# CQ

FEBRUARY, 1950

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- How to Stabilize your VFO operation
- A High-Power Modulator for Mobiles
- Getting on 420 mc with Surplus Gear
- A Completely Hash-Free Power Supply

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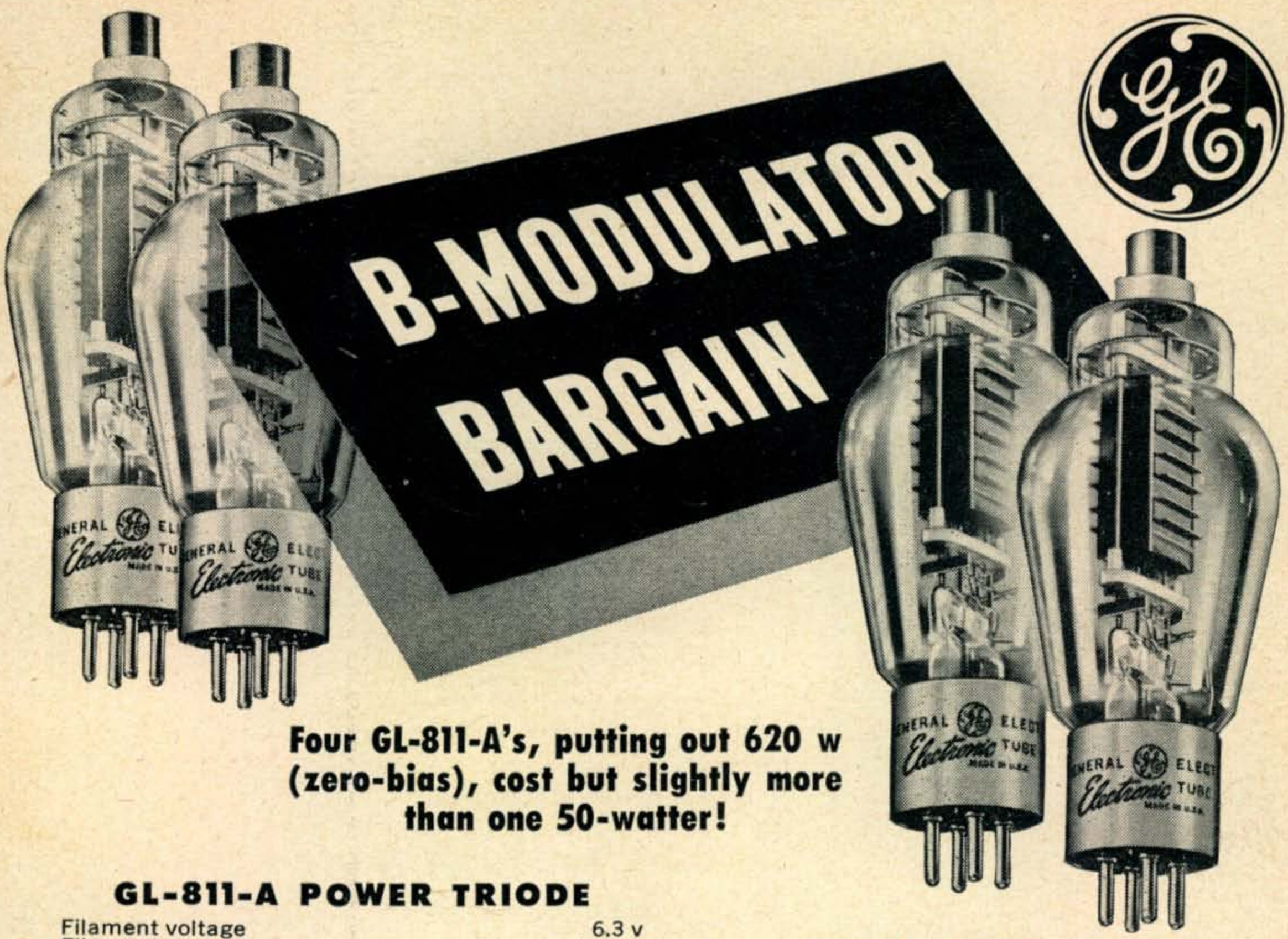


**Four GL-811-A's, putting out 620 w (zero-bias), cost but slightly more than one 50-watter!**

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| | |
|---|---|
| Filament voltage | 6.3 v |
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| | 2 tubes | 4 tubes |
|---|---|---|
| d-c plate voltage | 1,250 v | 1,250 v |
| d-c grid voltage | 0 v | 0 v |
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| max signal power output (approx) | 310 w | 620 w |

DECIDEDLY a "best buy", the new GL-811-A! Whether you're running high power or low, the cost advantage is substantial. Two tubes will give you enough audio (340 w max) for a moderate-power transmitter, and should you own—or whenever you complete—that dream kilowatt rig, a second pair in p-p parallel will double your modulator output.

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## In This Issue

*OUR COVER*—We just can't resist a good-looking piece of ham gear when it comes time to select each month's cover. We hope you, too, find W2ESO's power supply attractive. For further particulars see page 16. The photo is by Arthur S. Alberts.


Feenix, Ariz.

Deer Hon. Ed:

I are recently eavesdrooping on the bands and heering that the Five Meter Bootlegger Club members are thinking of defuncting their club and starting new one. Well, this are natchurally making Scratchi's dandruff rise. After all, I are Hon. Charter Member of F. M. B. Club, and no one are consulting me. Matter of factly, are not receiving invitation to club meeting even.

Hence, night of meeting, Scratchi are arriving early and appropriating chair in front row. (This are most important, as front row only row with chairs.) After while Hon. President are appearing and restoring order so can starting meeting. The first order of business is report of the Frequency Allocation Committee.

Chairman is rather long-winded, but he saying that committee try to find out whether club should continue to operate on five meters, or move to six meters. Seems that too many members getting caught by FCC on five meters, for one thing, and second, six meters are ideal band on acct. are so unoccupied that plenty room still available for bootleggers.

Net result is members voting unanimously (two big guys sitting on Scratchi's hands so vote against not counting) to dissolve F. M. B. Club and form new Six Meter Bootlegger Club. I struggle to my feets and start to make big speech, but being out of order as are having valid amateur license, which barring me from membership in new club. Scratchi at this point are in big huff and about to walk out when they making me first Hon. Honorable Member Ex-officio, whatever that is.

Next week Hon. President of S. M. B. Club are talking to me on land line and saying that some oddball members of club are wanting to learn see-w, and Hon. Pres. inviting me to be see-w instructor and form class for same. Scratchi are quick to admitting he are only moderately good see-w man, with top speed of 75 WPM (coded groups), but he be glad to handle the job.

Certainly enough, few days later four guys are showing up at once, armed with earphones and all ready for see-w class. Scratchi are getting things arranged, even to spending five minutes adjusting weights on bug, to impressing poopils with importance of key adjustment. Next are ripping off few characters at 50 per to show what Hot-Shot Scratchi can do, then settling down to four WPM.

Amazing—all poopils have perfect copy. So,

(*Continued on page 72*)

no other set gives you so much

# HAM PERFORMANCE

so economically as the new ... SX-71

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**DOUBLE CONVERSION** — images practically eliminated. First i-f 2075 kc.

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# ★ ★ Letters ★ ★

### DX by the Gallon

Route 1, Box 297-3, Baton Rouge, La.

Editor, *CQ:*

I have just moved to the Deep South here in Baton Rouge, and hope to have my W5 call real soon.

I notice here in the South they have a gasoline called "D-X." I wonder, if the portable boys used it for their gas engines generators, would it increase the number of distant stations worked on field day?

*Peter N. Saveskie, W2JFE*

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### Angle of Radiation

R.R.#2, Box 363, Palatine, Illinois

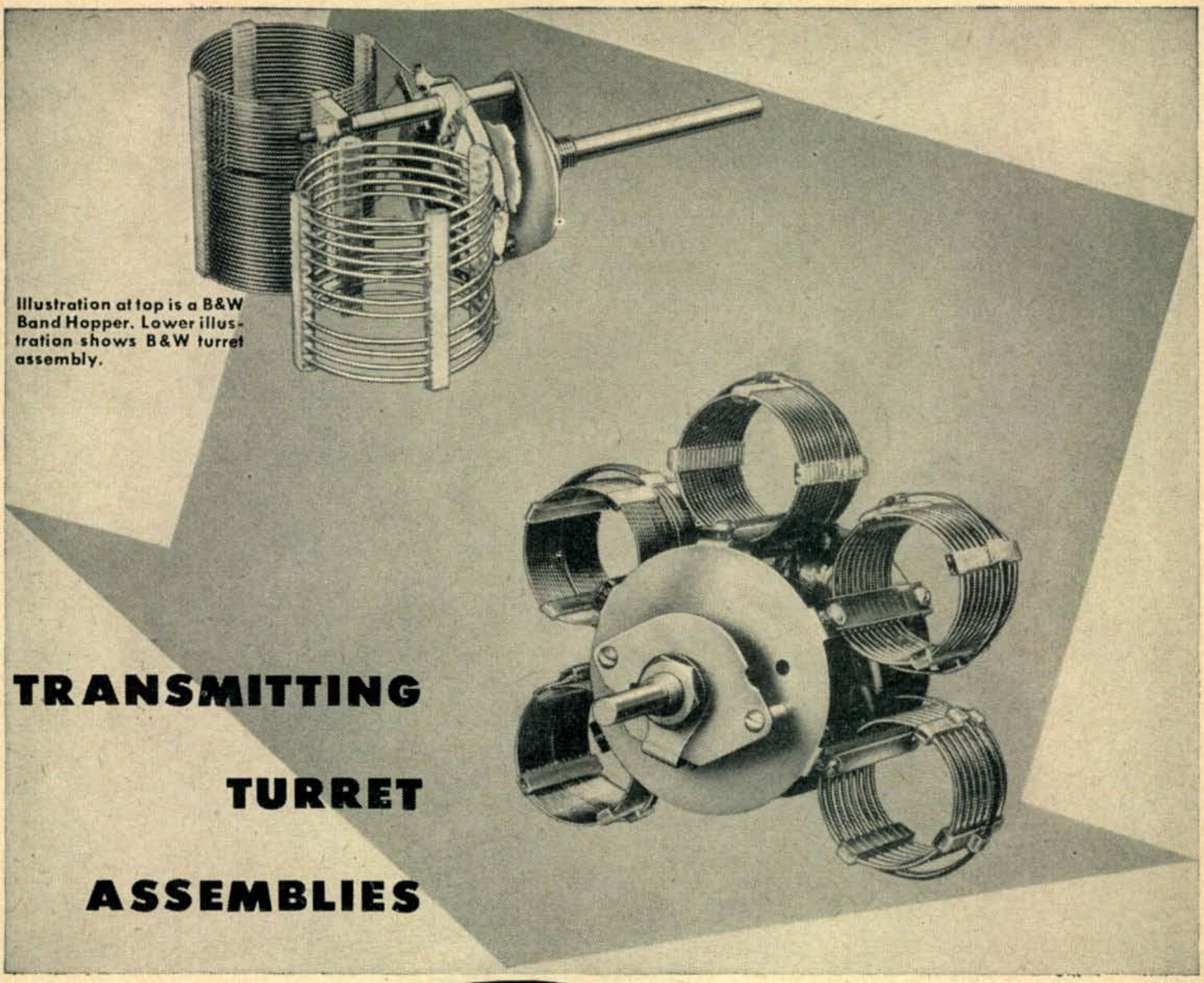
Editor, *CQ:*

If one consults the literature one finds that, almost always, the most effective vertical radiation angle, for long distance communication on 14 mc, is somewhat less than twenty degrees. The authorities seem to agree that, for best results, the 14-mc antenna should concentrate its radiation between the vertical angles of three and about fifteen degrees above the horizontal.

Yet we have found here, not once or twice but repeatedly, that the most consistent DX (five to eight thousand mile) contacts are made with antennas radiating at much higher angles, usually between fifteen and forty degrees above horizontal. This is at 14 mc. On several occasions we have gone to the trouble of building an antenna system that would be effective at the lower (five to fifteen degree) angles, only to have it definitely out-performed by a simple horizontal half or full-wave wire less than a quarter-wave above ground. This seemed to occur even when the advantage of careful construction and placement were with the low-angle radiator. In each case the antennas involved were situated in a fairly open suburban location, where high building density or other absorption factors were almost negligible. Again, we are quite sure that horizontal directivity is not the main factor, as this judgement is based upon "all-around" results.

What we would like to know is: have other fellows experienced similar effects, particular in inland locations and, if so, why is amateur experience so at variance with the carefully-conducted experiments of commercial engineers? Even with all the noise being made now about horizontal directivity, we feel here that the ultimate factor in good antenna design is the vertical directivity characteristic. No matter how sharp a horizontal beam one can produce, if most of the energy "warms the clouds", we cannot expect good results. What, then, *is* the most effective vertical radiation angle?

*C. F. Rockey, Jr., W9SCH*

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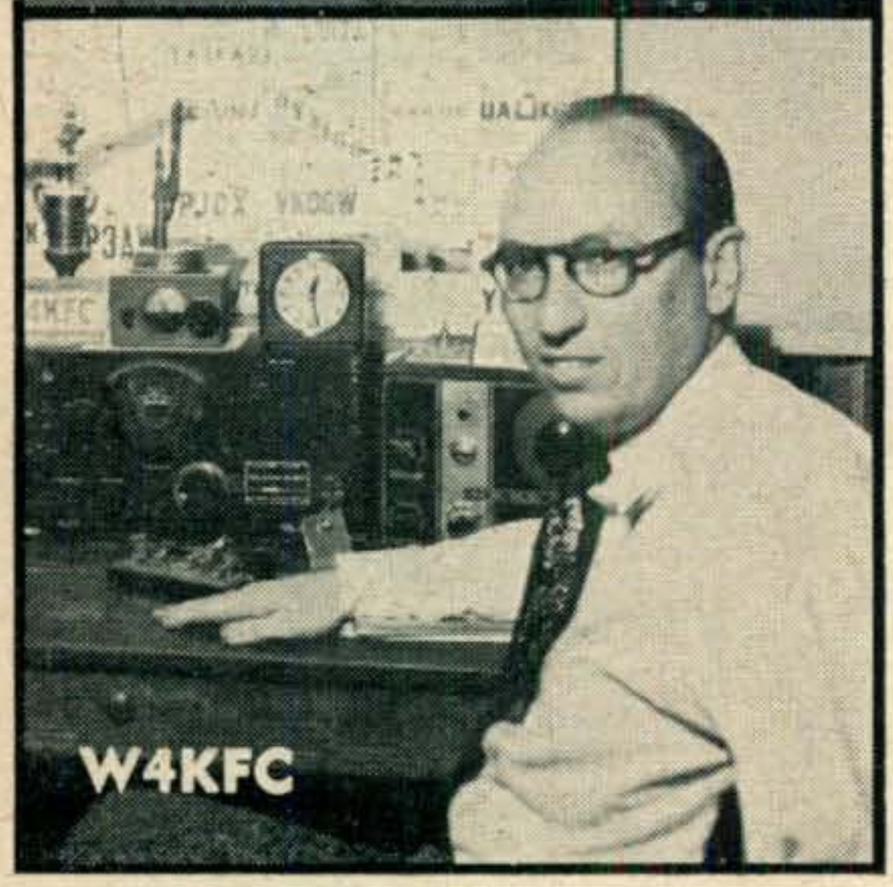


Eimac TUBES

# CHOICE OF CHAMPIONS

Top operators of the 15th annual ARRL DX contest again have proved the superiority of Eimac tubes.

Highest scoring CW operator W8BHW, Rolf Lindenhayn, powered the final amplifier of his rig with a pair of Eimac 250TH triodes.

For the second straight year 1st place phone went to W2SAI, J. Dawson Ransome. W2SAI used 4-250A tetrodes for his 1949 win.

W1ATE, C. R. Knowlton, also used 250TH's for the 2nd place phone position. Third place CW went to another tetrode user W4KFC, Vic Clark, with a pair of Eimac 4-125A's.

Benefit by the experience of these top operators . . . Depend on Eimac tubes to help you get more out of amateur radio.

## W8BHW

"The rig here has been the same since the new start in December '46. A Temco 75-GA drives a pair of Eimac 250TH's in final and the original 250TH's are still in there. In between contests, I've filled up six log books with contacts in 209 countries and 40 zones. Also was world high in the 1947 VK contest on CW and second to XF1A on fone."

## W2SAI

"As you know I used a great many Eimac tubes in the past and at the present time I am using Eimac tetrodes exclusively in my transmitter, both in the final amplifier and as modulators."

## W1ATE

"I have used Eimac tubes in my final amplifier in every sweepstakes and DX contest since 1939 without failures or trouble."

## W4KFC

"4-125A's were good for 490 contacts in 84 countries and 34 zones in 42 hours of CQ DX contest."

The 16th ARRL DX contest is just around the corner. Modernize your equipment now . . . use your skill plus Eimac tubes to earn a winning score. Complete application notes are available in a packet of data titled: "Tubes for Amateur Service." This information is free, write for yours today.

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# ZERO BIAS

## EDITORIAL

LATE IN THE EVENING, when the traffic nets have shut down and the filaments of the final tubes cast their fitful light on a couple of ops who are about ready to hit the hay, the conversation frequently turns to the differences between ham radio as we know it today and ham radio as it existed in the "good old days." One of the main differences which is almost always called to mind when old timers start reminiscing about days of yore is the difference in the origin of the equipment which makes up the average ham station today—so much more of it is factory-built than was the case in the ham station of the early 1930s. In those days it was a lot more difficult for a ham to get a station on the air than it is today. The manufacturers who have grown up with ham radio have maintained a steady flow of receivers, exciters, transmitters, and even antennas which make life much easier for today's amateurs. More power to them!

But what of the amateur himself? Granting that the construction in the home workshop of a communications receiver of quality comparable to the top-flight manufactured product is an exceedingly difficult task, we think it can be approached, and that every amateur should weigh the return in increased technical ability and knowledge that he will gain from such a project against the purchase of a ready-made unit. Let's ask ourselves honestly: "Do we know as much about the care and feeding of our communications receiver as we would if we had built it ourselves?" In time of emergency would *you* feel competent to effect emergency repairs in your shiny new 1950-model "Super Chromate?" Probably not. The rise of the radio service establishment which caters to the repair of amateurs' receivers seems to us to be one of the saddest facets of the growth of amateur radio.

If you're not a heck of a good technician, and an engineer to boot, with a shack full of test equipment and a couple of lab assistants, the chances are that the receiver you build will not be up to the manufactured product, but wouldn't it be worth it to be able to say, in QSO—". . . RCVR HR 12 TUBE HOME BREWED SUPER"? How about that nice warm feeling of accomplishment?

And what we've said about receivers goes equally well for these multi-band exciters which many of the ham gentry are building (but which most of us are buying). Certainly the amateur press, as represented by *CQ* and *QST*, has not, hesitated to publish technical articles which show that it can be, and has been, done by ordinary hams such as you and I and that these home-built exciters really put out signals of which their operators can be proud.

So we've worried about it and told you how we feel about it, but we've got something more concrete in mind. Next month, on this page, *CQ* will announce what we consider the biggest spur to home construction since the invention of the electric soldering iron and the chassis punch. Try to drop around this corner and see what we've got in mind—it may pay you well.

### Third-Party Traffic

It is time that we did our bit to kill an unfounded myth which appears to have become a part of the "thought-pattern" of some portions of the amateur fraternity—that the handling of traffic which has to do with business matters is not permissible under our regulations. This is not the case. The regulations pertaining to the handling of third-party traffic are quite specific in their prohibition of the handlng of any traffic for which the ham or hams concerned receives any compensation, direct or indirect, but that's as far as it goes. Aside from the rules pertaining to the transmission of obscene or profane matter and the simple rules of good taste, the *text* of a message has no bearing on our legal right to handle it. For example, a neighbor of yours who owns a furniture business finds himself in need of a shipment of chairs in order to fill an order before the first of the month. He does not wish to use the commercial wire services because of the expense involved. He asks you to do him a favor and handle the traffic. This traffic, although completely "commercial" in any sense of the term, is legal, and permissible. This, of course, applies only to domestic traffic. It is not permitted to exchange third-party traffic with any foreign countries except Canada, Chile, and Peru, and also stations licensed to U. S. Military personnel in occupied areas. Since third-party traffic arrangements with these foreign countries frequently contain restrictive clauses, it is best to contact someone who knows the law before routing such material. Play safe.

Remember the fundamental test of the legality of domestic traffic: "Do I, the amateur handling the message, receive any compensation, direct or indirect, for this work?" If the answer is "no," go ahead and handle it . . . if the answer is "yes," forget it! We understand Leavenworth is mighty chilly these days.

# A Medium Power Transmitter of General Utility

MAURICE P. JOHNSON*

***A pair of 24Gs running at 225 watts, complete with exciter and all power supplies, on a pair of 8¾-inch rack panels approaches the ultimate in compactness.***

THE DESIGN AND CONSTRUCTION OF THE TRANSMITTER was undertaken with several definite objectives in mind. One of the main design criterions was the fact that occasionally it would be necessary to transport the rig from place to place, along with other equipment, thus a compact design was highly desirable. At the same time, it was necessary to consider that a reasonable power output is needed for satisfactory operation on the crowded ham bands. After carefully weighing these two stipulations, it was decided that the complete rig should fit into a standard table rack cabinet with 26¼" panel space. By careful layout it has been possible to fit the entire r.f. unit onto a standard 8¾" rack panel. The power supply takes a similar panel, which leaves room for another panel of the same dimensions for a high-level plate modulator. This discussion will be primarily concerned with the r.f. unit.

In the design of the power supplies and the final stage, it was decided that readily-available components from the surplus markets should be used in the interests of economy. As an example, the parts used in the low-voltage power supply are available from the Heath Company, in Benton Harbor, Michigan, as a kit intended for powering surplus aircraft transmitters. The 24G triodes used in the final are also available on surplus at very attractive prices.

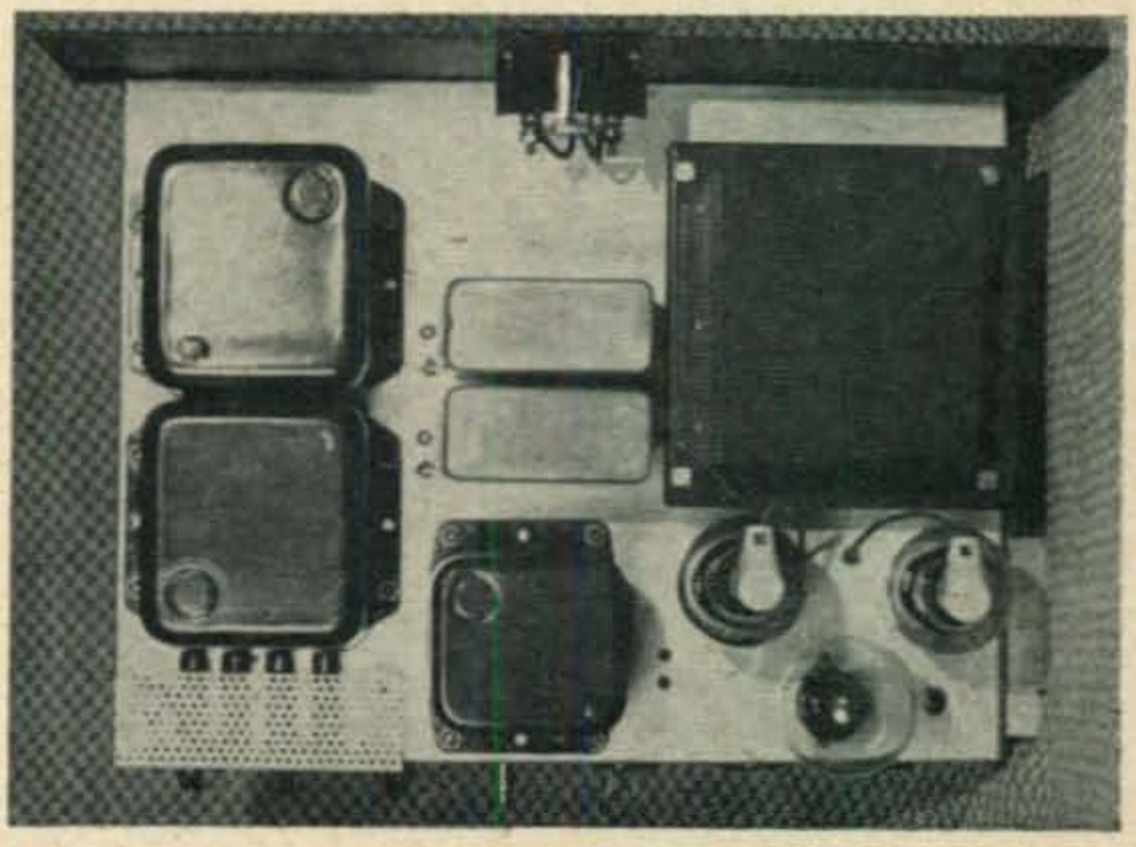
However, it should be pointed out that quality parts, with adequate voltage ratings, etc., must be selected if consistent trouble-free operation is to be expected. Components listed in the parts list meet this requirement.

### Circuit

In the interest of minimum TVI, the oscillator and multipliers should operate at relatively low power, with the final power amplification done at the operating frequency. Also, it is desirable to use sharply tuned circuits in preference to broadband frequency multipliers.

The oscillator incorporated in this transmitter makes use of a 6J5 tube in a conventional Pierce triode circuit. Such an oscillator is simple and reliable, with the added advantage that no tuned circuit is required. The oscillator is operated with a conservative 150 volts on the plate, which is stabilized by a VR150 voltage regulator tube. Selection of crystals or an external VFO is accomplished by means of a rotary tap switch. In four of the five switch positions, crystals are inserted between the plate blocking condenser and the grid, while the fifth position applies the VFO signal between grid and ground, with the stage then acting as a buffer. Since VFO operation was contemplated, four crystals for spot frequency operation were considered ample; however, additional crystal positions may be gained simply by adding more crystal sockets and accompanying switch contacts. Very little r.f. output from the oscillator stage is needed, so it was not found necessary to include any feedback capacity between grid and cathode. No trace of crystal heating is evident under these operating condtions.

Three frequency multiplier stages permit continuous tuning from 3 to 32 mc. Since multiplying takes place at low r.f. power levels (which is possible due to the exceedingly low excitation requirements of the driver), the well-shielded type 6AG7



**Everything fits on the power supply chassis without crowding.**

* *4402 Roland Ave., Baltimore 10, Md.*

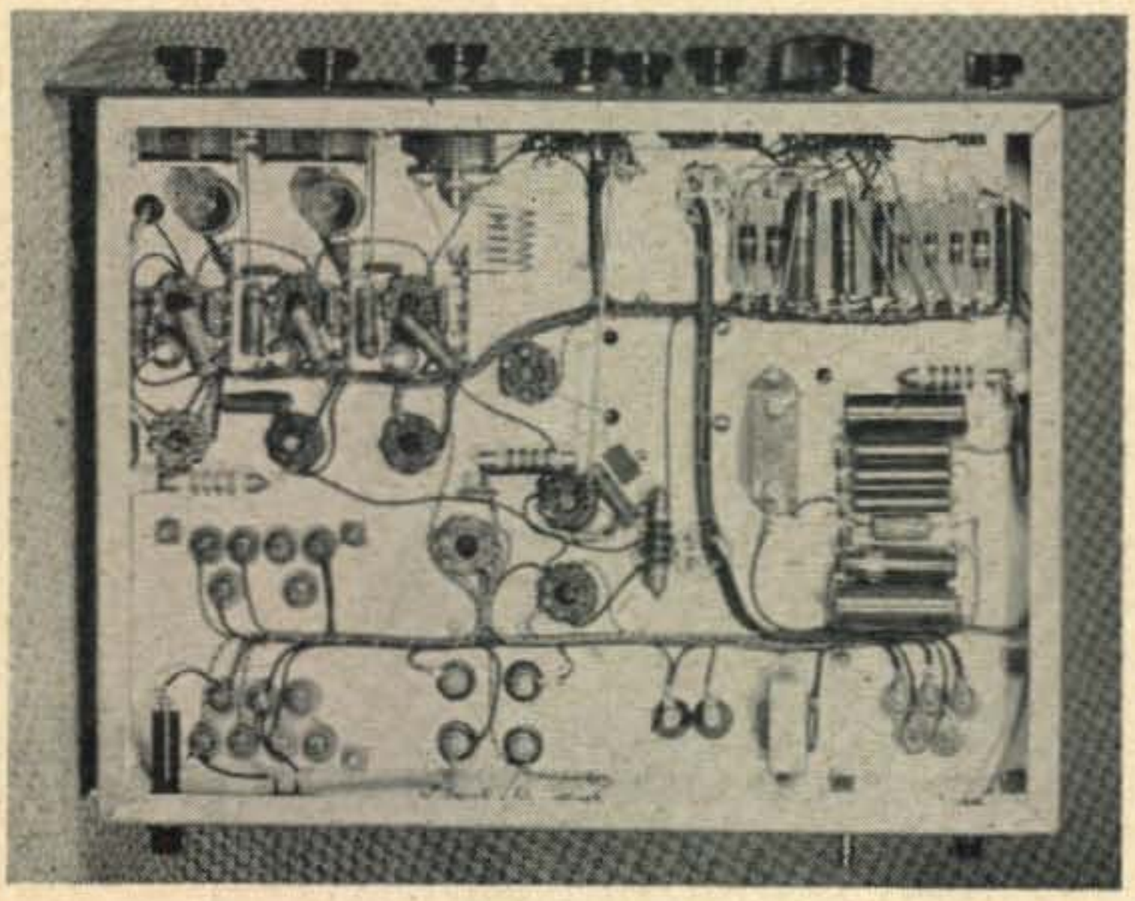
tubes make excellent multipliers. Here the plates are shunt fed, permitting the tank condensers to be mounted directly on the chassis. A midget broadcast-type condenser gives the first multiplier a continuous tuning range from 3 to 9 mc, allowing a wide choice of crystals within the range of 1.5 to 9 mc. A similar condenser in the second multiplier tank covers 6 to 18 mc. The third multiplier utilizes a condenser of smaller capacity, with ceramic insulation, together with a self-supporting coil, to give a high $Q$ tank covering 18 to 32 mc.

The screen voltage of the first multiplier stage is made variable by means of a potentiometer which acts as an excitation control. A three-position, two-pole rotary switch, $S_2$ in the schematic, has two functions as exciter bandswitch. Operation in the 3.5- and 7-mc bands requires the use of only the first multiplier, while the second multiplier must be included to reach 14 mc, and 28 mc operation requires all three stages. One section of $S_2$ is therefore used to connect the output of the desired multiplier to the grid of the driver stage.

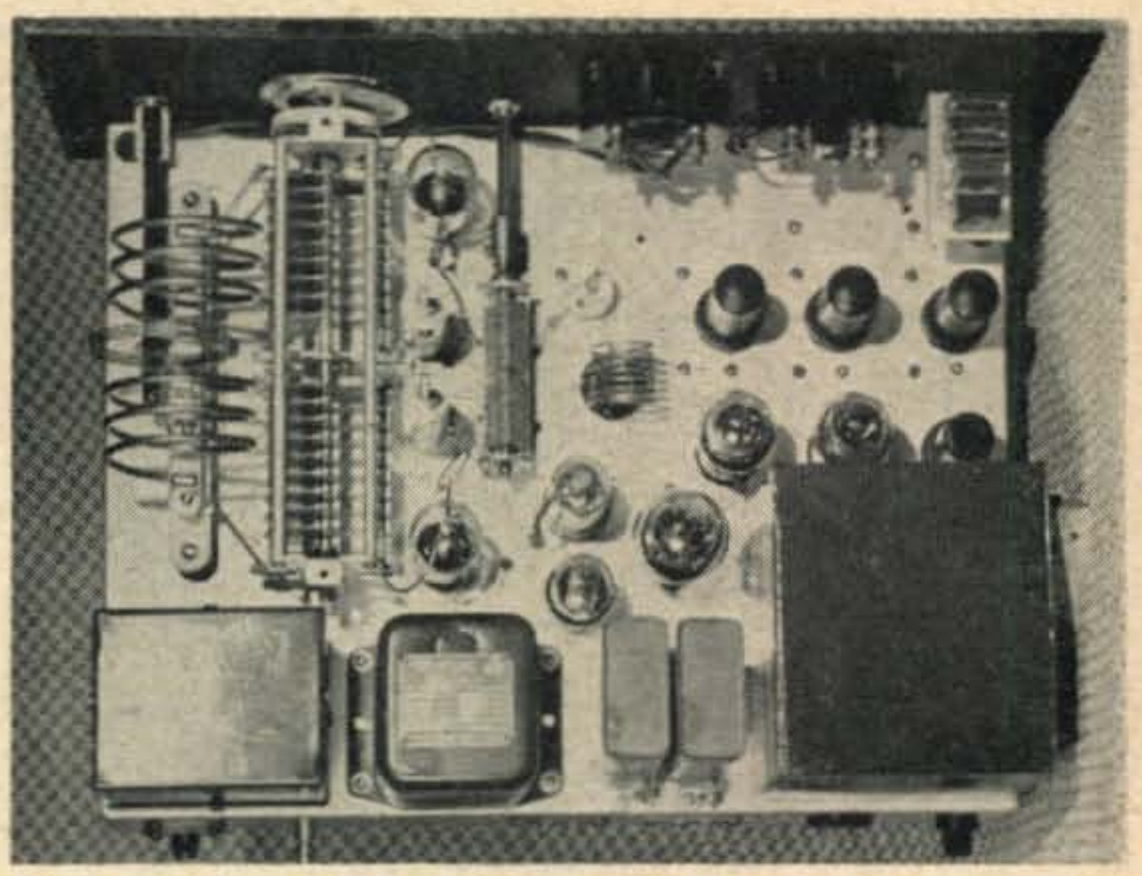
The second section of $S_2$ controls the voltages applied to the screens of the second and third multipliers. Whenever a multiplier operates into another multiplier, the former is operated with reduced screen voltage. When operating into the driver, full screen voltage is applied.

A 2E26 is used as the driver. It is a compact yet efficient tube with good shielding, low grid drive requirements, and with approximately 450 volts on the plate, provides ample excitation to the final. The screen of the driver is supplied with 150 volts from the same VR150 used to stabilize the oscillator plate voltage. The grid is operated with –50 volts fixed bias from the bias supply. The input condenser to the 2E26 grid is a compression trimmer which allows setting for optimum drive.

Type 3C24 (24G) triodes are used in the push-pull final. These are physically small tubes with grid and plate connections brought out through



There's plenty of room under the r.f. chassis to do a neat wiring job. It looks rather easy to service, too—a blessing when you hear something go "sputt."



The top view of the r.f. unit. The bank of crystals can be seen at the lower left, the relative positions of the components of the final stage at the right.

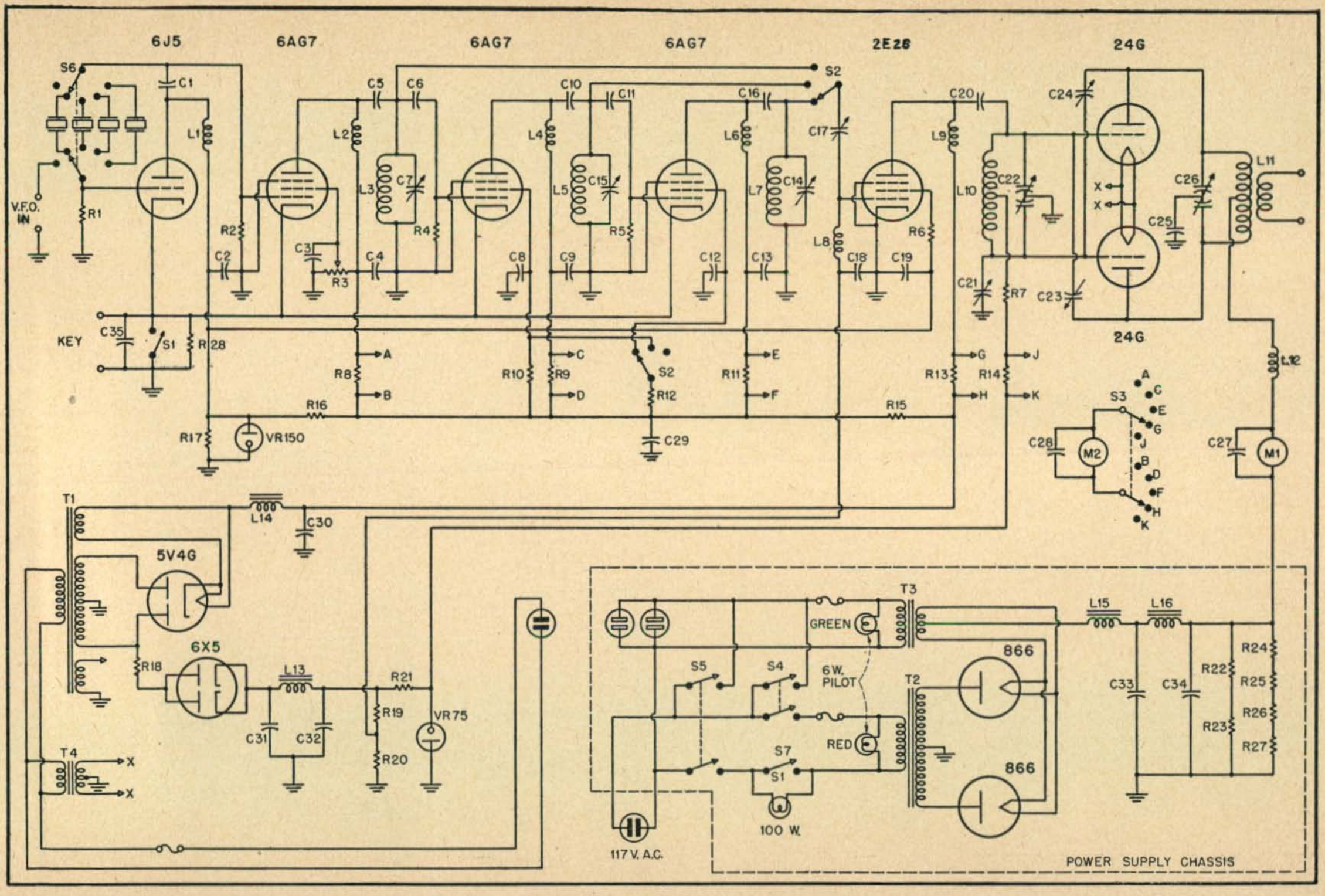
the envelope. With a plate voltage of 1500 volts, they are capable of handling 225 watts power input. These tubes are also readily available on the surplus market at extremely reasonable prices.

Split stator condensers are used for tuning the grid and plate circuits with standard commercial plug-in coils. The grid condenser is of the compact Hammarlund HFD series, and the grid coils are B&W "Baby" 25-watt inductors. The single ended 2E26 driver is capacity coupled through $C_{20}$ to the push-pull grid tank. To compensate for the tube and other capacities thus added to the top half of the grid tank, a small ceramic balancing condenser is added from the other end of the grid tank to ground ($C_{21}$).

A Bud JC-1576A dual plate condenser, together with 500-watt B&W TVL tank coils, cover the bands from 40 meters up without alteration. In order to cover 80 meters, it is necessary to add approximately 20 $\mu\mu$f additional capacity to the tank condenser by means of a small vacuum condenser. The Bud JC-1576A has a maximum capacity of 55 $\mu\mu$f per section, which is not quite sufficient to reach 80 meters with commercial coils, but does give a better L/C tank on 6, 10, and 20.

In the interest of conserving space on the chassis, tubular-shaped neutralizing condensers are used. These make use of a ceramic tube with a metal outer cylinder and a metal slug inside. Ceramic insulation is necessary since the heat from the 24Gs will melt polystyrene. Bud NC-1929 neutralizing condensers were used, with a range of 1 to 6 $\mu\mu$f, since they measure only ¾" diameter by $2^{7}/_{16}$" high. This is ample capacity to neutralize the 24Gs.

The rotor of the grid condenser is grounded directly, but to provide for the high peak voltages encountered in plate modulation, it was decided to put the plate condenser above ground. This requires mounting the condenser on creamic standoffs and insulating the shaft from the front panel. The latter was easily done by using a National "Velvet-Vernier" tuning knob from a surplus tuning unit which has a built-in insulator disc. The vernier action gives very smooth tuning.


6J5
6AG7
6AG7
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2E26
24G
24G
S6
C1
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R28
C2
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C3
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C12
L6
C16
R6
L7
C14
C13
S2
C17
L8
C18
C19
L9
C20
R7
L10
C22
C21
C23
C24
C25
C26
L11
L12
R8
A
B
R10
C
D
R9
S2
R12
R11
E
F
R16
R17
VR150
C29
R15
R13
G
H
R14
J
K
S3
C28
M2
C27
M1
T1
L14
C30
5V4G
6X5
R18
L13
R21
R19
R20
VR75
C31
C32
T4
X
X
T3
GREEN
6W. PILOT
RED
S5
S4
S7
S1
100 W.
117 V. A.C.
T2
866
866
L15
L16
C33
C34
R22
R23
R24
R25
R26
R27
POWER SUPPLY CHASSIS

C1—.001 midget mica
C2, C3, C4, C8, C9, C12, C13, C18, C19, C35 —.01 600 v. paper
C5, C6, C10, C11, C14, C16, C20—100 μμfd midget variable
C7, C15—365 μμfd midget variable
C17—3-30 μμfd trimmer
C21—10-60 μμfd ceramic trimmer
C22—dual 140 μμfd midget variable
C23—Bud NC-1929 neut. condenser
C24—Bud NC-1929 (1-6 μμfd)
C25—.001 μfd, 3000 v. mica
C26—dual 55 μμfd, .144" plate spacing
C27, C28—.01 200 v. midget
C29, C30—6 μfd, 600 v. oil-filled
C31, C32—30 μfd, 150 v. electrolytic
C33, C34—4 μfd 1500 v. oil filled
R1—10K ½ watt
R2, R4, R5—47K 1 watt
R3—50K 5 watts wire-wound pot.
R6—470 ohms, 1 watt
R7—1500 ohms, 10 watts, wire-wound
R8, R9—150 ohms, 1 watt
R10, R17, R28—100K, 2 watts
R11—150 ohms, 1 watt
R12—15K, 10 watts, wire-wound
R13—100 ohms, 2 watts
R14—150 ohms, 2 watts
R15—1500 ohms, 20 watts, wire-wound
R16—3000 ohms, 10 watts, wire-wound
R18—10K, 20 watts, wire-wound
R19, R20, R21—5K, 10 watts, wire-wound
R22, R23—1 meg., 2 watts
R24, R25, R26, R27—20K, 20 watts, wire-wound
L1, L2, L4, L6, L8, L9, L12—RFC 2.5 mh
L3—15T, 1" dia. form, spaced to 1" winding length, #18 wire
L5—9T, 1" dia. form, spaced to ¾" winding length, #18 wire
L7—6T air-wound #14 wire, ¾" dia., spaced to 1¼" long
L10—Grid coil, standard B&W 25 watts "Baby" series MC, center tapped.
L11—Plate coil, standard B&W 500 watts TVL series, for center link
L13—30 H 50 ma filter choke
L14—6 H 150 ma filter choke
L15—5-20 H swinging choke, 350 ma
L16—8 H smoothing choke, 350 ma
S1—s.p.s.t. toggle switch
S2—d.p. 3 pos rotary switch
S3—d.p. 5 pos rotary switch
S4, S5—d.p.d.t. heavy duty toggle switch
S6—d.p. 5 pos rotary switch
S7—s.p.s.t. heavy duty toggle
T1—power transformer, 500 v. each side, 200 ma, 6.3 v. & 5 v. heater windings
T2—plate transformer, 3600 v. CT, 350 ma
T3—filament transformer, 2.5 v. at 10 amps, CT
T4—filament transformer, 6.3 v. at 6 amps, CT

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The bias supply provides -75 volts of fixed bias, stabilized by a VR75, to the 24G grids. In addition, $R_7$ produces grid leak bias, so that approximately 125 volts of bias is obtained at normal grid current.

Two milliammeters on the front panel allow complete metering of the entire RF unit. A 200-milliampere meter in series with the plate lead to the final gives a constant check on the plate current. A five position double-pole switch together with a 100-ma meter permits checking the multiplier and driver plate currents as well as the final grid current. This is accomplished by shunting the meter across small carbon resistors in series with the desired lead. The resistors are of such value as to add insignificant resistance to the circuit whenever the meter is removed, while, at the same time, are large enough compared to the meter resistance so that negligible error is introduced by the shunting action on the meter.

A power supply for the exciter is mounted on the RF chassis so that only the final plate supply must be obtained from an external source. This self-contained power supply delivers 450 volts, from a choke input filter, to the 2E26 plate, and an additionally-filtered 300 volts to the 6AG7 plates. $R_{16}$ and $R_{17}$ together with a VR150 supply the regulated voltage to the oscillator plate and driver screen.

Voltage from one side of the high-voltage winding of $T_1$ is fed thru a dropping resistor $R_{18}$ to the 6X5 bias rectifier. This rectifier delivers approximately 125 volts to a small pi-filter with considerable capacity to remove all traces of ripple from the fixed bias. The voltage dividers consisting of $R_{19}$ and $R_{20}$, as well as $R_{21}$ and a VR75, produce the fixed biases for the driver and final. It is important to notice that a 5V4G is used as a rectifier, a tube of the slow heating cathode type, which delays application of plate voltage to the exciter until the bias pack is also delivering voltage. This prevents abnormally high voltages from being applied to the tubes during the warmup period and helps prolong stable tube life.

In addition to providing a high voltage winding, $T_1$ has a 5-volt winding to supply the 5V4G rectifier and a center-tapped 6.3-volt winding to supply the remaining exciter tubes. The final tubes obtain their filament voltage from a separate transformer, $T_4$, which supplies 6.3 volts at 6 amps.

Because fixed bias is used on the driver and final, keying or stand-by is done simply by removing excitation. Actually this is accomplished by opening the cathode of the oscillator and multipliers by means of $S_1$. Resistor $R_{28}$ prevents the cathode-to-ground voltage from becoming excessively high. If oscillator keying is desired, it is a simple matter to add a jack in series with the oscillator cathode lead only. A two-lug terminal strip on the rear of the chassis connects to the key or to a relay if the VFO and other units are to be actuated simultaneously for break-in operation.

**Construction**

The entire r.f. unit is assesmbled on a 14 gauge aluminum chassis, measuring 17 by 13 by 3 inches. Power supply conponents, namely $T_1$, $C_{29}$ and $C_{30}$, $L_{14}$, and $T_4$, are mounted along the back

(*Continued on page 49*)

# In The Public Eye

***New York amateurs were provided with two opportunities to demonstrate the ability of amateur radio to handle record traffic, and in both cases did a bang-up job. Here are a couple of angles your emergency group might try if the gang wants something of greater-than-normal interest to replace "checking into the net."***

ALBERT E. HAYES, JR., W2BYF*


**Clara Reger, W2RUF, one of the best traffic "men" in the business, handled most of the organizing of the western New York gang for the special election net.**

WE ALL KNOW that amateurs, in their day-to-day operations, frequently contribute much to the public welfare, but it is the unusual, rather than the usual, when such public service receives general acclaim in the public press. Such public notice generally is confined to sensational operations such as the supplying of emergency communications during a period of disaster, as has been documented in these pages many times before.

The amateurs of New York State, however, had not one, but *two* opportunities to be of service to the non-amateur public during the month of November, and they were "dream" operations in that there was adequate time to prepare to do the job. And do the job they did.

### Beating the Wire Services

The first Tuesday after the first Monday of November is marked as Election Day in most parts of the United States, and New York is no exception. On this Election Day, November 8th, the interest in an "off-year" election in New York was higher than usual because of the national importance of the issues on which the Senatorial candidates, Dulles and Lehman, had chosen to base their campaigns. The swift and accurate reporting of the returns from New York's 65 counties was a project which all of the wire services and New York City's many BC stations had prepared well . . . but one had prepared best, as was proven on election night.

WNYC, New York City's city-owned BC station, which had built up quite a reputation over the past years for the excellence of its election reporting, had determined to improve its record, and had contacted Gay Milius, W2NJF, with a view toward lining up a state-wide net to gather election data in each county and to shoot the dope into the WNYC studios by ham traffic circuits. Gay, in turn, got the word to the traffic leaders in the state, and the gang went to work. W2RUF, in Buffalo, and W2CLL, in Albany, covered the northern portion of the state with inquiries to traffic-handlers and emergency workers in each of the county seats, while W2TYU, in Bayside, L.I., set his station up as a message center and clearing house, with a Bell System teletype line into the WNYC studios. Local emergency corps groups in each county prepared local coverage between the polling places and the "central" traffic station, and, at 1900 on election night, the system was ready to go into action.

The setup in Nassau County may be cited as an example of how things were handled. Ev Gibbs, W2FI, emergency coördinator for the county, had determined that the Elks Home in

**Bill Knott, W2QGH, (left) and Gay Milius, W2-NJF, were kept pretty busy on the teleprinter circuit between the Westchester County message center and WNYC. All of the Westchester election returns went over this 144-mc link.**

*Editor, CQ

Hempstead was to be Republican County Headquarters, and that the election results were to be posted on a blackboard there as soon as they became available at the polling places. W2BTA, operating in a car parked in front of the Elks Home, assisted by W2QAN, was the originating point for the Nassau County contact. As fast as BTA and QAN read returns off the blackboard the results were transmitted on 144 mc to W2FI, which was set up in Bay Park at a "crossover point" between the 144-mc and 3.5-mc nets. W2s ANN, CB, DUS, GG, RPZ, SPI, and ZUC assisted in the 144-mc operation. From the 3.5-mc relay station at Bay Park the results were transmitted to W2TYU, on 3720 kc, from which point TYU transmitted them directly into WNYC on the land teleprinter circuit. It might be pointed out that all of the bulletins, from all except Westchester County, were funnelled through W2TYU. Pop had his hands full that night.

All of the "upstate" returns were collected by W2CLL who then transmitted them to W2TYU *en bloc* at about ten minute intervals. This made for maximum efficiency since TYU had to copy only a few different fists rather than the entire upstate gang. TYU copied everything directly on the teleprinter keyboard, thus saving another few minutes.

How did it all work out? The newspapers of the following day tell the story. The editorial columns of the New York press were lavish in their praise of WNYC's excellent coverage which ". . . in many cases were as much as two hours ahead of the wire services." The NYS gang proved again that the hams can do it.

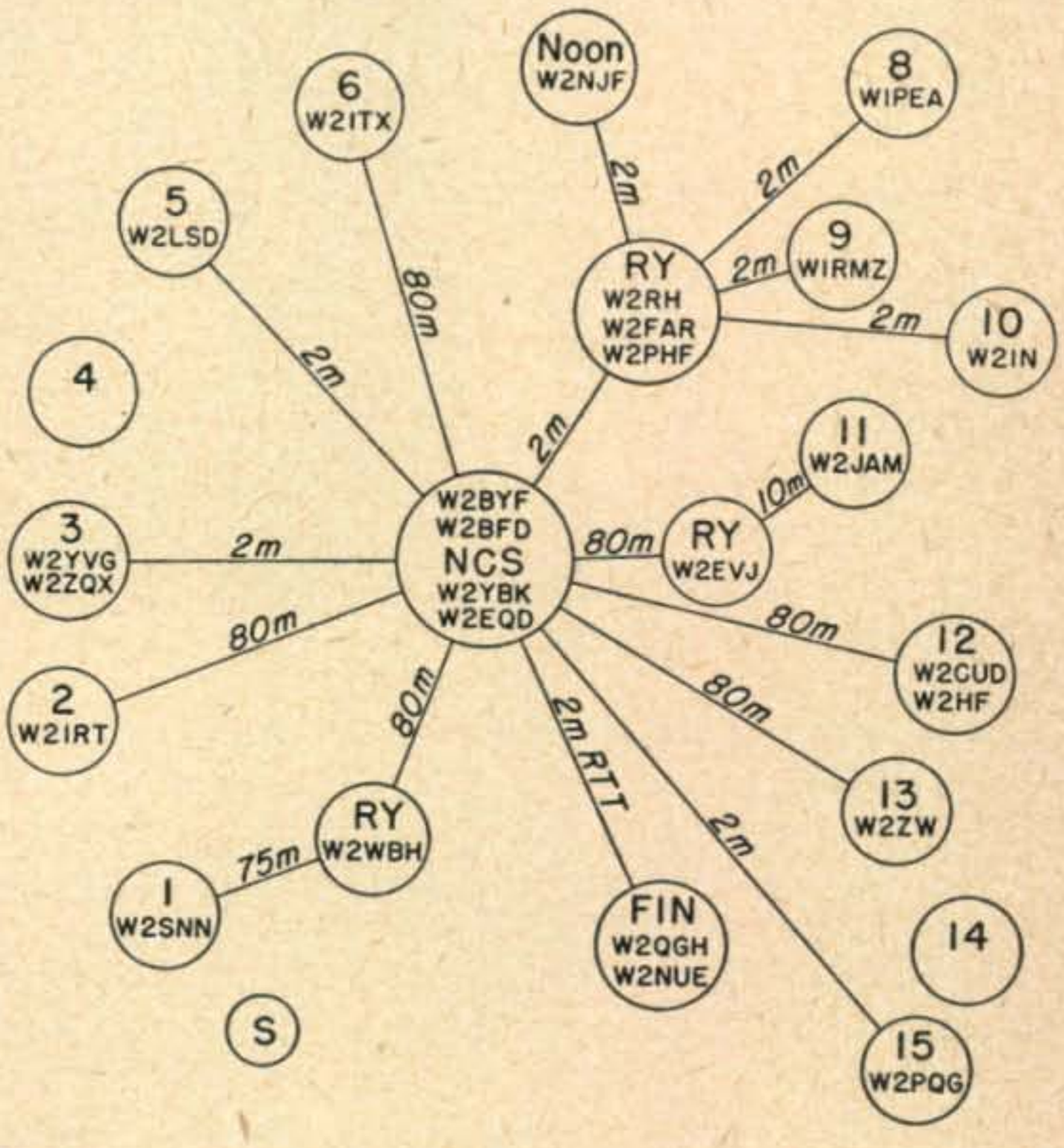
The following are among the amateurs known to have taken part in this operation: W2FEB, W2TYC, W2NHY, W2GTC, W2CJP, W2RUF, W2YRF, W2YGW, W2FE, W2TCZ, W2WZQ, W2FCG, W2YGC/2, W2UBU, W2SUL, W2GWY, W2PGT, W2JHA, W2LYH, W2SJP, W2HUM, and W2WIK.

**Fred Skinner, W2EQD, operating W2EQD/2 on 3720 kc at the message center. From this point the results were sent down to the finish line on a teleprinter circuit operating on 144 mc.**

**George Sleeper, W2CLL, shown here at the operating position, collected upstate returns and transmitted them, on 3720 kc, to W2TYU in New York City. George was a mighty busy man for a few hours.**

### Popcycles on the Loose

Why almost 100 motorcycle riders should knock themselves out for the better part of a day covering a 150-mile cross-country course through dense




**The setup for scoring the motorcycle races was really extensive.**

woodland, creek beds, and up nearly vertical cliffs, we hams will never know. Maybe it's the same thing that moves our traffic gang to lose sleep handling messages for perfect strangers, but there is no enthusiasm like that of the true hobbyist. At any rate, some 100 motorcyclists did just that on November 13th, under the auspices of the Westchester County Motorcycle Association. This affair was not a "race" in the strict sense of the term, since the object was to maintain an average speed of about 25 miles per hour, rather than to be the first to finish.

(*Continued on page 27*)

# A Slightly Different High-Voltage Supply

EUGENE BLACK, JR., W2ESO*

***The use of high-vacuum rectifiers in place of the conventional mercury vapor bottles cleans up that annoying "hash" which has been giving you trouble on break-in c.w. or s.s.s.c. The use of top-quality components is about the only way to beat corona noise in high-voltage units.***

THE EASIEST way to start this off and describe the beast shown in the accompanying photograph is to repeat the conversation that took place when I showed the pix to Ye Editor.

Me: "Here, Doc, look."

Doc: "Nice photography. What is it?"

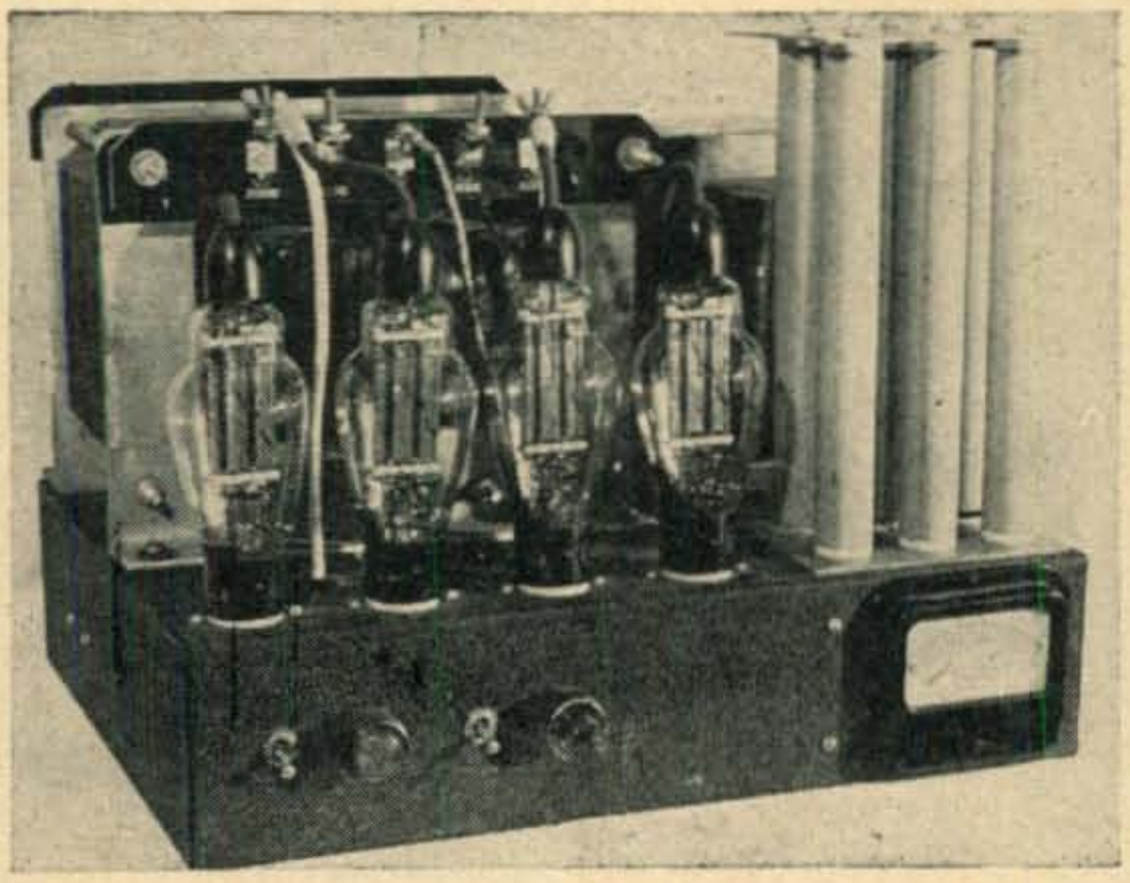
Me: "Power supply for my final and driver. 2200 volts for the 250TH and about half that for a 4-65A."

Doc: "Oh. Very nice photographs. You take them?"

Me: (sadly) "No."

Doc: (even less impressed) "What's different about it?"

Me: (*"Here's my chance."*) "Well, I can work full break-in on any band with anybody, without having to kill the supply, because it kicks up no hash. The rectifiers are 836s, running within their ratings in a bridge, so I didn't need hash filters, and I get half-voltage for my driver conveniently. The whole thing fits on a 17 × 13 × 4 chassis, and is easier to wrestle around than a rack-panel job, besides being cheaper. The driver and final are built the same way, and the whole works fits into a screened cabinet, which was cheaper to make than buying a rack and panels, besides being better for TVI protection."



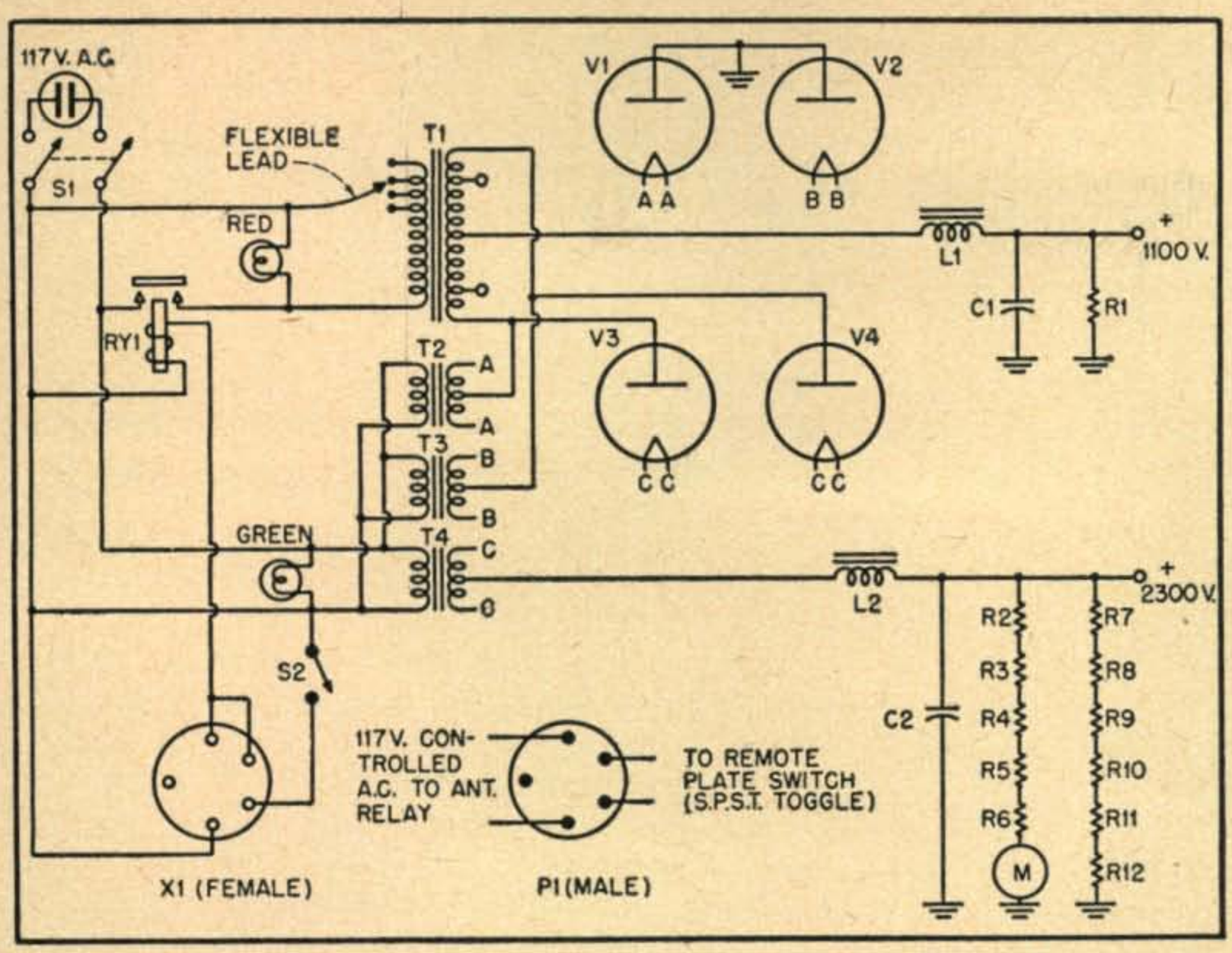
At this point, I saw I had him wrapped up so I stopped to breathe and hauled out the circuit diagram of *Fig. 1* from my briefcase. You can see pretty quickly that the circuit is basically standard, but the availability of certain components in surplus, coupled with my alleged sense of humor, made the final product look unlike the power supplies you see in the handbooks.

For example, take the six 120-watt resistors that form the high-voltage bleeder. Non-ham visitors always ask what "all those columns" are. However, at two bucks for the lot, they were cheaper than the single 200-watt bleeder otherwise required, they run cold, and the easy mounting clinched it. The bakelite panels above and below serve to align the resistors but are not necessary to prevent voltage breakdown to the chassis, as was proved by several months operation with the ceramic bushings resting on the chassis The precision resistors in the meter multiplier string are admittedly frivolous, but cost only a few cents more than composition resistors of doubtful ageing quality. One other out-of-the-way item is the contactor used to break the primary of the plate transformer; this is in essence a double-break relay with heavy contacts, and is designed for just this type of operation. Its use permits a light duty toggle switch to serve as the plate "off-on" control.

Bridge rectification of the 220-volt plate transformer not only delivers a reasonably high d.c. output with 15 v. a.c. input, but also offers a chance to let the 836s work within their ratings. A number of fellows have tried using these tubes in order to avoid the hash problem of 866s, and have given them up because they would not stand up under voltage overloads. This failure is understandable; in order to keep the internal drop down to a reasonable value, it was necessary to resort to a heater-cathode construction, with very close spacing between the cathode and plate. Although the tube can be run somewhat in excess of the manufacturer's peak inverse rating, this process cannot be carried very far, and the tube cannot be used to replace an 866A under any and all conditions. The manufacturer's rating of 5000 volts peak inverse corresponds to approximately 1750 volts RMS a.c. per plate in the usual full-wave rectifier, which means just a bit over 1500 volts d.c. output if you stay inside the ratings.

In a bridge rectifier, of course, the peak inverse voltage appears across two tubes in series, thus raising the permissible d.c. voltage to 3000.

* *130 E. 24th St., New York 10, N. Y.*




C1—6 μfd, 1500 d.c. w.v., filter capacitor
C2—2 μfd, 3000 d.c. w.v., filter capacitor
L1—6-19 Hy, 200 ma (max.), swinging choke
L2—9-60 Hy, 400 ma (max.), swinging choke
R1—50K, 100 w. (IRC type HA)
R2-R6—0.5 meg, 2 w., 1% tolerance
R7-R12—10K, 120 w. (Sprague)
RY1—10-amp contactor
S1—d.p.s.t., 15-amp rating
S2—s.p.s.t. toggle switch
T1—Plate transformer. RCA type 901141-501, 1.75 kva.
Primary tapped for 190, 210, 230, 250 v. a.c.
Secondary 2300-0-2300, tapped at 1750-0-1750 v.
T2, T3—2.5 v., 5.0 a., 7500 v. test (Stancor P-6133)
T4—2.5 v., 10 a., 7500 v. test (Thordarson T-19F90)
P1—Five prong male plug
V1-V4—836 or 866A
M—0-1 ma meter with 2500-v. d.c. scale
X1—Five prong socket

Even on a dollars-and-cents basis, the bridge rectifier doesn't work out too badly. Although much of the 220-volt surplus went into export (this voltage is more common abroad than our 115 volt standard), I observed these transformers selling sufficiently lower than comparable 115 v. transformers to offset the cost of the additional two tubes, sockets and pair of filament transformers very nicely.

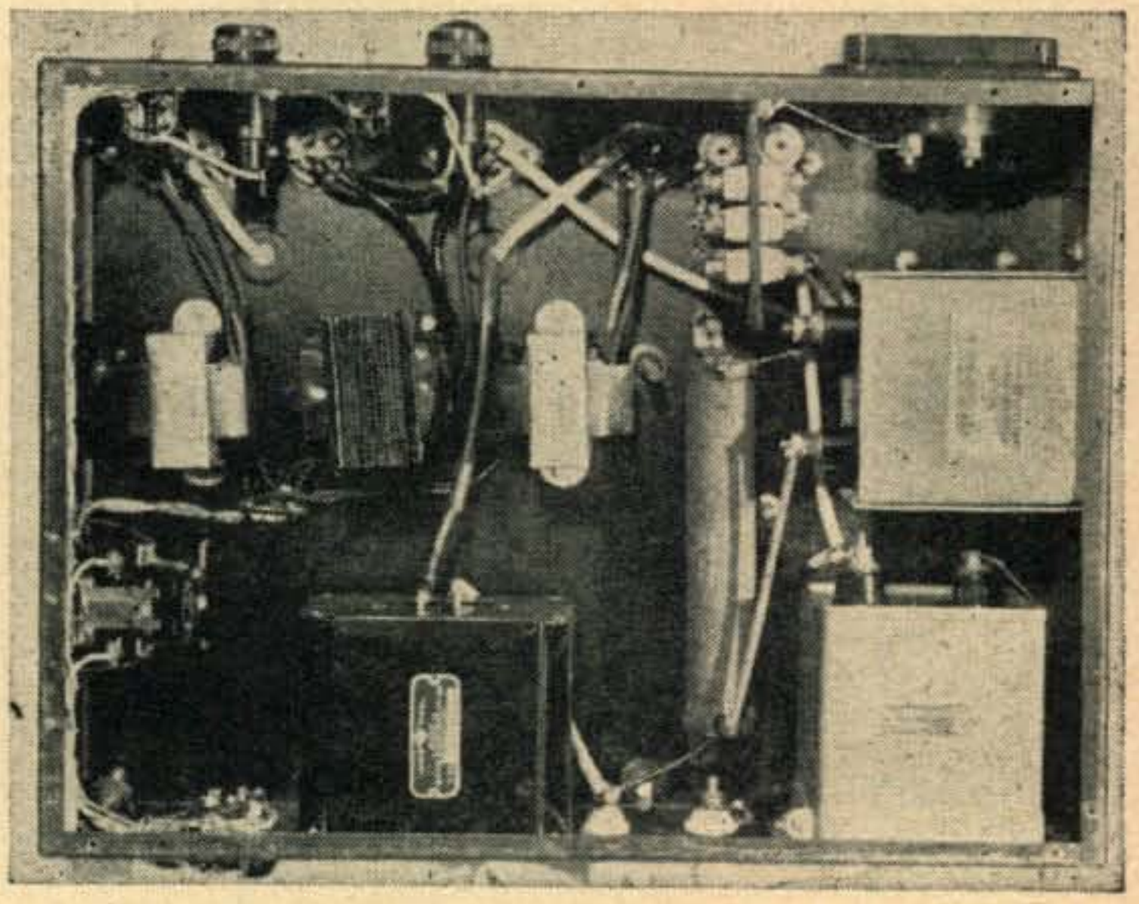
At this point, one word of caution about using bridge rectifiers under certain conditions.

Some inexpensive transformers are built with limited safety factor as regards internal insulation. These units require that the high voltage center-tap be held at ground potential, thus ensuring that no point on the secondary will ever rise above ground (and core, case and primary) by more than half the secondary voltage. This automatically rules out a bridge rectifier, in which each end of the secondary alternately rises above ground by approximately the full secondary voltage.

### Corona noise

Of course, this limitation does not apply in the case of a 220-volt transformer run on a 115-volt line, as then the secondary voltage is only 50% of rated voltage, but this condition may be a limiting factor in other cases. In general, inexpensive transformers should be avoided by hams with a yen for break-in, as the internal corona in these units often results in more hash output than mercury vapor rectifiers could cause, and is a lot harder to eliminate. Since the majority of hams don't seem to be concerned about this, many of even the better transformers are poor in this respect. The military surplus transformers are generally excellent as regards low or negligible corona noise, due no doubt to the large safety factors usually specified with respect to voltage breakdown. (My only suggestion to the break-in enthusiast is that he arrange with his dealer to buy on a trial basis. A rough check can be made by running the transformer with no secondary load, grounding the case, and listening on a communications receiver with a few feet of antenna, checking the background noise as the primary is energized. A really good transformer will cause no hash, and only a click as the primary switch is opened or closed.)

(*Continued on page 56*)



**Bottom view. All high voltage leads run directly, but the 115-volt leads and control wiring are cabled. The gadget at the lower left below the filament transformer is the primary contactor. The strip at the upper right near the meter carries the high voltage meter multiplier.**

# Putting Surplus to Work on the 420-mc Ham Band

T. R. DAVIS*

***Units of the APQ-9 radar jammer form an ideal starting point if you want to operate in the u.h.f. region. The tube and "plumbing" problems—often stumbling blocks—are taken care of nicely. Warm up that soldering iron and get in on the fun!***

WITH THE INCREASED ACTIVITY on the 420-mc band comes the problem of getting a transmitter going that is stable and free of bugs. Most amateurs have limited themselves to the conversion of the BC-645 for a transmitter, although many have built circuits employing lighthouse, doorknob, and acorn tubes.

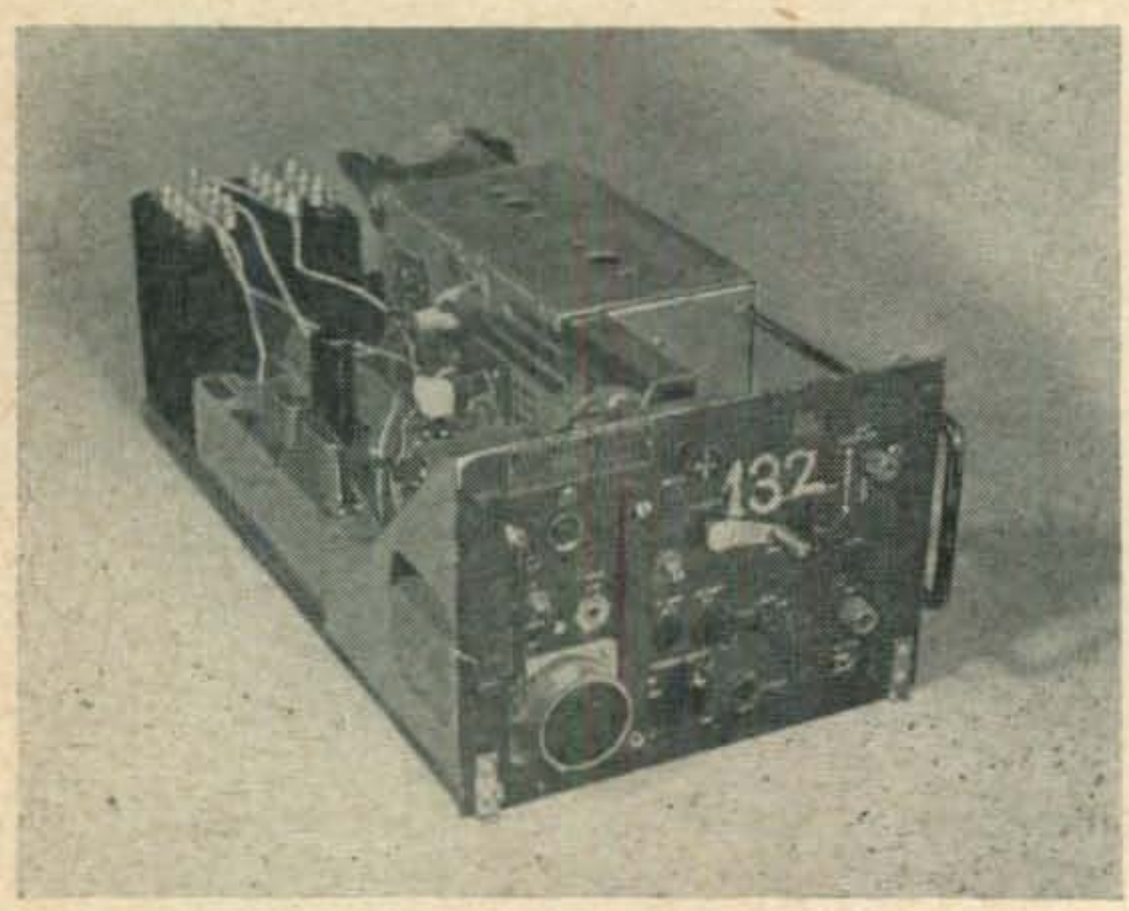
The author has experimented with various u.h.f. oscillators employing these tubes in convential tube-line circuits, but their main drawback is that the complete mechanical layout must be made from scratch, including the building of tuned circuits, coupling mechanisms, etc.

It was recently suggested that the APQ-9 could be used for these frequencies, and this article is the result of a simple conversion of that radar jammer.

The transmitter uses two type 8012 tubes in a parallel-plate oscillator in which the plates, grids, and cathodes are tuned. The modulator used two 807 tubes in parallel, driven by a 6AG7. The tubes preceding the 6AG7 included two 6AC7 tubes used as video amplifiers, and a phototube, the 931A, with its electron multiplier system. The phototube amplified the video noise components of a pilot lamp placed inside the tube housing.

The oscillator actually operated from 500 to 700 mc. By adjusting the mechanism which slides the 8012 tubes along the parallel plates for maximum distance between the tubes, and by varying the tuning vanes all the way in, it was found that the frequency went down to 430 mc. Some transmitters will tune even lower in frequency and others may tune higher. If the particular one you get does not tune low enough, silver solder, or braze, extensions one inch in length to the ends of the parallel plates. Also cut off $\frac{3}{8}$" of the center conductors in the cathode tuned lines. This is to allow the tubes to be moved farther back without straining the filament leads and causing the tubes to break. A hole must be drilled in this center conductor to accommodate the small screw which holds the filament connectors in place. After this is done, the lower frequency limit should be in the vicinity of 400 mc, giving ample tuning range with the tuning vanes.

* *Valparaiso Technical Institute, Valparaiso, Ind.*



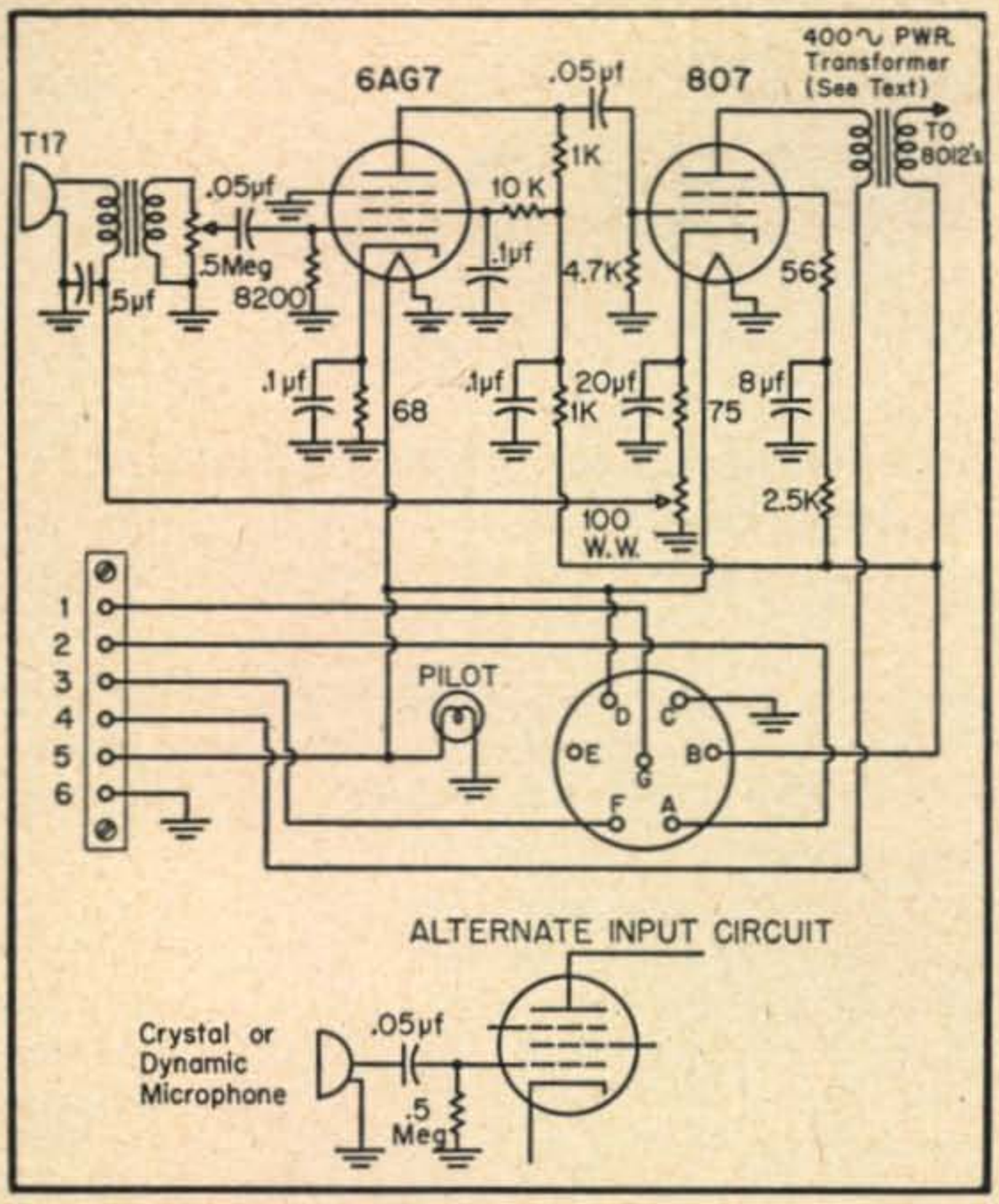
**The r.f. unit, designated T39/APQ-9, doesn't need much "working over" to make a satisfactory transmitter.**

### Adjusting the Cathode Lines

The adjustment of the cathode lines determines the amount of feedback in this type oscillator, and lowering the frequency may require adjustment of the sliding contacts inside the cathode lines. This is accomplished by loosening the locknuts on the cathode adjusting screw and running the cathode shorting fingers back to the end of the lines. The author found that this improved the characteristics of the oscillator. This adjustment should be made with the tuning vanes all the way in.

The filament transformer must be removed and the 8012 filaments conected to the terminal strip at terminals 5 and 6 (bottom of strip). The wires which connected to this transformer and to the blower motor were completely removed from the chassis. It was found that using 450 to 500 volts on the plates of these oscillator tubes did not cause them to heat up excessively.

If the voltage applied to the plates of the 8012 tubes exceeds 500 volts, it would be advisable to use the blower motor, if possible. It was found that some of the APQ-9 transmitters used 27-volt d.c. blower motors, and that others used 275-volt d.c. motors. The 27-volt d.c. motor will operate at slightly reduced speed from a 12-volt a.c. source, and 18 volts a.c. seemed to make it operate better. The 275-volt motor will operate nicely from 117 volts a.c. if the field and armature are connected in series. The circuit diagram shows this motor being used. In connecting this motor into the circuit, the yellow wire with the brown tracer was connected to the solid green wire, although the other connection would work just as well. The




**The modulator unit uses the 400-cycle power transformer as a modulation transformer, and works quite well. See text for details.**

two free wires were then connected to terminals 1 and 2 of the terminal strip.

The choke at the plate terminal of the oscillator is the one which was originally used and works quite satisfactorily. From this choke the B+ lead must go to the modulation transformer, but in order that the plate current drawn by the oscillator tubes may be measured, it was wired to the meter switch and then from the switch to the modulation transformer.

Since the conversion was made so that all filaments were parallel, this put one side of the 8012 filaments at ground potential. Therefore, the meter switch must be studied in order to connect it in the circuit to measure d.c. plate current. The "CATH" position was used since this originally measured cathode current of the oscillator tubes. The 1K resistor in series with the meter was removed, and a 500-ohm resistor replaced it. With 450 volts on the plate, the maximum plate current which can be expected is 150 ma but in most cases is lower. Thus, with a 2.5-ohm resistor in parallel with the meter and its 500-ohm series resistor, we have, by a simple calculation, 200 ma plate current when the meter reads 1 ma. This is sufficient for most cases. The 2.5-ohm shunt is the one originally in the cathode circuit and was soldered from the cathode tap on one wafer of the 2-gang switch to the cathode tap on the other gang. The correct position on the switch may be found by turning the switch to the "CATH" position and noting which terminals are contacted. Placing the meter at B+ potential necessitates the insulation of the meter jack from ground. The antenna and grid positions on the switch are left as they are, since they are properly connected already. In the grid position, the grid current will be 50 ma when the meter reads 1 ma. More about this switch when we discuss the modulator.

The power plug and the fuses were removed from the transmitter section, although it is not essential. This completes the modification of the transmitter section, and it is ready to go.

### The Modulator

The circuit diagram of the modulator is very nearly self-explanatory. There are a few points, however, which must be taken into consideration.

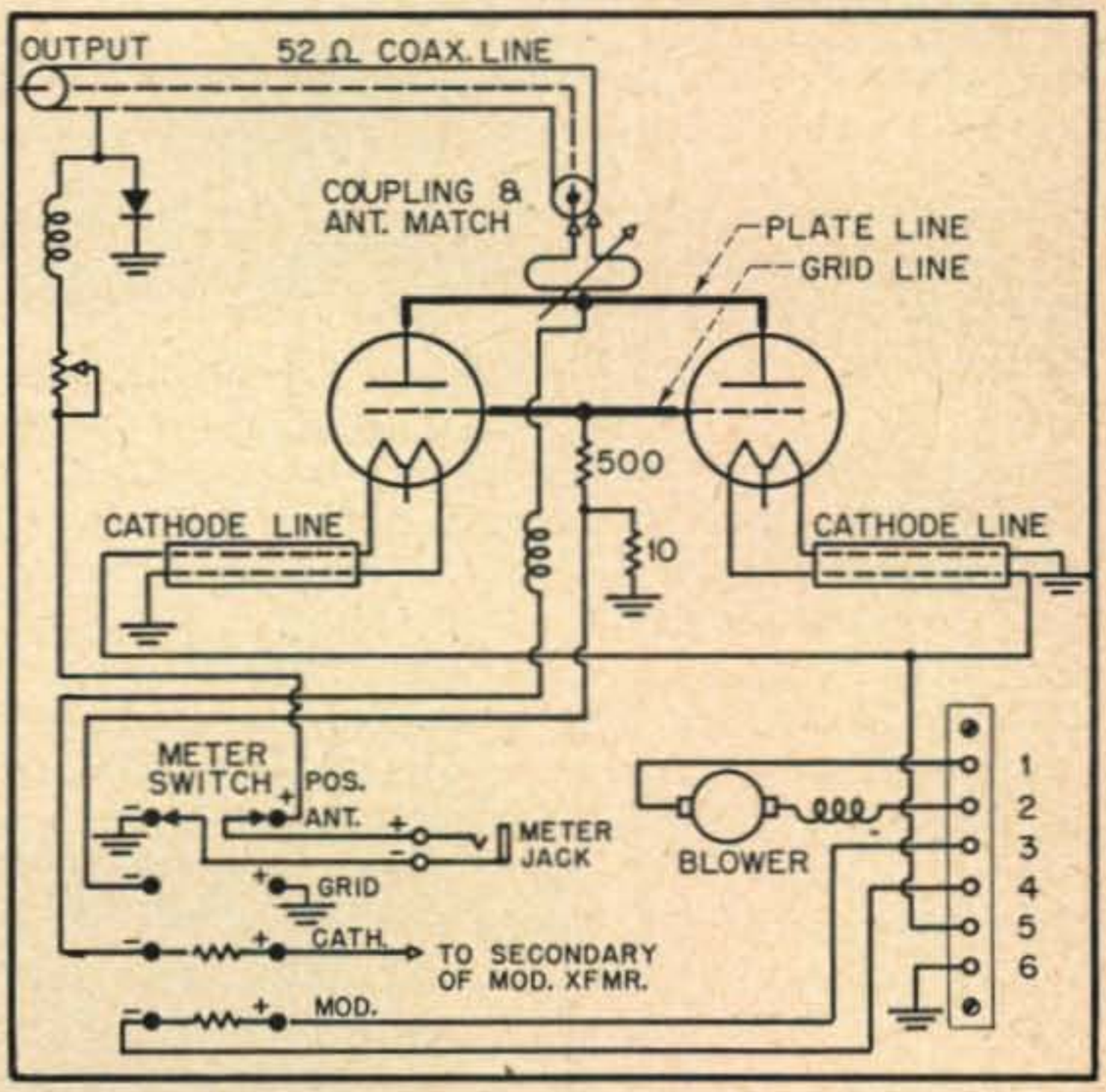
For the microphone circuit, it was decided that the carbon microphone would be used, although an alternate circuit is given which may be used if desired. (See Fig. 2.) The potentiometer in the cathode bias resistance of the 807 tube is the gain control which was originally connected to the phototube. This is a wire-wound potentiometer which has a sufficiently high dissipation rating for the cathode resistance of the 807. The potentiometer was mounted on the chassis where the video modulation choke stood. The 75-ohm resistance was originally in the cathode circuit of the 807 and is disconnected from terminal number 1 of the terminal strip. The potentiometer is then soldered to this free end.

The circuit would probably function very nicely without the 6AG7 driver, since the output of the carbon microphone is high. Due to the fact that some may wish to use a crystal or dynamic microphone, the circuit was developed so that both types may be used.

The values of the resistors are not critical in the modulators, however, they should be fairly near the values given on the circuit diagram.

The grid circuit of the 807 tube is grounded through the 47,000-ohm resistor, and the wires which connect the 6AG7 plate to the filament of

(*Continued on page 54*)



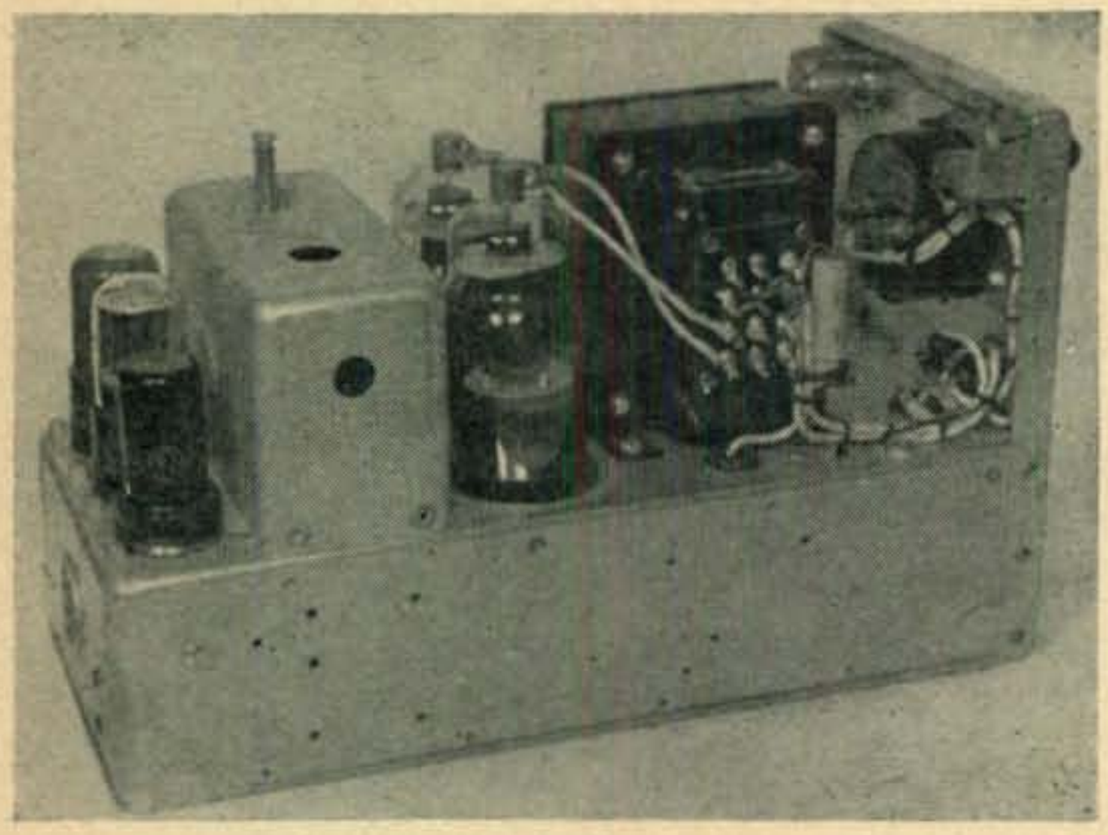

**The circuit diagram of the r.f. unit, after conversion, is as straightforward as we could wish.**

# A High-Power Modulator for Mobile Operation

GEORGE M. BROWN, W2CVV*

***A pair of 807s in Class B makes an excellent modulator for use with your converted 274-N transmitter. The low idling plate current of the Class B connection is just the thing for mobile operation where battery drain is a factor.***

THE MOST COMMON FAULT with amateur mobile phone installations (and many home stations) is probably the lack of sufficient high-quality audio power for adequate modulation without overload. This is a perfectly understandable situation, since plate power is precious, and the desire to put as much of it as possible into the final, even at some sacrifice in modulation capability, is part of human nature, regardless of the effect it may have on the readability of the signal. The modulator to be described herein, and the complete high-



**The modulation transformer fits nicely between the 807s and the meter and leaves plenty of room for the cover.**

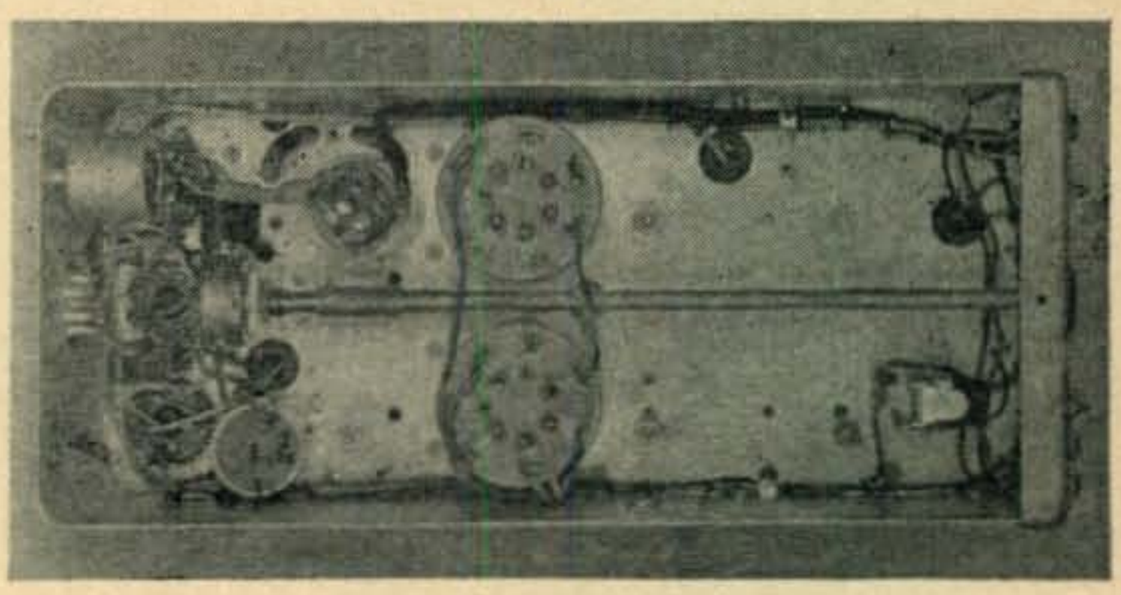
power mobile installation built around it, provides about the highest level of fully-modulated power that can be handled by a standard automobile battery and generator without excessive auxiliary charging. It is capable of as much as 60 watts input to the final, with 100% modulation, using a PE-103 for plate power and can be readily removed from the car for use as a fixed or portable station, using a rectifier power supply, and operated with as much as 120 watts input.

In spite of this high power capability, the modulator is economical for transmitters of as low as 30 or 40 watts input, since the static plate current is lower than that of a 6N7, with 10 watts rated output, and about one third the static plate and screen current of a pair of 6L6s, Class $AB_1$ with 24.5 watts rated output. Higher plate voltage is required, but in general this is obtained from a 450- to 600-volt dynamotor used for the r.f. also and is readily available.

### The Driver

One of the most unique features of the modulator, *Fig. 1*, is the use of a push-pull cathode follower driver stage direct coupled to the grids of the 807 modulators. The 807s are operated with their "zero bias" Class B connection, in which their screens and control grids are both driven, the screens somewhat harder than the grids. With zero voltage on both grids and screens, the static plate current is reduced to a very low value, of the order of 5 or 10 ma. Actually, the direct-coupled cathode followers supply approximately 10 volts of positive bias with resultant total static plate current on the 807s of 30 ma. Of course, with tone modulation this plate current increases to 80 to 150 ma, depending on the output required, but on voice, although peaks of the same magnitude are present, the average is far lower. This means that a PE-103, rated at 160 ma at 500 volts, can be loaded to 120 ma into the p.a. and still be within its average rating with voice modulation.

One of the penalties incurred by operating 807s in this fashion is that considerable driving voltage, accompanied by as much as 20 ma peak grid current, must be supplied. Conventional methods of producing this driving power would involve power consumption largely cancelling the power-economy advantages of the Class B operation. Since power need be supplied to each grid only on its positive half of the cycle, however, the cathode follower driver is a natural. Note there is no connection from the 6SN7 cathodes to ground except through the grids and screens



**The bottom view illustrates its simplicity.**

* *c/o New York Central System, 466 Lexington Ave., New York 17, N. Y.*

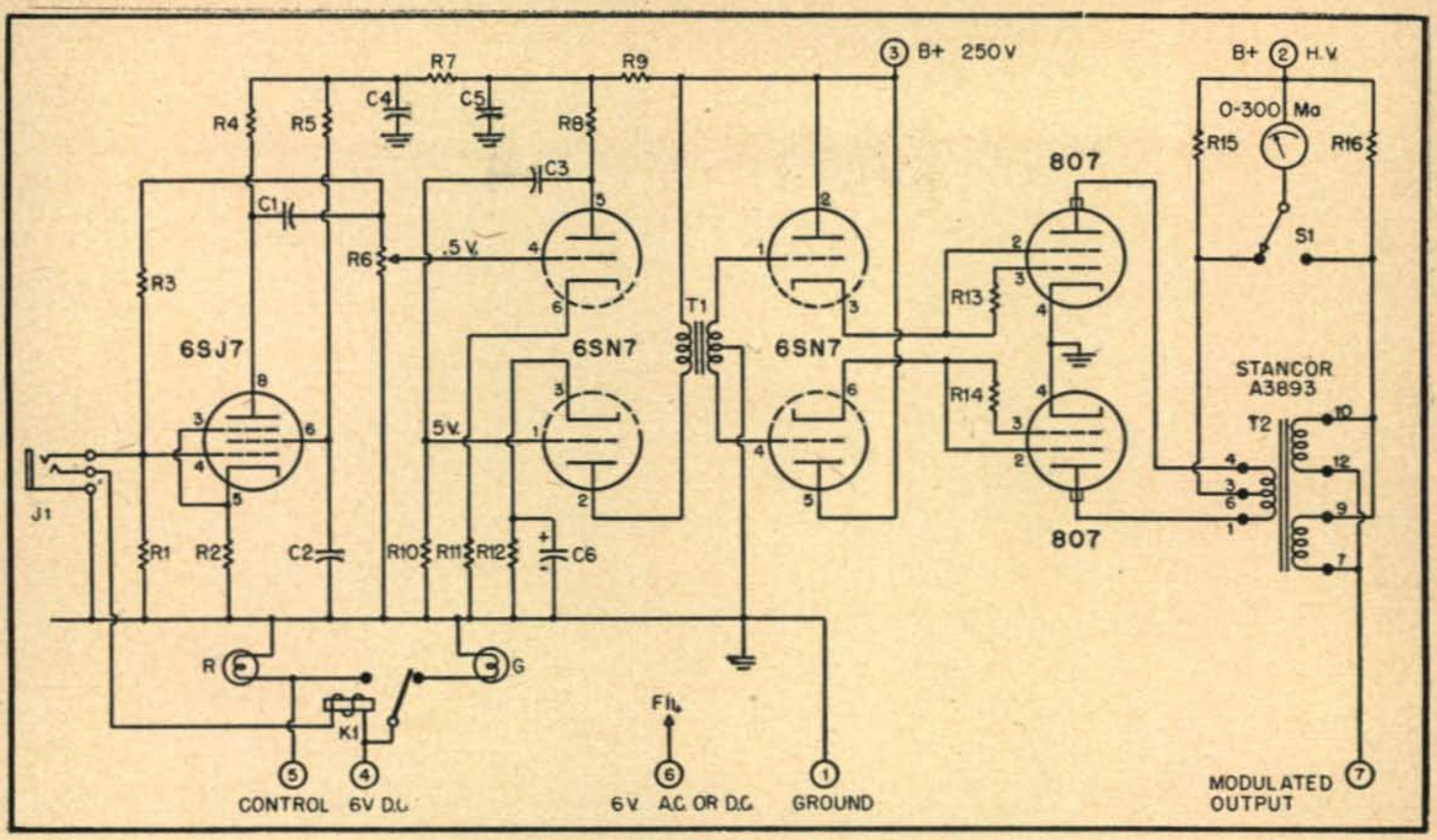



**Fig. 1. The circuit diagram of the modulator.**

C1, C3—.006 μf
C2, C4, C5—.05 μf
C6—5-μf audio bypass
R1—3 meg, ½w.
R2—1K, ½w.
R3—10 meg, ½w.
R4—220K, ½w.
R5, R10—1 meg, ½w.
R6—0.5-meg pot.
R7, R8—100 K, 1w.
R9—33K, 1w.
R11, R12—3.3K, 1w.
R13, R14—22K, ½w.
R15, R16—10 ohms, ½w.
T1—push-pull input transformer
T2—modulation transformer (Stancor A3893 or equivalent)
K1—push-to-talk relay, 6v. d.c. coil, s.p.d.t.

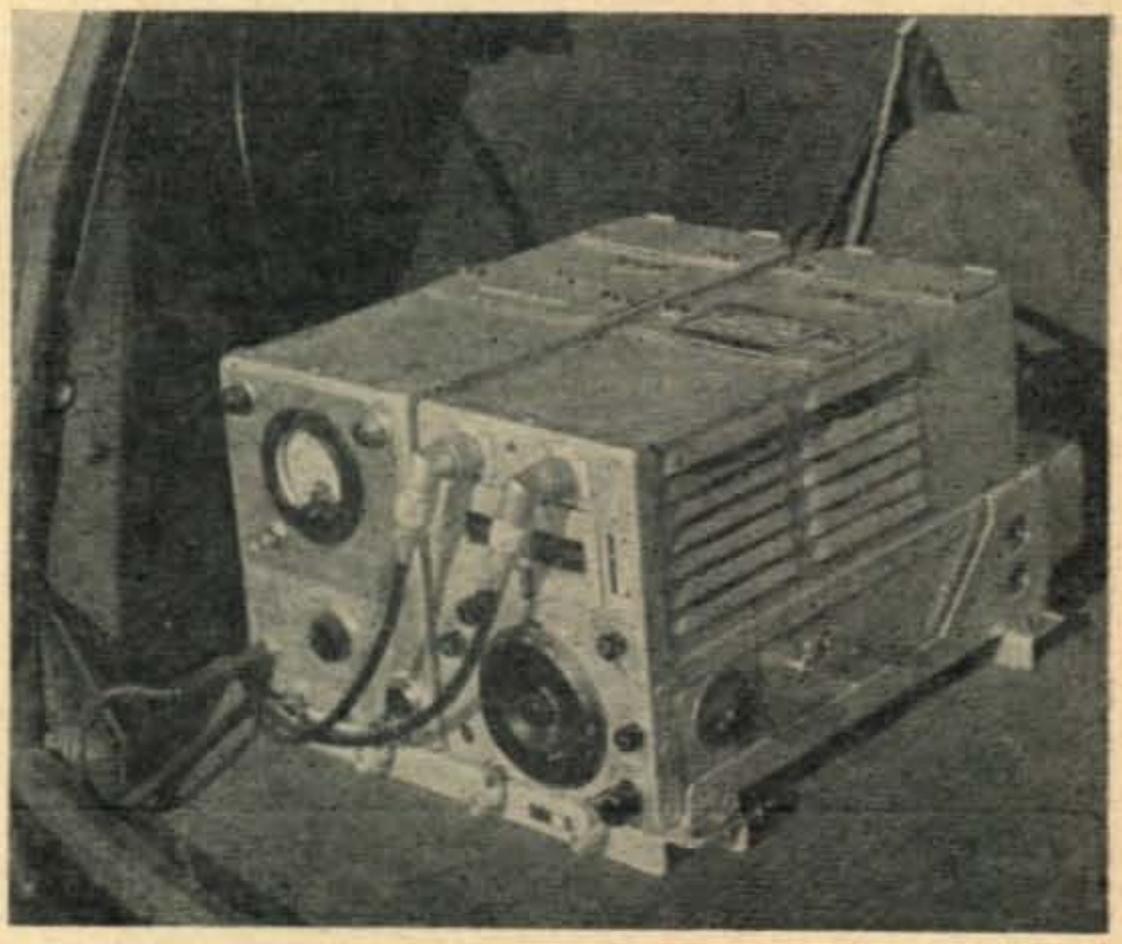
of the 807s. Thus the plate current flowing in the 6SN7s is equal to the grid and screen current of the 807s, and varies from less than 1 ma to peaks of 20 ma with voice modulation. Actually the total plate current consumption of the entire driver, up to the 807 grids, is less than 10 ma under static conditions. Since this driver section works on 200 to 250 volts, its plate power as well as that of the r.f. driver stages is obtained from the receiver plate supply to save all the output of the high-voltage dynamotor for the final and the modulator. The receiver plate power supply is switched from the receiver to the transmitter during transmitting periods.

### Speech Amplifier

The early stages of the speech amplifier section are conventional in design. Transformer coupling is used to the grids of the cathode follower stage, using a conventional step-up interstage transformer, since they require higher voltage that can readily be obtained by resistance coupling. Of course the cathode follower draws no grid current, so the usual heavy-duty driver transformer and power stage are not required, but be sure the transformer is step-up, about 2 to 1 from primary to each grid. The type usually used between a 6J5 and a pair of 2A3s is okay.

The 10 megohm resistor $R_3$ is included to provide inverse feedback around the 6SJ7 preamplifier tube, since somewhat more gain than necessary was available. It may be omitted or increased if more gain is desired.

The optimum load on the modulator is ap-



**The modulator sits on the right of the r.f. unit in the 274-N dual-transmitter rack. The whole assembly can be slipped out of the trunk for fixed-station operation.**

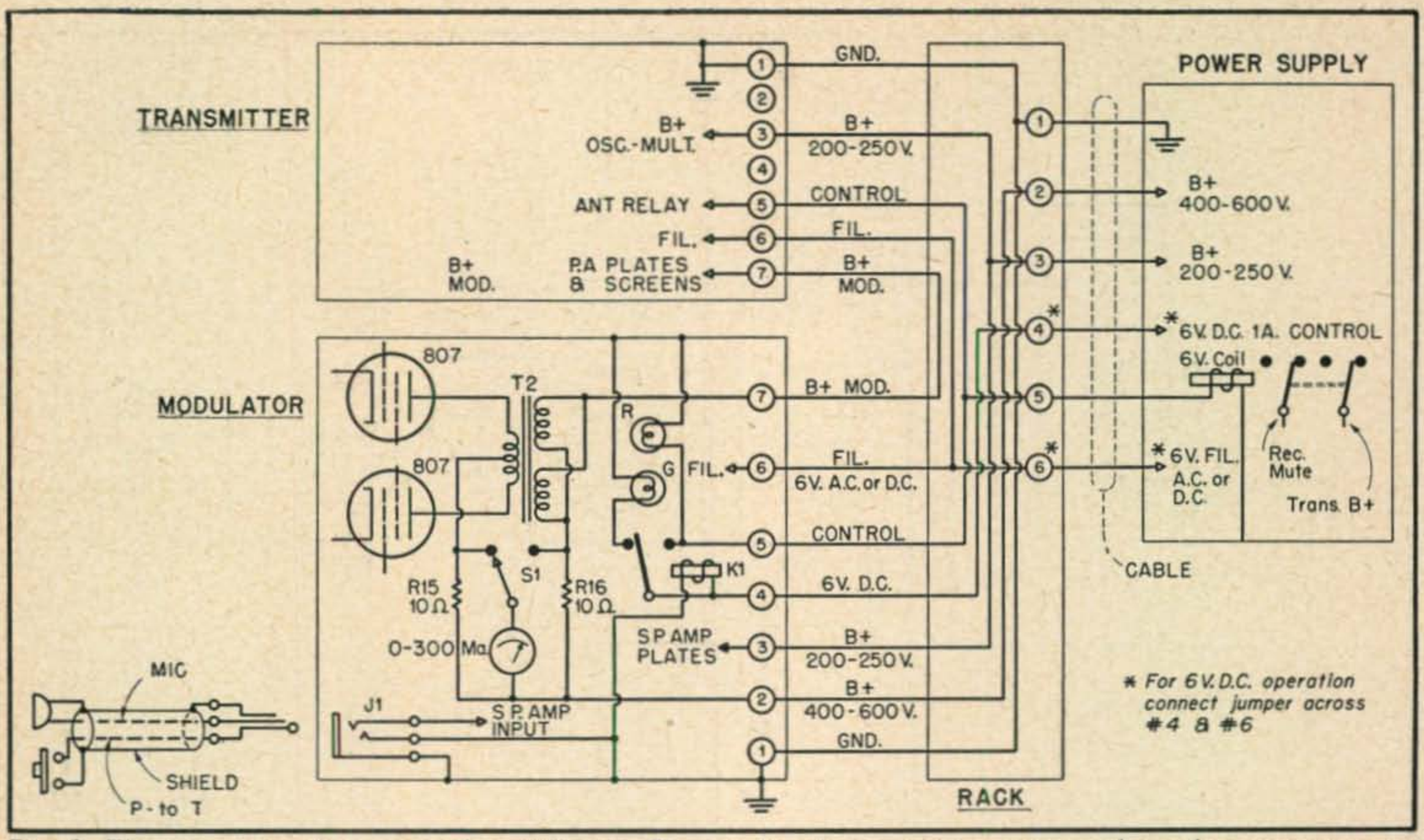



**Fig. 2. The interconnections as used at W2CVV. The numbered connections correspond to the connectors on the 274-N chasses and the mounting rack.**

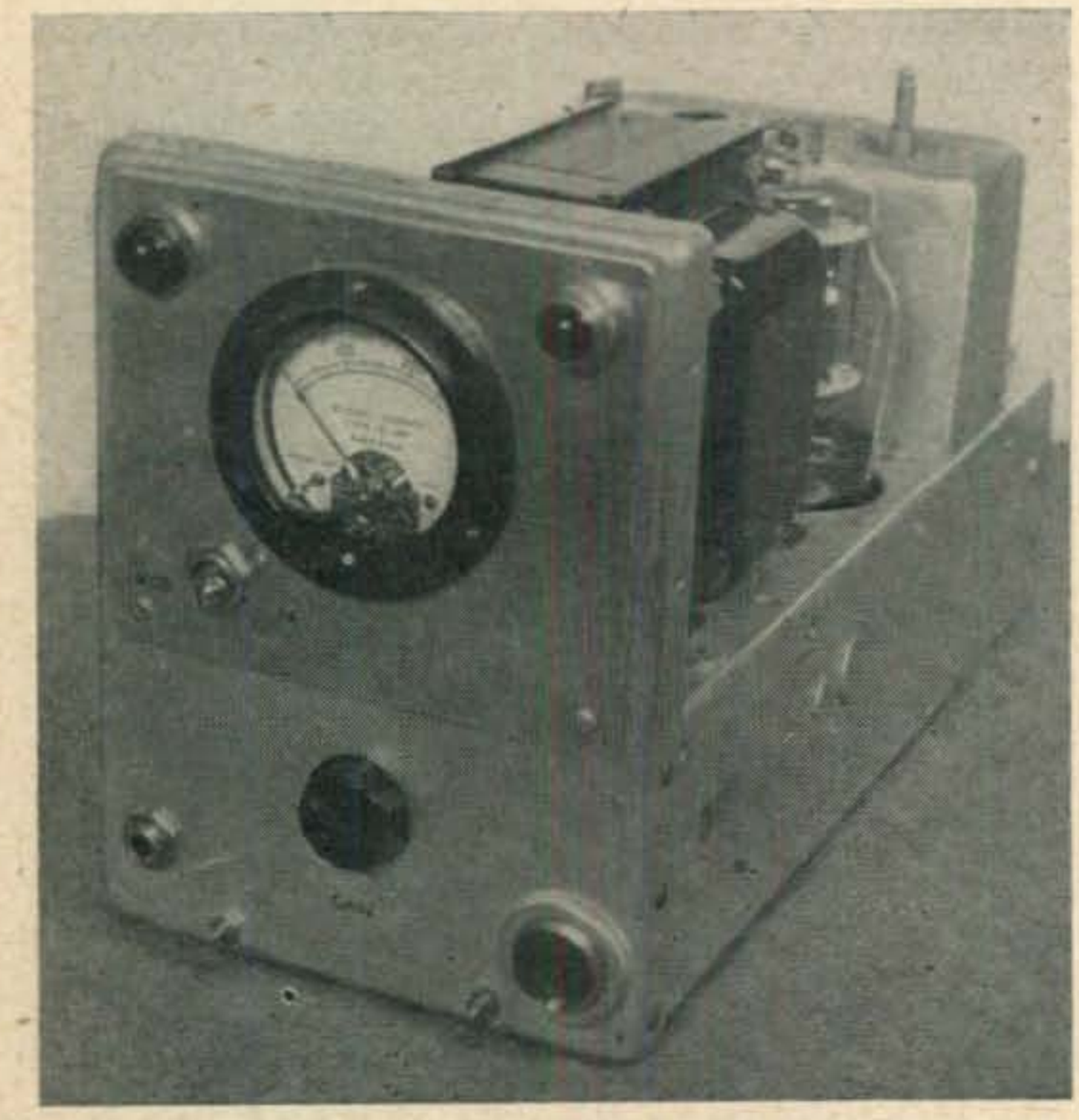
proximately 12,000 ohms, plate-to-plate. With the transformer and connections shown in *Fig. 1,* and the same plate voltage on the final and on the modulator, a load of any reasonable impedance down to 3500 ohms can be fully modulated. No changes are required to operate with any supply voltage within the rating of the tubes. In one test, the entire modulator was operated from a 150-volt receiver supply, and, although the power was reduced, the modulation level and quality were satisfactory.

As shown in the photographs, the entire modulator was built into a stripped-down 274-N chassis. The 1625 sockets were filed to fit the 807s and the three other tubes are mounted in the three sockets on the rear of the chassis. The interstage transformer was mounted under the original VFO shield can, and the can used to cover both it and the large holes in that section of the chassis. One of the adjustment screws was left protruding from the shield can to form a rest when the unit is inverted on the bench.

A patch-plate was cut to cover the top portion of the front panel, and drilled for mounting the various components. The two receptacles in the lower corners are provided to permit the use of two different types of microphone plugs and are simply wired in parallel.

The metering circuit permits monitoring either the modulator plate current or the final plate and screen current by means of $S_1$. The two 10-ohm resistors, $R_{15}$ and $R_{16}$ are large enough so that they will not appreciably affect the calibration of the meter.

Note that the gain control $R_6$ is provided with a long extension shaft to permit keeping it near its associated components and still be accessible from the front panel. A tapered knob, protruding only a little way through the front panel, was selected in order that the gain would not be accidentally disturbed by the knob being bumped.



**The meter may be connected, selectively, to the modulator or to the final at the flick of the panel switch.**

### Choosing the Microphone

As originally built, the speech amplifier was intended to provide sufficient gain for a dynamic microphone, and a low-impedance microphone-to-grid transformer was incorporated. This transformer is shown in the photograph of the bottom

*(Continued on page 61)*

# Overall Carrier Shift and Modulation Monitor

HAL BUMBAUGH, W6HI*

MANY OTHERWISE EXCELLENT STATION MONITORS have a fundamental shortcoming. Their indications do not encompass the operation of the entire transmitter and the antenna. Many work through bridging or other amplifiers at some point in the circuit and are fully acceptable as far as they go, but something may happen beyond the point in the system at which they operate, and hence they fail actually to show what kind of a

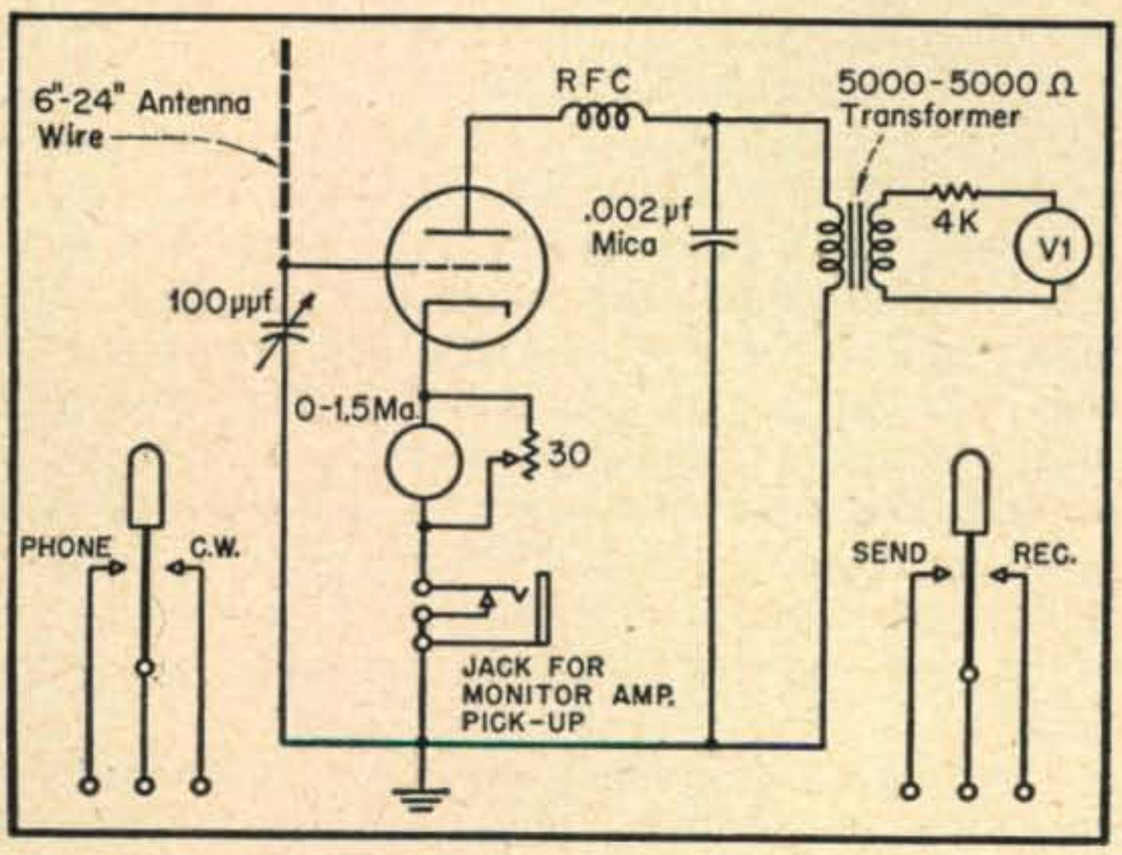



**Fig. 1. The circuit of the monitor.**

signal the fellow on the other end of the QSO is receiving.

In order to check what kind of signal your rig is putting on the air, it is necessary that the station monitor "sample" a part of the signal from the air just as the distant receiver does. For this reason, the monitor cannot have any direct connection with any part of the r.f. or a.f. sections of the transmitter. Since this is the case, the monitor must be entirely self-contained and use a foot or so of wire as a "sampling antenna" to provide enough energy from the station signal to operate the monitor. Such a monitor has been in use in the author's station for a number of years and has proven very satisfactory.

### The Circuit Arrangement

As may be seen from *Fig. 1*, the circuit is a very simple one and uses only one tube. Energy is collected by the short antenna and fed to the grid of the triode and to the variable bypass condenser $C_1$. In the cathode circuit are the carrier shift milliammeter and the monitoring input jack. No voltage is supplied the tube with the exception of the normal filament requirements. An r.f. choke and volume indicator transformer complete the plate circuit. The transformer is bypassed for r.f. by means of a 200-$\mu\mu$f mica condenser.

It will be noticed that the carrier shift milliammeter is shunted with a variable 30-ohm resistor. This resistor and the antenna shunting condenser $C_1$ are the only variable controls.

With the transmitter set for the desired percentage of modulation on voice, the monitor is heated up, and, while talking into the microphone in a normal manner, the shunting condenser is varied until the V.I. meter kicks to some wanted value —say mid-scale. If, with $C_1$ all the way open, not enough energy is received to give this meter reading, the antenna wire should be lengthened slightly. Conversely, if, with the condenser plates completely meshed, the meter reads too high, the antenna wire should be shortened slightly.

When the desired condition has been obtained, the carrier shift meter in the cathode circuit will probably read too high if the full 30 ohms is in the shunt circuit. To get some desired reading —again let us say mid-scale—when the carrier is on the air, it is only necessary to reduce the resistance in the shunt circuit until the meter reads at the desired point. In this way the two indications are related to each other, and this relationship will hold as long as neither the setting of the shunt pot nor the antenna bypass is changed.

(*Continued on page 66*)

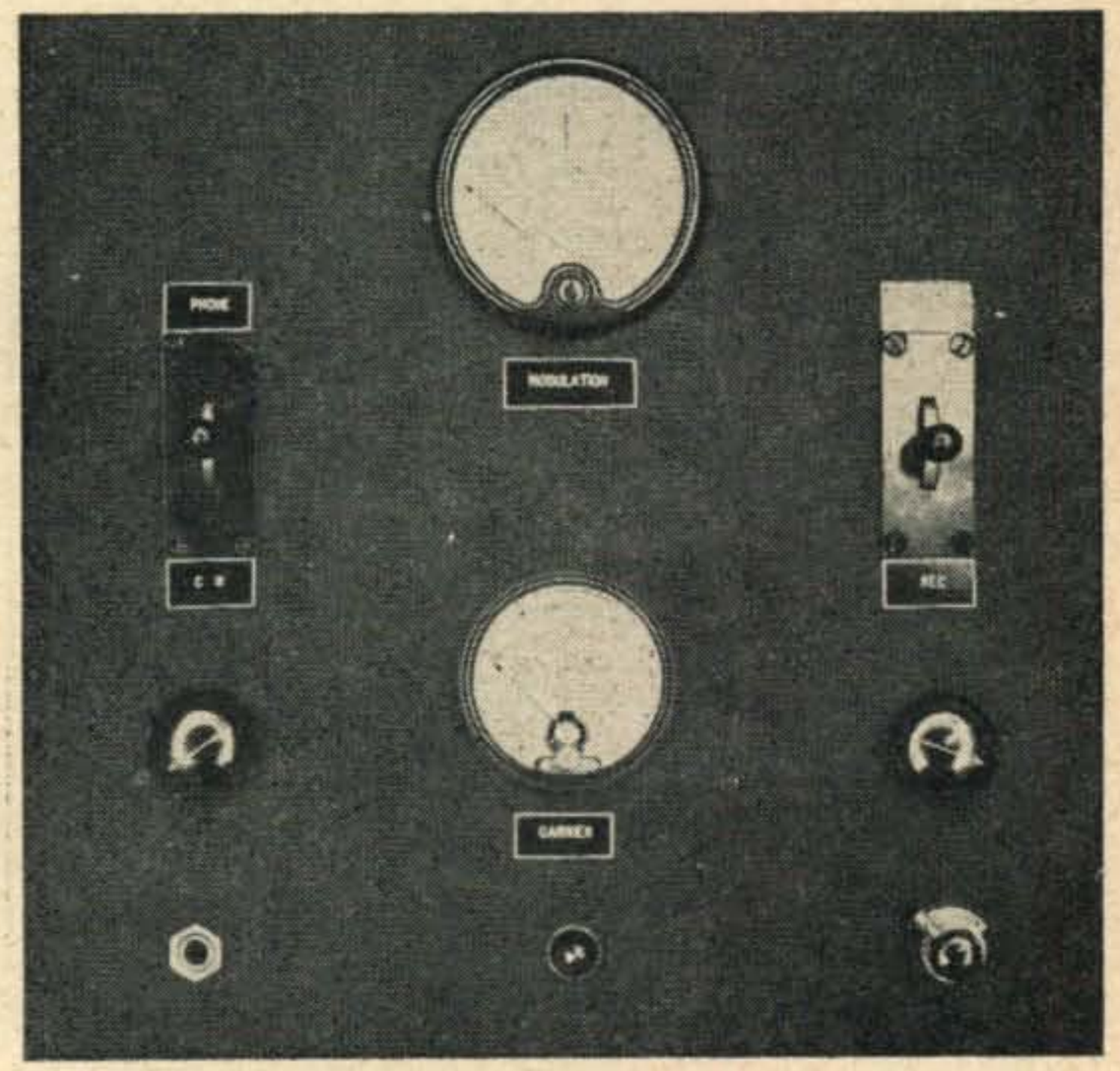



**Fig. 2. The panel arrangement is tailored for efficiency.**

* *H. L. Bumbaugh, 724 No. Crescent Hts. Blvd., Hollywood, 46, Calif.*

# Stabilizing the VFO

CLARENCE A. WEST, W2IYG*

***Hanging a good VFO onto the front end of a transmitter is not always the entire answer in the battle for a good signal. Here's a report on what one of the gang found out while cleaning up his rig. If you have a good VFO which doesn't seem to "make the grade" on the air, this is right down your alley.***

BECAUSE THE ABILITY TO CHANGE FREQUENCY in these days of congested amateur bands often makes the difference between making or not making contact, the use of VFOs has increased greatly. Along with their use has come also the ability to complete the QSO once contact has been established. Numerous VFO-Exciter construction articles have appeared, but little has been written concerning their installation and adjustment. This article deals with problems encountered and overcome when a VFO-Exciter, namely the BC-696, was installed at W2IYG. The problems included the difficulty of coupling the VFO-Exciter to the remotely operated transmitter, parasitic oscillations, poor note, frequency drift, and r.f. feedback.

### Coupling the VFO-Exciter to the Transmitter

Since the station is arranged in two units, master console and transmitter, the first problem was coupling the BC-696 to the main transmitter across the room. The original transmitter in use was a multistage job consisting of an 807 crystal oscillator, 828 buffer, and an 833A single-ended class C final amplifier running at 600 watts input. At first, a length of unshielded wire was used to couple the grid circuit of the 807 crystal oscillator in the transmitter to the antenna post of the BC-696 through a 0 to 100-μμf variable condenser. The crystal, of course, was removed and the stage operated as a buffer-doubler. The BC-696 antenna loading coil was then rotated for most efficient coupling. This method of coupling worked fine, except that the lead wire radiated a lot of energy. To keep the r.f. confined, coaxial mike cable with the outer shield grounded was tried. The required 20-foot length of cable proved unsatisfactory because the r.f. voltage at the grid of the 807 was not high enough. Link coupling was tried next. First the BC-696 antenna loading coil was disconnected from the small variable link which is located inside the tank coil of the 1625 stage. Next, the same coaxial cable used previously was connected to the variable link as shown in *Fig. 1*. The 807 stage in the transmitter was then provided with a tuned grid circuit and fixed link. The other end of the coaxial cable was connected to this link and the BC-696 and 807 stage were put into operation. The 807 performed well as a doubler, but when used as a buffer in the 3.5-to-4-mc band the stage burst into oscillation. Despite several attempts at shielding and rearrangement of the circuit components, the oscillations still persisted.

The stage was then converted for grounded-grid operation[1] as shown in *Fig. 1*. This conversion proved quite satisfactory when the stage was used as either a buffer or doubler. There was more than enough driving power at the cathode of the 807 at all times. The 807 stage is biased to the point where approximately 20-ma plate current flows under key-up conditions. The rest of the transmitter is biased to cutoff when no excitation is applied.

* *Tube Department, R.C.A., Harrison, N. J.*

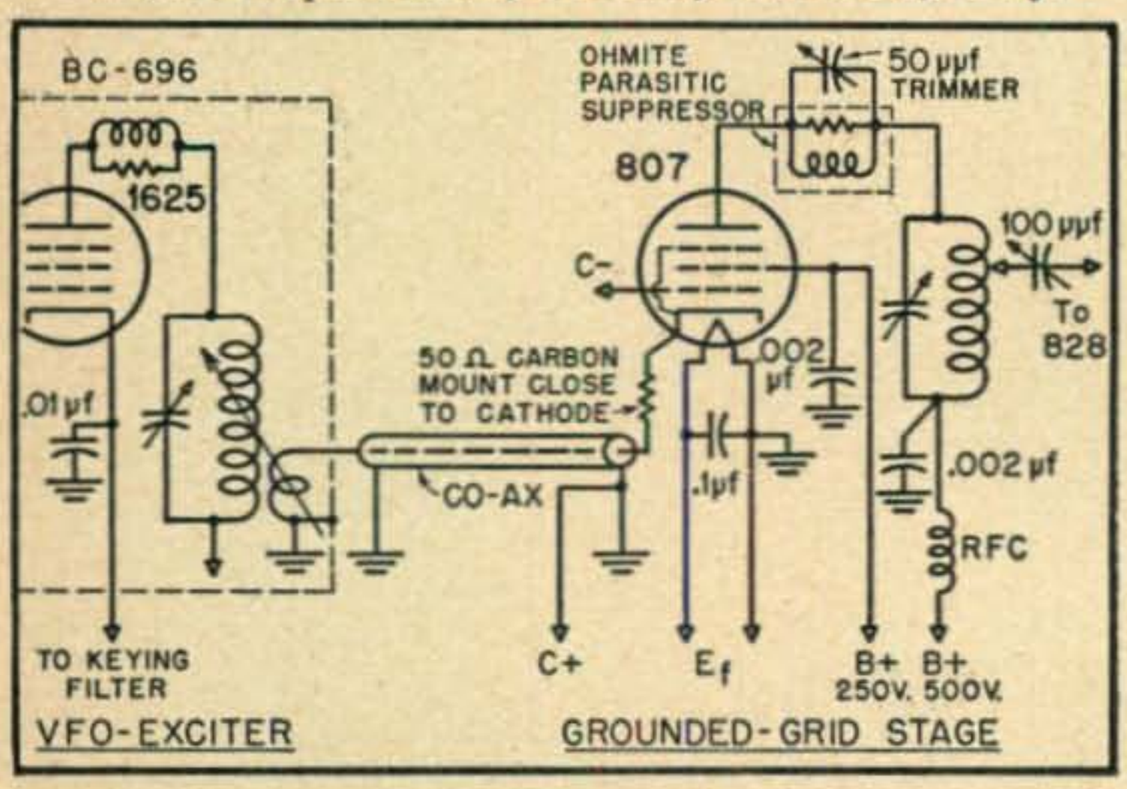



**Fig. 1. This method of coupling a BC-696 to an 807 amplifier solved a lot of the problems. The reduction of parasitics is discussed in the text.**

### Parasitics

Because the grounded-grid stage tended to become unstable at times, several tests were made to determine if parasitics were present.[2] When a neon lamp was held near the 807 plate lead, with the stage in operation, the lamp showed a bluish tint, thereby indicating the presence of high-frequency parasitics. As a further check, a wavemeter which tuned from 50 to 100 mc showed considerable output when brought near the 807. To eliminate these parasitics a 50-ohm resistor was placed in series with the cathode of the 807 and an Ohmite Parasitic Suppressor with a 50-μμf trimmer connected in parallel with it was installed at the plate cap of the tube.

The BC-696 was designed for use with d.c. on

[1] Eugene Black Jr., "Grounded-Grid VFO Coupling Amplifier," CQ, July 1948, p. 39; John Clemens, "E. C. O. Coupling Circuit," *Hints and Kinks*, Vol. 3, pp. 28-29.
[2] See *Radio Handbook* or *ARRL Handbook*.

the heaters, with one side of the heater supply connected to the chassis. When a.c. is used, however, this heater arrangement is unsatisfactory because some a.c. appears on the chassis. To correct this difficulty the heater circuits were rewired and the supply leads brought out to two separate pins on the power supply socket at the rear of the chassis. The heaters were wired for parallel operation to facilitate use of a 12.6-volt center-tapped transformer with the center-tap grounded. The use of a voltage-regulated power supply for the oscillator circuit, as explained later, also helped to improve the signal.

### Decreasing Frequency Drift

To reduce heating of the BC-696, one of the 1625s was removed from the circuit. This removal was practical because there was plenty of output from one tube to drive the 807 stage. It was desirable at this point to check the 1625 circuit for self-oscillation. A cathode resistor of approximately 500 ohms was installed in the cathode circuit of the 1625 stage and the 1626 oscillator tube was removed from its socket. Voltages were then applied and a listening check made with the receiver at various frequency settings of the BC-696 dial. There should be no output from the BC-696 if the 1625 stage is working properly. However, in my case there was a signal being generated by this stage. Trying first one tube, then the other, in each of the two sockets, I found an arrangement where there was no evidence of self-oscillation. The heater voltage on all tubes was reduced about 10% to further reduce heating of the unit in general. While on the heat-reduction project, it was decided to reduce the oscillator plate voltage. A pair of OC3s were installed in the 807 power supply which, by the way, was also used to supply the BC-696. Because voltages much below 210 volts on the plate of the 1626 oscillator tube caused a pronounced decrease in output from the BC-696, a plate voltage of 210 was used. Stations worked on c.w. and phone remarked on the good frequency stability. T9 and T9X reports were obtained on c.w. From a cold start the VFO drifts about 2 kc low. Two or three minutes after the heaters are energized the VFO frequency drift is negligible.

### Keying

Because frequency shift can occur with change in oscillator plate voltage, it was decided to key the cathode of the single 1625 and let the oscillator run continuously. The cathode of the 1625 was opened and keying leads installed. An r.f. bypass condenser of 0.01 μf was connected from the cathode of the 1625 to ground as shown in *Fig. 1*. Omission of the 0.01-μf condenser can result in a poor note from this stage. A listening check with the receiver when the BC-696 was keyed showed considerable clicks so a key-click filter was provided as shown in *Fig. 2*. Local stations later contacted reported that clicks and thumps were under control. The waveform, as checked with an oscilloscope, verified these reports.

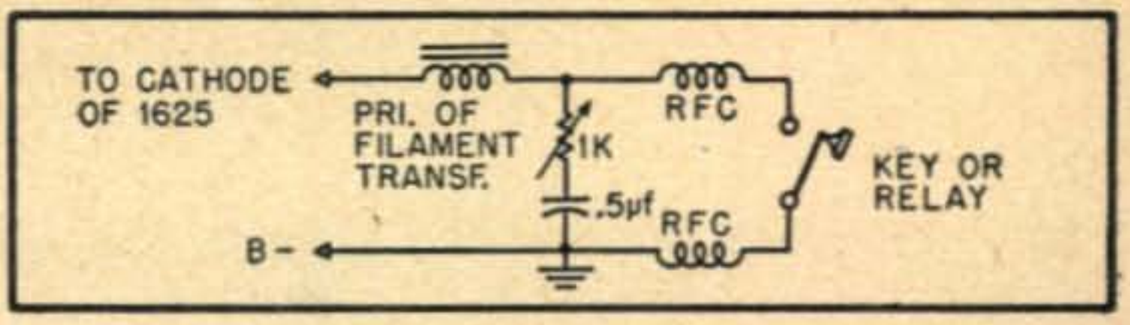



**Fig. 2. The key-click filter is a must in the average installation. The 1000-ohm variable resistor should be set to provide optimum keying in your setup.**

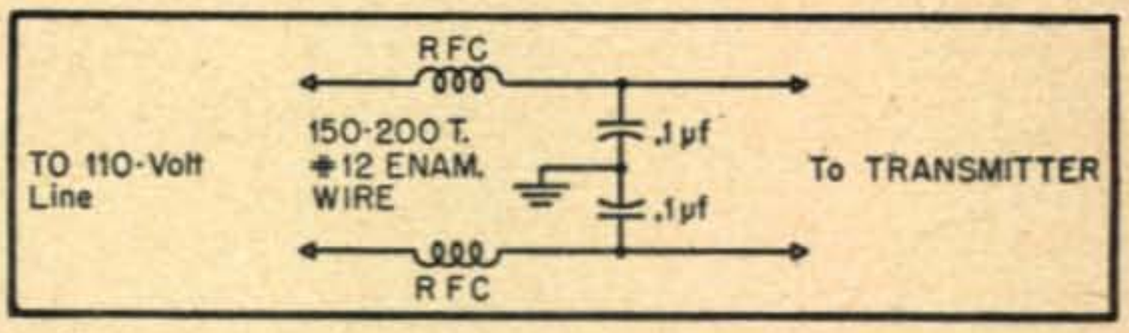



**Fig. 3. Line filters are often needed even when BCI and TVI are not problems. R.f. travelling through the power line can cause no end of mysterious effects.**

### R. F. Feedback

Up to this point good progress was being made. The BC-696 and 807 stage were put into operation and sounded T9 in the receiver. Palte voltage was removed from the 833-A final and the 828 buffer-doubler was then put into operation. Tune-up showed plenty of grid drive on the 833-A when operating on 14 mc with the 828 doubling from 7 to 14 mc. The 807 stage was doubling from 3.5 to 7 mc. Another listening check was made and the signal still sounded OK. The plate voltage was then applied to the 833-A and, with a 500-watt lamp used as a dummy load, the entire rig was placed in operation. The signal still sounded OK. A great feeling of satisfaction ensued since this was my first experience with remote VFO control.[3] Then, the 3-element rotary-beam antenna was coupled to the final and the key pressed. Brother! what a note. T3! At first I thought it was the receiver, but I soon learned that it wasn't. The entire transmitter was extremely unstable. Meter needles bounced nervously as tuning knobs were adjusted on the rig. Little did I know at this point about r.f. feedback, but I learned the hard way.

A considerable amount of oil was poured into the midnight lamp and the frantic search for articles on r.f. feedback had begun. After much digging and scraping for some dope on this problem, I became discouraged and decided to experiment. I had always suspected poor grounding so I started there. I had ground leads strung all over the shack, first grounding one thing then another, then tying them all together, etc. Believe me, I sweated. I talked to numerous amateurs in an attempt to get some more clues to work on. Ideas came thick and fast, but unfortunately very few helped. I finally found that a lead from the grounded side of the 110-volt line to the VFO

(*Continued on page 58*)

[3] *The arrangement at W21YG showed that the frequency of the VFO-Exciter could be varied up to ± 25 kc about the main transmitter tune-up frequency without changing transmitter output excessively.*

# One Solution

ROBERT M. RYAN, W7GWA*

(A knock at the door of the shack.)

"Come in."

"Are you George Dibble, the radio ham?"

"Ssshhhh. Just a minute. I'm copying c.w."

"Now don't give me no 'just a minute talk.' You're bustin' up my television program."

"Ssshhhh. Just a minute."

"Are you talkin' to somebody in code?"

"Just a minute, I'll be with you. This is an Australian I'm talking to. I'll sign off with him."

"You mean you're talking to a guy in Australia?"

"Yep. Hold it, while I sign with him."

"Gee, look at them lights blink when you send them dots and dashes."

"Just a minute, I'm signing off with him now."

"Is that him there again now, sendin' them dots and dashes?"

"Yeah."

"What's he sayin'?"

"He sent dit dit dit dah dit dah."

"What's that mean?"

"Means the end of transmission."

"You mean he's all through talkin' to you?"

"That's right. Now . . . what was it you wanted to see me about?"

"Well, we been havin' trouble with our television set, and my wife says that it only happens when you are out here in this radio room of yours, so she sent me over to talk to you. She wouldn't give me no peace until I said I'd come over and see you."

"I don't believe we've met before. My name's George Dibble."

"Glad to know you George. My name's Harry Watson."

"Like a drink, Harry?"

---

* *Pine Tree Trailer Park, Highway #35, Eatontown, N. J.*



"Don't mind if I do. Say, that's alright. Got a little refrigerator out here, eh. Woops. That's enough for me. Fill it up with water now."

"How's that?"

"Fine. Thanks."

"Now, about this television interference. How does your set act?"

"Well, it's really not as bad as my wife says it is. It's just on one channel that we have any trouble. Kind of flickering at times. Say, this drink is all right."

"Let me freshen it a bit for you, Harry."

"Woops. That's enough. Fine. Thanks."

"So your set flickers on one channel when I'm on the air, eh? Well, that shouldn't be hard to fix."

"You mean, there's something you can do to eliminate the trouble right in the set?"

"Oh, sure. Tell you what. I'm going downtown tomorrow, and I'll pick up some parts, and tomorrow night I'll come over and straighten out your trouble. Say . . . better let me mix you another drink."

"Well, now I guess I could stand a little one. Woops, that's plenty. Thanks."

"What channel is it that I seem to bother?"

"Come to think of it, it's channel four. I hardly ever watch the picture on that channel anyway. My wife turns it on to see a program that I hate. Some home economist is on there with recipes for braised moose jowels, and new kinds of desserts that you can make with Smith Brothers Cough drops . . . The more I think of it, the more I think you might be doing me a service by bustin' up that channel."

"Better let me fix you another short one."

"Thanksh. George, why donsha forget thish whole thing. I'll tell the old lady that the noish

(*Continued on page 58*)

# IN THE PUBLIC EYE

*(from page 15)*

Fifteen "check points" were set up along the course, in great secrecy, and the exact time at which each rider passed each check point was carefully noted by officials of the motorcycle club. It worked this way, roughly: each cyclist left the starting point, in Yonkers, N.Y., with 1000 "points" to his credit. As he passed each check point a number of points equal to the number of minutes he was "early" or "late" (computed from the proscribed miles-per-hour and his exact starting time) was subtracted from

**W2BFD spent many busy hours operating his teleprinter installation at the message center. Almost everything was put on tape before transmission in order to ensure "perfect copy" at the receiving point.**

his 1000 points. After each cyclist had passed the finish line, in historic Yorktown Heights, the points remaining to him were added up and thus the rider with the highest point score was adjudged the winner. Members of the Westchester Amateur Radio Association, stationed with portables and mobiles at each of the check points transmitted the officials' notes to the finish line where a running record of each rider's accuracy was kept. In many past races it took as long as a week to compile the final result. But this year, at last, the identity of the winner was known shortly after the last rider crossed the finish line. This was due entirely to the speed and accuracy of the members of the Westchester Amateur Radio Association. The identity of each of the operators, and the band-mode of each operation can be seen on the accompanying operational map. A high point of the operation was the precision with which the results appeared at the finish line on a 144-mc radioteletype circuit,

**The man with the topcoat is Nils, W2LSD. The others are a motorcyclist (obviously) and checkers representing the motorcycle club. This shot was made at check point nr. 5.**

manned by W2QGH and W2BFD, from the net control station, W2EQD/2, which had been set up on a nearby hill.

The entire affair ran from about 10 A.M. to 5 P.M., but this was easily handled, since the nature of the race was such that each of the check points was "in service" for less than three hours. At the Net Control Station things were more rugged because the operators were on duty all day, but there were enough of the WARA on hand to provide relief for eats and exercise.

It is interesting to note that there were no failures of equipment to mar the success of the operation—this largely due to the great stress which the WARA places on the possession of dependable emergency equipment. Everyone who took part *knew* that his gear was reliable because he had tested and used it many times before. There is no substitute for experience.

Looking for "something new" in ham radio? Ask any of the WARA gang—they thrive on new angles!


**J. C. Ward operating W2ITX/2 in the back of his station wagon had a mighty potent signal. J.C.'s operating was up to his usual standards—among the best on the air.**

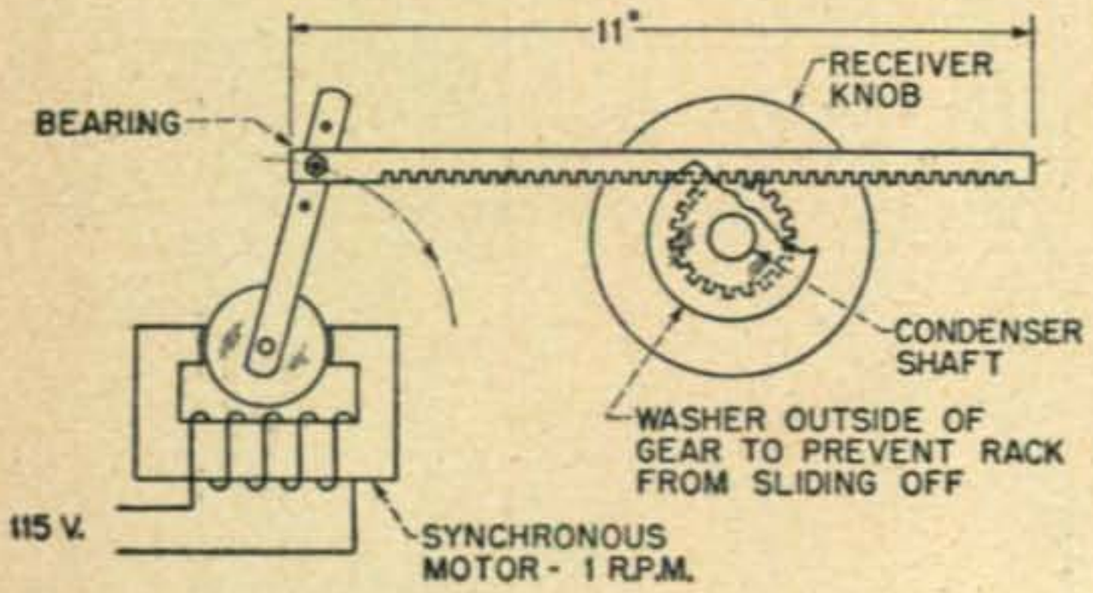
# *Inside the* SHACK AND WORKSHOP

Many of the most important developments in the communications field originated as "gadgets" in a ham's station. For this reason we regard this department, a running record of the developments of the experimenters in our ranks, as a most important feature of your CQ. When you work up something which you feel will be of general interest to the gang, make a couple of sketches and send them with a brief description to this department. If our S&W editor feels that it's hot stuff, you'll receive a check for two dollars to add to your lab fund. You all know, from reading S&W in the past, the sort of thing we like to include, so dig out that pencil and start making money. Don't worry about making it fancy—our S&W crew will do it.

### Automatic Sweeping Receiver Control

In order to catch some of the DX openings on 6 meters and still not have to spend fruitless hours tuning the band, I have been using the following mechanical sweep with great success. It is based upon the time-honored rack and pinion. Coupled to the shaft of a 6 meter bandspread tuning condenser is a small gear having an outside diameter of about one inch. Laying on top of this gear is a toothed rack, one end of it being loosely bolted to a small metal arm about four inches long. The other end of this short arm is coupled to the end of the shaft of a synchronous 1 r.p.m. motor (Teletron—from a sign clock). As the motor shaft rotates it swings the short arm through an arc and draws the toothed rack back and forth through the gear setting it in motion. The shaft oscillates and reverses itself every 30 seconds. The value of the tuning condenser is such that the ends of the sweep are 300 kilocycles apart. The sweep starts just outside the low edge of 50 mc and moves on up to about 50.3 mc. If the junction between the short arm and the toothed rack are varied, you will have some control over the sweep speed.

*C. G. Hoffman, W9ZHL*

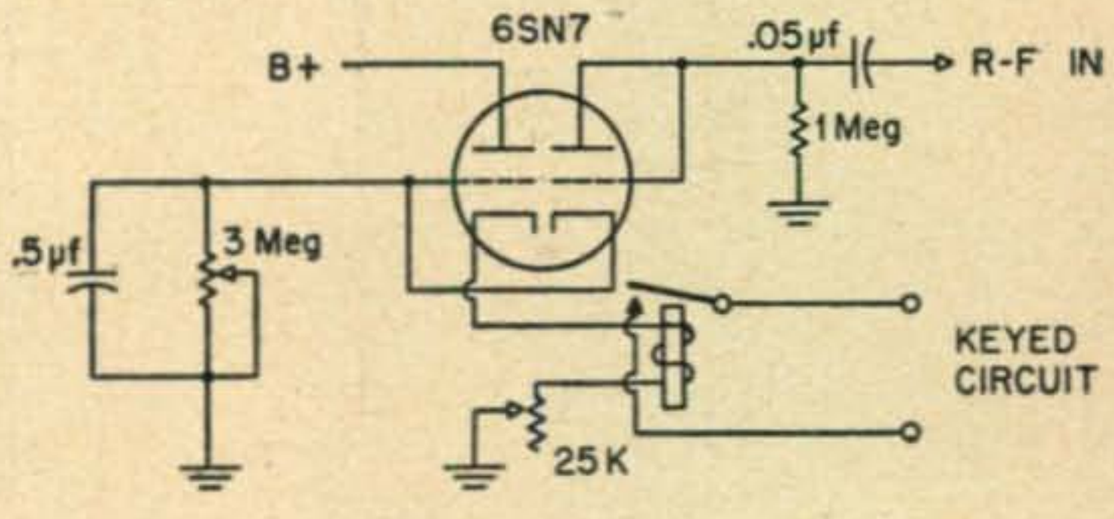



### Key-Controlled Transmitter

This circuit was originally a voice control relay which we have adapted for c.w. use. The circuit will instantly turn on the final plate voltage whenever the key is depressed. Raising or releasing the key will shut off the plate voltage in a pre-determined interval governed by the time constant of *R1* and *C1*. This relieves the operator of switch throwing and offers instantaneous break-in.

The r.f. voltage must be taken from a tank coil in the keyed stage. The rectified voltage will then flow through *R1* producing a positive voltage on the grid of the 6SN7 triode connected section. This will charge *C1* and at the same time cause sufficient current to flow through the associate cathode section to close relay *RY*. When the key is released the r.f. will be cut off and the condenser *C1* will then discharge, holding the grid positive. The period that the grid is held positive will depend on the RC values and in this circuit it is of the order of 3 seconds.

The potentiometer *R2* varies the cathode bias on the 6SN7 and will control the sensitivity of the

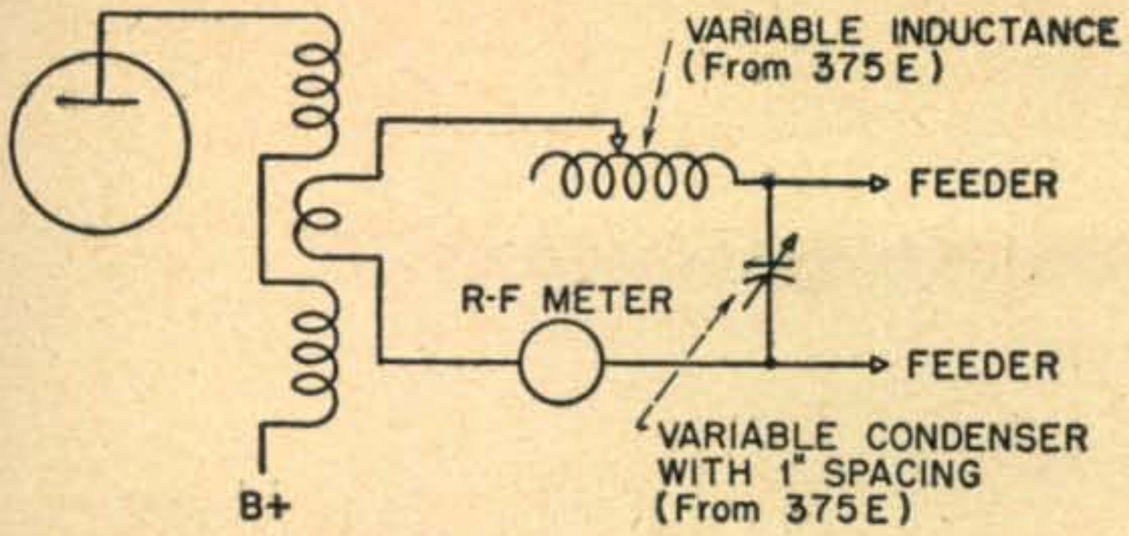



circuit. The relay used here came from the squelch circuit of a surplus SCR-522. The contacts are connected to the stage or stages that need to be further controlled.

*A. C. Morse, Jr., WØGCP*

### Antenna Tuner from BC-375E

An exceedingly versatile antenna tuning network may be constructed by using a couple of the components from a defunct BC-375E or its associated antenna tuner. The arrangement shown has been used at W8YPG to couple the final to a half-

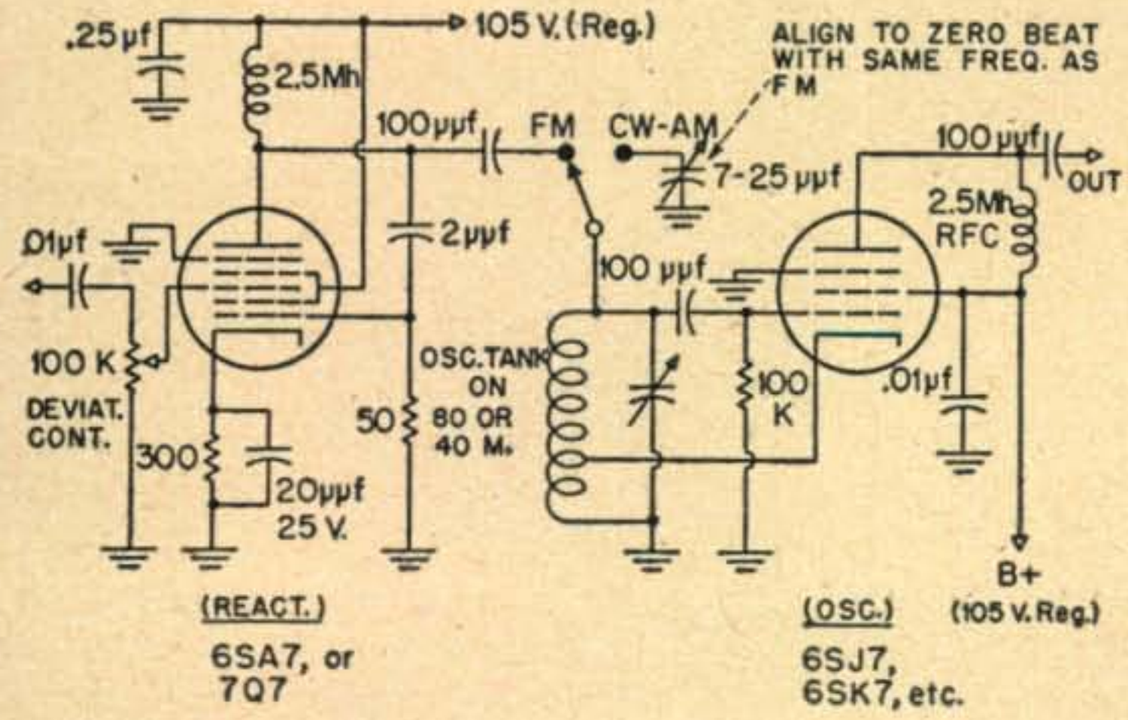



wave center fed antenna using 600-ohm feeders. The antenna has been used on 80, 40 and 20 meters with equally good results and can handle 250 watts with ease. There are no coils to change and by varying the L/C ratio the tuner will load up a piece of wire and possibly even the kitchen sink!

*R. J. Rodenbo, W8YPG*

### Spot Frequency CW-AM-NBFM

This is a circuit I have been using for quite some time. While the values may not be optimum, they will give NBFM that is pretty hard to beat.




The one thing that needs to be stressed is that with this circuit you can switch from NBFM to cw and AM without shifting frequency. In most reactance tube circuits the oscillator is loaded down with a little extra capacity, and switching from NBFM to cw results in a small frequency shift.

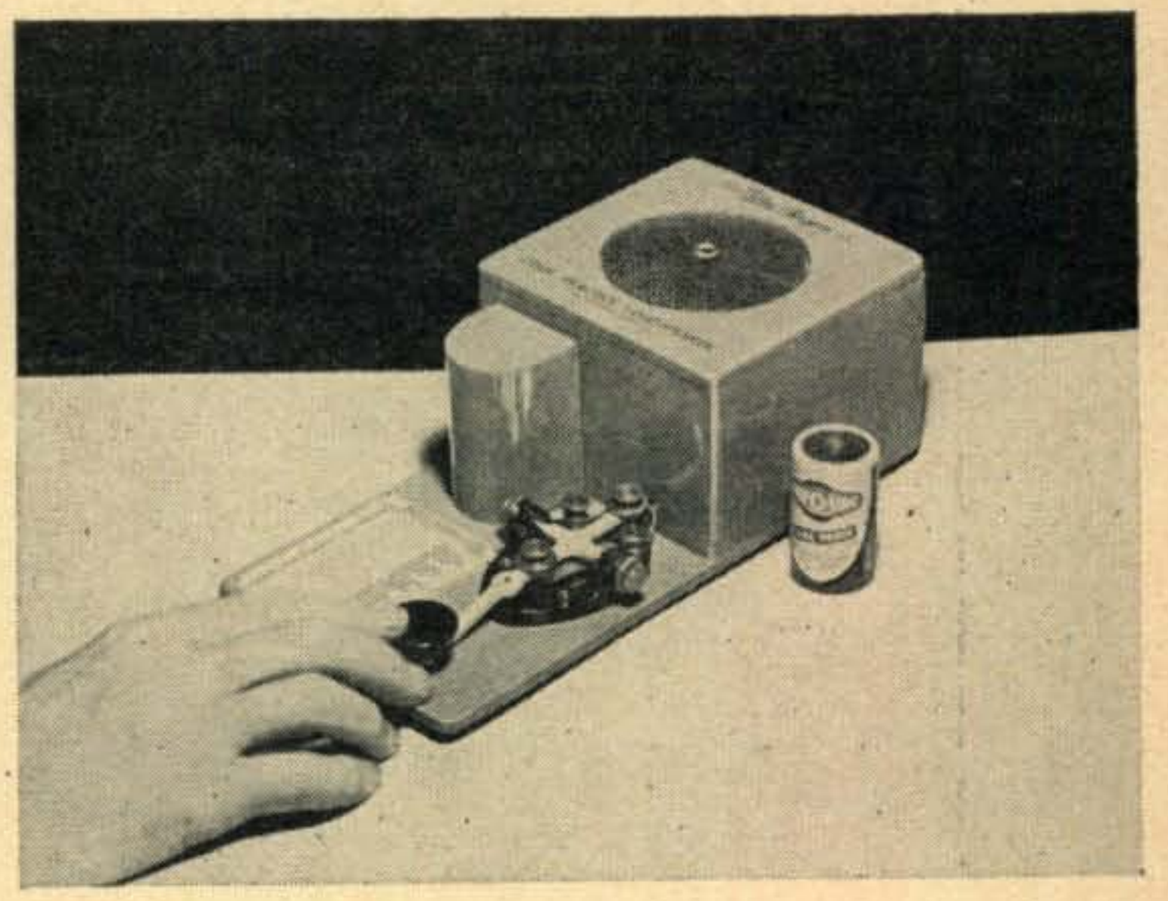
The circuit is straightforward with the exception of two items. The grid resistor on the reactance tube is supposed to be 50-ohms and the condenser 2 $\mu\mu$f. The toggle switch or spdt relay serves to disconnect the output of the reactance tube and in its place substitute a low capacity value pre-set by the 25 $\mu\mu$f APC condenser. You will want to get this condenser as close to the oscillator tank coil as possible to keep the v.f.o. electrically and mechanically stable. When setting up, zero beat the oscillator signal on your receiver with the NBFM switched in the circuit. Then throw the toggle switch to cw and bring the oscillator back to the NBFM frequency by adjusting the APC padder.

*George Willis, W6OKR*

# NEW PRODUCTS

### Code Practice Set

The Martin Manufacturing Company, 194 Gelston Ave., Brooklyn 9, N. Y., announces the availability of something really unusual in a code practice set for the aspiring neophyte. They call it the "Duplex Practicode," and its main feature of merit is that it sounds like a v.t. oscillator without the use of tubes. A 4-inch PM speaker is the radiating element. Martin invites inquiries from all interested parties.



### The Ultimate in Selectivity

National's new SELECTO-O-JECT, with its boost or rejection, up to 38 db, of any frequency between 80 and 9,000 c.p.s., appears to us to be one of the neatest little boxes to have come along in many a year. One of these hung onto the output end of your receiver can make all the difference between R0 and R5 when you're trying to pull a weak one through the mess. On phone the gadget is pretty good, enabling you to reject any single heterodyne which might trouble you, but c.w. is where she shines, enabling the operator to boost any desired signal by the terrific amount of 30 db. The price, $24.95, seems to allow National an awfully slim margin of profit, but their loss is our gain. Try it for a new thrill in ham radio.

# The 6-Meter Observing Project

O. P. FERRELL, Project Supervisor*

*(This work is supported in part by Contract No. AF19(122)-72 and modifications with the U. S. Air Force, through the sponsorship of the Geophysical Research Directorate, Air Materiel Command.)*

Total Number of Work Group Members:
North America ..... 326
Oceania ..... 1
South America ..... 9
Total Number of Screened Observations
5783 (1/1/49–5/19/49)
Total Number of Reports Received .... 1278
Number of Observers Inactivated ..... 19
New Observers: CE1AH, LU9EV, LU9MA, PY1FN, PY2QK, VE3RM, W1ZE, W1FZ, W2KDB, W3QFL, W5IOW, W5KCP, W5KTY, W5LEI, W5LFQ, W6AWY, W6BWG, W6HEK, W6BJI, W7LYA. W8CEQ, W8EAG, W9JBF, W9JMS, WØOUE, WØYKX, XE1PA, Fogg, Sellers, Stapf.

### Project Participation

We are very glad to welcome the group of new observers into the 50-mc Project. Response to our various announcements to ham gatherings and to individual 6-meter operators as well as SWLs has been exceptionally encouraging. In this line, we would like to impress again upon our readers the fact that your SWL friends who are VHF-minded may serve in the 50-mc Observing Project. They may obtain information by applying to this office at the address given below.

The month of December saw considerable missionary work with regard to the 6-meter project in various countries in South America and Africa. A number of stations in "new" countries are being urged to get on the air. Our friends in New Zealand and Australia where the 6-meter band has always been extremely popular were undoubtedly influenced by the splurge of rare DX during November, 1949. Many expressions of interest and cooperation have been received, and it is envisioned that numerous tests and DX schedules will be established for the coming spring months. Sunspot conditions which continue a very unusual and very unstable pattern will undoubtedly permit considerable DX to be worked if many of the new fellows are on the air at the proper times.

It is hoped that by the Spring several DX schedules between North and South America, Africa and North America, and Australasia will be established. Activity is planned for the west coast of Africa, and for the northeastern coast of South America. These two areas appear to be in ideal geographic spots for Spring inter-continental six-meter DX.

### Contest

As we mentioned in this column last month, every effort must be made in the 50-mc Project to reduce the incidence of observational bias. Basically, our reports are utilized to determine the prevalence of sporadic-E at any given interval. Although spatial findings are limited by geography, it has become increasingly valuable to ascertain whether or not the temporal findings are influenced to any great extent by insufficient activity at the most opportune times. There is some evidence that lack of activity may constitute a greater influence in this project than had been anticipated. This is especially true of long-range paths between North and South America which opened frequently during the past fall in the mid-morning hours. To some degree the operation of automatic beacon transmitters will alleviate any inaccuracies in the temporal findings of our reports.

On November 27, W8NQD reports hearing the beacon operated by VE1QZ as the only signal on the band. This was undoubtedly a short burst of sporadic-E. On December 14, W7QLZ heard VE1QZ's beacon at 1330 EST. This particular instance was probably F-2 layer transmsision. What is desired, however, is to take a certain period or group of periods during the principal sporadic-E season and attempt to foster as much activity as possible. An incentive here would most likely be a contest limited to 6-meter operation. Considerable thought is being given not only to the method of scoring for this contest, but to ways of analyzing the scoring sheets in such a manner as to weigh them against a "normal" sporadic-E opening. In all probability, this contest will take place over two consecutive weekends—the latter part of May and/or the first part of June. At the present time the scoring is most likely to be based upon mileage with multipliers based upon activity. Hence, the W9s or WØs have the opportunity to work into the denser activity areas in the east, south, and west, while in contrast, the W1s could only work to their south and west.

The contest will not be limited to just RASO members, although the high scoring RASO triumvirate will be given special awards. Awards will also be made to the high scoring 6-meter stations who are not RASO Project members. Further details will be published in the monthly Newsletters as issued from the RASO office, and the principal rules will be printed in this column.

* *c/o Radio Magazines Inc., 121 South Broad St., Philadelphia 7, Pa.*

# The Monitoring Post

**gleaned by THE BRASSPOUNDER***

THE OLD, OLD TIMERS CLUB, whose members date back forty years in amateur wireless, will come up with a volume dedicated to ham radio in which many interesting developments and accounts of individuals will be set down as permanent records; each member is invited to contribute his share of material and send it to **W1NQ**. sec. —this should be a highly interesting book. . . . The traffic net on 7200 kc at 0130 EST daily will continue to operate though NCS **W4PL** has been advised by his doctor to QRT and spend the winter in Florida; W7CZY, W6CE, W6IOX, W1AW, W2BO, W9SUF, and many others will keep pushing traffic to any spot in the country and all U.S. possessions, having skeds with Guam, Hawaii, and other Pacific islands—W4PL is expected to be heard again in the spring. . . . **W2LYH** now has a band-switching final that causes no TVI. . . . After thirty years on the air **VE3GG** got a SX42 for himself, the first commercial receiver he's ever had. . . . The Greenlee County Boys, Morenci, Ariz., offer as prizes, sent postpaid, a pair of "Arizona Thunder Birds" or "Porcupine Aigs" to all hams able to contact the four active phone hams in their county; they are: **W7TZW, NTS, LED,** and **LZT.**

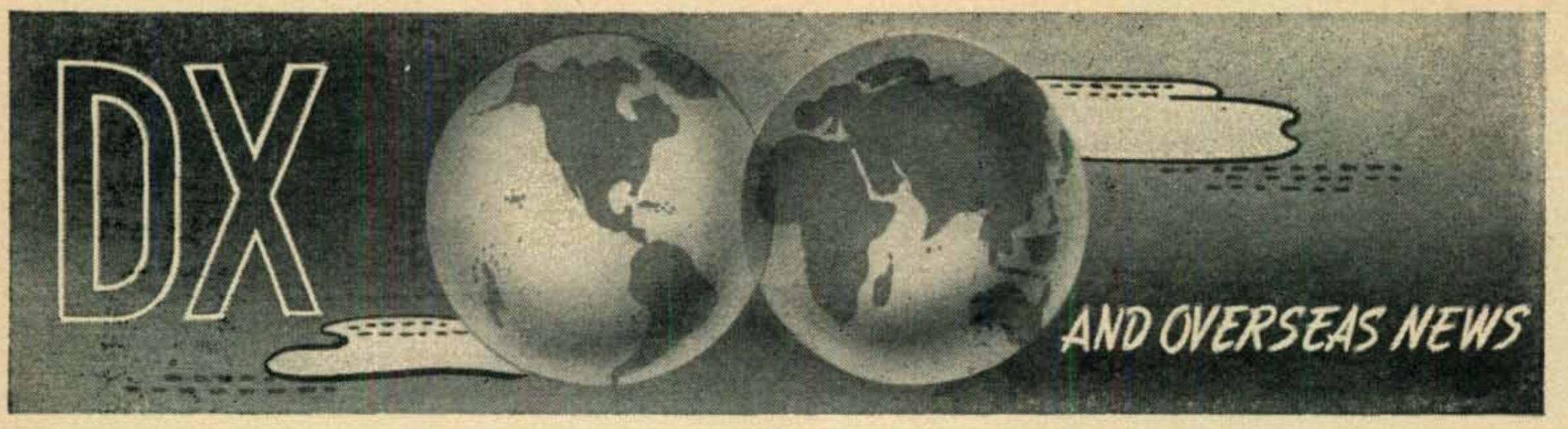
About 275 miles from Goose Bay, Labrador, in northern Quebec, and on the George River, **VE2PB** is at a weather observation post—he's heard on 7 mc and will be there until May. . . . **W1KYG** don't like beam tubes and is converting to PP 810s. . . . **W3NNW** is finally going to give c.w. a try and has a half kw perking. . . . **W2CGG** QRT suddenly one morning when his heart slowed down and will have to remain in bed indefinitely—this old traffic hound rates some traffic addressed to him wishing him well. . . . When **VE3BIG** was told of the images in her receiver she had her informant stand by for five minutes while she looked for them, but nary an image could she see.

The Hill-Top ARC at Worcester, Mass., **W1SAG,** recently sponsored exams for ham tickets with 17 applicants going through the routine under the watchful eyes of W. J. Butterworth, FCC inspector; Hill-Top was organized by its first president, **W1EJD,** a year and a half ago—his son was one of the applicants; the club holds classes three nights a week, code and theory, at no cost to students, and great progress is reported though no dues are paid by its members. . . . Try your Morse on **W4NLH**—he's been at it since 1906, and though he suffered the loss of his left hand, he went to sea in '37 on a tanker; in the Merchant Marine during the war he touched Italy, Canal Zone, Pearl Harbor, Okinawa, Japan, and Manila; now, in the Virginia woods, his gear is home built and runs off a 1,500-watt power plant. . . . All you Broadcast station fellows are invited to join the BC Net every Saturday at 0200 EST to meet other BC workers; among those heard are **W9NN** of WGN; **W2WOE** and **W2UXU** of WJJL; **W9EAM** of WGIL; **W8NXN** of WTOD, and **W2BO** of WMGM. . . . **W7GV,** Arizona's first ham, passed away on Dec. 3; his QSO with the USN Dirigible Shenandoah guided its crew, lost over the mountains near Bisbee, Ariz., to the Mexican border; another first or W7GV was his QSOs with a Calif. station from the 400-foot level of a mine, disproving that transmission from underground was impossible. . . .

**G5LK** says radio is a fine hobby, especially for a fellow, like him, who is blind. . . . **W2BY** had a swell trip to the West Coast and worked portable all the way. . . . **W8ASX** gives us the info that Grand Rapids ARA's mid-winter hamfest will be held at the Rowe Hotel, Grand Rapids, Mich., at 2000, on Feb. 25—advance tickets, 50 cents; at the door, 75 cents; write GRARA, P. O. Box 333; its annual election came up with W8AXP , pres.; COF, v-p.; ASX, sec.; IV, treas.; and YDJ and DLZ on activities committees. . . . Thanksgiving Day brought a new call to **W5QVV,** Medicine Park, Okla. . . . Not to be outdone, the stork visited **W5PML** and xyl on Turkey Day, bringing a daughter, Cathy Lynn. . . . **W9MRK** is a newsreel cameraman on TV for a Windy City station. . . . **W8NXN** uses a 14 mc folded dipole on all bands and does well on 3.5 mc.

**The fifth semi-annual dinner meeting of the Quarter Century Wireless Association, held in Fraunces Tavern, New York, on December 18th, drew a record turnout of more than 100 old timers. This picture (taken by W2DJJ) of a group at the speakers' table shows Dr. A. L. Walsh, W2BW, extreme left, John DiBlasi, W2FX, standing, president of the association, Arthur Batcheller, of the FCC, and S. Young White, at the mike.**

** Address correspondence to: The Brasspounder, c/o CQ Magazine, 342 Madison Ave., N. Y. 17, N. Y.*




Conducted by HERB BECKER, W6QD*

SEVENTEEN DX MEN HIT PAY DIRT THIS MONTH in achieving WAZ. It looks as though gold has really been discovered, and I guess C8FP was the nugget for quite a few of the boys.

I would like to extend sincere congratulations to the following DX men in accomplishing their WAZ.

| | | | |
|---|---|---|---|
| 160 | ZS6CT | Hugh W. Green | 40–113 |
| 161 | W9NDA | Paul L. Edwards | 40–194 |
| 162 | G3BI | George H. Williams | 40–144 |
| 163 | G2FSR | John A. Hunt | 40–196 |
| 164 | W6PDB | Kenneth Moore | 40–161 |
| 165 | OK1SV | Vladimir Srdinko | 40–151 |
| 166 | W7ASG | Joe Vogt | 40–125 |
| 167 | G4CP | C. R. Perks | 40–195 |
| 168 | VE6GD | James Smalley, Jr. | 40–146 |
| 169 | VE7VO | Ted Fowler | 40–162 |
| 170 | VE7GI | Frank Taylor | 40–165 |
| 171 | W6EYR | Everett E. Bryant | 40–150 |
| 172 | WØSQO | Kenneth L. Klippel | 40–171 |
| 173 | PY1DH | Edward C. B. Knapp | 40–201 |
| 174 | PY1AHL | Georges Ligneul | 40–171 |
| 175 | W6VE | Dewey M. Beraldo | 40–170 |
| 176 | W1FH | Charles Mellen | 40–234 |

By looking over the above, you can see that they are pretty well scattered throughout the globe. Naurally, none of these need any introduction to you, and each has his own little story to tell on who was the hold-out zone needed to complete his WAZ. Nice going fellows, and let's hear from you often.

### WAZ HONOR ROLL

To enter the Honor Roll, fill out one of the Zone and Country List forms which we will supply on request. Please send a stamped, self-addressed envelope.

The Honor Roll contains totals of postwar contacts only, that is, contacts made since November 15, 1945.

It is not necessary to submit combinations until you are eligible for a WAZ certificate. To be awarded a WAZ certificate, send confirmations for the 40 zones, as well as a list of them, direct to the DX Editor. If a Country List has not been previously submitted, then one must accompany the WAZ certificate application. For these lists, please use one of our standard Zone and Country List forms, and it will then become our permanent record.

The Honor Roll is in two divisions; the c.w.-phone section, which gives the current total of zones and countries any station has worked while using c.w. or phone, or both; the other section contains a list of "phone only" stations. All contacts claimed in this section must be on a "phone-to-phone" basis.

All-time WAZ certificates will be issued upon preesntation of proper confirmation. The Certificate will be similar to the postwar certificate, although no listings of all-time WAZ certificate holders is anticipated at this time.

### Editorial

Hey, gang, have pity on the poor old DX Ed. Every once in a while, I get a letter panning me for what someone thinks is an error in the DX column. Sometimes we print a QTH, and the DX station writes in and says, "Taint so!" Now and then, something is reported in the column and someone writes in to say, "You're all wet! It should have been this way." I don't mind getting panned. . . . I can take it as well as anyone, and for that matter, maybe better than some. But, remember this. . . . The stuff you fellows send in is what goes in the column. If a bum QTH is listed, it came from one of you. If a certain DX station is reported as doing so and so, and if I think it is interesting, it gets printed. If it's wrong . . . I am the fall guy.

Most of you realize that I cannot possibly check the authenticity of everything reported to me, and I won't take the responsibility of saying it is correct. By and large, there isn't much of this sort of goings on, but mistakes do happen once in a while. There would never be a DX column if we had to check every item.

No doubt, some of you fellows wonder why replies are not forthcoming on some of the queries you send in. For example, every month I get requests to send certain QTHs to some of you. In many instances this is done, whereas, many times, it is not done. It is impossible for me or any of the committee to spend much time running down QTHs and send them in the nature of a personal reply. Many times the information re-

** Send all contributions to Herb Becker, 1406 South Grand Ave., Los Angeles 15, Calif.*

# W. A. Z. HONOR ROLL

## CW & PHONE — WAZ

| | |
|---|---|
| W1FH | 234 |
| W6VFR | 231 |
| W2BXA | 226 |
| W6EBG | 225 |
| W3BES | 224 |
| W6ENV | 224 |
| W6GRL | 223 |
| W6MEK | 222 |
| W3GHD | 221 |
| W6ADP | 221 |
| W8BHW | 218 |
| W3LOE | 217 |
| G2PL | 216 |
| W6PFD | 216 |
| WØYXO | 215 |
| W6SN | 214 |
| W6ITA | 214 |
| G6ZO | 214 |
| VK3BZ | 212 |
| W6SAI | 210 |
| W6FSJ | 210 |
| W2AQW | 208 |
| W8HGW | 208 |
| W6MX | 207 |
| VE7ZM | 206 |
| W4BPD | 206 |
| W6DI | 204 |
| W6MJB | 204 |
| W6TT | 204 |
| W9VW | 204 |
| W4CYU | 203 |
| W3EVW | 203 |
| W6SYG | 203 |
| W6RM | 202 |
| W7GUI | 202 |
| W6SC | 202 |
| W6OMC | 202 |
| W6PKO | 202 |
| W7AMX | 201 |
| PY1DH | 201 |
| W6DZZ | 200 |
| W6MVQ | 200 |
| W6OEG | 200 |
| W9KOK | 200 |
| ZL2GX | 200 |
| ZL1HY | 199 |
| W2IOP | 197 |
| PY1AJ | 196 |
| W6WB | 196 |
| G2FSR | 196 |
| W6AM | 195 |
| LU6DJX | 195 |
| W6NNV | 195 |
| VE7HC | 195 |
| G4CP | 195 |
| W9NDA | 194 |
| VE4RO | 194 |
| W6GAL | 193 |
| W6AVM | 192 |
| W6HX | 192 |
| W6ZCY | 191 |
| W5KC | 191 |
| ZS2X | 191 |
| VK2DI | 191 |
| W6PQT | 191 |
| W6RW | 190 |
| VK3JE | 189 |
| W6RBQ | 188 |
| WØNTA | 188 |
| W6AMA | 186 |
| CE3AG | 186 |
| W2CZO | 185 |
| W6PB | 185 |
| W6SA | 184 |
| W6UCX | 184 |
| W6AOA | 181 |
| W6KRI | 181 |
| W6SRU | 181 |
| VK2ACX | 180 |
| W6EFM | 180 |
| W6DLY | 179 |
| W6TI | 178 |
| W7DL | 177 |
| WØUOX | 177 |
| W6IFW | 177 |
| CX1FY | 176 |
| W6IBD | 176 |
| W1AB | 175 |
| G3DO | 175 |
| W8SDR | 175 |
| W6WKU | 174 |
| W6CIS | 174 |
| W6TS | 174 |
| W7FZA | 174 |
| W6PCS | 174 |
| W6TZD | 173 |
| W6UZX | 173 |
| G5YV | 172 |
| OK1LM | 172 |
| W6SRF | 171 |
| LA7Y | 171 |
| WØSQO | 171 |
| PY1AHL | 171 |
| W6BAM | 170 |
| W6VE | 170 |
| W6PZ | 169 |
| VK4HR | 169 |
| KH6BA | 169 |
| W5AFX | 169 |
| ON4JW | 169 |
| W6JZP | 168 |
| W6RLN | 168 |
| W6ANN | 167 |
| W6GDJ | 167 |
| W6UHA | 167 |
| VK3CN | 167 |
| W6EPZ | 166 |
| W6DUC | 166 |
| KH6MI | 166 |
| VE7GI | 165 |
| W6EAK | 163 |
| W6YZU | 163 |
| VE7VO | 162 |
| W6KUT | 161 |
| KH6IJ | 161 |
| W6PDB | 161 |
| W6PUY | 160 |
| W6BVM | 159 |
| W6CYI | 157 |
| W7BD | 157 |
| W7BE | 156 |
| W6BAX | 155 |
| W6PH | 155 |
| G3AAM | 154 |
| I1IR | 153 |
| W6KEV | 153 |
| OK1HI | 153 |
| W6LN | 153 |
| W6BPD | 152 |
| WØOUH | 152 |
| VK2QL | 151 |
| OK1SV | 151 |
| W6LRU | 150 |
| W6LEE | 150 |
| W6FHE | 150 |
| W6EYR | 150 |
| OK1FF | 148 |
| OK1CX | 147 |
| W7DXZ | 146 |
| W6AYZ | 146 |
| VE6GD | 146 |
| W9NRB | 145 |
| W6MUC | 145 |
| W6QD | 145 |
| W6WWQ | 145 |
| W6LER | 145 |
| ON4TA | 144 |
| W6LDD | 144 |
| G3BI | 144 |
| JA2KG | 143 |
| W6CEM | 136 |
| W6RLQ | 134 |
| G3AZ | 133 |
| W6TEU | 133 |
| W6RDR | 133 |
| W6MHB | 130 |
| W7GBW | 127 |
| G8IP | 127 |
| G5BJ | 126 |
| W7ASG | 125 |
| PK6HA | 124 |
| W6NRQ | 123 |
| W6MLY | 123 |
| W6BIL | 119 |
| ZS6CT | 113 |
| W7KWA | 98 |

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| | |
|---|---|
| W3KT | 214 |
| WØNUC | 211 |
| W2PEO | 211 |
| W4AIT | 211 |
| W3IYE | 209 |
| W9ANT | 209 |
| W2HHF | 208 |
| W3JTC | 208 |
| W2NSZ | 206 |
| W1ENE | 203 |
| W8NBK | 203 |
| W1JYH | 202 |
| W1BIH | 201 |
| W9RBI | 201 |
| W9IU | 201 |
| W2HZY | 200 |
| F8BS | 198 |
| W2GWE | 195 |
| W5ASG | 194 |
| W3OCU | 192 |
| W3JNN | 191 |
| W3EPV | 191 |
| W3DPA | 191 |
| W2AGO | 191 |
| W1AWX | 191 |
| W2CWE | 190 |
| W4GG | 185 |
| W8RDZ | 184 |
| W3DRD | 183 |
| W4INL | 183 |
| VO6EP | 179 |
| W3DKT | 177 |
| I1KN | 177 |
| W9MXX | 177 |
| W1ZL | 176 |
| KP4KD | 174 |
| WØDU | 173 |
| W8CVU | 172 |
| W3JKO | 171 |
| W2WZ | 171 |
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| W6BZE | 149 |
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| W6JWL | 114 |
| W6VAT | 110 |
| W6EYC | 105 |
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| W6LEV | 103 |
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## CW & PHONE

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| | |
|---|---|
| VE3QD | 190 |
| W2PUD | 180 |
| CM2SW | 174 |
| W8KPL | 166 |
| W3IYE | 161 |
| VE3IJ | 161 |
| W8FJN | 160 |
| W2RGV | 156 |
| W3LVJ | 145 |
| ZS2AT | 139 |
| W2WZ | 138 |
| TF3EA | 137 |
| VE3AAZ | 137 |
| W9FKH | 135 |
| W4FPK | 131 |
| G8IL | 131 |
| G5CI | 130 |
| W2PQJ | 130 |
| W3ZN | 129 |
| G6LX | 126 |
| W9MZP | 126 |
| FE8AB | 126 |
| GW3AX | 123 |
| W9TB | 122 |
| GW4CX | 120 |
| W6ETJ | 109 |
| W7EYS | 107 |
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### 37 Zones

| | |
|---|---|
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| W1KFV | 168 |
| W2ZA | 160 |
| W4LVV | 157 |
| W4IWO | 146 |
| W3WU | 146 |
| W4RBQ | 146 |
| W4AZK | 144 |
| GM2UU | 142 |
| W8EYE | 142 |
| W4ML | 137 |
| W9ABA | 134 |
| W2AYJ | 133 |
| W9TQL | 129 |
| WØAZT | 129 |
| W4DIA | 129 |
| VE3ACS | 128 |
| W3FYS | 124 |
| VE1EA | 116 |
| WØFET | 115 |

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### 39 Zones

| | |
|---|---|
| W6DI | 192 |
| W6VFR | 165 |
| W7HTB | 161 |
| HB9DS | 145 |
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### 38 Zones

| | |
|---|---|
| W4CYU | 173 |
| W2BXA | 173 |
| W1HKK | 153 |
| W9NDA | 152 |
| W6KQY | 143 |

### 37 Zones

| | |
|---|---|
| W1JCX | 170 |
| W3LTU | 169 |
| W9RBI | 166 |
| W8REU | 163 |
| G2PL | 154 |
| G3DO | 153 |
| W6PXH | 152 |
| W6WNH | 150 |
| W8BF | 146 |
| W3JNN | 136 |
| W6TT | 133 |
| G6LX | 124 |
| F8VC | 124 |
| G2AJ | 121 |
| W6AM | 107 |

### 36 Zones

| | |
|---|---|
| W1NWO | 163 |
| W1MCW | 157 |
| VK3BZ | 153 |
| W7MBX | 144 |
| W4ESP | 141 |
| W9HB | 139 |
| W9BZB | 135 |
| GM2UU | 135 |
| W6PDB | 130 |
| W4INL | 129 |
| W1FJN | 128 |
| G6BW | 127 |
| W8AUP | 124 |
| WØHX | 118 |
| VE3BNQ | 108 |
| G5YV | 106 |
| G6WX | 105 |
| W3DHM | 96 |
| W6SA | 92 |
| F8DC | 87 |

### 35 Zones

| | |
|---|---|
| W4HA | 140 |
| W6PCK | 135 |
| PK4DA | 132 |
| W6CHV | 128 |
| W2RGV | 126 |
| G8QX | 123 |
| W2GHV | 121 |
| CE3AB | 121 |
| W9CKP | 117 |
| G3FU | 115 |
| WØPUE | 114 |
| W5LWV | 108 |
| W4OM | 106 |
| W3PA | 105 |

### 34 Zones

| | |
|---|---|
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| W5KC | 125 |
| W8ZMC | 122 |
| W6UZX | 120 |
| WØEYR | 120 |
| W8BIQ | 120 |
| W4LZM | 117 |
| W4LZM | 114 |
| W9MIR | 113 |
| W1BPH | 105 |
| W8UIG | 100 |
| W41WO | 99 |
| W8QBF | 92 |

### 33 Zones

| | |
|---|---|
| W5ASG | 134 |
| W9RNX | 131 |
| M9MIR | 123 |
| W9WCE | 117 |
| W5ALA | 116 |
| W2ZW | 115 |
| W9HP | 114 |
| WØANF | 112 |
| WØANE | 106 |
| W2PQJ | 100 |
| W9BVX | 100 |

**W6BIL was kind enough to send us this shot of the operating position at OX3MG. With all those receivers around he should be able to hear down to the third layer . . . and he does!**

quested is immediately available, and when it is we try to get it to you. Usually a self-addressed card helps in this respect. Other times, stations for which you request QTHs show up in the next issue of the magazine, and we let it go at that.

To some of you, this may sound like a sloppy and unbusinesslike way of doing things, and I guess maybe it is. Those of you who feel that way, please remember that I, as well as the other members of the DX committee, make a living in other lines of work. We have just so much time we can devote to the DX department, and we are all very happy to do this much.

We certainly don't want you to stop writing, but if you don't get a prompt reply, it is because we do not have the information, or something covering the situation will soon appear in the magazine. I certainly wish I could personally answer everyone who asks a question, but I just don't see how it is physically possible. . . . Now, maybe when I retire . . . ?

### The Mail Bag

XE1AC said he had a radio holiday as he just received a confirmation from AC4NC. This gives him 37 zones confirmed on two-way phone. Al also says that CR5UP is leaving for Portugal where he will use the call CT1BW. . . . HC8ME is still fairly active on 40-meter phone, and Al says that if any of the Ws want to work him, you might send HC8ME a set of 20-meter coils for a BC375A transmitter. . . . I1YJ told XE1AC that VT1RF in Kuwait is on 20-phone, but Al wants to know if it would be worthwhile to look for him. All I can say is that the only other time I have heard from VT1RF was from ZL1HY (I think it was), and he sent me the QSL card so I could really be amazed. Yep, he's good.

VK3BC says he wants to report a big event for the past month. He had a QSO with W6ENV, but actually, it was with W6OEG, with Andy at the key. Now Morrie wants to know why Andy can't use his own rig. (Morrie, Andy's neighbors tell me he uses it too much!)

OE1FF is now in Norway and can be reached in care of LA2SA. Frank has answered every QSL card he has received from a W station, and, in case any of you have not received his card, you can send another of yours to him in care of LA2SA. He promises to answer it via ARRL or direct if postage is included. Just how long OE1FF will be in Norway is not quite certain, but I guess he will drop us a line when he heads home.

It looks as though the slow boat came back from China and brought a bunch of cards from C8FP. A flock of the boys have needed this one for their WAZ. I believe C8FP should be given a vote of thanks, because, in view of the apparent handicaps, he managed to make up some cards and mail them to the Bureaus. As a matter of fact, his card is hardly a card at all. It is on very thin paper and looks as though it might have been cut from ruled message forms. Each card has the essential data typewritten on it, and the large red call letters "C8FP" look as though they were printed from a carved wooden block. Each card I have seen has been signed in ink by the operator. You fellows who have received his card really should appreciate it.

### Pietermaritzburg DX Club

The club was founded on November 1, 1948, and comprises twelve members who are all DX enthusiasts. They operate on the 10- and 20-meter bands on fone and c.w. Any foreign station contacting five of the members is made an honorary member and a certificate is sent to him. Stations in Africa, south of the equator, or Maritime Mobile stations operating in African waters south of the equator are not eligible for the certificate. The call signs of all members begin with ZS5, and they all reside in or around Pietermaritzburg. Up to date, only twenty-six certificates have been issued: 14 to Australia, 4 to Hawaii, one to Africa, one to Great Britain, one to Europe, 2 to Asia, and 3 to New Zealand. The issuing of the Certificate soon became known among hams in all parts of the world, and has in consequence brought a good deal of publicity to Pietermaritzburg—hams being heard regularly calling "CQ Pietermaritzburg." Any further information on activities of the club will be gladly supplied. Give your 5th Pietermaritzburg station the names only and dates of other QSOs, and he will do what is necessary. No QSLs or call letters are necessary.

The above was from Walter Reid, ZS5DS, and was kindly forwarded to us by W2RGV.

W6EFM says 9 P.M. seems to be the magic hour since he worked three new countries, on different dates, of course, but all at 9 o'clock. . . . W4AIT is working on channel 2 type of TVI.

KP4KD is changing his QTH, or maybe has moved by this time. Not far away . . . just a few miles. . . . W4TO admits he is on phone and is using a sample mike.

W2OST says he thinks *CQ* ought to have the same type of DX contest TWICE a year, but when my over-paid secretary heard that, she almost tore up his log.

**W6BZE** relays some information (gee, he must be one of these relay stations!) that the recent big wind in San Diego tore down W6EHV's stacked 8JK rotary. Hey, who was the "big wind in San Diego?"

Here's something from F8TM. Recently F8EX told him that there would be a couple of choice DX stations on the air shortly. Read 'em and drool: FB8XX on the Kerguelens and FB8ZZ on the Amsterdam Islands. Both are in the South Indian Ocean, and FB8XX should be on the air now, while FB8ZZ is due to be on the latter part of February. They will use 14 and 28 mc. I can hear someone asking now, "Are you guys going to make Amsterdam Islands a new country?" Right now, my answer is, "I don't know, but don't let that stop you from working them." Go ahead and test your DX skill. Work them and worry about the country later.

W2AIS had a chat with ZS5YF who told him he had worked W6ADP on four bands within an hour. He started on 10 at 0600 G.M.T., then went to 20, 40, and 80. In addition to W6ADP, ZS5YF has worked W6SAI, W7LEE, W1BPX, W2ABE, and W2CJX on 80. . . . Have you received your card yet from FM8AD via W4AZK?

DL1DA says his 20-meter ½-wave vertical is really doing a fine job, but he still can't work zone 23. One reason is that he has yet to hear anyone in this zone. . . . W4LQN received a letter from EA6AF, as well as a QSL card and photo. EA6AF claims he is the only one, as of November, who holds an official license.

KH6PY is happy after snagging ST2TC. The only cards he needs now are from zones 23 and 40. . . . ZD1PW told W5ALA that ZD1PW, FB, and SW are active on 10 meters, while ZD1BD is on 20. . . . W4BYF reports that PJ5TR has returned to Aruba. As before, W4BYF will handle his QSLs. . . . By the way, several of the boys are happy because FA8DA QSLs so promptly.

It says in the Southern California DX Club Bulletin that W4KVX took some pills to keep him awake during the *CQ* DX contest, and as a consequence, he slept 12 hours. . . . GM3CSM wants everyone to economize and reduce power to 100 watts. Well, could be! Anyway, Ian did very well in the recent contest.

SM5XH is trying to locate KP6AA, as he wants to get further details on the stacked 8JK he was using. SM5XH mentions too that DX conditions in Scandinavia during the winter are rather poor, mainly because of Polar-light and magnetic disturbances. A typical evening, he says, would be in hearing one single c.w. station on 14 mc . . . an OE3 in Austria chewing the rag with a ZS, which he could not hear, the rest of the band being completely dead.

ZL2GX has gone and done it. . . . It's 200 countries for Jock now. The one that did it for him was VQ3SS on phone. Jock says he is going to begin "operations QSL" to try to catch some QSL cards that are long overdue.

ZS2AT writes to tell me that ZD6HJ is now on the air at Dowa, Nyasaland. . . . W5LVD, assisted by W5LGG, apparently had great fun in the recent *CQ* DX contest, and from now on, these fellows will probably give many of the old-timers a run for their dough when it comes to DX contests. 5LVD says W5JC may be leaving San Antonio soon for an overseas assignment.

FE8AB adds three new zones and a flock of new countries. Now Ivan is up to 38 zones. The three new ones were VE8AO, OX3MG, and UJ8AF. . . . . Perry Ferrell, the propagation specialist, informs me that there will be two new LU stations which will operate in the Argentine Anarctic zone. LU1ZB will be on Melchior Island, Palmer Archipelago, LU1ZC on Deception Island in the South Shetlands. Perry says it looks like they will be on the air in the early part of 1950.

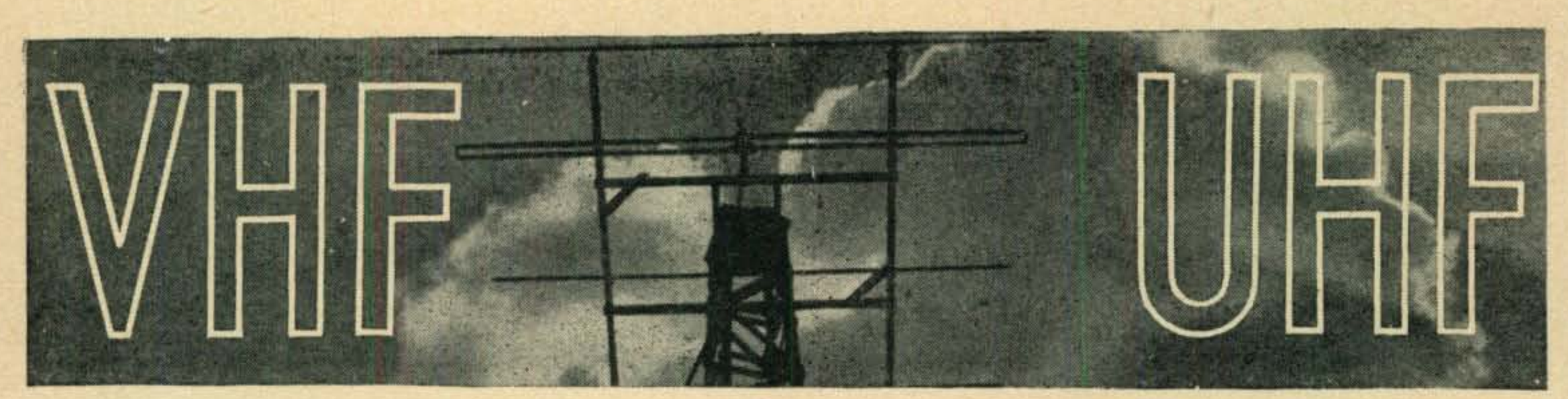
W1ENE got his new rotary up the weekend before the contest, but luck was againt him, and he sheared off the coax when it caught on one of the steps of his pole. Even so, Jon says he worked VQ1CUR after chasing him for about four hours. ENE, along with many others, would like to know if anyone has received a legitimate card from any PX station.

### Those 4X4 Calls

4X4BX writes that the calls for hams were issued from AA to DZ with the exception only of RE and ES. He says if there are any calls outside of these, they are unknown to the I.A.R.C., and if QSL cards are received for these unknown stations, they will be returned to the sender. He also says that for the time being they cannot operate on the 3.5- and 7-mc bands. Another item from him which might work itself into something is his suggestion that a group be formed in this country which would be willing to send some of their small radio parts to the foreign countries with money restrictions in exchange for postage Stamps. Sam says this would certainly be a great help and get a lot more hams on the air in foreign

(*Continued on page 64*)


**Here's one of the most famous DXmen in the business —J. M. Cordova, EK1AO, formerly EAR96 (remember?), and EA4AO. He is now up to his old tricks in Tangier, and is showing a lot of the young squirts how a real OT operates.**




## Conducted by E. M. BROWN, W2PAU*

MUCH OF THE APPEAL OF THE V.H.F. BANDS lies in their unpredictability. Despite all efforts which have been made to predict the trend of propagation conditions, it seems as though the only way to tell for sure whether the band is open is to hear those DX signals rolling out of the loudspeaker! Our *CQ* column last month was filled with news of sensational six-meter DX. And we mentioned sadly in passing that the old two-meter band was pretty sparsely populated during this season of the year. Then, what happened? During the early days of December we kept the automatic receiver scanning back and forth across the six-meter band while we carried on construction projects and helped the XYL address Christmas cards. Aside from a couple of not-too-satisfying sporadic-E openings and a rumored aurora display, the six-meter band sounded pretty dead at our observation point. Finally, in desperation, we QSYd back to two meters and found the band loaded with out-of-town signals. For a solid week, to date, conditions on two have been almost up to the standards which prevailed during the summer DX season, here on the eastern seaboard. It was a swell chance to pass along the Season's Greetings to stations within a 200-mile radius, and at times signals from even greater distances were boiling in. It is unlikely that these favorable conditions were experienced over the entire country, for the newspapers have been carrying stories of blizzards and ice storms (the bane of every v.h.f. ham's activity) in the central states. However, our experience serves to illustrate what can, and often does, happen on these temperamental frequencies.

### The Contest Season

By the time this issue of *CQ* reaches you, the Annual v.h.f. Sweepstakes for 1950 will be a thing of the past, and the v.h.f. air-waves will be filled with contest post-mortems. It is too late now for us to suggest that all those hams who are able to participate in this contest please do so, in order to provide ample opportunities to demonstrate what can be done with the v.h.f. bands, even in the middle of winter. However, there is one feature about these contests which we would like to comment on, even at this late date.

Every year about this time there is a great increase in activity on the "contest pay-off" bands, namely six and two meters. The contest-minded hams decide that this is a good chance to show that they can win contests regardless of the frequency involved. They pull the v.h.f. gear down off the shelf, dust it off and tune it up, they string up temporary antenna supports and get on the air in the best way possible—for the contest period.

Clubs like to sponsor contest activity. It is, somehow, good for club morale to see the name of the ol' association high on the list of contest winners, even though it wasn't a very big contest. So the club members get together, pool equipment and talent, and make a very strong showing—for the duration of the contest.

There are other hams who are true v.h.f. specialists, who unfortunately live away from the centers of population. Things generally get so dull during the slack season that they practically give up v.h.f. activity and go on the lower frequencies, where they can at least *hear* signals once in a while. But when a contest is announced they, too, peak up the v.h.f. gear and get in there—during the contest. They know that at this time, if no other, the v.h.f. operators will be active and searching for those elusive weak signals.

One week after the contest, things are back to normal. In fact, they are usually duller than normal, due to the inevitable "recovery time" following a weekend full of all-out activity. The gear reserved for contest activity is back on the shelves, the big antennas are stored in the shed, not to be moved until field day, the borrowed converters are back to their rightful owners, and in the minds of the transient operators the v.h.f. bands are forgotten. Why?

Part of the reason, of course, is that some hams have no desire at all to operate on any band where the normal service radius is limited to about 100 miles, except where some added incentive is offered. Another group may be suffering from frustration. In the haste to get something on the air for the contest, some important element in the station set-up was overlooked, and the resultant poor performance was blamed on "poor location," "high noise level," or some other equally irrelevant factor. Maybe the v.h.f. gear produced a new crop of TVI complaints. After spending a lot of time and trouble to eliminate TVI in his low-frequency gear, a ham is naturally going to be somewhat reluctant to continue operations with his v.h.f. set-up if TVI results regardless of how haywire his v.h.f. rig may be, or how often he is

---

* *Send all contributions to W2PAU, 88 Emerald Avenue, Westmont, N. J.*

reminded that the v.h.f. bands are inherently less subject to TVI troubles than the lower frequencies.

But we personally feel that a large percentage of the fellows who use the v.h.f. bands only during a contest get the impression that they have little in common with the regular population of these bands. They are not made to feel welcome by the "regulars." It is not too late to correct this impression, fellows. Next time you hear one of the contest new-comers call a CQ, give him a buzz, treat him as a friend and as a potential member of the v.h.f. fraternity, and give him good cause to keep his equipment set up on the v.h.f. bands the year around, not only during contests. It will pay off, in more and better activity, broader local representation on our bands, and in a worthwhile influx of new ideas.

While we are on the subject of contests, I wish that you fellows who have ideas, pro and con, on this subject would drop me a line and explain your thoughts. Everyone realizes that the present contest rules are filled with inequities, the uneven distribution of v.h.f. activity across the country makes any scoring system based on the number of QSOs made during the contest period completely unfair to those hams living away from the centers of activity. We have also heard loud objections to the idea of six-meter hams competing on an equal basis with the two-meter specialists who have no hope for an F-layer or sporadic-E opening to help them pick up sections. There must be some way of stimulating activity by some means—maybe we should even not label it a "contest"—which would arouse the competitive instincts of the v.h.f.-minded hams. The Amateur V.H.F. Institute of New York Two-Meter Mileage Contest, which was held during April, 1949, was an excellent illustration of a worthwhile attempt in this direction. *CQ* has, in the past, sponsored DX competitions, and it is not beyond the realm of probability that we might be talked into running a v.h.f. affair of sorts—if the gang really wants it.

### Thoughts of a Ham Planning for 420 mc

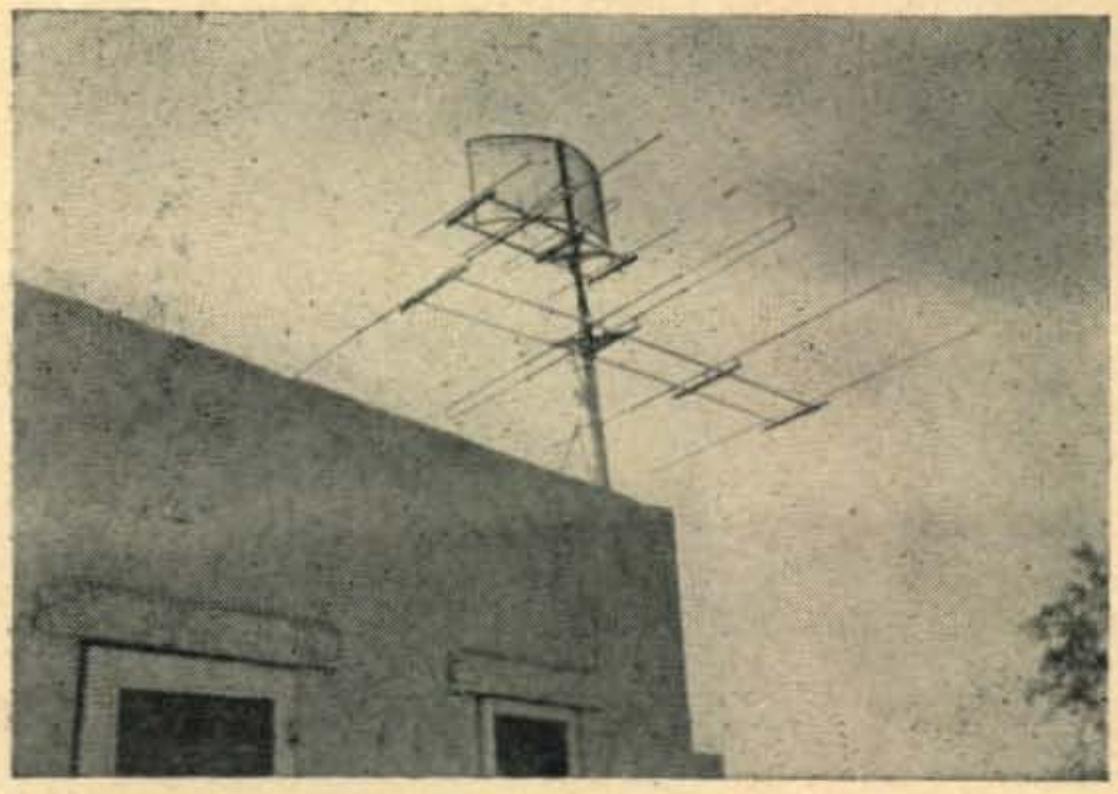
A large number of hams have already stepped over the boundary into the u.h.f. spectrum and have actually started to utilize the 420-mc band for regular communication work. This looks to us like the band most likely to receive the attention of the experimenters in the months to come. Already the number of stations known to be active on 420 exceeds that on 220 mc. The u.h.f. assignment seems to be sufficiently different from our two-meter band to arouse great curiosity and the urge to experiment in the gang, and now many of them want to find out what we can do with this band. To date, most of the experimentation has been carried on with relatively simple gear, much of it consisting of converted war-surplus equipment. A few of the pioneers have attempted to start things off on a high plane, and are advocating the use of crystal-control and narrow-band receivers. Others are starting off the same way that they did on five and two meters with modulated oscillators and super-regenerative receivers. Sooner or later the two schools of thought are going to clash.

It might be well at this time to apply a little advance planning and try to estimate just what kind of results might be expected on the 420-mc band under "closed-band" conditions. Let's compare it with the 2-meter band, for instance.

Most of the 144-mc receivers now used by the more serious workers employ low-noise triode r.f. amplifiers, and narrow-band (10 kc) i.f. strips. This results in sensitivities such that a signal in the order of 0.1 microvolt at the antenna terminals can be detected without too much trouble. On the other hand, most of the 420-mc receivers now in use have no r.f. amplifiers, and they generally have i.f. amplifiers designed for pulse work—perhaps a full megacycle wide. So, taking into account only these factors, our typical 420-mc receiver would probably require about 30 times the signal voltage for the same signal-to-noise ratio as our two-meter receiver. A really good r.f. stage using a tube which works as well on 420 as the 6J4 (for example) works on 144 mc might cut this down to about 10 times. And if we cut the bandwidth down to the same 10 kc which we can use on 144 mc, we would wind up with about the same order of sensitivity as we now know.

Skipping the receiver, let's look at the antenna feedline. The loss we might expect in a given length of line on 420 would be about twice as high as that which we experience in the same line on 144 mc. This is plain waste. And, if one is fortunate enough to have an antenna support of unlimited height, it places a definite restriction on the optimum height of the antenna. What good is doubling the antenna height, if by so doing one introduces more than 6 db of feeder loss? This factor more than any other might well point the way to a radical change in the layout of our u.h.f. stations. Already I can foresee the hams building their converters and transmitters for mast-head mounting. Some are already using this approach on two-meters. The problem of working out complete remote controls will be a nice one! Next comes the antenna (or antennas, if good feeder change-over relays are too hard to find). Here we can see the rabid 420-mc fan's eyes light up, as he points with pride to his tidy little 32-element beam. It is true that the field radiated from a given type of antenna for a given power input is essentially independent of the frequency. In other words, a 13-inch dipole with ten watts input at 420 mc will lay down the same field at nearby points as a 40-inch dipole with ten watts of 144-mc energy fed into it. The fields, in microvolts per meter, are equal. Increasing the size of the antenna will produce the same gain on the u.h.f. bands as a proportional increase in size on the lower bands would yield. BUT, when the antennas are used for receiving, a different situation is encountered. In a given field, a wire which is a full meter long (such as a two-meter resonant dipole) will intercept much more energy than a wire which is only ⅓-meter long (which is represented by our 420-mc dipole). In order to pick up as many microvolts on the receiver input on 420

(*Continued on page 66*)



The antenna set-up at W7QLZ, Phoenix, Arizona. Note the parabolic-type 420-mc array on top of the mast. This installation was lost in a recent windstorm, but is being replaced with one even more elaborate.


Conducted by LOUISA B. DeSOTO, W7OOH*

YLS IN THE NEWS! In the *San Antonio Express* Sunday magazine section, recently, a full page complete with photos was devoted to Frances Hollifield, W5KQG, while an issue of the Melbourne (Australia) *Herald* published an FB photo and writeup about Gwen Adams, VK3US. Some of you may have heard the rebroadcast from Holland of a QSO between two YLs—PAØZC, Louise Herkel, the first licensed YL in Holland, and VE3TW, Ethel, over station PCJ (9.59 mc). And in the mail the other day we received from Lilia, 2nd op at EA5BE, a copy of *U.R.E.* the official organ of the radio society of Spain, in which appeared a picture of KH6NB and KH6UR, together with a reprint of most of the YL's Frequency from *CQ*.

**"Toni Twins"**

While they're not twins, W2RTZ, Hope Plummer, and W4MKP, Jane Hodgson, photographed together in Miami last winter, share quite similar interests and background in ham radio, both getting into the hobby when very young and with no other hams in their families to create the interest or help with the studies.

It was when she decided to try radio control of model airplanes that W4MKP became interested. "At the tender age of 9 I began to build model airplanes," explains Jane. "Rubber at first, then the gas powered models, and it was on one of the free flight ventures that I thought it would be great to control the planes with radio. That turned out to be wishful thinking for I haven't got to that yet, but it did start me on radio."

"I began on code immediately and got my license when I was 13; then the building angle proved so interesting to me that I have never gone back to the planes. All equipment here has been built by me which includes: 807 exciter, p.p. 812 amplifier, Class AB2 modulator for 807 p.p. amplifier, running about 200 watts, and numerous power supplies. Exceptions are BC-348Q and BC-458."

Secretary of the Dade County Radio Club, W4MKP is on the Gator Net, 7290 kc, where she sometimes is net control station. Code speed is 40 w.p.m. Awards include: OBS, ORS, OO, CP, AEC, RCC, Class A, amateur and 1st Class Radiotelephone. This summer she worked part time for station WWPB/WWPB-FM. Fifteen and starting her junior year, Jane plans to study electrical engineering when she completes high school.

W2RTZ, Hope our other "Toni twin," has held her ham ticket since she was 15. She had been exposed to the "bug" a year earlier, but having read that teenagers often change their minds, she figured she would lose interest in a few months. When that didn't happen she went after her ticket, learning code by whistling it to herself and later using an Instructograph. Theory was memorizing the License Manual at first, but in 1943 she attended the Melville Aeronautical Radio School. She likes construction, built her own Clapp v.f.o., power supplies, etc., and puts up her own antennas which in the country involves tree and/or roof climbing and running up and downstairs and in and out of other people's apartments for New York City antennas—verticals against the building sides.

W2RTZ is ORS, RCC, AEC, WERS during the war, and holds CP 25 (reads 35). Her primary interest is traffic handling and she makes BPL occasionally. While in the north she belongs to the NLI (NYC-LI Section) Net, Swing Shift Net, and Eastern Shuttle Net. While in Florida last winter she was on the Palmetto Net and Traffic Outlet and sometimes on the Western Florida Net.

The second hobby at W2RTZ is ceramics. Her ambition: to combine hobby #1 with hobby #2 and start a small business making ceramic articles for radio shacks, etc.

By the way, Hope is the one with the Toni. . . .

** Associate Editor, CQ. Send contributions to L. B. DeSoto, Verde Valley School, Sedona, Arizona.*

**"Which twin has the Toni?" Well, not twins, but W2RTZ, Hope Plummer (left), and W4MKP, Jane Hodgson, share similar backgrounds and interests in ham radio.**

## WAS/YL

Here it is—certificate No. 1 for WAS/YL. Now that you know it can be done, how about some more contestants? In case it will help, here is a list of the stations Howy worked to win this award:

| | | | |
|---|---|---|---|
| W7HDS | W7GLK | W7COX/9 | W9CMV |
| W9BEY | W5IGO | W4GDV | W4ITR |
| W7FWB | W8SJF | W7LEE | W5HEK |
| W3JCY | W4HVZ | W5JAL | W1LYR |
| W1LJZ | W9AFK | W6NAZ | W3CDQ |
| W6OOK | W7KVF | W9EVT | W1MIM |
| W5IZL | W2NAI | W1MUP | W8UDA |
| W4GFO | W5ZA | W3HGA | W9JMI |
| W4GEK | W3HVD | W4GIW | W5IBQ |
| W9ZWL | W1FTJ | W1KOH/4 | W9DBD |
| W1NAD | W9FRR | W7NH | W7GUQ |
| W8UHB | W9ZQI | W9JTX | W8EVR |

Howy worked long and hard to complete his WAS/YL. For a long time West Virginia was the stickler, but when W8EVR got her ticket just recently they arranged a sked. And note that W2QHH accomplished this award working only c.w. on his end, with a maximum input of 35 watts!

By the way, don't forget you can still get a copy of the YLRL Call Book to assist you in working YLs. Just send $1 to YLRL Secretary Marion Kurtzner, W3NHI, 823 Fairview Rd., Swarthmore, Pa.

## YL of the Month

"Stealing my stuff," said W6QD in his DX column when reporting the 32 zones and 101 countries worked by Margaret Roberts, W8BFQ. Could have been said by W2PAU, too, for W8BFQ is a v.h.f. enthusiast as well as a DXer. This remarkable YL explains it thusly:

"As to my amateur radio love life, I was exposed when twelve years old by my brother Ray, W8BCT (now W4BCT), with no visible ill effects. No interest in radio developed from a second exposure when I married the OM, then W8FPN. Much later, after the OM again took to hamming as W8WJC, I still didn't feel any attraction to ham radio, and believed I had developed a permanent immunity to the dratted little bug. But one day the OM tuned the receiver across the 10-meter band, where I heard strange far-away places—and the bug bit, hard! In my deep ignorance sez I, 'This is wonderful, let's go on ten meters,' and Jerry (who thinks any frequency below 144 mc is d.c.) counters with, 'If you want to go on ten, you can get a license from the F.C.C., all for free, by answering a few questions, then you can have your own station on ten.'

"All for free! Horrors! Flunked the code first try, but made it the second, and was issued W8BFQ in September, 1947. Quick like, the local v.h.f. gang threw together a flea-power 10-meter rig, hung a dipole on the 2-meter stick, thrust a mike in my hand and said, 'Call that one.' Hoping he wouldn't answer, I called J9ANT—and hurriedly signed with him when he came back. How did I know I shouldn't raise Okinawa on the first call?

W8BFQ, Margaret Roberts, YL of the Month.

"That's how it started and after getting over my mike fright I loved it. Got a 20 wpm code proficiency certificate shortly, then 10-meter phone WAC, and at the end of the first year my Class A ticket. Also acquired a kw rig, and after working 100 countries on 10 phone, moved down on 2 meters. The score now stands at 109 countries on ten, 15 states, 6 call areas and Canada on two." W8BFQ also won the September '49 v.h.f. contest for the Ohio section with 93 contacts, 13 sections.

W8BFQ's 10-meter rig is a pair of 304TLs modulated by 805s, and the receiver is a low-noise converter working into an HRO-7. The 2-meter rig consists of a pair of VT127As with the same modulator, and the receiver is two stages 6J4 grounded-grid and 956 mixer, into either the HRO-7 or a KP-15. The 10-meter antenna is a dipole and reflector, and the 2-meter beam is 16 driven elements in a 4 by 4 stack, with reflectors, both about 85 feet up.

As if both DX and v.h.f. weren't enough to take up her interest, W8BFQ adds: "During the summer days when the bands are not so good I waste time trying to raise flowers, and make hooked rugs on winter evenings when the OM takes over the shack. Cocker spaniel puppies have taken up lots of our spare time in the past, and now I'm being eased into photography. What with housework, never a dull moment. I've enjoyed ham radio immensely from short DX contacts to long-winded rag-chews, conventions and hamfests, and just plain club meetings, where a gal obviously wasn't expected!"

## Here and There

Do any of you have any old or odd (one may have been lost) cuff links that you don't know what to do with? If so, send 'em on to Helene Leonard, W6QOG. Collecting cuff links is Helene's latest hobby, a most interesting one she tells us.

## New Licensees

We're glad to welcome to the air these newly licensed YLs: W6HCT, Anne Proctor; W6HDG, Katherine Woods: KH6AAJ, Beatrice Eells; W9IES, Nelda Ricketts; W6HGA, Kathryn Alverez, and W6HHD, Teresa Collier. —33

# Ham Radio in Darkest Africa

GEORGE BREAKSTON, VQ4NZK*

***When a Hollywood camera crew goes to the Dark Continent to film life au naturale—and when there's a ham in the gang—there's high adventure afoot.***

YOUR SIGNALS about QSA4R7—QRM a little heavy and did not quite get your QTH during your last transmission. Would you please repeat—VQ4NZK This is VQ5PBD over—."

"VQ5PBD — VQ4NZK right back — Okay, Peter, sorry you missed so much of the last transmission. I repeat I am not exactly sure of our location. We are about 150 miles southwest of Narok in the Masai—exact QTH unknown."

Thus it was that for almost five months of steady amateur radio contact while in VQ land, it was an almost daily occurrence to say "QTH unknown."

Republic Pictures had sent us on a photographic expedition that was to cover over 8,000 miles by land through the heart of east and central Africa for the filming of "Jungle Stampede." Our route covered the territories of Belgian Congo, Uganda, Tanganyika, and Kenya, where our safari travelled for days on end over little known trails in search of photographic adventure.

Prior to leaving Nairobi for the expedition, I met up with as fine a group of amateur radio men as one ever wants to know. Knowing we would have tremendous difficulties concerning communications, they went out of their way in every respect to aid and supply us with precious equipment.

As an ex-amateur operator in the U. S., it never dawned that any government would have rules different than ours regarding the operation of an amateur radio station, and so, being a foreigner in a foreign land, I never anticipated that it would be possible to get an amateur station license from the British government. However, the post office department in Nairobi, knowing our need, extended themselves and issued my station letter calls VQ5, 4 or 3 NZK for whichever territories we would be in, letters of which were taken from my ex-U. S. license. This was indeed a fine gesture on their part, and as a result of this, a fast and firm friendship with a really great group of men was started.

Several of the amateurs got together and furnished me with a small British army surplus 21-set; transmission equipment in Africa is indeed very difficult to obtain and extremely expensive.

The mighty power of this 21-set was barely 3-watts input; a self-excited, poorly modulated and confusing piece of equipment, whose thousands of intricate connections and controls do little to aid the performance of this real Rube Goldberg. This was to be our only means of communications for the five months safari that followed.

*2244 Manning, Burbank, Calif.

The little transmitter-receiver was geared for the 7 and 28 megacycle band, but to try to put a signal out on 10 meters was practically impossible. The receiver section was set up in such a way that when listening on 10, you would also pick up all the 40 meter transmissions; thus you never knew whom you were listening to or where. This only left the good old 40-meter band on which VQs are allowed to operate on phone.

The first day out on safari we passed through a bamboo forest on a 9,000-foot pass about 150 miles out of Nairobi. Our boys immediately cut several tall bamboo poles that were to be used to hold up the 66-foot diapole radiator for the mighty 3-watts. These bamboo poles become a scourge to all the non-radio members of our expedition. I was cursed, begged, and threatened because of the unsightly gadgets that were always entangling someone or keeping them up at night from the horrible screeching of static. As a martyr to the cause of amateur radio, I suffered threats of divorce from my wife, who accused me of loving the 21-set far more than her, received the invocations of our white hunters, who claimed that more time was spent putting up the aerials than fixing the tents, and suffered loss of dignity at having one member of our group refuse to lend me his battery receiver any longer as a speaker out-put because the noise at 5:30 in the morning disturbed his beauty rest.

All in all, as far as radio was concerned, I turned out to be a pretty unpopular character. Unpopular, that is, until urgent messages and requests for aid were forthcoming. Then in a sudden shower of profuse admiration, I would get a few words of appreciation that were always answered with, "See, it has good purpose after all."

One of the worst and most mortifying morale shocks was to be calmly and plainly told one day by the whole expedition, who had gathered in war council, including my wife, that all amateur radio men, including yours truly, could say more about nothing in endless gossip than any tribe of cackling, gossiping women could possibly ever do.

Anyway, there was no sabotage. The rig, in spite of itself and the terrible beating it was getting, continued to operate, and VQ4NZK stayed on the air.

It was a thrilling experience while camped on top of a volcanic crater in Uganda to look acroos the open plain stretching before our camp and see the towering peaks of Ruwenzori, the Mountains of the Moon, on the border of the Belgian Congo. How many times I had heard in the years past

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the faint and fading signals from OQ land, and now seen from the distance cloaked with its massive green coat of Itura Forest stood this magic land of OQ—the Congo itself.

Permission had been asked for temporary license to operate while in the Congo, but communications being difficult, no answer yet had been given, and we had only two weeks left to go before crossing the border at Kasindi.

During this time, schedules and arrangements were being made with my good friends Peter Dodds, VQ5PBD, and Duncan Fletcher, VQ4GDF, so that in the event the Congo permit would not be granted, we could at least expect to receive messages from them every day.

In the meantime, while in the highlands of Uganda, I wanted to find out just how far the 3-watts could reach out, and would call any and all CQs phone or c.w. that could be heard. VQ3AA from down Tanganyika way came through. Also, several ZE2; which, considering everything, was pretty good DX. My mouth watered when hearing a W2 or some other Stateside station in the wee hours of the morning calling CQ with a 9 strength signal. I would tediously answer the CQ, only to have the W2 answer some W3.

On one occasion I called a W signal and received what I thought was an answer, but the QRN and QRM closed in so heavily that a QSO was beyond reason.

But for the lack of signal strength, it was a pleasure for a change to feel that you were DX and that your signals were sought, not like the old days of being a W6 when you had to fight for a DX QSO.

The boys in Africa very seldom use more than 50 watts, their maximum strength allowed being 150. When they put out a CQ on the DX spans, it is amusing to watch the returns. They have their choice and can simply pick out the signal that they care best to answer. However, I have found our VQ friends a very sporting lot who, unlike our California kilowatt happy boys, see how much they can possibly do under trying and difficult conditions. To them the talk of a kilowatt is like going lion hunting with a 75 millimeter cannon. All the sport of amateur radio is taken out with custom-built sets and heavy outputs.

Shortly after starting the expedition, something went wrong inside the maze of wires that go to make up the 21-set. It seemed like an operation was called for. With the help of my technically minded cameraman, Herman Schopp, and several screw drivers and pliers, we proceeded to unscrew every single bolt on its face in an attempt to get at its well-concealed innards for the repair. It seemed that the more screws we took off, the more plates that came off, the more screws and plates we would find underneath. And still the casing could not be removed. It seemed that an immovable object had been met by an irrisistible force, namely, a 21-set as versus Schopp and Breakston.

A council of war was held, and it was decided to "rip the bloody thing open" by any and all means. A cold chisel and hammer were applied to the casing, and slowly but surely the 21-set was being peeled like a banana. Suddenly my eye caught sight of four unmolested screws with a peculiar cross mark and circle about them which somehow resembled condenser locks. The operation was suspended, and figuring that as long as we were going to rip everything open, we might as well take a chance of untuning the whole works. A screw driver was applied to each of the screws, and then presto! the back fell off, displaying all the little pieces that go to making up a 21-set.

One solitary connection had broken loose during its daily joggling on the back of a truck. This was repaired without event, and now the complex problem of putting everything back suddenly appeared. Somehow, someway, we managed to peel back the iron casing, and put almost everything in its place. I said "almost" because when we were through, we had a rather large cigarette box filled with excess screws and bolts which I am sure were never meant for this radio. The set operated just as well as before, except that now we had some spare parts.

These parts tagged along with us many months until finally, sick and tired of seeing them, I decided to throw them away. A horrible mistake, not that the parts were needed, but in Africa you just can't throw anything away if you have good safari boys.

The little box of bolts was conveniently left as we were wrapping camp one day. That night it was lying on my table right next to the radio. One of the boys, a big smile on his face, reported that the bwana had left something, and he remembered to bring it along. I next resorted to throwing the box in a gully. Two days later the famous package appeared, another boy smiling and saying he had found it, and wasn't I glad he had such keen eyes. No matter how many times I tried to throw away those useless odds and ends, somehow they would reappear.

After the expedition was over, this box of bolts was found in my suitcase where one of our safari boys had so graciously put it—his bwana would never lose anything as long as he saw to it.

The first time that our make-shift amateur station came in handy was during our first visit at Kampala, capital of Uganda. Our safari had made camp about tweny miles away in Entebbe, which is situated on a peninsula that extends into Lake Victoria. For weeks there had been rumors of a native uprising. It seemed that the local Bugandan natives were dissatisfied with their Prime Minister and that threatened outbreaks of violence were being contemplated. They wanted him to resign to make way for someone else, who, they claimed, would look after their interests more sincerely. On asking a rather educated native what if he refuses to resign, his answer was short and explicit . . . "If he does not resign, we will kill him—cut him in little pieces—and eat him!"

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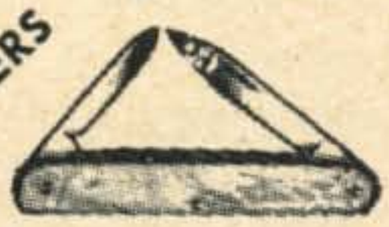

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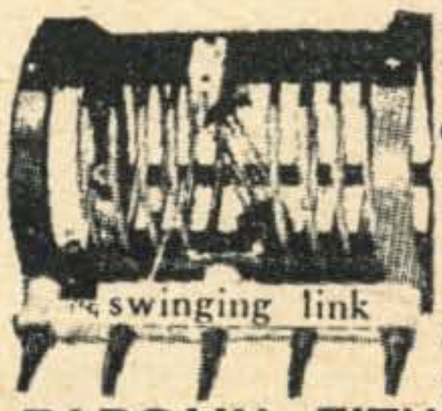


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The day of the breakout we were in Kampala on business, but managed to convoy our equipment and trucks to Entebbe under police escort where things were not quite so upset. However, that turned out to be a rather foolish move, as we then found ourselves isolated on a peninsula with the revolution increasing as the hours went by and threatening to spread as far as Entebbe, from which there was no retreat.

Sizing up the situation, we saw the possibilities of enraged natives moving toward Entebbe and us with our backs to the shore of Lake Victoria—crocodile infested. For hours on end during the few days that followed I kept constant communication with my friend, Peter, in Kampala, who would be most optimistic about the turn of the day's events.

Our destination at the time was the Belgian Congo. There seemed to be no other way of travel except through the hottest and most disturbed area, past the palace of the King of Buganda where throngs of natives were milling about, throwing stones and threatening to overrun the palace if the Prime Minister did not come out and give himself up. Peter did his best to help without breaking any rules or regulations regarding the transmission of information. The police had warned us not to try to run the gauntlet, but to try to make arrangements with a large river boat which was due to arrive at Entebbe the following day. This seemed to be the only method of evacuation. This boat could take us as far down Lake Victoria as Bukoba in Tanganyika where we could peacefully go about our business of photographing the much less dangerous wild animal life.

The last thing to be dismantled before loading our equipment on the river steamer was the the little 21-set. It was operating practically to the moment we were ready to sail.

Even from the boat far out on Lake Victoria, and with permission of the local radio operator, VQ5NZK stayed on the air long enough to be able to say, "We are now crossing into the territory of Tanganyika," and signed off with the call letters VQ3NZK.

Pushing our way toward the Congo over miles of endless dust under a tropical sun, we would each day record the events that had happened, and as the sun would set, this information would be passed on over the air to our friends who were anxiously awaiting news of our progress.

Peter Dodds, VQ5PBD, knew the territory we were travelling quite well, and would try to pinpoint our location on his map by asking if we could see certain land marks from our camp sites. He was uncanny in being able to describe our location from the description that would be given him of the surrounding country over the air. Peter's signal, incidentally, throughout the course of our expedition was always one of the strongest and clearest in all East Africa. Our daily QTH while in Tanganyika and Uganda usually was quite exact. However, there came the turning point when it was everybody's guess work as to exactly where we were.

Crossing into the Belgian Congo—into OQ land—I left exact schedules in the event that the station could not be put on the air. The government officials in the small towns we passed all said the same thing: "You will never receive permission for your transmitter to go on the air, but if you should happen to go on, no one will say anything. Just don't say too much and tell the boys you are listening."

Remembering the rules and regulations against 'bootlegging' in the states, I was rather afraid to fire up the rig. However, one day the temptation became too great. Deep in the Itura Forest, in pygmy country, I answered one of Peter's calls, told him all was well, and that we would be back in British East Africa in less than a month, at which time I could again maintain regular schedules.

In the course of the months that followed, the camp sites ranged from good to bad for the purpose of communication. Open plains where one could choose his antenna site were, of course, the best. However, many times our camps were situated in gullies that were surrounded by tall thorn trees, making it almost impossible to set up a decent transmission line.

As the weeks wore into months, the power and stability of the little 21-set waned. My reports were growing steadily worse. It seemed that the transmitter was getting tired. When we moved to the northern frontier of Kenya for the final phase of our photographic mission, in the heart of the rhino country, the signals all but gave up. I started resorting to c.w., but even that was getting hopeless. In final desperation, a 12-volt battery was hooked on instead of the normal 6, and for a few fleeting moments, I was able to say that the expedition was finished, and that we were returning to Nairobi.

From the window of my room in Torrs Hotel in Nairobi, I kept my last Sunday schedule with the whole gang in VQ land. Sunday was the day that the East African amateur radio society gave the news bulletins and spent most of their time going over the week's events. The now reconditioned 21-set went on the air with nothing but a thirty-foot piece of wire hanging out the window as an aerial. The next morning a sea plane would be taking off from Lake Naviasha to bring us back home after a long and arduous safari. That Sunday was the day to say farewell to a really fine group of men who have taken the spirit of amateur radio and kept it in a fraternal and sporting association.

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***Low Down Payments*** **$24.95**

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Built-in power supply on separate chassis with heat resistant barrier the height and width of cabinet. Front of panel oscillator compensation control. Speaker matching transformer built into receiver with 8 and 500/600 ohm output terminals. Provisions for NFM adapter. Push-pull radio output. 10" speaker in matching cabinet. Voltage regulated oscillator; two tuned RF stages; manual and automatic volume control; Micrometer type dial with 20-1 precision gear drive and 500 division scale for logging purposes; Coils cover amateur bands from 1.7 to 30 mcs; Special coil provides 50 db signal-to-image ratio on 28 mcs band.

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# ESSE RADIO CO.

Indianapolis, Indiana

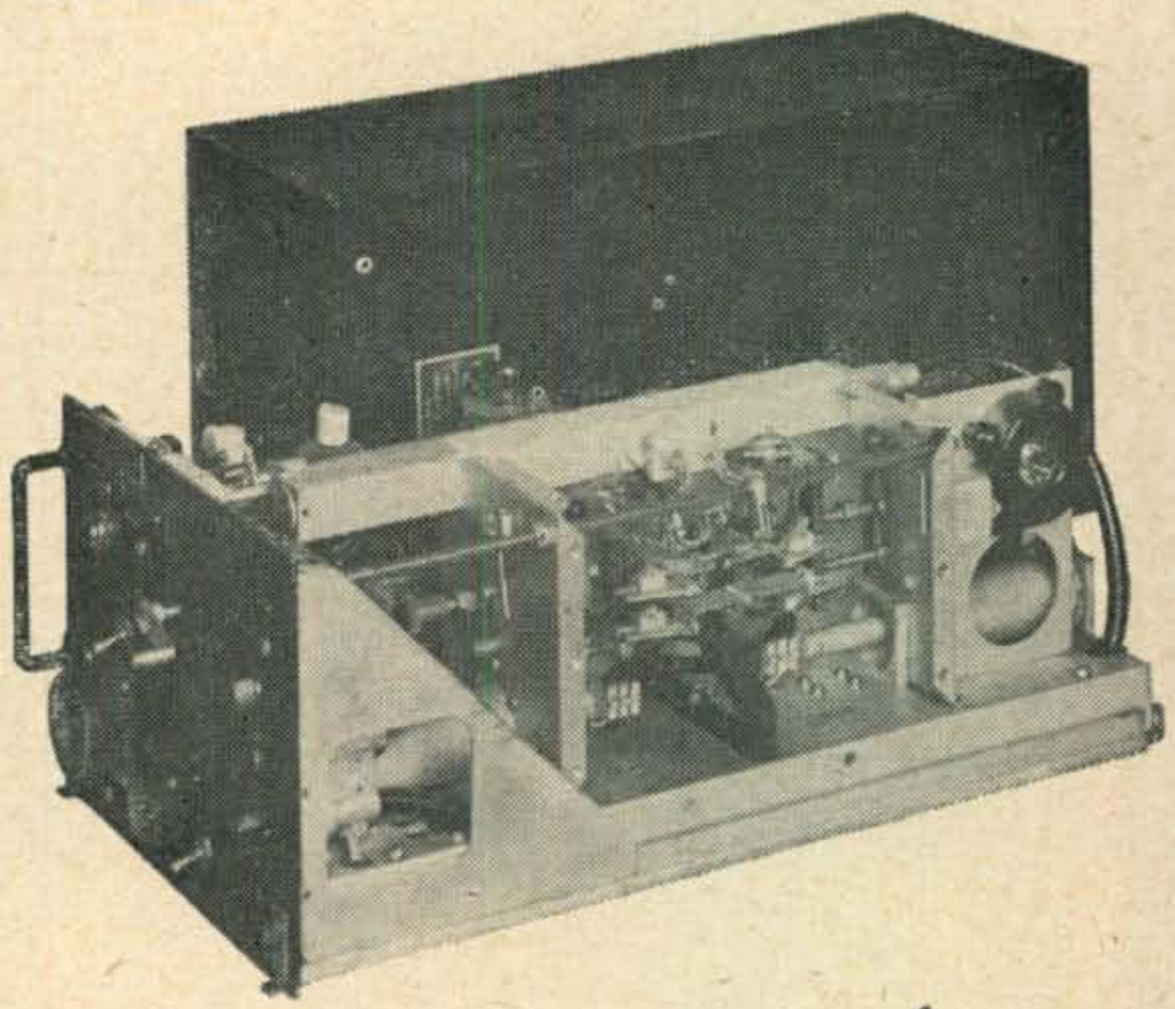
## *Esse's Special Offer*

## T-39/APQ-9 RADAR TRANSMITTER

This is the transmitter described in this issue of "CQ" for conversion for the 420–450 Mc. Amateur band and is now being subjected to approval by the F.C.C. for the 465 Mc. Citizen's band. Albert N. Gahimer, dba/ Home Radio & Electric Co. at Indianapolis, Indiana, has been conducting exhaustive tests experimentally in the Citizen's band frequency under experimental license KS2XAB. He states that the oscillator has excellent frequency stability and that two-way communications are possible for distances of 22 miles between his shop and auto. The above person is requesting approval for licensing this equipment on the 465 Mc. Citizen's band.

If conversion is not desired, the transmitter contains many excellent parts for the VHF experimenter such as a cavity oscillator using 2—RCA 8012 tubes rated at full output to 500 Mc. Tubes are forced air cooled by 24 V. DC motor, which is easily converted for 110 V. AC operation. Other valuable parts such as a pair of 807's, 2—6AC7, 1—931 and 1—6AG7 tubes, ceramic switch, potentiometers, gears, revolution counter, etc.

Price .... **$17.50 ea.**



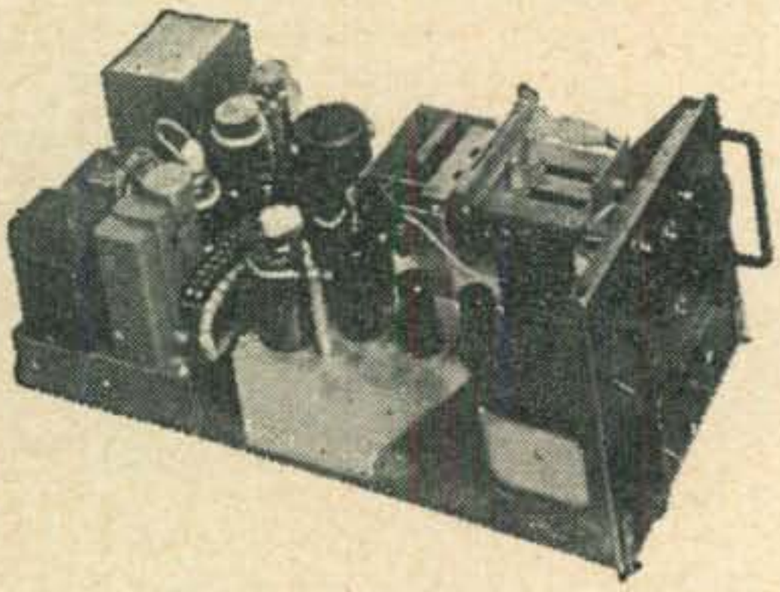
★ ★ ★

### AN-80A ANTENNA

470 Mc. This antenna was designed for use with the BC-645 and is ideally suited for use on the Citizen's band, for roof-top, mobile or other installations. Has fittings for RG-8/U Coaxial cable. Includes porcelain mounting insulator and flange. Element length 5⅛", overall length 8½", maximum width 1⅞" x 3".

Price each, New ... **$2.00**

## PP-51/APQ-9 RECTIFIER POWER UNIT



Used as 115 V. 400 cycle power supply for APQ-9 transmitter; however, the power transformer makes ideal modulation transformer for conversion of T-39/APQ-9 for amateur use. Also contains other valuable parts such as 4—5R4GY tubes, 2—4 Mfd. 1000 V. DC condensers, 2—1 Mfd. 1500 V. DC condensers, 400—2600 cycle transformers, power resistors, etc. Weight 38 lbs. Size 21" Lx5⅛" Wx7¾" H.

Price .... **$4.95 ea.**

★

## HUSHATONE PILLOW SPEAKER, Model BA-301

Manufactured by the Brush Development Co. Hi-Z crystal type. Connect into any radio for disturbance-free radio reception or use for microphone.

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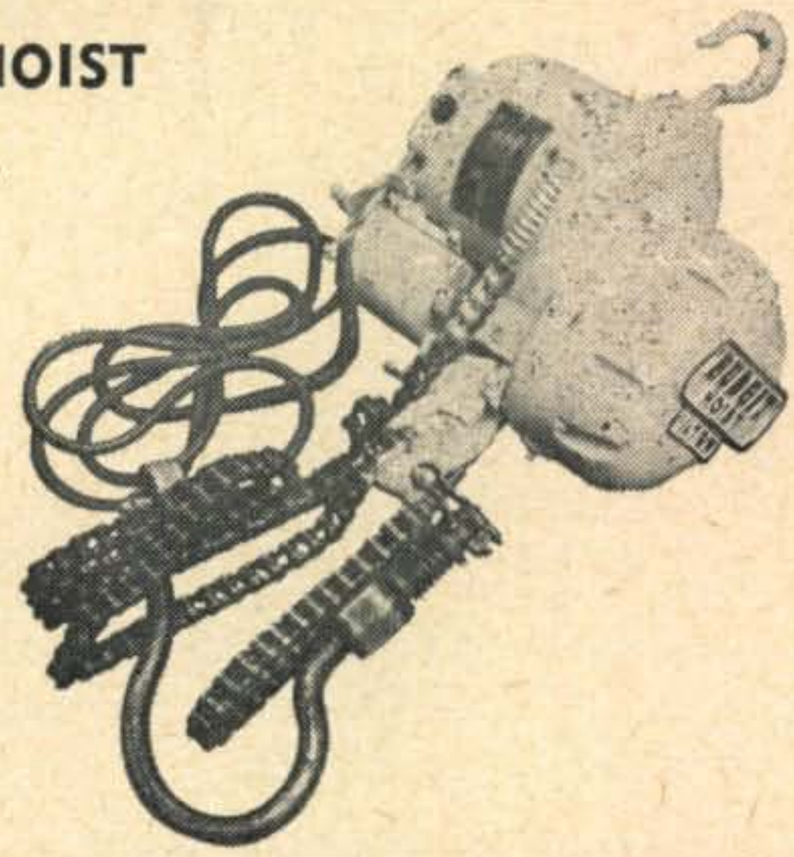
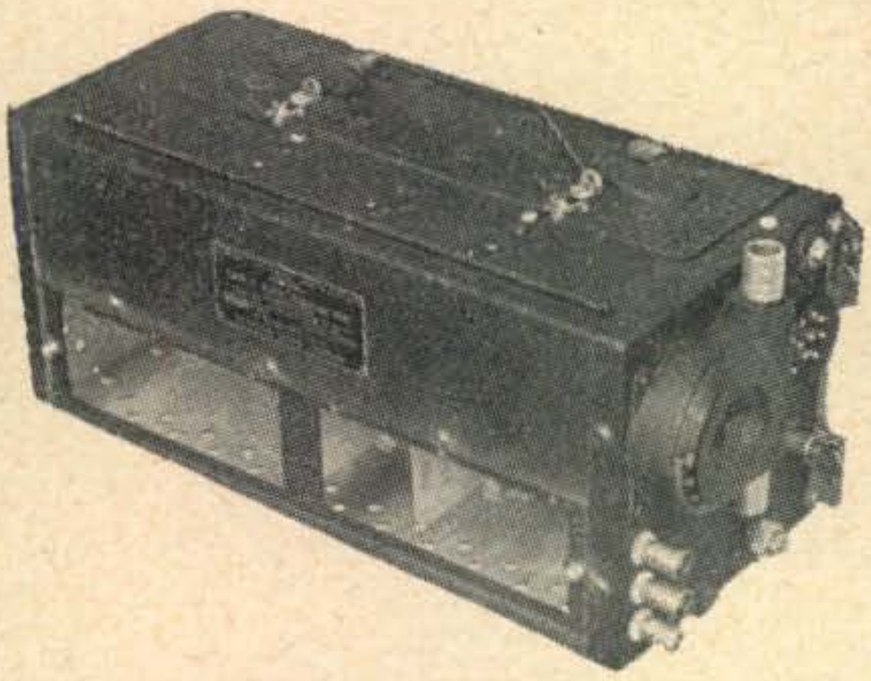


10 ft. lift, ¼ hp., 110 V. 60 cycle AC single phase motor. Capacity of hoist 500 lbs. These hoists were sold as used by W.A.A.; however, we cannot tell them from new as appearance is new and they are packed in original shipping boxes. We are using these hoists in our warehouse and have lifted loads of over 1200 lbs. without difficulty. Here is a time and back saver for any business.

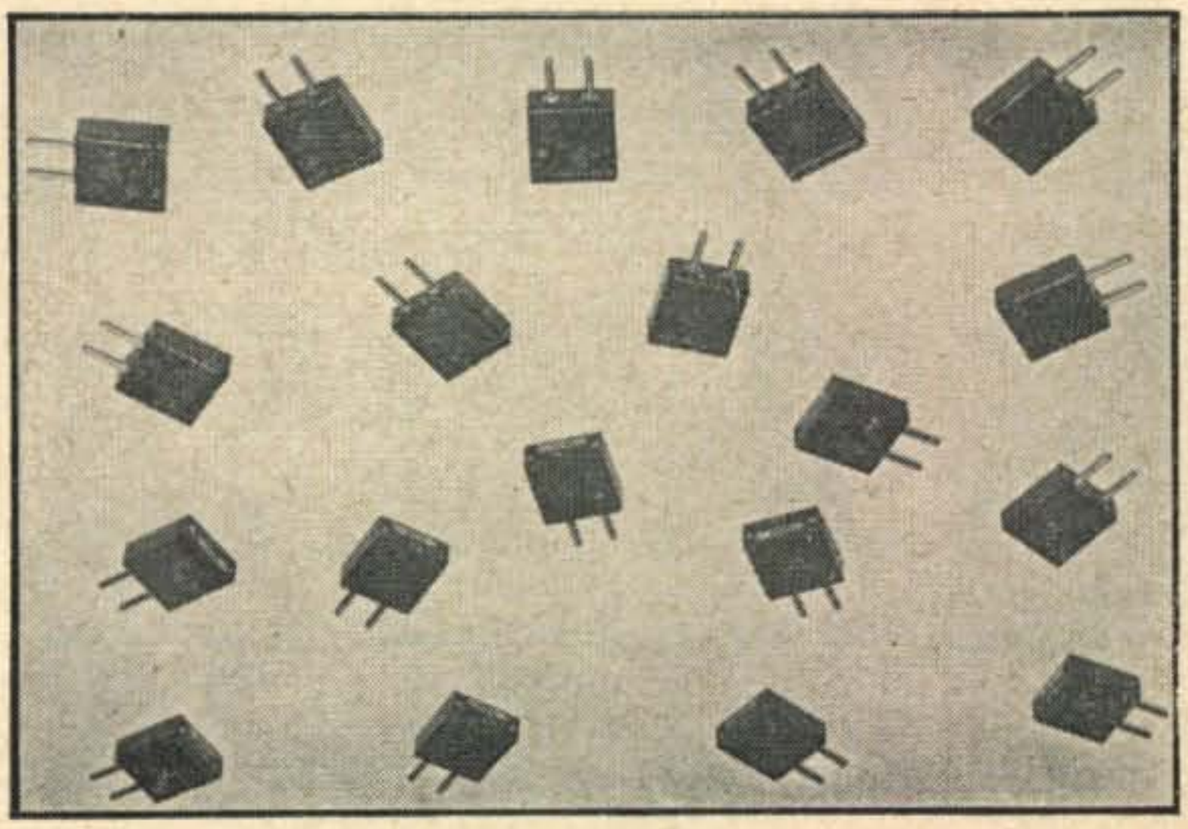
Our Price .... **$85.00 ea.**



## RECEIVER RU-16

A really hot receiver which makes an ideal auxiliary for the ham shack or for mobile installation. Made to operate from 12 or 24 V. DC systems; however, tubes may be wired in parallel for 6 V. filament operation. Tunes frequency range of 195 Kc. to 13,575 Kc. with the plug-in tuning coils listed below. Contains six tubes. Size 6½"x6½"x15".

Price .... **$5.00**



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| 8520 | 8362 | 7990 | 7340 |
| 8488 | 8361 | 7970 | 7320 |
| 8486 | 8360 | 7950 | 7300 |
| 8480 | 8357 | 7710 | 7290 |
| 8477 | 8352 | 7700 | 7280 |
| 8476 | 8351 | 7690 | 7270 |
| 8452 | 8250 | 7680 | 7260 |
| 8451 | | | |

Price ..... **$1.00** each
Or Six (choice) for **5.00**

## RU-16 RECEIVER TUNING COILS

For use with above receiver or may be purchased separately for parts.

195-290 Kc.
290-435 Kc.
400-600 Kc.
540-830 Kc.
850-1330 Kc.
1330-2040 Kc.
2040-3000 Kc.
3000-4525 Kc.
4000-6000 Kc.
5075-7780 Kc.
6000-9050 Kc.
9050-13,575 Kc.

CHOICE **50c**

Dual coil set C-379
Range 201-398 Kc.
2500-4700 Kc.

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## GF-11 TRANSMITTER

Combination unit used with RU-16 Receiver. Complete with tubes. ..... **$5.00** ea.

Tuning coils for GF-11 transmitter:

2000-2500 Kc. .... **50¢** ea.
3000-3675 Kc. .... **50¢** ea.
3675-4525 Kc. .... **75¢** ea
6000-7350 Kc. .... **50¢** ea

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### Quartz Crystals without Holders

Get an assortment of these and grind to your own frequencies or use them as they are. .5x.6" B-cut lapped on faces and squared on edges. (Ready to use). We will give you an assortment of these from approximately 13 thousandths of an inch to 24 thousandths of an inch whereby you can grind to frequencies desired. These crystals are now ground to the approximate following frequencies:

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|---|---|---|---|
| 3880 | 4640 | 6225 | 7300 |
| 3900 | 4900 | 6275 | 7400 |
| 4140 | 5300 | 6700 | 7500 |
| 4600 | 5580 | 6850 | 7800 |
| 4650 | 5800 | 6900 | 7900 |

Formula for converting thicknesses of B-cut crystals to frequency is as follows: F=98.4/T where F is frequency in kilocycles and T is thickness in inches

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Any factory built transmitters and receivers such as Hallicrafters, National, Temco, Collins, RCA, RME, Hammerlund, Millen, Meck, Harvey-Wells, Meissner, Sonar, McMurdo-Silver, Gonset, Stancor, Bud, etc.

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Large stocks of transformers

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## TRANSMITTER

(*from page 13*)

edge of the chassis. The parts comprising the final stage occupy the remaining space on the right half of the chassis. The tank condenser mounts above the chassis on 1″-ceramic standoffs, with sufficient clearance between it and the panel to install the vernier dial mechanism and insulator disc. The tank coil is to the right of the condenser, and is also spaced from the chassis by small standoffs. The 24Gs are located close to the ends of the tuning condenser, with space between for the neutralizing condensers. The grid tuning condenser mounts the neutralizing condensers, spaced above the chassis by ½″-metal bushings. The grid coil and balancing condenser are to the left of the grid condenser. This permits a symmetrical layout of the tank, with all leads short and direct. Since the photographs were made the plate, leads have been replaced with thin copper strap, with heat-dissipating plate connectors for the tubes. The grid wiring is done with copper bus and bare copper braid.

Seven of the front panel controls are equally spaced along the front lip of the chassis. These controls, from left to right, are: tuning condensers for the three multipliers, exciter bandswitch ($S_2$), the excitation control ($R_3$), meter switch ($S_3$), and the cathode standby switch ($S_1$). The three 6AG7s are spaced in a row behind their tank condensers, with room for the coils underneath. Directly behind the 6AG7s are the 6J5 oscillator, VR150 and VR75. The 5V4G and 6X5 rectifiers are grouped with the 2E26 driver in the space near the two filter condensers.

The crystal sockets and selector switch $S_6$ are mounted on a small aluminum angle bracket, which fastens to the front panel by means of the switch mounting nut. A narrow lip along the edges of the bracket gives it added rigidity. Leads from this crystal deck feed through a grommetted hole to the oscillator socket. The two milliammeters are spaced between the crystal switch and the grid tuning control. The knob on the extreme right of the panel is the link coupling adjustment.

The a.c. male connector and fuse, terminal

strips for the key or relay and the VFO input, a binding post for ground connection, and a Millen high voltage connector are mounted on the rear chassis lip.

A terminal board directly behind the meter switch holds the metering resistors $R_8$, $R_9$, $R_{11}$, $R_{13}$, $R_{14}$, in addition to $R_{16}$, $R_{10}$, $R_{12}$, $R_7$ and $R_{15}$. A second terminal board behind the first supports the bias supply components $R_{18}$, $R_{19}$, $R_{20}$, $R_{21}$, $C_{31}$ and $C_{32}$.

All bypass condensers, r.f. chokes and other small components are mounted as close to the tube sockets as possible, with the aid of small tie-down strips. The r.f. leads are made with light bus wire, while the voltage leads are cabled stranded hook-up wire. The final plate lead is run with heavy test prod wire, with the filaments connected with heavy stranded wire to minimize voltage drop.

With care in the layout, no difficulty was experienced in wiring the unit or in getting it to operate.

### Power Supply

At the present time, NBFM is being used, but a high level plate modulator is planned using 24Gs or 811s. A power supply with sufficient reserve current rating to handle the final and the modulator stage has been constructed. An additional output filter condenser on the modulator chassis will give reasonably good regulation.

Reference to the photographs will show that the power supply is conventional. The power transformer was originally of the upright mounting style, but, in the interests of conserving space, one cover side was removed and half-shell mounting used. This gives an over-all height to the supply of only 8¾". The panel supports a 0–400-millampere meter which will indicate total current drain from the supply. Two heavy duty toggle switches and two 117 v pilot lights are mounted along the bottom of the front panel. The switches are so wired that, regardless of which is closed first, the rectifier filaments will be energized first. The RF unit is plugged into the socket on the back of the power supply chassis, as is the modulator, so that the final filaments and low voltages are turned on along with the 866 filaments. The other switch on the panel then applies high voltage to the final.

A 100-watt lamp serves to drop the line voltage to the plate transformer whenever $S_7$ is opened for tuning up. The bleeder is made from 4 twenty-watt resistors fastened under a perforated metal safety cover. Protective carbon resistors are shunted across the high voltage in case the bleeder should open.

### Operational Notes

When first firing up the rig, it is wise to check the exciter before applying plate voltage to the final. With the cathode switch in the closed (operate) position, the 2E26 plate voltage should be approximately 450 volts, and the multiplier plate voltage 300 volts. The VR tubes MUST be in their sockets to attain correct operating volt-

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### Eldico Transmitter Filters

Dual low-pass, 40 Mc cut-off, over 75 db harmonic attenuation. 52-72 ohm input and output. At other impedances use antenna tuning network. Good for 1 KW input, negligible fundamental attenuation. No effect on antenna performance.
**Model TVT-62, $7.99 kit, $10.99 wired & tested.**

### Eldico Receiver Filters

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**TVR 300 for Twinex—TVR 62 for Coax**
**Either model } $1.98 in kit form**
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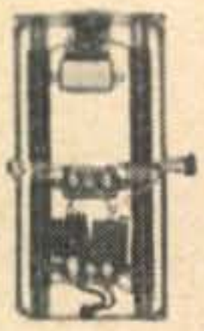


### Brute Force Line Filter

Similar to one on Page 508 ARRL Handbook. Will handle 1 KW. Completely filtered and shielded. **$5.98 in kit form, $8.98 wired & tested.**

### Copper Mesh Shielding

Heavy Duty, tightly wound, expensive but it really does the job right, the only screening we've found that will. 36" wide, minimum order 6 sq. ft. **Per sq. ft...$.85, plus $.50 per order packing and shipping charge.**

### GDA GRID DIP KIT

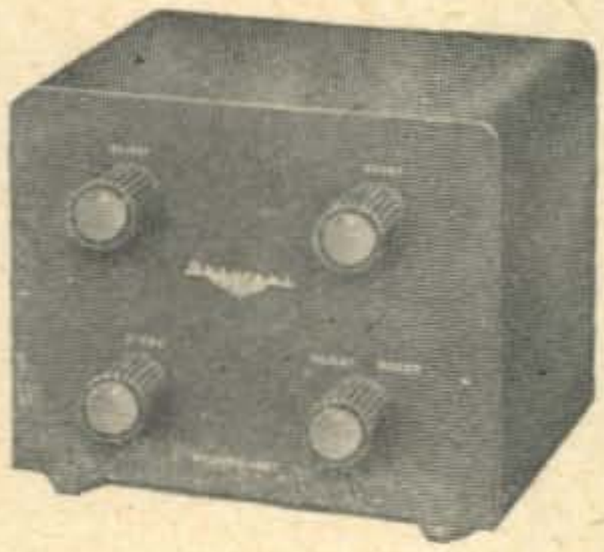
The most valuable piece of test equipment in the ham shack is the Grid Dipper. Build one with this kit and save countless hours in building, improving and de-bugging your rig. The GDA Kit builds an exact duplicate of the "Grid Dipper" and includes everything from the special handy case permitting one-hand operation down to a complete application and instruction book. With tube and internal power supply, range 3 Mc to 250 Mc in 6 steps, size 5½" x 2⅜" x 3". **Complete Kit .....$21.50**

***See our January ad for complete information on Eldico Transmitters, Power Supply, Modulators, etc.***

## BC-221 FREQUENCY METER

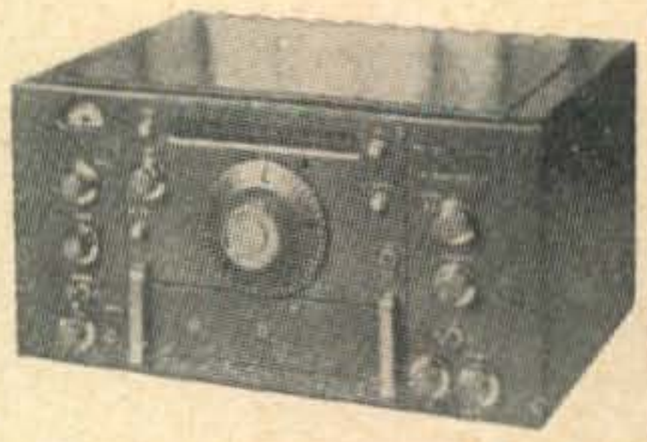
These won't last long so get your order in now for one of these famous freq. meters. They are just like new, with original calibration charts. Range 125-20,000 kc, with crystal check points in all ranges. Complete with crystal and tubes. **Harvey Special Price .....$79.50**

## SELECT-O-JECT



Beat QRM on the bands with this new National product. Unbelievably versatile, it is a variable single frequency rejection filter and selective amplifier. Add Select-O-Ject to any moderately priced ham receiver and get "big" receiver performance. **Complete with tubes...$24.95**

## HRO-50



This new National will set new standards of performance. 12 all-new features including: variable threshold automatic noise limiter, voltage regulated oscillator, 2 tuned-RF stages with fine image/signal ratio and gear driven micrometer dial. **In Stock ..... $349.00**

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**103 West 43rd St., New York 18, N. Y.**

ages. The plate of the oscillator will receive 150 volts from the VR tube, and the 2E26 grid is biased 50 volts negative. With these voltages checked, and a suitable crystal in the oscillator, the multiplier tuning should be checked. A small neon bulb and a wavemeter will aid in locating the tuning points for various frequencies. The plate currents of the multipliers will range from approximately 10 to 30 ma, depending upon mode of operation and frequency. Multiplier tuning is best done by setting both meter switch and excitation switch to the #1 position and adjusting the excitation pot to approximately 20 ma plate current in the first multiplier at resonance. The meter and excitation switch are then progressively switched to multiplier 2 and 3.

With r.f. output from the multipliers, and a suitable coil in the final grid tank, the 2E26 should show plate current when the final grid is tuned thru resonance, and grid current will be indicated at the final. The 2E26 will be cut off without excitation because of the fixed bias applied to it. The driver plate current should be adjusted to 50 to 70 ma by means of the grid trimmer and the excitation pot. This should give approximately 30 to 50 ma of grid current at the 24Gs, which operate with 125 volts bias with grid current flowing.

The final should be neutralized before applying plate voltage. The condensers should be set near minimum capacity since the 24Gs are low *C* tubes. While neutralizing, a rough check of the final plate tank resonant setting should be made before applying plate power.

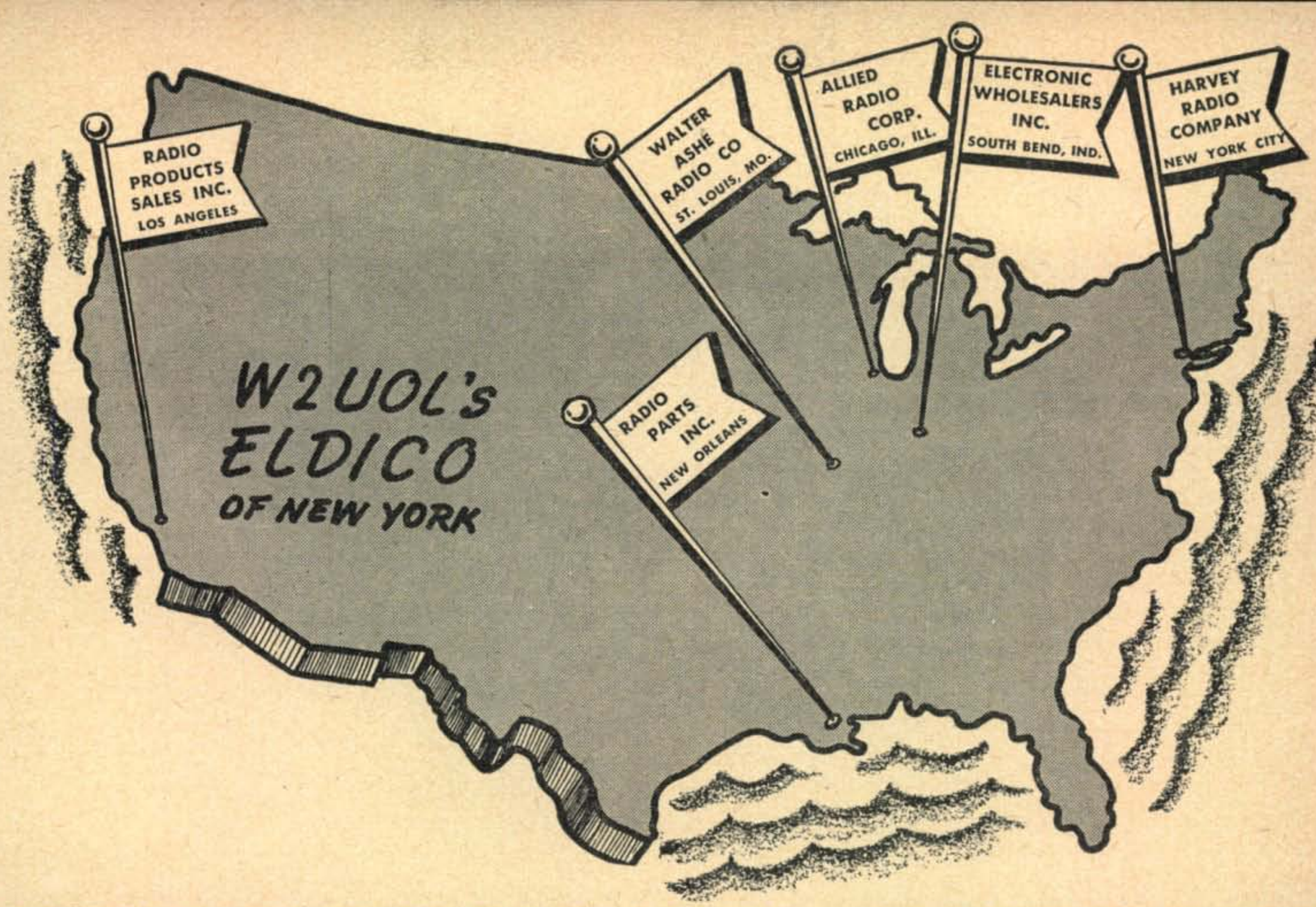
The high voltage leads may now be connected and the hi-lo switch set in the open position which puts the lamp bulb in series with the plate transformer primary. With the link decoupled, low plate voltage may be applied and the tank tuned to resonance. Couple in slight loading and retune the tank, until the tubes begin to show color. It will now be possible to adjust $C_{21}$ until both plates show similar colors, after which the neutralization should be rechecked.

The final is now ready for high power, and should be coupled to its load until 150 ma of plate current is indicated on $M_1$. This condition should not produce excessive plate heating. When the cathode switch $S_1$ is opened, the exciter currents will drop near zero, and then the final 24Gs will draw about 40 ma on standby.

A complete check for TVI and parasitics as well as hum should be made before extensive on-the-air operation. In the unit shown, no objectional TVI is caused when the unit is encased in the cabinet rack, and the carrier is clean and hum-free.

The transmitter is normally operated with the HT-18 NBFM VFO and keying is done in the VFO. For operation by keying the 6J5, some experimentation will be necessary with the proper *RC* circuit to reduce key clicks and chirps.

The finished transmitter has proven very satisfactory as to operation and finished appearance, and has been operated by W8ZGH/3 with much success.

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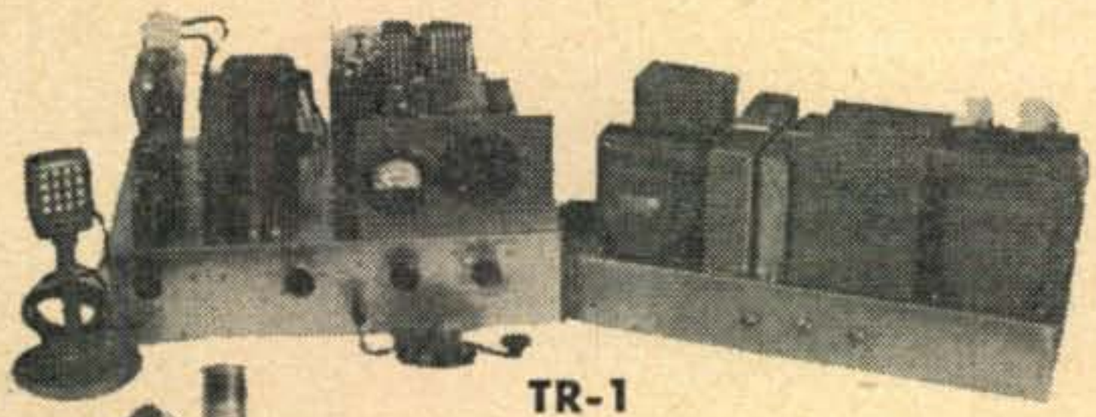


**TR-1**

**Cramerton, N. Car.**

**Dear W2UOL:**

I already have my TR-1 Transmitter on the air. I am using a folded dipole antenna and getting a good many contacts.

I am a blind ham. I got my ticket in February of this year. I have been wanting to get on the ten meter phone band but did not feel that I had the money to buy what I wanted until I heard of your kit. Some of my local ham friends wired it up for me.

**Oscar W. Norris, Amateur Radio W40XH**
**542 Brooklyn St., Cramerton, N. C.**

**Pomona, Calif.**

**Dear Sir:**

I am very to report great pleasure and success from building your "grid-dipper" kit. It works very well far better than I had hoped!

**George Stringfellow, W6BMH**
**1160 No. Garey Ave.**
**Pomona, Calif.**

**GDA**

**Wayne, Mich.**

**Dear Don:**

Rcvd a real FB Xmas present last nite — one of Ur TR75's tho' I had been raving abt it since the first time I had seen ur ad in the "CQ" and the Swap & Shop" I didn't really expect to get it. Really a pleasant surprise. The XYL knew I had bn planning on gettint one rite aftr the first of the year. Hi. Unpacked and inspected it tonite and I must say that U boys sure do live up to ur word — the components parts are top quality stuff. Sure anxious to get to work on it and get it on the air — but as you advz I'm going to take my time with it and do a gud job.

**Joseph A. Butkiewicz**
**W8EHC**
**4487 Mildred Ave.**
**Wayne, Mich.**

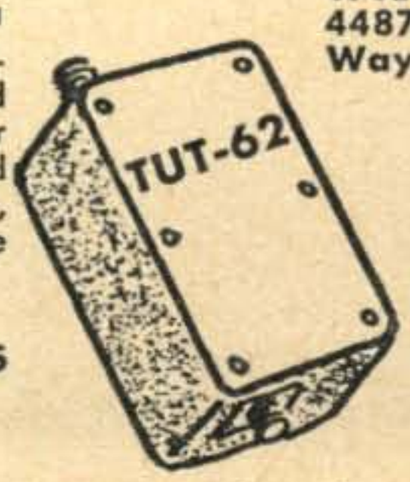
**TR-75**

**Dear Sir:** **South Bend, Indiana**

I am using the transmitter filter with complete success and have passed the word around town to the rest of the boys. The transmitter filter is wonderful. I run a KW on 80-40-20 and where my neighbor was out of business before, he can now watch his weak signal in complete enjoyment.

Thanks again and

**Arthur E. O'Neill, W9PDS**
**Radio Station WSBT**
**South Bend 26, Indiana**




**W2UOL's ELDICO OF N.Y.**
**44-31 Douglaston Pkwy.**
**Douglaston, L. Is.**

# 420-MC CONVERSION

*(from page 19)*

the 807 are removed. The phototube circuits and the two 6AC7 circuits were completely removed, as well as all of the wires to the terminal strip.

Terminals 3 and 4 of the terminal strip are used for the modulator meter circuit. The 2.5-ohm resistor, which was originally connected from pin number 5 of the 807 tube to terminal number 1 of the terminal strip, was removed and placed across the meter switch in the MOD position. Using the 0-1 ma meter, full scale deflection on the meter corresponds to 200 ma in the 6AG7 and 807.

In casting about for a likely modulation transformer for the voice signals (rather than the video noise originally used for modulation), it was found that the 400-cycle power transformer which comes with the unit serves the purpose quite well. When the 807 output circuit is connected to terminals 8 and 10, the 8012 plate circuit to terminal 12, and the d.c. supply to the 8012s connected to terminal 14, a pretty good match is obtained.

All power connections enter through the modulator power plug, and the audio gain control was placed where the original 100-ohm gain control came from. The modulation transformer was placed at the rear of the modulator chassis by cutting off the unused end of the chassis. At the same time, it is necessary to cut a small corner out of the oscillator chassis in order to make room for the modulation transformer. One of the bolts on the transformer was anchored to the oscillator chassis by a metal strap.

The power supply requirements for this unit are not too great. The 6.3-volt filament winding (or transformer) must have at least a 6-ampere rating. The oscillator will function very nicely with a "B" supply of 450 or 500 volts and give about 10 watts output.

The antenna used on this transmitter was a war surplus item which was made for 420 mc, the AN-80A, which is a vertical quarter-wave section. Most amateurs, however, will probably prefer some directive array such as the Yagi, corner reflector, or possibly the coaxial antenna, which is non-directional. Or maybe you would like to try a parabolic section reflector, noted for its high gain. Anyway, here is an excellent opportunity to do some experimenting with various arrays and to apply the knowledge gained to your 2-meter or 10-meter rig.

How does this transmitter compare with others for the same frequency? Exhaustive tests were not made; however, it has a good lead over many that have been built or tested to date. If the amateur wishes to push these tubes, they can be operated with 1000 volts on the plates at 150 ma plate current giving a power output above 50 watts on c.w. For phone operation the oscillator plates may be run at 800 volts with about 125 ma

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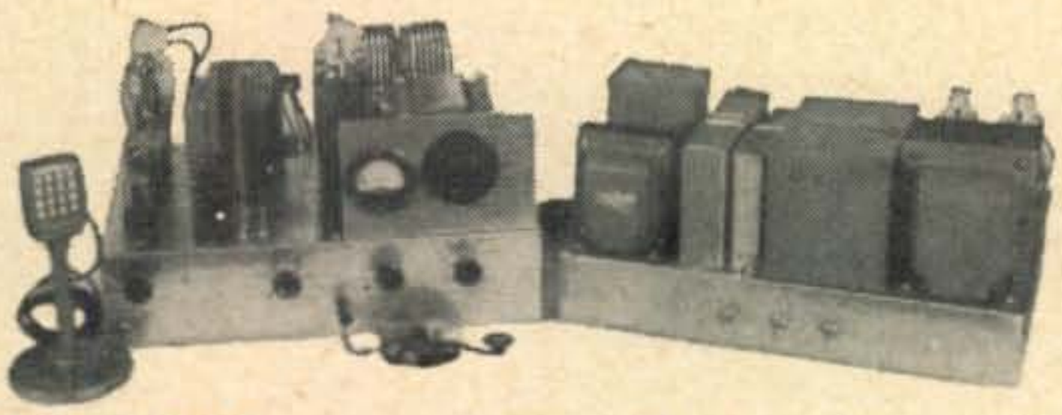

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plate current. Of course, with these operating voltages the tubes must be forced-air cooled.

* * *

*Editor's note: All too often, in this surplus-conversion business, a really good conversion article appears in a magazine, but the readers find the equipment almost impossible to obtain at their regular distributors. In order to prevent this in the case of the APQ-9, we sent letters to all of the dealers we know of who handle surplus equipment, telling them of the forthcoming articles, and asking them to indicate whether or not they have the necessary units in stock. The following companies have informed us that they stock the APQ-9 components:*

*Engineering Associates,*
*434 Patterson Road*
*Dayton 9, Ohio*

*Electronic Research Labs,*
*1021 Callowhill St.,*
*Philadelphia 23, Penna.*

*East Coast Radio*
*Bldg. 29, Mun. Airport #1*
*North Main Street*
*Jacksonville, Florida*

*Esse Radio Co.,*
*42 W. South Street*
*Indianapolis, Indiana*

## HIGH VOLTAGE SUPPLY

*(from page 17)*

The transformer used in this supply passes this test very nicely. With 866As in place of the 836s, some hash is present, but none is noticed under any conditions with the 836s. The d.c. voltage output with 866As is about 75 volts higher at full load than it is with 836s (the rectifier drop in a bridge is twice that of a single tube) but that seems a small price to pay. I do miss that old familiar blue glow, though!

Ripple voltage measures well under 5% at each terminal, under load, and locals report no audible hum, despite the use of single section filters for both driver and final. This checked previous experience and was expected, as in practice I have always found a good single section filter to be sufficient even for AM 'phone, despite what the handbooks say.

The mechanical construction needs no comment except to point out that the transformer and the large choke are aligned with the edges of the chassis, which is a heavy duty job. So far it shows no signs of caving-in, and you can take it from me, it's a lot easier to put that meter hole in a chassis, even a heavy gauge one, than it is in a mild ole' ⅛" panel.

## ONE SOLUTION

*(from page 26)*

ish coming from the electric hot water heater."

"You'd better let me fix it for you, Harry. I'm going down town tomorrow anyway. I'll pick up the parts and fix it tomorrow night. It's no trouble."

"I shay forget it, George. And when Harry Watshun says forget it, thatsh juss what he means."

"No, Harry. If I'm causing any interference, I want to clear it up. It's a part of the Code of the Radio Amateur. If I allow interference to go unattended I damage the reputation of all the hams. I'll get the parts tomorrow and fix it."

"Wh'nt you let me pay for the partsh?"

"No. I'll buy the parts, and I'll fix it for you."

"Listen, George. I like you. And I'm not gonna let you buy parts for my television set. Now, I don't want any trouble from you. Will five dollursh cover it?"

"Put that money back in your pocket."

"Now lishen. I'm puttin thish five dollorsh right here on the table. If you're gonna fix my televishion, the leasht I can do is pay for it."

"Take your five dollars."

"Lishen. You wanna be my friend, don't you?"

"Sure."

"You take that five dollorsh then, or I'll be the worsht enemy you ever had."

"Well, I really think I should buy the parts."

"Are you gonna take the five dollorsh, or do I have to get mad?"

"Oh, alright. You can buy the parts."

"It'sh been swell meetin' you, George. I'd better get back home, before the old lady wondersh where I've been. I'll see you tomorrow night. And thanksh."

"Glad to have met you, Harry."

"Sholong."

Curtain.

## STABLIZING THE VFO

*(from page 25)*

chassis in the console helped considerably.

I turned next to shielding. After shielding the power cable which ran between the BC-696 and transmitter and placing a tube shield on the 1626 oscillator tube, the note still did not sound too good in the receiver, but I swung my beam to the west and called a W9. I was very pleased to receive a T9X report and I heaved a sigh of relief after the nightmare I had gone through during the past several weeks. The receiver had fooled me somewhat. Evidently the strong r.f. field was affecting it too.

The next evening, being more eager than ever

to operate, I put the rig on phone, swung the beam into the southwest and proceeded to call a W5. One glance told me something was wrong because the meter needles were nervous again as I applied modulation. The grid current on the 833-A varied as much as 15%! The W5 came back and told me that there was considerable distortion and bad frequency modulation. That "wrung out" feeling came over me as I thanked him, signed, and pulled the big switch. Frankly, I began to search through the surplus ads for crystals. In all my years of ham radio I had never had so much trouble. I had just about as much of VFO as I could stand.

The next day, however, I felt different. Surely, hundreds of others must have gone through the same thing and licked it. So back to the shack I went. I racked my brain trying to figure the thing out. I had made no changes in the rig, yet one night everything was normal and the next I was right back with my original trouble. Slowly I began to realize what was happening. The entire station is located in a third-floor attic room while the rotary beam is located about 25 feet away on the roof. One night the beam had been headed west and the next night southwest. Evidently the r.f. field from the beam in the west position wasn't strong enough to disturb the VFO, but it was strong enough when the beam was pointed southwest. A quick check of the beam in the southwest position showed that the beam pattern was aimed directly at the rig. But how could the r.f. be getting into the VFO? I had already shielded everything I could think of, including the oscillator tube itself. I had inserted r.f. chokes and by-pass condensers throughout the rig until

it seemed ridiculous. There was little doubt in my mind by this time that there was considerable r.f. feedback. I cut off two lengths of broomstick about ten inches long and wound them with about 150–200 turns of #12 enameled wire. The 110-volt line which fed the entire transmitter was then broken right at the rig and one of these chokes placed in each side of the line. Two 0.1-μf condensers were connected from the transmitter end of these chokes to ground (see *Fig. 3*) and the rig again fired up. If r.f. from the beam was getting in the 110-volt lines through the power supply to the VFO, this filter arrangement should help. I put the rig on the air and rotated the beam continuously through 360° applying modulation at the same time. The rig seemed quite stable, so I worked a few stations in different directions on both phone and c.w. All phone reports were OK. Critical checks made by stations contacted showed no frequency modulation, distortion, or instability of any kind. C.w. reports were again T9 and T9X.

I was happy again, but not for long! One morning I had the beam pointed west working a KG6 on c.w. His report disturbed me. While he was kind enough to give me T7, I knew it must be worse. He reported severe chirps, clicks, and instability. Here, after weeks of hard work, there was still r.f. feedback. I asked my KG6 friend to please QRX and lifted the cover of the console to look in and see if my ground connections were OK. Everything seemed to be in order, so I closed the lid and called the KG6 again and told him I would have to QRT. To my surprise he came back with a report of T9X and said all traces of chirp and click had disappeared. Now what? The only thing I had done was move the microphone, which wasn't in use at the time because I was working c.w., and lift and close the wooden lid of the console. Frankly, I was baffled. After some thought I concluded that regardless of all my grounding of chassis, shield cables, wiring, etc., there was still r.f. around. All I had done during my experiments was shift it from one place to another. Here is what I figured happened this time. My mike cable is a double-shielded affiair consisting of a regular piece of coaxial mike cable plus an additional covering of braided shielding. Both pieces of shielding are grounded. This arrangement was required to eliminate r.f. feedback in the speech equipment. The home-built wooden desk to hold the console has a strip of aluminum edging around the front and sides measuring about thirteen feet in length. When the braided shield of the mike cable touched this strip the r.f. voltage was shifted to a point in or near the oscillator circuit of the VFO. The mike cable passes beneath the VFO in the console to get to the speech amplifier which is mounted next to it. Further tests showed that with the beam pointed in certain directions the cable could touch the metal strip with no ill effects, but with the beam pointing towards the shack it was necessary to keep the mike cable away from this strip. When I operate phone or c.w. now I make sure the cable is separated from the strip.

**Recommendations**

After several months of phone and c.w. operation with stations at various beam headings there has been no trouble with r.f. feedback. As a result of my experiences, recommendations for VFO users having similar difficulties are as follows, in order of their importance:

1. Erect the antenna as far from the VFO as possible.
2. Keep the main ground lead for the station as short as possible and use the largest wire size available. Build the station in the cellar, if possible, to help obtain a good ground and experiment with grounds at various points, on or near the VFO chassis. Don't take it for granted that the 110-volt line is at r.f. potential in the shack. It probably isn't. Don't be surprised if points tied to the chassis in the VFO through wires make poor r.f. grounds. In one case the B-lead for the BC-696 power supply socket was connected to the chassis with a three-inch wire. A noticeable improvement was experienced when the socket terminal itself was grounded directly to the chassis and the three-inch wire eliminated. All this may sound screwy, but close attention to these small details makes the difference between a really good-sounding rig and a poor one.
3. Place the VFO far enough from the transmitter to eliminate pickup from the higher-powered stages.
4. Insert a heavy-duty r.f. filter in the 110-volt line as close to the transmitter as possible to keep r.f. from getting into the power supplies.
5. Don't skimp on shielding. When the BC-696 was used by the Services as a VFO-Exciter, the unit was installed *inside* the aluminum fuselage of an airplane, while the antenna was on the *outside*. The amount of shielding required depends on the amount of r.f. voltage floating around the shack and the completeness of your r.f. grounds. Some experimentation is required as each case of r.f. feedback is different due to arrangement of equipment in individual ham stations.
6. Don't depend on the station receiver as a monitor when the antenna is hooked to the rig. A strong r.f. field can cause the receiver to become extremely unstable and render a false report.

## MOBILE MODULATOR

*(from page 22)*

of the chassis mounted near the tube sockets and is shielded by a section of iron pipe to reduce magnetic hum pickup. A crystal microphone would have eliminated the need for this transformer with its associated hum-pickup troubles, but the sensitivity of that type to temperature and humidity renders it unsuitable for mobile use. The recent availability of ceramic microphones,

however, has changed this situation. They are essentially impervious to temperature and humidity conditions, and, having electrical characteristics similar to the crystal type, require no transformer. An Astatic CC1S, equipped with a ceramic cartridge, was modified to permit operating the push-to-talk relay, $K_1$ with the conventional microphone switch. The additional lead was obtained by replacing the single-conductor cord with a double-conductor one. The microphone transformer was removed and the microphone jack wired directly to the 6SJ7 grid as shown in *Fig. 2*.

Results with the ceramic microphone have been very gratifying. Reports from stations familiar with the previous dynamic unit (and it was a good one of standard make, not surplus) have invariably included reference to the greatly improved quality and intelligibility. A slight persistent vibrator hum, originally magnetically induced by the push-to-talk relay into the dynamic microphone transformer, has completely disappeared. A CC1S similarly modified and used by W2DZV has been equally successful.

A modulator such as this, on a 274-N chassis, mounted beside a converted 274-N transmitter on a dual transmitter rack as shown in the photographs, makes a very convenient installation for either fixed or mobile operation. All inter-unit connections may be made via the plugs on the rear of the chassis, with cross-connections made in the shielded compartment which comes on the rear of the rack. By means of a plug connector on the rack, the entire assembly may be plugged into either the mobile power supply cable or removed from the car and used with an a.c. power supply as a fixed or portable station. Perhaps even better, separate racks may be used for mobile and fixed operation, and the modulator and transmitter units only transferred.

The transmitter shown in the photographs is a 4- to 5.3-mc, BC 457, converted for 10 and 11 meters, essentially as described in January, 1948, *CQ*. The two grid current jacks are at the rear of the chassis, on the right, since they would not be accessible on the left as shown in that article. Note that the rack must have clearance holes to permit access to the jacks. No plate current jack is included since plate current may be read on the meter on the modulator. Because of the relatively high power level at which this installation is intended to run, two 807s in parallel are used in the final. The exciter shown in the January, 1948, article is capable of driving them.

By providing other 274-N transmitters, converted as necessary for the desired bands, band-change can be reduced to the simple process of plugging in the proper transmitter and making such antenna modifications as are required. Since each can then be set on a preselected frequency, and completely pretuned, one to two minutes are all that are required for a complete band change, including adding or removing an antenna loading coil as may be required for lower frequency bands.

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|---|---|---|---|---|
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| S-458A | 14 | 4.5 | 1.75 | 7.25 |
| S-167A | 14 | 10 | 3.75 | 10.95 |
| S-292A | 14 | 40 | 12 | 29.95 |
| S-296A | 28 | 1.8 | 1.25 | 5.75 |
| S-344A | 28 | 5 | 5.75 | 11.50 |
| S-172A | 28 | 10 | 6 | 16.50 |
| S-291A | 28 | 20 | 12 | 29.95 |
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|---|---|---|---|---|
| RPS-8883 | 18 | 3 | 3 5 | $ 3.75 |
| RPS-8884 | 18 | 5.2 | 5.5 | 4.25 |
| RPS-8885 | 18 | 12 | 12 | 6.15 |
| RPS-8886 | 18 | 46 | 35 | 19.65 |
| RPS-8888 | 36 | 2 | 5 | 4.15 |
| RPS-8889 | 36 | 6 | 12 | 6.75 |
| RPS-8892 | 36 | 12 | 25 | 11.65 |
| RPS-8890 | 36 | 23 | 32 | 19.25 |
| RPS-8891 | 36 | 46 | 78 | 51.25 |

NOTE A: All transformers have 3 extra taps—for example: 20, 19, 18, 17 volts and 38, 37, 36, 35 volts.

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## DX and OVERSEAS

*(from page 35)*

countries, as well as improve the signals of those who are already on the air.

W4LZM, who incidentally has just been elected Prexy of the Jacksonville Amateur Radio Society, reports that CR5UP has left Sao Thomas Island. . . . F9QU/FM8 says he lives in a free country and there are no mail restrictions. W4LZM is still running 67 watts on 10-phone and figures on firing up a 4-125A any day now. Bob grabbed UB5BV who uses a VFO, seldom using the same frequency for two consecutive QSOs. He also worked FF8PG, which isn't bad.

W6CTL says Thanksgiving Day came through with FY8AA. And, by the way, FY8AA takes the prize for being the most reported station worked this month. . . . W8EKK is right in the middle of DX fever and says he has really gotten a few tips out of our "CQ DX Handbook."

Gee, I can't help thinking about those 17 guys making WAZ this month. Imagine checking seventeen sets of 40 cards. Wow! I can't overlook the country total of W1FH. . . . 234. Also the fact that the cards from PY1DH and PY1AHL came in a day apart. Then, too, it looks like VE6GD is the first VE6 to WAZ. Yep, that's a lot of cards to check in one month.

Two or three fellows have told me that UY5AK is ex-YR5I, undercover, and unlicensed. But, we don't know where the guy is, and, of course, there are no cards available. In short, we are not much better off than we were before.

W5NUT passes along a little info about W5FYN/VR4. In a period of eight weeks, he worked 561 different stations in 38 countries. The field has been closed down on Guadalcanal and it looks as though he is being transfered to Arabia.

Those of you who work 10-phone might be interested to know that CX3BH is still using push-pull 210s. Yes, that's right! Those old, old 210s. I wonder is he saws slots in the bakelite base, or maybe he de-bases the 210s completely like many of us used to.

W2BXA has received a card from EA8AO on which it stated "QSO made in Rio de Oro." Prior to receiving the card, Ben still thought the fellow possibly may have been in Madrid.

Well, look who's here . . . GM2UU. It has been over a year since we have heard from Doug. He hasn't had much time to get on the air, so this accounts for the lack of correspondence. Doug says, for safety reasons, he took down his old mast that supported his rhombic and put up V-beams. He is now fooling around with rotary types and has tried a two-element 8JK, a quad, and at present is now using a three-element close-spaced. The next on his list, he says, is going to be a 5-element affair. Doug says he has picked up a few new countries, but no new zones.

W4RBQ worked UA9EC for his 37th zone and FY8AA and AP2N for new countries. . . .

W5FXN has a suggestion involving the QSL Bureaus, and offhand it sounds like a good idea to me, although, of course, I have never run a QSL Bureau. Jim's idea is this. Since probably most QSL Bureaus, like the one at W5AJG, have cards on file for several years that are unclaimed, Jim feels something can be done about them. He feels that in spite of a certain amount of publicity given to the procedure of sending in a self-addressed envelope to the Bureaus to get your cards, there are still plenty of hams who don't know about it, or in any event don't claim their cards. For sometime now, when he sends in his usual self-addressed envelope to the Bureau, he includes a stamped envelope which is otherwise blank. He goes a bit farther and encloses a note in a plain envelope, typed on onion skin paper which reads something like this:

> "For some time, you haven't claimed your DX QSLs. Possibly you are not familiar with the QSL Bureau's operation, or didn't know or care about these cards. Several of us are trying to help the bureaus see that all unclaimed cards are delivered to their rightful owners. We have included an extra envelope for the purpose of sending these cards to fellows like yourself with the regular envelope that we normally send. You may have your DX cards forwarded to you promptly by sending a stamped, self-addressed envelope showing your call in the upper left corner to:
>
> ADDRESS OF QSL BUREAU
>
> As soon as cards are received by him, he will forward them to you. Won't you send a new envelope now and include an extra?"

As you can see, the QSL manager, if he has some unclaimed cards of long standing can address the plain envelope and send the cards along with the note. Jim says this has been working to the satisfaction of the W5 QSL Bureau and thinks, possibly, other hams might like to do the same thing. He certainly has a good spirit about the subject, and although he is not trying to be a Boy Scout, it looks to me as though he has done a pretty good turn. Jim signs off his letter to me with the following. "DX has been lousey lately, and I am down to working guys like W6SN. Rough . . . ain't it?" I trust he knows SN!

That does it for this month, gang; good luck in the brawl . . . see you next month. 73.

### QTHs

| | |
|---|---|
| F9QV | Ponts et Chafisses, Bonifacio, Corsica |
| MD2PJ | Via R.S.G.B. |
| MD3MB | Via R.S.G.B. |
| OQ5GD | George Dauvin, P.O. Box 271, Leopoldville, Belgian Congo |
| PJ5RE | Via W5MMD |
| VP1WS | Bill Swan, c/o Government Radio Department, Belize, British Honduras |
| VS9AV | c/o Aden Com. Sigs., Aden |
| ZB2I | 9 Naval Hospital Road, Gibraltar |

## MODULATION MONITOR

*(from page 23)*

Two switches are provided on the face of the monitor panel which can be used to actuate appropriate relays to change the transmitter from phone to c.w. and to perform the send-receive operations.

In *Fig. 2* the markings clearly indicate the purpose of each meter and switch. On the bottom row, from left to right, are the jack for the aural monitoring pick-up, the pilot light bullseye, and the "on-off" switch.

The volume indicator may be either an old discarded rectifier type (that used by the author was of such ancient vintage that the scale read in TU [transmission units] instead of the more modern db [decibel] notation. An a.c. voltmeter of some 3 volts or so scale reading may also be used if available.

The unit should be housed in a metal cabinet which is to be grounded so that r.f. pick-up is restricted to the small piece of wire acting as the antenna. The case shown in the photograph is 10″ × 10″ × 7″.

## V.H.F.-U.H.F.

*(from page 37)*

as we get with a straight dipole on 144, we would have to increase the length of the 420-mc array three times—which would call for at least a three-element colinear affair. In the case of broadside arrays, a parabola-type screen reflectors, the frontal area of the 420-mc array should remain the same as that of the two-meter array for equal field-strength sensitivity. The added gain of such a large array on transmitting is our 420-mc bonus! In short, don't jump to the conclusion that just because you have a 16-element beam for 420 mc you are going to do as well as the fellow up the street who has a similar two-meter array. It's going to take a few more elements in your beam to approach his results, even if the rest of the station equipment measures up to two-meter standards.

We are not going to go into much detail regarding the propagation phenomena which might come into play as we move up to the higher frequencies. Reflections and shadowing will be much more apparent. Setting up a 420-mc antenna in the presence of reflections might well be like adjusting a TV array for minimum ghosts. There are certain to be more mysterious phenomena of propagation which we will be hard-pressed to explain. In fact, we have already heard some reports which seem astounding to us. In a recent survey of u.h.f. TV signal propagation made by research workers of the RCA Laboratories, it was demonstrated that, in a fairly large percentage of the receiving sites tested, high-gain antennas actually provided less input to the receiver than much lower-gain antennas. It seemed as though the sharp high-gain antenna was discriminating against some of the signals which arrived from slightly different directions than the main wave, and neither the direct wave nor any of the echo signals seen by the sharply directional array was as great as the composite sum of all the signals picked up in the less discriminating (and hence, lower gain) antenna. If, in fact, reflections will occur from smaller and less substantial objects on the higher frequencies, we might well predict more and

better band-openings than we can hope for on the lower channels.

As for the u.h.f. transmitters, I would venture a prediction that it will be many months before we will see many high-powered stabilized transmitters on the air. At this time the tubes which can be used for this sort of project are in short supply, and are unduly expensive when obtained commerciaHy. It is not too hard to obtain a few watts of crystal-controlled power on 420—the boys who have tried the 832 and 8025 as multipliers have shown this to be true. But the hard part comes when one tries to build up the feeble output of these tubes to something useful. We need someone to show us the way this can be done using readily available tubes. The few commercial u.h.f. jobs which we have seen to date look like masterpieces of machine-shop techniques, and can hardly form the foundation for ham practice.

In summary, the present-day picture of 420-mc techniques does not look too rosy. We are using inferior receivers, lossy feeder lines, and low power. Still, the workers on this band are reporting very optimistic results! Maybe those mysterious phenomena which we mentioned above are working in our favor! How are we best going to take advantage of the full potentialities of the band? My private opinion is that we will go through an experimental period in which our principal source of signals will be fairly high-power self-controlled oscillators. To accommodate the signals from these rigs we will require relatively broad-band receivers, but it would be well to provide means for obtaining higher selectivities for the day when stable transmitters are finally developed. As long as the wide-band receivers are in general use, the emphasis in transmitter design should probably be placed on higher power output, not upon stability at the expense of output. Perhaps the use of FM might help to bridge the gap during this phase of the development of the art. Larger antennas are necessary, and we should learn to judge antennas by size, not by the number of elements alone. Along with these larger antennas must come techniques for using them, for the needle-sharp directivity which we will obtain from these high-gain arrays is much greater than anything we have had to cope with to date. Expert navigation will be required to set the beam exactly on the particular station which you hope to work!

But let's stop worrying about the problems, and get on the ol' band and give it a chance. The less we know about a band, the more fun we will have trying it!

## More on Beacon Transmitters

As we predicted last month, the use of continuously-operating amateur "beacon transmitters" has already started to pay off. On at least two occasions during the past month the signals from VE1QZ have been reported, by W8NQD on the 27th of November, and by W7JPA and W7FIV on the 28th.

There are still plenty of un-answered problems involved in the operation of these beacons. If they are all set up on one frequency, there is a chance that they may QRM each other on a good opening. This mode of operation would be ideal for the fellow who would like to leave his receiver set on one frequency to await developments. If all the beacons are on one frequency, the stations situated near any one of the beacons will have trouble pulling the weaker ones through the QRM of the local. The question of "what frequency" also comes up. It would be nice to put them near the low end of the band to insure that they are as close as possible to the climbing MUF, but this practice might well irritate some of the regular low-end dwellers.

The problem of reasonably high-gain omni-directional antennas is another tough one. When asked about this, Ye Ed laughingly suggested the use of vertical polarization, which would permit the use of stacked colinear dipoles. We pointed out that this might relieve the ground-wave range QRM problem, and would not make too much difference on true ionosphere contacts, since on these contacts the original polarization is usually scattered beyond recognition anyway. How-

ever, if the beacons are to be useful in plotting ground-wave conditions, the use of vertical polarization would drastically reduce the coverage of the stations, because of the almost universally-employed horizontal six-meter beams. So it would appear that the beacon operators should start planning for stacked loops or halos, turnstiles, bent-end dipoles, or other non-directional horizontally-polarized arrays.

## Those Washington Beacons

Thanks to W3NL, our "Mobile Corner" editor, we have some more information on the keyer-circuit signals emanating from Washington, D. C., near our two-meter assignment. The Navy uses the following frequencies: 140.85, 142.29, 142.65, 143.01, 143.37, 143.73, 148.05, 149.13, 149.49, 149.85, 150.21, 150.93 and 151.83. These signals originate at the old NAA site at Arlington, Va., and are beamed in various directions to the transmitting stations being controlled. The Army uses similar transmissions on 148.23, 148.41, 148.59, 148.77, 148.95, 151.11, 151.29, 151.47, and 151.65 going to and from the Pentagon building and various Army installations.

These are multi-channel teletype circuits, and the modulation can best be described as a weird combination of musical tones. Some of the gang have nicknamed them the "jingle-bells" signals. Exact information on the power used is not available at this time, but it is understood to be quite low. Some of the transmitters use rhombic antennas and are horizontally-polarized. The above list of frequencies is included here in the hope that more of the two-meter operators can locate the signals and use them, as we do, as excellent indicators of propagation conditions.

## Circular Polarization

W3ARL of Bristol, Pa., and W2UEZ of Trenton, N.J., have decided to settle the polarization controversy by constructing helical antennas for the two-meter band. We worked W3ARL the other night, and he had a very strong signal despite the fact that the new antenna is quite low compared to his old one. The amazing part of the experiment was to watch the *S*-meter as our antenna was slowly rotated from the vertical to horizontal position—not a bit of change! Of course, by using circular polarization these boys are knockng 3 db off their signal strength reports when they work stations using plane-polarized antennas. Working each other, they get the full benefit of the helix's gain. They hope to get more stations interested in this project and collect data on the signal-strength over greater distances. One benefit claimed by the proponents of circular polarization is reduction of the fading phenomena produced by reflections. Under conditions where reflections might out either a horizontally or vertically polarized signal, there is a pretty good chance that cancellation would be incomplete in the case of circularly polarized waves. We'd like to hear from any other two-meter station interested in helping these fellows along with their investigation. State your preference for right-hand or left-hand helixes—we don't want to get involved in another polarization battle!

## Notes on 2-Meter Activity

W7DYD reports that local activity in the Seattle, Washington, area could stand some stimulation. Local QRM is no problem, and the DX record for that section is now pegged at 210 miles. The Seattle gang is all vertically polarized (which Herb, being an old six-meter man, figures is all wrong!). Cheer up, Herb, most of the guys here in the east are "all wrong," too!

W7JPA, of Yakima, Washington, includes with his report of some swell six-meter DX the news that he is all set for two meters with an 18-element vertical beam, a 6J6 pre-amp ahead of a VHF 152, and an 829-B in the final. He reports no DX so far, and he, too, is casting aspersions at the up 'n' down antennas that most of the gang out that way are using.

WØEMS reports that the gang in western Iowa has just about deserted the two-meter band for the winter. He listens for hours without ever hearing a signal.

Cheer up, Frank, there will be other nights like September 16, 1949! Stick around. Frank's 16-element beam blew down in a mild breeze (110 mph!) and he is now back to using the record-breaking 4-element Yagi.

Ed, WØELL, labels himself a "V.H.F. man located in the wrong part of the country." He is looking for someone within a reasonable distance of Denver, Col., interested in trying to maintain two-meter schedules. Ed's equipment set-up sounds really top-notch, and if he cannot contact anyone on two, it must be due to the lack of activity in his area. Have you tried contacting the local ham radio clubs or emergency organization for recruits, Ed? Certainly a city the size of Denver should have a nucleus of v.h.f. activity. We hear plenty of signals from that area on ten meters, so there should be no lack of raw material!

## 435 mc in Scratchi's Home Town

W7QLZ tells us that the Phoenix and Mesa 435-mc net is still struggling along. Clyde says that the low-frequency end of the band is hardly usable out there because of QRM from aircraft altimeters which often climbs as high as 425 mc. The boys have tried ASB7 receivers and BC-788s, and they find the 788 is a pretty good bet. They are rounding up more of these surplus receivers for new converts to the band. That, again, is the way to build up activity on these bands. Make it a group project to push fellows into trying the frequency, and they will in turn attract more new blood.

W7QLZ is a rabid antenna experimenter, and has tried many types of phased arrays up to 32 elements. He found that none of these measured up to the corner-reflector and the parabolic-reflector screen jobs which he has developed. At the last reckoning Clyde was in the midst of constructing his sixth parabolic screen. The antenna illustrated on the first page of this column is not a true "parabolic" antenna since the spacing of the radiator from the screen is not great enough to permit the antenna to act as a true focussed parabola.

Results obtained with the 435-mc equipment have been most encouraging, and seem to be at least as good as those obtained on ten meters, using beams on both ends. The mountains between Phoenix and Mesa don't prevent Clyde from working into Mesa with S9 signals, in spite of the fact that the beam aims into the side of a granite cliff half a mile away!

## Six-Meter Notes

It has been reported that PAØUN has been granted a special permit for experimental operation on the 50-mc band. Maybe this will be a chance for us relative new-comers to the band to make that European QSO after all.

In order to stimulate year-round six-meter activity and promote local rag-chewing on the band, informal networks have been formed in certain areas. It is a pretty good bet that if you live within the working radius of one of these active groups you'll be able to hear plenty of activity at the designated times, and you'll be welcome to join the net with no obligation.

The Atlantic Six-Meter Net, including stations around the Philadelphia, Delaware, Northern Maryland and Southern New Jersey areas, meets every Thursday at 2230 EST. The frequency recommended is about 50.4, but they tune the whole band.

The Greater Washington (D.C.) Net meets on Thursday evenings at 2200 EST.

The famous Horsetrader's Net, which includes six-meter operators from Connecticut down through southern New Jersey meets on Tuesdays at 1930 EST.

The New England Six-Meter Net meets every Monday at 2000 EST.

Please pass along any information which you may have regarding activity in your area—organized or otherwise. We'll add it to this list, and it may bring out some new recruits, which we all agree we need.

(QSY to page 72)

# Classified Ads

**Advertising in this section must pertain to amateur radio activities. Rates: 25c per word per insertion for commercial advertisements. 5c per word for non-commercial advertisements by bona fide amateurs. Remittance in full must accompany copy. Phone orders not accepted. No agency or term or cash discounts allowed. No display or special typographical ad setups allowed. "CQ" does not guarantee any product or service advertised in the Classified Section. Closing date for ads is the 25th of the 2nd month preceeding publication date.**

QSLs SWLs! Free samples! W1HJI Box 32B, Manchester, N. H.

10-METER 3-ELEMENT BEAMS—$19.50. Send card for free information. Riverside Tool Co., Box 87, Riverside, Illinois.

AMATEUR RADIO LICENSES. Complete theory preparation for passing amateur radio examinations. Home study and resident courses. American Radio Institute, 101 West 63rd Street, New York City.

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QSLs, SWLs. Made the way you want them. Samples? W9BHV QSL Factory, 857 Burlington, Frankfort, Ind.

WANTED: AN/ART-13, BC-348, RTA-1B, AN/APN-9, R5A/ARN-7, AN/ARC-1, AN/ARC-3, BC-788-C, I-152, MN-26, test sets with TS- or I- prefix, dynamotors, control boxes, transmitters, receivers, power supplies, etc. State quantity, condition and best price first letter. HI-MU Electronics, Box 105, New Haven, Conn.

NOW AVAILABLE—TVI SECOND EDITION—Order your copy today and keep abreast of the latest developments in eliminating TVI from your rig. Price 50¢ per copy plus 10¢ postage and handling. Dept. CT, Radio Magazines, Inc., 342 Madison Avenue, New York 17, N. Y.

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MUST SELL—MAKE AN OFFER. Complete 600 to kilowatt xmtr., phone and c.w., 810s final, 813 buffer, Meissner Ex Signal Shifter, 810s modulators wtih high-level clipping, 6AS7G speech amplifier, separate power supplies and meters. Lambda scope, D104 and 22X mikes, spare parts and tubes. All inquiries and offers will be considered and answered. Joseph J. Hoff, WØTEA, 164 West Arrow, Marshall, Missouri.

ART-13 FOR SALE. Complete with power supply in black crackle case. Transmitter and power supply form one unit 21 inches square and 12 inches deep. Full relay operation and interlock protection. Ready to plug in. Like new—$195. BC348N with 110 power supply—$60. W6IMZ, Rt 1, Box 30, Parlier, Calif.

QSLs? SWLs? "America's Finest!" Samples 3¢. Sackers QSL-printery, W8DED, Holland, Michigan.

COLLINS ART-13 complete with AC power supply, case, carbon mikes, coils, pruned relays changed for fully automatic with ten meter operation. $150, no trades. May be seen at A. Corbett, West Sayville, N. Y.

"TAB" guaranteed tested tubes! 6AG5, 6AK5, 6BG6G, 6BH6, 6J6, 6SN7GT, 1R5, 1S5, 7Y4, 12AT7, 117Z3, each . . . 37¢; GE/2J1G1 selsyns tested, perfect, used, pair $1.49; tuning meter, 5 ma, 98¢; 6V Carter magmotors 400V/150 ma, $8.98; 250V/100 ma, $4.98; both $12.49. Write for bargain "TABOGRAM", "TAB"—107 Liberty St., NYC.

"BARGAINS—NEW AND USED TRANSMITTERS—RECEIVERS—PARTS: Globe King $299.00; Meissner 150B $295.00; Hallicrafters HT9 $295.00; Sonar SRT-75 $149.00; new 150 watt phone $199.00; 60 watt phone $99.00; Globe Trotter $57.50; HT-17 $39.50; new Meissner signal calibrators $29.95; MB611 $35.00; HRO 5TA1 $199.00; HRO complete $149.00; SX43, NC173, HQ129X $139.00; RME-45, SX25 $99.00; S38 $29.95; S41 $22.50; latest signal shifter $59.50; DB22A $49.00; BC610s, AF100, and many others. Large stock, trade-ins. Free trial. Terms financed by Leo, WØGFQ. Write for catalogue and best deal to World Radio Labs., Council Bluffs, Iowa.

10 AND 20 METER BEAMS $19.25, up. Aluminum tubing, etc. Willard Radcliff, Fostoria, Ohio.

SELL: BC-654-A 80 meter mobile trans-rcvr. complete; power supplies, tubes, etc. Like new, $30.00. O.S.S. "Lucy" Rcvr., 2-12 Mc. New condition, needs adjust., $15. Triplett 2", 0-5 d.c. ma, new, $3. Karushat, 588 Wilson Ave., Brooklyn 7, N. Y.

WILL TRADE BC-211 frequency meter with crystal and calibration book; new DM-35 dynamotor; BC-1068 converted to 2 meters. Want Heathkit oscilloscope kit, latest model; McMurdo Silver all band multiplier. W7KKB.

BARGAINS: NEW AND RECONDITIONED Collins, Hallicrafters, National, Hammarlund, RME, Millen, Meissner, Sonar, etc. Reconditioned S38 $29.00, S40A $59.00, S53 $49.00, SX42 $179.00, NC57 $59.00, NC173 $139.00, NC183 $199.00, HQ129X $129.00, RME45 $89.00, RME84 $59.00, DB22A, HF-10-20, VHF152A, HRO, NC240D, S47, SX43, SX28A, Collins 75A1 $285.00, BC610, etc. Shipped on approval. Terms. List free. Henry Radio, Butler, Missouri.

SELL: Collins autotune transmitter. 350 watts. Automatic bandswitching, built in precision VFO. 75, 40, 20, 10. Including heavy duty supply $300. George Kravitz, 7919 20th Avenue, Brooklyn, N. Y.

"GUARANTEED satisfaction when you trade with W1BFT at Evans Radio, Concord, N. H."

Colortone QSLs! "America's Finest!" "No Junk!" Samples? Colortone Press, Tupelo, Mississippi.

SUPER-PRO BC-1004 for sale $150., 500-20,000 kc.; in relay rack with speaker, Garrard 78 rpm changer thrown in. M. Carton 64-50B 188th St., Flushing, N. Y., or Hanover 2-2600, 10 A. M.-4 P. M. only.

FOR SALE: New condition 20 meter Workshop Associates 3 element Beam in original box $80.00. New condition, Post-war TEMCO 500GA KW transmitter complete with microphone, spare tubes, all coils. Original cost $1800. Sell for $950. Both items priced F. O. B. Washington, D. C. Lt. John Adel, W3PWR, Andrews Air Force Base, Washington 25, D. C.

SPECIALIZED QSLs, SWLs. Choice selections, economical. Samples. Ace Print, WØQFZ, 2705 So. 7th St., Council Bluffs, Iowa.

WANTED: Millen Variarm—used—good condition. Cayer, W4HKM, Jacksonville, Fla.

SELL: Rack mounting HRO-7 installation in cabinet. Four units all in very best condittion. Tom Popeney, 908 W. Haines, Plant City, Florida.

HAMMARLUND COMET PRO, crystal-filter model, for sale. All coils from 550 kc thru 18 mc., in excellent condition. Total price, FOB, is $35. Interested? Write L. A. Fine, 34 Rochester Road, Newton 58, Massachusetts.

TEMCO transmitter 75 GA, excellent condition, all coils, $300.00. High Frequency Equipment & Service Corp., 705 North Barry Avenue, Mamaroneck, N. Y.

NEW WESTON 2" panel instruments. White on black linear scale 0 to 100. FS 0-1.2 ma. Suitable for field strength meters, tuning indicators, etc. Only $3.00 postpaid. Overbrook Company, Overbrook 81, Mass.

QSLs, HIGH QUALITY, fair prices, samples? W7GPP, 1380F, The Dalles, Oregon.

WILL TRADE radio equipment for stamps. Have large variety of top-grade components. Want U. S. and foreign, mint, used, etc. W2IOP. Larry LeKashman, 1634 Kent Drive, Hewlett, L. I., N. Y.

SELL: ART/13 complete with d.c. filament supply—$140.00. SW-3, $15.00. DB20. WØDGE.

FOR SALE: Like new Stancor ST-202A 150-watt c.w. transmitter coils and tubes—$90.00. Bud VFO, all coils, $35.00. Bee-Bee NBFM adapter—$12.00. Micamold 45 watt c.w. rig, wired with tubes—$20.00. W5POG, 1015 So. Hazelwood, Sherman, Texas.

# CQ Ad Index

Apparently due to too much Christmas enthusiasm, we haven't heard many reports on the condition of the six-meter band during the past few weeks. We do know that there were sporadic-E openings on December 7, and December 10; we happened to be on during these openings. But for solid coverage of the situation we will have to wait until your reports come in. It isn't necessary to send separate reports to Ye Ed if you are already reporting in the RASO project, but please, fellows, try to keep your reports up to date. . . . 73

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## SCRATCHI

*(from page 4)*

are upping to 10 WPM. Still, everybuddy having perfect copy, all neatly printed in block letters. (This should have making me suspicious right then and there, but it didn't). Moving weights back on key and then sending reel snappy like at 15 WPM. Oh, oh, same results. At this point are deciding to change tactics, so picking on guy that seemed to be most bored by process, are asking him to try his sending on me.

He agrees, picks up my bag, loosens the weights and lets them slide off, and then proceeds to send something that sounds like two multiplex stations fighting. In fact, I are trying to copy, but are no more than getting my pencil to the paper when he asks if I heering enough. I say yes, and also tell him I'm sorry I didn't copy it, but the pencil were a wee bit too short to get hold of, the paper was too thin to write on, and anyway the oscillator is adjusted for wrong tone. Excoose please.

At this point I are asking same guy to copy reel fast stuff. Scratchi decide to pull all stops and bar no holds so I leave weights off bug, get firm hold of the key, and let 'er rip. Honestly, Hon. Ed., Scratchi are outdoing himself. That see-w pouring out so fast it sound like continuous tone.

Hokendoke Hackensaki—when I start sending, this guy pulling out knife and very calmly starting to sharpen pencil, then he lights a cigarette, and about the time that poor old Scratchi are about done in from stoopendous effort, fellow is starting to write something on paper. I are able to hold out for a few more seconds, then I stop sending. Fellow keeps right on writing, one page, two pages, three pages. It are here that Scratchi are smelling strong, small rodent in woodpile.

Sure enough, the copy is perfect. So there I am, big-shot Scratchi, trying to teach see-w to a guy who copies a couple of minutes behind, and with Scratchi sending as fast as he can. To be frankly, Hon. Ed., I are flabbergast. Just then the Hon. President of club are showing up, and he introducing me to my poopils, especially the bored fellow with the multiplex fist. Hah hah. Big joke. Good gag. This character are ex-Signal Corps see-w champion.

Hon. Ed., meeting a new ex-see-w man. Me. From now on Scratchi are strictly a fone man (all bands but six.) How's my modulation?

Respectively yours,
*Hashafisti Scratchi*

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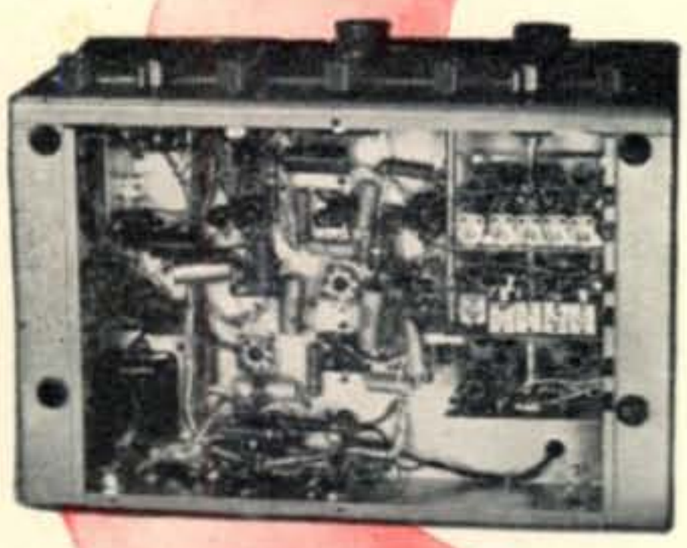
(See page 11, Nov. 1949 QST).



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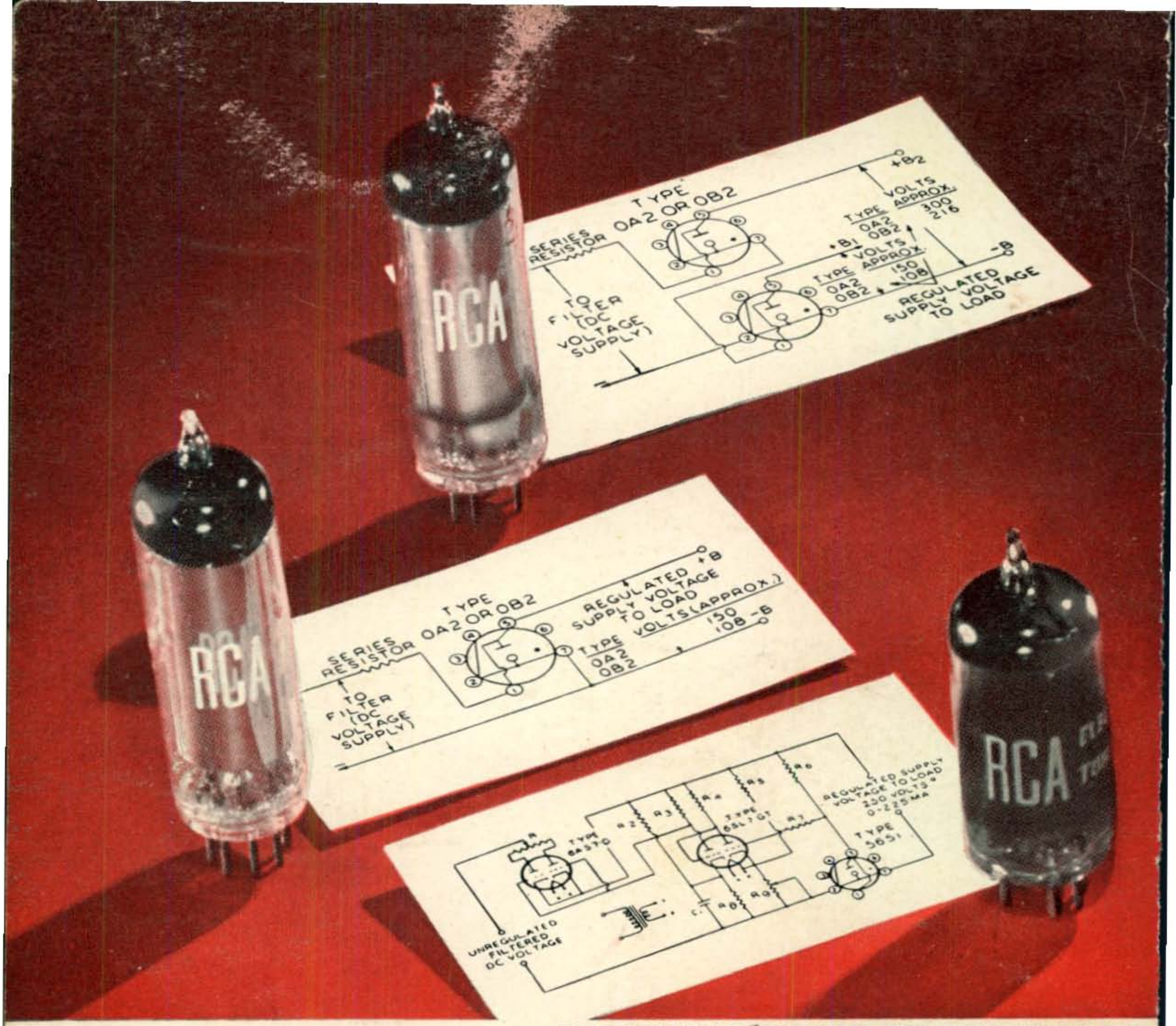


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