
W6AY
W6BAX
W6BET
W6BMU
W6CBN
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W6CHE
W6DJI
W6DUW
W6DVB
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W6JFV
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W6MUC
W6NBD
W6NGP
W6ODT
W6OHU
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W7ESK
W4TO
W6QD
W6ENV
W6JBC
W9AIO
W9DZY
WØNWW
WØRPE
WØAZT
Eimac
TUBES
HOLIDAY GREETINGS
from the
EIMAC GANG

RMZ is active mobile on 2, 10, 20, and 75 meters. SJO was washed out by Hurricane Carol. KML has 250 watts on 20 and 40 meters. VJG lost his beam to Hurricane Edna. Ten-meter mobile operators from Connecticut gathered at Bridgeport Sept. 30th to exchange ideas with a similar group at Port Jefferson, L. I. YQR is gaining fame on the faculty of the U. of Bridgeport. NFG reports on c.d. activity in the Hamden–New Haven Area. BGP worked G5DQ with 10 watts on 40 meters and reports fine participation by Stratford hams during the hurricanes. YAZ, ZTY, ZZU, and ZNU are now General Class. FYG reports on Meriden hurricane activities. TZP went off to M.I.T. after completing the new receiver. NLM renewed EC and ORS and ABZ renewed EC appointments. LHE hopes to regain his traffic status at the new QTH. YNC has a new antenna and 200 watts on 40 meters. BFS added 10-meter vertical to his antenna farm. MLT is portable at Block Island and usually on 3880 kc. OBS skeds are being kept by GIX and TD regularly. Thanks to all who sent in reports of c.d. and AREC activities during the hurricanes. Activity at WNH has been curtailed for school. The CN/CPN joint meeting on Sept. 25th was very successful. UIZ furnished the only OES report. Connecticut had many participants in the V.H.F. Contest. RAN is a freshman at W.P.I. UIZ worked Ohio, West Virginia, and Kentucky on 2 meters, which gives him 14 states plus VE1. RWD now is completely s.s.b. and praises it highly. Traffic: (Sept.) W1WNH 306, CUH 184, KYQ 156, YBH 139, LIG 116, EFW 100, AW 99, OPZ 67, RGB 60, BVB 55, HYF 44, GIX 32, HUM 32, YYM 31, QJM 23, LV 20, MLT 20, UED 20, KV 15, FTM 12, BDI 11, BFS 4, YNC 3. (Aug.) W1LIG 105, UNG 61, QJM 18, FTM 17, RAN 7.

MAINE — SCM, Bernard Seamon, W1AFT — SEC: BYK. PAM: WRZ. RM: OHT. The Pine Tree Net meets Mon. through Fri. at 7 P.M. on 3562 kc.; the Barnyard Net Mon. through Sat. at 7:30 A.M. and the Sea Gull Net Mon. through Fri. at 5 P.M., both on 3960 kc. Your SCM was very sorry to receive the resignation of BTY as PAM. Your new PAM is WRZ. Hap has had a lot of experience as the founder and chief woodtick of the Barnyard Net. With a bit of help from us he will do a good job on the Sea Gull Net, too. No sooner had Hurricane Carol gone than Edna blew in. The Maine gang was ready for her. BPI, deputy SEC, had all stations alerted and standing by well in advance of Edna's visit. In connection with the above, your SCM has a new chimney. LHA and HZE are going s.s.b., LHA plans to use a gallon. BPI and SDW called on AFT. PTL has returned after mobiling across the U. S. to Seattle. Welcome to WN1CEV, of Augusta. The Boothbay Radio Club's "Hambake" was rained out by the hurricanes. 'Tis rumored that the AMRs will winter in Florida. Your SCM would like to hear from you c.w. operators. Let's have the dope on your station, your activities, etc. Season's Greetings to all. Traffic: W1LKP 158, BPI 109, WTG 72, YYW 45, ZBN 37, UDD 32, BX 28, LYR 25, RSC 17, BTY 16, NIQ 16, BAD 14, NXX 11, VYE 10, AFT 9, LHA 6, SNE 4, UZR 4, VEH 4, EFR 2, FKH 2.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — The following counties make up the Eastern Massachusetts section: Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, and Suffolk. New appointments: ZBD Hudson, WCI Newburyport as ECs; WLW as OO Class IV. Appointments endorsed: IAP Lexington, VYS Weston, IO Danvers, LJT Region 6 of Mass. C.D., BKR Westford, Littleton, Tyngsboro, as ECs; MEG as OPS; BHD as OES; HWE as ORS. TWK is on 2 and 10, BRK is on 2, ALV is on 10, WEW is on 75 meters. AR also has the call AWF. AJU moved to Quincy. OT has TBS-50 mobile. AQI has General Class license. New Novices: CAS Dorchester, CAF Brockton, CDR Lexington. ZOP is new in Framingham. New officers of the El Ray Radio Club are RND, pres.; BOD, vice-pres.; WYX, secy.; ZOY, treas.; CAS, act. mgr.; AQE, chief engineer. WN1BPW is a new ham in Whitman. WGM is secretary of the Wellesley Amateur Radio Society, TKZ. WN1CFF is new in Chelmsford. His father is AMQ and he is on 80-meter c.w. The South Shore Radio Club held its first regular meeting with a talk by WK. Meetings are held the 1st and 3rd Fri. at the Quincy YMCA. SZV is secretary. ALP has a Viking II transmitter. The following Beverly hams helped out during our two hurricanes on 144-Mc. mobile: NF, GGV, TYP, LIU, DWY, TAD, NAR, and JPS. BND is on with an Elmac AF-67. VMD is having trouble with the rig. YAL, formerly of Needham, now is K4ABL in Virginia. 2OLH wants skeds with Barnstable, Dukes, and Nantucket Counties for his WANE certificate. New officers of the Framingham Radio Club are SQY, pres.; HJP, vice-pres.; WLJ, secy.; ZEN, treas.; MHC, act. mgr. Members on mobile during the storms: MEG, WPW, QQW, WMT, LPM, and RVA. MEG has a new NC-183D. Among those active during the second storm were MHC, SQY, WLJ, JUL, SRG, and MQU. LQQ, Hamilton EC, was on with TIN and YLQ mobile. AVY/1 and WKM handled lots of traffic during the storms. SS and UPZ kept the press informed of the course of the storms. WPW/m has a Gonset Commander and a Super Six on 10 and 75 meters. QLT has a new QTH in Quisset. UBC is going back to W.P.I. CTR visited his old club at Framingham. Radio Amateur Open House met at the Cambridge YMCA and Mr. Doorakian, of the FCC,

(Continued on page 94)

MALLORY HAM BULLETIN

How a peanut can "knock out" an Electrolytic Capacitor . . . . . .

Believe it or not, a salted peanut is one of the worst enemies of electrolytic capacitors. Just a few grains of salt on an assembler's hand—left over from a mid-afternoon snack of peanuts—would be enough to ruin a whole production lot of capacitors.

Mallory engineers, investigating potential sources of trouble in the manufacture of electrolytics, have found that extreme care must be exercised to avoid any contamination by chloride salts. Only *one part in a million* of chlorides is enough to shorten the life of a capacitor seriously. Not only the salt from peanuts, but even the traces of chlorides present in a worker's fingerprint must be strictly eliminated from chance introduction into the manufacturing operations.

As a matter of fact, the making of Mallory electrolytics demands far cleaner working conditions than you would find in a hospital. All employees in Mallory's capacitor plant are *not permitted* to handle or even touch capacitor raw materials or capacitor cartridges with their bare hands. They use rubber or cotton gloves which are regularly cleaned and changed, to avoid possible contamination. And they observe what may seem to the casual visitor to be extreme precautions in every phase of assembly.

The result of this full-time vigilance on the production line is exceptionally *high* standards of life and performance of Mallory capacitors in their intended service. On a great many small details such as these is built the reputation that Mallory electrolytics have gained in years of use by radio experimenters, service men and electronic manufacturers.

Whether you buy electrolytic capacitors for your own radio gear . . . or whether you buy for someone else . . . you can be sure of this:

NO OTHER ELECTROLYTIC CAPACITOR IS MADE WITH GREATER CARE THAN MALLORY ELECTROLYTICS

In addition to the highest standard of purity, Mallory capacitors also give you the exclusive Fabricated Plate anode construction, which permits 475 volt operation at 85° C. without derating. Serious amateur experimenters find it pays to specify Mallory every time they need electrolytics. Your local Mallory distributor carries a complete stock and can give you prompt service.

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was the speaker, with music by QIU and his XYL. TON was chairman. WLZ is on 40 and 80 meters. The Satuit Amateur Radio Club of Scituate and the Wayland Radio Club are now affiliated with the ARRL. CCL is living in Pembroke. HWE has been very ill again. 7SAB/1 has a 522 ready to go on 2 meters. LN, Radio Officer for Danvers, reports the following were mobile on 2 meters during the storm: EMN, HVN, IO, LN, NUH, PIM, WMM, VVY. With a 522 in the Public Works Hq. and a gas generator to act as NCS, YQF operated this station. AVY reports the following helped out during storms: WGN, CTZ, LAZ, HPH, TZU, BMQ, UID, ZPE, WU, AWH, MHN, AGG, AEN, OH. Jerry Mullen, and Edgar Connor. 2VNG/1 has a rig in the car on 75 meters. LLY, Arlington EC, reports LXR, THO, WBX, LLY, CTW, OEX, and AUQ helped out during the storm. Mobile on 6 meters were BAQ, CTW, FWQ, LLY, LXR, NBI, THO, VCZ, WYC, and WBX. IAP, Lexington EC, reports WQH, ADP, AGN, PIU, TLD, WAE, TWG, SNR, PEX, MSF, ZPY, and ZNG were active during the storm. RSY, Bedford, reports YFP, ZSG, ZHN, TCG, NAD, SAP, NDI, OG, UHV, VGC, DTA, and ACE were on during the storms. ALP, Quincy EC, reports that IA was on the air at City Hall during the storms and ZWQ, YJG, HGJ, ACB, WFQ, WLV, WK, VJC, and YYE were in touch with all of the towns that were on. MSH, Winthrop, kept all the nets up to date on the weather reports from Logan airport. TOI moved to Readville. BB, Winthrop EC, says these hams were on helping out: MQB, DJ, CMW, OIR, OUC, HFJ/M, BB, BDU, AGB/M, BOX, TTH, PBX. The Falmouth Radio Club held a meeting. NFE moved to Foxboro. DVS has a B&W 400 transmitter. The Club has started a training course for newcomers with LYN, DVS, and TJW helping out. Traffic: (Sept.) W1AVY/1 609, UKO 337, LYL 261, WKM 200, EPE 40, QPU 32, SS 32, WPW 20, BY 17, QLT 16, TY 8, WAI 7, UBC 6, WU 6, BB 4, CTR 2. (Aug). W1QPU 30, CTR 10.

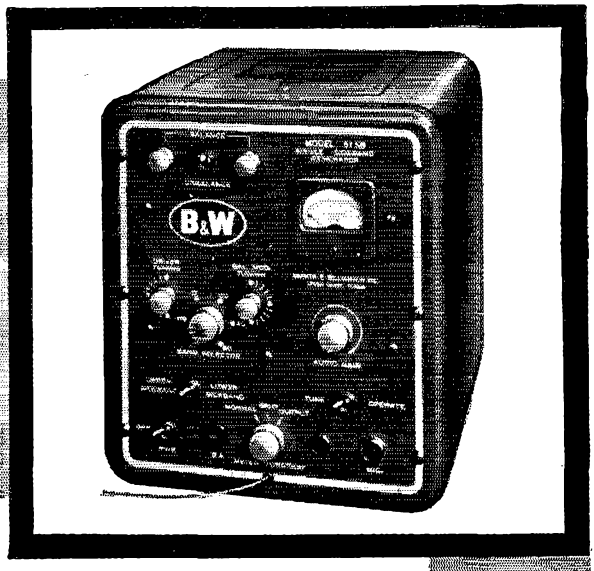
WESTERN MASSACHUSETTS — SCM, Roger E. Corey, W1JYH — RM: BVR. WMN meets at 7 P.M. EST Mon. through Fri. on 3560 kc. Western Massachusetts is made up of the following counties: Berkshire, Franklin, Hampden, Hampshire, and Worcester. All others are in the Eastern Massachusetts section. The Northbridge High Radio Club, ZPJ, is on the air from its new location with an HQ-140 and a Navy surplus ATD transmitter. BDV is trustee and YHU is chief student operator. WEU is a student in his first year at Emerson College. DBM and ICP gave the ARRL TVI talk and demonstration for the Hampden County Radio Club. FWJ has moved to Agawam from Pittsfield as has BXB from New Jersey. 5TPZ/1 is stationed at Fort Devens and makes his home in Groton. YXV is up to 30 countries and picked up HB1MX/HE for a goody on 40-meter c.w. BVR, MKD, AGM, and MNG report their AREC organizations were alerted during Hurricane Edna. JRA expects to broadcast the Official Bulletins on tape this season. Watch later columns for schedules. UKR attended the YLRL picnic at Shenendoah National Park. JYH is now the proud owner of a Collins 310B exciter. The s.s.b. gang is growing daily, with KK, WJ, LFI, CGY, QWJ, TTL, JYH, and BBT active on 75 meters. QWJ is having good luck with a single 4/125A on 20 meters. ABD is a new ORS appointee. AVK is getting world-wide SO reports with his new three-element 20-meter beam. RDR is now in his new QTH but finds that building a house single-handed limits his on-the-air time. KFV has WANE and Worked Vermont awards. TTL has a new Johnson Ranger and an HRO-7. Traffic: W1UKR 329, K2CBD/1 168, W1BVR 130, TVJ 80, WCG 76, SRM 66, MNG 45, RR 38, HRV 25, ABD 23, WCC 21, TAY 20, YXV 19, JRA 15, TZA 9, JYH 7, WEF 7, UVI 4, OBQ 1.

NEW HAMPSHIRE — SCM, Carroll A. Currier, W1GMH — SEC: BXU. RM: CRW. PAM: AXL. Asst. RM: TBS. Your SCM now has a new QTH on the same street but at No. 1531. The question of the day is, how did you survive the Hurricane Edna? The New Hampshire boys in the various emergency nets went into action early in the morning and worked diligently until the emergency was declared over. Almost every city and hamlet was represented and a great job was done by all. WUU has a 500-watt rig with 813s on the air. SGD has new 10-meter beam. YVK is much interested in verticals and has them in use. Those in the first group of Novices examined by the Manchester Radio Club were successful in getting their licenses. KYG and his XYL, QJY, are back in Manchester and are renewing old acquaintances on the air. QJX and her OM had a fine trip to Nova Scotia. Many old-timers will miss HXE, who has passed on to Silent Keys. He sure liked 2 meters and was always ready for a ragchew. Our sympathy to his family. I wish the new SCM all the best, and many thanks for your response during my term. Traffic: (Sept.) W1CDX 110, COC 90, WUU 74, GMH 55, FZ 10. (Aug.) W1COC 35, QGU 7.

VERMONT — SCM, Robert L. Scott, W1RNA — SEC: SIO. PAM: RPR. RM: OAK. Nets: 'Phone GMN, 3860 kc., Mon. through Fri., 1200-1300; VTPN, Sun., 3860 kc. at 0930. VTN, 3520 kc., Mon. through Fri., 1900; c.d., alternate Sun. 1000 hours, on 3993 and 3501.5 kc. NLO's XYL, Helen, now is WN1CKO. BJP's shack is now off the kitchen. Fellows taking part in the c.d. aviation test received letters

(Continued on page 96)

HERE'S YOUR KEY TO SSB



Single Sideband Generator

FOR B & W'S MODEL 5100 TRANSMITTER

Single sideband transmission, with its superior effectiveness over AM and its elimination of heterodyne interference, is yours with B&W's new Single Sideband Generator, Model 51SB. Used with the B&W Model 5100 Transmitter, this generator offers you:

- **SSB bandswitching operation on 80, 40, 20, 15, 11, and 10 meters**
- **150 watts peak input on SSB and CW, 135 watts on AM phone**
- **VFO or crystal control on AM, CW, and SSB**
- **Voice control operation on SSB**
- **Speaker-deactivating circuit**
- **Completely self-contained — except microphone**
- **Simple to install**
- **No test equipment required for installation or operation**

The Model 51SB Single Sideband Generator converts a B&W Model 5100 into a band-switching single-sideband suppressed-carrier transmitter—with all the advantages of SSB plus the AM and CW features already built into your Model 5100. Its construction is completely unitized. Equipment removes easily and disassembles into three major sub-assemblies: the R-F Unit, the Audio Unit, and the Main Chassis Unit.

Factory wired and tested, the 51SB comes to you complete with tubes—all set to convert your Model 5100 Transmitter to SSB. This combination provides a superlative driver for *any* high-powered linear amplifier! Write for descriptive Bulletin 51SB.

Information regarding the application of the Model 51SB Single Sideband Generator to other composite transmitters having certain required characteristics will be made available in the near future. Send name and address for Bulletin SBC.

B&W BARKER & WILLIAMSON, Inc.

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of appreciation from Governor Emerson for their contribution of personal time and use of the station. Stations reporting traffic are a very small minority of those heard. Those interested in AREC, please contact your local EC or the SEC, SIO. Traffic: W1RNA 129, OAK 126, SIO 124, AVP 90, VZE 26, VVO 22, IT 12.

NORTHWESTERN DIVISION

ALASKA — SCM, Dave A. Fulton, KL7AGU — PDC is leaving the Territory and soon will be back in W1-Land. Kodiak reports a new Novice, WL7BGD, and he is looking for contacts on the 40- and 80-meter Novice bands. ALJ is back in Kodiak and should be on the air soon with a Viking. BCP is looking for an Anchorage and Fairbanks traffic outlet, 'phone or c.w. How about it, some of you c.w. experts? We could use a good c.w. net in the Territory. The Kodiak Amateur Radio Club is setting up a Novice station for the Novice members of the Club. DG is busy working on a homesite in Kodiak. He says it is an ideal spot for a radio station. A sharp earthquake at 1:18 A.M. Oct. 3rd shook a lot of Anchorage hams out of bed, judging by the activity on the 75-meter band at about 1:30 A.M. Damage and casualties were light so there was no emergency, but the gang was there just in case. AWR and AYZ arranged for the air rescue of a Nunivak woman via ham radio.

IDAHO — SCM, Alan K. Ross, W7IWU — Emmett: TYG is now editor of the *Hambone*, official organ of the FARM Net. Five Net Controls were chosen, one for each night of the week. MKS remains as Net Mgr. Sessions are at 6:30 P.M. MST now. Rupert: VJL has applied for membership in the AREC. Lewiston: IFG built a Heathkit VFO. TLV is driving a new Buick with Morrow converter and Elmac transmitter installed therein. OWA attended a ham picnic in Walla Walla. AOO took the Elmac and NC-57 with him on a mountain vacation trip. CTT is working at Atomic Works, Hanford, Wash. IDZ has to resign from the EC post for the time being. Kellogg: RQG is a new OBS. PTI had to resign as EC because he is attending school in Oregon. Boise: It's very lonesome on the GEM Net (c.w.), 3638 kc., Mon., Wed., and Fri., at 8:00 P.M. MST. All the rest of you appointees, please drop me a line. Traffic: W7NH 154, RQG 84.

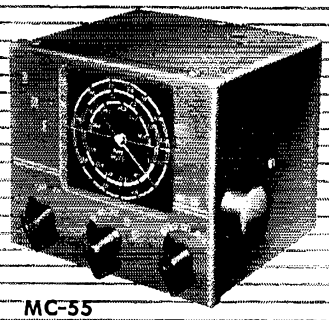
MONTANA — SCM, Leslie E. Crouter, W7CT — New officers of the Harlo Radio Club of Harlowton are TGL, pres.; INM, vice-pres.; OOY, secy.-treas.; and NPV, acting mgr. OOY and NPV contacted Kurt Carlson on the *Flying Enterprise II*. RDM operates mobile only. TTC is modulating an 807. LBK and KGJ keep busy with TV servicing. The Montana State C.W. Net meets every Tue.; Thurs.; and Sun. at 1900 MST on 3520 kc. The Montana 'Phone Net meets every Mon., Wed., and Fri. at 1730 MST on 3910 kc. The FARM Net meets every Mon., Wed., and Fri. at 1900 MST on 3935 kc. The Montana Breakfast Club meets at 0715 MST on 3910 kc. These nets have a purpose. Working with one or more of them helps you to learn how to operate and organize in case of an emergency. You owe it to yourself and to the general public to know what to do when needed. Recent renewals or appointments: KUH as SEC, FUB and LBK as ORS, NPV and LBK as EC. If you are reading this you are interested in what is going on in Montana and we are interested in what you know, so let's have some news. Please send in your activity report. Traffic: W7CT 6, LBK 5.

OREGON — SCM, John M. Carroll, W7BUS — The teen-agers in the Oregon-Washington Area are starting a teen-agers net. Send applications to ULU. UMA is on 20 meters. EDU is moving to Seaside. Cascade Net officers are LRT, mgr.; QWZ, asst. mgr.; HUI, dir.; AEF, asst. dir.; and TWL, secy.-recorder. WAT now is in W7-Land looking for a job. The Oregon Slow Net has been changed to the Oregon State Net. Applications are received for membership by AJN. V1L really is active in the traffic nets. ISP and BSY are new ECs. FUN is a school teacher. VKA is in W8-Land getting a new car. LY is now on active duty with the Navy in New York. WN7WLY is a member of the OARS. The OARA's new officers are QFY, pres.; QWE, veep; RUN, secy.; QEI, treas. VCH and PON sent applications to MARS. CZ is building a new house. RLG is putting a new room on his QTH with the aid of a book on carpentry. The Dipsy Net is becoming active again on 3940 kc. AZP and his house trailer have moved into Eastern Oregon for the hunting season. NFC still is hunting contacts on 6 meters. UQQ is back at the university. Traffic and news notes still reach BUS after the 10th of the month, too late to be in that month's news. Traffic: (Sept.) W7APF 450, WAT 93, AJN 65, TBT 57, THX 44, QEI 20, PRA 15, ESJ 12, EDU 8, PHJ 8. (Aug.) W7THX 39, PHJ 16, WAT 11, KTL 6, ESJ 3.

WASHINGTON — SCM, Victor S. Gish, W7FIX — FWD and FWR celebrated their Golden Wedding Anniversary on Sept. 14th and received a flood of congratulations from their host of friends, both by mail and on the air. OE is rebuilding the shack and gear for the traffic season. RXH took over as WSN Manager on Armistice Day. UQY submitted an OO report and an imposing list of 40-meter DX with all Grahamland stations worked. CZY mobiled through Glacier, Yellowstone, and Teton Parks. ETO made two vacation trips but now is back home ready for traffic. V.h.f.

(*Continued on page 100*)

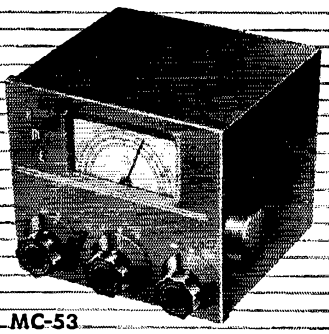
USE RME FOR BETTER QSO'S *Coming and Going!*



MC-55

MC-55 FIVE BAND MOBILE CONVERTER

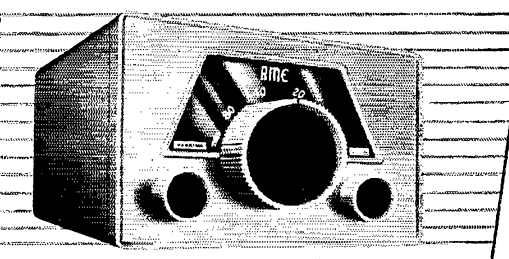
For 10, 15, 20, 40 and 80 meters. 1.25 micro-volt sensitivity on all bands. Edge-lighted dial. 25-to-1 worm gear tuning. ANL. Transmit-receive switch. Three gang tuning capacitor. Individual coils for each band. Aperiodic i.f. stage aids in providing high-gain characteristic. Input impedance 50-72 ohms. Output frequency 1550 kc. 150-180 v. at 18 ma. 6 or 12-volt operation. Tube lineup: 6BJ6 r.f. amp; 12AT7 osc-det; 6BJ6 i.f. amp; 6AL5 noise limiter. Dark gray. Size: 4⅛" high, 5¾" wide, 5¼" deep. Shpg. wt. 7 lbs. **Amateur Net**.....**$69.50**



MC-53

MC-53 VHF THREE BAND MOBILE CONVERTER

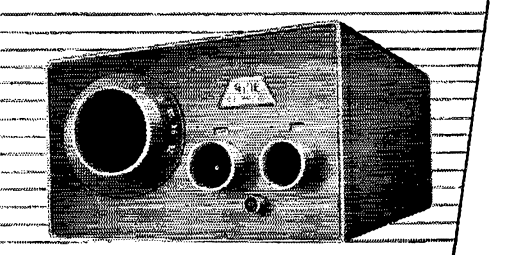
Designed for 2, 6 and 10-11 meters. 1.25 micro-volt sensitivity on all bands. 25-to-1 worm gear tuning. Individual coils for each band and each circuit. Three gang tuning. Aperiodic i.f. stage aids in providing high gain characteristic. Separate input connectors for each band. Send-receive switch. ANL. VR provides excellent stability. 6-volt operation. 150-180 v. at 25 ma. Output frequency 1550 kc. 6AK5 r.f. amplifier; 12AT7 osc-det; 6BJ6 i.f.; 6AL5 limiter and OB2 voltage regulator. Gray enamel. Size: 5¾" wide, 4⅛" high, 5¼" deep. Shpg. wt. 7 lbs.
Amateur Net.....**$66.60**



DB-23

DB-23 PRESELECTOR

Substantially improves the performance of any receiver. Three 6J6 twin triodes as neutralized push-pull stages in combination of selective and wide band r.f. amplifiers. Minimum gain of 20 db all ham bands from 3.5 to 30 mc with substantial image rejection. Signal-to-noise improvement can be as much as 7.5 db over the receiver itself. Permits optimum use of mechanical, crystal or audio filters. Input circuits match standard type antenna. Set band and adjust peaking control. With power supply. Blue-gray. Size: 5" high, 7⅝" wide, 6" deep. Shpg. wt. 8 lbs. **Amateur Net**. **$49.50**



RME-100

RME 100 SPEECH CLIPPER

Peak limiting pre-amplifier provides higher articulation and intelligibility to combat QRM and QRN. Ideal for use with Johnson Viking, Collins 32V and all ham-built equipment. Clipping level adjustable from 3-20db. Pi low-pass filter provides high suppression of generated harmonics above 3000 cps, concentrating voice power to most effective band of frequencies. Response 200-3000 cps. If set to provide 100% modulation, louder speech will not over-modulate. Front panel input for Hi-Z microphone accommodates PTT circuit. Tube lineup: 6SC7, 6H6 and 6X5GT rectifier. With power supply in blue-gray steel cabinet. Size: 5" high, 7⅝" wide, 6" deep. Shpg. wt. 9 lbs. **Amateur Net**.....**$39.50**

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Do you have your
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Handy, complete DX information computer. *Amateur Net*, $1.00

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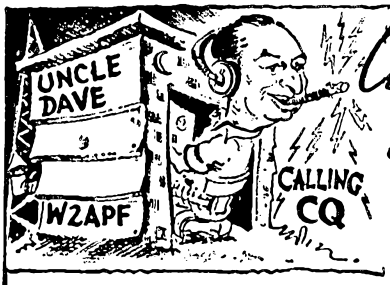
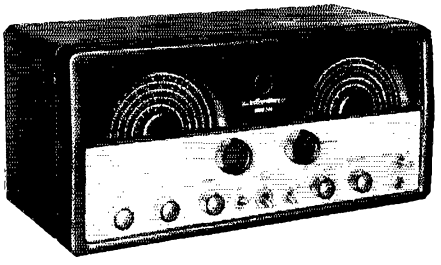


Uncledave sez — "hallicrafters is by far-the-best for Hams"

I've been in business since 1921 and a Hallicrafters communications distributor since "way back when". I've been a ham for over 33 years — W2APF — and know it's items like the new SX88 that keep Hallicrafters leading in reputation with hams.

SX88 receiver — a new peak of perfection! Full precision gear drive for main and band spread tuning. Six position Band Width Control (selectivity) from 250 cycles to 10 kc. Exhalted B.F.O. for tops in single sideband reception. Full frequency coverage from 535 kc to 33.3 mc. Plus more than 20 other features. $595.00 Speaker, $19.95 extra.



S–85 receiver with over 1000 degrees of calibrated bandspread. Newly designed and engineered Hallicrafters with 10, 11, 15, 20, 40 and 80 meter amateur bands calibrated on easy-to-read dial. One r-f, two i-f and separate bandspread tuning condenser. Covers three S/W bands 1680kc–34mc. Built-in speaker. $119.95

HT–30 — new V.F.O. exciter/transmitter with full band switching. At your finger tips S.S.B., AM or CW with carrier frequency stability .009% or better. Built-in voice control and 50 watts S.S.B. peak envelope power output. Stable 50 kc filter system for side band selection. $349.95

SX–96 high frequency oscillator temperature compensated. Dual crystal controlled second conversion oscillator for side band selection on AM or S.S.B. $249.95. Speaker $19.95

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Wow, only a few weeks till Christmas, and Uncledave will don the white whiskers again. Here's a tip for all you hams – if you want to give ham equipment for gifts, call Uncledave, W2APF and he'll help solve your gift problems (or any problems for that matter).

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Single sideband equipment

20A $199.50 k
249.50 w/t

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Slicer 49.50 k
74.50 w/t

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QT–1 Trip
12.50 w/t

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VFO for 20A
Surplus converted
62.50

GONSET COMMUNICATOR

2-Meter
Transmitter Receiver

Model 3026 **$209.50**

Model 3025 **$229.50**

Operates from either 115-Volt AC or 6-Volt DC source.

JOHNSON VIKING II

$279.50

(In Stock)

Kit, complete with tubes—less crystal, key and mike.

Wired and Tested, $337.50

JOHNSON RANGER

$179.50 $258.
kit l.t. w/t l.t.
TUBES extra, $23.

ACCESSORIES

Matchbox	$49.85
VFO Kit	42.75
VFO w/t	62.50

PARTIAL LIST OF USED EQUIPMENT

Surplus CBY 52208 transmitter	$ 25.00
National SW3 Rec. complete	20.00
Thordarson 100 W. transmitter C.W.	75.00
RME DM30X	25.00
Lafayette UHF Converter (6-1e-11-15)	35.00
MM-1 Micro Match	27.95
(3) Tri-Band Gonset Converters ea.	30.00
Noise Clippers ea.	5.00
(2) Gonset transmitters Converters ea.	30.00
National 5886 power supplies, new ea.	25.00
National HR07 w/4 coils/power supply/speaker	275.00
Eldico TR75 transmitter	50.00
Motorola T69.20A transmitter	50.00
Motorola MT30M – 10 meter complete	150.00
National HR060 complete	450.00
Lysco 600, new condition	115.00
Millen 90800	25.00
Hallicrafter S41G	25.00
WRL Globe Trotter transmitter	65.00
Collins 32V2 transmitter	450.00
Collins 32V1 transmitter	395.00
RME GF10/20	75.00
BC 221–M Freq. Meter	125.00
Sonar MB611	25.00
Hallicrafter SX42 w/R42 speaker	70.00
National NC125 w/speaker	125.00
HQ129X Hammarlund w/speaker	195.00
Gonset super 6 converter (like new)	40.00

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Collins 32V-3 Transmitter

$775

VFO Controlled, Bandswitching, Gangtuned. Covers 80, 40, 20, 15, 11 and 10 meters; 150 watts CW; 120 watts phone; entire RF section enclosed in metal shield. (In Stock)

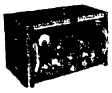
COLLINS 75A-3 RECEIVER **$550**
With Mechanical Filter and Speaker

Folded dipole amateur antennas 300 ohm (kilowatt cable) each cut to band length 75 ft. lead-in.

10 meter 28 mc, 20 ft.	$3.00
20 meter 14 mc, 36 ft.	4.50
40 meter 7 mc, 68 ft.	5.85
80 meter 3.5 mc, 134	8.45

SONAR SRT 120 TRANSMITTERS

All bands 120 w. CW, 100 w. phone



Switches in all six bands. TVI suppressed, with 10 tubes.

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Trans-Citer

$177.00 Net

PMR 6A.....$135.00
PSR 6..... 24.50
6 or 12 V power supply

ANTENNA ROTATOR SPECIAL

Will hold up to 200 lbs.

$26.95

Complete with 100 ft. 4 Cond. Control Cable

HAMMARLUND HQ140–X

with spkr..$279.50

TELREX 520 BEAM

$55.00

Also other Beams

CABLE SPECIALS

4 cond. rotor	per 100'	$2.50
RG 59/U 6c ft.	per 100'	4.00
RG 58/U 6c ft.	per 100'	4.00
RG 8/U 14c ft.	per 100'	9.00
Kilowatt twin lead, clear poly insulated. 12 ga. cond. 9c ft.	100'	5.00

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904 BROADWAY, ALBANY, N. Y.
TELEPHONE ALBANY 5-1594

(Continued from page 96)

activity is on the upswing in the section after an interesting talk by 1HDQ. The Spokane Amateur Radio Club meets the 1st and 3rd Tue. of each month at Manito Park. Officers are GBU, pres.; EHH, vice-pres.; PCV, secy.-treas. The Clark County Amateur Radio Club (Vancouver) meets the 1st and 3rd Wed. in the Red Cross Bldg., 1310 East 10th, Vancouver. Officers: SAP, pres.; LVH, secy.; KJN, treas. The Sound Traffic Net resumed operation Oct. 1st on 28.6 Mc. at 1900 PST and will meet Mon., Wed., and Fri. for the time being. JPH is on 75-meter mobile. SFN is building a modulator for the big rig. WSN reopened the 1988-kw. c.w. section Oct. 11th, 1930 PST Mon. through Fri. The WARTS meets on 3970 kc. at 1800 PST daily. BA put "torque guys" on his 95-ft. tower with the 130-lb. beam on top. CBE is about ready for RTTY. PHO has a new beam on 20 meters. 4ESK now is 7ESK. TIQ is installing a new antenna. TGO has a vertical for 20 and 40 meters. HKA has orders from the doctor to take a rest from radio. BG's big antenna is down. AMC has been hunting and rebuilding the house. HDT is preparing the RACES plan for Asotin County. FM is on 20-meter mobile. KKY moved to Idaho. The Walla Walla Valley Radio Amateur Club, Inc., reports the club house is practically finished. Club officers are GVC, pres.; RCS, vice-pres.; NSU, secy.-treas. and the Club meets Mon. at the club house off Milton Highway 3 miles southeast of Walla Walla. The Valley Amateur Radio Club, Inc., meets the 1st and 3rd Fri. at Puyallup Memorial Bldg. on Meridian North. Officers: JJK, pres.; MCU, vice-pres.; OEB, secy.; UZE, TGO, sgt.-at-arms; HMQ, pub. Traffic: (Sept.) W7BA 1151, PGY 844, SFN 556, FRU 531, USO 156, HKA 126, OE 85, FIX 50, OEB 46, RXH 46, FWD 40, ZU 39, AIB 37, TGO 33, VCF 26, APS 15, JEY 11, KT 8, AMC 5, BG 3, TIQ 1. (Aug.) W7RXH 55, ETO 9.

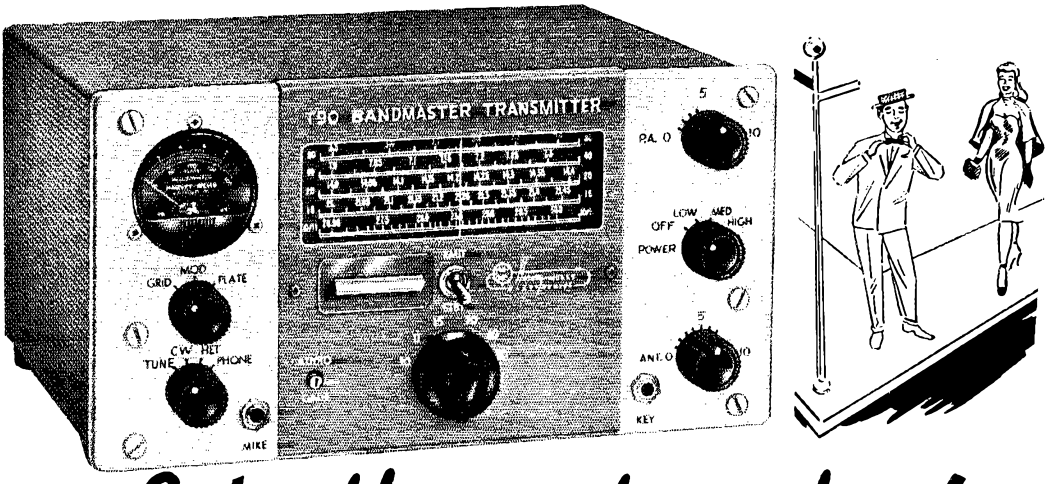
PACIFIC DIVISION

NEVADA — SCM, Ray T. Warner, W7JU — ECs: PEW, TJY, ZT. OPSs: JUO, UPS. ORSs: MVP, PEW, VIU. OBS: BVZ. PEW is the newly-appointed EC for Elko County. LGS, of Boulder City, has settled down in Reno. JLN is active again with an ART-13 from his Paradise Valley ranch. HJ's daughter received the call SNP. As Nevada's only active YL, she should be popular. 6QHL now is 7WTR. RSY, of Las Vegas, handled emergency CAA flight traffic when a long lines telephone cable was broken recently. K7FDB makes BPL again with a traffic count of 721. KOA resigned as EC but remains an active Emergency Corps member. The Southern Nevada Amateur Radio Club (SNARC) held its annual picnic at Mount Charleston this year. It was well attended by members and their families. Traffic: K7FDB 721, W7JU 11, BVZ 3, VIU 3.

SANTA CLARA VALLEY — SCM, Roy I. Couzin, W6LZL — Well, fellows, this is my last report and I wish to take the opportunity to say I have enjoyed working with you and I hope the many friends I have made during my two terms as SCM will keep in contact with me. It is with regret that I give up the job, but I honestly believe WGO, your new SCM, will do a real job if you will give him the kind of support he needs to put the section on the map. I want to thank the ever-faithful gang who made a real effort to get an activity report to me the first of the month, also the clubs who sent their papers or notices to me for meeting information. I hope you go right on sending these to your new SCM as he will appreciate them also. HC has been elected a chairman of the Pacific Area Staff (PAS), and also has been appointed director and asst. mgr. of TCC. EXX reports the new 144-Mc. rig is almost complete and he is designing equipment for 50 and 420 Mc. and rebuilding a low-frequency rig. YHM is back from KL7-Land. He got in some air time while up north and operated from a helicopter. Best DX was a G5 on 7 Mc., 25 watts c.w. WLI reports participation in the F.M.T., and that he received his 25-w.p.m. sticker. BAM reports Europe and Africa are needed for WAC and 5 more states are needed for WAS. MMG reports he was active on 144 Mc. on Mt. San Bruno during the V.H.F. Contest. The SCCARA put up a booth at the Santa Clara County Fair. It was well planned and the help needed to set up the booth and man it was offered, but the booth was so far set aside from the main center of interest very few people saw it. Traffic: W6UTV 150, YHM 94, HC 64, K6BAM 28, BBD 8, W6MMG 5.

EAST BAY — SCM, Guy Black, W6RLB — Asst. SCMs: MXQ for v.h.f. activity and RVC for TVI work. RMs: IPW, JOH. PAM: LL. ECs: CAN, CX, FLT, QDE, TCU, ZZF, and the newest, K6ERR, who handles the Berkeley-Albany-El Cerrito Area. Les also is a new OES. QZE represented the Walnut Creek Area, and RTA was Acting Emergency Coördinator for the Oakland Radio Club, assisted by DDT, UTX, K6AUD, and K6CCQ, during the Simulated Emergency Test. The Vallejo gang operated under ZZF, and CAN represented Napa. The gang up that way furnished communication to the Silver Lake Boy Scout camp during the summer. ATM, ZZF, DTB, QEA, and IZU kept skeds with NQJ, LRT, and LL to let the boys keep in touch with home. The Vallejo gang did a swell job of furnishing communications at the Mare Island Centennial celebration. TWH is a new Emergency Corps member in Brentwood. JKW has joined in Centerville. BXE is new

Continued on page 102)



Worth waiting for!

THE *Harvey*-WELLS T-90 SUPER BANDMASTER

This midget with the mighty punch is truly a fine piece of engineering. Our field and laboratory tests have indicated even better performance than might be expected from its power range. Here in one small package (only 12⅜" x 10½" x 6¾") is a complete 90 watt band-switching transmitter for fixed or mobile operation incorporating more features per cubic inch than ever before offered at such a low price. In design, and in construction, the T-90 has "built-in" provisions for versatile adaptability in meeting most existing conditions of power source, antennas and other coordinated equipment. For example, filaments may be operated with either 6 or 12 volts input simply by proper wiring of the power input plug. A built-in low voltage D.C. relay is wired for antenna change-over; push-to-talk and receiver muting; and an efficient pi Network with a very flexible antenna loading circuit puts out the power and allows tuning out of considerable antenna reactance.

Other features include:

- TVI Suppression
- Complete break-in keying or keying of exciter stages only
- VFO tuning without carrier on
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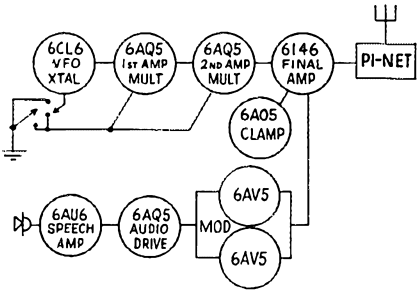
- VFO voltage regulated and temperature compensated — VFO completely shielded
- Crystal access door on front panel
- Illuminated dial and meter
- Internal switch provided for either carbon or crystal and high impedance dynamic microphone
- Power supplies available for both fixed and mobile operation
- Price only **$179.50*** completely built and tested and with tubes

For more complete information, request Bulletin HW 456 and HW 457



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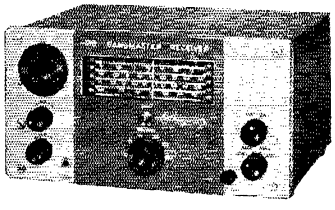
9 tubes — double conversion — packed with performance. Same size as T-90 transmitter — together they make a complete station in only one cubic foot.

Price **$149.50***



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MORSE CODE

I could fill pages with the story of the excellence of Morse code in communications. Especially with the new equipment we are building as a result of my conferences in England and Northern Europe this past year. We have a perforator which is as rugged in construction and dependable in operation as any good typewriter. We have a keying head which is so simple and dependable as to require practically no maintenance.

We have a Morse printer which will accept dots and dashes of the Morse code and deliver typewritten copy. This printer will loaf along at 120 words per minute on very poor circuits whereas ordinary teleprinters employing five unit code require good circuits and operate normally about 60 words per minute. All of this equipment, available here in Littleton, is sure to bring about a more widespread use of Morse code.

We have devised methods and equipment for teaching Morse code faster than had ever been thought possible. The methods are the result of a lifetime of experience of fine telegraph and wireless operators. The student will receive words and sentences (on our selection of certain letters of the alphabet for roll No. 1) — within hours, instead of days or weeks.

The equipment is of quality such as used in Government telegraph as well as communications companies employing perforated slip as used throughout the world.

We were the originators of inked slip and photo-tube keyers at the time when there was no other method of providing low cost practice material. Those photo-tube keyers did a good job, but there is no longer any need for them. Our Morse keyboard perforators and our Morse reperforators make it possible to supply Morse perforated slip at a cost *lower* than the inked tapes and you have real commercial communications equipment throughout.

I would be grateful for any comment any of you may be so kind as to make. If you are a beginner we can make of you a good operator fast. If you are now an operator we can make of you a much better operator faster than you had ever dreamed. If you are a very fine operator we can make you still better.

AND FINALLY — We are more interested in developing good Morse operators for this new commercial equipment of ours than we are in any kind of a school job. I do hope, therefore, that schools and clubs will ask me for this information as well as individuals. This is the kind of equipment that will make it possible for you to toss into the junk heap any photo-tube keyers, which at best have been a substitute for the real thing. Write to me, won't you?

McELROY MANUFACTURING CORPORATION
LITTLETON, MASSACHUSETTS
(Ted McElroy)

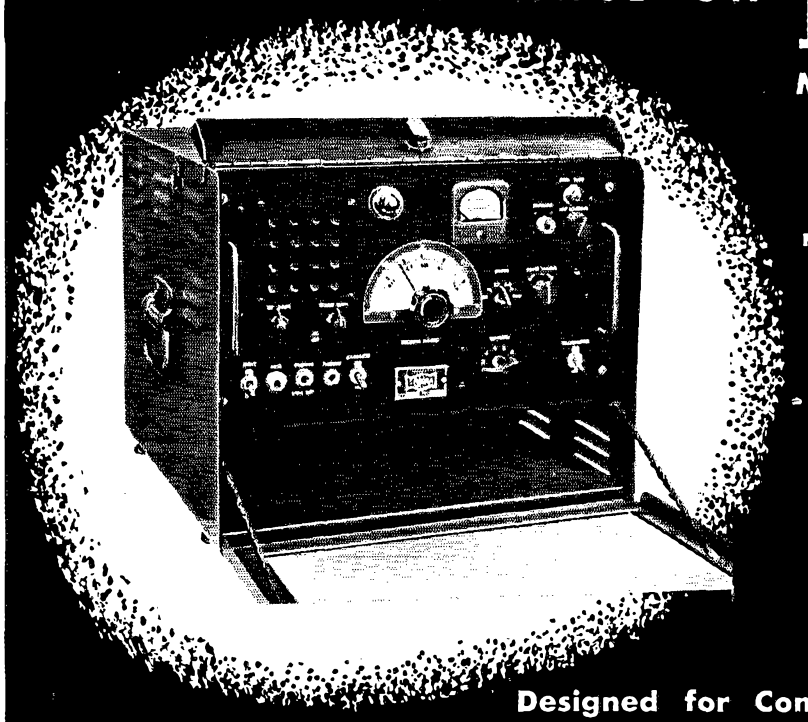
OBS. Listen for him on 3870 kc., Mon., Wed., and Fri. at 0700 and Mon., Wed., and Sat. at 1900. The Central California Radio Council has set up a license plate committee to press for renewal of our temporary privilege. ACN is chairman, with CTH, LOZ, and Mrs. GGC on the committee. A Northern California RTTY Society has been organized and meets the 3rd Thurs. of each month at 909 Fallon Street, Oakland. 1HDQ addressed the Oakland Radio Club when he was out here for the V.H.F. Hamboree. Over 200 attended the Hamboree. K6BAO's "whirling dervish" copped first place in the hidden transmitter hunt, with K6ORR as co-pilot. Not only does BAO have the gadget to end all gadgets on hidden transmitter hunts, but he runs a 4X150A on 420-Mc. mobile, and is well under way in constructing a 420-Mc. repeater station. The team of K6AXN and K6BAT is active on 420-Mc. mobile, and OHQ has talked to Vollmer Peak on 420-Mc. mobile with his plug-in converter for the Gonset Communicator all the way from Auburn and Sacramento. K6DJS and CAX are now General Class. New hams are K6IRB, KN6HRL, KN6HEJ, KN6HTP, and KN6GBZ. AAQ is leaving for the Orient and BDF is going to Seattle. Ex-9UN now is K6GK. W6TWI and K6AUC are putting up verticals. ACM is working up a kw. s.s.s.c. rig. BYD plans to bandswitch with selsyns. BYJ works great DX with only 8 watts. PAZ had a lot of explaining to do when he switched to s.s.s.c. Traffic: (Sept.) K6FDG 1354, BDF 195, W6QPY 175, K6WAY 163, W6EFD 49, JOH 47, AKB 34, HBF 9, LIL 4. (Aug.) K6BDF 163, GK 105, W6EFD 37, ITH 29.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC — SEC: NL. WB was guest speaker at the September meeting of the San Francisco Radio Club and spoke on "Pi Network." The HAMS and the San Francisco Shipyard Club held a joint picnic and all enjoyed a steak dinner. The Naval Shipyard Club invited the XYLs to join them every second meeting night of the month. The Humboldt Radio Club entertained two visiting Japanese hams at its last meeting and in return for their hospitality were shown through the Japanese boat and viewed the radio gear. SLX, from Eureka, attended the Hamboree at San Mateo. The Mobileers will handle communications for the Nevada Days at Carson City as usual this year. The 29ers held its annual breakfast with a good attendance. The Teletype Club held its first breakfast the same Sunday as the 29ers. At the Marin Amateur Radio Club meeting LTC, Larkspur, told of an interesting experience which he had in Korea. PIJ was presented with a medal for 80-meter Field Day loading. K6BU won a 2-meter converter. MIY, Mill Valley, is a new member of the Club. At the SCRA LOU, Santa Rosa, has taken over the job of getting the boys of the Mission Trail Net a meeting place for the get-together next season. ACN reports that up to June 6040 hams have applied for the special plates for mobiles. BYS has resigned as EC. Bill stated that his health would not allow the extra time needed on this assignment. Sorry to lose such a good helper and I would like to take this opportunity of thanking him for a job well done. UOQ has accepted this assignment. Tony Gomes is another good helper. GQA now is using an ART-13. Ten teletypes are almost ready for the airwaves locally. Ed Tilton's 2-meter talk was enjoyed by all. After the Hamboree many attended the dinner in his honor. The Ladies Radio Club in San Francisco started a c.w. round table Thurs. at 1 P.M. All Novices are invited to join in on 3725 kc. IKO got stuck in the Nevada Desert and could hear the boys but had no transmitter mobile. MXV is back to work after an injury. DEK refused the nomination as president of the SFRC because of ill health. ATO and GGC also refused nomination as each had held the office for two terms and thought that was long enough for one man to hold that office. CBE is active on 20- and 40-meter 'phone. Congratulations to SWP, PHT, and QMO on making BPL in September. A surprise c.d. drill in the Bay Area found 2 and 10 meters very active. Amateurs came through with flying colors and news reports showed the drill was very successful. C.d. is looking for more 10-meter mobiles. Traffic: W6SWP 889, PHT 869, QMO 651, GCV 44, GGC 19, MWF 16, GQA 4.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — With the Sacramento Valley Section Meeting coming up we hope to have a great many more appointments in the section so, fellows, come prepared to accept one soon. In the south we have the Sacramento Club doing fine with code classes and c.d. checks. OPY would like to have a general ragchew, or rather a discussion on how to better the traffic and other amateur necessities. This would bring us closer together and our many problems could be ironed out, thereby we probably could come up with something real good. We will sure talk this over during our section meet. ZF still is on low power but gets out very well. K6EDK is in the traffic run and hope he does much better in the coming months. FGW has a vertical and worked AYU, 20 miles away, while New York stations were booming in. 7WAT, ex-6IEO, sends a letter and extends his 73 to all the gang in W6-Land. SBII is keeping his Official Bulletins going out very fine. REF still is doing very fine as net control for the Mission Trail C.W. Net and also has a good traffic count each month. DDC has just returned from a vacation which took in the southern part of the State where he visited a large number of amateurs. K6HTY is a new ham in Mt.

(*Continued on page 104*)

PROVEN PERFORMANCE ON 144-148 MEGACYCLES



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CD-2

DOUBLE CONVERSION RECEIVER

Designed for Continuous Duty.

27 watt input - 17 watt output

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- **8 CRYSTAL CHANNELS**
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- **PLATE MODULATED**
- **ANTENNA INPED.: 32 - 72 OHMS**
- **PROVISIONS FOR COMPLETE REMOTE CONTROL**
- **PUSH-TO-TALK OPERATION**
- **AVAILABLE FOR 6 METERS (CD-6)**

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TERMINAL RADIO CORP.
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VALLEY ELECTRONICS
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VAN SICKLE RADIO
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WORLD RADIO LABS, Inc.
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ZACK RADIO SUPPLY CO.
San Francisco, Calif.
Palo Alto, Calif.

Shasta, Calif. Keep those activity reports coming! Traffic: W6REF 402, MWR 22, JDN 5, K6ED 14.

SAN JOAQUIN VALLEY — SCM, Edward L. Bewley, W6GIW — SEC: EBL. RM: K6BGM. PAMs: ZRJ, WJF. The Stockton Club played host to ATO, who gave a very informative speech. DBH and RRN got a write-up in the Stockton newspaper by saving the life of a critically injured truck driver. GQZ and BCL both achieved a fine score in the V.H.F. Contest, both on 6 and 2 meters. QUE has been appointed by the Stockton Club to give Novice exams, and is being kept quite busy. EXH still is under the doctor's care but is in excellent shape. The Merced Club put on a demonstration of ham radio for the Merced Junior Chamber of Commerce. Those participating were K6DUU, W6BCY, W6ZRJ, W6YWH, and K6BGM. Fixed-station-to-mobile communication was demonstrated, also messages were sent via the National Traffic System. K6EKS is leaving the Air Force and the Merced Area. Ben plans to settle in the Los Angeles Area. K6DUU and W6ZRJ make up the new TVI committee in Merced. KN6HFA received his ticket in September and now reports he has worked 16 states with a Heathkit AT-1. K6NAT is the USNR station at Merced and is looking for traffic on Tue. nights. WJF has a 54-foot mast and 3-wire doublet constructed, and now has the problem of erecting them. Traffic: (Sept.) K6FAE 530, W6ZRJ 500, TTX 126, SJJ 67, FEA 42, WJF 22, EBL 17. (Aug.) K6FAE 508.

ROANOKE DIVISION

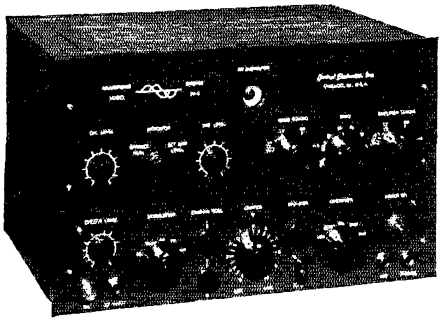
(See Roanoke QSO Party Announcement, Page 106)

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — AKC is handling traffic from Rock Hill and reports into the traffic nets at least twice a week. MVX has a new jr. operator born Sept. 26th. FFH is active on MARS nets and the South Carolina 'Phone Net. WN4HGW has an HA-129 and Heathkit transmitter. ZIZ reports into the Early Bird Net and expects to be a regular on 4RN soon. GQE and ØSTV are Navy hams currently stationed in Charleston and will be on the air soon. Few activity reports for September were received. More activity reports are needed from this section. Others are interested in your activities, so keep the SCM informed of your activities monthly. Traffic: W4AKC 365, ZIZ 88, FFH 76, FM 7, ANK 4.

VIRGINIA — SCM, John Carl Morgan, W4KX — All Virginia section nets are back on full winter schedule. All are invited to participate. Thanks to TYC, UHG, YZC, and IF, who led in keeping VN rolling during the summer. TYC, newly-appointed RM, is roll-keeper of VN. Congrats to JG, who celebrated 50 years on the air September 19th. The Harrisonburg Area gang threw a big surprise shindig in Tom's honor, and the SCM understands several of them did some fancy "jamming" to keep the cat from escaping the bag beforehand. The Tidewater Mobile Club handled communications for the International Yacht Regatta, with mobiles in pits and afloat and NCS at Yacht Club Hq. Those participating were DHZ, PWX, YVG, RGZ, ULL, PAK, IPA, LCW, ZKA, MLD, RRA, SYO, SVT, JZQ, and 9GLR. TMRC also started a Novice School. Irony Dept: QCW, VZQ, and HBC, while operating as KC4AB on Navassa Is., tried to raise the big DXer, HQN, who was on 75-meter mobile, but Bill "unheard" 'em — gulp. BGP now is DL4SK. VZH is moving to Georgia. K4ABL, in Staunton, is ex-1YAL from Massachusetts. HJK, now in Arlington, is ex-3NOE. TFX reports college work at GWU will curtail his hamming, so pappy IA will come out of mothballs to keep the family on the air. LW continues to publish the outstanding *Virginia Section Bulletin*. If you're not on the mailing list you're missing a lot. Drop LW a line. The SVARC is about ready to break ground for a new club house. And speaking of clubs, about the most active club station around is PCC, of the Roanoke Club. VYZ has a new 20-meter beam to play with — another good traffic man gone wrong. Congrats to MWH, who is starting his second term as our Division Director. He's YOUR voice in League affairs. If you have any suggestions or gripes he's ready to listen. Traffic: W4PFC 390, BLR 117, SVG 64, AKN 61, DWP 45, TFZ 38, VYZ 38, IF 36, YVG 34, CKI 30, OWV 15, VZH 13, KX 11, LW 10, UHG 6, YOL 6, TFX 2.

WEST VIRGINIA — SCM, Albert H. Hix, W8PQQ — SEC: YPR. PAM: FGL. RMs: DFC, AUJ, GBF, HZA. New hams in this State are WN8TGT, WN8TGS (daughter of PZT), WN8SNG (son of BOK), WN8SNF, SXE, PQF, WN8TFD, WN8TIG, and WN8TJV. MUJ has returned to Princeton. WN8SSA, a new ham in Charleston, worked 23 states on 80 meters in five weeks. W8IDH (son of HZA) now is General Class. The following hams are away at school: ISA, ISB, MBA, and MFF. DFC says things are beginning to pick up around his way. 9EHQ, formally of Fairmont, visited the MARA recently. PZT and AUJ attended the October gabfest held by MARA at Starkey Restaurant near Bridgeport. The SJARC, in Weston, is conducting two code classes per week. WVN lost a very consistant NCS when MBA left for college. The Ground Observer Corps has completed quite an extensive observation tower on a hill-top near Weston. The Blennerhassett Club had an election of officers in August. The Club meets at the YMCA every other Fri. evening at 7:30 P.M. NQW

(Continued on page 106)



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and for good reason. It's versatile, permits all-band operation 10 thru 160, it's extremely stable and it's a well engineered, dependable piece of communications equipment.

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MULTIPHASE EQUIPMENT is the overwhelming choice of SSB OPS everywhere. Ask any ham who uses it! Listen to it perform on SSB, AM, PM or CW!

MODEL 20A

- **20 Watts Peak Output SSB, AM, PM and CW**
- **Completely Bandswitched 160 thru 10 Meters**
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Choice of grey table model, grey or black wrinkle finish rack model.

Wired and tested.....**$249.50**
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Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts QRM in half. Exalted carrier method eliminates distortion caused by selective fading. Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC TV receiver sweep harmonics.

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- **Perfected Voice-Controlled Break-in on SSB, AM, PM.**
- **Upper or Lower Sideband** at the flip of a switch.
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- **10 Watts Peak 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.

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Plug-in IF stage — used with Slicer, allows receiver to be switched back to normal.

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NEW AP-2 ADAPTER

Combined AP-1 and xtal mixer. Allows Slicer to be used with receivers having 50, 85, 100, 915 KC and other IF systems. One xtal suffices for most receivers. **$17.50**

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FIRST ANNUAL ROANOKE DIVISION QSO PARTY

December 11–12, 1954

A QSO Party open to amateurs in the Roanoke Division will be held from noon EST December 11th to 6 P.M. EST December 12th. All amateurs in North Carolina, South Carolina, Virginia and West Virginia are urged to participate.

Rules: 1) The object is to contact as many fellow Roanoke Divisioners in as many different counties as possible during the contest period. 2) There are no restrictions as to power, band, mode, or hours of operating, and cross-band and c.w.-to-'phone contacts are permissible. Each station may be worked but once regardless of band or mode. 3) The general call will be "CQ RD" on c.w. and "CQ Roanoke Division" on 'phone. 4) Information to be exchanged in each QSO will consist of the number of contact, your call, RS or RST report, your county and state (if located in an independent town or city use nearest county), your name. Example: NR 3 W4ACY 589X GUILFORD NC PHIL. 5) Scoring: *Novices* — all contacts whether with W or WN count 5 points for each message sent and 5 points for each message received for possible total of 10 points per QSO. *Others* — 1 point for message sent and 1 point for each received for possible total of 2 points for each W-to-W QSO; 5 points for each Novice message sent and 5 points for each Novice message received for a possible 10 points for each W-to-WN QSO. *Bonus QSO Points* — 25 points before multiplier for each of the six elected ARRL officials (Director, Vice-Director and 4 SCMs) contacted. *Multiplier* — Multiply total QSO points as determined above by the number of different counties worked to determine final score. 6) Suggested frequencies: 1810, 3680–3750, 3800–3850, 7150–7200, 7200–7250, 14,100, 21,300, 28,800–29,000 kc. 7) The highest scoring W and WN in each section will be awarded an attractive memento. 8) All stations taking part to any degree are urged to submit their logs before January 15, 1955 to Owens Hutcheson, W8DFC, Chairman Awards Committee, P. O. Box 587, Princeton, W. Va.

Here's a chance to meet the gang in your division. Get on the air December 11th and 12th and see how many you can work!

has a new Viking II transmitter. AUJ has agreed to act as NCS for the C.W. Net. The Princeton Club is sponsoring a low-speed Novice net on 3725 kc. PQQ visited 3GHD, LVF, GHM, CTJ, KT, BES, CGS, and K2EDL (all members of the Frankfort Radio Club) in Sept. Traffic: (Sept.) W8AUJ 109, DFC 23. (Aug.) W8RRD 5, WN8QWU 2

ROCKY MOUNTAIN DIVISION

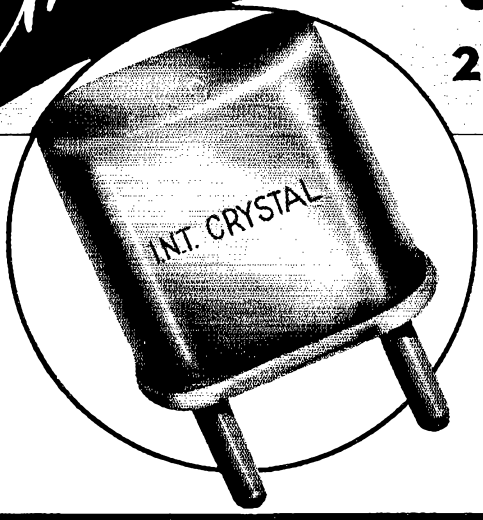
COLORADO — SCM, Karl Brueggeman, WØCDX — SEC: MMT. This session of the Legislature is the one which considers new bills, so it will be our last chance for two years to get our license plate legislation through. Our state-wide amateur representation is large enough so that we can contact all the Legislature members and put through our bill. Let's all contact at least one Senator and Representative, both personally and by letter, so that they know us and what we can do. IC is spear-heading the drive and has prepared the letters. The El Paso Radio Club handled the communications for the annual Pikes Peak hill climb again this year with TV at the starting line with stand-by equipment, WPK and SDW as NCS. Participating were SDW, ANX, HHR, PBN, MJD, CCG, CVG, MFF, QQX, JMB, MEY, PTR, VCZ, WPK, HEM, EYN, TV, K2IMC/Ø, and W5BTI/Ø. HOP has moved to Monte Vista from Minatare, Nebr. LO is the new president of the Denver Radio Club. NIT and daughter, NCB, visited KQD and her OM at Alamosa. KQD is new RM and also Radio Officer for San Luis Valley. IA is Colorado MARS NCS. Schedules are 1920 Mon. on 3289 kc., 2100 Tue. on 2220 kc. APK's final is rebuilt Collins style with an 813. NVX reports a joint meeting of the La Junta and Lamar Radio Clubs. Both clubs are working on ARRL affiliation. Traffic: KØFDX 1625, WØKQD 153, KØWBB 52, WØNVX 37, APK 22, HOP 17, IA 7.

UTAH — SCM, Floyd L. Hinshaw, W7UTM — QWH is a new OBS and Class III OO. Visitors in September were 6WT and his XYL on the 10th and K6BMM and XYL on the 30th. Very enjoyable in-person QSOs were had with both. K6BMM is planning to make this his QTH when his service days are finished. PIM, in Salt Lake City, works 40- and 80-meter traffic and sent me his report this month. More reports are requested to better list the activities of

(*Continued on page 108*)

Amateurs and Experimenters

ONE DAY SERVICE
2000 KC to 54 MC



ONE-DAY Processing

Orders for less than five crystals will be processed and shipped in one day. Orders received on Monday thru Thursday will be shipped the day following receipt of the order. Orders received on Friday will be shipped the following Monday.

International TYPE FA-9
(fits same socket as FT-243)

Pin Spacing .486 Pin Diameter .093

RANGE (kc)	TOLERANCE	PRICE
Fundamental Crystals		
2000-9999	.01%	$2.80
10000-15000	.01%	$3.90
Overtone Crystals (For 3rd overtone operation)		
15 MC- 29.99 MC	.01%	$2.80
30 MC- 54 MC	.01%	$3.90

SPOT FREQUENCY

.01% TOLERANCE—Crystals are all of the plated, hermetically sealed type and calibrated to .01% or better of the specified frequency when operated into a 32 mmf load capacitance.

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Please Send: _____Crystals Freq._____ _____
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Address:_____
City_____Zone:_____State:_____

Enclosed: ☐ Check, ☐ Cash, ☐ M.O. for $_____, or Ship C.O.D. ☐

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hams in this section. Now with fall weather, business is picking up on the mobile frequency, 3935 kc., and so is the QRM. UTM's shack is surrounded by a forest of TV antennas but no reports of TVI — just ITV. NMK has sold his mobile rig so is restricted to fixed operations for awhile. Traffic: (Sept.) W7PIM 67, UTM 3. (Aug.) W7CCC 12.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Joe A. Shannon, W4MI — PAM: RNX, RM: KIX. New appointments: ZSP (Trussville) as EC, SUF as OO-II, CAII as OO-III. The Anniston Club reports activity zooming on 10-meter mobiles and hopes to have a total of eight soon. We welcome the following new hams in the section: KN4s ACL, ACO, and ADS in Fayette (thanks go to WOG for the effort), KN4AAQ, WN4IHV, and WN4IHX, a family affair (father and two sons), in Brent. 5ONL/4 says that his AREC organization is rapidly taking shape in Auburn with a large assist from SXS. Asst. EC, in Opelika. W1IW reports the Mobile Club is holding 10-meter transmitter hunts every two weeks. GJW moved into a new home and added new 32V-3 and 75A-3. He is now at 800 feet elevation. WOG is going strong with new mobile while OBV continues having trouble with his. ZGE has a new jr. operator. EJZ and VOM gradually are getting back in the groove. TXO has converted link transmitter to 75-meter mobile drawing on the junk box for parts. VIY says the new home should be ready soon. Net activity in both AENB and AENP is increasing with cool weather. Traffic: (Sept.) W4WOG 156, KIX 150, EJZ 44, YRO 44, ZSQ 33, TXO 28, YAI 26, BFM 16, DXB 10, TKL 8, OAO 7, ZSP 3. (Aug.) W4PPK 65, AAN 28, BFM 10, OAO 2, WHW 2.

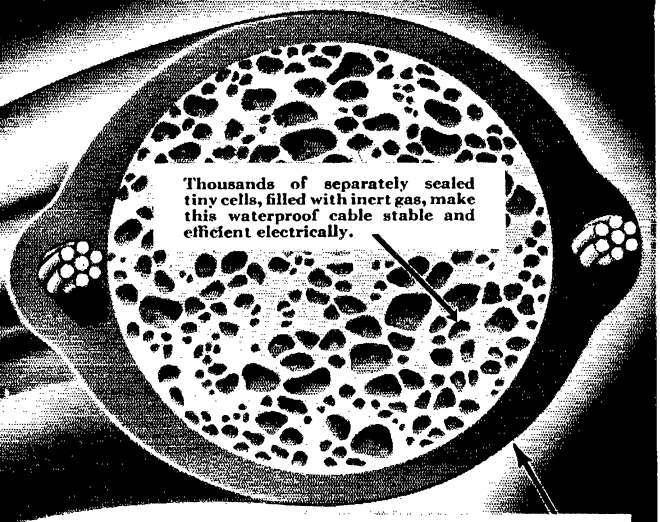
EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — Two excellent bulletins are Vol. 1, No. 1, on the Palmetto Net (FN) from Net Mgr. LAP and Vol. 1, No. 1 on the Novice Hurricane Net from Net Mgr. YJE, Ft. Lauderdale: 144-Mc. interest is high. FNR demonstrates it. ZQQ is the club code instructor. Club attendance averaged 30 at each summer meeting. IM celebrated his 24th wedding anniversary. *Bird Sparks:* HC1RT was at the Flamingo Bar-B-Q. DUH uses an NC-98. UWP has Subraco mobile. NJM is MM. VGV is hi-fi. Clewiston: Welcome home to PJU, who visited 28 states. Jacksonville: VMF is vest-pocket on 20 meters. HWA went to California and back. The JARS licensing examining committee is doing FB work. Key West: DRT is ground-plane on 10 and 20 meters. Lakeland: SVB reports the passing of DIN in Tampa. Lake City: YNM is doing extra well with AREC and now has a "Columbia Radio Amateur Pool" of 23 members in the high school club with FB help from the Naval Reserve for training material. In Lake County FE is doing a swell job as EC. Melbourne: BWR is back with 2-kw. emergency power. Miami: IYT vacationed in Nassau. DRC plans road signs announcing the club meeting dates and time. The club has started new code and theory classes. St. Petersburg: *Spark Gap;* WME will handle code classes. JOU is handling arrangements for the ARRL Southeastern Division Convention to be held next June, Sebring: WN4EGB is now emergency powered. Nets: NHN key stations are BKC, EGB, and SDR. FN ANCSs are WEO, SVX, OZC, and ATA. ZQL is doing FB as ANCS for FTPN. Net traffic: FN 604, FPTN 160. DVR, PJU, and DRD made the BPL. Traffic: W4DVR 703, LAP 298, DRD 193, WEO 117, TRN 60, ZIR 38, LMT 32, IYT 26, SVB 26, RWM 19, FSS 16, AYD 5, FWZ 5, DRT 4, TJU 4, WEM 3.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: PLE. ECs: HIZ, MFY. K4ALI is the station call of the Pensacola Amateur Radio Club. K4AFF is the club call of Pensacola High School. GMS has an antenna eleven stories up. KN4AEP is a newcomer in Pensy. KN4AGM is a YL in Pensy High. UUF continues to work 144-Mc. DX. ZFL has an FB vertical antenna. YRF is working on a modulator. DAO/DEF keeps the club humming. HIZ is looking for c.d. applicants. HQG moves traffic on 75 meters. RZV is busy with the Dagwood Net. FHQ hopes to have more time for 7-Mc. c.w. QK is getting on 75 meters with a pair of 813s. HJA wants s.s.b. for his B&W transmitter. 9CPI/4 also is enjoying his B&W rig. WN4HJU and WN4HJW want more power. TTM is having trouble with the HT-9. PTK keeps the mobile rig hot. CCY is putting the club rig in shape. MS has s.s.b. exciter going and is studying linear amplifiers. DOB, BBU, UYS, BGG, and ZUN are active in the high school radio club. BGG wants a 75-meter antenna. UYS is almost exclusively 144 Mc. VR stays on 40 meters. BFD joins the gang on the "party line" Sun. a.m. PLE plans to visit clubs in the section for emergency net work. SIW wants a 10-meter converter. UNV, KWM, MFY, SRX, RKH, VEY, CAJ, and UDC are participating in EARS simulated emergency tests.

GEORGIA — SCM, George W. Parker, W4NS — SEC: OPE. PAMs: LXE, ACH. RMs: MTS, OCG. Nets: Georgia Cracker Emergency Net, 3995 kc., at 0830 Sun. and 1900 Tue. and Thurs.; Georgia State Net, 3570 kc. at 1900 Mon., Wed., and Fri.; Atlanta C.W., 7150 kc., 2100 Sun. The meeting of the South Georgia Rag Chewers Net held at Albany, Ga. Sept. 26th was attended by 110 hungry hams and XYLs. A good time and a fine barbecue was enjoyed

(Continued on page 110)

New UHF&VHF LEAD-IN



ADVANTAGES:

1. Lowest losses at UHF and VHF frequencies.
2. Great abrasion resistance and mechanical strength.
3. No time-consuming end seal required; easy to install.
4. No internal moisture to cause signal loss.
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6. Resistant to snow, ice, rain, and wind.
7. Resistant to ultraviolet rays from the sun.
8. Uses Belden Weldohm conductor for long conductor life.
9. Can be clamped tightly in stand-off insulators without crushing. No special fittings required.
10. Conductor spacing is constant even when the lead-in is transposed.
11. No stripping problem for attaching the conductor.

...Cuts SIGNAL LOSS

This completely new 300-ohm line results from the development of a new cellular plastic core where each separate cell is filled with an inert gas to make an efficient cable with the lowest possible losses at both UHF and VHF frequencies. With this absolutely waterproof cable, no sealing of the ends is necessary. Celluline cable can be fixed in stand-off insulators without crushing. The thick outer wall of polyethylene serves to protect the cable from abrasion and sun damage.

By fusing *only* virgin polyethylene, the wall can be made smooth—absolutely free from rough spots—to prevent the adherence of dust and other impurities which would increase the losses.

The copper-covered steel strands, which make up the conductors, assure 49% greater resistance to breaking from flexing or stretching than any all-copper conductor.

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TRANSMISSION LINE

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WIREMAKER FOR INDUSTRY

by all. New officers of the SGRCN are WRT, net control; RIH, alt. net control; PGK secy.-treas.; OIL, business mgr. BXV now is on 20 meters in Quitman. WRV is net control for the Kennehoochie Emergency Net. FZO, in Jackson, has a new Globe Scout on the air. CFJ is building a TV transmitter. ZUF has a new beam for 10 meters. YEK (YL) now is s.s.b. IMQ, in Cedartown, is set to go on emergency power with a 2-kw. generator. UMJ underwent surgery on his eyes. KFL has an acute case of matrimony. PGV and CKN are now s.s.b. The Athens, Cedar Valley, and Bell System Clubs now are affiliated with the League. AREC organization in this section is growing daily. If you are not now a member you are invited to contact your EC, SEC, or SCM. Traffic: K4WAR 526, FCI 433, W4OCG 115, IMQ 86, ZWT 40, BWD 36, MA 20, MTS 20, NS 16, ZD 9.

WEST INDIES — SCM, William Werner, KP4DJ. SEC: HZ. ZD, Ramey AFB, registered in the AREC. National Guard station WAC received new Globe Champion transmitter and NC-125 receiver. CX is Radio Officer of the Air National Guard. FI and ZK have a daily sked on 3900 kc. so that ZK can talk to son PZ. WR's receiver is being repaired by CI. DV is assembling a pre-fab aluminum shack. GP is back on 75 meters. RD is building an 813 transmitter. KV4AA air-conditioned the shack. MP is C.D. Comms. Officer. JZ operates mobile with Elmac transmitter and receiver. WV and WY have B.&W. transmitters. NY repaired 75-meter folded dipole. KD has a Heathkit VFO. ZY has a 20-meter Mini-beam. HM put up a folded dipole for 3925 kc. QV bought a 500-watt transmitter from RC. RC is using TBS50. WP4AAB is now KP4. W2CZU/KP4 is now KP4AAO. WS relayed weather reports from USWB office in Ponce to ES on 2 meters for relay to San Juan on 75. OS, Aguadilla EC, reports five full and one supporting AREC member with one mobile unit and one emergency unit available at Aguadilla. The local net frequency is 3960 kc. The P.R. Emergency Net was alerted twice during September at the request of USWB because of torrential rains and flood threat. MV received a letter of appreciation from USWB. The Antilles Net, with TO as NCS, provides USWB with two weather reports daily from islands between KP4 and VP4. WT, Mayaguez, and YX, San Juan, keep housewife guard on 3925-kc. Net frequency all day. WX is in Ft. Bliss, Tex. WØEMN is in Waverly, Iowa. UA is putting up 100-ft. tower for TV antennas. New officers of A.&M. Arts College RC are FI, pres.; PZ, RW, CO, and DG, directors. ZW is on 14,070 kc. at 2130Z daily looking for traffic for the Caribbean Area and is arranging traffic skeds to Europe, N. Africa, Turkey, etc. ZW's XYL is ZV. Traffic: KP4ZW 329, RK 7, DJ 4, ID 2, RC 2, ES 1.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W6YVJ — News of the month is the excellent job done by the LSN gang in bringing about the "new" Southern California Net, which has acted like a shot in the arm for c.w. traffic. CMN, BHG, and GJP are heading the show in SCN. Radio clubs have sent in reports like mad, including bulletins created by members. K6CUX, Upland College Club, is a new ARRL affiliate. The San Gabriel Valley RC meets Tue. at 8 P.M. They say that TCO now has his General Class license. Corky, of the Club and *West Coast Ham Ads* fame, sent the scoop on a DXpedition to Mexico over Labor Day by MYC, WSQ, and YGC. The Rio Hondo Radio Club announces meetings will take place at 7:30 P.M. the first Sat. of each month at the Youth Center in Palm Park, courtesy of the Whittier Dept. of Recreation, according to UKC. From *The Oscillator*, of the Associated Radio Amateurs of Long Beach, comes word that our RM BHG and his wife went to the rescue of some people on the road near Tulare. Hank's radio gear was working OK; however, nobody in Tulare was on the air so Hank literally had to blast his way for help with his auto horn. The Lockheed ARC, via its *News Notes* tells of the arrival of distinguished visitors, Commissioner E. M. Webster and others. The station call of the Radio 50 Club of Whittier is HUY and Jim Ashby is president. Secretary honors go to EYP, and the treasurer is the son of BLY. The gang is more a part of civic activities than many a club in the section, holding activities with the local police on at least one occasion during the year. BHG now is equipped with one-kilowatt emergency power at 115 v.a.c., single phase. MBW sports 300 watts into an 813 on LSN. LYG has a Gonset 20-meter beam and a Rocket-Quad on 2 meters. NJU has started at UCLA. K6CPX, the wife of GKM, schedules KX6AF and turned in a traffic total of over 100 in her first report. Let's hear from some more girls. ORS made 220-Mc. contact with NIT and OJF, in Lynwood and Huntington Pk., respectively. AM's Chile rhombic is in a state of repair because of a thrashing machine. RNN, EC for E.L.A. District of Area B, also is trustee for MHM, club station of the Bell Gardens Amateur Radio Assn. Operation is on 160, 10, and 2 meters at present. Skyhooks in use are a 264-ft. flat-top and 10- and 2-meter ground-plane antennas. Traffic: (Sept.) K6FCY 735, W6LYG 544, CMN 235, K6CPX 124, BWD 96, W6USY 92, MBW 84, FMG 70, K6COP 26, W6BHG 23, CK 16, UGA 12, EBK 10, ORS 7, AM 4, K6BEQ 1. (Aug.) K6BWD 110.

ARIZONA — SCM, Albert H. Steinbrecher, W7LVR —

(Continued on page 112)

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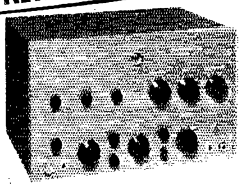
Write for HARVEY'S NEW HAM CATALOG



New CENTRAL ELECTRONICS
Model 20 A Multiphase
Bandswitching SSB Exciter

Has new performance features, plus the proven characteristics of the popular Model 10A. 20 watts peak output — SSB, AM, PM, CW..... **$249.50**
In Kit Form..... **199.50**

MULTIPHASE EXCITER 10B—10 watts peak output—SSB, AM, PM, CW. **179.50**
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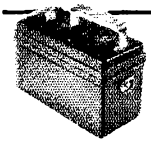
SIDEBAND SLICER—An SSB adapter that will improve any receiver..... **74.50**



Lightweight
URANIUM FINDER
Model RDN

Extremely simple to operate, the Uranium Finder detects ores with as little as .01% uranium. This sensitivity is greater than is available with any instrument in this price range.

Visual and audible indicators are provided: flashing neon and headphone. Geiger tube is built-in. Employs standard type, long-life batteries. Operates with single switch and detects beta and gamma rays, X-rays and cosmic rays. Weighs only 3¾ lbs.

Complete with headphones, batteries and instructions..... $59.50

SUPERIOR POWERSTATS

Smooth, efficient voltage control, 0-135 volts output from 115 volt AC line. Models also for 230 volt input. Write for free literature. Models for table and panel mounting.

Type 10, 1.25 amps..... $ 8.50
20, 3 amps..... 12.50
116, 7.5 amps, table mtg..... 23.00
116U, 7.5 amps, panel mtg... 18.00
1126, 15 amps..... 50.00
1156, 45 amps..... 118.00

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NOTE: Prices Net, F.O.B., N. Y. C.
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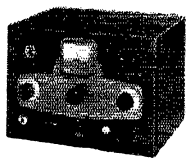

The Viking 'ADVENTURER'

Will fill the bill perfectly for Novices and General Class amateurs who prefer low power CW operation or as an extra, standby transmitter to more elaborate rigs. Specially engineered for the amateur with little or no construction or operating experience. Features include:

• TVI Suppressed • Crystal Control • VFO Input • Single Knob Bandswitch — 10, 11, 15, 20, 40 & 80 meters • 50W input—807 Output Tube • Wide Range Pi-Output Tuning • Dual Service, Self Contained Power Supply—Has Receptacle for providing power to other equipment.

Amateur Net, including tubes $54.95

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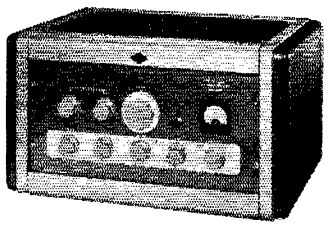

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Multi-purpose
LINEAR RF POWER AMPLIFIER
For SSB . . . CW . . . AM Phone

SSB.....250W (Peak env. output)
CW.....200-240W Output
AM.....90-100W Carrier

A complete ready-to-operate RF linear amplifier. Single Knob control bandswitching (including grids) 10, 11, 15, 20, 40 and 80 meters with provisions for 160. Provides extremely stable Class AB_2 output stage. Substantial power output with low grid drive. Excellent linearity and extremely low harmonic content in pi network output circuit matching 50 to 300 ohm loads. Completely stable and free from parasitics or self-oscillation. Utilizes 4-807's in parallel. Complete metering of individual 807 cathodes, grid current, relative RF output. Screen protection overload relay with panel warning light. Heavy-duty, dual-voltage power supply utilizing 4-666JR's in bridge. 80 mfd. filter essential for SSB dynamic regulation.

Complete with tubes..... $395.00

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A completely weatherproofed, durable, miniature beam for top 20-meter performance. Elements are individually factory adjusted and pre-set to middle of phone band.
Complete and ready for one-man installation..... $59.95

Other rotary shortbeams include:

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Established 1927

Our new SEC, VRB, with his full kw. and a pair of 813s has been very busy reorganizing the entire AREC and has divided Arizona into 13 sections, with the following ECs covering the sections shown: BFA — Prescott Section, LAD — Tucson Section, KUJ — Ajo Section, LSK — Flagstaff Section, NYN — West Phoenix Section, and USX — East Phoenix Section. In addition to the above, JYH has been appointed assistant to the SEC, and UXZ is the EC for Novice Operations. There still are openings for EC appointees in the Kingman, Douglas, Morienci, and Winslow Sections. It is suggested that those interested in these appointments and in joining the AREC contact VRB, or the ECs in their respective sections, and listen on 3865 kc. for more information. The OPRC now issues WAT (worked all Tucson) certificates for 15 or more Tucson contacts to those living outside the city. Contact LAD, secy. The AARC of Phoenix elected the following: IRX, pres.; MWQ, vice-pres.; KWB, treas.; PMQ, secy.; and KOY, SUL, and UCA, board of directors. QFQ has 200 watts to 803s with a 40-foot vertical. PEG is mobile on 10 meters with a Subraco. Traffic: W7QFQ 101, SUI 70, VRB 32, LVR 30.

SAN DIEGO — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU; Shelley Trotter, 6BAM; Dick Huddleston, 6DLN. SEC: VFT. ECs: BAO, BZC, DEY, DLN, HFQ, HRI, IBS, KSI, KUU, WYA. RM: ELQ. New clubs in the area include The Dragnet, a teen-age group composed of high school students at Grossmont, Hoover, and Helix High Schools with the following officers: K6EFE, pres.; K6ADA, vice-pres.; K6DVD, rec. secy.; and K6ANV, treas. The Chula Vista Amateur Radio Club recently was formed with 22 charter members, is connected with c.d., and has a club station, K6HGA. The Gillispie Amateur Radio Club was formed for members of the county unincorporated area, and is connected with c.d. The LaMesa C.D. Net is now operating on 3825 kc. at 2000 each Wed. For information contact BAO. NIY and MVV are active on 420 Mc. in San Diego. SYA has returned to San Diego after a trip to England. WNN has a pair of 4-250As on 20 meters s.s.b. The AREC picnic near Fallbrook was a success, with 40 AREC members and their families attending. KN6HQZ is a new Novice in Palm City. The Coronado Radio Club expects to have a new San Diego County amateur directory ready for distribution in early January, 1955. JCE, past-pres., of the Coronado Club, passed away at Moffatt Field. The visit and talk by HDQ was well attended and enjoyed by many hams in the San Diego Area. CAE now has a two-element 40-meter beam in operation. The Coronado Radio Club is having a DX contest lasting until March, 1955. We note that FJH, past-SCM and EC for Escondido, has moved to the Pasadena Area. Merry Christmas and good DX in 1955 to all. Traffic: W6IAB 3263, YDK 574, IZG 538, KVB 49, FCT 11.

SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — JGS has gone to Memphis, Tenn. Good luck to you in W4-Land, Mac, and thanks for your coöperation while at K6CST. K6NBI radioed in another fine traffic report. K6CRJ made 43 contacts in 3 sections during the V.H.F. QSO Party. QIW says he knows of several stations working traffic in this section but cannot get them to report their activity. Reports from all active stations in the section are welcomed. Just drop a card to the SCM at the end of each month. FYW is active on CARS, which operates on 3645 kc. at 7 P.M. Traffic: K6CST 510, NBI 114, W6QIW 43, K6CRJ 10, W6FYW 2.

WEST GULF DIVISION

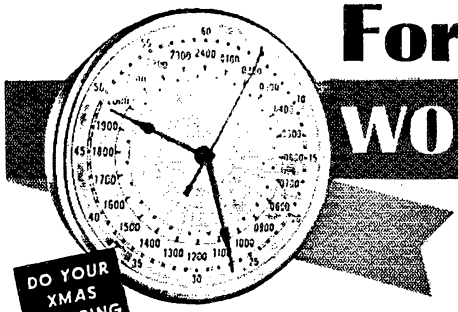
NORTHERN TEXAS — SCM, T. Bruce Craig, W5JQD — SEC: RRM. PAMs: IWQ and PAK. RMs: PCN and QHI. PAK, new PAM, is at present net manager of the NTO Traffic Net. LUP announced that amateurs have a booth at the Odessa Oil Show. 4TRY/5 is a newcomer to Waco, also 6IZT. The Central Texas Amateur Radio Club at Waco announces new officers are VHF, pres.; ZSY, vice-pres.; BHX, secy.; TUB, treas. The 160-meter Blue Ridge Net reports 88 per cent attendance for September. LUD is going to Texas Tech. at Lubbock. AHC reports working ZL3SP on 40-meter c.w. with 25 watts. JNK reports his XYL passed the General Class exam. The Snyder Amateur Radio Club's new officers are KXY, pres.; DWV, vice-pres.; and CRP, secy.-treas. WN5GQO is a new call in the Club. We extend our sympathy to TTU, who lost her sister recently. LHF is a Silent Key. Amateur Radio Day at the State Fair drew the largest number of amateurs known to have gathered at one time in the Northern Texas section, according to some estimates. Fort Worth was awarded the next West Gulf Division Convention. The group at the Convention representing the AREC in Northern Texas section went on record as favoring a 2-meter net for the entire section for emergency work. The Snyder Amateur Radio Club and the San Angelo Amateur Radio Club are now ARRL affiliates. Traffic: W5TFB 675, AHC 208, KPB 139, PAK 131, YPI 104, TTU 63, UBW 41, UFP 40, ZWR 29, TFP 26, CF 21, AEV 20, RHP 1.

OKLAHOMA — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Cannady, 5CIQ. SEC: KY. PAMs: PML, SVR, and ROZ. RM: GVS. PAK has accepted the job as net mgr. of the N. Tex.-Okla. Net. This Net meets daily on 3960 kc., 1730 to 1830 CST. Those who do not like

(*Continued on page 114*)

For a Ham's Xmas!

WORLD TIME CLOCK



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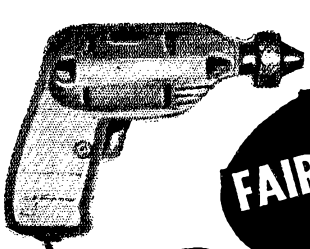
AT A SINGLE GLANCE this fabulous clock tells your favorite Ham the exact time in every zone of the world. Key cities and countries are shown on inner dial. 0100-2400 hours and 1-60 seconds are shown in separate bands! Gray metal with chrome-plated bezel. Self-starting. Convex crystal. A unique clock of time-proven quality at a modest price that HASN'T risen with inflation! *Order No. 32-870-Q.*

ONLY **$12.50** *Plus $1.25 U.S. Tax*



REG. $18.50 FAIRCHILD ¼" DRILL **$9.95**

LOWEST price for a famous-make ¼" electric drill we've seen in a blue moon. Brand new FAIRCHILD "Electric Industries" drill with die-cast aluminum pistol grip and gear case, trigger switch with side locking button, 6½ ft. rubber cord. Fairchild's world-famed 1/10 hp 110-120V AC-DC motor delivers no-load 1200 rpm, full load 700 rpm. Hobbed steel spur gears, armature wound with triple formex wire. 3-spring-collet hand chuck (also available with geared Jacobs chuck, see below). Ship. wt. 3 lbs. **Order No. R-5170**

WITH GEARED JACOBS CHUCK:

Above Fairchild ¼" drill with the fabulous Jacobs geared chuck including gear key and rubber holder which holds key onto drill cord! Anyone who knows the regular price of this precision chuck can see the savings. Anyone who knows prices will tell you a drill with this chuck has never sold this low! Ship. wt. 3 lbs. **Order No. R-5270.**

$13.44

REG. $2.50 ACCESSORY KIT!

Sander-polisher kit for Fairchild or other drill. Includes: lambs wool bonnet, molded rubber disc, sandpaper, countersunk screw and other requisite hardware. Ideal for use with furniture, cars, silverware, hobby and shop, metal, plastics, drill press, lathe. etc. Ship. wt. ½ lb. **Order No. R-5270.**

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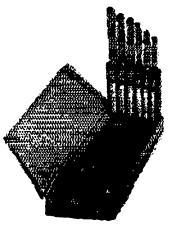
13 PIECE TWIST DRILL SET!

Shown in metal Huot index (optional at extra cost). 13 chrome vanadium drills from 1/16 through ¼" in 1/64 divisions! Way off price! Drills only, 98c, **Order No. R-5215.** Heavy gauge index has marked compartments for above drills, 2 hinged panels, and cover! Worth twice our **61c** price, **Order No. R-5216.** Each ½ lb.

98¢ LESS INDEX



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Here's a real bargain with savings of nearly $9 — while they last. FOUR brand new MGM 45 rpm 4-record albums — 16 records — 32 sides:

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LOVELY TO LOOK AT: Kathryn Grayson, Howard Keel, Ann Miller, Marge and Gower Champion, Red Skelton, Carmen Dragon Orchestra. The wonderful songs from the screen version of Roberta, recorded directly from the MGM sound track. Songs: Lovely to Look At, Smoke Gets in Your Eyes, The Touch of Your Hand, I Won't Dance, Lafayette, You're Devastating, Yesterdays, I'll be Hard to Handle. Music by Jerome Kern. 4 records, MGM album K150.

RAYMOND SCOTT: the brilliant Raymond Scott and his orchestra play music for listening and dancing, magnificently orchestrated. Selections: Two Guitars, Huckleberry Duck, Manhattan Serenade, Tired Teddy Bear, Rub-Dub, Jackrabbit, Estrellita, Coming Down to Earth. 4 records, MGM album K75.

WALTER GROSS PIANO: one of America's keyboard kings plays 8 songs by Vincent Youmans: Orchids in the Moonlight, Through the Years, More Than You Know, Tea For Two, Without a Song, I Know that You Know, Sometimes I'm Happy, Time On My Hands. Walter Gross at the piano with rhythm accompaniment. 4 records, MGM album K114.

These 4 albums comprise the ideal gift package for your favorite pop music listener and the well over 50% savings make it easy for you to play Santa Claus. All albums brand new, 1st quality! Ship. wt. 2½ lbs. Order No. R-7054.

RADIO SHACK

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nets, please remember there are from 40 to 60 stations occupying one frequency for one hour and at the same time justifying band occupancy for all hams. PML is net mgr. for OPEN and is a new PAM. CKQ has resigned as SEC because of the press of business and KY has accepted the appointment and will, I am sure, do a bang-up job. A new Novice is WN5IIBL, Enid, 14 years old. GZW is ex-ØNFO. EHJ has a new harmonic, a.m. not s.s.b. WN5ERV has a new receiver and worked into St. Louis with 5 watts on 7 Mc. UZG has gone to W6-Land. Several Oklahoma hams received mention for their assistance in the Powder Puff Derby. The West Gulf Division Convention at Kerrville was a great success with plenty of prizes and entertainment, thanks to the Kerrville gang and FNII in particular. ARRL President ØTSN, Vice-President 5NW, Director 5CA, and SCMs 5JQD, 5FJF, 5ZU, and 5RST were all there. All three candidates for Director, CA, CF, and FJF, were there. An estimation of about 100 mobiles there was made. Traffic: W5GVS 211, PML 36, SWJ 31, RST 22, ADC 20, ZCE 19, TNW 18, REC 13, EHC 11, PAA 10, FEC 9, SVR 8, WSM 7, RDI 6, PNG 5, MFX 4, CCK 3.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — The recent ARRL Regional Convention held in Kerrville was an FB affair. Everyone seemed to have a good time. As usual there were plenty of prizes and some very nice social gatherings. FNH, DSH, BEO, OSP, TSG, SFP, TQN the XYL of DEH, and the XYL of FNH were the ones who did the work. Morris, an SWL from Austin, was there to display his excellent photographs of hams throughout the area and to take new ones. G. L. Dosland, President of ARRL, attended and answered many questions concerning the policy and actions of ARRL. There were several excellent programs by FJF and CLP, also an excellent v.h.f. program conducted by FEK and featuring HPC. KSW was in Houston recently, and he looks very well. Keith has gained a considerable amount of weight. He is one man so devoted to amateur radio that when he is too ill even to eat, you can hear him on one of the bands with his bedside rig. Keith is OK now and hamming more than ever. He is going s.s.b. and has a real antenna farm. Let's send in some more dope. GER moved to San Antonio from Dallas. FJX also recently moved back to San Antonio. JC has gone hi-fi. Traffic: W5MN 844, GER 49.

NEW MEXICO — SCM, G. Merton Savre, W5ZU — SEC: KCW. PAM: BIW. V.H.F. PAM: FPB. RM: JZT. NMEPN meets on 3838 Tue. and Thurs. at 1800, and Sun. at 1730; the NM Breakfast Club every morning except Sun. 0700–0900 on 3838 kc.; the NM C.W. Net daily on 3633 kc. at 1900. Mr. Herbert Moran, Regional C.D. Communications Officer, has conferred with New Mexico officials regarding a RACES plan for the State. The Portales Radio Club adopted a constitution and selected the name I-Tappa-Ke, with 25 charter members. AKR talked to Albuquerque Kiwanis on "Ham Radio." KN6GCL is attending ENMU at Portales. WN5s ECQ and ECR are active from Gallup. CIN reports Farmington has a BC-610 with emergency power, also five mobiles. Scores in the V.H.F. QSO Party were FAG 24, VWU 10, EYR 7, NSJ (on 420 Mc.) 2. Newcomers on 144 Mc. are JLJ, WBA, YXM, 9EYV/5, 9WGG/5, VJN, and BGF. KCW again is active on 144 Mc. During the Pecos Valley flood on Oct. 7–8, AK provided communications for Hagerman; ARD, CXC, and EFT for Dexter; PSP and UTS for Artesia; QKA, RNG, YAS, and ZGG for Carlsbad; AHQ, BZA, BZB, FAB, PGJ, QKG, RZS, TBP, TDB, UP, WPA, YFN, YUM, YWU, ZM, and ZU for Roswell. Mobiles especially active were BZA/BZB, CXC, UP, WPA, and YUM. Traffic: (Sept.) W5AHQ 146, BTB 20, WPA 17, CEE 9, CXC 9, ZU 8, HJF 7, BXP 4. (Aug.) W5HJF 21.

CANADIAN DIVISION

MARITIME — SCM, Douglas C. Johnson, VE1OM — Asst. SCM: Fritz A. Webb, 1DB. SEC: RR. PAMs: VE1OC, VO6N. ECs: VE1DQ, VO6U. New appointees: VO2AW as PAM, VO2G as EC, VO6X as RM, W1UBW/VO6 as OBS. Bouquets to those who did such a swell job of traffic-handling during Hurricane Edna. Outstanding were the gangs at VE1DW and VE1FQ, who operated with emergency power and passed weather and damage reports throughout the storm. Recent visitors to VE1 were VE3ANB and VE8SK. Best wishes to DZ, NR, and ex-8SF on their recent marriages. ADU is giving the new Telrex beam a workout on 14 Mc. Officers of the N.B. Amateur Radio Assn. are WB, pres.; ADU, 1st vice-pres.; UL, 2nd vice-pres.; UT, secy.-treas. The organization has directors from the N.B. counties, a good membership, and is off to a fine start. EC VO6U and the AREC group held Operation Dew Drop and covered the Goose Bay Area with operations on 51 Mc. VO2AW, ex-VE3BTQ, is active at Gander. Also heard in the Gander Area are VO2s F, G, CM, and S. Is your community prepared for emergencies? Contact SEC VE1RR for details on forming your Emergency Corps *now*. Traffic: (Sept.) VO6N 394, VE1FQ 342, VO6U 113, VO6B 87, VO6S 61, VO6X 55, VO6AH 31, VE1UT 27, VE1ME 24, VE1AV 16, VE1BL 14, VE1OM 4, VE1ZZ 4. (Aug.) VO2AW 11.

ONTARIO — SCM, G. Eric Farquhar, VE3IA — Congratulations to the following recently-licensed YLs in the

(*Continued on page 116*)

100% SATISFACTION
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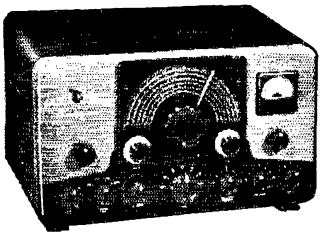

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Kit, less Tubes **$179.50**

Factory. Wired, less Tubes **$258.00**

Built-in VFO — TVI Suppressed — Band-switching —seven bands—75 Watts CW Input — 65 Watts phone input. Offers more features than any Transmitter/Exciter ever built for amateurs!

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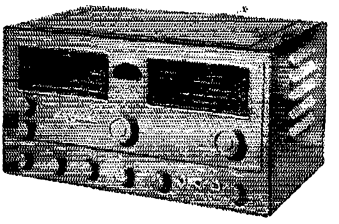
New NC98 ONLY

Now for the first time, your choice of electrical bandspread calibrated for either amateur or SWL bands. A crystal filter, an S-Meter, an RF stage and 2 IF stages.

15⁰⁰ Down

18 monthly payments of **$8.00**

Cash price **$149.50**



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Elmac PMR6A or PMR12A.....134.50	Collins 32V3 .....775.00	Hallicrafter SX88 595.00
Elmac AF67 .....177.00	Collins 75A3 & spkr. 550.00	Hallicrafter SX71..249.95
Viking 11 kit.....279.50	Babcock MT5B 119.50	Hallicrafter S76.....199.95
Viking 11 factory wired 319.50	National NC98 .....149.95	Hallicrafter S40B ..119.95
Morrow 5BR 74.95	National NC88 .....119.95	Gonset Super-6..... 52.50
Morrow 5BRF 67.95	National NC125 ....199.95	Gonset Super-Ceiver 119.50
Morrow FTR 128.40	National NC183D ..383.50	Gonset Communicator 11.....229.50

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North Bay Area: BFE, DUZ, BRJ, DVO, DVU, and DVV. Hospital officials are grateful to the Ontario Fone Club for the generous donation, which will assist in further work on behalf of children. GI is manager of TRN. DSM now is Class A. The Belleville Club meets in the YMCA. ARF pounded out a good signal from lake QTH. NZ caught some dandy bass. NG and his XYL, DZA, attended the 'Phone Club picnic at Collingwood. DTO and DUG are newcomers in Toronto. AXC now is located in Kitchener. CAB, now Class A, mobiles on 75 meters. AAS returned to Belleville after one year in VE8-Land. NN is heard mobiling. Officers of the Brantford Radio Club are CP, pres.; BSG, vice-pres.; DCL, secy. AVS has daily skeds with Hearst, Cochrane, and Chapleau. AJR and DNV attended the Findlay, Ohio, ham picnic. Sixty members of the v.h.f. fraternity attended the meeting at Oakville. It was nice to see such a fine representation from New York State. W2UTH delivered a splendid talk on emergency work in the Rochester Area. DIR and BQN were recipients of 2- and 6-meter trophies. BGI, the XYL of AGW, was congratulated on getting her ticket. DHG has completed work on the ten-meter walkie-talkie. With regret we record the passing of AVP, whose fine signal out of Clarkson will be missed. Traffic: (Sept.) VE3BUR 230, NG 196, TM 99, ATR 91, EAM 62, BJV 44, AUU 31, DQX 34, VZ 30, CP 29, AJR 26, NO 18, IA 17, AOE 12, VD 4, DU 3. (Aug.) VE3KM 6.

BRITISH COLUMBIA — SCM, Peter McIntyre, VE7JT — Taking a look in the perspective at this column I have come to wonder what is the value of same. Other than two or three interested persons who take the time to send in activity reports and traffic counts the rest of you just sit and hibernate and wait to see what the other guy will do for you. Seemingly the VE7s are the most inactive bunch in hamdom or the laziest when it comes to reporting anything. You ask, "Why don't you listen on the bands?" Well, 75 per cent of my time is spent listening and about 1 per cent of what I hear is "fit" to comment on. Amateurs are individualists but individuality does not mean hibernation or stagnation. I would like, for once, to have enough material from the VE7s so that it would have to be edited to be able to make it fit the column. We have this amount of space allocated for each month but let's get some meat to put in it not just gleanings from the few. If you are interested enough to read this you should be interested enough to help make it interesting for the other readers. Your "comments," by letter, would be appreciated, and maybe in this way we can have an interesting column of what's what in British Columbia. What happened to the two-minute pause on 3755 kc. and the Wednesday Nite Swap Time? See you on 3755 kc. nightly. Traffic: (Sept.) VE7TF 79, QC 55, DH 23, ZV 18. (Aug.) VE7QC 150.

MANITOBA — SCM, Leonard E. Cuff, VE4LC — The end of another year is drawing near and as it is not possible for me to meet all of you personally I wish to take this opportunity to wish you all a Very Merry Christmas and a Happy and Prosperous New Year. Traffic: VE4AI 60, VE5DS 27, VE4HL 22, GE 21, KG 12, EF 9, YR 7, CK 6, RB 6, XP 6, NW 5, VE5GO 4, VE4EY 3, FD 3, EU 2, GB 2, VE5JK 2.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — DD was presented with a Viking mobile unit for 25 years service as minister in his church. Congratulations, Pere. DA has his ticket endorsed all-band A3 now. JV had top c.w. score for Saskatchewan in the ARRL DX Test. AS/mobile works lots of DX with his Viking. EH landed in the hospital after mixing with high-voltage supply and getting severe burns to his hands and face. New officers of the Saskatoon Radio Club are RL, pres.; AJ, vice-pres.; MK, secy.; OB, treas. Ex-5PR now signs 6HP. New net time is 1830 hours daily. You are invited to check in or become a member. Frequency is 3780 kc. Best wishes to you and yours for a Very Merry Christmas from me and mine. Traffic: VE5FG 26, BZ 14, HR 11, GO 8, GX 6, PJ 6, QL 4, RE 4, BF 2.

BRIEFS

The Toledo Radio Club is sponsoring the "Worked Toledo, Ohio" award. The WTO certificate will be given to any radio amateur submitting confirmation of contacts with fifteen amateurs in the Greater Toledo area. The outlying communities of Holland, Maumee, Perrysburg, Sylvania, Curtice, Moline, Walbridge, Trilby and Rossford are considered as part of the Greater Toledo area. Contacts may be made over any period of time, between mobile, fixed or portable stations, crossband, 'phone to c.w., or any possible combination so long as the FCC regulations are adhered to. Confirmations should be sent to Maynard Nelson, W8HHF, 5514 Roan Road, Sylvania, Ohio.

—•••—

An amateur radioteletype exhibit at the Western Washington Fair, held in Puyallup, Wash., in September, met with considerable public interest, W7HMQ reports. RTTY contacts with Alaska, W6-land, and local stations were logged.

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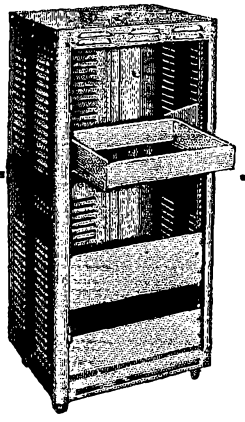

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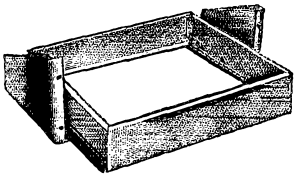

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120-Watt Modulator

(Continued from page 19)

sounds, in view of the fairly large capacitance tolerances that are usually associated with paper condensers. The ideal method would be to measure the capacitances and pad them out to the correct values, and if the facilities are available to do this it is a recommended procedure. However, even quite wide departures from the theoretically correct values do not greatly affect the performance from a practical standpoint — that is, in the way the transmitter sounds or in the suppression of splatter. A reasonable procedure, therefore, is to pick out a standard value of capacitance that lies somewhere on the load resistance line between the 2500- and 3500-cycle curves.

It will seldom be possible to find an iron-cored choke having exactly the required inductance. However, it is easy to modify a "television" power supply filter choke for the purpose. These usually have ratings from 1 to 2 henrys at 200 or 300 ma. Measurements on a "1-henry 300-ma." choke of this type (Stancor C-2326) showed its inductance to be about 1.9 henry, without d.c. and with small applied a.c. voltage. Removing the entire stack of I laminations reduced the inductance to 0.53 henry. Calculations based on the total resistance and the wire size (No. 28) showed that the choke had about 22 layers, so 7 of these were unwound and the inductance was then measured with various air gaps, using paper and cardboard spacers. The measured values are shown in Table I.

In the course of making measurements it was found that the presence of the "finishing" laminations that overlap the I sections on each side of the core had a very marked effect on the inductance and Q. These end pieces cause a pronounced increase in inductance for a given air gap, as compared with the inductance when the end pieces are not assembled with the regular core pieces. They also reduce the Q of the coil to less than half the value obtained when they are not used, presumably because of flux concentration in the small cross section of the overlapping part. They were therefore not used in making the measurements in Table I, nor in reassembling the choke shown in the photograph, the whole works being held together by clamps made from tempered Presdwood. The Presdwood mounting also serves to insulate the core from the chassis, which should increase the coil-to-chassis breakdown voltage.

Table I shows that for air gaps above 0.020 inch, the inductance changes fairly slowly with the thickness of the gap, so in this range — roughly 0.25 to 0.5 henry — this particular type of choke as modified can easily be adjusted to any value required for Class C loads ranging from 2000 to over 5000 ohms. This covers most of the practical cases. Measurement of the inductance is desirable but not necessary if the thickness of the spacer used in the air gap can be measured with moderate accuracy.

(Continued on page 120)

The inductance of a choke varies with the a.c. voltage applied to it as well as the direct current flowing through it. Because of the rather large air gap that is used in this application the d.c. component is of practically no consequence. Checks showed, however, that the inductance increased about 15 per cent at a.c. levels representative of full audio output from the modulator as compared with bridge measurements made with a low-voltage source. An allowance of this order can be made in determining the proper air gap. The figures in Table I are based on bridge measurements of inductance.

Performance Data

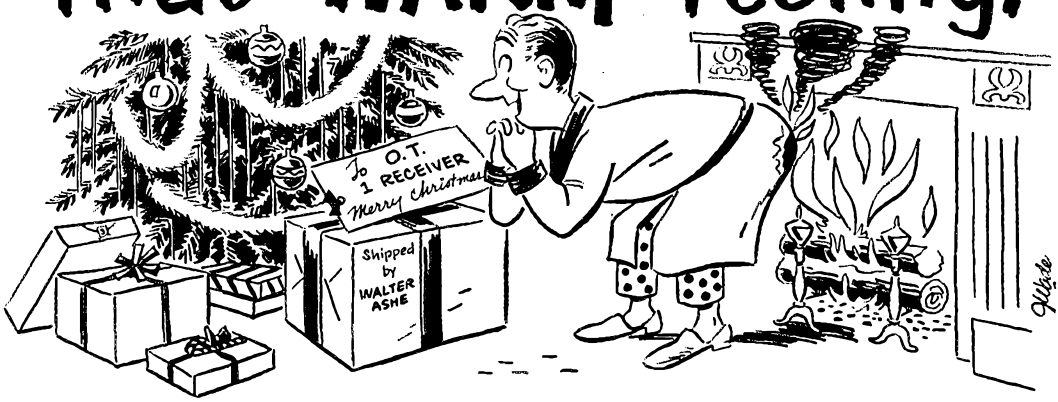
The over-all frequency response of the system including the splatter filter is such as to tend to emphasize those frequency components that contribute most to effective speech transmission, without sacrificing that nebulous thing called "satisfactory quality." Judged by listening tests, the balance between highs and lows is quite satisfactory; also, there is no difficulty in identifying sibilant sounds such as "s" and "f" which often become indistinguishable when the highs are cut too much. The response curve is essentially flat (within ± 2 db.) between 350 and 2800 cycles with the components and values given in the diagrams, and using a splatter filter designed for working into a 5000-ohm load (measured values, 0.47 henry and 0.01 μf.). Compared with the level at a 1000-cycle reference, the response is down 6 db. at 200 cycles and 12 db. at 100 cycles. At 3000 cycles the response is down 4 db. below the same reference, and drops at a uniform rate of 20 db. per octave above 3000 cycles.

Practically all of the attenuation at the high-frequency end is in the splatter filter. The modulator and speech amplifier are intentionally cut only at the low end and the response stays fairly uniform out to 5000 or 6000 cycles. On the premise that the frequency components that cause splatter will practically always be generated in the modulator or Class C amplifier, as discussed earlier, the ones generated in the modulator obviously have to be suppressed between the modulator and Class C amplifier. Reduction of high-frequency response elsewhere in the audio system accomplishes little or no splatter reduction — since the legitimate high-frequency components in the ordinary voice are of low amplitude — and simply causes a loss of intelligibility and naturalness. In other words, there is no point in cutting the high end unless it is done in a splatter filter, located in the right spot to catch not only the legitimate components outside the needed band but also the spurious components.

The measured power outputs at various voltages were mentioned earlier. The power supply filtering, plus low-frequency cutting, result in a hum level that is largely masked by the first-stage noise, without voice input and gain at maximum. At maximum output with a pure tone signal the hum increases because of the heavier drain on the power supply, and appears practically entirely in the modulator output and not in

(Continued on page 122)

That "WARM" Feeling!



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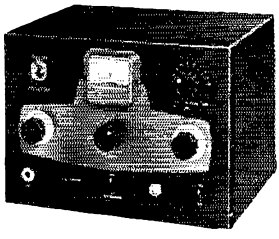

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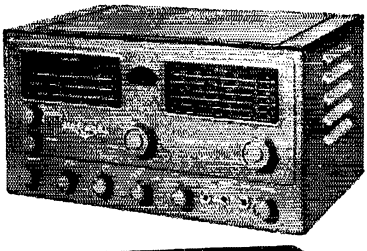

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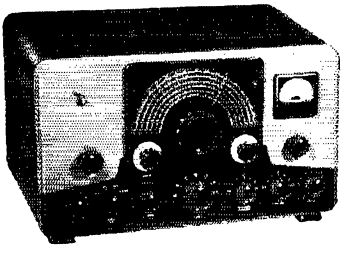

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the earlier stages. At this level the signal-to-hum ratio is over 30 db. With voice input and gain adjusted for full output on peaks the drain on the supply is considerably less and hum is not observable.

With sine-wave input, the plate current at full output is 240 ma. when the load is adjusted to the appropriate value for the plate voltage in use, as listed earlier. This maximum current is practically the same at all plate voltages listed, since the plate dissipation rating of the 6146 does not permit using a bias value that gives a very large value of no-signal plate current. The grid bias should be adjusted for a total plate current that represents a no-signal input of slightly under 50 watts at the particular plate voltage used.

The voltage gain from the microphone input to the modulator grids is such that full output can be secured with an input voltage of about 3 millivolts, r.m.s. This is of the order of one-tenth the voltage available from a crystal microphone with close talking.

Technician Rig

(Continued from page 30)

a microphone and apply power. With the gain control advanced, talk into the microphone and check to see that the lamp load brightens with modulation. The gain should be set so that normal speaking close to the microphone produces a just-perceptible flicker in the bulb.

The rig is now ready for connection to an antenna. Suitable types for both bands are described in the v.h.f. antenna chapter of recent *Handbooks*. Open-wire line or 300-ohm ribbon is suitable for the transmission line, and either can be connected directly to the antenna socket. The operating frequency should be checked again after the antenna is connected, as it may be shifted in the process. Antenna coupling should be the minimum necessary to transfer energy satisfactorily. A simple field-strength meter that is suitable for both 220 and 420 Mc. was described about a year ago in *QST*.[3]

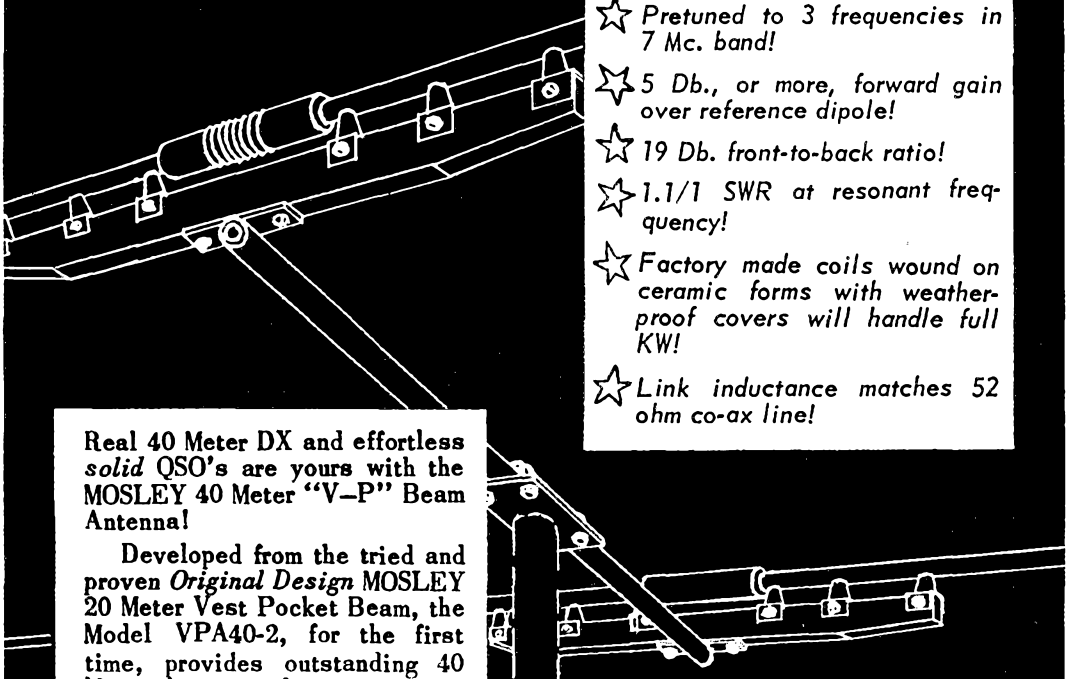
It is suggested that modulated oscillator operation be confined to 221 to 224 and 421 to 432 megacycles, leaving the remaining frequencies for crystal-controlled rigs. Be careful to avoid the band edges.

About 8 watts input may be run on either band. When the coupling loop is adjusted for 8 watts on 420, however, the input will be about 5 watts on 220. This will provide about equal output on the two bands because of the different efficiencies. About 1½ watts output can be expected.

In working stations using broad-tuning receivers, set the audio gain to the point that gave an appreciable brightening of the load lamp. When the fellow you're trying to work has a selective communications receiver, your audio level will have to be much lower. A high level of modulation will swing your transmitter frequency too much for him to be able to understand you.

[3] Tilton and Southworth, "A 220-Mc. Station for the Beginner," Part III, *QST*, December, 1953, page 43.

FOR "40" 2 Element, 40 Meter MOSLEY VEST POCKET BEAM



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- ☆ *5 Db., or more, forward gain over reference dipole!*
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- 68 lbs. Assembled Weight.
- Element Sections and Element Supports pre-cut, pre-drilled for fast assembly.
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MODEL VPA40–2, MOSLEY 2 Element 40 Meter "V–P" Beam, less 52 ohm coax line, rotor and mast.

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Interpolation Oscillator

(Continued from page 81)

can be calibrated when the modulating tone is changed to 600 cycles.

Although the receiver b.f.o. can be used for this purpose, a separate b.f.o., built for the purpose, will provide greater accuracy and convenience. Fig. 1 shows a suitable circuit. The tuning circuit is one that permits adjusting the frequency range accurately to cover the desired band.

C_3 is the calibrated bandspread condenser. C_1 is a zero-temp. fixed mica or trimmer condenser. C_2 is an air variable to aid in accurate adjustment of the tuning range. Slug-tuned coil L_1 limits the tuning range in the low-frequency direction. The values shown in the diagram are approximate.

As an example of adjustment, for 455 kc. set the slug of L_1 about half-way in. Set C_2 and C_3 at about half capacitance. Then adjust L_2 to tune the circuit to 455 kc. Then use L_1 to set the low-frequency limit, and C_2 to set the high-frequency limit of the tuning range of C_3. By careful trimming of all four components, the range may be set at the desired point.

The unit should be sturdily built, of course, and be provided with a large-size vernier dial of good quality. The unit should be shielded to prevent harmonics from getting into the front end of the receiver, and a shielded injection lead should be used. Both the receiver and the b.f.o. should be well warmed up before using, of course. With care, it should be possible to make readings to an accuracy of 50 cycles at any frequency with this system.

Conversion Attachment

(Continued from page 88)

can be brought through and is most easily connected to Pin 4 of the second i.f. tube. Near the front goes the B+ 105-volt regulated lead. This is best picked up from the screen terminal, Pin 6 of the second i.f. tube. If in some sets this screen terminal is not connected directly to the VR tube, then, of course, the 6BE6 plate voltage should be taken directly from the anode of the VR tube.

Adjustments

Turn on the set and shunt the dropping resistor for the regulator tube until this tube lights. About 5000 to 10,000 ohms at 5 watts will probably be right. It is desirable at this point to check the approximate frequency of the oscillator section of the converter tube. Its signal can be picked up on a communications receiver and it should oscillate over a range in the vicinity of 10,245 kc. Put the cover on the outboard unit and allow the whole works to warm up for some thirty minutes before proceeding with the alignment.

A signal generator covering 455 kc. and 10.7 Mc. and an output meter are essential. The latter may be an a.c. voltmeter with a blocking

(Continued on page 126)

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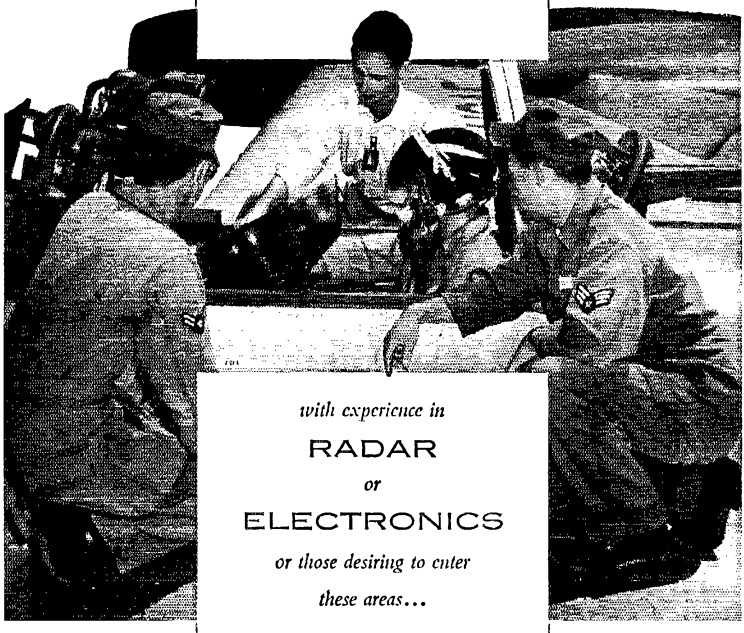

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condenser of about 0.05 μf. Connect it from the plate of the audio tube to ground. Or it may be a 20,000-ohms-per-volt or a vacuum tube voltmeter connected from the a.v.c. bus to ground. First align the 455-kc. section. The final alignment of these circuits should be made with the signal generator connected to the oscillator grid, Pin 1, of the 6BE6 converter tube. Keep the signal generator output as low as possible for the final touching up. After these circuits are aligned, under no circumstances whatsoever touch them again.

The signal generator can then be shifted to the signal grid, Pin 7 of the converter tube, and the frequency set at 10.7 Mc. Adjust the oscillator frequency with the slug-tuned coil to bring this signal through. Check that the converter oscillator is at 10,245 kc., on the low side of the signal, not 11,155 kc., on the high side. Now connect the generator to the first mixer grid, Pin 2 or 7 of the 12AT7 mixer. The 10.7-Mc. i.f. cans can now be aligned. The final trimming should again be done with the signal generator output as weak as can be used.

Remove the generator, replace the cover on the bottom of the set and, without an antenna connected, tune the receiver across its range to see if any birdies show up within the band. Should one appear, change the second oscillator frequency (with the slug-tuned coil) to a lower frequency, if the birdie is at the low end of the band, or higher if at the other end. Reconnect the signal generator to the signal grid, pin No. 7 of the 6BE6 converter, and, keeping the signal as weak as possible, retune the *generator* for maximum output. Then following the earlier procedure, realign the 10.7-Mc. i.f. transformers to whatever frequency the generator is now set. Continue this procedure, if necessary, until the birdie is outside the band.

Should i.f. oscillation occur, it will probably be in the 10.7-Mc. circuits. It can be tamed usually by judicious dressing of the plate, the B+ and the 455-kc. grid leads inside the receiver. These can be shielded from each other with the disk ceramic condensers scattered around the tube sides. If this is not sufficient, a 33-ohm composition resistor can be placed between cathode and ground of the first i.f. tube. Leave this resistor unby-passed.

The details given here are for the Sonar SR-9.

For other sets, the procedure will vary but the following basic points will hold. Use only one stage of low frequency i.f. The front end stability will probably not permit greater sharpness. For mobile use, a second conversion to 1500 kc. might allow easier tuning and will help if the first local oscillator is not too stable under road shock. Use 105 volts, regulated, on both plate and screen of the converter tube, not only to gain stability but to save a screen-dropping resistor and its associated by-pass. Use a high-C oscillator; from 150 to 200 μμf. is about right for the tank condenser, which should be a silver-mica or other high-stability type. Do not apply a.v.c.

(Continued on page 128)

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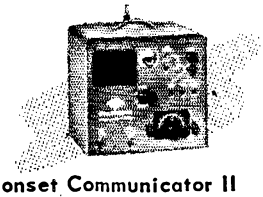

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Viking II complete with tubes, wired and air tested $337.00

Viking VFO Kit, companion to Viking II..... $42.75

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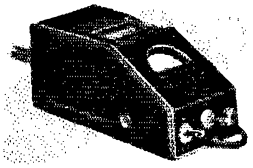

Millen 90651 Grid Dip Meter

The No. 90651 Millen Grid Dip Meter is compact and completely self-contained. Has seven calibrated uniform length scales from 1.5 mc to 300 mc plus an arbitrary scale for use with the 4 additional inductors available to extend the range to 220 kc..... **$61.50**

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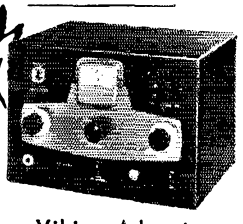

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to the converter tube grid as this will tend to shift the local-oscillator frequency. Use a reasonably low-gain converter such as the 6BE6. Don't hesitate to cut the i.f. gain for stability. The extra gain of the converter stage will compensate. It is not necessary to use the grid resistor and blocking condenser between the 455-kc. transformer and its i.f. tube. The a.v.c. can be brought to the ground lead of this transformer through a decoupling network consisting of a ½-megohm resistor and a 0.01-μf. condenser.

On two receivers so modified, the over-all gain was increased about 10 db. while the background noise of man-made QRM was greatly reduced. This improvement meant the difference between communications or not over the difficult circuits on which these units were used.

Grounded-Grid Amplifiers

(Continued from page 38)

plate lead. The lead from the grid to the grounding capacitor was as short as possible, and was made out of ¼-inch copper strap. No fussing was necessary and the amplifier was completely stable. It is suggested that the 304-TL be submounted so that the internal grid shield is about on the same level as the chassis, and that the clearance hole be made not larger than necessary to clear the tube envelope at that point. Due to the protruding grid terminal, the tube must be wiggled a little to get it through the hole, but once the grid terminal is through, there should be ample play so that the tube may be inserted in the socket without difficulty.

Linear Operation

A question of major interest whenever linear amplifiers are used is just how linear are they? It can be easily shown that when small-signal operation is considered, there are good reasons for expecting the grounded-grid amplifier to be more linear than a comparable grounded-cathode amplifier. It would seem reasonable, then, to expect some perhaps smaller improvement when large-signal operation is considered.

To try to get some numerical data on this point, a series of runs was made using a 4-250A as a zero-bias amplifier, both grounded-grid and grounded-cathode. Comparable operating conditions were used in both cases.

The usual trapezoidal oscilloscope pattern is not sensitive enough to indicate differences in linearity of the small magnitude under consideration, so a technique was used based on the fact that if a modulated signal is applied to a slightly nonlinear amplifier, the nonlinearities will cause spurious modulation products to appear in the amplifier output. The magnitudes of these spurious products compared with desired products give an indication of the amount of nonlinearity in the amplifier.

The actual procedure is as follows: The driver is amplitude-modulated with a steady audio tone.

(Continued on page 130)

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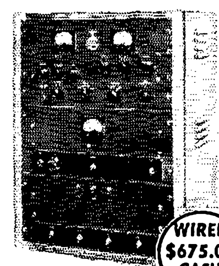

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Its output will then consist of a carrier and two sidebands, the sidebands being spaced on each side of the carrier by an amount equal to the audio modulating frequency. This signal, when passed through the slightly nonlinear amplifier, will be distorted, and the distortion will appear as extra sidebands on the output signal spaced at multiples of the modulating frequency from the carrier. The ratio of the amplitude of the first undesired sideband to that of the desired sideband (nearest the carrier) is a convenient measure of the distortion.

To get accurate data, the receiver used to detect and measure the sidebands must have enough selectivity to separate them properly, and it must have an accurate S-meter. The selectivity problem is made easier if a relatively high audio modulating frequency is used, as this increases the separation between sidebands. The S-meter situation is not so good, as few, if any, receivers give really reliable signal strength indications. If a signal generator having a calibrated attenuator is available, the S-meter may be calibrated against it.

Using this technique, the general conclusion reached was that the grounded-grid arrangement consistently gives slightly better performance than the grounded-cathode circuit. Improvements of the order of 3 to 6 db. were noted (6 db. corresponds to a reduction of the amplitude of the distortion by a factor of 2).

Plate Modulation

One check run was made driving the grounded-grid amplifier with a steady signal and plate modulating it in the usual fashion. The question is whether the unmodulated signal from the driver which feeds through to the output will substantially reduce the percentage of modulation. This unmodulated signal, the same one discussed earlier in connection with Fig. 1B, appears in the output regardless of the amplifier plate voltage. As plate modulation simply consists of varying the amplifier plate voltage, the output of a plate-modulated grounded-grid amplifier will consist of the regular modulated signal plus an unmodulated signal from the driver.

It is to be expected that the tubes which require the least r.f. driving voltage would be the most free of this effect. The 4–250A was set up as a zero-bias amplifier, with about 500 watts d.c. plate input, and plate modulated. It was found that the unmodulated part of the signal only amounted to about ten per cent of the total output power, which was consistent with the estimated driver output of about 50 watts. The resultant small decrease in modulation would not be noticeable in most cases.

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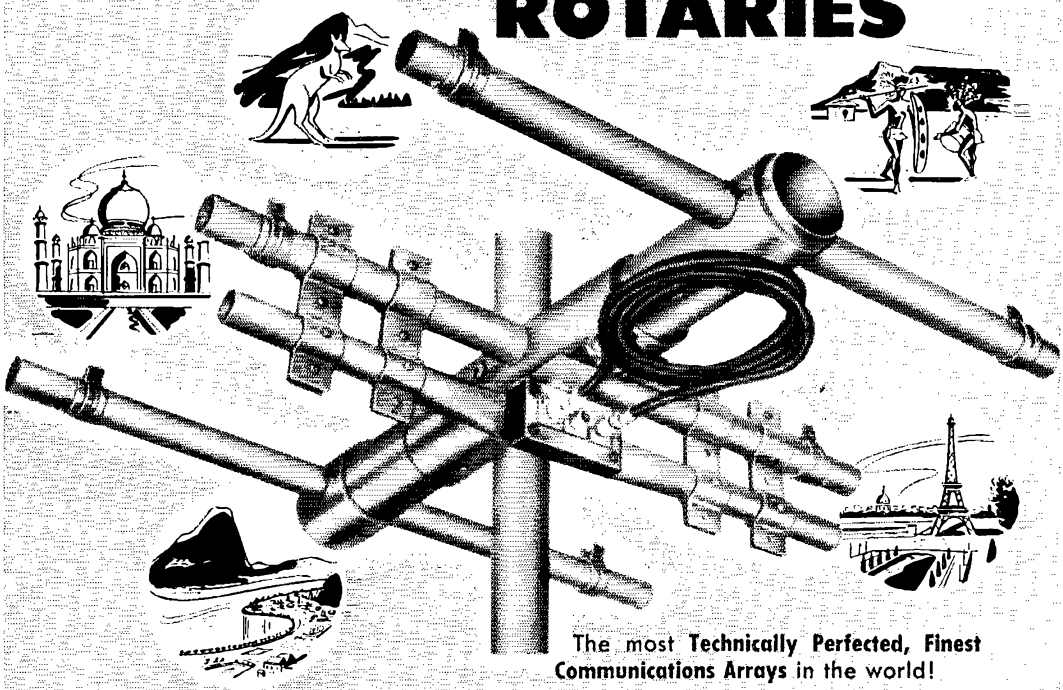

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BETTER BY DESIGN

Recent Equipment

(Continued rom page 41)

For s.s.b. operation, the 500-W can be run in Class AB_1 or AB_2, depending upon the amount of drive that is available. The maximum rating is 250 watts of peak envelope power output, under which conditions the grid current (four tubes) will swing up to about 12 ma. and the cathode current of a single tube will swing to about 130 ma. About 10 watts of peak envelope power is required to drive under these conditions.

Used as a linear for a.m., the manufacturers suggest using speech clipping in the modulator of the low-level modulated stage at about 90 per cent modulation and adjusting the linear for slightly less than 100% modulation capability. This is a worth-while suggestion that boosts the capability of the amplifier so that it can be run with a carrier output of around 90 watts.

We didn't have an opportunity to see the instruction book, but we understand that it goes into detail on the use of the excitation control and the rectified r.f. output indicator in tuning up a linear, which should be a big help to those who are coming face to face with linear-amplifier operation for the first time.

— *B. G.*

40-Watt Rig

(Continued from page 14)

others, and by adjusting C_2 it is possible to get more output. When using a 7.1-Mc. crystal and tripling in the oscillator, one can expect to get a 2- to 3-ma. reading in the grid position.

Shown at Fig. 2 is an antenna system for two-band operation, 7- and 21-Mc. The 67-foot length is actually a compromise between the 21-Mc. long-wire dimension of 68 feet 5 inches, and a half-wavelength of 65 feet 2 inches for 7 Mc. However, the 67-foot compromise shows a low standing-wave figure and worked out well in actual operation. On-the-air tests produced some excellent contacts and reports. When the 21-Mc. band is "open," one can easily "work the world" with the power available from this rig.

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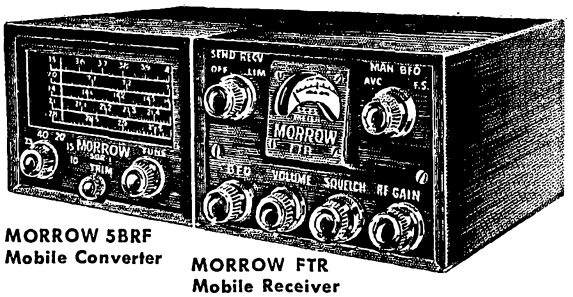

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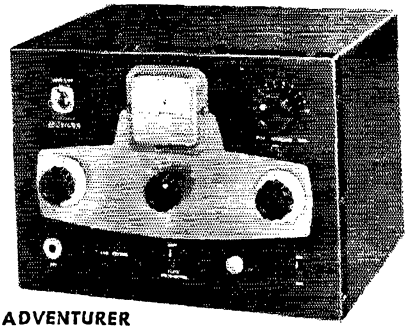

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Field Day Results

(Continued from page 50)

W1WQM/1	Port City Amateur Radio Club	175-	B-15-	3000
W9LL/9	Lake County Amateur Radio Club	412-	AB-12-	2997
W9SWQ/9	Four Lakes Amateur Radio Club	348-	AB-25-	2955
W9UIJ/9	(nonclub group)	301-	A- 9-	2934
W6VB/6	Santa Monica Mike and Key Club	320-	A- -	2880
W6YAS/6	Frank Wiggins Amateur Radio Club	319-	A-14-	2871
W1AWA/1	Quannapowitt Radio Assn.	313-	A-11-	2817
W1WFB/1	Milford Amateur Radio Club	309-	AB-14-	2730
VE3BXT/3	Scarboro Amateur Radio Club	276-	A-14-	2709
W5DSZ/5	Caravan Club of Louisiana	397-	AB- -	2691
WØLNO/Ø	Air Capitol Amateur Radio Assn.	366-	AB-25-	2582
W1TKA/2	Stamford Amateur Radio Club	388-	AB-16-	2505
VE1ND/1	Fredericton Amateur Radio Club	253-	A- 7-	2502
W9QAY/9	Kankakee County Amateur Radio Club	415-	B- 7-	2496
W5SRW/5	Mesilla Valley Radio Club	408-	B-22-	2448
W5JJC/5	Fort Smith Radio Club	393-	B-18-	2358
W3VPR/3	Anne Arundel Radio Club	367-	B-15-	2352
W9DUP/9	DuPage Radio Club	253-	A-23-	2277
W3QYK/3	Flood City Radio Club	378-	B-30-	2268
W7LA/7	Twin City Radio Club	348-	AB- 8-	2199
W6BRY/6	Paso Robles Radio Club	243-	A-10-	2187
K2IBC/2	Avenel Radio Club	217-	A-11-	2178
K6BLM/6	Glendale Civil Defense Radio Council	306-	AC- 8-	2175
W2QQ/2	Amherst Civil Defense Group	302-	AB-16-	2064
W3PGA/3	Aero Amateur Radio Club	346-	B-11-	2058
W5TSV/5	Pampa Amateur Radio Club	340-	B- -	2040
W8CCO/8	Northeast Amateur Club	359-	BC-19-	2013
W4GCW/4	Pickens County Amateur Radio Club	305-	B- 6-	1980
W5BXX/5	Longview Amateur Radio Club	288-	B-11-	1878
W1UXS/1	Caledonia Amateur Radio Club	306-	B-10-	1848
W1MB/1	Satuit Amateur Radio Club	209-	AB-24-	1836
W8DC/8	Grand Rapids Amateur Radio Assn.	285-	AB- -	1818
VE6NQ/6	Calgary Amateur Radio Assn.	242-	AB- 7-	1569
W9IAW/9	Twin City Radio Club	204-	AB-12-	1515
K6FBM/6	Yuba-Sutter Radio Club	140-	A-12-	1494
W3UF/3	Annapolis Radio Club	134-	A-10-	1431
VO1X/2	Newfoundland Radio Club	145-	AB- 8-	1128
VE7ND/7	Totem Amateur Radio Club	154-	ABC- 9-	1068
W1DGV/1	Great Bay Radio Assn.	133-	ABC- 7-	1011
W1PCC/1	Lowell Radio Operators Club	327-	AB-16-	875
W4HQF/4	Gaston County Amateur Radio Club	325-	AB- 9-	751
W5YJU/5	Pioneer Radio Amateurs	117-	AB-13-	711
W1BIM/1	Central Massachusetts Amateur Radio Assn.	101-	B-15-	606
W3FF/3	Penn Central Radio Club	282-	ABC-11-	479
K2EY/2	(nonclub group)	55-	ABC-55-	369
VE3AJ/3	Lakehead Amateur Radio Club	86-	BC- 5-	306

Five Transmitters Operated Simultaneously

W6CG/6	Royal Order of Suds	1092-	A-20-	10,071
W2BVL/2	Nassau Radio Club	729-	A-30-	6786
W2KOJ/2	Watchung Valley Radio Club	726-	A-25-	6759
W3SOB/3	York Road Radio Club	746-	A-27-	6714
W1AA/2	Lake Success Radio Club	710-	A-19-	6669
W6MIGJ/6	Helix Amateur Radio Club	712-	A-14-	6633
W7DK/7	Radio Club of Tacoma	604-	A-23-	5679
W3NA/3	DX Club	748-	AB-18-	5331
W9BA/9	St. Clair Amateur Radio Club	695-	AB-15-	4428
W8ACW/8	Genesee County Radio Club	660-	AB-27-	4266
W6NCL/6	Skyriders	473-	A-15-	4257
W6KA/6	Pasadena C. D. Net	617-	AB-10-	4221
VE3BER/3	Clinton Amateur Radio Club	443-	A-12-	4212
W2DPQ/2	Huntington Radio Club	584-	AB-25-	4164
W6PMI/6	United Radio Amateur's Club	466-	AB- 9-	4056
W2GM/2	Albany Amateur Radio Assn.	466-	AB-25-	3987
W6LUC/6	Santa Barbara Amateur Radio Club	449-	AB-16-	3789
W5CF/5	Kilocycle Club	547-	B-22-	3432

(Continued on page 136)

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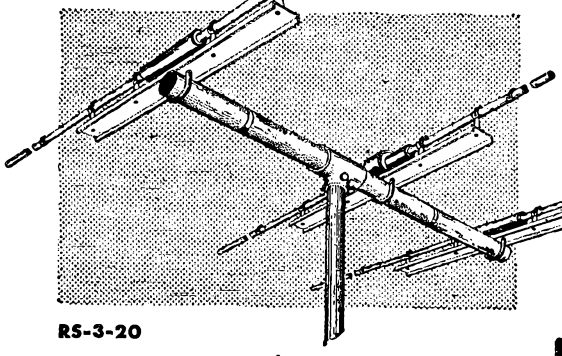

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W7MXH/7	Cascade Radio Club	198–	B–14–	3138
W7DA/7	North Seattle Amateur Radio Club	440–	AB–18–	3084
W6LUF/6	Mount Diablo Amateur Radio Club	422–	AB–25–	2946
K6CFT/6	Burbank Civil Defense Radio Council	426–	AB–12–	2928
W4NVU/4	Dade Radio Club	382–	AB–22–	2718
W8KGG/8	Huron Valley Amateur Radio Assn.	436–	AB–29–	2649
VE2ADX/2	South Shore Amateur Radio Club	256–	A–20–	2529
W2NFU/2	Northern Nassau Amateur Radio Club	280–	A– –	2520
W4HBB/4	Amateur Radio Club of Savannah	350–	B–20–	2250
W7YN/7	Nevada Amateur Radio Assn.	348–	B–10–	2238
W8BLV/8	Dial Radio Club	314–	B–15–	2034
W7WJ/7	Oregonian Amateur Radio Society	184–	A–16–	1881
W7KYC/7	Portland Amateur Radio Club	234–	B–10–	1554
W3CAB/3	Washington Radio Club	183–	AB–10–	1155
W8SG/8	Denison University Amateur Radio Club	166–	B–12–	1152
W2BNW/2	Tryion Radio Club	241–	AB–13–	543
W1TAN/1	Rutland C.W. and Phone Radio Club	62–	AB– 9–	140

Six Transmitters Operated Simultaneously

K6BAG/6	Pacifico Radio Club	1270–	AB–17–11,065
W2VDJ/2	Lakeland Amateur Radio Assn.	1188–	A–21–10,917
W9PCS/9	York Radio Club	1151–	A–25–10,584
K6EM/6	Cresenta Valley Radio Club	1013–	A–30– 9369
W2FUS/2	Morris Radio Club	843–	A–26– 7812
VE3ZM/3	Guelph Amateur Radio Club	739–	A–30– 6876
VE3JJ/3	West Side Radio Club of Toronto	760–	AB–25– 6738
K8AIR/8	(nonclub group)	767–	AB–25– 5397
W6MLI/6	Coronado Radio Club	638–	AB–22– 5319
W2GMM/1	Westchester Amateur Radio Assn.	701–	AB–20– 5184
W9PZT/9	Illinois Valley Radio Assn.	554–	A–20– 4986
W1GLA/1	Framingham Radio Club	449–	A–15– 4266
W8FO/8	Toledo Radio Club	435–	A–25– 4140
W9SW/9	Chicago Suburban Radio Assn.	412–	A–20– 3933
K6ER/6	Sacramento Amateur Radio Club	419–	A–42– 3771
W8RNF/8	Lake Geauga Amateur Radio Club	616–	B– – 3696
W1ECO/1	Submarine Signal Amateur Radio Club	446–	AB–30– 3603
W4VTA/4	Confederate Signal Corps	476–	AB–10– 3252
VE3HX/3	Brantford Amateur Radio Club	346–	A–19– 3114
W9TBT/9	Browning School Amateur Radio Club	456–	AB– 7– 3099
W2IN/2	Fordham Radio Club	357–	AB–34– 3018
W9LDT/9	North Central Indiana Amateur Radio Club	468–	AB–12– 2961
W6BXN/6	Turlock Amateur Radio Club	461–	AB–16– 2901
WØERH/Ø	Johnson County Radio Amateurs Club	331–	AB–42– 2682
K2CXP/2	IBM Radio Club	414–	B–18– 2484
W7PXL/7	Valley Radio Club	412–	B– 6– 2472
W4JP/4	Blue Grass Radio Club	381–	AB–20– 2436
W9SWD/9	Western Electric Amateur Radio Club	349–	AB–16– 2250
W2AVZ/2	Hamilton Township Radio Assn.	336–	B–19– 2166
W6LMN/6	San Mateo County Amateur Radio Club	242–	AB–16– 1707
W8WIT/8	Toledo Mobile Radio Assn.	249–ABC–11–	1146

Seven Transmitters Operated Simultaneously

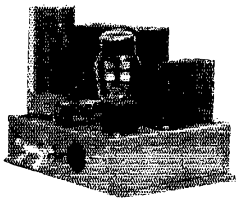
W4FU/8	Ohio Valley Amateur Radio Assn.	1570–	A–20–14,355
W6LS/6	Lockheed Amateur Radio Club	932–	AB–60– 6789
W1WKN/1	Old Colony Amateur Radio Assn.	557–	A–17– 5256
W1AAT/1	Yankee Radio Club	576–	AB–23– 4794
W4PCC/4	Blue Ridge Amateur Radio Society	525–	B–23– 3300
VE3RW/3	Quinte Amateur Radio Club	408–	AB–20– 3174
W6SDE/6	Corona Gang	323–	A–11– 2907

Eight Transmitters Operated Simultaneously

K6DTA/6	West Valley Radio Club	1420–	AB–25–10,473
W3RCN/3	Rock Creek Amateur Radio Assn.	1013–	A–64– 9312
W1OC/1	Concord Brasspounders	998–	A–20– 9009
W6TOI/6	Downey Radio Club	1284–	AB–30– 8550
W6OTX/6	Palo Alto Amateur Radio Assn.	947–	AB–27– 8292
K6EBN/6	Westchester Amateur Radio Assn.	1085–ABC–30–	6738
W1NEM/1	Hartford County Amateur Radio Assn.	642–	A–45– 6057
W6OT/6	Oakland Radio Club	756–	AB–25– 6030
W6BIP/6	San Francisco Radio Club	861–	AB–35– 5790

(*Continued on page 138*)

MOBILE POWER PALCO MOBILE POWER



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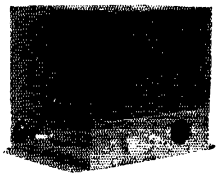
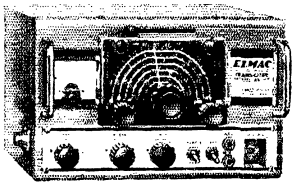
- ★ Built in relay for remote control
- ★ On-off sw for local control
- ★ 700 Volt filter condensers
- ★ Extra heavy duty Vibrator



Model 6A $39.50



Elmac AF-67 Mobile Transmitter with
Palco Model 6A Power Supply **$226.50**

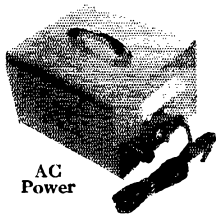
Elmac PMR-6A Receiver (less speaker) **134.50**

Elmac 6 or 12 V. Receiver Power Supply **24.50**

Fast Delivery • Personal Service • Complete Stocks

Cornell-Dubilier Dictator Model 6/12D5

Designed to operate dictating machines or other AC devices such as shavers, phono turntables or small amplifiers in automobiles or boats. Delivers 110 V. AC 60 cycle power up to 50 watts continuously, and handles loads up to 75 watts on a short-time basis. Operates from either 6 or 12 volt battery.



AC Power

Cornell-Dubilier D.C. to 110 V. AC Converters

TYPE	INPUT	WATTS OUTPUT	NET PRICE
6/12D5	6-V	50–75	**$26.53**
6R10	6-V	100–125	**40.25**
12R8	12-V	80–100	**28.37**
12RU15	12-V	150–175	**53.39**
32R8	32-V	80–100	**32.81**
110R10	110-V	100–125	**27.02**

Order From

PALCO ENGINEERING, INC.

BOX 41
Carmel, Indiana

K6AGF/6	Tri-County Amateur Radio Assn.....	761-	AB-15-	5208
W6PMK/6	North Peninsula Electronics Club.....	464-	A-25-	4401
VE7AQL/7	British Columbia Electric Railway Amateur Radio Club.....	488-	AB- 8-	4038
VE3DJS/3	Niagara Peninsula Amateur Radio Club.....	508-	AB-30-	3882
W7NCW/7	Lower Columbia Amateur Radio Assn.....	492-	AB-14-	3243

Nine Transmitters Operated Simultaneously

W9AP/9	North Suburban Radio Club.....	1445-	A-30-13,230	
W9IT/9	North West Amateur Radio Club.....	1224-	A-37-11,241	
VE3BRR/3	Nortown Amateur Radio Club.....	846-	A-38-	7848
VE3DC/3	Hamilton Amateur Radio Club.....	836-	AB-28-	7617
W6SY/6	San Francisco 29ers....	807-	ABC-35-	5025

Ten Transmitters Operated Simultaneously

W2LI/2	Tri County Radio Assn.	1958-	A-30-17,847	
W2GSA/2	Garden State Amateur Radio Assn.....	1979-	AB-40-16,899	
W6UW/6	Santa Clara County Amateur Radio Assn.	1540-	AB-28-11,874	
W6UF/6	Elmac Gang.....	1435-	AB-32-10,044	

Eleven Transmitters Operated Simultaneously

W5SC/5	San Antonio Radio Club	1255-	AB-28-10,113	

CLASS B

Grouped in this special listing are the scores of stations manned by one or two operators. Where two persons participated, the call of the assisting operator is given following that of the amateur whose call was used. Figures following the call listings indicate number of contacts, power and final score.

One Transmitter

W2JBQ/2	373-	A-	5373
W2FBA			
W5VRP/5	191-	A-	2916
W5SXF			
KØWBB/Ø	307-	A-	2763
VE3BCL/3	238-	A-	2547
VE3EK			
W6LDR/6	398-	B-	2538
W6RW			
W1RAN/1	278-	A-	2502
W1RC8			
W6RSU/6	293-	B-	2049
W6IYG			
W3WPY/3	305-	B-	1980
W3VEJ			
W3RZG/3	216-	A-	1944
W3PWK			
W5OLD/5	169-	B-	1764
W5OG8			
W2NCI/2	123-	A-	1661
W2QNT			
W9EIZ/Ø	250-	B-	1512
W9ESQ/9	160-	A-	1440
VE3WY/3	81-	A-	1431
K2IHM/2	133-	A-	1422
W8VWY			
W9DSP/9	195-	B-	1320
VE3CWB/3	116-	B-	1269
VE3DOU			
W7JKB/7	180-	B-	1230
W7BBT/7	120-	A-	1080
W7QMK			
W7CMQ/7	54-	A-	1067
W7PUA			
W5WQN/5	223-	B-	1066
W5YSA			
W9MQV/9	108-	B-	972
W9DOH			
VE2QP/2	46-	A-	959
VE2PO			
VE3DOU/3	76-	B-	909
W7UNL/7	124-	B-	900
W8OPG/8	65-	A-	810
VE1AAM/1	35-	A-	810
VE1AAU			
W5ZHA/5	61-	A-	774
W5APN			
W5AER/5	99-	B-	744
W7IWU/7	48-	A-	716
W9PNE/9	52-	A-	702
W9OHU/9	26-	A-	683
W9OEY			
WØPAH/Ø	23-	A-	648
WØYUQ			
W4ZWL/4	106-	B-	636
W4ZSW			
W8OUD/9	19-	A-	594
VE3DBT/3	58-	A-	522
W4KAC/4	83-	B-	498
WØADT/Ø	163-	C-	489
WØSQN			
W6TUZ/6	53-	A-	482
W7VIU/7	133-	C-	474
W6PFE/6	31-	A-	419
V01D/2	5-	A-	405
W5BD/5	43-	A-	387
W5UMY			
W9QEI/9	187-	B-	376
W9NVP			
W9OIN/9	85-	A-	321
W8NOH/8	24-	B-	306
W8PUV			
W3IIX/3	22	A-	297
W3TYC			
K2GFX/2	22-	A-	297
W4KVM/VO6	48-	B-	288
W7NXZ/7	7-	B-	288
W7T8M			
W1HDQ/1	20-	A-	270
VE2DG/2	133-	B-	266
VE2ALP			
W1MMN/1	29-	A-	261
W8GGC/8	26-	A-	252
W8BCO/8	25-	B-	225
W8KS			
W8HOR/8	48-	C-	219
W8LXG			
W1NXX/1	16-	A-	216
W5ONL/4	43-	A-	210
W2AOD/2	13-	A-	176
W3TYC/3	12-	A-	162
W3IIX			
W5PIZ/5	48-	A-	144
W5TJT			
WN9GBC/9	10-	A-	105
WN1AIF/1	6-	A-	81
W4DAF/8	23-	B-	46
WN4C2F			
W1ZZO/1	5-	A-	45
W1VHM			
WØETW/Ø	!-	A-	18
VE3BAJ/3	2-	A-	6
VE2IB			

Two Transmitters

W6VIF/6	190-	A-	2903
W6BYC			
W4KUX/4	401-	AB-	2835
W4KCQ			
W4QCA/4	269-	B-	1614
W4SJU			
K2ESM/2	165-	A-	1485
W2HES			
W7SGD/7	54-	A-	486
W7WBS			
W8JTB/8	25-	B-	50
W8MVD			

(Continued on page 140)

CLASS C

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

K6ASK/6	238-A-3551	W8GHO/8	29-A- 729
W8IIFE/8	146-A-3470	W6QHU/6	6-A- 675
W8AEU/8	213-A-2876	W7OYO/7	25-A- 675
W8AJH/8	91-A-2727	W8ZEU/8	25-A- 675
W8AJW/8	77-A-2727	W6EPX/6	5-A- 662
W6NQQ/6	172-A-2673	W7NVY/Ø	19-A- 662
W6GQF/6	162-A-2538	W8AGA/8	24-A- 662
W8MWE/8	71-A-2457	W9OGZ/9	23-A- 662
W8ERA/8	68-A-2417	W9YRF/9	24-A- 662
W8INW/8	64-A-2363	W3IFW/3	22-A- 635
W6OLC/6	149-A-2349	W6UHC/6	46-A- 635
W8QAV/8	62-A-2336	W8LEX/8	22-A- 635
W8BDZ/8	57-A-2268	W9AYU/9	22-A- 635
W8PM/8	55-A-2268	W9MYI/9	20-A- 635
W9RQM/9	142-A-2268	W3KKH/3	21-A- 621
W8VK/8	54-A-2228	W3VAG/3	21-A- 621
W8INO/8	52-A-2201	W6KMJ/6	2-A- 621
W8JNF/8	53-A-2187	W7MSI/7	20-A- 608
W8YPE/8	51-A-2187	W3NKY/3	17-A- 594
W6HDT/6	136-A-2174	W6LMQ/6	2-A- 594
W6ROJ/6	135-A-2174	W8ZSD/8	19-A- 594
W8ZJQ/8	50-A-2174	W7OEN/7	17-A- 581
W6TSA/6	160-A-2160	W9CKR/9	18-A- 581
W8GHT/8	49-A-2160	W7JPH/7	17-A- 567
W6ZVD/6	133-A-2147	W7OTA/7	17-A- 567
W8CZM/8	48-A-2147	W7RT/7	17-A- 567
W8FKB/8	54-A-2147	W7CBE/7	15-A- 540
W8NNO/8	42-A-2066	W9LVS/9	14-A- 540
W8MYM/8	41-A-2052	W3ESM/3	12-A- 500
W8NNC/8	41-A-2052	W7HRC/7	12-A- 500
W8GMK/8	56-A-2039	W3JE/3	11-A- 486
W8ZXL/8	40-A-2039	W7TMO/7	11-A- 486
W8IWP/8	38-A-2012	W3JAS/3	10-A- 473
W8AFW/8	38-A-1985	W3EQK/3	15-A- 459
W8LHJ/8	38-A-1984	W8WAG/8	9-A- 459
W8NLJ/8	35-A-1971	W3FRD/3	8-A- 446
K6DSM/7	105-A-1950	W3GBB/3	8-A- 446
W8LXR/8	33-A-1944	W8LPZ/8	8-A- 446
W8MAE/8	37-A-1944	W3AAX/3	46-B- 432
W8NZI/8	33-A-1944	W3PSQ/3	7-A- 432
W8KHM/8	32-A-1931	W7QGF/7	3-A- 432
K6CDA/6	141-A-1904	W3DOD/3	31-A- 419
W6EHB/6	109-A-1809	W3KIU/3	3-A- 378
W6JSP/6	106-A-1769	WØUQV/3	28-A- 378
W6OAY/6	100-A-1688	W3NPL/3	2-A- 365
W3FMG/3	61-A-1647	W4URF/8	1-A- 351
W6RKC/6	182-B-1638	W7JWE/7	1-A- 351
W6JOM/6	77-A-1620	W8AJZ/8	1-A- 351
W6PIX/6	91-A-1593	W8HUS/8	1-A- 351
W8MIX/8	31-A-1566	W8INH/8	1-A- 351
W6EIG/6	115-A-1553	WN8QXG/8	1-A- 351
W7PGY/7	30-A-1553	W8QYM/Ø	1-A- 351
W5CTG/5	73-A-1323	W8VM/8	1-A- 351
W6INX/6	69-A-1296	W8WAE/8	1-A- 351
W6FJF/6	70-A-1283	W2KTF/2	24-A- 324
W6GBL/6	67-A-1256	W8KZM/8	23-A- 311
W7BA/7	67-A-1242	W9RKE/9	22-A- 297
W6BHG/6	62-A-1229	W1TYR/1	32-B- 288
W6GAU/6	45-A-1215	W6HYN/6	20-A- 270
W6QHD/6	64-A-1202	W1JMY/1	2-B- 252
W6JIE/6	60-A-1148	W6EY/6	25-B- 225
W6OLY/6	58-A-1121	W3FXG/3	16-A- 216
W7CO/7	58-A-1121	K2BGS/2	16-A- 216
W7KZP/7	58-A-1121	W7OCW/7	14-A- 189
W3FDJ/3	56-A-1094	W6QGO/6	13-A- 176
W3VLL/3	53-A-1053	W2ZAL/2	12-A- 162
W4LHB/4	78-A-1053	K2BWG/2	18-B- 162
W9YWF/9	49-A-1026	W2IHE/2	11-A- 149
W9GFA/9	47-A- 972	WØDEL/Ø	11-A- 149
W6YQH/6	24-A- 959	K6CET/6	10-A- 135
W7FTR/7	45-A- 945	WØNNY/Ø	12-B- 108
W3BII/3	42-A- 905	W1AGB/1	7-A- 95
W3QLG/3	19-A- 837	K6DGD/6	7-A- 95
W3NNX/3	33-A- 810	W9DLM/9	10-B- 90
K6EA/6	16-A- 810	W8LHK/6	6-A- 81
W6NZP/6	12-A- 783	W1IHL/1	5-A- 68
W6KT8/6	13-A- 770	W8CBM/8	5-A- 68
W9EZS/9	31-A- 770	WØLQV/Ø	7-B- 63
KN6EKY/6	31-A- 770	WØABL/Ø	4-A- 54
W7PZT/7	25-A- 729	W4NHS/4	2-A- 27
W7RTQ/7	29-A- 729		

CLASS D

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

WØSVE	74	W1ZEO	25
KN6DGX	27	W1WZN	13

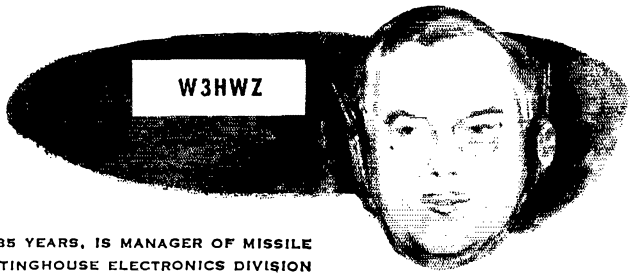
CLASS E

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

W4KFC/4	833	W8TZO	129
W4ZJB/4	309	W1UBC	113
W5YJS	280	K2DEM	113
VE1ZZ	242	K6CWX	104
W6BJU	200	W9AEM	102
W1WEF	186	W2KHQ	97
W2APH	182	W7LXY/7	95
W3TNO	151	W2ZCZ	88
W1AW	140	K6BAM	83
VE3DFM	130	W6UUG	78

(Continued on page 142)

CQ



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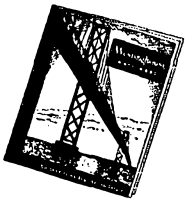

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W1ZDX	74
K6EA	70
W1APM	69
W3HVM	69
W3HDV	67
K2DIM	67
W8KID/8	64
W4MG	62
W1WMH	57
W1ZBL	55
W2TVC	53
K6ATN	52
K2EKS	50
W6AM	49
W2CUE/3	48
W3WAF	48
K5NRC	46
W1LIG	45
W4BXX [12]	45
WØRJX	45
W3WCP	44
K2CQJ	44
VE3BUR	43
W8DAE	38
K2EWR	36
VE2JL	35
KV4BD	33
W6NAZ	32
W6ZOL	31
W1ZCH	27
WN1ZUM	27
W3FQE	27
KN6DVA [13]	27
W2BFN/2	26
K2GBM	26
W5BSX	26
W8OCA	26
W3MDE	25
W8QCU	22
WN3YLJ	21
WØRDM	20
WN1AJX	19
W6JDN	19
W8VLW/8	18
W9VJD	18
W3WKP	17
W1PDN	16
W3YNZ	16
W5BLA	16
W1WLZ	14
W2CVW	14
WN9BCO	14
W2QFH	13
W2TNC	13
K2DG	13
W3LXE/3	12
W3VKD	12
WN4BXV	12
W7JAZ	12
W7NWP	12
W1TXI	11
W3RHT	11
W3VZI	11
W4DRT	11
WN8QHW	11
W9PHE	11
WØPWO	11
W3BNU	10
W6DKN	10
W7UZR	10
W1CTR	9
W1MEP	9
W4RXI	9
W8NEM	9
W9CHD	9
K2CUM	8
KN6EDI	8
W2BXM	7
W2GVV	7
W6JKR	7
VE7WL	7
W2OAE	6
W3WNH	6
W7JWE	6
WØVFM	6
VE1VN/1	6
W1YDS	5
W2HAZ	5
W2JGP	5
W5B8R	5
W9JMG	5
K2ENO	5
KN6CNL	5
W1GPN/6	4
W1MGP	4
W2ZAL	4
W3AHM	4
K2ENH	4
W3UTR	3
W7ALU	3
W1BB/1	2
W1RPQ	2
W4WYA	2
W7PSS	2
W8WYL	2
W9ALO	2
W9CLH	2
WØFDK	2
KN6DGE	2
W2HY	1
W2OTZ	1
W4GGD	1
WNØTGC	1
KN6DDO	1

[1] WØs BMQ MYX, oprs. [2] K6KBT, second opr. [3] W6TEN, second opr. [4] W9RLB, second opr. [5] W6EHA, second opr. [6] W5DAH, second opr. [7] W4WWO, second opr. [8] W3FWZ, second opr. [9] W3s AEL EIS FKA GRF MFJ PZW, W4s HQN IA KFC NTZ PNK TFX TKR UD, oprs. [10] W6RUC, second opr. [11] W1WPR, opr. [12] W4ARH, second opr. [13] KN6-DYP, second opr.

Silent Keys

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

W1FWH, Walter E. Bradley, Hartford, Conn.
W1HXE, Paul W. Muller, Salem Depot, N. H.
W1QPR, Thomas P. McDonald, jr., Beverly, Mass.
ex-W2BAG, F. Austin Lidbury, Niagara Falls, N. Y.
ex-W3FIA, Henry P. Wagner, Catasauqua, Penna.
W4SEZ, Buell Vincent, Franklin, Ky.
W4TUT, Mayor Ivan C. Kelly, Somerset, Ky.
W4ZQZ, George H. Scarboro, Spartanburg, S. C.
W5BR, ex-W5DNN, ex-HC2OT, H. E. M. Stevenson, Houston, Texas
W5LHF, Ralph A. Grogan, Fort Worth, Texas
W6JCE, Earl P. Patrick, Coronado, Calif.
W7PZA, Francis T. Clodfelter, Corvallis, Ore.
W8BPH, William Everett Janes, Chillicothe, Ohio
W8DDL, Thomas Thomas, Dayton, Ohio
W8MUL, John J. Messler, Detroit, Mich.
WN9DLB, Harold W. Davis, Libertyville, Ill.
WØCRM, B. F. Piper, West Plains, Mo.
WØDRW, Frank J. Whalen, Kansas City, Mo.
WØJVD, Walter W. Soderman, Duluth, Minn.
WØLVG, John R. Lally, Minneapolis, Minn.
WØVQN, Aaron G. Brehmer, Scottsbluff, Nebr.
VE3AVP, William J. Godsman, Clarkson, Ontario

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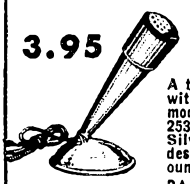

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- UTC Ouncer Transformer

A terrific value! High impedance mike with —55 db output level. Compact, modern, slim styling. Contains W.E. 253A magnetic head and UTC ouncer. Silver plastic casing with detachable desk stand. Lightweight — only 11 ounces. Complete with 6 ft. cable.

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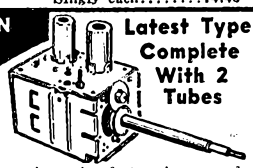
CARDWELL ES-1 Converter—Lots of 3 each.....13.95
Singly each.....14.45

SARKES TARZIAN VHF TUNER



Latest Type Complete With 2 Tubes

Brand new—covers entire VHF spectrum. It is an exact duplicate of thousands now in use in many chassis including the Sylvania 510 and 520 series. Has 7" long concentric shafts. Excellent gain, noise factor, image and I.F. rejection. For 40 mc IF systems. Complete with 6BC5 and 6x8 tubes and shields. Shpg. Wt. 4 lbs. Worth 3 times the price!

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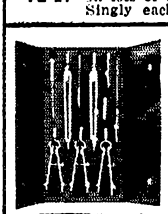

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11 Pieces—Fitted Felt-Lined Case

Made in Germany, of heavy brass, nickel plated and polished. Instruments include 5½" Compass with pencil and pen points and lengthening bar. 5½" Divider, three 3¾" sidewheel bow dividers with needle point, pen point and pencil point. 5" Ruling pen, extra handle for pen or pencil, capsule with extra leads. Interchangeability of these many parts makes this an exceptionally versatile set. Your money back—if this set is not worth twice our price!

F-13.....Net 2.75

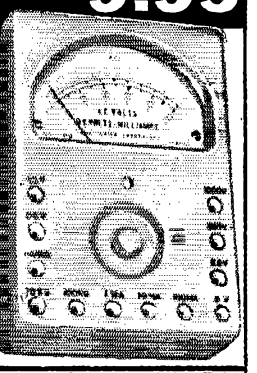
WESTERN ELECTRIC HEARING AID

Best Buy

Reg. price ~~$185.00~~ *Our price* **$14.95**

Brand new, in original Western Electric's jeweler's case. Supplied with receiver, receiver cord, battery cord and plug (less batteries). Money back guarantee. Act now while they last! Uses Burgess XX30E and 8R batteries at $1.55 per set.

NEW POCKET AC-DC VOM MULTITESTER 9.95



This instrument is one of the best buys that Lafayette has ever offered in a Wide Range **AC-DC MULTITESTER.** An ideal portable unit that meets the need for a compact, yet rugged test instrument. Has ease of operation usually **FOUND ONLY IN MORE EXPENSIVE INSTRUMENTS.** Has 1000 ohms/volt sensitivity on both AC or DC. Uses full 3" rectangular meter with large, easy to read scale. Uses 1% precision resistors, jeweled D'Arsonval microamp meter movement. Ranges: AC-DC and output volts 0-5, 0-25, 0-250, 0-1000V; DC current 0-1, 0-10, 0-100 MA; Resistance 0-10K and 0-100K ohms. In handsome sturdy bakelite case. Size: 4¾" x 3¼" x 1⅜". Supplied Complete with test leads and batteries. A Must for every serviceman, shop, Laboratory or experimenter—and at Lafayette's Price you can afford to own one. Shpg. Wt. 2½ lbs.

MODEL RW-27C—Complete
In Lots of 3 **9.45**
Single, ea. **9.95**

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only **29.95**

Stock No. F-32

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With F3.5 Coated Lens

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Shpg. Wt. 7 lbs.

- Built-in Flash Synchronization
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NEVER BEFORE AT THIS PRICE

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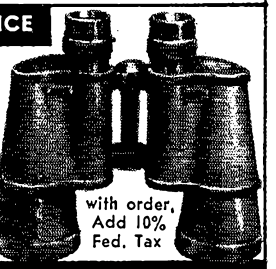

- ALL-METAL CONSTRUCTION
- INDIVIDUAL FOCUS
- COMPLETE WITH LEATHER CASE & STRAPS

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F-103, 7 x 50 with case.....Net **24.95**
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Novice Round-up

(Continued from page 61)

2) *Time:* All contacts must be made during the contest time indicated elsewhere in this announcement. Time may be divided as desired but must not exceed 40 hours total.

3) *QSOs:* Contacts must include certain information sent in the form as shown in the example. QSOs must take place on the 80-, 40-, 15-, or 2-meter bands. Crossband contacts are not permitted. C.w. to 'phone, c.w. to c.w., 'phone to 'phone, 'phone to c.w. contacts are permitted. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your number and section and receipt of a number and section.

4) *Scoring:* Each exchange counts one point. Only one point may be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see page 6 of this *QST*) worked during the contest is the "section multiplier." A fixed scoring credit may be earned by entrants who hold ARRL Code Proficiency certificates. If an entrant does not hold a CP award he can apply for credit by attaching to his Round-up report a copy of qualifying run from W6OWP, December 4th or January 7th, or from W1AW, December 16th or January 14th. CP credit equals the w.p.m. speed indicated on the latest certificate or sticker held by the entrant. The final score equals the "total points" plus "Code Proficiency credit" multiplied by the "section multiplier."

5) *Reporting:* Contest work must be reported as shown in the sample form. Reporting forms and a map of the United States will be sent gratis upon request. Indicate starting and ending times for each period on the air. All Round-up reports become the property of ARRL and must be postmarked not later than February 14th, 1955.

6) *Awards:* A certificate award will be given to the highest-scoring Novice in each ARRL section.

7) *Disqualifications:* Failure to comply with the contest rules or FCC regulations shall constitute grounds for disqualification. ARRL Contest Committee decisions are final.

Happenings

(Continued from page 63)

What is the formula for calculating total inductance when two or more inductors are connected in series? In parallel?

What is the formula for calculating the reactance of an inductor?

What is the formula for calculating the reactance of a capacitor?

What is the formula for determining the total resistance of two or more resistors connected in series? In parallel?

What is the formula for determining the total capacitance of two or more capacitors connected in parallel? In series?

What is the formula for determining the characteristic impedance of an air-insulated parallel conductor transmission line?

What is the formula for determining the standing wave ratio in a transmission line?

What is the formula for determining the wavelength of radio waves?

What is the formula for finding the resonant frequency of a tuned circuit?

In a series-resonant circuit, if the value of inductance is kept constant, what must be done to the value of capacitance to double the resonant frequency?

In a series-resonant circuit, what must be done to the value of the inductance-capacitance product to halve the resonant frequency?

Draw a schematic diagram of a high-pass filter with constant-*k* pi section, balanced type.

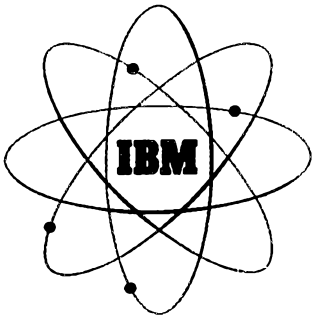
Draw a schematic diagram of a low-pass filter with constant-*k* pi section, unbalanced type.

Draw a schematic diagram of an r.f. power amplifier stage using parallel feed.

Draw a schematic diagram of a wavemeter with an indicating device.

Draw a schematic diagram of a Colpitts oscillator circuit.

(Continued on page 146)



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"ITV" FILING

At its May meeting, the ARRL Board of Directors voted to file comment in Docket 9288 supporting the action of the Federal Communications Commission in proposing maximum radiation standards for certain devices such as television receivers. The text of the League's filing follows:

FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C.

In the Matter of

Amendment of Part 15 of the Commission's Rules Governing Restricted Radiation Devices } Docket No. 9288

COMMENTS OF THE
AMERICAN RADIO RELAY LEAGUE, INC.

Pursuant to Paragraph 12 of the Notice of Proposed Rule Making in Docket 9288, the American Radio Relay League files these comments on behalf of the more than 42,000 licensed amateur radio operators who are members of the League.

The interest of the American Radio Relay League in the present proceedings arises from the fact that stations in the amateur service have, since the inception of television broadcasting, been plagued with disruptive interference due to spurious radiation from television receivers. The amateur service is undoubtedly the single communications service most adversely affected by this unnecessary interference, inasmuch as amateur stations are located almost exclusively in residential areas; in other words, the distribution of television receivers follows closely the distribution of amateur stations in any particular area.

The American Radio Relay League has heartily supported the past actions of the Commission in dealing with this general problem, and endorses the present effort of the Commission to require manufacturers of television receivers to turn out products which are in reasonable conformity with the necessities of their users to live harmoniously together with other services provided for under international treaty and licensed by the Commission.

The League wishes to record its appreciation of the efforts made by the Radio-Electronics-Television Manufacturers Association, through its committees, to bring to the attention of manufacturers the need for better receiver design and construction to meet today's spectrum requirements. While the proposals of the Commission for maximum radiation limits, which we assume are based on the Association's recommendations, will not by any means solve all of the problems of interference to the amateur service and therefore leave much to be desired, they are a step in the right direction. The League is pleased to see that the Commission, in Paragraph 10 of its Notice, recognizes this fact and indicates an intention of progressing to stricter limits as may be required to protect the various services it licenses.

AMERICAN RADIO RELAY LEAGUE, INC.
By PAUL M. SEGAL
Its General Counsel

A. L. BUDLONG
Its General Manager
October 9, 1954

FEED-BACK

In the caption under the diagram of the CD-10-TC 10-meter transmitter-converter on page 33 of the November issue, the references to the crystals, X_1 and X_2 are reversed. X_2, of course, is the converter crystal.

In the article describing the mobile modulator, starting on page 21, the length of the chassis is given as 6½ inches. This dimension should be $6\frac{5}{16}$ inches.

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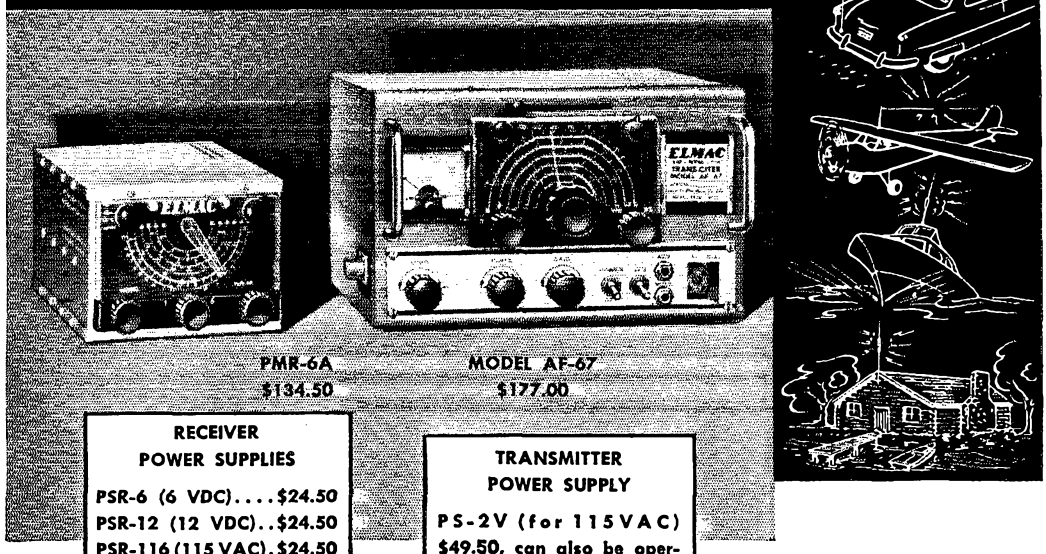

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$177.00

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PSR-116 (115 VAC).$24.50
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PS-2V (for 115VAC) $49.50, can also be operated from a dynamotor or vibra-packs.

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(Continued from page 68)

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(Continued on page 158)

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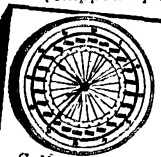

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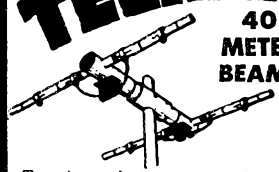

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MODEL 403—
3 Element—40 Meter Full Size. 3"x29 ft. reinforced dural boom. 1/2 wave elements. 8.3 db gain; 19 db F/B ratio. 52 ohm co-ax feedline Wgt. approx. 92 lbs. **NET** **$330.00**

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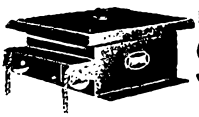

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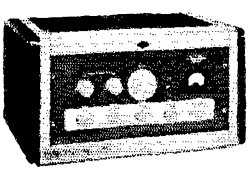

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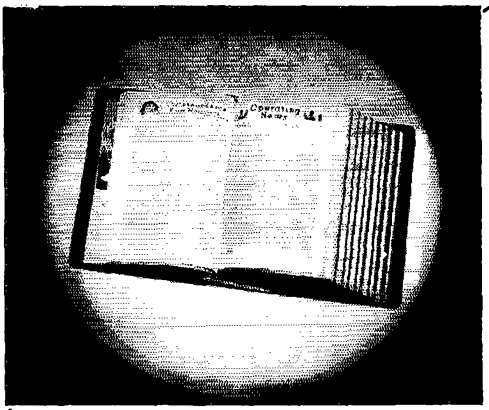

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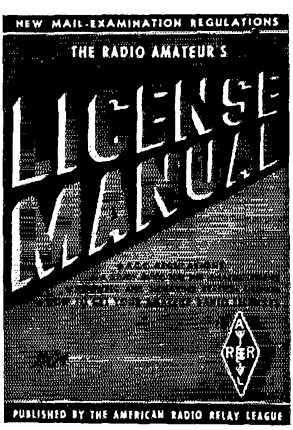

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- EXTRA-CLASS

The AMERICAN RADIO RELAY LEAGUE, Inc.
WEST HARTFORD 7, CONN.

Amperex® Tubes DELIVER MORE POWER...LONGER LIFE... MORE FOR YOUR MONEY

Amperex JAN-type 5894

Special Features that make this tube the OUTSTANDING SELECTION IN ITS CLASS

- Lower battery drain.
- High power gain.
- No external neutralization necessary.
- Zirconium coated molybdenum anodes for high overload capacity and lifetime gettering action.

The 5894 is a UHF and VHF twin tetrode for wide-band operation, RF amplifier, modulator, frequency multiplier service and wide-band oscilloscopes. Considerably reduced capacities provide higher resonant frequencies. Single cathode and screen grid construction results in low RF degeneration, therefore low drive required. Self-neutralized over entire band. Only 4" x 1 13/16". This tube has proved to be outstanding with 5 years of actual mobile operation.

NEW ICAS RATINGS

PLATE VOLTAGE.....750 volts

ANODE DISSIPATION.....45 watts

HALF FILAMENT BATTERY DRAIN ON "STANDBY"

ACTUAL MEASURED POWER OUTPUT

PUSH-PULL OPERATION

144 Mc.....85 watts

220 Mc.....85 watts

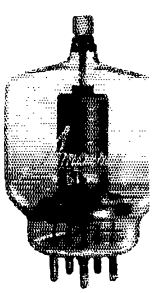
420 Mc.....60 watts

Amperex type 6155—Tetrode

Replaces old type 4-125A. Features heavy, zirconium coated graphite anode for high overload capacity. Powdered glass stem for strength eliminates external "heat-trap" base.

Amperex type 6156—Tetrode

Replaces old type 4-250A. Same features as 6155. Proven outstanding in high frequency communication and amateur service.



Amperex type 6360—Twin Tetrode

High Power At Low Cost! A small, low-cost, efficient twin tetrode, (only 3" x 7/8"). Highly efficient for operation at up to 200 Mc. Excellent frequency multiplier for 2 meter and 220 Mc bands.

Amperex type 866AX—Rectifier

Rigidly controlled mercury pressure insures a more rugged, more stable, more efficient tube with longer operating life.

Available From Your Local Radio Parts Distributor

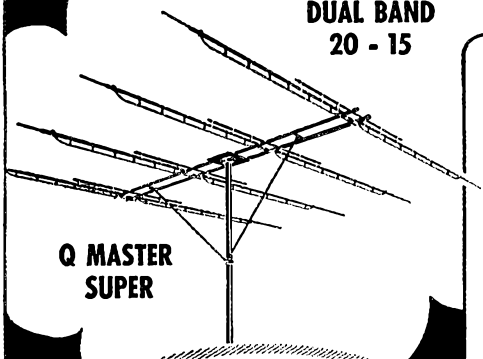
AMPEREX ELECTRONIC CORP.

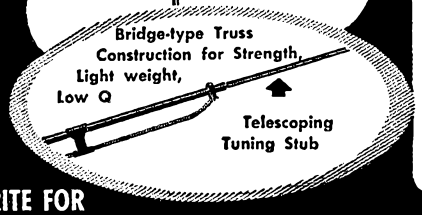
230 Duffy Avenue, Hicksville, Long Island, N. Y.

In Canada: Rogers Majestic Electronics Ltd.
11-19 Brentcliffe Road, Leaside (Toronto 17)

AMPEREX

3 NEW STARS in the ANTENNA SKY





Q MASTER

COMPACTED PRE-TUNED BEAMS

	**Q MASTER Twin EL	***Q MASTER Tri EL	****Q MASTER Super
No. of Elements	2	3	4
Approx. Forward Gain*	4.8db	7.4db	8.2db
Approx. F/B Figure	15db down	29db down	36db down
Overall El	20'	20'	20'
Length Boom	7'	12'	24'
Approx. Weight	13.5 lbs.	18.0 lbs.	28.0 lbs
Price	$59.50	$78.50	$99.50

* As measured against reference dipole.

Q MASTER beams are the NEW concept of multi-element antenna design. All elements are dual-conductor, truss designed, making for light weight, great strength and broad-band electrical properties, making possible large frequency excursions while maintaining a relatively low standing wave ratio change. All insulation is of Polystyrine or Poly-ethylene. Double booms are diagonally braced for stability. All three Q MASTER models may be used on both the 15 or 20 meter bands. All models PRE-TUNED — For complete details, write for brochure.

"BETTER BY RESEARCH"

Halliday Moede Company Salem Oregon

WRITE FOR BROCHURE

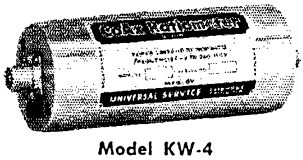
Call Jim Halliday, W7QJ on 15 or 20

Be *Sure* of Your Transmitter to Antenna Match with the new **CoAx Ratiometer** (S.W.R.)

Install a CoAx Ratiometer in the line between your transmitter and antenna (or tuner) and stop guessing at a proper match. In this new device, well-established principles are applied to produce a unique answer to the problem of measuring standing wave ratios. The result is a design of exceptional accuracy and simplicity.

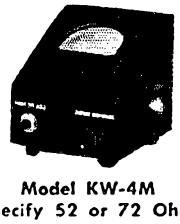
There are no condensors to balance, no resistors in line to dissipate your power. The unit handles frequencies from 2 to 200 MCS, power loads from 10 to 1000 watts (so it can't be overloaded). Rugged construction, but so compact it can easily be permanently installed inside your transmitter. Free mounting bracket included with every unit.

Sensing unit may be purchased with or without the easy-to-read remote indicator. Complete instructions include how to make your own remote indicator. See your favorite distributor today. If he hasn't heard about the CoAx Ratiometer, send us his name and your check. We'll ship direct to you, postpaid. 73-W8IJ



Model KW-4
Specify 52 or 72 Ohm
CoAx Unit and Switch Box

$27.50



Model KW-4M
Specify 52 or 72 Ohm
CoAx Unit with Meter

$47.50

Full One Year Warranty
on Both Models

UNIVERSAL SERVICE

114 N. Third St. Columbus 15, Ohio

(*Continued from page 148*)

Spain: U.R.E., P.O. Box 220, Madrid
St. Vincent: VP2SA, Kingstown
Sweden: S.S.A., Stockholm 4
Switzerland: U.S.K.A., Postbox 1203, St. Gallen
Syria: P.O. Box 35, Damascus
Trieste: P.O. Box 301, Trieste, F.T.T.
Trinidad: John A. Hoford, VP4TT, P.O. Box 554, Port-of-Spain
Tripolitania: 5A2TZ, Box 372, Tripoli
Uruguay: R.C.U., P.O. Box 37, Montevideo
U.S.S.R.: Central Radio Club, Postbox N-88, Moscow
Venezuela: R.C.V., P.O. Box 2285, Caracas
Virgin Islands: Richard Spenceley, Box 403, St. Thomas
Yugoslavia: S.R.J., Postbox 48, Belgrade

How's DX?

(*Continued from page 66*)

CM1RU, EA6AX, FA8IH, HC1FG, KL7s ARZ AYM BEZ, LU5DBD, OA5N, TIs 2RKL 2WLC 5CAP 5RM 8FG, VK9RM, YN1MX, YV5BD and ZL2BE.

Eighty c.w. provided DU7SV (25), JA1CR (24) and KG6GX (25) for W7JLU . _ . _ . _ K2BZT picked up many Europeans, EL2X (5) 0–1 *EST*, KV4AA twice, LU1ZS (13) 0 and YV1AD (12) 19–20 . _ . _ . _ 80-meter doings at random points — *W2ESO:* heard ZD2DCP (7) 22–23 EST, worked VKs 2QL 3AHH, VP4LZ. *W4CEN:* nailed that ZD2. *W9APY/5:* an LU "Z" feller, PY6AK . _ . _ . _ VP8BE was W4BRB's 113th 3.5-Mc. DXCC-style country; VE1ZZ also passed the 80-meter century mark.

Fifteen 'phone rode the erratic m.u.f. crest in such fine style that 21-Mc. converts popped up by the dozens. A 4-hour-and-20-minute WAC is included in this W4DOU roster: CN8MM 14 *EST*, a DL1 and G5, VP3YG 14, a W7, ZC4JA 11–12, ZL2LV 16 and 4X4BL 10–11, all on 'phone. Ross also caught ELs 1ØA 12A, VQs 2PL 4EZ and ZE2JE. Heard to be active on 21-Mc. A3 by W4DOU but still sought are FB8BC, FQ8AT, FR7ZA, VK9BS, VQs 5EK 6LQ 8CB, VS1FE, YI5AM, ZBs 1AUV 2A, ZCs 4AD 7BB, ZD9s AB AC (100) and 4S7YL . _ . _ . _ W9RBI's first tangle with 15 meters netted CR6BH, a ZL and 4X4BL . _ . _ . _ LU8DB collided with EAØAC and SVØWO . _ . _ . _ CP5AB, CX5AF, VP2KB, VQ4RF, YN1AA, YS1RA and ZP5AM gave in to W4UWC . _ . _ . _ W6ZZ's 21-Mc. log reveals CE2HJ, HC1LW, KV4BD, PJ2AO, TI2BX, VKs and ZLs galore, VP6WR, ZS6DW and enough maritime mobiles to clinch him MM-diploma No. 79 . _ . _ . _ CE4BP (242), CN8s CS CX, EL3A, OK1KTL, VP5SC, VQ2DT and ZS9G (310) are recommended by NNRC.

So there you are. The bands are jumpin' — pick your megacycle, throw the switch, and let the prefixes fall where they may!

HAMFEST CALENDAR

NEW YORK — The Yonkers Amateur Radio Club will hold its 5th annual Hamfest-Dinner on Friday, December 3rd, 7 P.M., at Schmidt's Farm Restaurant, Fort Hill Road (west of Central Park Ave.), Greenburgh, N. Y. The Dinner will be a choice of turkey or swordfish steak. There will be a good time in store for all, with flowers for the YLs and XYLs. A dance will also be held. Tickets are $4.50 each and may be ordered in advance from the club treasurer, Kern Bowyer, W2GHH, 1 Midland Gardens, Bronxville 8, N. Y. Make checks payable to Kern Bowyer. No tickets will be sold at the door.

MEMBERSHIP CHANGES OF ADDRESS

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

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.

(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 noncommercial 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.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS. Radio publications. Latest Call Books, $3.50. Mrs. Earl Mead, Huntley, Montana.

WANTED: Cash or trade, fixed frequently receivers 28/42 Mc. W9VIV, Troy, Ill.

WANTED: All types of aircraft radios, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

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.

POSTCARD brings you free information on our new Amateur Desk Signs and money-saving club purchase plan. Hawkins Distributing Co., Paquatuck Terr., East Moriches, N. Y.

URGENTLY need AN/APR-4 items. New high prices. Littell, Far Hills Branch, Box 26, Dayton 9, Ohio.

RK-4D32, brand new, $17.50 postpaid. W5AXI.

HOTTEST Ham List in the nation! Trade-ins and closeouts of all leading Amateur brands including Collins, National, Johnson, Hallicrafters, Gonset, Elmac, Morrow, Harvey-Wells, RME, Millen, Meissner, Sonar. We trade and offer our own time payments tailor-made for you. All leading brands of new equipment in stock. Write for latest bulletin. Stan Burghardt, WØBJV, Burghardt Radio Supply, Inc., Box 41, Watertown, South Dakota.

NEED ARC-11 Bill O'Connell, 4908 Hampden Lane, Bethesda, Maryland.

WANTED: BC-348 receiver. W. Richards, 4908 Hampden Lane, Bethesda, Md.

NEED: ART-13. R. Ritter, 4908 Hampden Lane, Bethesda, Maryland.

TRANSFORMERS while they last! 550VCT @ 90 mile with 6.3VCT @ 3½ A, cased, $2.00 each; 700VCT @ 90 mile with 6.3VCT @ 3½ A cased, $2.20 each; 5260VCT @ ½ amp. ICS, $40.00 each. Grand Transformers, Inc., 226 Washington St., Grand Haven, Michigan.

WANTED: March, May, June 1916 *QST*. Sell four or more *QST*s 1930 to date, 25¢ each. WØMCX, 1022 N. Rockhill Rd., Rock Hill 19, Mo.

TELESCOPIC Aluminum tubing: All sizes: ⅝" x .058 wall, 12¢ per ft., ½" x .058 wall, 14½¢ per ft.; ¾" x .058 wall, 22¢ per ft. All sizes stocked. Handy Tool, Inc., P. O. 142, Tilton, N. H.

WANTED: Cash paid for BC-610 xmtrs and BC-221 frequency meters. In addition we buy technical manuals. Also TCS sets, R5AØ ARN-7, ART-13, DY-17, others. Amber Company, 393 Greenwich St., New York 13, N. Y.

DON'T Fail! Check yourself with a time-tested Surecheck Test. Novice, $1.50; General, $1.75; Amateur Extra, $2. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

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. No. 8-8696, No. 8-8262.

WANTED: Bargains in transmitters, receivers, laboratory and test equipment, also miscellaneous and unusual gear, etc. What have you? Please state price desired. Especially interested in husky power supplies, large filter chokes and condensers, etc. Also need plate transformers putting out about 4,000 V or more each side center. Harold Schonwald, W5ZZ, 718 North Broadway, Oklahoma City 2, Oklahoma.

QSLS, SWLS? Finest and largest variety of samples 25¢ (refunded). "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Mich. (Subscriptions, renewals accepted, appreciated all radio magazines.

QSL's, SWL's. Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 423 Barker Bldg., Omaha, Nebraska.

QSL's-SWL's Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSLS-SWLS. 100, $2.85 and up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSL-SWLS. Samples, free. Bartinoski, Houlton, Me.

QSLS. Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

QSLS! Two colors, $2.00 hundred. Samples for stamp. Rosedale Press, Box 164, Asher Station, Little Rock, Ark.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSLS! Taprint, Union, Mississippi.

QSLS. Samples, 10¢. C. Fritz, 1213 Briargate, Joliet, Illinois.

QSLS: Beautiful blue, silver and gold on white glossy stock: $3.85 *per 100. Two-day delivery.* Satisfaction guaranteed. Rush order and get surprise of your life. The Constantine Press, Bladensburg, Md.

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. QSL Press, Box 71, Passaic, N. J.

QSL samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

QSLS. Postcard brings samples. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

QSLS Personalized. 150, $2.00. Samples, 10¢. Bob Garra, Lehighton, Penna.

QSLS-SWLS, as low as $1.50 per color. Samples dime. Stronberg, P.O. Box 151, Highland Station, Springfield, Mass.

QSLS-SWLS. Free samples. The Backus Press, C. Backus, 5318 Walker Ave., Richmond, Va.

QSLS, samples dime. Printer, Corwith, Iowa.

WESTERN Hams, order your QSLS in the west. Save time, save money. Personal Prints. P.O. Box 64553, Los Angeles 64, Calif.

QSLS. Postcard brings samples. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

QSLS-SWLS, Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSLS! Advanced designs! Reasonably priced! Samples 10¢. Tooker Press, Lakehurst, N. J.

QSLS: New designs. Samples. Besesparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

QSLS! Only the very best! Oscar Craig, P.O. Box 157, Newark, Arkansas.

W6HTN, Riesland, prints QSLS. $1.00 for 100.

CANADIAN QSLS, Snappy samples for stamp. Beynon, VE3WV, Collingwood, Ont. Can.

QSLS! Want 'em fast? Reasonably priced? Cleanly printed? "Superspeed Specials" are the answer. Dozen samples, 10¢. Robinson, W9AYH, Dept. U, 12811 Sacramento, Blue Island, Ill.

QSLS-SWLS. Rainbows, Cartoons, Others. Reasonable. Samples 10¢ (refunded). Joe Harms, W2JME, 225 Maple, North Plainfield, N. J.

QSLS distinctively different. Postpaid. Samples free. Roland J. Dauphinee, W1KMP/6, Box 78374, Los Angeles 16, Calif.

UNUSUAL! Vivacious! Illustrated QSLS, typolithographed. Free samples. WAT, Box 128, Brecksville, Ohio.

COMMUNICATIONS Engineers and Technicians! Excellent salaries, minimum requirements. Engineer: Graduate with 3 years experience. Technician: 2 years school in communications and 5 years experience. Require installation, adjustment, and maintenance experience with communication receivers and associated terminal equipment. Also, men with similar experience with high-powered transmitters, antennas, transmission lines. Must be willing to travel in United States and overseas. Write: Page Communications Engineers, Inc., 710 Fourteenth St., N.W., Washington 5, D. C.

FOR Sale: Practically new RCA tape recorder, less than 30 days old, two speed, 1800 ft. plastic tape, $135.00. W9LQI, Boyd, Ashton, Ill.

SURPLUS: RG-8/U cable 100 ft. $5.95; 250 ft., $13.25; 500 ft. $25.00. New connectors, PL-259 and SO-239, 5 for $2.00; new oil-filled condensers, 600 WVDC, 2 mfd, 69¢, 4 mfd. 90¢, 7 mfd, 95¢, dual 8 mfd, $1.95; 1000 WVDC, 1 mfd, 69¢, 2 mfd 90¢, 4 mfd, $1.59; 8 mfd, $3.25. AN/APS-13 420 MC transceiver with 17 tubes, $15.50 Postage extra. Request new bargain bulletin. Visit new store for thousands of unadvertised bargains. Wanted to purchase: Surplus radio equipment, Navy synchros. Lectronic Research Laboratories, 715-19 Arch St., Philadelphia 6, Penna.

COLLECTING War Dept. Technical Manuals, etc., in communications and electronics. What have you got? Write to: Bob Briody, 140 West 57th St. (1 RE), New York 19, N. Y.

GLOBE KING, 400 watts. Like new, factory shielded, coils for 80, 40, 20 crystal mike and some extra tubes. Best offer over $350.00. Clem Coggin, 232 Rose St., Jackson, Miss.

WANTED: RME VHF2-11. State condition and price. W3IEJ, 901 Perkiomen, Lansdale, Penna.

FOR Sale or swap: Collins ART-13, Autotune, in gud condx and operational, complete with low frequency exciter, crystal calibrator, speech amplifier, and instruction manual. Want: 32V2 or similar transmitter, W5VJR, 3404 South Atlanta Pl., Tulsa, Okla.

FOR Sale: National HRO-50-T 1 with coils A,B,C, and D, plus speaker, like new, best offer. Pietro Bomben, 1647 Langlois Ave., Windsor, Ontario, Canada.

SHOPPING Early? Jumbo lawn stake callsign, reflectorized aluminum, $2.75, mobile sign, Regular, $1.50, Jumbo, $2.00. Overnight service. Whitley, W2LPG, 133 Airsdale Ave., Long Branch, N. J.

NATIONAL NC57 rcvr, gud condx, new tubes, $50.00. L. Blum. 47 N. Westgate Columbus 4, Ohio.

SELL: National HRO5TA1 rcvr, complete: coils, tubes, speaker, power supply; VHF152A, never used; DB22A, six months old, perfect condx. W2JIL, Box 62, Brooklyn 12, N. Y.

COLLINS 32V3, new condition, in original carton, $600. 75A3, new, unused, with 800 and 3 Kc. mech. filter, xtal calib., and speaker. Complete: $500.00. F.o.b. Chicago, Ill. Richard Karl, 2836 Leland Ave., Chicago, Ill.

MISCELLANEOUS gear for sale. Call or write for list. Some free to local Novices or hams. Ross, Apt. 321, 1107 W. Green, Urbana, Ill. Tel. 7-3393.

SELL: 75A3, NFM and matching speaker, $485.00; SX71, $165.00; Eldico GDO, $20.00; 28 Mc. xmittr with 6VDC dynamotor and relays, $30.00. Snover, W8ZRD, 511 N. Warner, Bay City, Mich.

TBS-50C, TVI'd, Viking VFO, power supplies, in excellent condx, deliver within 100 mi. Ex-W2VBP/4, 211 Longwood Court, Huntsville, Alabama.

SELL: 300 w. rig; 80–10 m, 812-As, final, 811-As mod; 28" rack, with power supplies, $250.00. J. C. Mitchell, W2BHS, 195 Amherstdale Road, Snyder 21, N. Y.

WANTED: Collins KW-1. State condition and price. Uncle Dave, W2APF, Ft. Orange Radio Distributing Co., Inc., 904 Broadway, Albany, N. Y.

VIKING I and Viking VFO, factory wired, TVI'd, like new. $210.00 takes both of them. N.Y.C. area. Pioneer 2-2091.

S-76 with R-46A, $150.00; Triplett 3256 wavemeter, $10.00; Eldico line filter, $5.00; Shure 505C mike, $10.00; Heath GDO, $12.00; Heath Antenna meter, $10.00; Sonar low pass filter, $7.50; Master All-band antenna with 40 and 80 coils, $5.00; McIntosh A-116 amplifier, $100.00; 6V-300V. 150 Ma. dynamotor, $5.00. Fred S. Eggert, 11833 Wisconsin, Detroit 4, Mich.

TRADE TBS-50D for SX-25 or NC-57B or S-36A. W4ENQ.

COLLINS 30K-1, complete, in new condition, $900; Motorola mobile FMT 30 DMS, 20 mtr., complete, $275.00 f.o.b. FMT 75 DMS, 75 mtr. W1THM, A. J. Brizzolari.

SALE: 170 watt c.w. xmittr, 6L6-813 power supplies included. Best offer over $100.00. Lanny Poole, 3441 Cliff Rd., Birmingham, Alabama.

BC-342 receiver, unconverted, $65.00; RME 10-20 converter, $45.00; VTVM, Electronic design Model 100, $20.00; 30 KV probe, $5.00; Philco 7170 AM/FM signal generator, $35.00; 500 watt final, rack, all bands with 812-H; B&W band switching grid turret, two meters, $50.00; complete power supply, rack, 1500 VDC, 300 Ma., $35.00; Dynamotors 250 VDC and 550 VDC, both 6 VDC inp., new; any good offer, all inquiries answered, W2PDH, Clark, 44 Lewis Lane, Syosset, L. I., N. Y.

FOR Sale: Office typewriter, mimeograph. Bargain priced. Local deal preferred. Samkofsky, 527 Bedford Avenue, Brooklyn, N. Y.

WANTED: A U.H.F. Resonator 3-element or Telrex 5-element 20-meter beam. Also, a 66 ft. whip. John Wilson, W8ZWX, Lawyer st Club, Ann Arbor, Michigan.

WANTED: Hammarlund Super Pro or other gud recvr, perfect condx from New York ham. Call Ray Furr, Pl 3-7628, 349 East 49th St., New York 17, N. Y.

COMPLETE Mobile and home station: HQ-129X and spkr, very good condx; Elmac 154H xmittr, used very little, extra cabinet for Elmac; A.C. supply for Elmac; two 450 volt 200 Ma. compact 6 or 12 volt Vibrapacks; push-to-talk Electro-Voice dynamic mike; complete W3GH slug-tuned mobile ant. and extras, cost $40. Really works. Master Mobile body mount and coax cables; Dow-Key 6 volt coax relay and cables. Precision 954 analyzer and tube tester. Let's hear your offers fellows. W3PFD, 337 13th Ave., New Brighton, Pa.

FOR Sale: NC183 with speaker, like new, $175.00; excellent 2-meter xtal converter with power supply, tubes, xtal, 6-10 Mc. IF, $20.00; Johnson 150DD70 condenser, $8.00; Johnson ceramic rotary inductor capable KW, $10.00; complete 2-meter portable, mobile, fixed station, receiver, xmittr and power supply 110 VAC or 6VDC, in oak case, $65.00; 10-meter, Handie-talkie with tubes, xtal and batteries, QST Feb. 1053, $25.00; 807s, 50¢; 2E26s, $1.50; 100TH, $4.00; homemade Panadaptor and power supply, $20.00. W. J. Moulton, Rt. 5, Chippewa Falls, Wisconsin. Phone 3000.

DANGER! High Voltage! Metal signs, 3" x 12", baked enamel colors, $1.00 postpaid. Save! 3-color reflectorized aluminum callsigns, 2" x 5" $1.00 postpaid; 4" x 12½", $1.50 postpaid. R. Lackner, W9WFT, 2029 Bradley, Chicago 18, Ill.

WILL Swap or sell: BC221-J, $65; VHF152A, $55; Millen VHF xmittr, Model 90810 with coils, Tubes, crystals, $65.00; Millen 750v. power supply Model 90810, $50; Electro-Voice speech clipper, Model 1000, $10.00; Meissner signal shifter, $50.00. Will consider swap involving modulation xformer of 500 w. or better. All prices F.o.b. Endicott, N. Y. K2BHP, Box 113, Endicott, N. Y.

SELL: Elmac A54, Carter dynamotor, Triband converter, noise limiter, loading coil and Hi-hat, complete, $160.00; 5-4125A, $10.00 each, new MB150, $15.00., 1 KW modulator and speech amplifier, $35.00; BC458, converted for SSB with filament transformer, $12.00; BC453 Q5-er with power supply, $15.00. W1SUQ.

FOR Sale: 2 BC-611F Handie-Talkies, in excellent condition. W4MFW, Robert J. Moore, 402 Edgewood Avenue, Rome, Georgia.

SCR-522 transmitter with 110V power supply, modified 2 meters; Gonset 2-meter converter and noise silencer; P103 dynamotor complete; all excellent, $90.00. John J. Dupre, K6BDD, 872 Warfield Ave., Oakland, Calif.

SELL: Complete station: VFO, Allband, AM-CW kilowatt transmitter; NC173 receiver and bug; need cash for college. KW xmitter recently built; 6AB6, 6AG7, 6L6, 807, PP813s, complete with all tubes, pwr supplies, relays, meters, coils (KW are plug-in), and in rack cabinet, complete, send for free pictures and schematic. Receiver in excellent condition. Realigned 1 year ago. Also Champion bug. Need money for college. Price: $500. Might consider individual sale (xmitter in Chicago). W9QXR/Ø P.O. Box 1855, College of St. Thomas, St. Paul 1, Minn.

FOR Sale: Gonset Super Six converter, $50.00; Gonset Tri-Band covers 10–20–75, $35.00. Both as new. VE5AY, P.O. 128, Lancer, Sask., Can.

SELL: HRO60 coils A to F, calibrator, new condx, $450.00. R. Ridenour, 839 Wildwood Pkwy, Balto 29, Md.

QSTs: 1946–1953, $15.00 plus postage. W8BSS.

SALE: April 1924 to Dec. 1951 incl. QSTs. Trade Leica 3-B lenses, etc. for good receiver. Howard C. Melcher, W3EFT, 2174 E. Cumberland St., Phila. 23, Pa.

BOEHME Automatic tape transmitter, complete with accurate Speedometer, plus McElroy tape perforator, all AC operation, suitable for school or commercial, $125.00. Frank Borsody, W2AVN/4, 1413 North Barton St., Arlington, Va.

WANTED for cash: Viking I or II. Not in operating condition. K2CW, 69 Ashland Road, Summit, N. J.

32V2 perfection condition, $420. K6GZH, 1138 W. 8th St., Santa Ana, Calif.

WANTED: Tilt base for SX-42 recvr. Harry Purcell, 1143 "D", Harvard, Santa Monica, Calif.

SX-24 and speaker. Sell $50, or trade with cash for 40–80 mobile transmitter and receiver. Consider enclosed AM transmitter. All letters will be answered. Donovan O'Brien, W9FKR, 8 8 Hammond Aurora, Ill.

FREE gift, new Astatic D-104 microphone with each purchase of Elmac AF-67, or Gonset Communicator. Your choice of either Vest Pocket Beam, Shortbeam, or Bantam Beam with each new Hallicrafters SX-96 receiver. Beam and microphone with each new SX-88. Tell us what you want. We'll make you a real deal! National Hi-Fi components. Many terrific bargains! Telcoa, Azurlee Dome, Malibu, Calif. Tel: GLobe 6–2611. Write, wire or phone anytime!

TRADE ABBOTT TR4B 2-meter transceiver for VOM. Tanenbaum, 1535 East 8th St., Brooklyn, N. Y.

FOR Sale: Elmac A-54-H. Excellent condition with AC supply, built to manufacturer's specifications. Both $115.00. Electro-Voice mike with stand, Model 630, $12.50. Simpson Model 240 multimeter, new, $20.00. James W. Craig, Jr., 3413 W. Roosevelt Dr., Lake Charles, La.

FOR Sale: 1 reconditioned National Select-O-Ject S-O-J 3. Send a money order for $20.00 and your address. Write to Cecil Moore, Madisonville, Texas.

30–40 Mc. Am crystal controlled 10-tube receivers, 6 volts DC with tubes. Spera Electronic Supply, 37–10 33 St., L. I. C., N. Y.

WANTED: ART-13 transmitters. Write James S. Spivey, Inc., 4908 Hampden Lane, Washington 14, D. C.

VIKING II factory-wired, with Matchbox, used 20 hours, $250.00; BC459, new, $15.00; cascode converter for 144 Mc., $30.00. No time to use. Wm. Baxendale, 2026 Kimball, Brooklyn, N. Y.

SELL: Hallicrafters SX-43 and R-44 matching speaker, $130.00 F.o.b. Wencil Kopecky, 1502 K St., S.W., Cedar Rapids, Iowa.

FOR Sale: HRO-60 coils and speaker, like new, $350.00. Viking II factory wired, like new, $250.00; Viking VFO, factory wired, $40.00; 3-el. 10 & 20 beam, rotator, indictor made by Johnson, relays, 48 feet aluminum tower, complete, $175.00. Estate of K6ARG, Mrs. J. W. Smith, 469 Dawson Ave., Long Beach 14, Calif.

FOR Sale: P-P 4–65A final, 500 watt input, completely metered, blower-cooled, shielded and filtered for TVI, $100. Lysco Transmaster, FB exciter for above, $50.00. Make an offer or trade. Joe Welch, W3PXX, 5026 59th Ave., Hyattsville P.O., Md.

WANTED: Book "Two Hundred Meters and Down." State price. W8HSG.

COLLINS 75A1 with speaker, $200; Eldico TR75TV xmittr, $40.00. Will not ship. B. Einwich, KN2HCA, 146 Union Ave., Rutherford, N. J.

HARVEY-WELLS TBS-50-D with VFO and APS-50. Used about 100 hours. Excellent appearance. $140 cash pickup. Roberts, 126 Ashbrook St., Springfield, Mass.

FOR Sale: TBS50C, new AC power supply. Both in excellent condx. $90.00. C. B. Story, W7TGZ, 540 Wyoming Ave., Sheridan, Wyoming.

WANTED: Collins 30K-1 or KW1 for cash. W2BBV, 49 Frum Ave., Yonkers, N. Y.

TOP Dollar paid for ART-13s, dynamotors, parts, racks and all other component parts. Write to Harjo Sales Co., 4109 Burbank Boulevard, Burbank, Calif.

BE Admired. Be recognized. Your call-letters on a beautifully finished Rhodium tie-bar, $2.00. Val's, 22 Brookshire Road, Hyannis, Mass.

SELL: Bendix automatic band-switching transmitter 100 watt, fone/cw 540 to 9050 Kc; new BC459 and companion receiver with dual power supply. W8ET, 366 Canterbury Road, Bay Village, Ohio.

SELL: Hammarlund Pro 400X, complete. Guaranteed, like new. Spotless, $275.00. R. Long, 933 E. Broadway, So. Boston, Mass.

FOR Sale: Harvey-Wells TBS-50 with APS-50 power supply, $80.00. J. E. Taylor, Stanwood Road, Mt. Kisco, N. Y.

GONSET Communicator converted to new power supply for 12 volt ignition. New 12/115 volt Communicator with warranty, $219.50 or your Gonset converted, $24.50. Pacific Engineering Co., 839 N. June St., Los Angeles 38, Calif.

VIKING II with V.R.O. In new condition, $275.00. HRO 50TI with speaker and 80–40–20–10 coils, $275.00. W9VSF, Gutzmer, 903 S. Madison St., Hinsdale, Ill.

EXCHANGE: 200 watt all band fone/c.w. xmittr. 813 final, Bud steel cabinet, fully power supplied. Needs some work. Also all parts for 500 watt power supply. Miscellaneous transformers, condensers, coils, RME Preselector. Abbott TR4, Mallory Vibrapack. For Hi-Fi equipment of equal value, or $195.00. Cash. Prefer buyer radius 150 miles. W1MAE, Bradford, R. I.

WANTED: 250–300 watt c.w. only xmitter, 80–40–20, with power supply; all details first letter. K2EOZ, 48 Walnut St., Auburn, N. Y.

SELL or swap: 150 watt c.w. xmittr pwr supply, also SW-54. G. Werlau, Todd Road, Katonah, N. Y.

FOR Sale: 1 base station transmitter, 2 car transmitters and a number of different types of receivers for base station and cars. The transmitters are set at 24.58 Kcs. For information on these please write or contact Mr. Grover C. Harrison, Police Commissioner, Electra, Texas.

WANTED: Complete 2-meter rig. B. J. Parisi, Box 1005, Onset, Mass.

SELL: National NC-101X recvr. Gud condx, best offer; 6146 cw xmittr, 90 w. with power supply, $65.00; 380 v., 6.3v.-5.0 V power supply $12.00; Triplett frequency meter, $10.00. Need money for college. W2IIG/4, Georgia Tech, Box 1573, Atlanta, Ga.

SELL S-40B receiver, in excellent condition, with "S" meter, $90.00. Alan Steger, Box 97, Huntington Station, N. Y.

SELL: Parallel 807s, 80–10 meters. TVI proof. 75 watts with built-in regulated power supply; 1954 ARRL Handbook design. Prefer local sale. Complete, $75.00. W1WXC, 24 Monument St., Concord, Mass.

WANTED: One Heathkit ATL transmitter. S. Booth, 1236 Rosevista Ct., Apt. 1, St. Paul 13, Minn.

REQUEST the following back issues of QST: 1952: October, November and December; 1953: January, February, May and June. Claude M. Phillips, 152 New Laredo Highway, San Antonio, Texas.

HRO-60 table model, xtal calibrator, coils, perfect, $475.00; BC-610 xmtr, Millen ECO, excellent, $425.00. W7BDW, 10910 Algonquin Road, Edmonds, Washington.

3 tube 6-coil Meissner receiver. Best offer. Roger Frech, 3107 Maryland Road, Rockford, Ill.

FOR Sale: HRO50T1, spkr, A, AA, AC, B, C,D, E, and F coils, NBFM adaptor, 100/1000 xtal calib., $325.00. Viking II, Viking VFO, $295.00, all in excellent condx. Bill Speck, 108 Washington, Marietta, Ga.

SELL: New LW 2-meter, crystal controlled converter. $12.00. New cathode modulator kit, $10. New VFO kit. Power supply $20. Regulated power supply, $10. More info on request. WØGSV, 798 Sherburne, St. Paul, Minn.

WANTED: Viking II or similar transmitter, VFO bug and Matchbox. State price. Will sell Harvey-Wells, Sr. with power supply and S38C, AR-Z. Bill Crowell, W3ZJG, 330 Paxtang Ave., Harrisburg, Penna.

HAVE Surplus Vibrapacks, clean and fully guaranteed. 6VDC input 400VDC 100MA. output size 5 ¼" x 3" x 6", about 6 lbs complete, $12.50. Crystals FT. 243 base 8150 KC, $.95 6L6's metal, $.70. 6C5's metal, $.36. Speed-X straight keys, $.60. .001 5000VDC surplus, $.80. 6VDC motors with gear assembly for sending SOS = SSS, $3.00. 11 PST antenna tap switch, $1.05. Gallagher's Service, W2VAQ, Boiceville, N. Y.

FOR Sale: HQ129X with matching speaker, clean condition. Best offer express collect. Dave Beckwith, W2SHC, Pompton Lakes, N. J.

BARGAINS: with new guarantee: R-9-er, $14.95; Gonset Triband, $27.50; VHF-152A, $39.50; S-72, $59.50; S-40, $65.00; NC-57, $65.00; RME-45, $99.00; Lysco 600, $99.00; S-27, $99.00; SX-43, $129.00; S-76, $149.00; SX-71, $169.00; SX-42,$189.00; HRO-50, $275.00; HT-17, $32.50; EX Shifter, $39.00; Globe Trotter, $49.50; Harvey Wells, Sr., $69.00; DeLuxe, $89.00; Viking I, $209.50; New SS-75, $189.00; HT-9, $159.00; Globe King, $275.00; 32V1, $395.00; 32V2, $475.00; 32V3, $595.00. We need used receivers: We give highest allowances for S-20R; SX-71, NC-100, S-40B, NC-125, SX-24, SX-25, HQ-129X, and similar receivers. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

SOLA constant voltage transformer, pri. volts 95–190 to 125–250, rated VA 2000, frequency 50–60, Ph.1. Will trade for a good receiver or transmitter. Lloyd L. Kimmel, Box 337, Cookeville, Tennessee.

WANTED: Used amateur and gov't surplus equipment in trade for new Johnson Viking, Ranger, Harvey Wells, National, Hammarlund, Hallicrafters, Barker & Williamson, Telrex, Gonset, Elmac, Morrow, etc. Particularly want complete or parts for ART-13, Dy-17, CU-25, Dy-12, BC-348, BC-342, BC-312, BC-221, LM, APR-4 tuning units, APR-5, ARC-1, ARC-3, RTA-1B, BC-610, BC-614, BC-939, TCS, TDQ, Collins 75A, 32V, 310, Teletype, Tape perforators, Boehme, Technical manuals, Loran, Radar. Cash or trade. Write to Alltronics, Box 19, Boston 1, Mass. Richmond 2-0044. (Stores: 44 Canal St., Boston, Mass., 60 Spring St., Newport, R. I.)

REAL bargains: New and reconditioned Collins, National, Hallicrafters, Johnson, Elmac, Gonset, Babcock, Morrow, RME, Millen, Lysco, others. Reconditioned S-38, $29.00; S-40A, $69.00; S-76, $149.00; NC-57, $59.00; NC-88, $79.00; NC-125, $129.00; NC-183, $199.00; HRO-50T1, $329.00; HRO-60, $399.00; HQ-129X, $169.00; VHF-152A, $49.00; RME-45, $99.00; Gonset Tri-band, $29.00; Super-Celver, $79.00; S-40B, SX-71, SX-28A, SX-42, SX-62, HFS, HRO-5, HRO-7, Collins 75A-1, 75A-2, 32V-2, 32V-3, Viking II, Harvey-Wells Bandmaster transmitters, others. Shipped on trial. Easy terms. Satisfaction guaranteed. List free. Henry Radio, Butler, Missouri.

HARVEY UHX-10 and/or cabinet wanted. W1BB.

GLOBE KING 400-C hardly used. Coils for 80 meters. Bud VFO with all coils. Bud antenna tuner. Antenna changeover relay. All equipment in excellent condition. $450.00 cash. Jack Knudson, WØNKD, Box 561, Granby, Colorado.

ATTENTION Hams NYC-LI vicinity! Selling HQ-129x, Viking I with VFO & B & W 72 ohm trap, in excellent condition. Best offer cash and carry. W2SIM.

WANTED — Mobile rig complete with antenna system and plate supply. Must be in good condition and reasonable in price. Ross Burgess, WØMDH, McClusky, North Dakota.

MUST sell complete station. Consists B&W 5100 and National HRO-50T1. Transmitter brand new with less than five hours operation. Receiver in excellent condition and complete with matching speaker, National XCU-50-2 crystal calibrator and ABCD coils. Will ship freight prepaid anywhere stateside in original factory cartons. Want $395 for transmitter and $275 for receiver. Will sell both and include 22X mike, 50' RG8/U and 110 volt coax relay for $600. WØAQJ, 6704, No. 31st Ave., Omaha 11, Nebr.

VIKING 2 — V.F.O. — and Match-box, $325.00, purchased in June. Will sell individually. W3CJP, 125 Girard Ave., Hyde Park, Reading, Pa.

IMAGE orthicons and iconoscopes removed from broadcast service but good for amateur TV use, $35 each FOB. WCOS-TV, Columbia, S. C.

COLLINS 310B-1, $180.00; Hallicrafters Sky Champion S20-R, $35.00; Meissner signal shifter, $25.00; Gonset 100%-R modulation indicator, $10.00; Heathkit transmitter, coupler, VFO kits unwired, $57.50; Underwood typewriter, $30.00; Mallory CRT-1 condenser checker, $25.00; CCO-2A, 6146 six meter final, $11.50; RME VHF-152 (needs repairs), $25.00; NOTICE: above offered prepaid U. S. A. Crysvals, meters, transmitting tubes, complete parts 300 to 1000 volt supplies, command transmitters several frequencies, miscellaneous units, real bargains, everything guaranteed, request complete detailed lists. WANTED: Dixieland Jazz tapes, records, transcriptions. Will rent, swap radio parts or loan my collection Dixieland tapes. WØDPL, Howard Severeid, 2431 East Riverside Drive, Indianapolis, Indiana.

TVI proofed 32VI, B&W low pass, co-ax relay, antenna coupler, D-104, push to talk, connectors, $400; SX-28A, matching speaker, $160; HF-10–20, $55; SP-44 panadapter, $60; Tem meter Elincor beam, rotator, selsyns, $50. Colorado sales preferred. Estate WØFHM. Mrs. Anna Palm, 1648 Ninth St., Boulder, Colo. Phone HI 3-0643.

SELL: Collins 75A-2-A with 3 kc, 6 kc filters, speaker, $445. 32V-1, $375; 32V-3, $595; 21A teletype midget tape printer, $49; tape transmitter, $25; 12,000 ohm dpdt 110 vdc relays, $1.75; Collins 30-J with 310C, $425; Boehme perforated tape keyer for Morse code with McElroy 3-key perforator, $145; HRO-5TA1 with coils, speaker and power supply, $165; NC-88, $75. Will take ham or surplus equipment in trade. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Richmond 2-0916.

FOR Sale. BC 610E and BC 614E Speech amplifier Tuning units 2 mc through 30 mc. Condition like new. Complete with manual, cables, remote control. $500.00. Ted Brix, 5573 No. Van Ness Blvd., Fresno, Calif.

COLLINS 32V3, Excellent, $600. Don DeShazo, Jr., W9BVC, 529 Blackstone, LaGrange, Illinois.

RKV MTN headqtrs for SSB. Central kits or wired in stock. Real bargains; New or reconditioned Elmac, Gonset, Morrow, Collins, Johnson, Hammarlund, National, Hallicrafters, RME, others. Reconditioned S40A, $60; S40B, $69; S76, $125; NC125, $130; NC183, $190; RME45, $90; S53A, NC33, SX24, 02 heathscope, 2T Panadaptor, Bandmaster Sr. Super-ceiver, ST203A, Subraco MT15X, DB22A, RME69, HT-9. We trade. Easy terms. Write Mel, WØGQV, Rogers Radio Co., 1745 Arapahoe St., Denver, Colo.

WANTED — One 1946 Edition of the Radio Amateur's Handbook in good condition. Will pay $1.25. Don Boughton, 1259 Pacific Beach, San Diego, California.

BUD VFO-21, $29.95; Collins 32V1 modified, $475.00; 32V2, $495.00; Deltronic CD-144, $129.95; Gonset 10–11 converter, $24.95; 2 meter converter, $24.95; Hallicrafters HT-9 $100.00; HT-17, $39.95; HT-18, $75.00; SR-75, $39.95; S-18, $59.95; S-29, $40.00; S-38, $34.95; S-38 A/B/C, $39.95; S-40B, $79.95; S-53A, $64.95; S-72, $59.95; S-76, $149.95; SX-62, $250.00; Harvey-Wells TBS-50A, $79.95; TBS-50C, $89.95; TBS-50D, $99.95; APS-50, $29.95; Johnson Viking 1 with push-to-talk and built-in VFO, $250.00; Lysco 381, $19.95; 381-R, $24.95; 401, $14.95; 500, $79.95; 600, $110.00; 600-S, $129.95; National HFS, $99.95; NC-46, $69.95; NC-183D, $299.95; SW-54, $34.95; other used items available; free list from W1BFT, Evans Radio, Concord, N. H.

EXTREMELY effective twenty meter rotary beams. Driven elements, insulated type of construction. Literature including actual photographs upon request. Write Apex Antenna Company, 2558 Ida Street, Omaha, Nebraska.

FOR Sale: Wilcox F3 receiver, $25; GR 726A VTVM, $50; Federal LX1 signal generator 8–330 MC., $350; GR LR3 secondary frequency standard, $585; GE YV7I Decade scaling unit, $85; Stancor ST203A 10–11 meter mobile transmitter, $35; BCR-645, $10; WE 124-B amplifier, $95; RCA 1" oscilloscope, $15; McElroy tape puller, $4; WE composite set (3 telephone plus 4 telegraph/signal circuits on 2 pair wires), $95; EE89A telephone repeater, $9; RM29A remote control unit, $18; WE255A relay covers, 45¢; Radiolab 52L amplifier, $29; communication equipment 12D telephone repeater, $19. All guaranteed excellent electrical and mechanical condition. FOB. W6ITH, Moraga, Calif.

QSTs wanted Jan. thru May 1916 and Dec. 1915. Will pay $10 cash, each. C. W. Janes, Col. Sig. C., Ft. Monmouth, N. J.

RACKS. Open base racks, undrilled, unpainted. Sturdy electro-welded construction. Made entirely of mild angle steel 1 ½ x 1 ½ x ⅛". Overall: 48 ½" high, 20 ½" wide, 18 ¼" deep. For 19" panels. Total vertical panel space 45 ¼". Weight 36 lbs. Price, $8.95 F.O.B. Lansing. W8BQY, Evert Laboratories, 235 E. Jackson St., Lansing 6, Mich.

FOR Sale: Collins receiver 75A-1 with triple conversion, $275.00; Collins exciter 310B-1, TVI proofed, $200.00; restricted range speech amplifier 200–2500 cycles, $50.00; transmitter, 750 watts phone-CW, PP 813 with 2E26 driver, variac control, TVI proofed, 8005 PP class B with negative peak and hi-level speech clipping, $550.00; Graphlex camera 5 x 7, f4.5 210mm Bausch-Lomb Zeiss Tessar lens, $90.00; final amplifier PP 4–125, B&W butterfly plate tank, National MB40L grid circuit, $150.00. W8JRG, 640 Snowhill Blvd., Springfield, Ohio. Tel. 2-8722.

VIKING II, like new, VFO, matchbox, LP filter, SX-42, speaker, recently aligned, excellent, F.O.B. First $500.00 takes all. John, 2636 Fifth Ave., Sacramento, Calif.

PRINTED circuits: Here is your chance to get started with this new and superior wiring technique. Achieve compactness and neatness not possible with old wiring methods. Kit contains all materials and instructions to make two complete copper conductor patterns. Send $2.95 now. Felix Dutko, 2078 Vyse Ave., Bronx 60, N. Y.

EICO signal generator, model 315, $25; manufactured VFO 40 and 80 meters, $15; new 3 ½" round bakelite case panel meters, $4 each; G.E. 0–4 R.F. ammeters, G.E. 2.5 DC kilovolts, Weston 1.5 MA DC, Westinghouse 0–150 Volts A.C. W6YC, 841 47th Avenue, San Francisco 21, Calif.

WHO'S Who in So. Dak. Hamdom. A 66-page book containing pictures and autobiographies of S. D. amateurs, highlights and sidelights of S. D. nets, YLRL, call letter licenses, VHF activity, and alphabetical listings by call and by cities. Send $2.75 to Prairie Dog Arc, Box 257, Vermillion, S. D.

SWAP: RAX-1 (200–1500 kc) rcvr. for NC-108 (FM). L. G. Barrett, 26 S. Main, Hanover, N. H.

HRO-60 Receiver for sale complete with coil sets A, B, C, D; also E and F for broadcast bands; matching speaker and crystal calibrator. Perfect condition, purchased new only 3 months ago. Complete outfit, $500.00 F.O.B. K2BMV, Herman Ferber, 235 Spring Valley Ave., Hackensack, N. J. Phone HU. 7–1726.

SELL: NC-46 receiver. 55–30 Mc. top condx, has noise limiter bandspread, etc. $50 takes it. W. F. Haffermann, Jr., W9QOK, Box 813, Mellen, Wis.

SX-71 like new, original carton and instructions, $170; NC-57 good condition, $60; Mallory VP553 vibrapack, $13; 200 watt AM rig, 813 final, 811's modulators, 1200 volt 500 ma supply, 500 volt 250 ma supply, sell complete or by chassis. Details on request. T. A. Zander, W9CVN, 204 N. Murray, Madison, Wis.

SELL AN/FRC-1 350 Watts Transmitter Receiver bulletin upon request — BC221-AK — LM14 — Scott High Fidelity Receiver — Hallicrafters SX42. W1UUU, A. van Breems, New Canaan, Conn.

32V-2 for sale. $400.00, like new, in original packing. Recently thoroughly checked and in perfect condition. Includes B&W low pass filter. Has been used a total of about 30 hours. Reason for selling: owner overseas. Please contact Dr. Millett G. Morgan, W1HDA, Thayer School of Engineering, Hanover, N. H.

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Hallicrafters S-85. NEW! 540 kc—34 mc in 4 ranges. Bandspread, RF amp., dual IF's, BFO with pitch control, ANL, tone control built-in speaker, etc.
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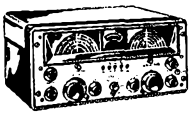
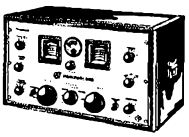
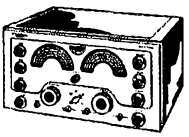


Hallicrafters SX-88. Dual conversion; 535 kc to 33.3 mc in 6 ranges. 2 RF stages, 50 kc second IF, crystal-controlled 2nd conv. osc.
98 SX 715. Net . . . **$595.00**
98 SX 716. 10" speaker. Net **$19.95**



Hammarlund HQ-140-X. 540 kc—31 mc in 6 ranges. Crystal filter, ANL, 6 sel. positions, electrical bandspread, etc.
98 SX 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 SX 732. Net **$149.95**
NC-98SW. As above, but with bandspread for 17, 19, 25, 31, 49 meter SW BC bands.
98 SX 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 SX 666. Net **$399.50**
97 SX 663. 10" speaker. Net **$16.00**

National HRO-60. Dual conversion; 1.7-30 mc; bandspread on 80, 40, 20, 11-10 meters. 2 RF stages; ANL; S-meter, 6-step crystal filter, etc.
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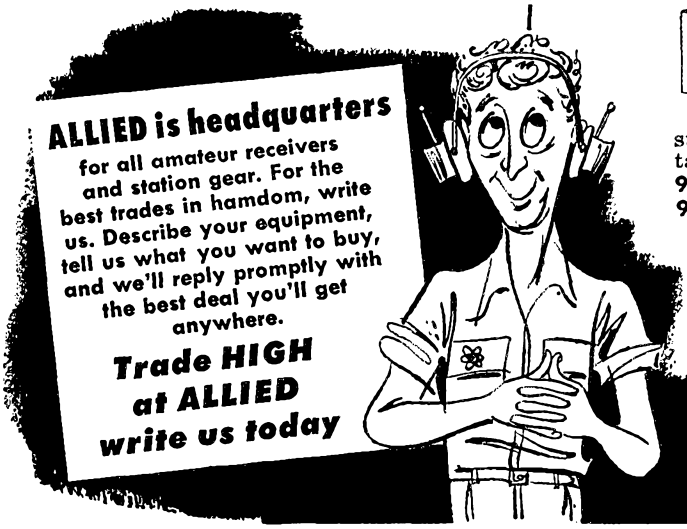

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TRANSMITTING

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SINGLE SIDEBAND SELECTOR #2

JUDGING from the comments on the air and the letters we have received, the page I wrote for the October issue of *QST* touched on a delicate subject. To clear up some of the misunderstandings, we would like to make the following statements:

1. The purpose of the tests was to determine the feasibility of incorporating selectable sideband in new receiver designs where reception of *double sideband AM signals* is a consideration.

2. The fact that our test indicated better readability with the crystal filter does not mean that we will not consider the use of selectable sideband since reception of SSSC signals is another important consideration.

3. The Single Sideband converter used for the tests is not available to Amateurs. It is a recent development for the military service. No single sideband converter *presently in production* for the Amateur market was tested.

4. The signals were clean, without evidence of frequency modulation.

5. The reception with the crystal filter was essentially exalted carrier selectable sideband, with the characteristics of the crystal supplying the peak to exalt the carrier and the notch to reject the undesired sideband. See page 65 of the February 1954 issue for the tuning details necessary to produce these results.

6. Our point was this: In the purchase of an NC-183D or HRO-60 receiver, a means of carrier exaltation and sideband selection of *double sideband AM signals* is built in if the time is taken to get familiar with it.

7. It does not necessarily follow that this performance will be obtained with all receivers containing crystal filters since there are other considerations.

8. All the operators used in making the test were thoroughly familiar with the equipment and the problem.

Since the last discussion of selectable sideband, I have had the pleasure of using a SSSC exciter at my home QTH. To say that I am enthused is putting it mildly — even twenty CW was omitted from my operating schedule last weekend. This is something coming from a DX hound.

National Company has expanded its activities which includes a program of more diversified Amateur products. This will include in addition to new equipment, a larger selection of components designed for the constantly changing market.

Certainly Single Sideband equipment and components will be among the new items.

ED HARRINGTON, W1JEL

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807	Beam Power	75	750
810	Triode	750	2500
811A	Triode	260	1500
812A	Triode	260	1500
813	Beam Power	500	2250
815	Twin Beam Power	75*	500
829B	Twin Beam Power	120*	750
832A	Twin Beam Power	50*	750
833A	Triode	1000	3300
5763	Beam Power	17	350
6146	Beam Power	90	750
6524	Twin Beam Power	85	600
8000	Triode	750	2500
8005	Triode	300	1500

*Total for tube

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