ANC

CQ RADIO AMATEURS' JOURNAL

APRIL
1954
35c

the magazine for the HAM, NOVICE, TECHNICIAN, EXPERIMENTER and SWL

W9NZZ DESERVES CONGRATULATIONS

Mr. J. Stan Surber, Peru, Indiana, 46 year old short-wave radio "mailman." Winner of General Electric's 1953 Edison Radio Amateur Award for the outstanding "ham" public service of the year. W9NZZ is the only regular communications link with home for hundreds of servicemen at Arctic weather stations. L year he transmitted and received over a million a a half words in Morse code to and from such poi as T-3, an ice island near the North Pole. His equ ment: Collins 75A-3 receiver, 32V-3 transmitter.

Mr. Surber's own account of how he kept on the air 8 hours a day for 353 days *without a miss due to equipment failure*

"During the year 1953, W9NZZ 'worked' the World's most northern stations (Alert and Eureka on Ellesmere Island; Mould Bay on Prince Patrick Island; Isachsen on Ellef Ringnes Island; and, Fletcher's Ice Island floating near the North Pole) in keeping traffic schedules, for a total of 353 days of 365. Of the 12 days missed, 4 of them were due to the necessity of my being out of town. The remaining 8 days missed were due to 'black-out' 20 meter conditions — not one day did equipment failure cause a 'miss.' Practically every day of the year the equipment is turned on at 7:30 a.m. and not turned off until just before I leave for work as a train dispatcher for the Chesapeake a Ohio Railway, or approximately 3:30 p.m. Sur that is dependability!

"The fact that Collins transmitters and/or receiv are used in five of the six most regularly schedul stations, adds much to this record of consistent co munications via 20 meters. It is easy to understa how, with such equipment at both ends, schedules kept, on frequency and on time.

"To me, the Collins 75A-3 with the 800 cycle m chanical filter, is the last word in CW reception surely it is the answer to the CW man's prayer."

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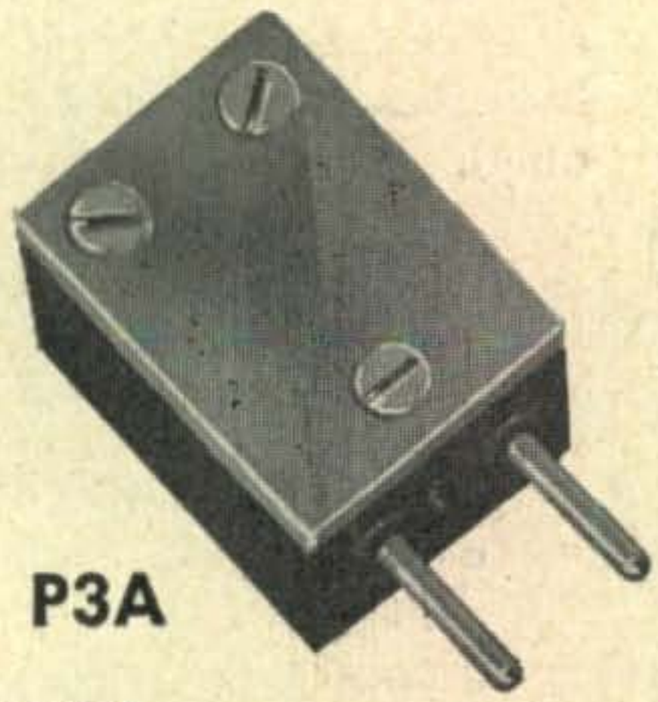

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Rush me complete details on LMRE Convention

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(Make all checks and money orders payable to:
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CQ RADIO AMATEURS' JOURNAL

Vol. 10, No. 4
APRIL, 1954

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Deer Hon. Ed:

Gracious to goodness. Normally when I riting you, Hon. Ed., it are because sum horribul excitements are happening. This time, howsumever, can't thinking of thing to telling you. Nothing to much from ordinaries occuring. May be next time are thinking of sumthing.

Respectively yours,

Hashafisti Scratchi

P. S.

You not counting little old thing like cutting my finger as exciting, are you, Hon. Ed? Only reason Scratchi cutting finger is on acct. knife is slipping when trying to remove insulation from wire when repairing mobile rig. The more I think of it, Hon. Ed., it are kinda funny. I are driving out of driveway when hitting tellyfone pole. Mobile rig tearing loose in trunk, trunk coming open, and mobile rig are all over the street. Boy oh boys, are that doctor mad at me, getting tire marks in his lawn.

Natchurally this not happening except that when I driving to hospital to seeing Hon. Brother Itchi, my brakes not working and I smashing into doctor's car. He can't driving home, so he asking Scratchi to taking him home. Golly sakes, it are least I can do, considering he having to pay for having his car fixed, and his wife will be having to stay in hospital until her broken leg are mending. Oh, didn't I mention that when I hitting doctor's car his wife are just getting into it?

Not that Scratchi to much worried about Hon. Doctor's finanshul condishun. He'll be giving Brother Itchi nice big bill to fixing Itchi up after he getting cut with the glass from his bedroom window. Hackensaki!! You never thinking that one piece of glass from one window can smashing into so many pieces. There were Brother Itchi, taking nap in bed, and Whammo!! glass all over the place. Well, I guess that what happening when ceramic antenna insolater hitting pane of glass full forcey.

No, no, no, Hon. Ed., that are not the case. I know what you are thinking. Scratchi having nothing to do with broken antenna. When the antenna pole are braking, the antenna are also braking, and the ceramic insolater are snapping like furies and going through Itchi's window—but it not my fault. You see, reason antenna braking are because pole are braking, and reason pole are braking is that guy wire are suddenly not there.

As a matter of fackly, Hon. Brother Itchi are most-

(Continued on page 8)

(from page 6)

ly to blame, as he are the one suggesting I putting guy wire on barn. He are saying that nothing are safer place to fastening guy wire than the barn. Maybe mostly he right. It are nice safe place. Of course, when barn falling down, guy wire having no place to staying, and it coming down to.

When I saying barn are coming down, I not being to ackyourat. Ackshually the barn are going up. Getting rite down to cases, barn are blowing up. And don't think we weren't lucky. Can you imagine the mess we having if the cows had been in the barn when the dynamight exploded!!

How's that, Hon. Ed? You asking if we storing dynamight in barn? Gracious to Saki! That are illegal. No, we storing dynamight in shed near to barn. This same shed where fire are starting. In fack, fire in shed are what making dynamight setting off. That taught me a good lesson though. Yes indeedy. Never again will I using a blowtorch to soddering pipes together unless I having sum water handy. That sawdust are lighting up like Xmas tree. First thing I know hole shed are on fire.

But don't you worrying, Hon. Ed. My finger are almost well, as cut not very deep. In case anything exciting are happening, I riting you post-hasty.

Respectively yours again,
Hashafisti Scratchi

Broad Band . . .

Editor, CQ:

Apparently the controversy of Scratchi vs. Snorlock Ohms has been resolved to this: we must accept both or nothing—O.K. I vote for nothing!

The space could be better used for more information on teletype or VHF or even the flounderings of some of our Directors.

By the way, when and where were SARA and NARC buried. I didn't even get an invitation to the wake.

H. Russell Boone, K2AEX
Little Falls, N. Y.

Editor, CQ:

I prefer Snorlock Ohms.

William W. Steinberger
Ann Arbor, Mich.

Editor, CQ:

I enjoyed very much the Command Set Roundup in the Feb. issue of CQ. Why don't you reprint this along with reprints of all the reference articles in book form—I am sure this would sell faster than any other pamphlet you have, you can put me down for one right away.

I enjoy CQ very much and look forward to seeing them every month.

Harold T. Mapes, W7DXV
Moose, Wyo.

Editor, CQ:

When the ARRL changed field day to a week earlier than it has been in the past, they probably didn't realize how many people would not be able to participate in the famous contest.

Most of the schools and colleges west of the Rockies let out the last Friday of June. With field day moved a week before school closes for the Summer it will be in the midst of all the final exams. This will keep all of the high school-college students out of field day. A great number of the amateurs today are in high school and college. I hope that every one who reads this will write the ARRL asking for field day to be changed back to where it was as all my friends and I have done. Field day has been the most looked forward to events in amateur radio, let's keep it that way.

Richard Somers, W6NSV
Los Angeles, Calif.

(Continued on page 11)

(from page 8)

Editor, CQ:

I've acquired a bit of humor that perhaps you would like to pass along to the readers of your fine magazine.

This morning at 09:14 EST I took a look at the 40-meter band to get an estimate of the conditions. On the low end of the fone band I heard a very lovely female voice calling "CQ." I fell victim to it and answered the voice, K2ASG. I was shocked to hear a male voice acknowledge me. Upon further examination I was told that the "lovely voice" was being played on the air from a record. The OM's name was Dick, and he explained that the voice was that of his mother, Marge. He had played the recording of his mother calling "CQ" as a joke to see how many Hams he could lure into disappointment.

I have heard many jokes about something like this happening, but this is the first time it ever happened to me.

Frank H. Duffy, W8IWK

Birmingham, Mich.

Editor, CQ:

I am not often disposed to write such letter, but when some one does a good job, it deserves mention and I would just like to say congratulations on WØURQ's article in the January issue on the Double-Con 6.

E. C. Pressler, Jr.

Norristown, Penna.

Editor, CQ:

The last letter you had from me was praising the series on "Men of Radio" and reminiscing on the "old days." You have a nice little magazine, and I enjoy it. That is why I subscribe to it. It has several features which are especially interesting: the DX section, the Ionospheric Propagation Conditions, the YL's Frequency and I even enjoy the Novice section!

There is only one fly in the ointment, and I hope I can call it to your attention without offending. My only desire is to be helpful. I have always enjoyed reading the editorials of any magazine which I felt worth having. Yours are generally quite interesting, but every once in a while there will be one which gets under my skin, and lends a bad taste to the magazine. The present Editorial (February) is the type I refer to, and it raises a feeling of resentment where none existed before.

We all know nothing is ideal in the world and you can find faults anywhere you care to look. —Any organization worthy of the name must have rules to abide by, and if they have "loop-holes" it would appear that they should be drawn more carefully. However, until changed, they should be followed with no exceptions from the orderly manner in which parliamentary procedures are specified.

The ARRL has done so much in the line of help for the amateur fraternity over the years that an itemized list would be unwieldy. The laboratory work at West Hartford, the code proficiency transmissions, the bulletin, the many awards to stimulate better operating, the Handbook, and the other booklets on operating. One could go on and on, but you know of these things. —Please give us some interesting editorials every time. Most of them are fine. In such as this February one, there is nothing of interest nor information worth cluttering your head with. There will always be bickering in any group, church, lodge, club or what have you.

This letter has been written in the spirit of helpful and constructive criticism. That is why I made it so long, so it wouldn't seem abrupt and tart.

R. Curtiss Cole, W9LCG

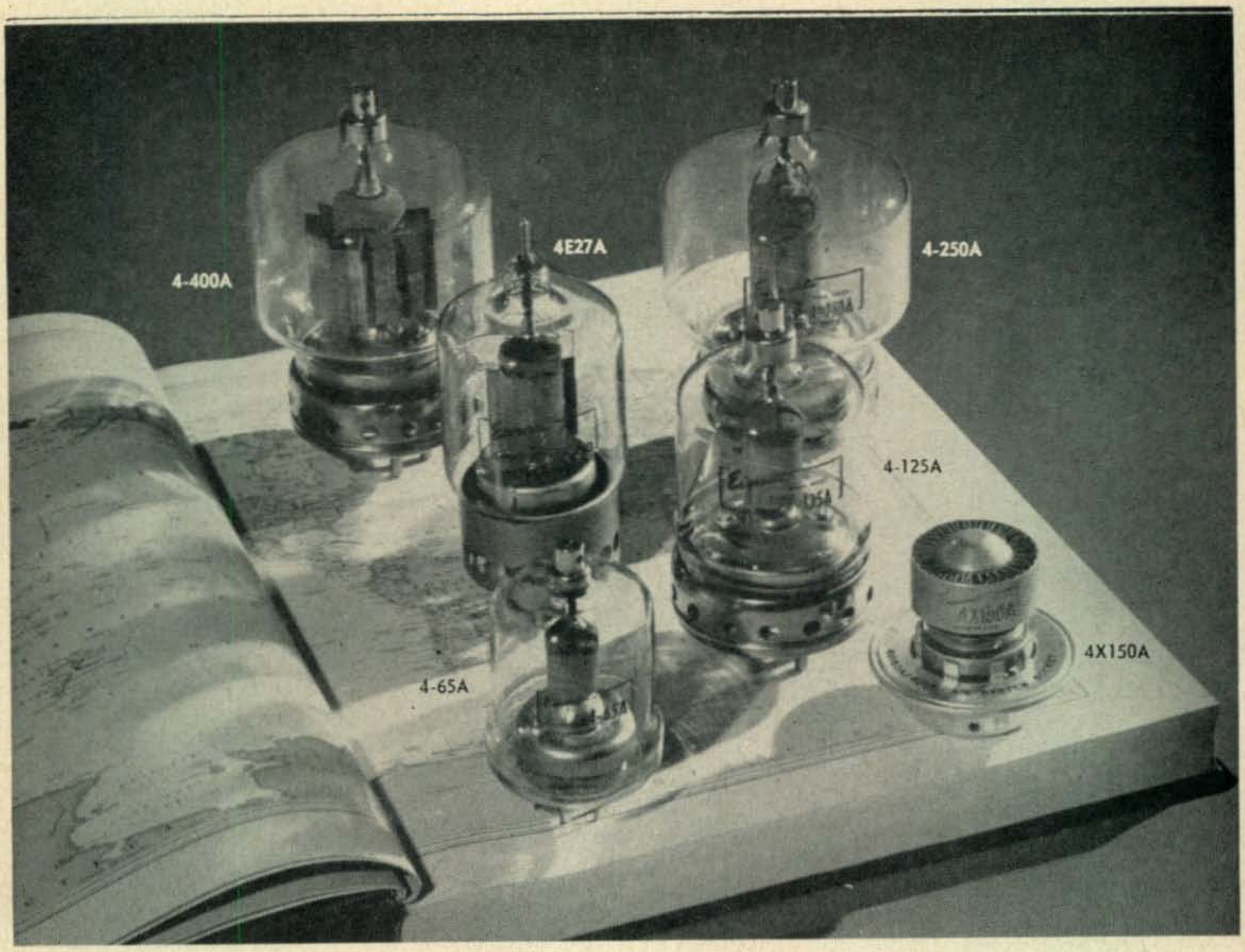
Chicago, Illinois

Editor, CQ:

Orchids to Herb and his Novice Shack.

"Clay" Elworthy, W6KXC

Sloat, Calif.



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4-125A	144mc	3.3w	2.5w	380w	500w
4-250A	50mc	3.2w	2.6w	675w	1000w
4-400A	50mc	3.5w	6.1w	825w	1000w
4X150A	420mc	2.0w	1.2w	200w	250w
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		Suppressor Grid Modulated			
4E27A	144mc	1.2w		180w	

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Zero Bias . . .

The following material we believe will become self-explanatory if it is read carefully. Essentially it consists of the last "filing" made by the *Maritime Mobile Amateur Radio Club* in defense of its request for 'phone privileges in the 15-meter band. Although the idea of granting such privileges met with the approval of every *individual* radio amateur, the ARRL, which claims to represent the same identical individuals, protested, and was granted a chance to air its objections at an oral hearing before the FCC. The disclosures made at this hearing were astonishing and once again reinforced the impression held by many that the affairs of the American radio amateurs are directed more often than is realized by the whims of one individual.

We have made the assumption that the ARRL side of this Docket will be covered in detail in their "club" magazine and thus we have not printed their "filing" made at the same time on the same subject.

o.p.f.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D. C.

In the Matter of
Amendment of Section 12.91(b) of
Part 12, "Rules Governing Amateur
Radio Service."

DOCKET No. 10501

MEMORANDUM OF MARITIME MOBILE AMATEUR RADIO CLUB

During the oral argument on the above-entitled matter, the parties were afforded the opportunity to submit suggestions as to the final order to be issued by the Commission (Tr. 44).[1] The following memorandum is submitted by the Maritime Mobile Amateur Radio Club:

1. The above-entitled rule making proceeding, instituted by the Maritime Mobile Amateur Radio Club proposes to permit maritime mobile amateur operation in the 21.0-21.45 megacycle amateur band in addition to the presently authorized operation in the 28.0-29.7 mc. amateur band. The proposal was supported by written comments from five amateur radio clubs, 60 licensed amateurs and five other individuals. The comments of the Maritime Mobile Amateur Radio Club set forth the following benefits which would derive from adoption of the proposal:

"1. The proposal is within the intent of Sec. 12.0, especially 12.0 (e)—Continuation and extension of the amateur's unique ability to enhance international good will.
2. The proposal is within the provisions of the 1947 Atlantic City convention in that the proposed expansion of maritime mobile operation to include the 21 mc band places such operation on an internationally allocated band free of regional restrictions and is in all respects similar to the 28 mc band so far as the international aspects are concerned.
3. Amateurs earning their livelihood in the merchant marine are deprived of many of the privileges of shore occupations. The records submitted as attachment to these comments indicate that many amateurs have availed themselves of the indulgence of their hobby while at sea and are deserving of consideration to further enhance their possibilities where such can be done without prejudice to any other phase of the amateur radio service.
4. Responsible amateurs of official status in amateur organizations covering all sections of the country have indicated their approval of extending maritime mobile operation to include 21 mc band. So far as can be determined, there appears to be no opposition to the proposal within the amateur service as a whole, nor does the proposal conflict with any privileges now existing or proposed.
5. As a morale factor aboard ship the amateur station is an indisputedly potent factor. Amateur communications to and from the ship provide a continuous contact with the outside world, relieves isolation and promotes better fellowship. All are highly desirable in improving life at sea.
6. Enhancement of international good will obtains from the obvious fact that amateurs aboard ship have, and use, the opportunity to visit those in foreign nations with whom they communicate via amateur radio. These personal visits add much to the understanding of peoples of different nationalities.
7. Propagation conditions with respect to operation above 28 mc are such that for the next several years only limited use of the band is possible. Examination of the capabilities of 21 mc, by comparison, to provide reasonably good openings on a day to day basis, for both long and short distance communication show a very marked improvement over 28 mc. Use of the 21 mc band will provide the maritime mobile operator with at least the partial ability to select a suitable communication band as compared to the wide selection available to land based amateur stations.
8. While not necessarily a primary consideration, it may be stated that amateur gear aboard ship is an additional safety factor and has been so used after failure of all other communication means.
9. Amateur experience and background of ingenuity acts to improve shipboard personnel. Permitting additional operating privileges for maritime mobile operation offers a further inducement to those having qualifications peculiar to amateur radio to take up occupations in the merchant marine."

That adoption of the proposal will increase safety at sea was vividly illustrated by the comments of Leslie L. Sterling, radio officer of the SS Santa Elisa:

"I personally have experienced the loss of all the ship's antennas due to heavy weather, with a consequent failure of communication until the weather abated and it had become possible to rerig the antennas. Had amateur equipment capable of operation in the frequency range of 21 megacycles been available, it is quite probable that some form of continuous operation would have been possible without exposing any officer or seaman to the hazards occurred in rerigging the ship's antennas under such hazardous conditions." (Tr. 10-11)

The epoch of Captain Kurt Carlsen[2] and the Flying Enterprise, whose amateur radio experience made it possible for him to stay with his ship, was also cited. (Tr. 10.)

2. The only opposition to adoption of the proposed rule was that of the American Radio Relay League, Inc., which merely stated that,

". . . the current international radio situation is such as to make such action highly inadvisable."

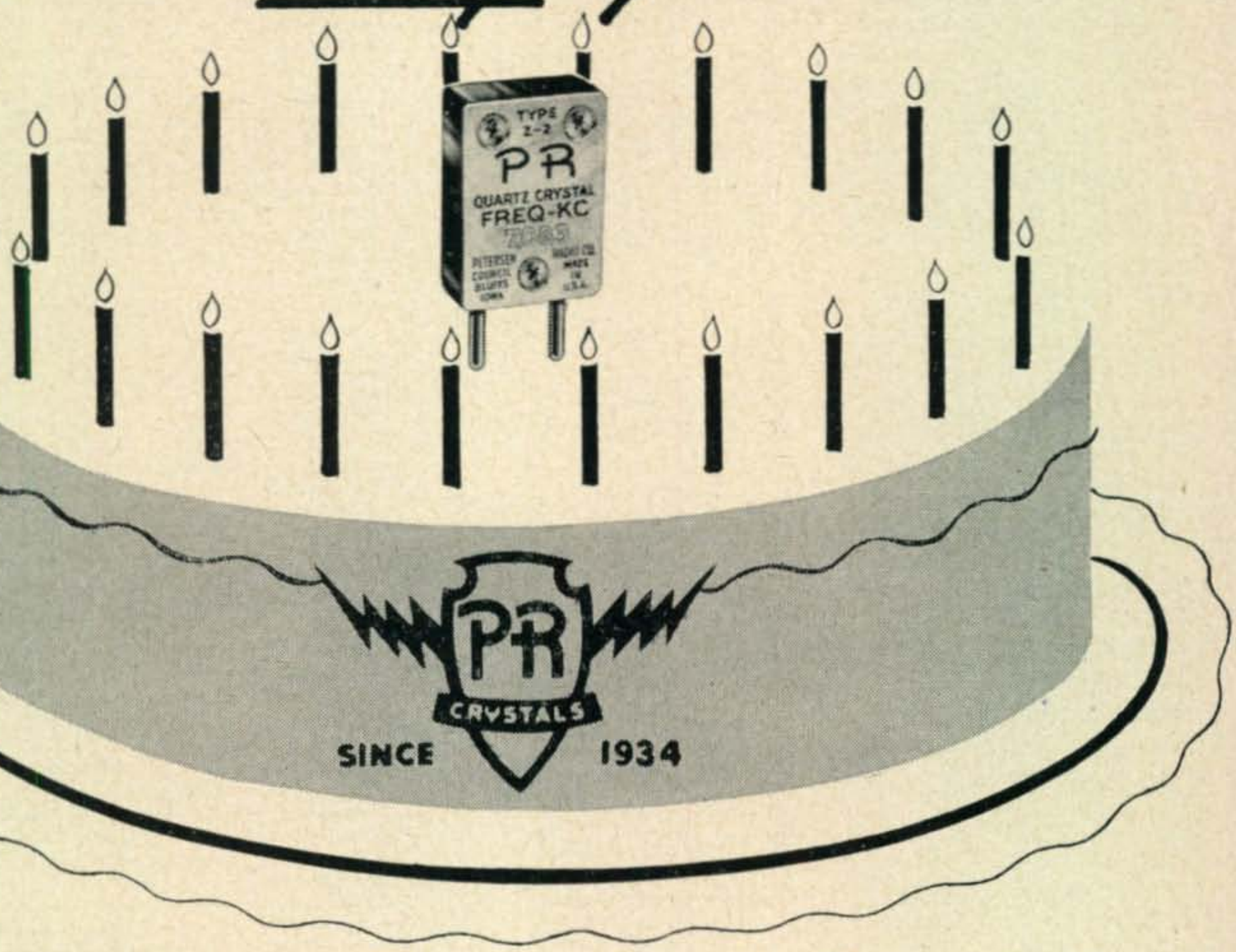
(Continued on page 52)

1. References are to pages of the transcript of the oral argument held February 8, 1954.

2. Captain Carlsen (W2ZXM) is Vice Commodore of the Maritime Mobile Amateur Radio Club.

20 YEARS

is a long grind!



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A Device for Continuous Transmitted and Received Signal Monitoring

In order to relieve congestion on our phone bands and to comply with FCC regulations, we must attempt to put on the air the cleanest possible signal. And a phone signal, to be arm-chair copy, must be well modulated with audio of the best *speech* quality. You may have read articles in the past about the techniques of getting good restricted audio quality by means of clipping, filtering, limiting, and just plain listening to the signal. But the quantity of audio present on the carrier is also an important factor in achieving good communication. We are, therefore, going to discuss the percentage of modulation as a means of improving the conditions on our crowded phone bands, or a method of continuously *observing* the amount of audio with respect to r.f.

Various Monitoring Methods

Hams have devised many methods of observing modulation percentage, ranging from watching the class B meter to listening to the groan of some transformer or choke in the rig. While any of these indicators are better than none a all, they still leave something to be desire when a definite and accurate indication of the amount of audio on the carrier is to be determined.

The only device that will give continuous and instantaneous indication of the modulation percentage is the cathode ray tube. Some transmitters use the CRT as a built-in monitor: this is the ideal method, but in many cases the oscilloscope is a complete unit, and, after the initial tests have been made on the new rig, it is placed back on the shelf to gather dust.

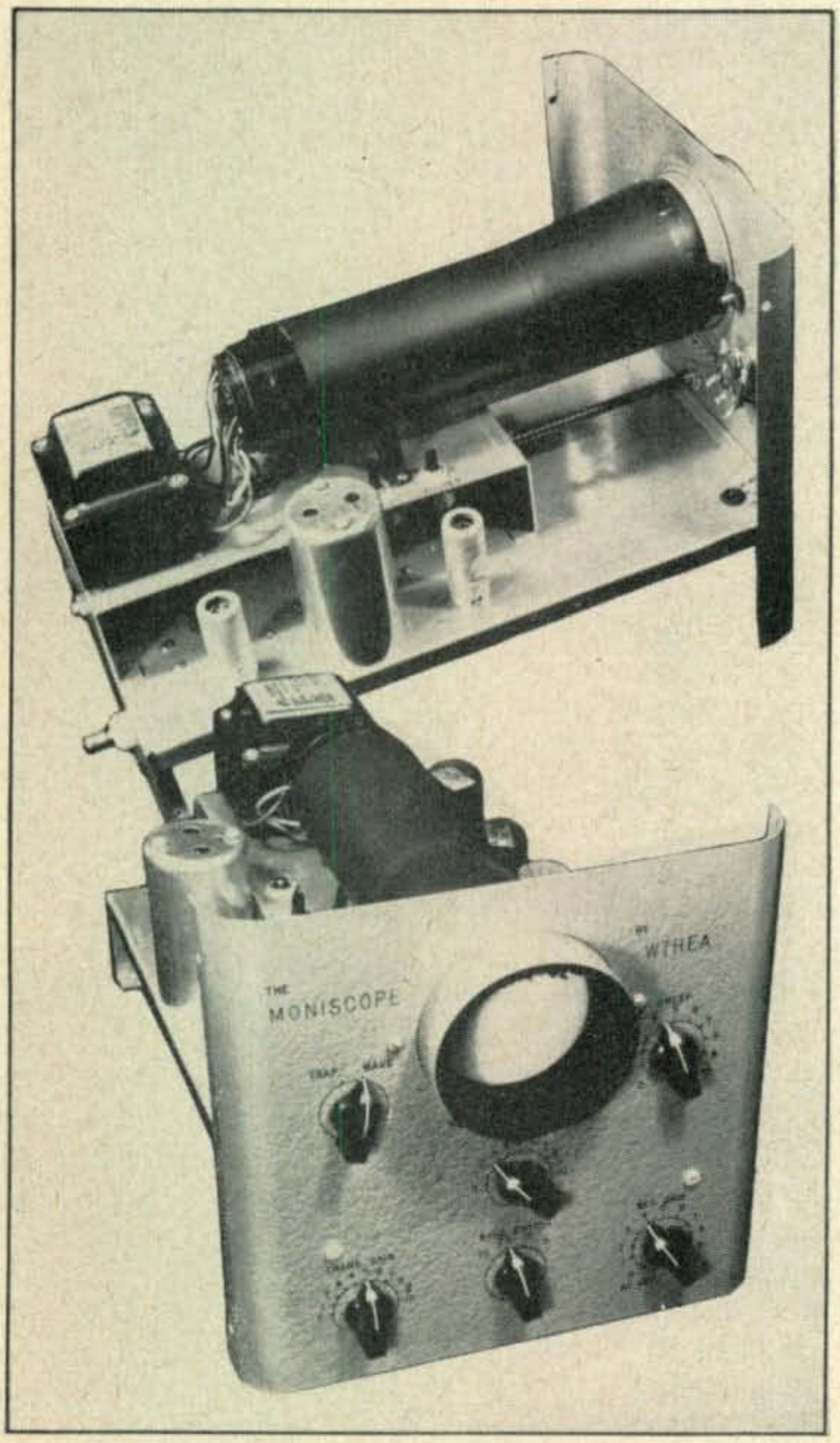
There are a number of drawbacks to the use of an external oscilloscope for constant monitoring when connected directly to the transmitter. Three of the most unfavorable drawbacks are: (a) when a trapezoid pattern is desired, it becomes necessary to bring out high voltage for the horizontal sweep, (b) when the transmitter is in stand-by condition, the fixed spot (due to the removal of the horizontal sweep) may cause a burn on the screen, and, (c) when more than one transmitter is in use, either more oscilloscopes must be in operation or the one must be moved from rig to rig.

One very common question on the phone bands is, "How is my modulation?"—a difficult one to answer with any degree of accuracy. With the idea in mind of answering that question accurately, and to eliminate the need of asking it ourselves, we developed the "Moniscope." With it, you continuously know your own modulation percentage and have available an accurate report on any received signal. You may form either a trapezoid or wave envelope pattern at the flick of a switch—for both transmitted and received signals. While transmitting, the modulation percentage of the transmitter is on the scope; when the transmitter is turned off, immediately and automatically the received signal is present. There are no switches or

relays to operate and no connections to the transmitter. There is one connection to the receiver—but more about that later.

The Circuit

Looking over the circuit diagram, *Fig. 1*, we see that *L1, L2* and associated parts form the conventional phone monitor. With headphones connected at *J1* the signal can be monitored in the regular manner. By means of band switch *S2, L2* gives continuous coverage from 3.5 to 60 Mc. *L1* is the antenna coil, and a length of wire attached to terminal *TRANS* and draped near the transmitter will pick up plenty of r-f signal for our purpose. Condenser *C4* acts to shunt *L1* and gives some degree of control over the signal being coupled to the tuned circuit *L2/C5*. The 6C4 is used as an infinite impedance detector giving good linearity over large values of signal voltage with very light loading on the tuned circuit. The r-f voltage for the vertical deflection of the CRT is taken from the grid terminal of the 6C4. With *S3* in the *T* (trapezoid) position, and audio applied to the horizontal deflection plates we have the trapezoid pattern. Placing *S3* in the *W* (wave) position, 60-cycle sweep voltage is used for the horizontal deflection and the wave envelope pattern is present.



This composite view shows the location of some of the components mounted above the chassis. The controls on the deck include both focusing potentiometers and the cathode ray intensity control. The extension shaft directly under the tube is for C5.

What about that 6BA6 and *T1* combination? Well, that is how we get the low down on the other fellows signal! A length of co-ax cable runs from point *RCV* for the purpose of sampling the receiver i.f. at the diode plate of the second detector. The 6BA6 is an additional stage of i-f amplification. *T3* is a standard replacement i-f transformer of the same frequency used in the communications receiver. The secondary of *T3* and *L2* are connected in series. Due to the wide difference in the resonant frequencies between *T3* and *L2* there is no interaction and we have automatic pattern changeover without switching. Potentiometer *R3* serves as a r-f gain control for signals coming from the receiver.

There is nothing critical about the CRT and power supply shown here. Condenser *C9* is necessary to bypass r.f. from the horizontal deflection plates. If a standard oscilloscope is used it may be necessary to add network *C9/R11* to clean up the trace on the tube. Keep the lead from the grid of the 6C4 to the vertical deflection plate as short as possible and *DO NOT SHIELD IT*. Any added capacity will affect the tuning range of *L2/C5* combination.

Putting it into Operation

To place the *Moniscope* in operation it will be necessary to make one connection inside the receiver. A small 3-30 $\mu\mu$fd. mica compression padder is connected to the diode plate of the second detector. This condenser must be connected as closely as possible to the diode terminal to minimize disturbance to the i.f. alignment of the receiver. A length of co-ax cable (RG-59/U) runs from this condenser to a coaxial fitting mounted on the rear of the receiver chassis. This terminal not only serves as a convenient connection for the *Moniscope* but can serve as an i.f. sampling point for future needs.

Make the necessary connection between the receiver and *Moniscope*. Turn both on and tune the receiver to a point where no signal is being received. Place *S3* in the *W* position and set the 3-30 $\mu\mu$fd. trimmer added to the receiver at maximum capacity. Now adjust the trimmers of *T3* for maximum indication of noise or "grass" on the face of the CRT. *R3* should be set at the point of maximum gain for this adjustment. After *T3* has been adjusted to the same frequency as the receiver i.f., place switch *S3* in the *T* position and decrease the capacity of the 3-30 $\mu\mu$fd. trimmer until the background noise creates about a one-half inch trapezoid. Only a very small amount of capacity will be needed to couple plenty of signal into the *Moniscope* from the average receiver.

There is considerable gain in the 6BA6 stage and the receiver i.f. is only slightly affected. A little touching up of the last i-f trimmers in the receiver will take care of any misalignment. You are now in business from a receiving standpoint. Tune in a few commercial broadcast stations to see just what patterns to expect.

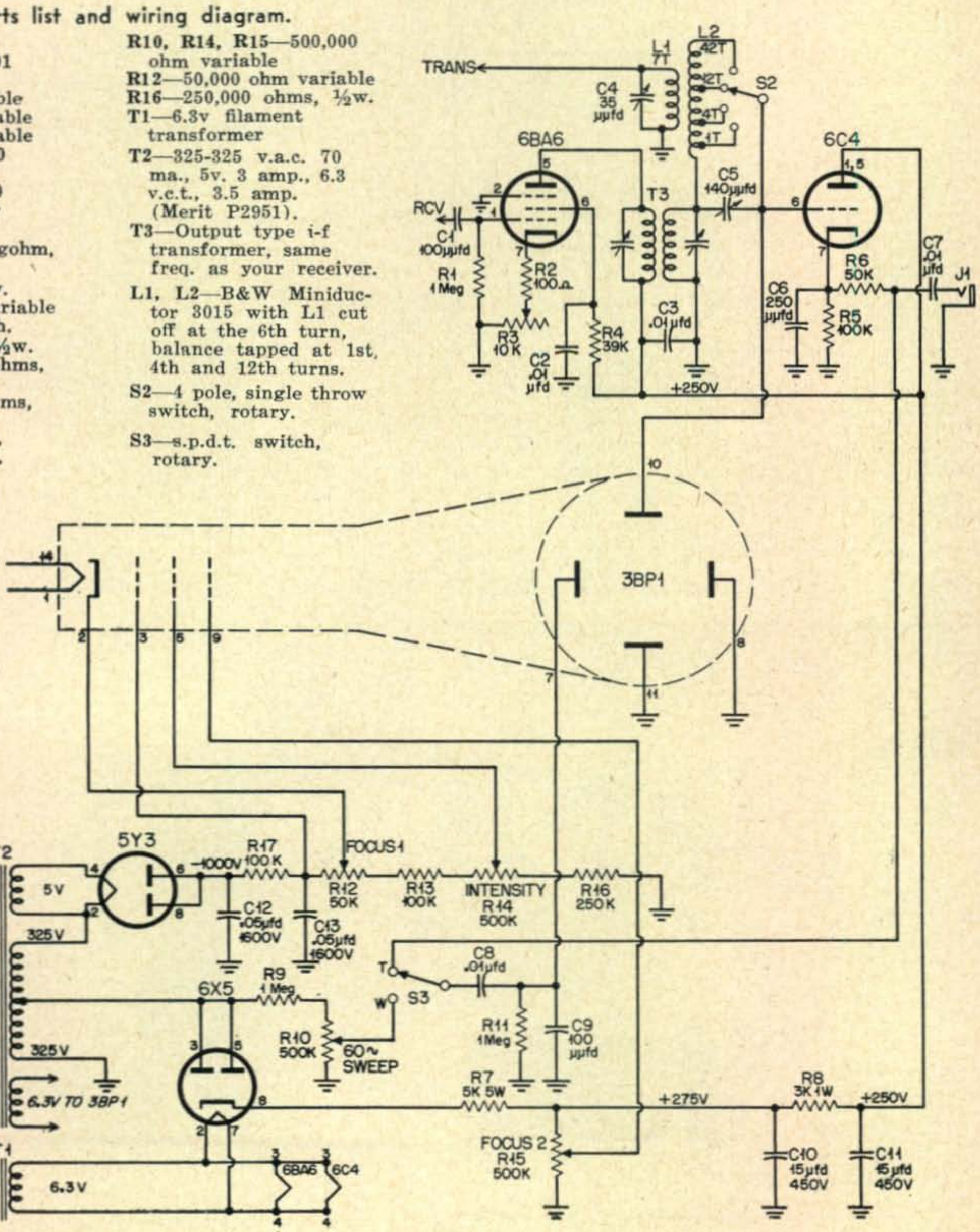
Connecting to your Transmitter

Getting set to monitor your own transmitter is still easier. You merely set condenser *C4* at maximum capacity and run a wire from post *TRANS* to a point near the transmitter or feed line. Set *S2* to the proper band, turn on the transmitter and tune *C5* for maximum indication on the CRT. Vary the position of the pickup antenna until the vertical part of the pattern occupies about one third of the scope. Secure the wire and from now on any changes in signal pattern height will be controlled by condenser *C4*. Since its action is rather limited some experimenting may be necessary to get the desired pickup from the transmitter. It is a good idea at this time to turn on everything except the final stage of the transmitter and ascertain that no r.f. from the exciter and multiplier is getting into the *Moniscope*. This r.f. will not be modulated—or at least it shouldn't be. If any is present, it will be impossible to see your point of negative peak modulation. If exciter r.f. is present, re-position the pickup antenna until no r.f. is being picked up, before attempting to make an accurate check of the transmitted signal.

Now that your *Moniscope* is tuned up and connected to the receiver, this is what you should expect to see on either a transmitted or

Fig. 1. Parts list and wiring diagram.

C1, C9—100 μμfd.
C2, C3, C7, C8—0.01 μμfd.
C4—35 μμfd. variable
C5—140 μμfd. variable
C6—250 μμfd. variable
C10, C11—15-15/450 electrolytic
C12, C13—0.05/1600 auto radio buffer condensers
R1, R9, R11—1 megohm, ½w.
R2—100 ohms, ½w.
R3—10,000 ohm variable with off-on switch.
R4—39,000 ohms, ½w.
R5, R13—100,000 ohms, ½w.
R6, R17—50,000 ohms, ½w.
R7—5000 ohms, 5w.
R8—3000 ohms, 1w.
R10, R14, R15—500,000 ohm variable
R12—50,000 ohm variable
R16—250,000 ohms, ½w.
T1—6.3v filament transformer
T2—325-325 v.a.c. 70 ma., 5v. 3 amp., 6.3 v.c.t., 3.5 amp. (Merit P2951).
T3—Output type i-f transformer, same freq. as your receiver.
L1, L2—B&W Miniductor 3015 with L1 cut off at the 6th turn, balance tapped at 1st, 4th and 12th turns.
S2—4 pole, single throw switch, rotary.
S3—s.p.d.t. switch, rotary.



received signal. When observing a trapezoid pattern under modulation, the modulated carrier should be twice as high as the unmodulated signal, assuming for the moment that the positive peaks and the negative peaks are equal and the carrier is being modulated at 100% level. Any increase in audio beyond this point will cause a distinct brightening of the tip of the trapezoid and indicates overmodulation on the negative peaks. If the carrier does not double in height then there is a non-linear effect in the transmitter. When using a negative peak clipper it should be impossible to bring the pattern on the scope down to a sharp point where the negative peak clipping action takes place. Of course, insufficient modulating power will give the same indication, but the carrier will not double in height.

Any published information on transmitter testing using an oscilloscope may be duplicated with the *Moniscope*—plus the added advantage that received signals can be given the same treatment. The trapezoid and wave envelope patterns present the same information in a different manner and it is sometimes easier to interpret this information more accurately on one pattern than on the other. Your ability to get the most information from the pattern comes only with experience in using the *Moniscope* and since any received signal can be analyzed, much information can be obtained on what to expect from your transmitter by looking at other signals.

Construction is Easy

The parts layout and method of construction are clearly shown in the various chassis view photographs. No further construction details will be given since the chassis and cabinet used for the *Moniscope* are specially designed and similar to those used in the construction of *Snoopers*.[1] Needless to say, any comparable layout with existing cabinets and parts should work equally well as no critical components have been used. The *Bud* streamlined scope cabinet *CU 1991* is a readily available foundation unit for the construction of the *Moniscope*.

Existing scopes and monitors may be used with good results although it may be necessary to add bypassing to the horizontal and vertical plates of the CRT to prevent r.f. from entering the tube. R.f. leaking into other than the desired scope tube elements will cause a distorted pattern to appear on the tube face. A little experimenting with a few 100 $\mu\mu$fd. condensers around associated circuits should remedy this trouble. If the scope has deflection amplifiers, these should not be used. Make the connections directly to the deflection plates, otherwise a true picture of the signal under observation will not be presented.

---

1. C. O. Bishop, "The Snooper," Part I, **CQ**, Aug. 1952, p. 14; Part II, **CQ**, Sept. 1952, p. 14.

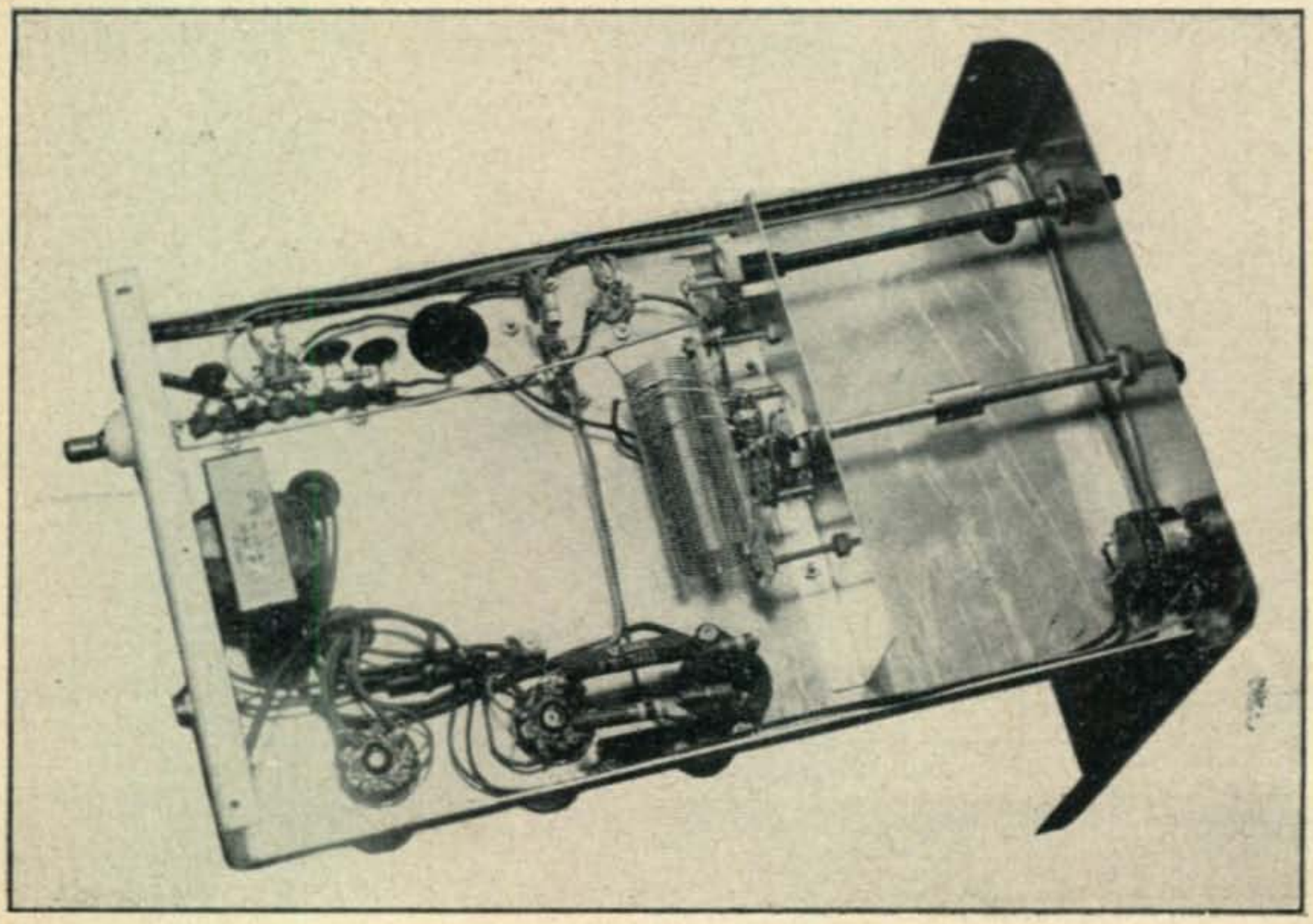
Followup on the "Rock Creek Suit"

Readers interested in the outcome of the "Rock Creek Suit" reported in our February editorial may have heard that the "requested temporary injunctions" were denied.

This was the suit contesting the interpretation made by the Executive Committee of the ARRL of the "Article of Association" dealing with elections.

It is interesting to note that Judge Shapiro, in handing down his two decisions, stated in one (re W3PRL and WØGZD) that: ". . . and considering the importance of having a nominee a member of the defendant corporation for a continuous term of at least **four years immediately preceding his petition of nomination . . .**" (Bold-face ours. **Ed**). But then in the decision relating to W3OMN the Judge stated, ". . . the applicable article of association and by-laws of the defendant corporation is that a member of this corporation, in order to be eligible for election as a director of the corporation, must have been a member of said corporation for at least **four years at the date of his election.**" (Bold-face ours, **Ed.**)

Surprisingly enough, this case was taken to court to clearly establish what four-year period the By-Laws were talking about. Since the date of the closing of nominating petitions and the date of the elections is some two months apart the question still begs to be answered.



In this under chassis view note the deck wall holding switch S2 and the tapped coil, L2. Condenser C4 is controlled through the extension at the top of this deck wall.

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Deluxe Break-in Keying System

MIRO VOZNJAK, YU1AD

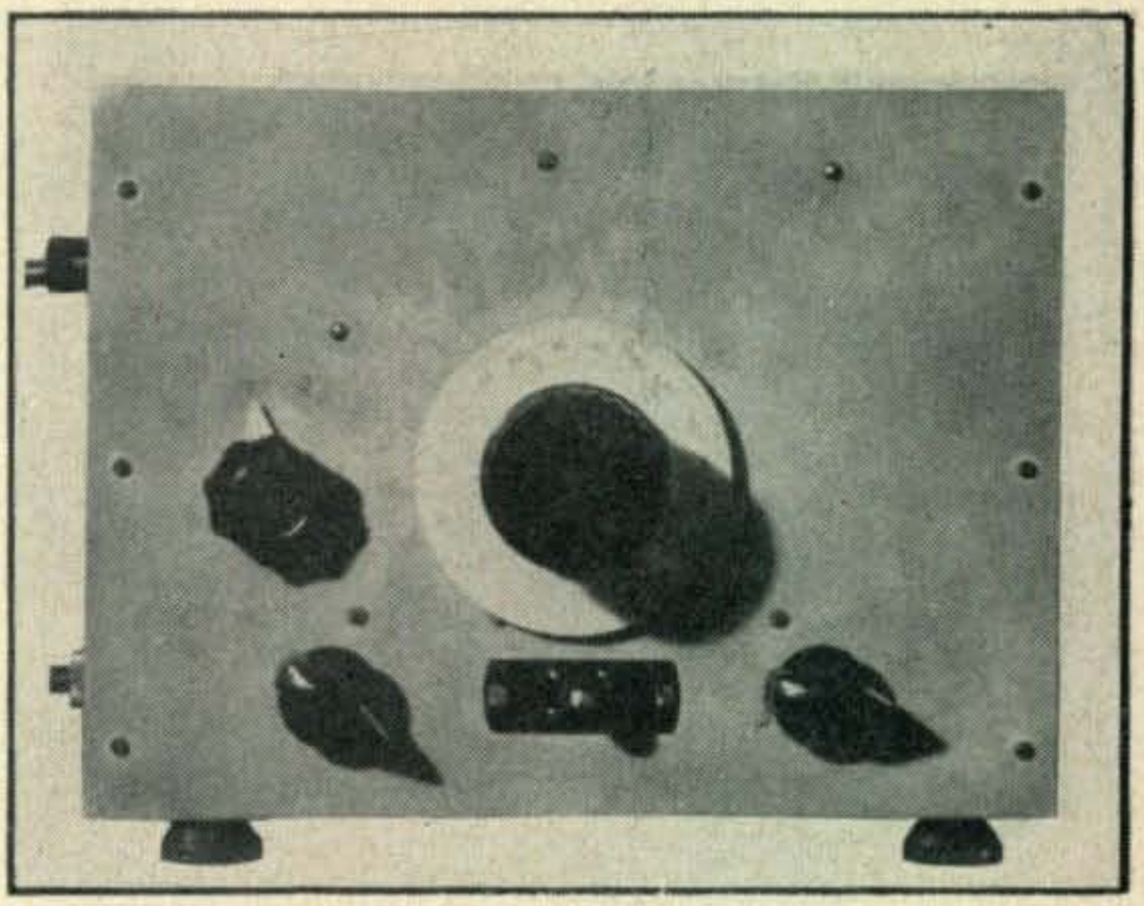
21 Gundulicev Venac, Belgrade, Yugoslavia

A Famous DX Man Describes His Integrated System for Good Keying, Effective Receiver Silencing and Quick Recovery

Many Hams have gray hairs from working out a good c-w break-in keying system. In theory, it is simple—you just apply protective bias to all amplifier stages and key the oscillator. Pressing the key puts the key on the air; releasing it takes it off.

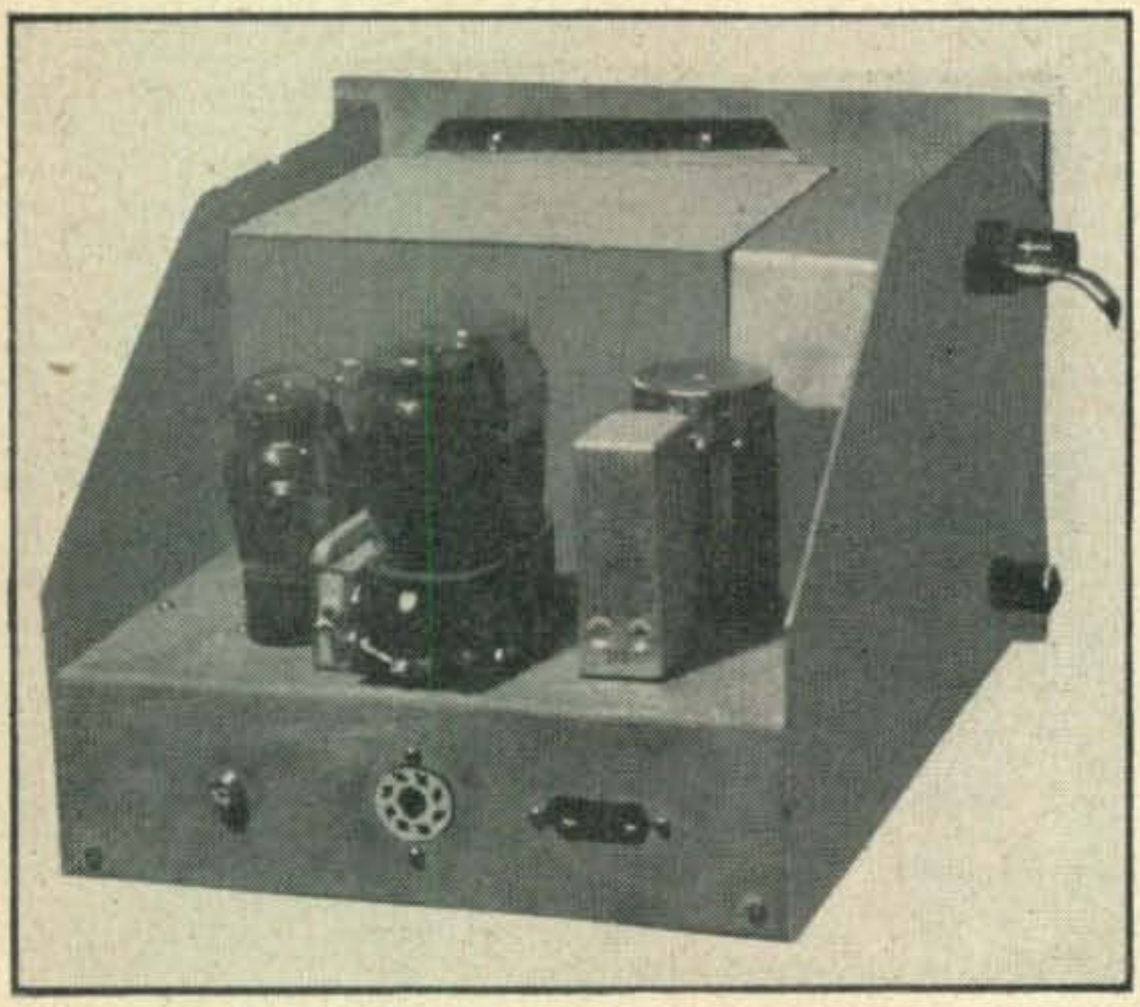
Unfortunately, with oscillator keying, it is virtually impossible to obtain a signal that is free of clicks and chirps at the same time.[1] For example, at YU1AD, I used a Clapp oscillator with its grid circuit on 1.75 Mc. for two years. By luck as much as anything else, it produced a beautiful T9X note, even when multiplying to the 14 and 28-Mc. bands with simple cathode keying. But, in spite of constant experimenting with key filters, I was never able to eliminate the clicks without producing a chirp.

Some of the circuits devised to solve the break-in keying problem work well, but are quite complicated.[1] Besides, comparatively few of them solve the knotty problem of receiver silencing. This results in loud clicks issuing from the phones or speaker every time the key is pressed and slow recovery of receiver sensitivity when the key is released. No wonder a "smooth-as-butter" break-in system is a rather rare item.



In the center of the cabinet is the slow motion dial and directly below it a switch to short the key terminals for tuning purpose or phone operation (SW1 in the diagram).

1. R. W. Johnson, W6MUR, "Keying the Kilowatt," **CQ**, Sept. 1953, p. 33.



In this rear view we have not identified the outstanding components since European parts have been used throughout. However, the circuit may be easily reproduced from American components. The big box shields the temperature critical L/C of the oscillator.

The Circuit Used at YU1AD

When I decided to install an improved break-in system at YU1AD, I spent several weeks at the drawing board before evolving the circuit diagramed in *Fig. 1*. Basically it consists of a Clapp, variable-frequency oscillator followed by a buffer/doubler stage, which is keyed in the cathode circuit through a vacuum-tube keyer.

The relays, *Ry1* and *Ry2* make the circuit unusual and effective. When the key is up, *Ry1* is de-energized, but *Ry2* is energized through the back contact of the first relay. *Ry2* shorts out the auxiliary r-f gain control, *R10*, and the receiver operates normally.

As soon as the key is pressed, the screen current of *V2* flows through the coil of *Ry1*, energizing it and applying screen voltage to the oscillator tube. At the same time, *Ry2* is de-energized, which grounds the receiving antenna and cuts *R10* into the circuit. Its purpose is to

set the strength of the monitoring signal from the speaker or phones.

Upon release of the key, *Ry1* stays closed for a period of time determined by the *R/C* circuit consisting of *C10, R4* and *R5* across its coil. Thus, the oscillator continues functioning and actual keying is done in the cathode circuit of *VT2*. But any pause in sending allows *Ry1* to de-energize, shutting off the oscillator and returning the receiver to normal.

Obviously, the proper functioning of the system depends upon the relays. They must be rapid acting and adjustable for minimum spacing between contacts, to be as nearly instantaneous in operation as possible. They must also operate on a current of four or five milliamperes. Most good-quality "plate-circuit" relays meet these requirements.

Construction

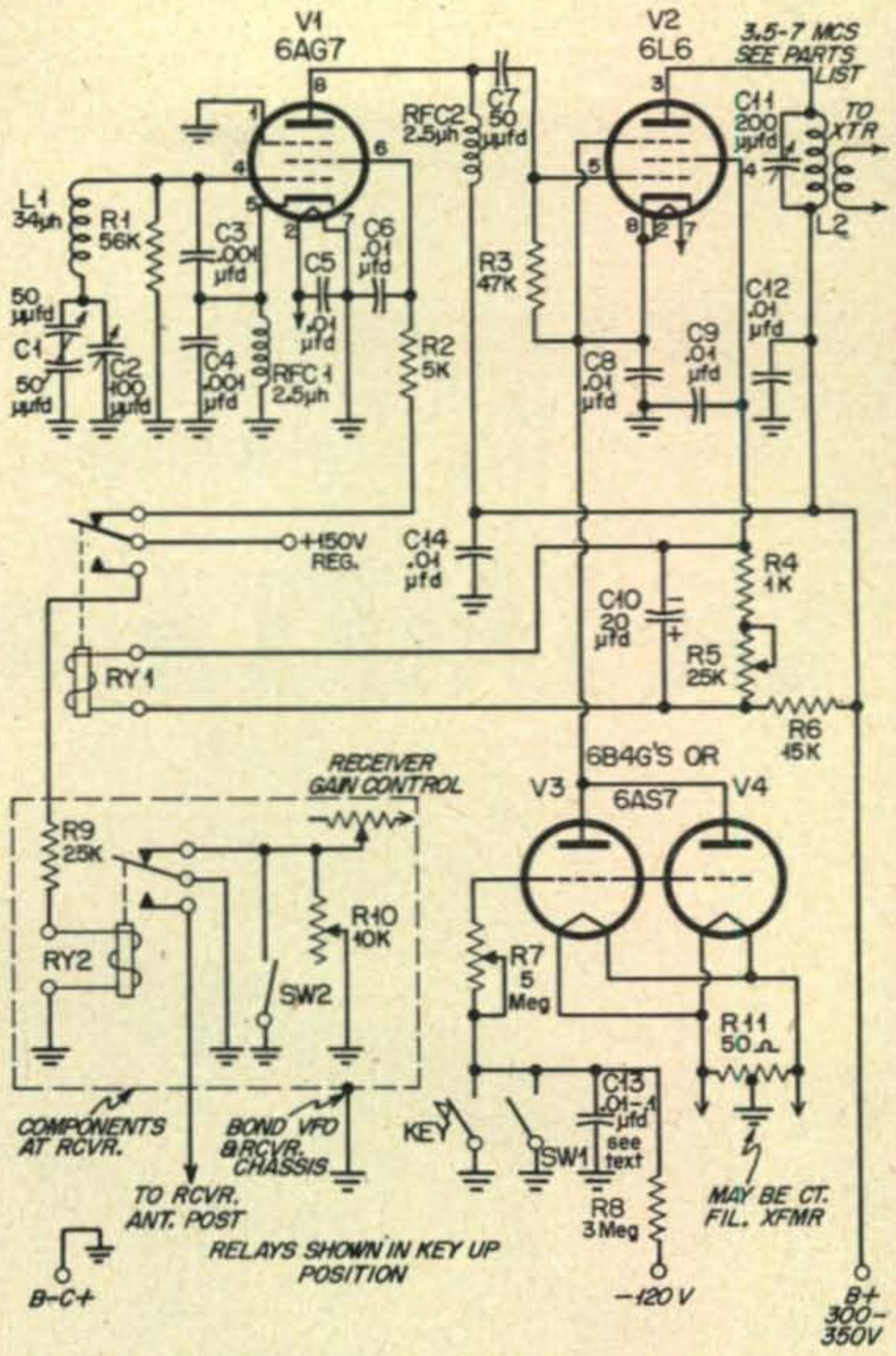
As a matter of personal preference, the v-f-o unit is separate from the rest of the transmitter. The usual precautions required to produce any stable VFO were observed in its construction. A few general notes should furnish sufficient information for any one wishing to build a similar unit.

I used *surplus* German tubes, but for the American reader, I would suggest a 6AG7 oscillator, a 6L6 buffer,* and a pair of 6B4G's or a 6AS7 in the keyer.

The floating rotor of the split-stator condenser used at *C1* eliminates possible frequency jumping caused by variation of resistance in the condenser bearings. I also discovered that the condensers used at *C3* and *C4* had to be chosen very carefully for best results. A number of new, silver-mica condensers of German, English, and American manufacture caused a peculiar kind of instability, which became evident on the higher frequencies. It was finally cured by installing a pair of American-made condensers salvaged from a piece of military *surplus*. Others of the YU gang have also discovered the importance of carefully-chosen condensers at these points.

Relay, *Ry1,* is mounted in the v-f-o cabinet, and *Ry2* is mounted in the receiver close to the antenna terminal, to keep r.f. pickup to a minimum when the receiving antenna is grounded. There may be some hesitation about modifying the receiver. Really, it is a very minor task. The ground connection on the receiver r-f gain control is removed, and the control is regrounded through the auxiliary control. At the same time, the junction between the two controls is connected to the "front" contact on *Ry2*.

At YU1AD, I mounted the auxiliary control on a small bracket right at the key and made connections to it through a length of two-wire cable. The switch across the control permits



C1—50 μμfd. per section, split stator. Rotor, insulated from chassis.
C2—100 μμfd. variable.
C3, C4—0.001 μfd. high-quality silver-mica.
C5, C6, C8, C9, C12, C14—0.01 μfd. mica.
C7—50 μμfd. mica.
C10—20 μfd. 150v. electrolytic.
C11—200 μμfd. variable.
C13—0.01 to 0.1 μfd. paper. Exact value found by experiment (See text).
L1—39 t. #18, 1½" diam., 1⅞" long.
L2—15 t. #16, 2" diam., 1½" long.*
R1—56,000 ohm, 1w.
R2—5,000 ohm, 5w.
R3—47,000 ohm, 1w.
R4—1000 ohm, 1w.
R5—25,000 ohm, variable.
R6—15,000 ohm, 5w.
R7—5 megohm variable.
R8—3 megohms, 1w.
R9—25,000 ohms, 2w.
R10—10,000 ohm, wirewound variable.
R11—50 ohm, c.t., or or ground centertap of filament winding.
Ry1, Ry2—s.p.s.t. sensitive relays, 5,000-ohm coils. (See text).
RFC1, RFC2—2.5 uh. r-f chokes.
V2—6L6.
V1—6AG7.
V3, V4—6B4G's or a 6AS7.
Sw1—telephone type switch across key.
Sw2—s.p.s.t. toggle switch.

Fig. 1—Diagram of YU1AD's VFO designed for full break-in operation. Power requirements are 6.3 volts for the filaments; 300-350 volts at 40 Ma. (approx.); 150 volts at 20 Ma. (approx); 120 volts, negative, at negligible current.

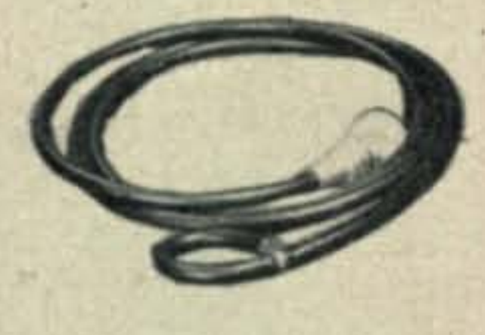
shorting it out to use the receiver without turning on the transmitter. It is a refinement that may easily be dispensed with, simply by turning the control to minimum resistance at these times.

When the VFO is first put in operation, *C12* in the keyer tube grid circuit (across the key) should be chosen experimentally; so that, with

(Continued on page 68)

* A better shielded tube, such as another 6AG7, might be advisable here, especially for "straight-through" operation—**Editor.**

Building a 1.7-150 Mc. Test Monitor



ARTHUR FRANKLIN MILL

1145 11th Street, Reading, Pa.

This Instrument is Really a Half Dozen Meters in One Box, and Is One of Those Things No Well-Equipped Amateur Station Should be Without.

A few of the uses of this self-contained, versatile little instrument described in this article are:

1) Field-strength meter.
2) Calibrated wavemeter.
3) Harmonic chaser.
4) Amplitude modulation percentage and carrier shift indicator.
5) Monitor for checking audio quality, hum on your carrier, etc.
6) Neutralization indicator.

This instrument's wide frequency coverage—1.7 to 150 Mc., divided into six bands—its simplicity, compactness and versatility all add to its usefulness. *Figure 1* shows the circuit, and the various photographs should amply illustrate the general appearance and construction. Although built in a 3 x 4 x 5 inch utility box, compactness has not been achieved at the cost of having to carry a large box full of accessories. The photograph at the top of this page shows the unit with all accessories.

The band switch and tuning knob occupy the 3″ x 5″ top of the box, with the antenna jack and coaxial connector for the remote probe in the rear corners. An 0-1 milliammeter and the remaining controls occupy the 3″ x 4″ front. This arrangement makes it easy to tune *C2* and read the meter, whether the unit is held in the hand or placed on the workbench.

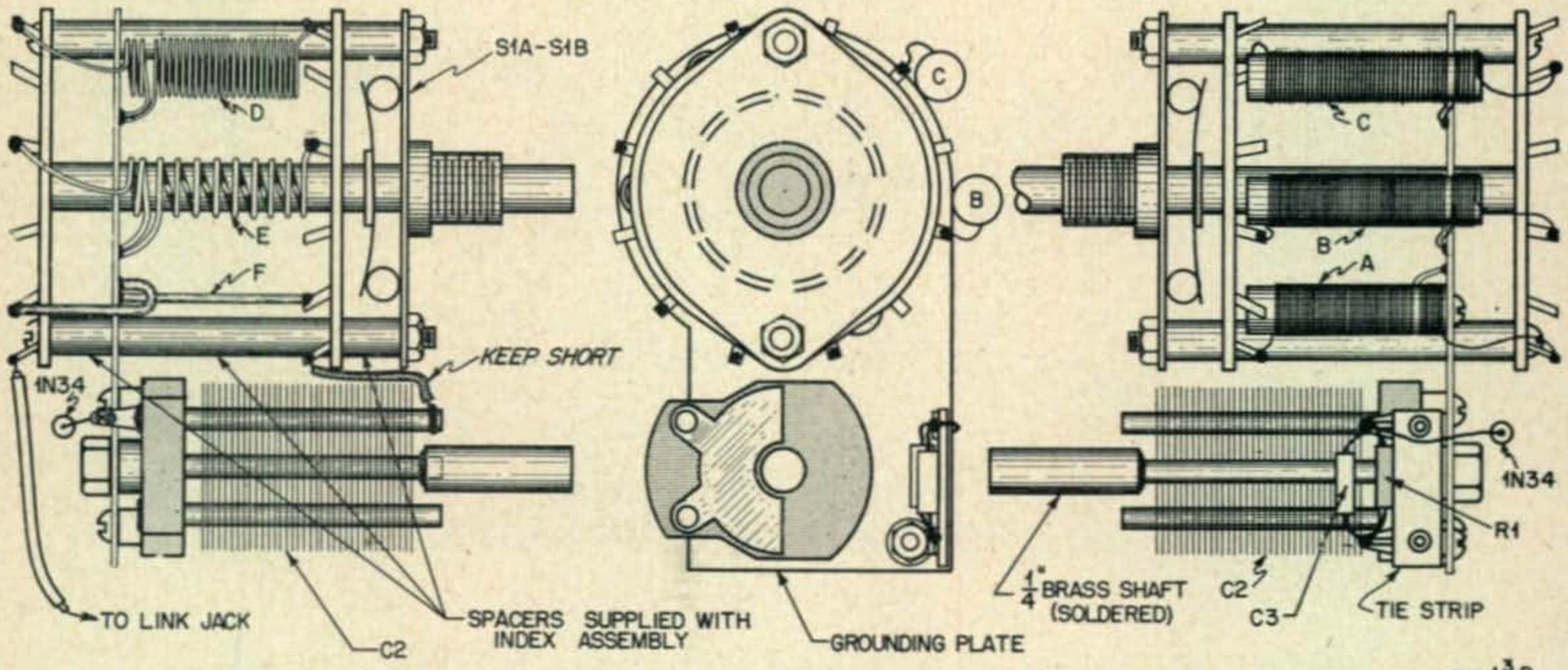
A quarter-inch aluminum rod, ten inches long, usually gives sufficient pickup for checking modulation and for routine tests around the station. The small size of the shielded probe makes it particularly useful in searching for harmonics, parasitics, and r-f leaks around the transmitter. It is also useful as a neutralizing indicator.

The low-impedance input is also convenient for coupling a center-fed doublet to the instrument when making field strength measurements. By using a long feed line, the instrument may be placed where it is most convenient to read *M1*. Alternately, an external milliammeter or microammeter may be plugged into *J2* for remote indication and/or increased sensitivity. A pair of phones may also be plugged into *J2* for audio quality checks. Using the instrument for measuring modulation percentage will be described later.

Construction

The heart of the instrument is the r-f sub-assembly. Details of its construction are shown outlined in *Fig. 2*. *S1a-S1b*, the band switch, serves as a support for all components in the sub-assembly. Its panel bushing fastens it securely to the panel.

The switch is constructed from two *Centralab* type "G" switch wafers and a K-122 index assembly. These type "G" wafers have eleven positions and differ from standard ones in that all except the desired contact are shorted. A piece of sheet copper, shaped as shown in *Fig. 2*, and mounted between the switch sections, serves both as a grounding ring for the coils and as a support for *C2*.



A 140 $\mu\mu$fd. APC condenser, *C2,* is used because its small size and terminal arrangement permits a lead less than a half-inch long between it and the band switch. This is an important consideration in reaching 150 Mc. with such a comparatively high-capacity condenser. It is mounted backwards on the copper shield. A shaft must be added to the condenser. This is readily done by drilling a hole in the end of a length of quarter-inch brass rod just large enough to fit over the back of the rotor, to which the rod is soldered. A bushing through the panel furnishes additional support and makes a smoothly-operating unit.

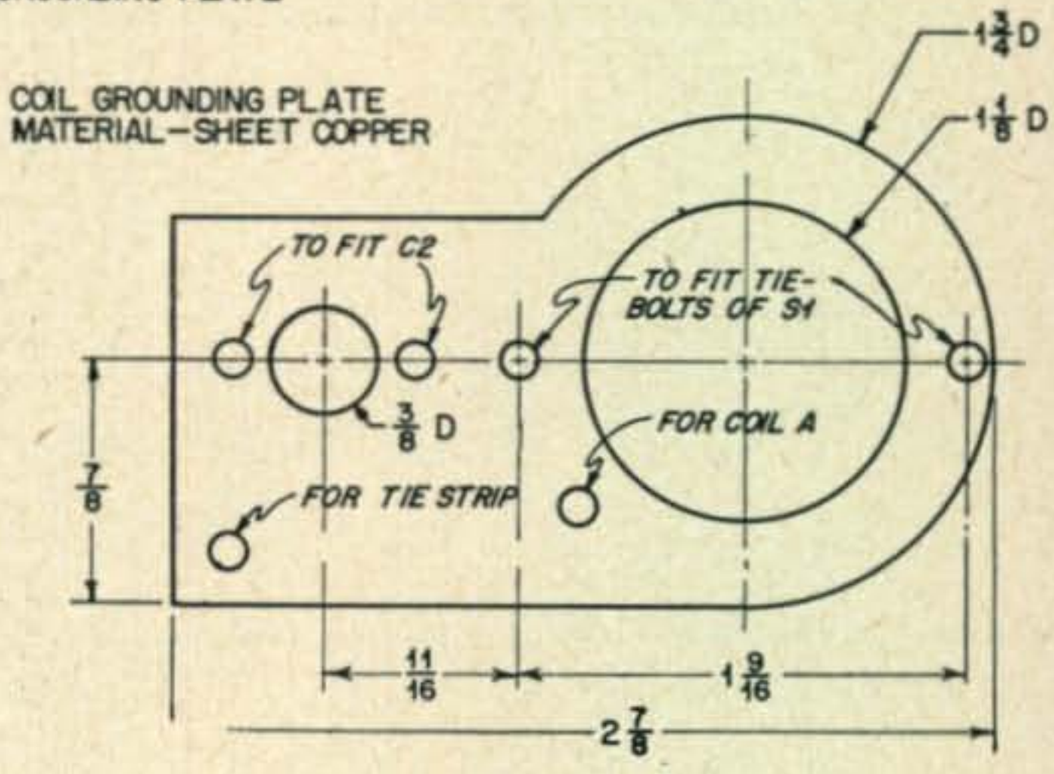
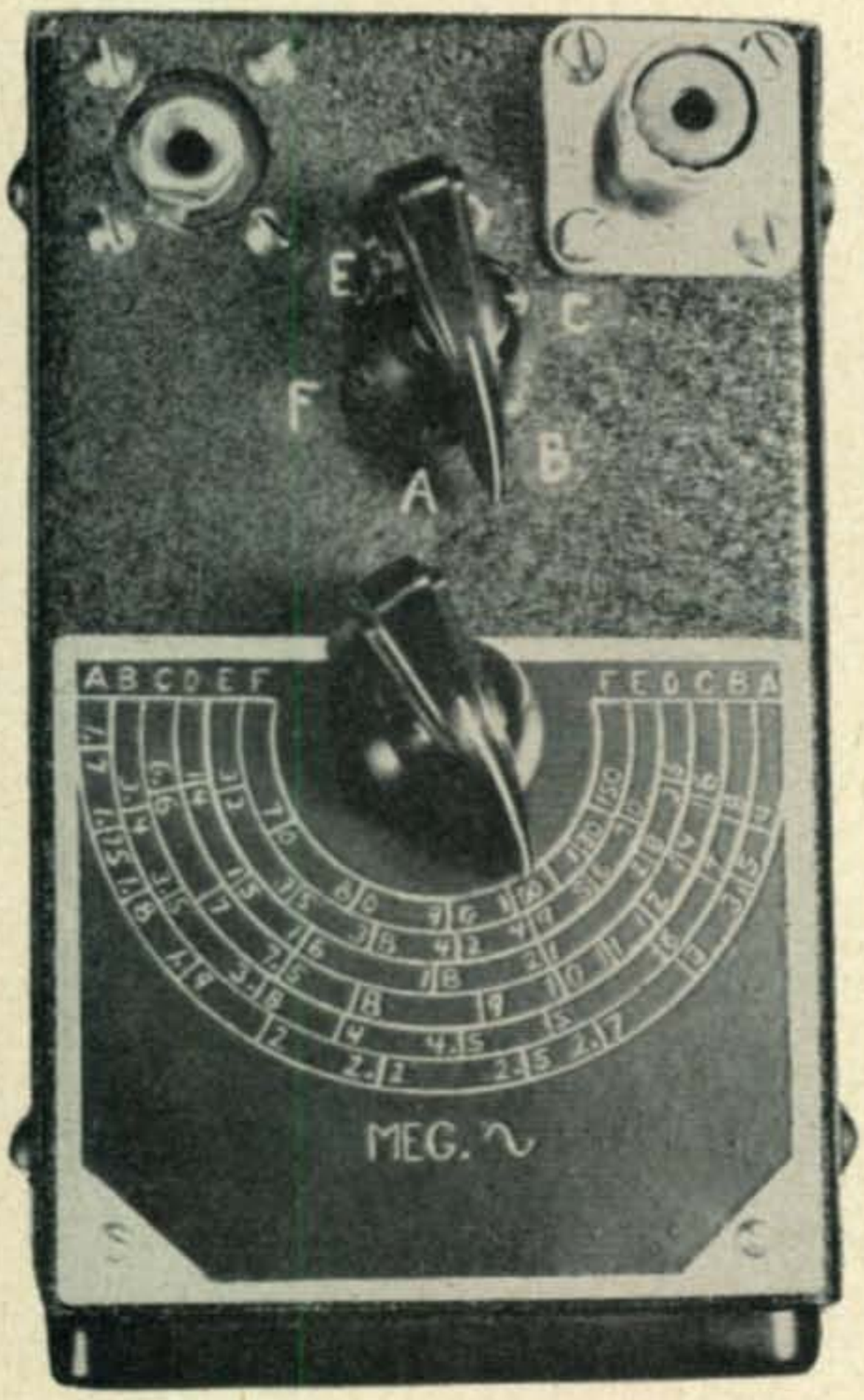


Fig. 2. Detail view of the coil assembly.



Top panel view of the test monitor.

At this point, drill the 3/8-inch diameter holes in the top of the box and temporarily mount the r-f assembly. Then lay out the remaining holes. Jack, *J1,* is mounted in the rear left-hand corner. Insulate it on a small square of polystyrene. Place the coaxial fitting in the other rear corner.

The size of the milliammeter almost determines the positions of the controls on the front of the box. Its position must be logical and convenient.

Wiring and placement of the few parts in the r-f assembly is clearly evident from the photographs and *Fig. 2.* The *Table* gives full data on the coils. They are connected to every other contact on the band switch, and all are supported by their leads, with the exception of the lowest frequency one. It is supported on the copper plate by means of a 6-32 screw in the end of the polystyrene rod on which it is wound. One of the unused contacts on *S1a* is grounded, thereby automatically grounding all unused coils.

Note that coil *F* for the 70-150 Mc. range consists of a length of *No. 12* wire. Both its length and that of the lead between the rotor of *S1a* and the stator of *C2* determine the maximum frequency that can be reached. Although I used

COIL TABLE

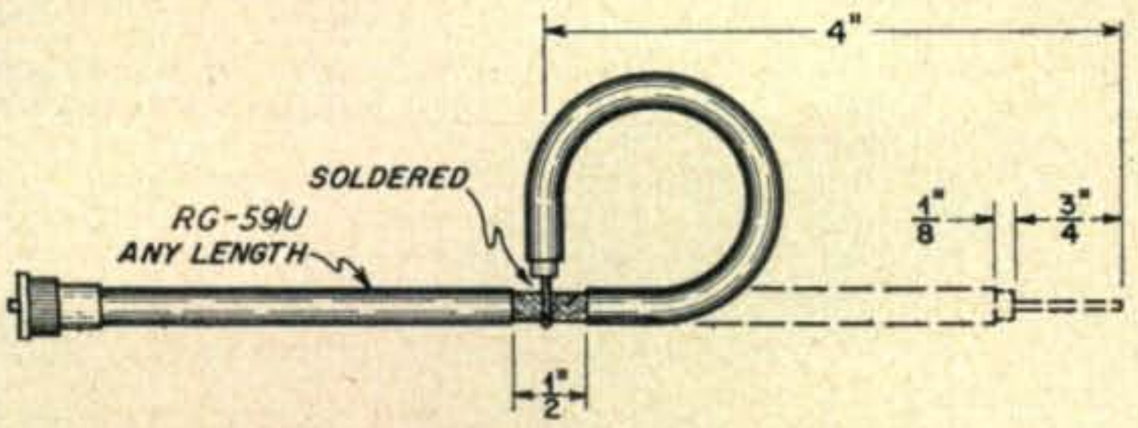
RANGE	COIL WINDING DATA
A 1.7-4 Mc	224 T., No. 36, En. Close wound on ¼-inch polystyrene rod. Tap 12 T. from bottom for link. End of rod drilled and tapped for 6-32 screw to mount coil.
B 3.4-8 Mc.	115 T. No. 30, En. Close wound on ¼-inch polystyrene rod. Tap 6 T. from bottom for link. Coil supported by leads.
C 6.5-16 Mc.	61 T., No. 24 En. Close wound on ¼-inch polystyrene rod. Tap 3 T. from bottom for link. Coil supported by leads.
D 14-35 Mc.	L—23 T., No. 18 En. Air wound, ¼-inch inside dia. L1 3T., same construction. Mount at bottom of L. Coils supported by leads.
E 32-70 Mc.	L—8 T., No. 14 En. spaced wire dia. Air wound, ¼-inch inside dia. L1 2T., No. 18 En. wire. Close wound and mounted below L. Coils supported by leads.
F 70-150 Mc.	L—No. 12 wire between switch contact and copper ground plate. L1—Hair-pin loop, ¼" x ¼", i.d. mounted 1/32-inch from L. See photograph and Fig. 2.

silvered wire for each, plain copper wire should work as well.

Positions of the components beyond the r-f choke are not critical. Two points are worthy of mention. One is to insulate *X2*, the audio rectifier, from the case in accordance with the manufacturer's recommendations. The other is that nothing is to be mounted on the removable sides of the box.

There is a choice of how to wire *J2*. When wired as in *Fig. 1*, everything plugged into it is connected in series with *M1*. This is convenient for plugging in an external milliammeter to read current deflection at two points, which is sometimes necessary in making field-strength measurements. However, *X1* is effectively in parallel with *J2* for audio frequencies. This affects audio quality slightly when the phones are used for monitoring.

Putting *J2* in the other side of the circuit will automatically disconnect *X2* and *M1* when a plug is inserted. To make the change, connect *R2* directly to *S2*, instead of through *J2*. Then connect the r-f choke to the "tip" terminal of *J2*. Lastly, connect the inner leaf of *J2* to the terminals of *S2* and *C4* which were previously connected to the r-f choke.



This drawing shows the method of constructing the loop probe from a length of coaxial cable.

The Dial

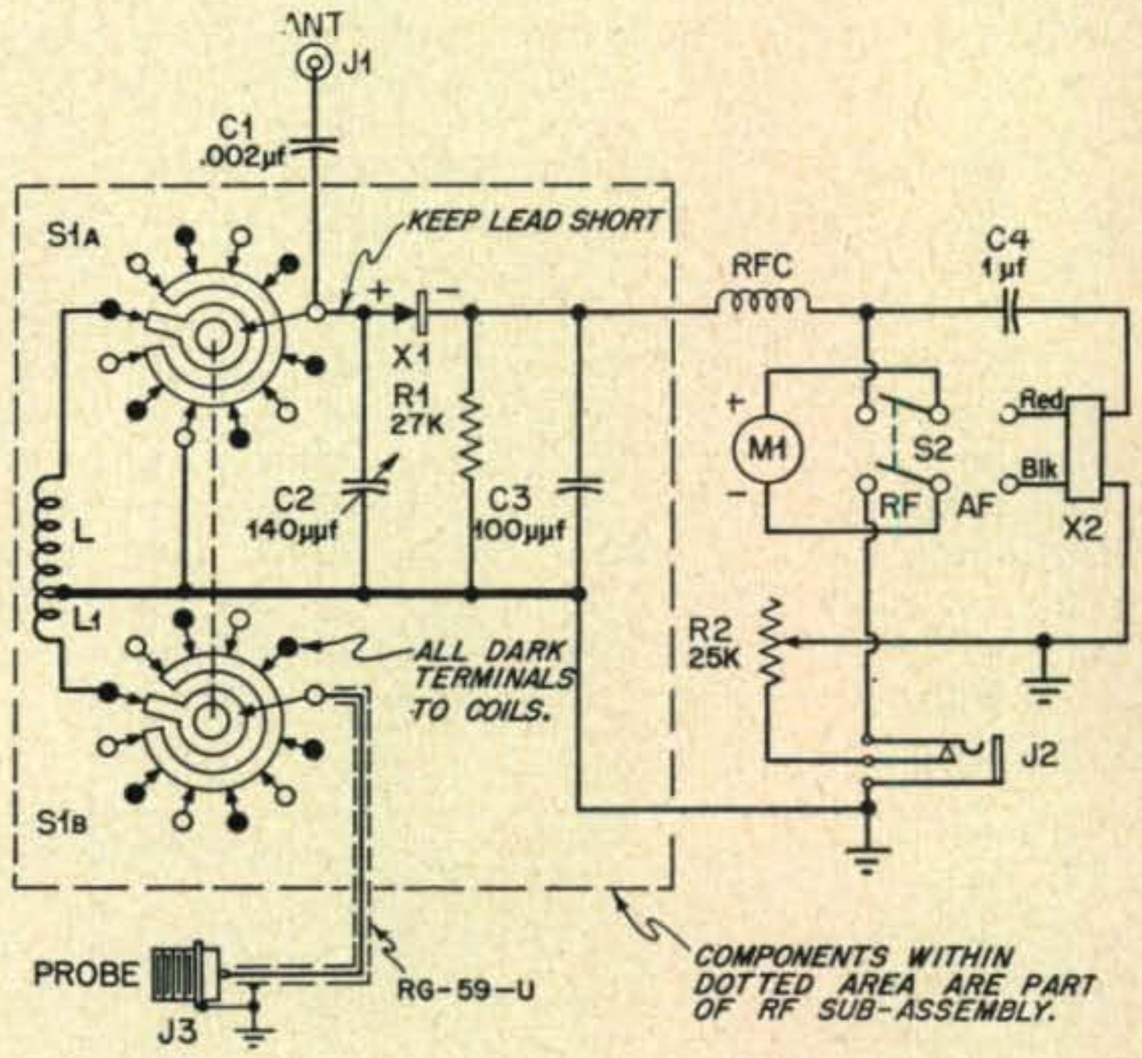
The dial is made of a flat piece of rust-proof metal (I used Monel), 2⅞" x 2½". Its appearance is clearly shown in the picture of the top of the instrument. Drill the ⅜-inch diameter hole for the shaft bushing and the two mounting holes. Then fasten the plate to a flat surface by means of Scotch tape and spray with two coats of flat black paint. The tape serves both to hold the plate in place and to mask the 3/32-inch borders and the diagonals at the corners.

After the second coat of paint has dried, scribe in the semi-circular lines with an inking compass or dividers from a drawing set. Temporarily mount the plate on the instrument and calibrate as indicated below. Use the sharp point of the compass to scribe in the radial lines and numerals. Remove and spray with two coats of "satin" varnish. A "flit" gun may be used to spray the paint and varnish. Allow to dry and replace on meter.

The Probe

The loop probe is made of a convenient length of RG-59/U flexible, coaxial cable. Bare the center conductor at one end for three-quarters of an inch. Cut back the shield and vinyl covering another eighth of an inch to

(Continued on page 66)



R1—27,000 ohm, ¼w.
R2—25,000 ohm, potentiometer (midget)
C1—0.002 µfd. ceramic
C2—140 µµfd. APC variable
C3—100 µµfd. ceramic
L & L1—see coil "D" in coil table
RFC—2.5 mh.
M1—0-1 ma., 3 inches square
X1—1N34 germanium crystal
X2—copper oxide bridge rectifier (Conant B4)
S1a, S1b—two type G, 11-position wafers. One K-122 index (Centralab)
S2—d.p.d.t. toggle
J1—banana jack for antenna
J2—closed circuit phone jack
J3—coaxial chassis connector
ANT—ten inch, ¼ o.d. aluminum rod, banana plug in one end to fit J1

Fig. 1. Wiring schematic and parts list.

Conducted by HERB BRIER, W9EGQ

385 Johnson Street, Gary 3, Indiana

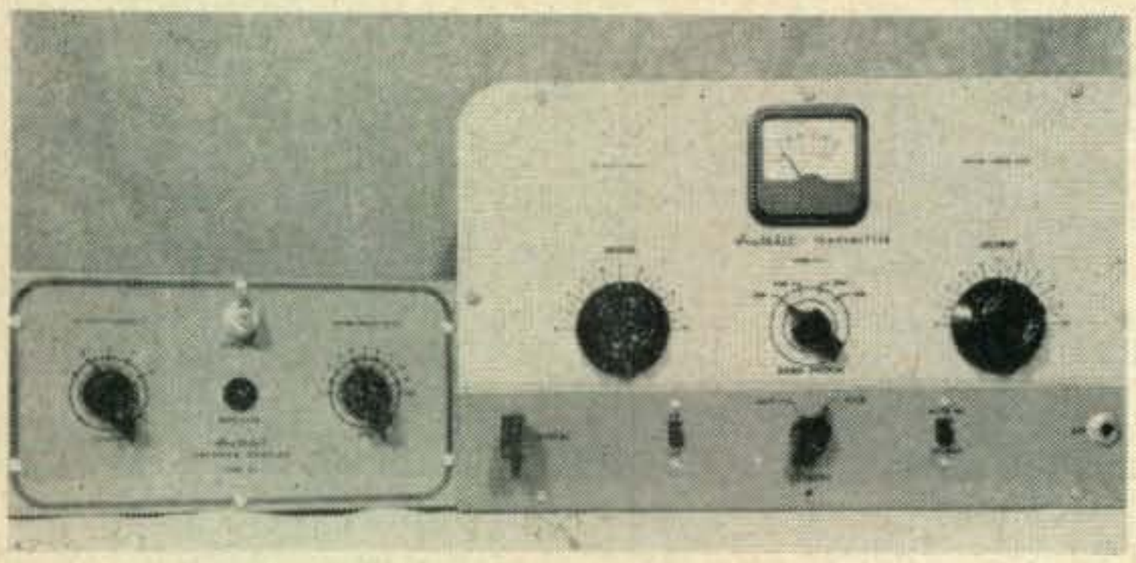
It has been some time since we have reviewed any commercial radio equipment or kits in the *Novice Shack*. This month, we have a double-header in the form of two companion kits. They are the *Heathkit AT-1* transmitter kit and the *AC-1* antenna coupler kit, which are manufactured and distributed by mail by the *Heath Company*, of Benton Harbor, Michigan.

When assembled, the *AT-1* is a compact 3.5 to 30 Mc., c-w transmitter. A 6AG7 crystal oscillator drives a 6L6G output stage to a maximum input of thirty-five watts. Band changing is accomplished by means of a band-selector switch, eliminating the need for plug-in coils. Crystals plug into a socket on the front panel.

Power is supplied by a built-in supply utilizing a 5U4G rectifier tube. It has an output of 425 volts at 100 ma. of which approximately 80 ma. are available for the 6L6G. In addition, 6.3 volts is supplied for the tube filaments.

A dual-range milliammeter and a meter switch permit measuring the 6L6G plate and control-grid currents, making it easy to tune the transmitter. A third switch position removes the meter from the circuit after the transmitter is tuned. This relieves the meter pointer of the banging it would otherwise undergo during keying.

On the back lip of the chassis are two octal sockets. One is wired to furnish power for an external variable-frequency oscillator, the output of which may be plugged into the crystal socket after making a minor change in the wiring of the 6AG7 circuit. The other completes the circuit in the 6L6G B+ line through a jumper plug. This plug may be removed and the output of a modulator, capable of furnishing fifteen watts or so of audio power, fed into the socket for phone operation.



The Heathkit AC-1 antenna coupler and AT-1 transmitter reviewed in this month's column. They are available in kit form from the Heath Company, Benton Harbor, Michigan. The AC-1 sells for $14.50 and the AT-1 for $29.50.

On all frequencies within the range of the transmitter, except for the range from 3.5 to 4 Mc., the 6L6G operates as a frequency multiplier. Although not feasible in a high-power transmitter, this simplifies the circuit and insures freedom from self oscillation. Output is reduced a trifle when compared to the amount that would be obtained with a straight-through operation, but certainly not enough to reduce the "getting-out" ability of the transmitter.

One effect of operating the 6L6G as a frequency multiplier on the higher-frequency bands is noticeable in the crystal frequencies required. For 3.7-Mc. Novice operation, crystals between 3700 and 3750 kc. are required, and for the 7.2-Mc. band, crystal frequencies between 3587.5 and 3600 kc. are required.

Seven-megacycle crystals are recommended for 14 and 28-Mc. operation, although 3.5-Mc. crystals may be used at the cost of somewhat reduced transmitter output, especially on 28 Mc.

For 21.1 to 21.25-Mc. Novice-band output, the *Heath Company* recommends crystals between 5275 and 5312.5 kc., Frequencies are doubled first in the oscillator plate circuit and again in amplifier stage.*

The cost of the *AT-1* kit is $29.50. For this price, all parts, including pre-wound coils, tubes, punched chassis, and metal cabinet are supplied. Crystals are not furnished.

Assembling the Transmitter Kit

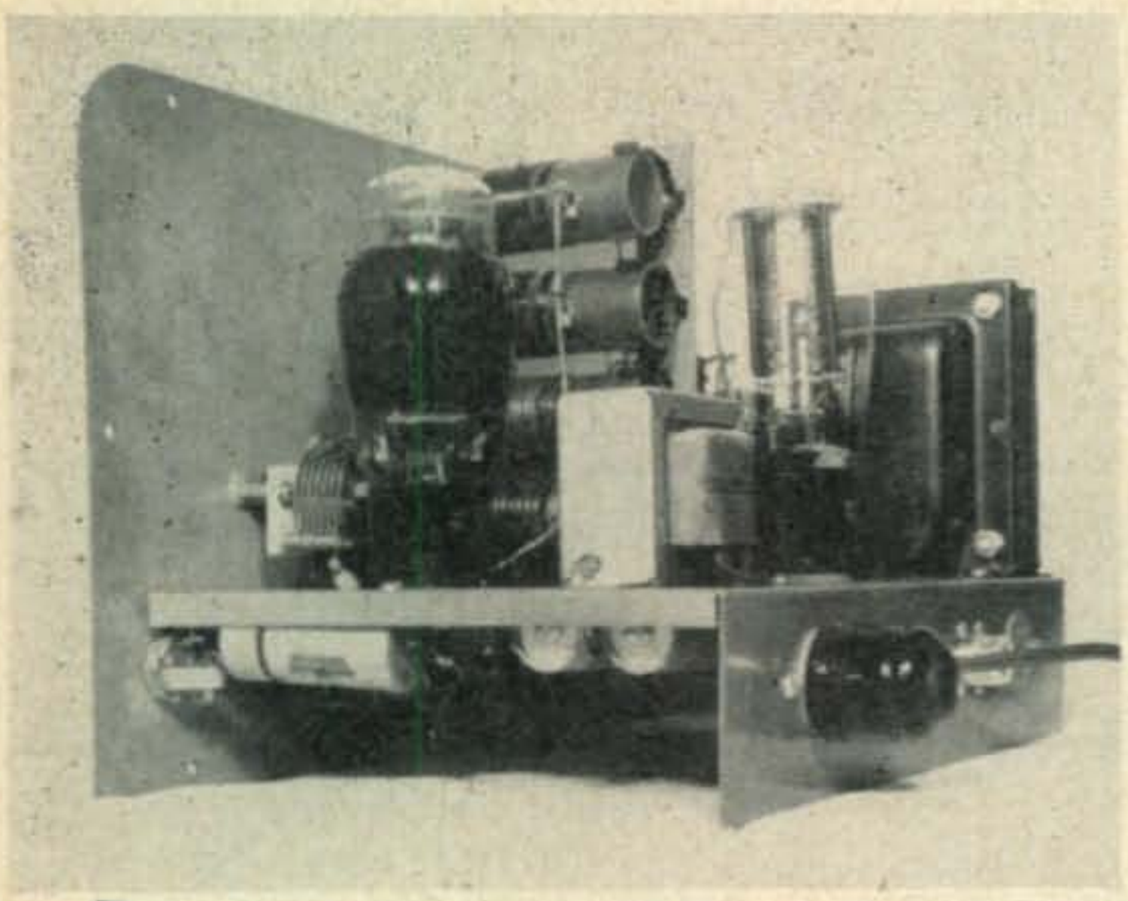
The only thing to be said about assembling the *AT-1* is that anyone who follows the precise instructions furnished will have no difficulty. First, read the 28-page instruction book completely and study the illustrations. Next, return to page one, and follow the step-by-step instructions exactly, checking off each step as it is completed.

Two pictorials and a schematic diagram at least double size show clearly where to place every wire

(Continued on page 28)

* My own experiments indicate that active crystals ground for frequencies between 3517 and 3541 kc. multiply into the 21-Mc. band just about as effectively as do 5.3-Mc. crystals. When they are used, care must be taken to choose the proper harmonic of the crystal frequency.

Turn the band switch to position **10** and the oscillator tuning condenser (marked **Driver** on the transmitter panel) to maximum capacity. Reduce its capacity to the **first** point of maximum grid current to the 6L6G. Avoid the setting near minimum capacity that also produces grid current to the 6L6G, because it will result in 28-Mc. output from the transmitter. Similarly, the amplifier tuning condenser will resonate at two points. Choose the high-capacity one for 21-Mc. output—**Herb.**



Final amplifier and power supply of the Heathkit transmitter.

and component in the transmitter. Next to following the instructions carefully, the best way to insure a good job is to take your time in assembling the kit.

Tools required are pliers, screw driver, soldering iron, and *rosin-core* solder. The soldering iron should have a small tip so that it may easily be applied to one connection at a time. Naturally, the tip should be clean and well tinned. A soldering "gun" is probably ideal, but with care an equally good job can be done with a conventional iron.

About the only thing that I did that was not specifically called for in the *Heath* instructions was to scrape the wire leads on all components before installing them, so that they were bright and shiny. Good soldered connections require that the surfaces to be soldered must be clean. In their manufacture, the leads on such components frequently acquire an almost-invisible film of dirt which makes soldering difficult or impossible.

Upon completion of the kit, I plugged in the tubes and crystal. Everything performed as the book said it should; therefore, I put the transmitter in its cabinet, connected a doublet antenna to the coaxial antenna terminal, and called CQ on 3735 kc. I raised WN9CCO, who gave me a T9X report. Next, I tested the unit on the other bands. Note and keying reports were excellent on all of them.

Just to see what would happen, I connected my 3-element, 14-Mc. beam to the transmitter and called W4SIQ on 14 Mc. Frankly, I do not know whether he or I was the most surprised at the strength of my signals.

The Antenna Coupler

The low-impedance output link of the *AT-1* is satisfactory for direct coupling to 52-ohm or 75-ohm lines used with center-fed, ½-wave doublets. Other types of antennas will require an antenna coupler to accept power. This is the purpose of the *Heathkit AC-1* antenna coupler.

When connected to the output of a transmitter with a low-impedance output circuit, the *AC-1* coupler will feed power into a 75-foot (or longer) single-wire antenna on frequencies at and above 3.5 Mc. Shorter lengths can be loaded on the higher frequencies.

The coupler is designed to handle a maximum r-f power of 75 watts, which is roughly equivalent to about 100 watts input. Its circuit consists of an L network coupled to the transmitter through a built-in low-pass filter. A length of coaxial cable (which is not supplied, although one fitting is supplied with each kit) should be used to connect the coupler to the transmitter. Cost of the *AC-1* kit is $14.50.

Assembling and Testing the Coupler

Assembling the *AC-1* coupler is quite simple and can be done in one evening. Nevertheless, tapping the *B&W miniductor* coil used in the L network and making one or two of the connections in the low-pass filter makes a small-tipped soldering iron or "gun" almost a necessity to do a good job. Incidentally, the coils used in the low-pass filter are supplied soldered to the tuning condensers and are pre-adjusted, therefore it is only necessary to solder them into position.

I did not have a single-wire antenna available to tune with the coupler. Instead, I connected the feeders of the other antennas I have available and tuned them as random length wires. I had no trouble feeding power to any of them. Adjustment is simple: The *Coarse Coupling* switch is set to an arbitrary position and the *Fine Coupling* control, a 250-$\mu\mu$fd. variable condenser, is adjusted for maximum output from the transmitter, indicated by maximum glow from the neon-bulb output indicator on the coupler and by the transmitter amplifier plate current, which will increase to its rated value. Should the first position of the *Coarse Loading* control not permit loading the antenna, choose another one and repeat the process. It takes only a few moments.

General Comments On The Kits

In my opinion, both the transmitter and the antenna coupler perform as the *Heath Company* say they do. No claim is made that the transmitter is TVI free in the usually accepted definition of the term. It does cause some interference to channels 2 and 5 on a television receiver operated three feet from it. The transmitter and TV antennas come through the same window and parallel each other, spaced a foot or so apart, for several feet. On 3.7 Mc. and 7.2 Mc., the interference is slight, but on the higher frequencies it is rather severe.

Adding the *AC-1* coupler eliminates all trace of interference from 3.7 Mc. and 7.2-Mc. operation. On the higher frequencies, the coupler reduces the interference, but does not eliminate it entirely—an indication of direct radiation from the transmitter. The

(Continued on page 59)

Leslie Bannon, WN9ZTD, located in Indianapolis, Indiana. He runs 35 watts on the three low-frequency Novice bands, and has worked 42 states in a few months of operation.

Monitored by LOUISA B. SANDO, WØSCF/7, ex-W5RZJ

9638 N. 16th St., Sunnyslope, Phoenix, Ariz.

Congratulations to the winners of YLRL's 14th Anniversary Party. In the phone section, held Dec. 5, W1FTJ, Dot, won first place with a score of 25,462.5. W3OQF (MAX), Barbie, placed second with 18,225., and W8HLF, Arlie, came in third with 14,850. In the CW section, held Dec. 12, highest score was 8,100, run up by W4RLG, Frances. W8HLF, Arlie, was second with 7,287.5, and VE3AJR, Dell, third, with 5,635. The loving cups, top awards, were won permanently last year by W3UUG (phone) and W1FTJ (CW), so YLRL is starting off this year's winners with new cups.

Here are some of the other scores:

PHONE		W6JZA	4,950.0	K2DYO	3,081.25
W1VOS	8,250.0	W6KER	2,275.0	W2EBW	1,530.0
W1TRE	7,020.0	W6WRT	2,047.5	W2EEO	555.0
W1SCS	6,500.0	W6CEE	1,837.5		
W1VYH	4,200.0	W6EWV	240.0	W3OQF	(MAX)
W1WTQ	3,570.0	W6EHA	105.0		2,800.0
W1QON	3,240.0			W3SVY	2,000.0
		W7OOY	2,730.0	W3TYC	1,837.5
W2FBZ	5,880.0	W7TGG	360.0	W3MSU	1,200.0
W2JZX	2,100.0			W3LSX	780.0
W2PVS	900.0	W8HWX	12,870.0	W3TSC	150.0
W2EEO/2	440.0	W8HUX	12,615.0		
		W8ATB	8,845.0		
W3WPP	10,360.0	W8GYU	3,150.0	W4SGD	3,150.0
W3MDJ	6,960.0	W8KLZ	1,710.0	W4UTO	2,300.0
W3UUG	4,920.0	W8FPT	1,500.0	W4TIE	156.25
W3RXJ	4,050.0			W4KYI	45.0
W3TYC	3,960.0	WØZWL	5.445.0		
W3MSU	337.5	WØUA	770.0	W6QMO	750.0
				W6PCA	262.5
W4KYI	12,300.0	VE3AJR	7,695.0	W6WRT	187.5
W4RIG	10,260.0	VE3DFC	4,350.0		
W4SGD	9,425.0	CW		W8GYU	4,593.75
W4TVO	5,775.0			W8HWX	3,562.5
W4RLG	4,950.0	W1FTJ	2,975.0	W8KLZ	1,487.5
W4UTO	367.5	W1WTQ	2,450.0	W8HUX	187.5
		W1RLQ	1,968.75	W8WUT	125.0
W5SPV	2,000.0	W1WPX	1,662.5		
		W1YYM	1,662.5		
W6QYL	6,247.5	W1VOS	1,575.0	WØZWL	1,168.75
W6QGX	5,270.0	W1QON	187.5	WØFVE	687.5

W2OWL, YLRL vice president in charge of contests, regretted that only 85 YLs submitted logs, although another 152 apparently participated in the contest. Ruth hopes more will send in their logs for the YL-OM contest.

9th District Meeting

The fourth annual get-together of the 9th District YLs is planned for May 21-22-23 in Milwaukee, Wis. Although it is especially for W9 YLs, any others who can make it are invited, and this goes for non-licensed as well as licensed gals. It is being sponsored by the Women's Auxiliary of the Milwaukee Amateur Radio Club and will be held at the Medford Hotel. Registration, at $2 per person to cover prizes and incidentals, will begin at 9 a.m. Friday and a good time is planned for the entire weekend. Each YL should make her own hotel reservations at the Medford, or wherever she wishes.

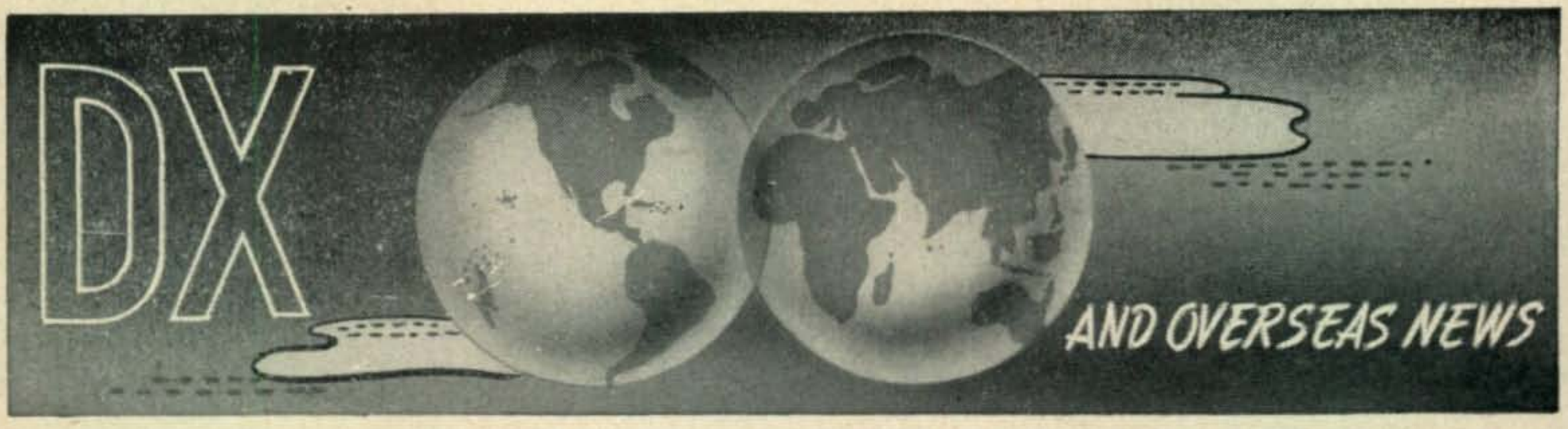
W6NZP Becomes DX

For several months W6NZP, Evelyn Scott, and her OM have been touring Africa—and according to ZS6GH it is the first time a W YL has visited ZS. The YLs have given Evelyn and Harold a fine welcome. The S.A. Women's Radio Club had a luncheon for them and ZS6GH, Diana, and OM ZS6J gave a cocktail party at their apartment in Johannesburg where 25 Hams gathered to meet Evelyn and Harold. YLs attending were ZS6AEU, Anitra; AJR, Jean; YL, Toni; VC, Pat; WV, Olga, and AIP, Theda. At Pretoria they saw ZS6BD, Edie, and ZS6WV, Yvonne, both at nursing homes. In Kimberley, ZS4FR, Doreen, and OM 4CT took them on a tour which included a trip to a diamond mine. At Cape Town, ZS1MU, Pat, and her OM showed them the Cape Peninsula and Table Mountain. Next stop was Oudtshoorn where they stayed with ZS1NY, Rose, and her OM 1PR, and among other things they visited an ostrich farm. Diana tells us that Evelyn actually rode one of the birds! At Queenstown, ZS2AA, Iris, entertained them in her home. ZS5TL, Sylvia, and ZS5KG, Muriel, made them feel at home in Durban. In Zuzuland they were met by ZS5DF, Meg, and other Hams. ZE2JE, Molly, and ZE5JY, Cynthia, they met in Salisbury, and Bulawayo, Southern Rhodesia. What a wonderful "Ham" world this is! Late in January two of the YLs back home had a chance to talk with Evelyn when she called

(Continued on page 54)

(W6WRT photo.)

Here's a set-up that would make many of us envious. W6HTS, Mildred O'Brien, and the rest of her Ham family, W6HSB and W6GDO.



Gathered by DICK SPENCELEY, KV4AA

Box 403, St. Thomas, Virgin Islands, USA.

Our heartiest congratulations go to the following stations upon their achievement of WAZ:

No. 297 ILMARI AHOLA OH5NK
40-145 (First OH WAZ)

No. 298 ROBERT WAHL DL1DC
46-145 (Fifth DL WAZ)

No. 299 ROY COLWELL W6LW
40-196 (115th W6 WAZ)

At Time of Writing

COCOS ISLAND, T19AA: Heino, DI9AA, operated from this QTH between Feb. 2 and Feb. 10. Activity was hampered by his many other duties and constant breakdown of his power supply transformer which limited operation to short periods. Costa Rican Hams cashed in Heino's efforts; 46 "TI" Hams contacted him, 3 on CW and 43 on phone. A total of 114 QSO's were made in the following order: TI2TG, W3CRA, W5CEW, W8PQQ, CO2OM, W9NDA, CO2SW, KV4AA, W3OCU, W8JBI, W3GHD, W8DAW, TI2PZ, TI2RK, TI2RC, W3JTC, TI2SJ, TI2PR, TI2DLM, TI2ELM, TI2JMC, TI2EV, TI2VJ, TI2RAF, TI2RL, TI2JA, TI5JLV, TI5EP, TI2JQ, TI2JBR, TI2MAR, WØPHZ, W3TMZ, W2BBS, W2FKE, W1JNV, W6WVU, W6LW, W1WSN, W8YGR, W6GPB, W2BUY, W4DQH, W9WFS, W4LRO, W8RYS, W9HUZ, W4DCZ, W1CLX, W7HIA, W8DLZ, W4GD, W8BKP, KV4BB, HC1FG, KZ5WZ, W5MIS, W4CEN, W2OCI, KZ5CP, W6BAX, W5FFW, W2HUQ, W9TGY, W9DUY/8, KV4AQ, W4TO, W2PRN, TI8FR, TI8AR, TI7RAC, TI4MD, TI3LA, TI2ALB, TI2MS, TI2JS, TI2AJ, TI2CHV, TI2WZZ, CM9AA, CO2BK, CO2BL, CO2AC, TI2JMA, TI2FG, TI2GA, TI2ER, TG9RB, KZ5GD, W2AX, W8HXL, W6TS, W8JGU, W8GZ, W8HRC, W6TSW, KZ5DG, W1FH, KZ5WP, KZ5AP, TI6RL, TI8CG, TI2OP, TI2KW/M, HR1AT, TI6JCH, TI8FG, TI2EO, TI2RU, CO2OZ, TI4EH, TI2AAL, TI8KR and TI2RKL.

The receiver at TI9AA did not have any BFO! In appreciation the Radio Club of Costa Rica has presented Heino with a special Honor Award and the TTI (Worked all Costa Rica Districts) certificate. QSL's may go via the RCCR, Box 535, San Jose, Costa Rica.

CLIPPERTON ISLAND, FO8AJ: WØNWX's expedition to this rare spot should occur, with reasonable certainty, during the second half of the ARRL's CW contest, March 26 to 28. Bob plans activity on all bands from 28 Mc. to 1.8 Mc. FO8AJ will QSY around the bands as per the pattern set during his activity at VP7NG a few years back. It is hoped his stay on Clipperton will extend somewhat beyond the contest period so that DX stations will have a crack at him.

SEYCHELLES ISLANDS, VQ9NZK: This expedition, scheduled for February, has been postponed approximately six months. VQ4NZK should now be in the states.

FANNING ISLAND, VR3D: The long CW drought from this QTH has been remedied by the presence VR3D, ex-VK2ANB. Ray has been dispensing QSO's on 7023 and 14052 kc. from 0730 to 1200 GMT. He will be there for two years. See QTH's. Ray skeds VK3FH.

WEST INDIES, G2RO: Bob wound up his Caribbean jaunt in mid-February and reported as follows: 700 QSO's from VP2GRO (Grenada, Windward Is.). 300 QSO's from VP4RO and 280 contacts from VP3RO. A slight illness contracted in VP3 necessitated a two-week rest period in Barbados, where he was heard as VP6RO. Bob's plans call for a three-weeks visit to Kenya around the end of March where he probably will not be on the air. Then, after returning to England for Easter, he will spend three to four months in Asia (VS6, VS5 etc.).

YEMEN, 4W1UU: Jim, ST2UU, after substantial stops at VQ6UU and FL8UU, arrived in Yemen on February 6 and operated from that QTH until February 16, when we advised that his next stop was HZ1 (Saudi Arabia) but, due to other HZ1 stations being on, little activity was planned. Visits to other rare spots are possible, but unknown, at this time. All QSL's should go to G2MI.

GUADALOUPE, FG7XA: This station has been putting on an appearance, of late, on 7008 kc. around 2130 GMT. The power is ten watts but signal strength good.

RIO DE ORO, EA9DE: We are informed that EA2CA has shipped his rig to this QTH and should be on the air, phone only, starting March 3 with the call of EA9DE.

(Continued on page 55)

The neat set-up of CR9AH, John Alvares, Macao. Two 807's in parallel are used and modulated by and 829B. The antenna is a dipole fed with 73-ohm co-ax, fifty feet above a two-story building. All gear is home-built.

WAZ Phone Award No. 1

VQ4ERR

E. Robson, VQ4ERR, of Nairobi, Kenya, has just sent in his qualifying QSL card, which entitles him to the first WAZ award on 'Phone ever issued. His first 39 Zones were received and checked by the committee over two years ago. Hearing this, we glance wistfully at our collection and once again bend over mike and key.

* * *

Another item which makes our keying finger itch is the news that all U.S.S.R. Hams may be able to work DX, and all other stations, commencing May 1st, 1954. This report was copied during a transmission by operator Sewa at station UB5KAB.

* * *

FO8AJ will be on the air at Clipperton Island, March 26-29 inclusive, using two HT-20's and an SX-88. The operator will be WØNWX. QSL FO8AJ at Hallicrafters Co., Chicago, Ill.

Ye Olde DX'er, Elvin Feige, W6TT of Oakland, Calif., needs no introduction. The rig consists of a Collins 310B1 exciter driving a pair of 4-250A's on phone and CW. Single sideband is also used. Receiving gear consists of an 75A-3, RME DB23 converter and sideband slicer. 3-element beams are used on 14 and 28 Mc. while 3.5 and 7 Mc. is taken care of by half-wave dipoles. W6TT's score stands at 230, with 225 confirmed, and 142 on A3. Photo courtesy of No. Calif. DX Bulletin.

The operating position of KR6AA in Okinawa. Doc Westervelt, W4VE, uses the small 50-watt band switching rig, which was his complete transmitter at KA9AA and KA2AA, to drive the 610 at 400 to 500 watts. The 7 Mc. band should now be available for use by KR and KA stations and Doc plans plenty of activity there. The antenna is a 700-foot long wire.

Old Timer Hal Jolliffe, VE3IG, Niagara Falls, Canada, is seen here tuning the HQ-129-X. The transmitter, not seen, runs 120 watts input to PP 807's and is completely de-TVI'd. Hal's Ham days date from 1912 and the spark coil era. His present ticket was issued in 1931. Chief interest is DX'ing and getting those QSL's in. VE3IG was the second VE to receive the WAS Certificate.

A very popular catch is YK1AH, Fadel Shihabi, of Damascus, Syria. Fadel is on daily, 14020, between 1230 and 1330. Power input is 60 watts to a doublet antenna.

Chapter One

Automotive Electrical Systems

Regulator Adjustment

Batteries

PE—103A

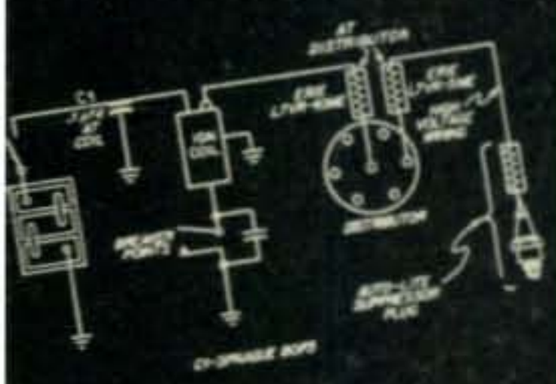
PE-101C

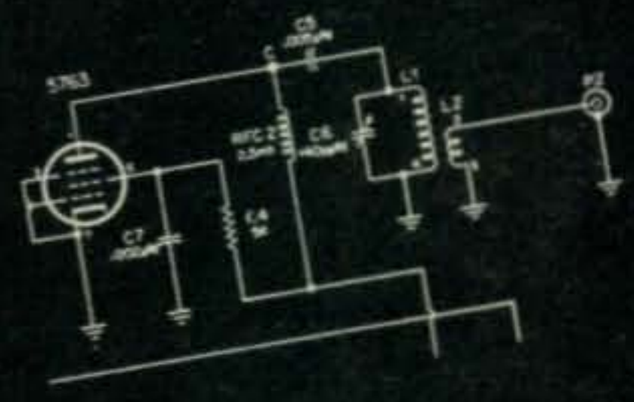
Remote Tuner

Chapter Two

Mobile Power Supp

High Power Supply





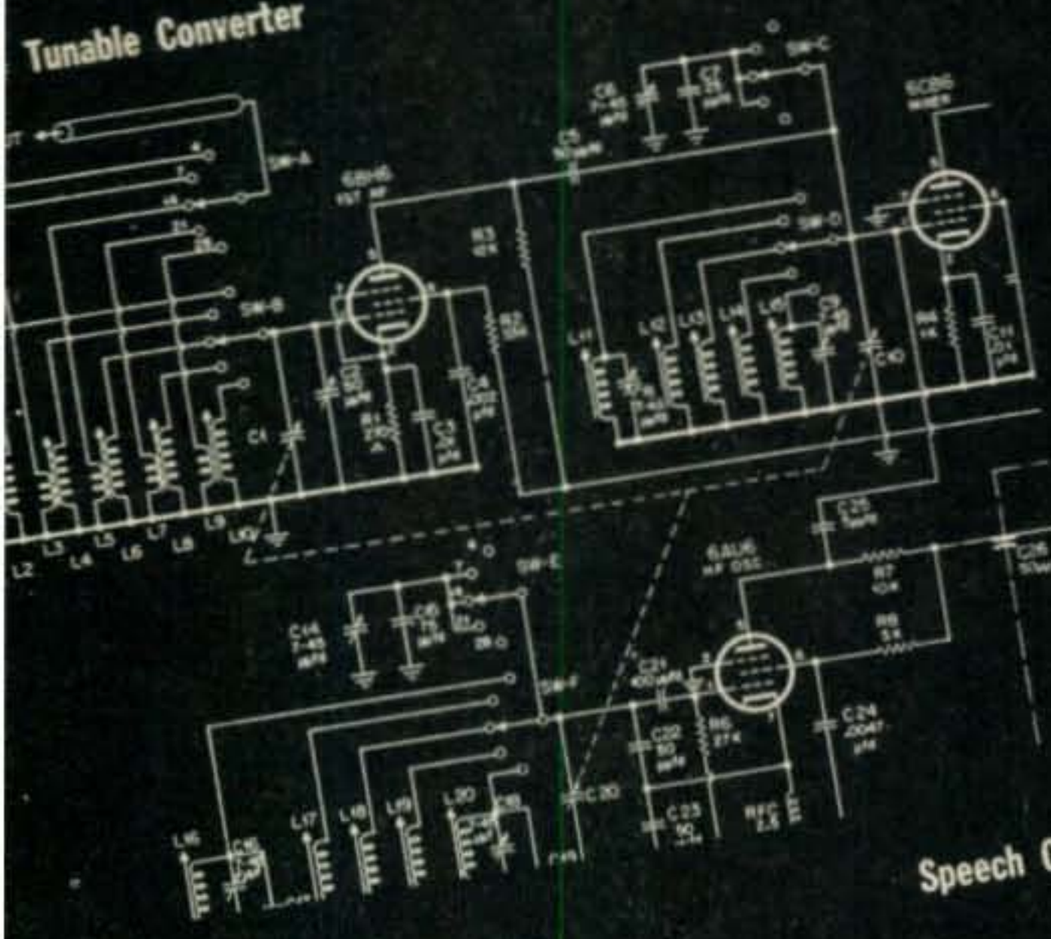
75-Meter V.F.O. Transmitter

Chapter Three

Safety in Operation

Mobile Receivers

Tunable Converter



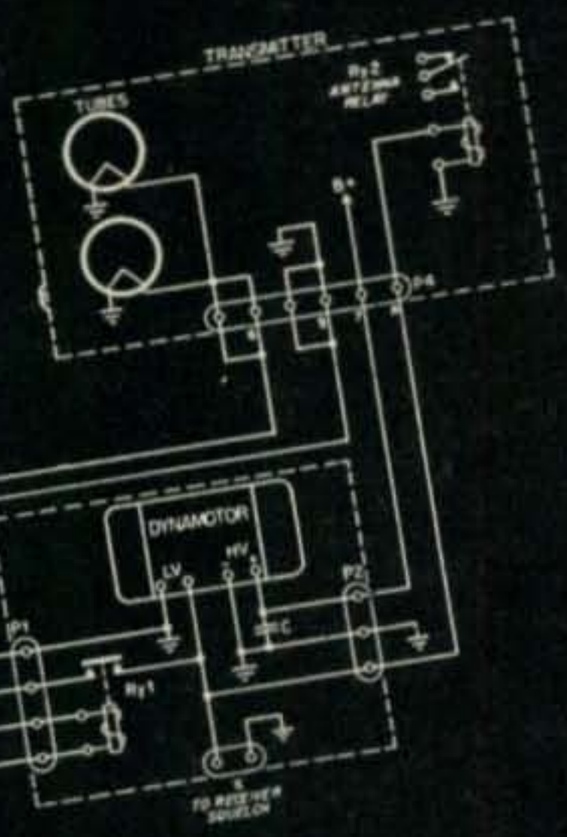
Converter Installation

12-Watt Mobile

Chapter Five

"Mobile Specia

3-Band Transmitter



Mobile Transmitters

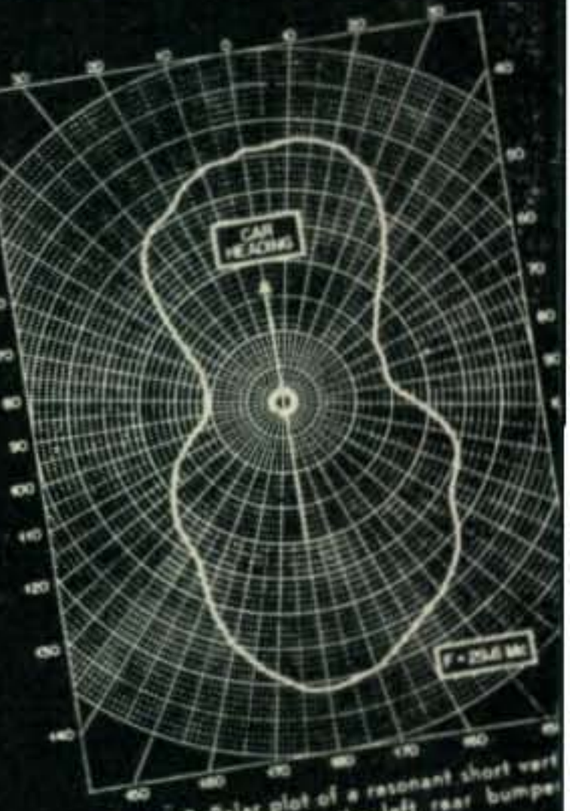


Fig. 6-1E. Polar plot of a resonant short vert antenna mounted on the left rear bumper an automobile.

160-Meter Loading

Speech Considerations

Chapter Four

Noise Suppression

Shunt Limiters

TNS

Speech Clipping

Chapter Six

Mobile Antennas

Everything in ONE book!

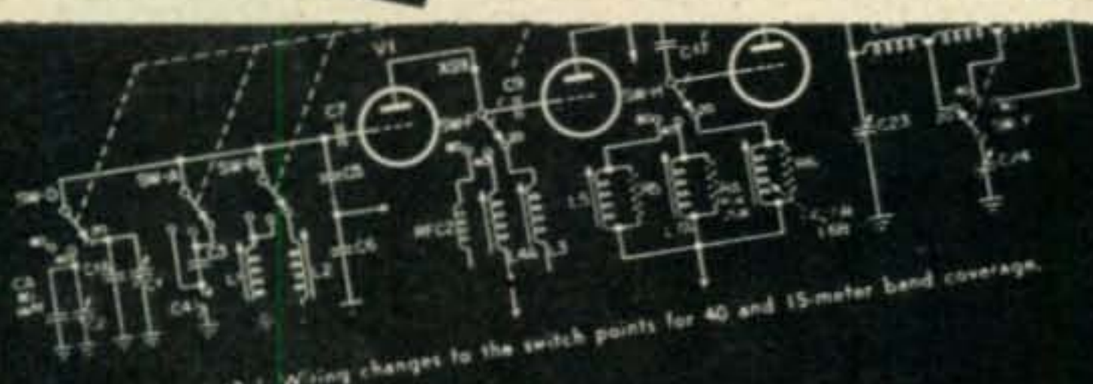


Fig. 5-17. Wiring changes to the switch points for 40 and 15-meter band coverage.

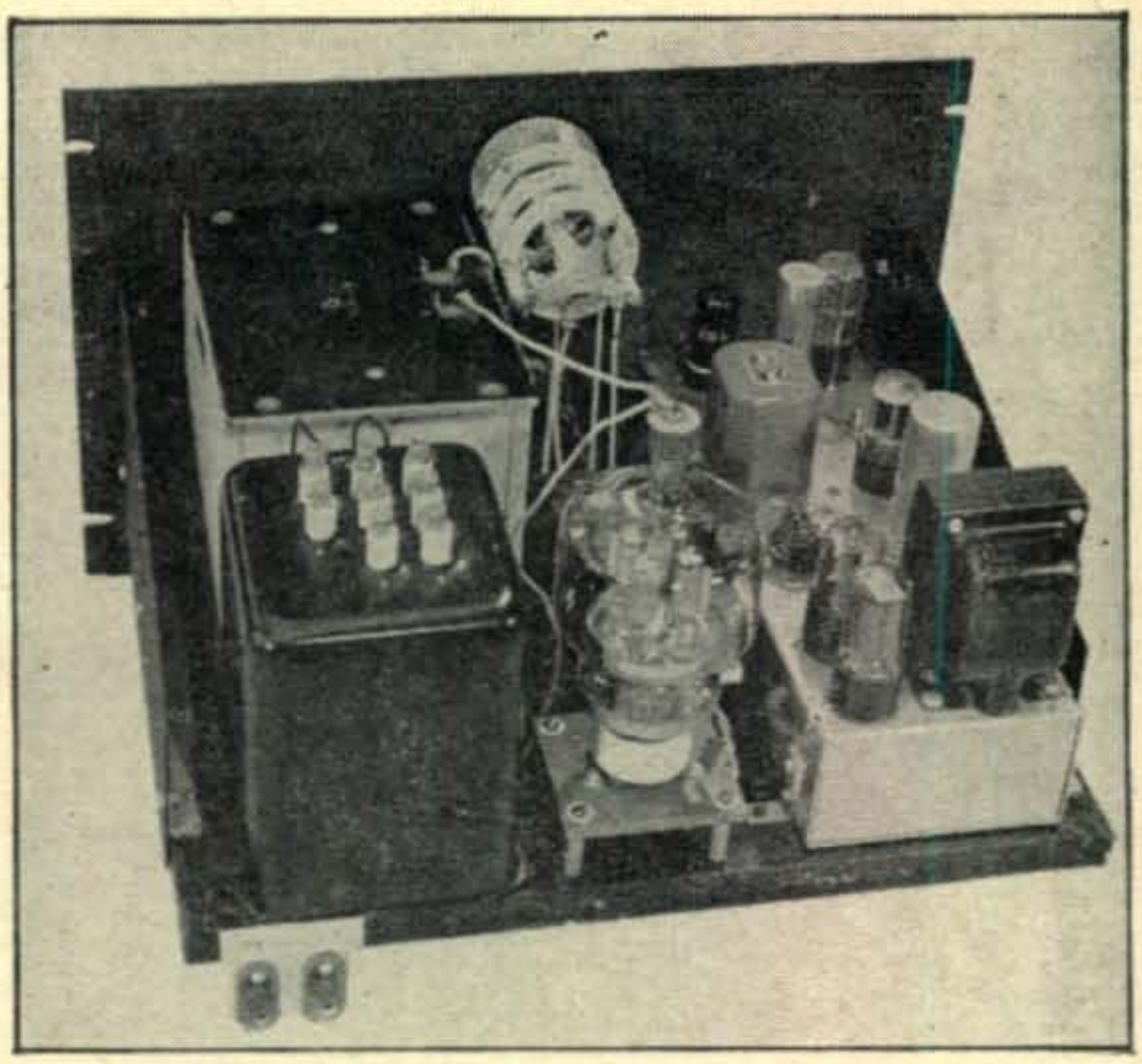
$2.00

Chapter Seven

Test Equipment

Grid Dip Oscillator

the Bias-Shift Modulator



WILLIAM I. ORR, W6SAI
Contributing Editor, CQ

An Economical Approach to the Problem of Modulating a High Powered Transmitter with a Single 304TL

The famous old class A Heising modulator has slipped into Limbo during the past few years. In the roaring twenties and thirties, it was the only system capable of high-level plate modulation. For a high-powered plate-modulated phone transmitter one would use, for example, a single UX-852 class C amplifier, modulated by a single class A UV-849, running at 3000 volts. This accumulation of about $140 (in those days!!—*Ed.*) of glassware, and tremendous expenditure of power would produce a 100% modulated 125-watt carrier—just about the output of a *Collins 32V*, or a *Viking* transmitter! How times have changed!

In November, 1931, Loy E. Barton of *RCA* threw a bombshell into the field of amateur radio communications with his classic article on the class B modulator.[1] Now it became possible to modulate a relatively high-powered transmitter with much smaller tubes, of the UX-210 variety! The rapid advent of the '46, the 805 and the 838 and other tubes designed for class B modulator service effectively finished the Heising modulator.

The 1931 Heising modulator met a quick death for a number of reasons: Its plate efficiency was only about 30%, and power supplies were very expensive items. It drew full plate current at all times, whereas the new class B modulator plate current drain was a function of the applied audio voltage. Also, in order to obtain 100% modulation, the class A modulator tube had to be run at a higher plate voltage than that of the class C modulated amplifier. This was not necessary with the then new class B modulation system.

In June of 1935, W6AAR (writing in the old *Radio* magazine) described a unique class A modulator using a parallel pair of UX-250 tubes which would deliver some 25 watts of audio power—a tremendous amount of power for these tubes operating in the class A mode. The secret of operation was to shift the operating bias of the tube in such a way as to allow class A operating conditions only when an audio signal was applied to the grids of the UX-250's. During the idling (non-speaking) periods, the grid bias was shifted so as to reduce the plate current (and plate dissipation) of the tubes. When the two tubes were producing 25 watts of class A audio, the combined plate dissipation was on the order of 25 watts. However, during periods of quiet, the dissipation dropped to only 2 or 3 watts. If voice waveforms only were used, with their high ratio of peak-power to average-power, the actual average plate dissipation of the UX-250's was on the order of 15 watts, which was the correct dissipation level for straight class A audio work.

An idea similar to this was presented in a 1950 issue of *CQ* by W2IJU.[2] This circuit employed a pair of 304TH tubes in parallel as a class A modulator, with a syllabic bias control system to vary the operating point of the 304TH's. This system produced some 300 to 400 watts of audio power, and was extremely

1. Loy E. Barton, "The Class B Push-Pull Modulator," QST, Nov. 1931, p. 8.

2. M. H. Kronenberg, "Low Cost Modulator for the KW Final," CQ, Oct. 1950, p. 34.

effective, but the skyrocketing price of surplus 304TH tubes torpedoed the scheme.

The class "K" modulator,[3] described by WØMCB in the October, 1953 issue of *CQ*, is a version of the syllabic control system applied to the screen network of a tetrode modulator. Using it, 45 watts of audio power were obtained from a single 807 tube.

The Bias-Shift Class A Amplifier

All of these systems are variations on the original bias-shift idea proposed by W6AAR. Let us examine the theory behind this curious system of modulation, and see if we can fit it to some 1954 specifications.

The operating point for a conventional type of class A modulator is largely determined by the maximum plate dissipation of the tube to be used. The bias for this operating point is so chosen that the normal class A plate input will not cause excessive heating of the plate when no audio voltage is applied to the grid of the tube. This fact also limits the maximum value of plate voltage that may be applied to the class A modulator. This disadvantage is avoided in class AB and class B audio equipment because these stages operate with somewhat more than the usual amount of class A bias voltage, so that the no-signal d-c plate input drops to a very low value. This action allows a cooling-off period for the tubes between pulses of audio excitation. However, the class AB and class B operating characteristics necessitate the use of a push-pull circuit in order to minimize the effects of even harmonic distortion generated by this type of operation. The distortion is caused by the fact that instantaneous grid excursions swing out beyond the cut-off point of the tube on the most negative part of the audio cycle.

A bias-shift class A modulator is normally biased close to class B (cut-off) conditions in the quiescent, or no-signal condition. This keeps the resting plate current down to a very low value with no signal excitation to the tube. The plate dissipation is also very low. When an audio signal is applied to the grid of the bias-shift modulator, a portion of the signal is rectified in an auxiliary circuit, and applied to the bias network of the modulator. If the correct polarity of rectification is chosen, the rectified signal will tend to buck, or reduce the static value of class B bias applied to the modulator tube. This action shifts the bias axis of the modulator to the right *(Fig. 1)*, and prevents the negative audio grid voltage excursions from approaching the cut-off point of the tube. The greater the audio signal applied to the modulator, the more the bias axis shifts to the right, and the lower the average tube impedance becomes, which improves the linearity and plate efficiency of the modulator *(Fig. 2)*.

The bias-shift rectifier output is filtered so that only the syllabic components below 20 cycles are employed to buck the quiescent negative bias on the modulator. Thus no extra modulation frequencies are generated, and the output waveforms are exact replicas of the input signals. The amplifier operates in a true class A fashion because its plate current flows for 360 degrees throughout the audio cycle.

By means of this type of pulsed operation, the overall efficiency of the modulator stage can be made to approach 50%, and the system competes very favorably with the usual class B audio system. In fact, from a financial viewpoint, it is a sure winner, since the expensive class B modulation transformer and audio driver transformer may be eliminated, and a common heavy-duty filter choke used as the modulating impedance.

Practical Circuits

Either a series or parallel bias-shift control circuit may be used. The parallel circuit is shown in *Fig. 3*. The normal quiescent bias is determined by the voltage drop across *R1* and

3. Dale Hileman, "Class K Modulator," **CQ**, Oct. 1953, p. 37.

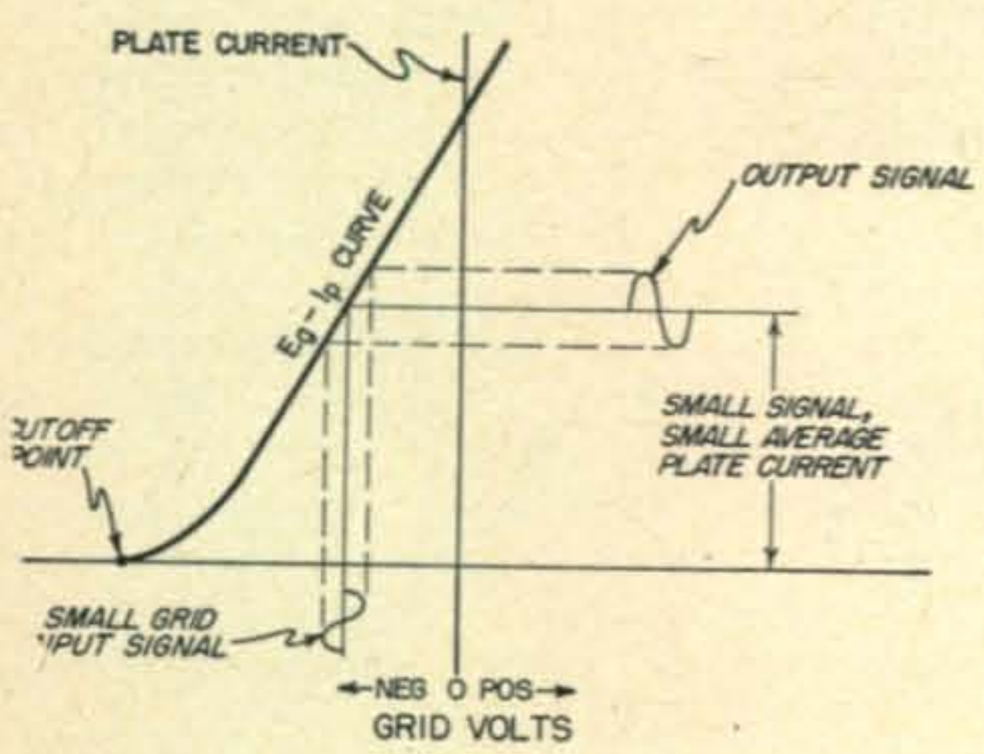


Fig. 1. The Eg-Ip curve for a typical bias-shift amplifier operating with maximum bias and small input signal. This corresponds to typical class A operation.

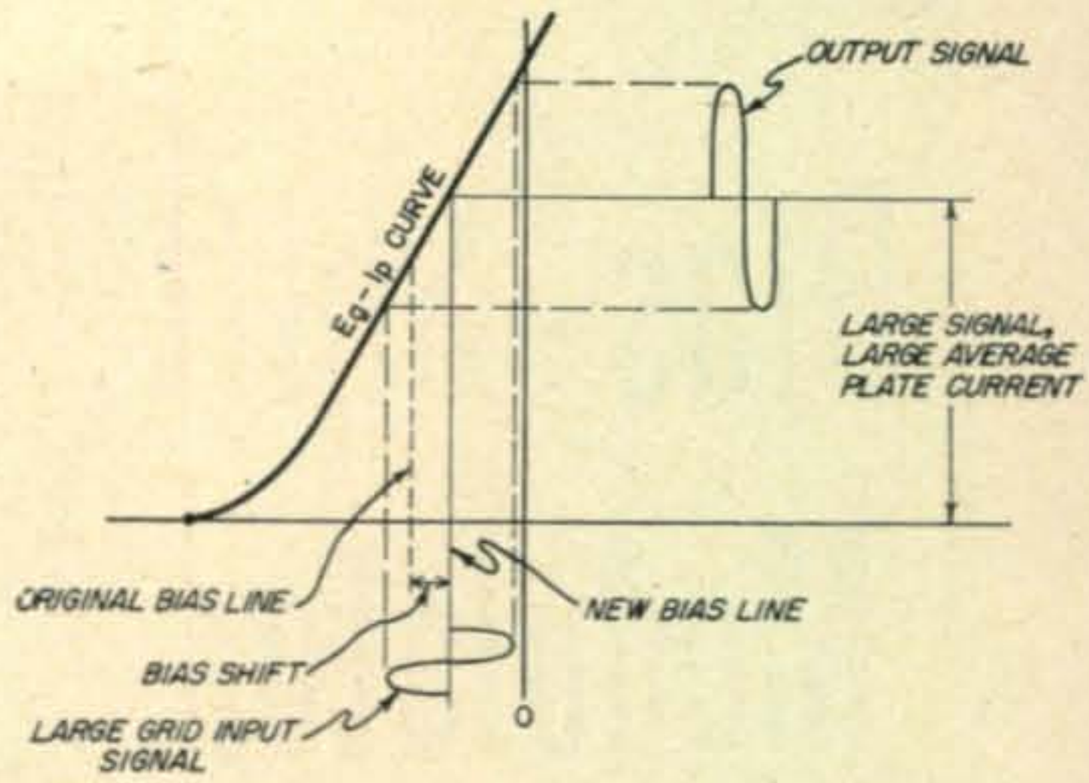


Fig. 2. This Eg-Ip curve is for a typical bias-shift amplifier, showing the shift of operating bias from the region near cut-off to a point farther up on the straight portion of the characteristic curve. Operation is still class A, but peak plate dissipation is excessive for simple sine-wave operation.

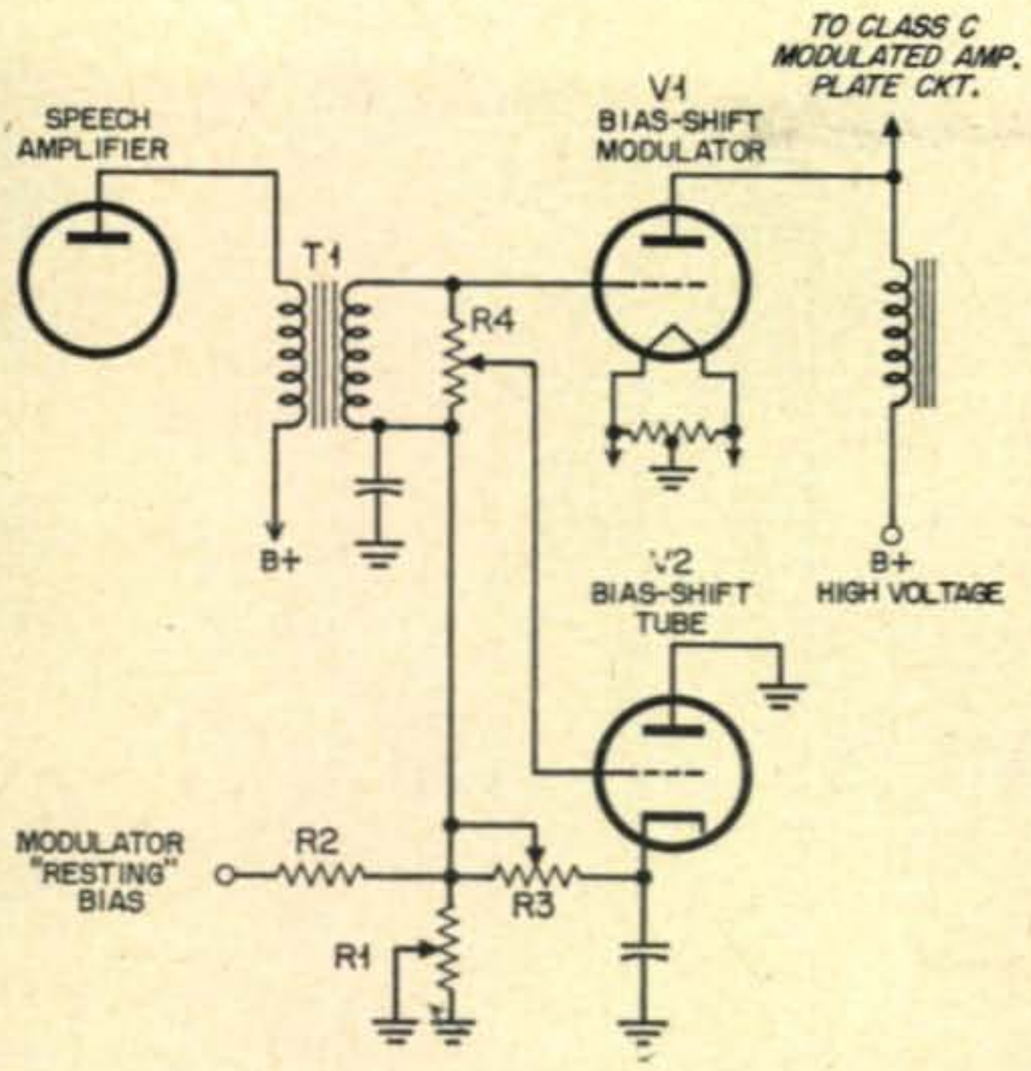


Fig. 3. The parallel bias-shift control circuit. See text for details on operations, etc.

R2, which form a bleeder across the bias supply. The resting bias is set by proper adjustment of *R1*. *R3* acts as cathode bias for the bias-shift tube *(V2)* and is so set as to effectively cut off *V2* when no audio excitation is present. When an audio signal appears across the secondary of *T1* and is applied to the grid of the modulator tube, *V1*, it is also applied to the control grid of *V2*, the bias-shift tube. The actual amount of signal reaching *V2* is determined by the setting of the potentiometer, *R4*. The audio signal applied to *V2* lowers the internal impedance of the tube, which is in parallel with *R1*. The flow of current through *V2* causes the voltage drop across *R1* to decrease, and the voltage drop across *R2* to increase, which lowers the bias on the modulator tube, *V1*. This action shifts the bias axis of the modulator tube from a region near cut-off (set by *R1*) to some point farther up on the straight portion of the operating curve. *(Figs. 1* and *2)*. The amount of bias-shift depends upon the average amplitude of the exciting audio signal, which corresponds closely to the syllabic amplitude. Thus the syllabic shift in the amplifier bias allows the system to operate at a considerably higher value of effective plate efficiency. In general, any audio tube is capable of about twice its true class A output when it is used in this bias-shift circuit.

The series control circuit *(Fig. 4)* is equally effective as the parallel control circuit, and is the one chosen to be used in the high powered modulator to be described later. *R1* and *R2* form a divider network, *R2* setting the quiescent bias level. After the audio signal is applied to the syllabic rectifier, *V3*, it is filtered and passes to the grid of the bias-shift tube, *V2*. This tube is in shunt with the quiescent bias setting resistor, *R2*. The action of *V3* and *V2* approximates the action of *V2* in *Fig. 3*—the bias-shift-ing circuit. The setting of *R4* controls the actual class A bias operating point of the modulator. In the interest of economy, *V2* and *V3* of *Fig. 4* may be combined into a double triode, such as a 6SN7, one section of the 6SN7 being strapped as a diode.

Choice of Modulator Tube

The best tube for use in a bias-shift circuit must have a relatively large plate dissipation for its size, and it must have a low amplification factor. For high-level audio work, the 304TL tube fills both requirements very nicely. It can dissipate 300 watts of plate power continuously, and can withstand short dissipation bursts of 400 or 500 watts with no apparent harm. The amplification factor is 12, low enough for this type of service. Also, it can still be bought for under $10, although most Hams still have one or two 304's "kicking around" that were purchased for 79c or so, back in the heyday of the surplus market.

Using a single 304TL operating at 3000 volts, a very clean (8% distortion) 325 watts of sine-wave audio may be obtained, with the average dissipation of the tube running about 300 watts. Using voice waveforms, and tolerating a bit higher distortion level (15%) caused by a minute amount of grid current flowing in the 304TL grid circuit, a hefty 450 watts of audio may be obtained from one 304TL tube! On voice peaks, the plate dissipation of the 304TL reaches some 500 watts, and the tube lights up in a red flood, but no harm is done to the tube, since the average dissipation level is still well under 300 watts.

The final r-f amplifier at W6SAI is a single 4-400A tetrode, operating at 3000 volts and 330 milliamperes, with a plate input of 990 watts. The modulator is a single 304TL bias-shift

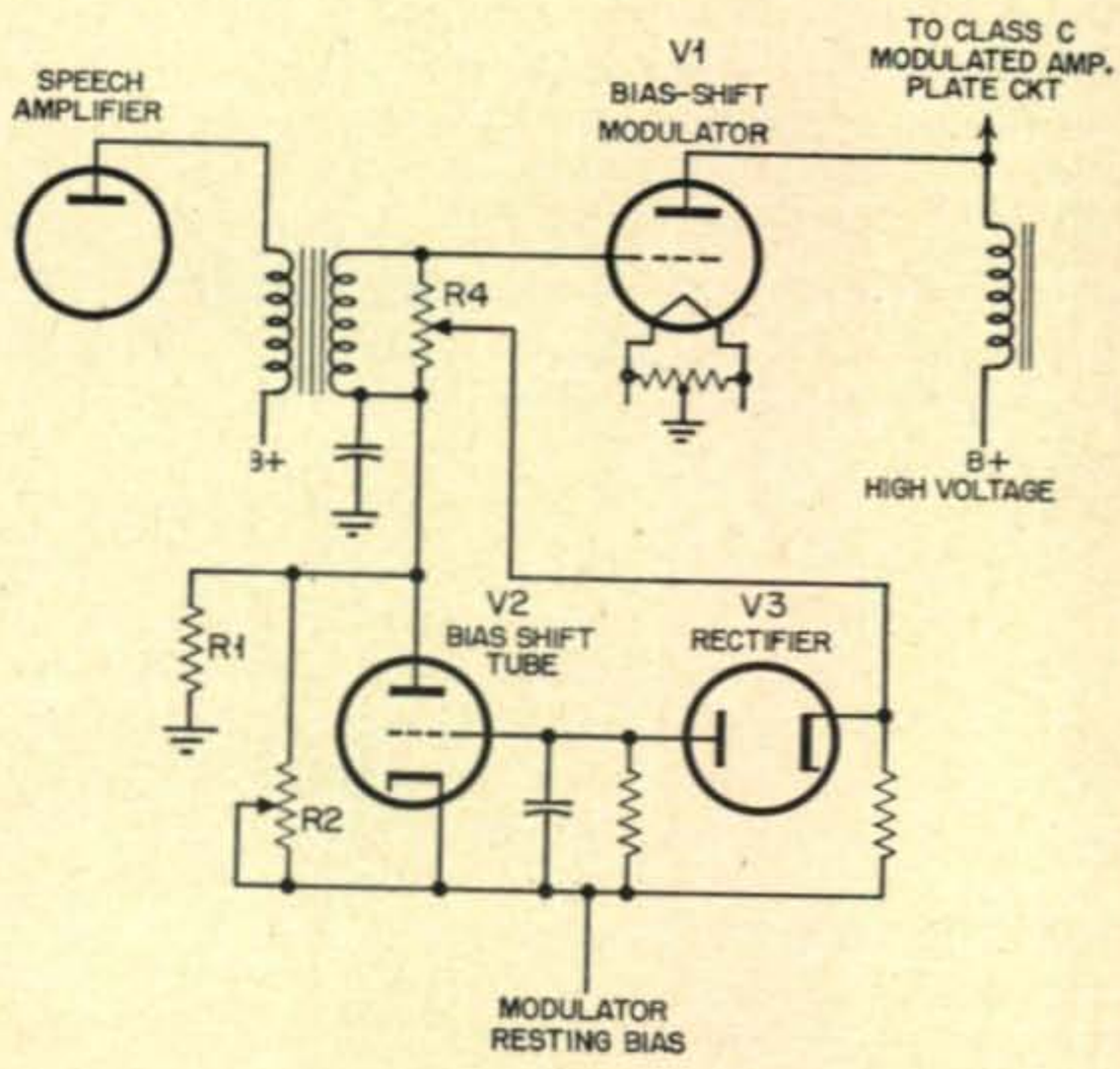
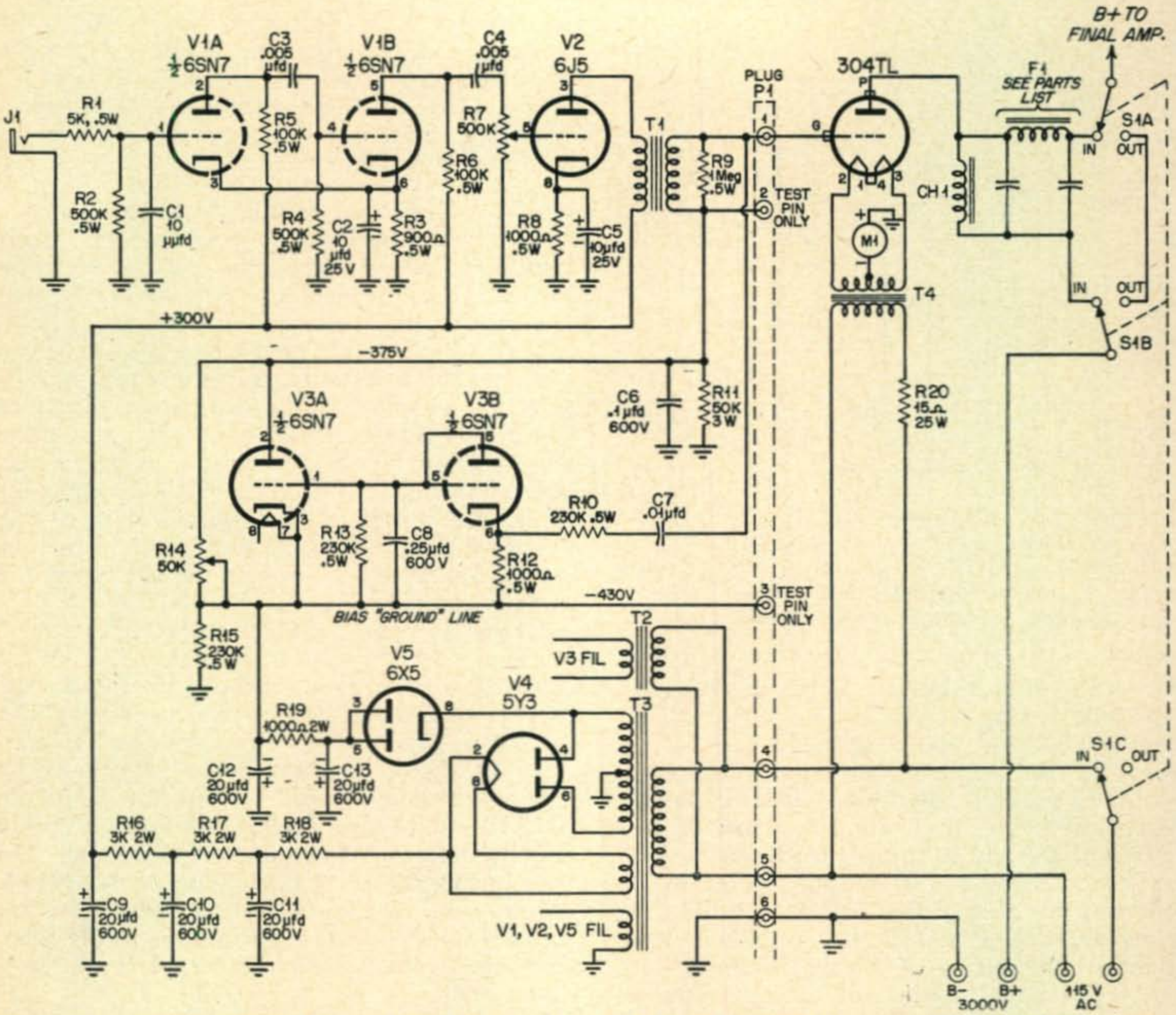


Fig. 4. This is the series type of bias-shift control circuit. It is used in the final design shown in Fig. 5. For details on operation see the accompanying text.



stage, also operating at 3000 volts. The modulator resting plate current is 20 ma, rising to about 270 ma. on voice peaks, as read on the plate meter. The 4-400A is 100% modulated under these conditions. The power drain from the plate supply compares favorably with the drain of a conventional class B modulator. This may not be getting something for nothing, but it closely approaches it!

A Practical Modulator Circuit

The W6SAI modulator is shown in *Fig. 5*. It is designed to operate from a 3000-volt supply, and to fully modulate an r-f load of about 10,000 ohms—i.e.: 3000 volts and 330 ma. input to the final r-f amplifier.

Incidentally, it is somewhat of a problem to design a suitable modulator for a kilowatt transmitter operating with a 3000-volt plate supply. The load impedance of most popular transmitting tubes, operating in the class B condition at 3000 volts is on the order of 25,000 to 30,000 ohms. It is not easy to obtain a high-level modulation transformer that will match this extremely high load impedance to the class C stage. Many inexpensive makes of modulation transformers will present this value of load to the modulator tubes with absolutely nothing connected across the secondary terminals! This is due to the inherent leakage reactance of the transformer. With such high impedance circuits, leakages and flashovers are also more likely to occur. It is much better to come down out

C1—10 µµfd., ceramic.
C2, C5—10.0 µfd., 25-volt, electrolytic.
C3, C4—0.005 µfd., ceramic.
C6—0.1 µfd., paper, 600v.
C7—0.01 µfd., ceramic.
C8—0.25 µfd., paper, 600v.
C9, C10, C11—20/20/20 µfd., 600-volt, electrolytic.
C12, C13—20 µfd., 600-volt, electrolytic with insulated casing.
Ch1—6 henries, 500 ma., Chicago Trans. R-65.
F1—Low-pass filter, Chicago Trans. SR-300 with associated condensers, etc. for 10,000-ohm load (see splatter choke instruction sheet).
M1—0-300 ma., meter.
P1—6-prong Jones plug.
R1—5000 ohms, ½w.
R2, R4—500,000 ohms, ½w.
R3—900 ohms, ½w.
R5, R6—100,000 ohms, ½w.
R7—500,000-ohm potentiometer.
R8, R12—1000 ohms, ½w.
R9—1.0 megohm, ½w.
R10, R13, R15—230,000 ohms, ½w.
R11—50,000 ohms, 3w. (three 150,000-ohm 1w. resistors in parallel).
R14—50,000-ohm potentiometer.
R16, R17, R18—3000 ohms, 2w.
R19—1000 ohms, 2w.
R20—15 ohms, 25w.
S1—3-pole, double-throw switch, high voltage type (mine taken from surplus BC-906D antenna tuner).
T1—4:1 step-up transformer, UTC S-2.
T2—6.3v. @ 1.2a. filament transformer, Stancor P-8191.
T3—350-0-350v. @ 90 ma., transformer, Stancor PC-8409.
T4—10v. @ 10 amps., Chitran FV-1010.

Fig. 5. Parts list and wiring schematic.

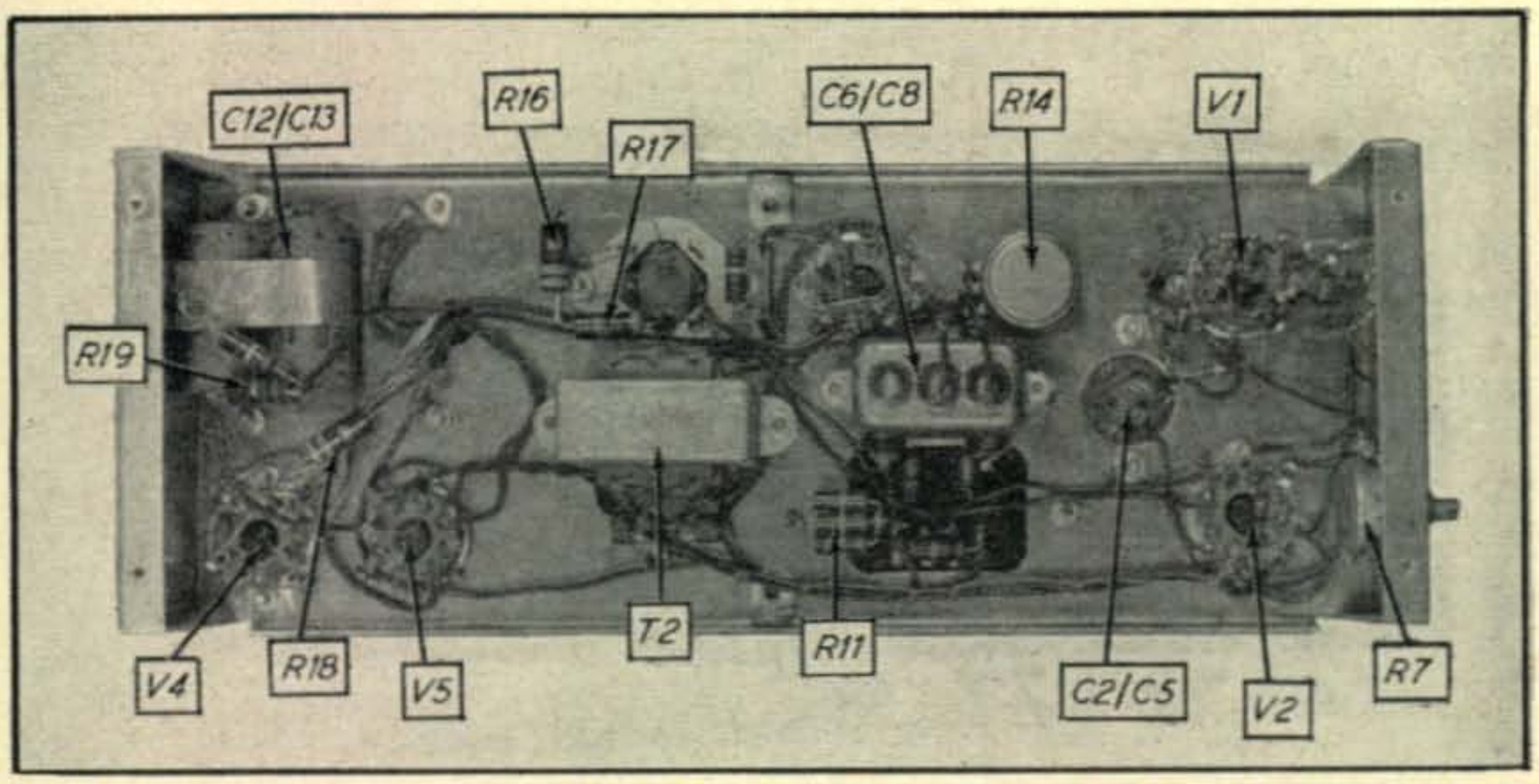


Fig. 6. Under chassis view showing the positions of the more important and outstanding components.

of the clouds to a reasonable plate impedance load—in the region of 5,000 to 12,000 ohms, so that it can be easily matched to the 10,000-ohm load presented by the class C r-f stage.

One solution is to drop the plate voltage on the modulators to 2000 volts. 500 watts of class B audio can still be obtained at this voltage, and the resulting plate impedance of the modulator is within reason, *But* (the rub)—this necessitates two different power supplies of 2000 and 3000 volts!

The bias-shift modulator solves this whole nasty problem by very kindly operating with an optimum load impedance of 10,000 ohms at 3000 volts! An inexpensive tube is used, no expensive transformers are needed, and the speech driver for the modulator is not required to supply any audio power—just voltage! Thus one large dragon and three subordinate ones are slain at one blow with the bias-shift system!

But my enthusiasm is running away. Back to *Fig. 5.*: A 6SN7 tube is used as a cascade speech amplifier, with a voltage gain of 200. With the usual inexpensive crystal microphone, the audio voltage developed across *R6* will be about 3 volts. This is reduced to about 2.5 volts by *R7*. The 6J5 produces about 50 volts of audio signal with this input, and 200 volts is developed across the secondary of *T1*, a 1:4 step-up transformer. This voltage is applied directly to the control grid of the 304TL modulator. A smaller portion of the audio voltage from *T1* is applied to the diode connected portion of *V3*, the control tube. The rectified output of *V3* is filtered by the 0.25 μfd. condenser *(C8)*, connected from grid to bias "ground" of the second section of the 6SN7. This second section acts as the bias-shift tube for the 304TL.

Front panel of the rack mounted 304TL modulator unit. The heavy duty switch just visible in the foreground is an antenna switch from a surplus BC-906 tuner.

Power Supply Requirements

A small power supply provides 300 volts d.c. for the plate supply of *V1* and *V2*. Since the current drain is small, a simple R-C filter *(R16, R17, R18, C9, C10, C11)* may be used. The same supply provides a negative bias of —430 volts (measured from *pin 3* of *plug P1* to chassis ground) which is slightly more voltage than required for the quiescent bias level of the 304TL.

Since the cathode of *V3* is operating at —430 volts with respect to ground, it is necessary to provide a separate ungrounded filament winding for this tube, to prevent filament-cathode breakdown within the tube. *T2* is used for this purpose.

A 6-henry, 500-milliampere filter choke *(Ch-1)* is used as the modulating impedance in the plate circuit of the 304TL modulator. As shown in the photos, a surplus choke of unknown vintage was first used. This "talked back" badly under heavy modulation, and has since been replaced with a *Chicago Transformer Co. R-65* choke. This cured the chit-chat from the choke.

Since the harmonics generated by the slight clipping action at high levels by the 304TL grid circuit will appear on the carrier as side-band splatter, a high-level filtering system is incorporated after the modulation choke. This is a standard high-level splatter filter, and does an effective job of suppressing any higher order harmonics.

The filaments of the 304TL tube are wired in series to permit the use of a 10-volt filament transformer, which seems to be more available than its 5-volt counterparts. A resistor is placed in the primary filament leg of the 304TL to drop the filament voltage to about 8½ volts.

The tube works just as well at this reduced voltage, and less heat is wasted in warming the shack! A high voltage switch *(S1)* stolen from an extinct *BC-906D* antenna tuning unit permits the modulator to be cut in and out of the transmitter circuit, allowing c-w operation.

Assembly Information

A small aluminum chassis holds all the components of the modulator except for the 304TL and its associated parts. This chassis measures 5″ x 10″ x 3″, and mounts with its length perpendicular to the modulator panel. An underside view of this chassis is shown in *Fig. 6*, with the main components marked for identification. The components associated with *V1* are mostly small parts and may be mounted directly on the socket pins. The microphone jack, *J1*, and the audio gain control, *R7*, are mounted on the front edge of the chassis. The "bias adjust" control, *R14*, is mounted atop the chassis behind the 6SN7 tube. A 6-prong *Jones* plug for the power leads (and grid lead to the 304TL) is mounted behind *T1*. All the wiring in the chassis is simple and straightforward and should cause the builder no trouble.

The 304TL components, as well as the speech amplifier chassis are mounted on a ¾″ piece of plywood, 10″ x 17″ in size. The plywood is attached by brackets to a standard 12½″ rack panel. The plate meter *(M1)* of the 304TL and the phone/CW switch *(S1)* are mounted to this panel. To the right of the 304TL are mounted the plate choke *(Ch-1)* and the low-pass filter inductance, *F-1*. The two condensers of the filter network are mounted beneath the plywood chassis.

The usual Heising plate dropping resistor and accompanying bypass condenser were tried in this circuit, and later removed, as it proved to be of no value. Purists may say that with both modulator and r-f amplifier operating at the same plate voltage 100% modulation is impossible. Perhaps so, but oscilloscopic studies show 100% modulation by voice waveforms with this circuit, and the resulting signal on the air takes a back seat to no one.

Testing the Modulator

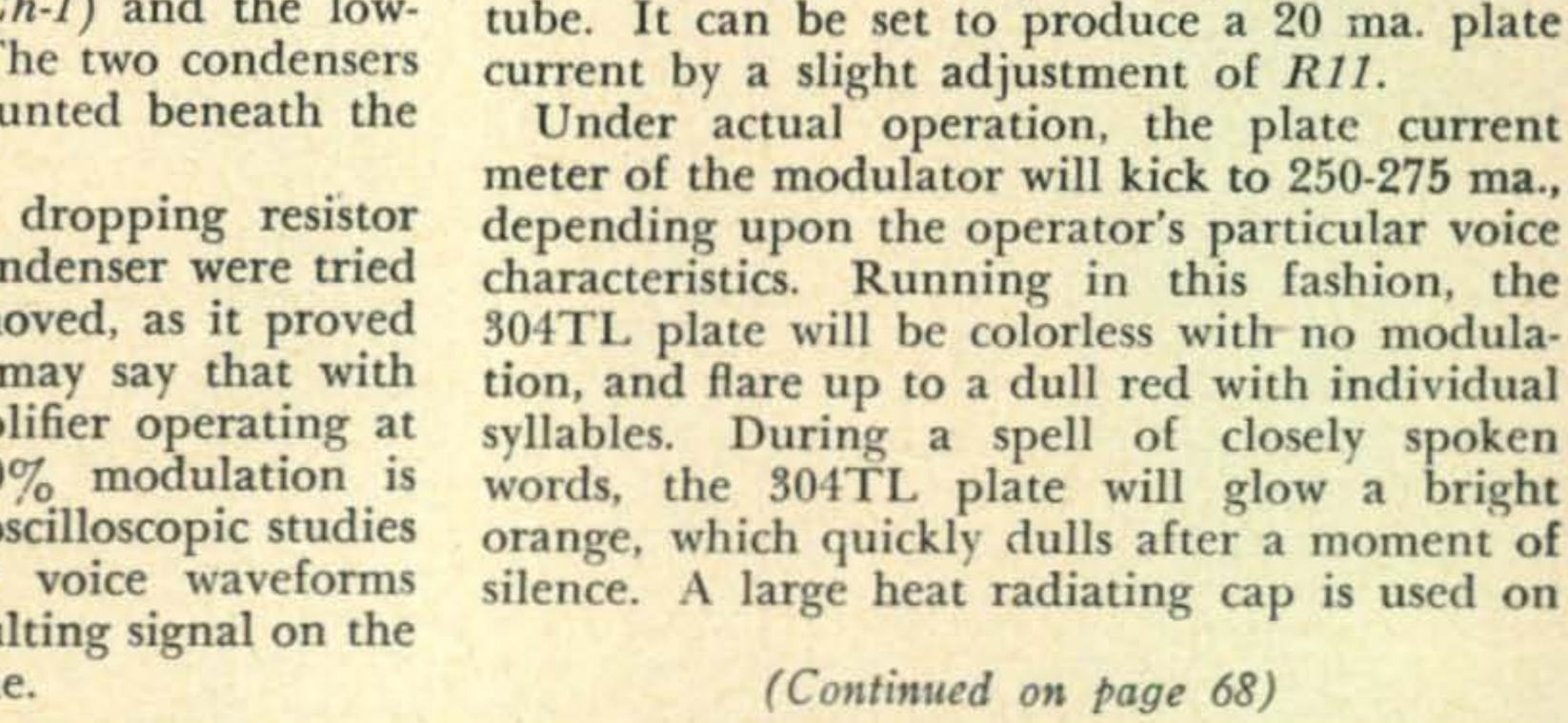
After the wiring is completed and checked out, the low level tubes should be plugged in the sockets for preliminary tests. After the unit has warmed up, the following voltages should be measured, using a high resistance d-c voltmeter:

1. *Pin 3, plug P1,* to ground (–430 volts).
2. *Pin 3, V2* to ground (300 volts).
3. Remove 6SN7 *(V3)*, and adjust *R14* to provide –275 volts from *pin 2, plug P1* to ground. Replace the 6SN7 tube.
4. A high impedance a-c voltmeter should be connected between *Pin 1* and *Pin 2* of *plug P1*. As *R7* is advanced, approximately 200 volts should be read upon the meter while speaking into the microphone.
5. The d-c voltmeter should be connected between *pin 2, plug P1* and ground. Approximately –375 volts should be indicated. Upon speaking into the microphone, the voltage should drop to –275 volts. Adjust *R14* slightly if necessary to meet this condition.

The 304TL tube may now be placed in its socket, and the grid and plate connectors attached to the tube. The quiescent grid voltage should be about –375 volts. When 3000 volts is applied to the plate circuit of the modulator, the resting plate current should be about 20 ma., the exact value varying slightly from tube to tube. It can be set to produce a 20 ma. plate current by a slight adjustment of *R11*.

Under actual operation, the plate current meter of the modulator will kick to 250-275 ma., depending upon the operator's particular voice characteristics. Running in this fashion, the 304TL plate will be colorless with no modulation, and flare up to a dull red with individual syllables. During a spell of closely spoken words, the 304TL plate will glow a bright orange, which quickly dulls after a moment of silence. A large heat radiating cap is used on

(Continued on page 68)



Top view of the speech amplifier for the bias-shift modulator, indicating position of major components.

Bedlam on Zanzibar

or The Adventures of VQ1NZK and the Mudir of Mkokotoni

C. RAY STAHL

c/o CQ Magazine, 67 West 44th Street, New York 36, N.Y.

It was insane, of course, but then all amateur radio "Hams" are slightly mad. We had just returned from a 2500-mile safari through Kenya, Uganda, Tanganyika, and the Belgian Congo, hunting locations for our next motion picture, tentatively entitled, "African Adventure." It would be about ten days before the cast arrived from England, and we had to buckle down to the long shooting grind.

George and Irene Breakston, Johnny and Gioia Carter, and I discussed what we might do in the meantime, what sort of real-life African adventure we could arrange for ourselves.

"Let's go to Zanzibar . . ." George suggested.

"Wonderful!" the wives enthused.

". . . And operate as VQ1," George concluded.

"Wonderful!" Johnny and I chorused.

"Oh, no!" the girls groaned.

And so it was agreed.

During two days of frantic preparations we got a lot of valuable help and advice from various members of the *Radio Society of East Africa*, notably Duncan (VQ4GDF), Bob (VQ4AA), Frank (VQ4RF), Robbie (VQ4ERR), and Val (VQ4VL). In the evenings just prior to our departure we were amazed to hear stations in various parts of the world calling us most insistently. From many cities in North and South America, from Denmark, Sweden, England, and India, and from all over Africa came queries about our proposed trip to VQ1-land, the anticipated length of our stay there, and the bands and frequencies on which we would operate. The news had spread like wildfire!

The Problems Start

So had the problems. We found that we needed customs clearances for our equipment, reimportation certificates, visas, and inoculations, among other things. Worst of all, no one in Nairobi could obtain our passage by sea from Mombasa to Zanzibar. All of the scheduled ships were booked to capacity.

We held another conference. A dozen alternatives were debated at length. Perhaps, if we went to Mombasa, some form of transportation could be found on the spot. It was strictly a gamble, but we decided to take it. After all, we had become public servants of a sort to the Hams of the world. They were counting on us.

On the morning of October 7 we borrowed a hunting car, loaded it with about a ton of personal effects and radio gear, and roared out of Nairobi. After numerous flat tires and vapor-locks we reached Mombasa at midnight and checked into a hotel for a few hours' sleep. At the crack of dawn we fanned out all over the city to tackle our many difficulties.

Fortunately, one of our first stops was the *Twentsche Overseas Trading Company*, where we encountered Mr. Frank O'Connor, the head of the Shipping Department. Mr. O'Connor, a complete stranger to us at the time, listened to our story incredulously. It was about the most idiotic plan he had ever heard of—and, therefore, worth solving. Although no compensation was at stake, either for him or his comany, he devoted his entire morning to the riddle. He took us personally to the Chief of Customs, the Chief of Immigration, and the *Smith MacKenzie* shipping agents, meanwhile exploring every possible means of sea transportation—including Arab dhows—without success.

In short, we had to fly, but even that was not as simple as it sounds. We insisted that our *Panda PR-120-V* transmitter and our *National HRO-50T1* receiver must ride on passenger seats where we could safeguard them personally. And our bulky, 3-KW generator would not fit into a DC-3's cargo space.

The shipping agents were appalled at the thought of that incredibly heavy monster standing unsecured at the rear of the cabin, free to run amok among the passengers in the event of bumpy weather. Again, luck came to our rescue: the co-pilot turned out to be a fellow Ham.

At 3:45 that afternoon we were airborne, flying down the coast of East Africa, gazing out of the portholes and watching a solid line of foaming breakers pounding on to a reef, a half-mile off shore. After a brief stop at Tanga (in Tanganyika) we headed out to sea. At 5:30 the plane cruised over the colorful city of Zanzibar, approached a landing strip carved out of a grove of coconut palms, and touched down on the Isle of Spice. We left our equipment in the customs shed at the airport, hired

George Breakston, W6NZK, VQ4NZK and VQ1NZK.

". . . we explored all the possibilities of transportation . . . including Arab dhows . . ."

a car, and drove to the Zanzibar Hotel. There was one vacant room. We had three extra beds installed, and the five of us moved in.

Pandemonium reigned the next day. It being Friday, our deadline was 1 p.m., when all Government offices close until the following Monday. We had four hours in which to accomplish everything, or waste the entire weekend as far as amateur radio was concerned.

We told our tale to Mr. Tubbs, the Senior Commissioner. We were on a Ham safari. We had flown a ton of equipment to Zanzibar. We could not stay in the hotel because the city functions on d.c. and the overhead fans that are so necessary in that humid climate would create impossible interference. Therefore, we must situate ourselves in some remote part of the island. No, we had no transportation, no accommodations, no bedding, no provisions, no cutlery, dishes, or glasses, no mosquito nets, lights, petrol, or oil—not even a license to operate on Zanzibar.

Mr. Tubbs shook his head. "You people are mad," he muttered.

"All Hams are mad," we grinned.

Mr. Tubbs sighed and pounded a bell on his desk. The Urban Commissioner appeared, then the Rural Commissioner. The District Commissioner popped in to see what was going on. Hurried conferences followed. Regulations were consulted. Orderlies were summoned and dispatched on errands. Clerks took dictation. Phone calls were made to various parts of the island . . .

At 2:30 p.m. VQ1NZK, VQ1CRS, VQ1JRC, and the two XYL's (wives) left the city of Zanzibar in a rented car, followed by a truck loaded with our gear and equipment. An hour or so later we arrived at the home of Ali Said Akbary, the Mudir of Mkokotoni, introduced ourselves, presented him with a letter from the Senior Commissioner, and explained our mission. The Mudir, a mild-mannered, soft-spoken administrator, took it all in stride. After a brief discussion with his alert and capable assistant, Suleman M. Gharib, he said to us, "The Government Rest House is unoccupied at the moment. However, it has only three beds, and there are five of you . . ."

"We'll take it!"

Our eagerness took him aback. "Also, there are no sheets, blankets, or pillow cases, no silverware, glasses, or dishes . . ."

"We'll take it!"

The Mudir kept his aplomb with difficulty. He told us where to buy provisions, where to hire pressure lamps, and where to obtain oil and petrol for the generator. His lovely wife, Zeyana, suddenly appeared with an armful of kitchen essentials, which we accepted gratefully.

"Now," the Mudir asked, "is there anything else you'd like?"

"Yes, a half-dozen men to help us unload the generator."

"Very well. Which reminds me," said our host, "you'll want a servant to help around the house."

"Right—one who is good at climbing trees."

"Climbing trees?" the Mudir echoed dazedly.

"Yes. We have to tie our long wires—our antennas—to the tops of some coconut palms."

The Mudir turned to his Assistant and spoke to him in Swahili, unaware that we had been in Africa for nearly a year and understood a bit of the language. What he said was, in essence, "We've had everything here—smugglers, slave traders, the lot—but these are the strangest fish of all!"

We Arrive at the Zanzibar QTH

Then he guided us to the Rest House—something of a misnomer, since it consisted of several rooms on the second floor of a large white building, the first floor being devoted to Government offices. We eyed our generator, about to be installed beneath the Mudir's window, and winced at the thought of its noisily devastating effect on the immediate future of Government business at Mkokotoni Point. Nevertheless we suppressed our qualms and surveyed the magnificent view before us.

We were facing a placid lagoon, dotted with the sails of scurrying dhows, the curving shore lined with picturesque palms. As we stood on the overhanging balcony an inviting expanse of glistening white beach stretched out below us. There was scarcely a ripple in the sheltered, shallow water, which extended for miles around us, radiating every hue from a brilliant green to a soft, diffused purple.

But we had no time to lose. Casting a practiced eye about him George nudged us and pointed to the sun, which was already taking a nose-dive into the ocean, indicating plainly which way was West. Then he waved toward the North. From our vantage point there was nothing but water in that direction. We knew what he meant. The three long wires we had planned to erect must point Southwest, South, and Southeast. We would have to work most of the world off their back ends. Only South Africa would lie directly in the path of any of them.

We glanced to our left and were dismayed to find telephone lines flanking the Rest House. Mentally we pictured the inevitable—our aerials shorting them out until we could secure our wires to the distant palms and take up the slack. George confronted the Mudir. "In the next hour or so," he ventured, "will anyone be using the telephone?"

"No, I shouldn't think it likely," came the puzzled response.

"That's good," we all muttered, knowing full well it would be an impossibility.

By then several strong backs had arrived, including our tree-climbing houseboy. The Mudir went home and we set to work, only to discover that a massive tree, close to the Rest House, stood right in the path of our middle antenna. In all fairness let it be recorded that we did not chop the tree down; we merely sawed off a few of its branches.

By 6:30—bathed in the glow of a gorgeous sunset—we were ready to go on the air. We fired up the rig, crossed our fingers, and threw out a CQ. Back came FB8BL, Andre on Madagascar. Before he had finished, a dozen other stations were calling us on the frequency. The game was on!

Throughout the next eight days of "maximum effort" we worked around the clock, going QRT only when the bands had folded up completely. For the most part George sat at the mike and worked the transmitter, while I tuned the receiver and kept the log. Johnny supervised the technical end, cajoled the generator into giving us faithful service, and kept the rig on the air and the antennas from sagging on to the telephone lines.

Meanwhile, behind the scenes, cooking was the biggest headache. The XYL's labored valiantly in the kitchen, but they were hindered, instead of helped, by the houseboy, who obviously had no other talent than climbing trees. The girls had to "rub two boy scouts together" in order to get a fire going, and that was the least of their troubles. We had been warned to boil all of our drinking water, but the primitive wood-burning stove proved inadequate for the task. Se we drank hot water, disinfected (we hoped!) with whiskey, and subsisted mainly on bully beef, beans, and bananas—a diet which the mosquitos, at least, seemed to appreciate, since they virtually ate us alive.

Still we carried on, slapping and scratching, talking and logging, and occasionally sleeping (an average of four hours per night). As the bunking arrangements panned out Johnny and Gioia had a bed apiece, George and Irene shared a single bed, and I curled up on an abbreviated sofa, using a bath towel for a blanket.

Whenever the bands were dead in the daytime we swam in the ocean or strolled along the beach collecting Persian beads (some embedded in rocks), washed ashore from sunken dhows that foundered centuries ago. We saw monitor lizards four feet long and snails bigger than a man's fist. We outmaneuvered a "sand fiddler," George filling in his hole while I held his attention. When he fled to his sanctuary and found the entrance blocked, his baleful, protruding eyes seemed to say (as we captured him), "Now that was a dirty trick!"

Zanzibar is truly a tropical paradise and—under the benign administration of the wise old Sultan—a happy and peaceful community. We did a lot of aimless sight-seeing in narrow alleys where even a woman can wander day or night without the slightest concern. In short, when we were off the air it was a tranquil existence.

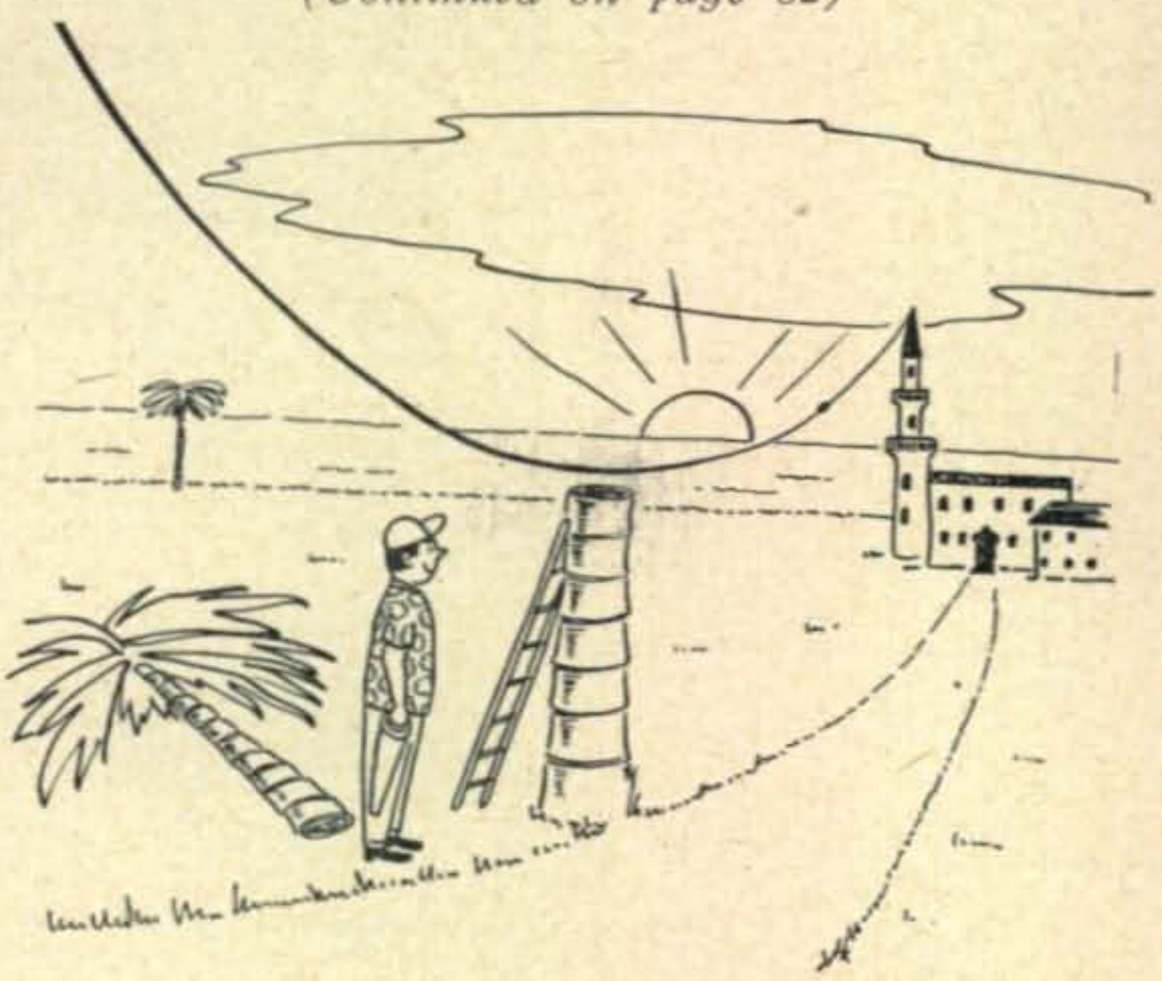
On the air it was bedlam. Hundreds of stations were constantly calling, most of them zero-beating on our frequency and smearing each other to the point where it was often impossible to read a single signal. We must have said, "Boys, please spread out!" a thousand times. In addition there was terrific QRN from our generator and from local atmospheric conditions. Sometimes we labored for as much as an hour without being able to complete a 100% QSO.

A Visit From the Mudir

The Mudir paid us one visit. He sat there patiently for several minutes while the torrent of QRM and ORN poured forth deafeningly from the receiver. Finally, when we turned down the gain and leaned back helplessly, he gave us a long slow look. "You mean you came all this way with a ton of equipment to listen to that?" We had no answer. The Mudir departed and never returned again.

When the going became impossible on phone we switched to CW. Even then we were frequently plagued by charter members of the QRM Club who

(Continued on page 62)



". . . in all fairness let it be recorded that we did NOT chop the tree down; we merely sawed off a few of its branches . . ."

ALL TIMES IN E S T

EASTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Western Europe	Nil	0830-1200 (1-2) 1200-1700 (2-3)	1700-2200 (3-4) 2200-0300 (1-2)	1800-0100 (3)
Central Europe & Balkans	Nil	0730-1100 (1-2) 1100-1700 (2-3)	1730-2100 (3-4) 2100-0130 (1-2)	1830-0100 (2)
Southern Europe & North Africa	Nil	0600-1100 (2-3) 1100-1800 (3-4)	1800-2200 (3-4) 2200-0130 (1)	1900-0100 (3)
Near & Middle East	Nil	1200-1600 (1-2)	1800-2200 (2-3)	2000-2300 (1-2)
Central & South Africa	1200-1700 (1)	0700-1230 (0-1) 1230-2000 (3-4)	1800-0000 (3)	1900-2300 (2)
South America	1200-1600 (1)* 1000-1600 (2-3) 1600-1830 (3-4)	0600-0900 (3) 0900-1630 (2) 1630-2030 (3-4) 2030-0000 (1)	1800-0300 (3-4) 0300-0500 (2)	1900-0400 (2-3)
South East Asia	Nil	1600-1900 (0-1) 0700-0900 (0-1)	0200-0700 (0-1)	Nil
Australia	Nil	0700-1000 (2-3) 1800-2200 (1)	0000-0600 (1) 0600-0830 (2-3)	0100-0730 (2-3)
Guam & Pacific	Nil	0730-1030 (1-2) 1700-2000 (1)	2300-0800 (3)	0030-0630 (2-3)
Japan & Far East	Nil	0700-0900 (1) 1700-2000 (1)	0200-0800 (1)	0300-0700 (0-1)
West Coast, USA	1200-1400 (0-1)	1000-1600 (3-4) 1600-2000 (1-2)	0700-1000 (2) 2000-2300 (3-4) 2300-0200 (2)	2100-0700 (3-4)

ALL TIMES IN C S T

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Western & Central Europe	Nil	0600-1100 (1) 1100-1500 (2)	1700-1900 (2-3) 1900-0130 (1)	1830-0000 (2)
Southern Europe & North Africa	Nil	0630-1130 (2-3) 1130-1600 (3-4)	1700-2000 (3-4) 2000-0000 (0-1)	1800-0000 (2-3)
Central & South Africa	1200-1600 (1)	0700-1200 (0-1) 1200-1900 (3-4)	1800-2300 (3)	1900-2200 (2)
Central America & Northern South America	1200-1600 (1)* 0900-1400 (2-3) 1400-1700 (4)	0600-0900 (3-4) 0900-1500 (2-3) 1500-2000 (4)	1800-0500 (4)	1900-0400 (2-3)
South America	1200-1600 (1)* 0900-1500 (2-3) 1500-1800 (3-4)	0600-0800 (3) 0800-1500 (2) 1500-1900 (3-4) 1900-0000 (1-2)	1800-0400 (3-4)	1900-0300 (2-3)
Japan & Far East	Nil	0700-0900 (1) 1600-2000 (2)	0100-0800 (2)	0200-0630 (1)

ALL TIMES IN C S T

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
South East Asia	Nil	0730-1030 (1) 1700-2000 (1)	0130-0530 (0-1) 0530-0800 (1)	0300-0600 (0-1)
Hawaii	1600-2000 (1)	1000-1900 (2-3) 1900-2200 (3-4)	2200-0200 (3-4) 0200-0900 (1)	0000-0700 (3)
Australasia	1600-2000 (1)	0700-0930 (1) 1500-1900 (1) 1900-2200 (2)	2230-0400 (3) 0400-0800 (1-2)	0000-0600 (2-3)

ALL TIMES IN P S T

WESTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Europe & North Africa	Nil	0700-1200 (0-1)	1900-0100 (1)	2000-2300 (0-1)
Central & South Africa	1400-1600 (0-1)	1000-1500 (0-1) 1500-1800 (2)	1800-0000 (2)	2000-2200 (1-2)
South America	1200-1500 (0-1)* 1100-1800 (3)	0600-1400 (2-3) 1400-1900 (4) 1900-0000 (1)	1800-0300 (3-4)	1900-0200 (2-3)
Okinawa	1500-2100 (2)	0730-0900 (1) 1300-1900 (2) 1900-2300 (3-4)	0100-0600 (3)	0200-0400 (2)
Guam & Mariana Islands	1600-2100 (2-3)	0700-0900 (1-2) 1200-1900 (2) 1900-2200 (3-4)	0100-0700 (3-4)	0200-0600 (3)
Australasia	1400-1900 (2)* 1100-2000 (3)	0800-1800 (1-2) 1800-2200 (3)	2100-0600 (3)	2330-0530 (3)
Japan & Far East	1600-2000 (2)	1200-1800 (3) 1800-2300 (3-4)	0000-0600 (3-4)	0100-0500 (2-3)
Philippine Islands & East Indies	1500-2100 (1-2)	0730-1000 (2-3) 1300-2000 (1) 2000-2300 (1-2)	0300-0500 (1-2)	0300-0500 (0-1)
Malaya & South East Asia	1600-2100 (0-1)	0830-1030 (1) 1600-2200 (1)	0400-0700 (1)	0500-0700 (0-1)
Hong Kong, Macao & Formosa	1600-2000 (1-2)	1300-2000 (2) 2000-2300 (3)	0130-0700 (2-3)	0300-0600 (1-2)

Symbols For Expected Percentage of Days of Month Path Open:

(0) None (1) 10% (2) 25% (3) 50% (4) 70% (5) 85% or more.

* Indicates time of possible 10-meter opening.

Ionospheric Propagation Conditions

Forecasts by
GEORGE JACOBS, W2PAJ

144-40 72nd Ave.,
Flushing, Long Island, N. Y.

General Propagation Conditions (April 15 to May 15)

10 METERS—DX possibilities very poor. An increase in short skip openings is expected.

15 METERS—Not much DX except for usual Central and South American daytime openings. An increase in short skip openings is expected.

20 METERS—Band remaining open for DX for longer periods of time than during winter months. This will be best daytime DX band.

40 METERS—Seasonal ionospheric absorption and atmospheric noise level increasing, but generally fair to good early evening and nighttime DX expected on this band during April.

80 METERS—Generally fair nighttime DX to many areas of the world, but noticeably higher static (atmospheric noise) level.

160 METERS—Higher noise levels and seasonably weaker signals will not permit much DX on this band until next fall, although there is the possibility that some Australasian circuits may come through during early April.

This overall picture of band conditions is intended to indicate qualitative changes in each band from month to month. For specific times of band openings for any particular circuit, refer as usual to the Propagation Charts on the opposite page.

This month's Propagation Charts are based upon a predicted *smoothed sunspot* number of 10, centered on April, 1954. Forecasts are based upon ionospheric data appearing in the Central Radio Propagation Laboratory (NBS) monthly publication "Basic Radio Propagation Predictions."

Moderate to severe ionospheric disturbances are forecast for April 14-18 and 20-26. A period of good short wave propagation conditions is forecast for April 7-12.

The forecasts are calculated in such a manner that they are valid until the 15th of the next month. This month's forecasts are, therefore, intended to cover the period ending May 15, 1954.

Sunspot Count

The Zurich sunspot number for the month of January, 1954 has been announced as *zero*. This is the first month since June, 1913 that no sunspots have been observed on the face of the sun. It is also the lowest sunspot number recorded for a January, since January, 1867.

The January sunspot number of zero, results in a *smoothed* sunspot number of 12.3 centered on July, 1953.

An error crept into the plotting of the sunspot curve appearing in the February column. The correct values are listed below and include all observed smooth sunspot numbers through July of 1953.

If these values are compared to the curve appearing in "DX and the Sun" (July, 1953 *CQ*, page 18), it will be noted that the values of smoothed sunspot numbers actually observed from the period July 1952-July 1953 agree almost exactly with the values predicted.

Jan. 1952	43.3	July	30.6	Feb.	22.6
Feb.	42.9	Aug.	27.8	March	19.8
March	40.2	Sept.	27.1	April	18.2
April	35.7	Oct.	27.5	May	16.5
May	33.5	Nov.	26.1	June	14.9
June	32.1	Dec.	26.0	July	12.3
		Jan. 1953	23.9		

NBS Short-Term Propagation Forecasts

Radio station WWV and WWVH are operated by the National Bureau of Standards. WWV is located near Beltsville, Maryland and WWVH in Maui, Hawaii. In addition to serving as a source for standard frequency and standard time measurements, transmissions of propagation forecasts are made periodically throughout the day on both of these radio stations.

North Atlantic Forecasts:—For over three years, the National Bureau of Standards Radio Warning Service has been making continuous 24-hour daily studies of the North Atlantic circuits by using specialized techniques. The results of this investigation has led to the development of the forecast system now being transmitted by WWV. These transmissions tell the condition of the ionosphere (in particular for North Atlantic circuits) at the time of the announcement, and also how good or bad communication conditions are expected to be for the next 12 hours.

The NBS North Atlantic forecasts are prepared four times daily and are transmitted in Morse Code twice each hour, at 19½ and 49½ minutes past the hour—on WWV standard frequencies of 2.5, 5, 10, 15, 20 and 25 Mc. The transmissions consist of a letter and a digit, the letter indicating **present** shortwave radio conditions, and the digit indicating **forecast** conditions as follows:

LETTER (CURRENT)	PROPAGATION CONDITIONS	DIGIT (FORECAST)
W (Disturbed)	Impossible	1
W (Disturbed)	Very Poor	2
W (Disturbed)	Poor	3
W (Disturbed)	Fair to Poor	4
U (Unsettled)	Fair	5
N (Normal)	Fair to Good	6
N (Normal)	Good	7
N (Normal)	Very Good	8
N (Normal)	Excellent	9

If, for example, propagation conditions at the time the forecast is made are normal, but are expected to be "fair to poor" within the next 12 hours, the forecast statement would be broadcast as N4 in Morse Code, repeated five times. New forecasts are issued by the NBS regularly each day at midnight, 0630, 1200, and 1800, EST. Each forecast is broadcast by WWV for a period of about six hours—until the next forecast is issued. Thus the forecast prepared at noon is first broadcast at 1219½ EST, and then at half hourly intervals through 1749½. The next broadcast at 1819½ carries the new forecast made at 1800, etc.

North Pacific Forecast:—The propagation forecasts transmitted on WWV refer principally to North Atlantic paths, such as Washington to London or New York to Berlin.

Commencing with **January 5, 1954,** forecasts on the quality of high-frequency radio propagation conditions on North Pacific transmission paths, such as Seattle to Anchorage, Anchorage to Tokyo, etc., are being transmitted by the National Bureau of Standards radio station WWVH, located at Maui, Hawaii. The transmissions consist of the same letter-number coding as used for the North Atlantic forecasts on WWV.

The announcement is broadcast in Morse code, repeated three times, every half hour at 9 and 39 minutes past the hour after the time announcement and station identification. New forecasts are made at 2100 and 1300 EST. The 2100 forecast is first broadcast at 2139 and every half hour through 1309 EST. The 1300 EST forecast is first broadcast at 1339. The 1409 EST broadcast is skipped (the station is off the air), but the announcement is broadcast again at 1439* and every half hour through 2109. WWVH transmits (synchronized with WWV), on 5, 10 and 15 megacycles.

To summarize, North Atlantic forecasts are transmitted

(Continued on page 51)

Elbert Robberson, W2FRQ, ex-W6ADH

44 Sintsink Drive, East; Port Washington, N.Y.

The Group of Instruments Shown Above Constitute a "Sawbuck" Q-Meter Which Enables a Q Reading to be Taken at any Frequency Covered by the Grid Dip Oscillator

Hams usually shy completely away from one of the most useful instruments a radio man can own: the *Q*-meter. The reason given is the same one for their not spending QSO time dreaming about 100-foot yachts, or twin-stack Caddies. Even now that a kit model is available, not many of them seem very *Q*-minded—the plunge seems too drastic.

Here is an instrument to cut your teeth on that does not tie up heavy cash or labor, and that has the main features of full-fledged *Q*-meters: the "*Q*-Box." It will measure *Q* directly, and it is self-standardizing. Furthermore, a unique method of injecting the generator voltage does away with the need for expensive meters, resistors, or other special components, and does not introduce unwanted reactance into the test circuit. Yet it is compact enough to tote in one hand; anyone can dig the parts out of the hope chest, and put them together in an evening.

Look at *Fig. 1*. If the a-c generator is swished on to the resonant frequency of the L/C combination, the voltmeter will come to life and swing over to a nice fat reading. The amount will depend upon the value of X/R, in which R represents the coil loss. With constant input, we can look on the meter reading as being indicative of the coil Q. If the voltmeter, *V1* of *Fig. 1*, indicates a value of 1, whatever voltage is shown on the voltmeter *V2* will be the numerical value of Q for the coil.

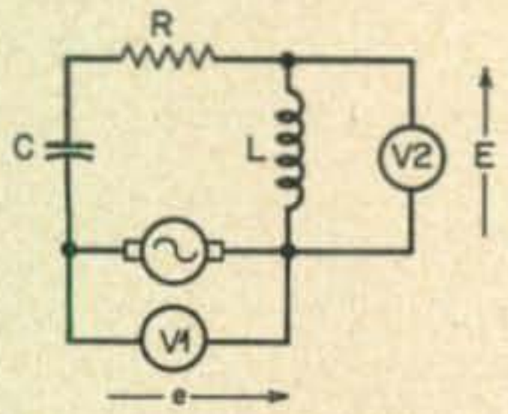


Fig. 1. Derivation of voltage measurements for finding the Q of a coil.

Most Hams have a grid-dip oscillator, and a VTVM. The *Q-Box* ties these tools together to make a perfectly adequate *Q*-meter.

Final Design

Figure 2 shows the final evolution of the *Q-Box*, with its parts list. In spite of what appear to be great differences, it actually uses the same principles as the commercial article. We use a common grid-dip oscillator as a generator, inject voltage into the test circuit by coupling the GDO coil to the *Q-Box* coupling-coil. A Faraday shield insures that coupling will be inductive only. The photo illustration shows the set-up: the GDO coil is simply put in a hole in the *Q-Box*.

Then, instead of pushing the induced current through an r-f milliammeter (which is expensive) and a resistor measuring 0.04 ohms (which we don't have) we allow it to circulate through *L2*, which is an auto-transformer. The voltage across *L2* is high enough to measure with the VTVM, so that is just what we do, with switch *S1* on the "*e*" position. *X1* rectifies the r.f., and the filter *R1-C2* isolates the meter from the circuit being sampled.

Coupling between GDO and *Q-Box* is varied by moving the coil in or out of the box, and is set to a value giving a voltage which we will take as our standard, or reference point. On my particular VTVM, the full scale used is 3, so a reference point of 0.3 is used.

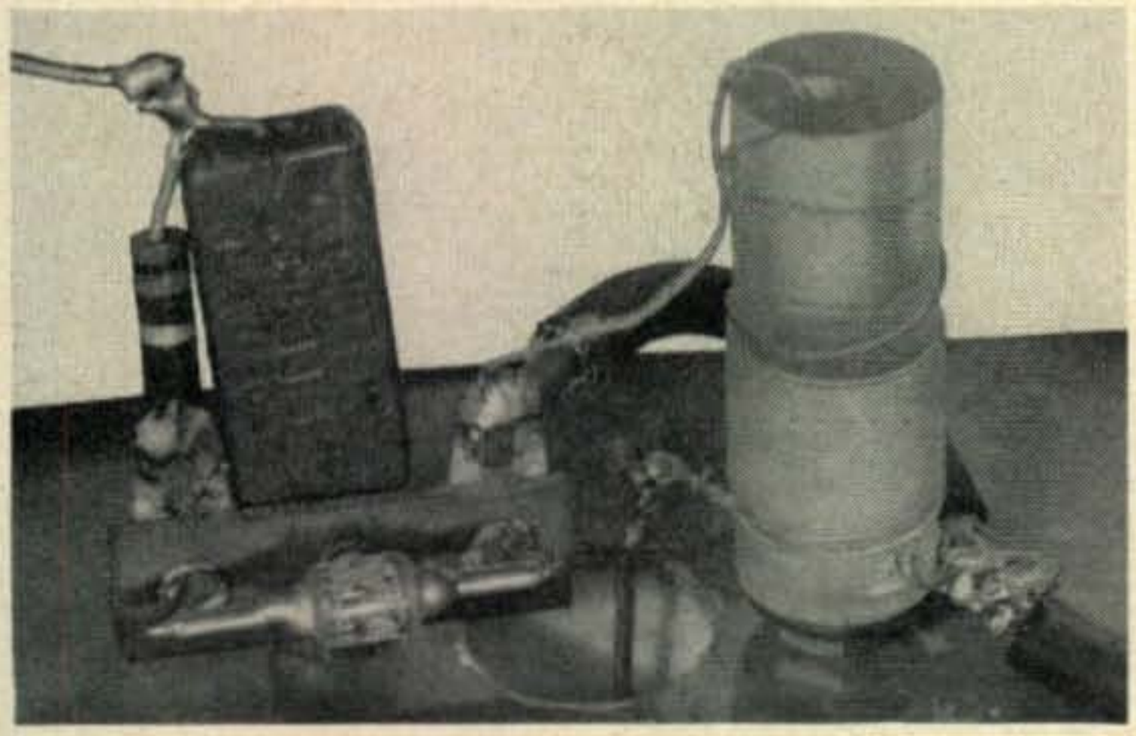
The inductance of *L2* is so great that its presence in the test circuit is not permissible—but a small fraction of this coil, such as one turn (or 1/30 of the total) has a sufficiently low impedance to be allowed in the circuit without any serious effect on the results.

Coil Winding Data

L1 15 t. #18 enam. closewound on 1½" dia. form.
L2 30 t. #28 sc closewound on ½" dia. polystyrene rod 1½" long, tapped 1 turn from lower end.
L3 coil under test.

Since 0.3 volts appear across the full 30 turns of *L2*, it follows that 0.01 volts exist across the one turn used as our injection impedance. We have now found, inexpensively and painlessly, that the injected voltage, *e*, is 0.01 volt.

When switch *S1* is transferred to position *"E"* the voltage developed across the test circuit is rectified by *X2*, and fed through isolation

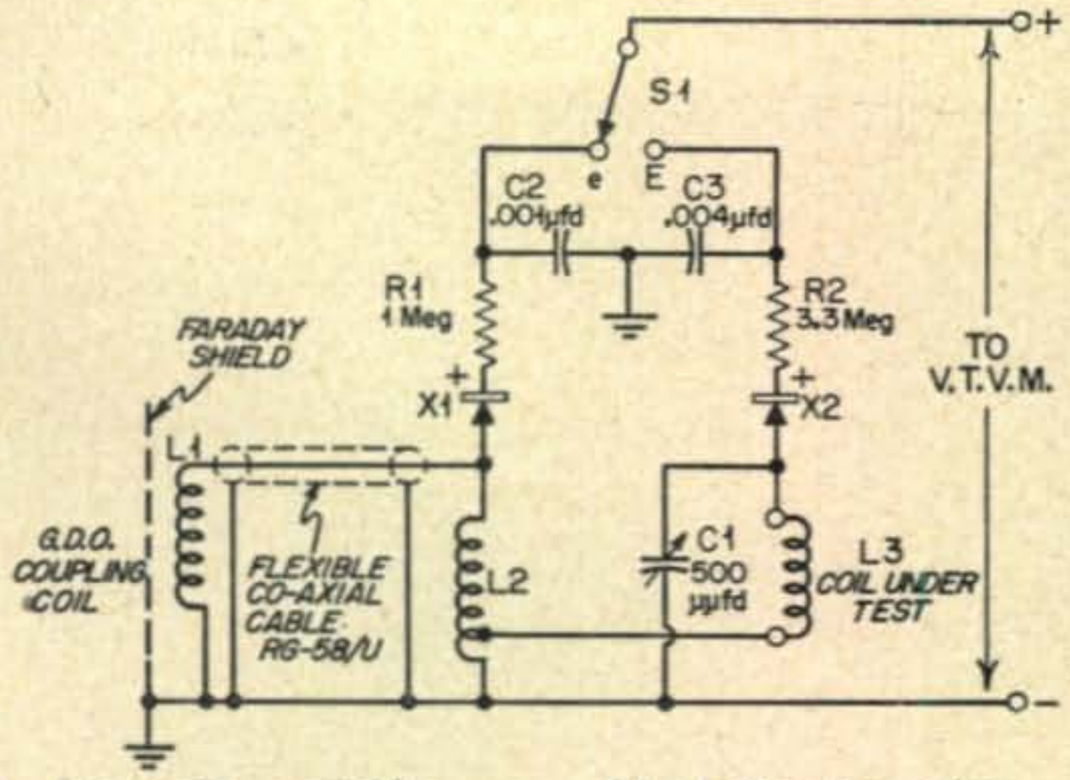


This is the injection transformer, rectifier and filter for obtaining the reference voltage. The actual injection voltage is that which is developed one turn above ground, at the tap connected to the wire going through the box to a connection inside the large outside stand-off insulator.

filter *R2-C3* to the VTVM. The tuning condenser *C1* is rotated for resonance, which is indicated by the highest VTVM reading.

This second voltage is taken as *E*. Remembering that the injected voltage *e* is 0.01, an indication of 2.5 for *E* would mean that $Q = E/e = 2.5/0.01 = 250$. In practice, no computation is needed. If the input is simply adjusted to a reference level of 0.1 of the meter full scale (such as 0.3 if full scale is 3), the output volts x 100 equals *Q*. Just read a couple of decimal places on to all output figures: 2.75 is 275, and so forth. You can then measure coils as fast as you can connect them to the box.

The *Q-Box* is not something that must be made exactly to one set of dimensions. The individual, therefore, has latitude in adapting



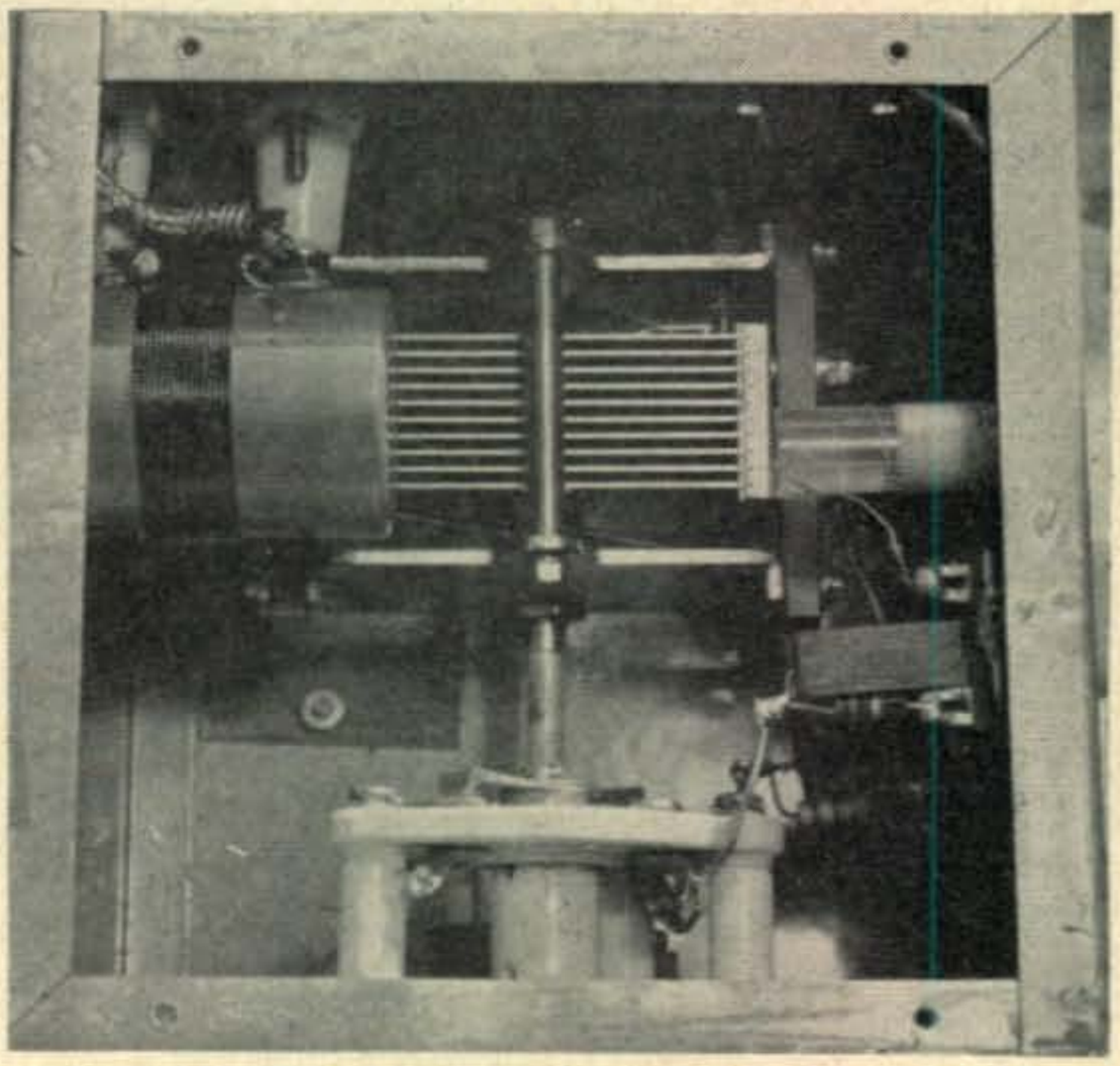
C1—500 *μμ*fd. variable, Cardwell XR-500-PS or equiv.
C2—0.001 *μμ*fd. 500v. mica
C3—0.004 *μμ*fd. 500v. mica
R1—1 Megohm, ½w.
R2—3.3 Megohm, ½w.
X1, X2—crystal diodes, Sylvania 1N34
S1—s.p.d.t. toggle switch

Fig. 2. Parts list and wiring diagram.

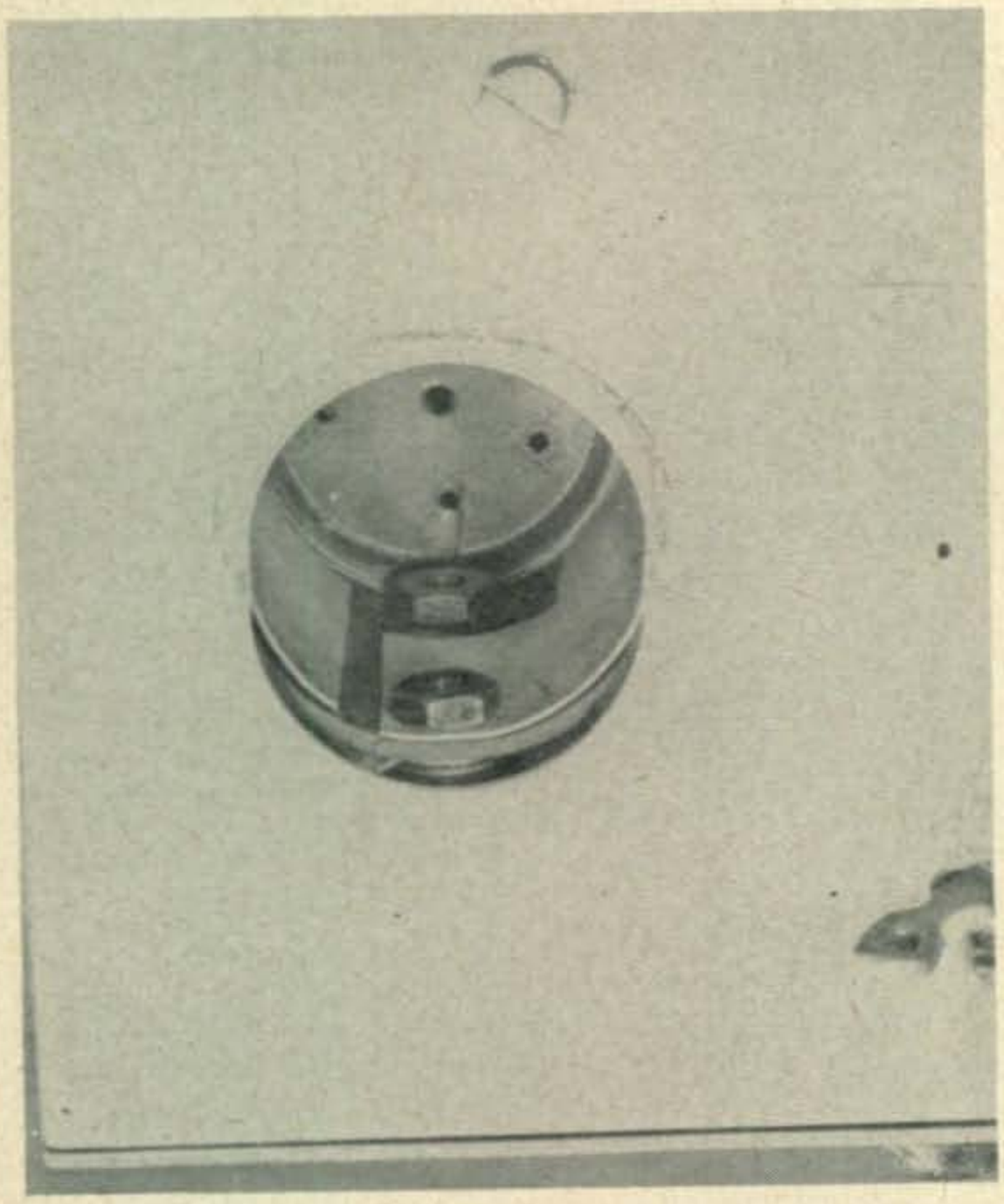
his own parts to the job as long as the principles are not violated, and the general scheme of the layout, as shown in the illustrations, is followed.

An explanation of why the components are placed as they are in these illustrations will show what the rules are.

Note first the fact that the test-coil terminals are fairly large stand-off insulators. This is necessary because of one of the characteristics of a *Q*-meter: the presence of metal in the immediate field of a coil is ruinous to *Q*, so, in order to give the coil we are measuring half a chance, it is necessary to support it away from the box or entirely incorrect readings may be obtained. It will also be found that the presence of material which is supposedly a good insulator



The internal layout of the "Q-Box" is not critical and can be governed by the physical characteristics of the builder's parts. For instance, the ceramic switch in this model could be replaced by a common toggle which would work just as well. The essential problem is to carefully provide isolation of the input and output r-f circuits.



The Faraday shield is a grounded sheet of non-ferrous metal inside the pickup coil, shaped into an incomplete loop. Note that the metal is connected to the grounded standoff insulator terminal screw, but cut away so as not to contact the "hot" terminal at the far end of the coil; and that there is an air gap breaking its continuity.

may cause leakage or eddy loss, and, hence, lower the effective *Q*. Get the idea? Don't prop the sample coil up on a piece of soggy cardboard.

Another thing to remember is that these test terminals are on the opposite side of the box from both the grid-dip oscillator and the operator. We want the tested coil to be unaffected by hand capacity, and protected from any possibility of direct pickup from the generator—the only voltage we want in the test circuit is that known quantity, *e*, injected by the injection transformer, *L2*. The latter fact explains too the strict necessity for both the Faraday shield and the use of the *RG-58/U* cable to pipe current from *L1* to *L2*.

The construction of the injection transformer, the pickup or coupling coil, and Faraday shield are evident from the photographs. The Faraday shield is simply an incomplete grounded loop of metal inside the coupling coil. This may be any easily worked metal such as aluminum, copper or zinc.

It might occur to some that there is a duplication of functions in *X1* and *X2*, and that a further economy might be realized by using only *one* crystal rectifier and filter, and switching it to sample either the injection voltage or the output. This, however, would mean switching r-f voltage and would impose changing loads upon the two circuits which would lead to greater inaccuracy. By using the two rectifiers and filters permanently connected as shown, we are only switching d.c., and the load upon the two branches remains steady as a rock.

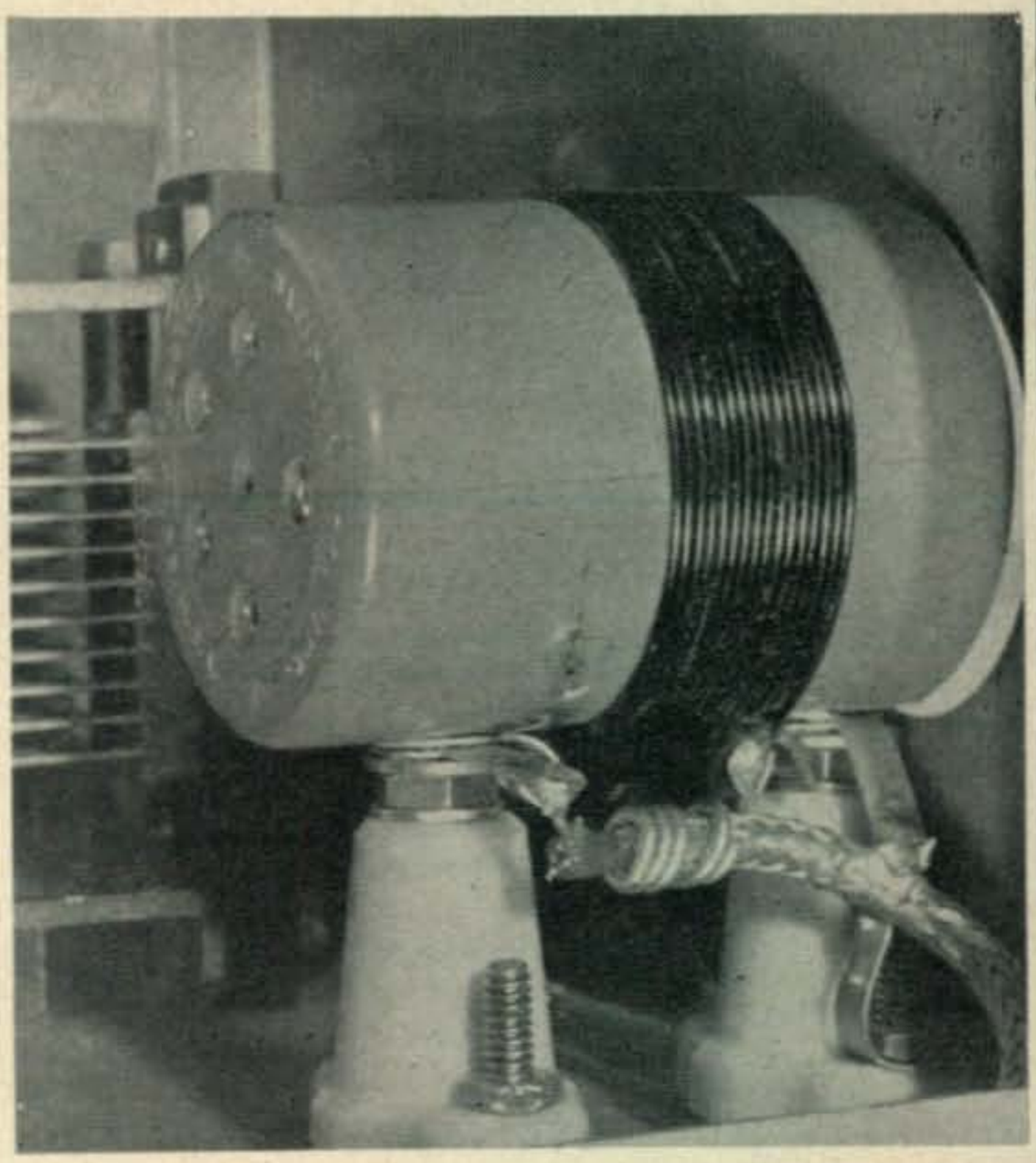
Calibration

The calibration of *C1* may be made most simply by assuming the semi-circular plates to give a straight-line-capacity curve. With a 500 $\mu\mu$fd. capacitor and a dial having 0 to 100 markings for 180° rotation, multiplying each dial mark by 5 will give a fairly close figure for capacity. A cardboard mask can be cemented to the dial, carrying these new figures. If desired, however, this mask may be calibrated more accurately by using either known condensers or known coils, with the GDO supplying known frequencies.

Mounting Components

1 ea—aluminum "utility box" 6" x 6" x 6"
2 ea—terminal strips, Cinch #52
1 ea—coil form, 1½" dia, 2" long
2 ea—standoff insulators, Birnbach #965
2 ea—standoff insulators, Birnbach #866
1 ea—planetary dial, National "Velvet"
1 ea—¼" flexible shaft coupling, National TX-10
1 ea—insulated jack, Birnbach #333
3 ea—rubber feet

(Continued on page 65)



This is the pickup coil. Note that the closest side to the operator is grounded as well as the sheath of the RG-58/U cable. Height of the standoff insulators will be governed by the height off the table of workbench of the GDO.

ESSE SPECIALS!

AN/ART-4 TRANSMITTERS & TARGET

6′ x 30′ plastic screen target containing two transmitters complete with microphones. One transmitter on 55.5 Mc., other on 56.75 Mc. ¾ watt output using 3A5 tubes. Dry battery operated (batteries not included). Brand new, in wood box 10" x 12" x 75". Shipping Wgt. 75 lbs. Box or plastic screen alone worth price.

NEW..... **$4.95** ea.

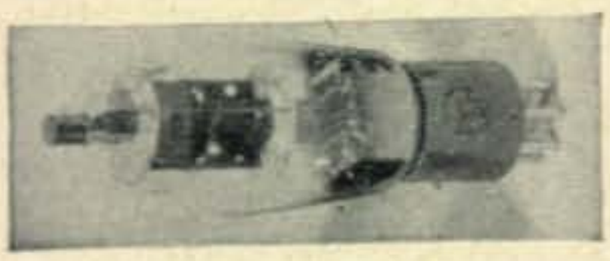
ZB-3 HONING ADAPTOR

(Also ARR-1)

Ideal Converter for Ham use. Dial calibrated 234 to 258 Mc. Uses 4—954 tubes (included). For 12 or 24 V. DC operation. Wgt. 4 lbs., size 3¾" x 3¾" x 11½". Removed from military aircraft.

FINAL CLOSE-OUT, ONLY A FEW LEFT **$6.95**

1625 TUBE 12 V. 807



These tubes are 807's with a 12 V. filament making them ideal for new 12 V. car mobile transmitters.

BRAND NEW, Guaranteed..... **$ .59** ea.

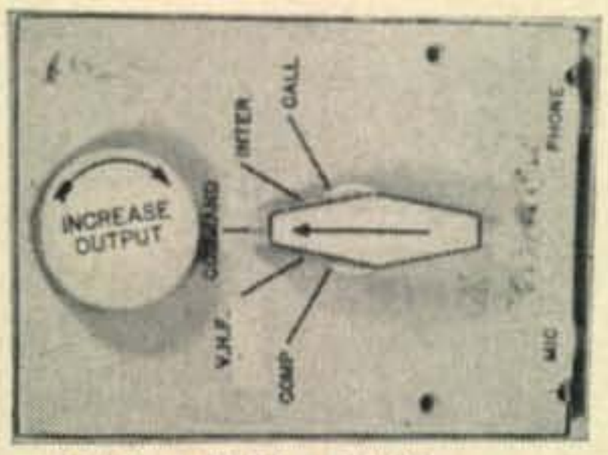
Lots of 10 or more..... **$ .39** ea.

BC-357 MARKER BEACON RECEIVER

Contains sensitive relay actuated by 75 Mc. signal. Use for door opener or other remote radio control. Contains two tubes and other parts. Sensitive plate relay worth price. 24 V. DC operation.

FINAL CLOSE-OUT **$1.95**

Sensitive BK 35 SPDT Relay removed from above equipment. **$1.25**



BC-366 JACK BOX 10 FOR $1.95

Contains 5 pole switch, volume control, phone and mike jack in aluminum case 3¼" x 4⅛" x 2¼".

10 for **$1.95**

525 FT. 3 COND. WIRE

3-conductor twisted weatherproof U.S. Army WT-1/U wire used for telephone communications. Consists of 4 steel and 3 copper strands per conductor giving it extreme tensile strength and adequate conductivity. Only a few coils—order early—

PER COIL..... **$4.95**

SELF-GENERATING PHOTOCELL

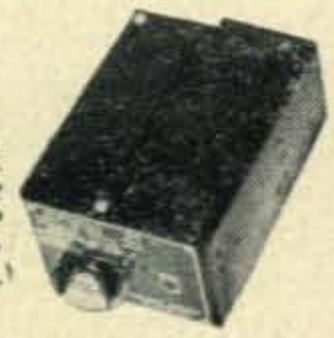
Barrier type self-generating photocell similar to ones used in photographic exposure meters. Cell has up to several hundred microamps output in sunlight. Use with microammeter to produce your own light meter. These made to sell for many times amount but our fortunate bankrupt purchase allows us to offer at this low price..... **66c** ea.

GUY WIRE — 5,000' spool — $1.95 per 1,000'

Extra strong snarl, and rust resistant cable. Originally used for aircraft control cable, has 21 strands alloy brass plated to resist corrosion. 350 lb. breaking test. OD 3/64". Ideal TV Antenna guy wire. Wound on wood & metal spool of 5,000′ length.

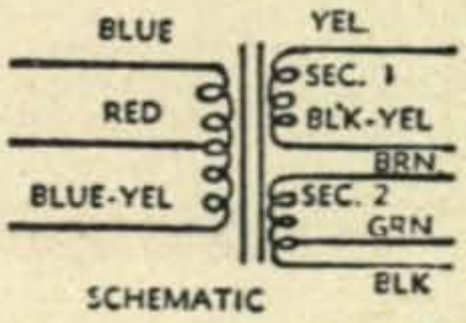
Per spool **$9.75**

CH PRESSURE SWITCH



Controls pressure within any setting from 50—250 lb./sq. in. with a differential of 20—75 lb./sq. in. Use for any motor up to I HP. @ 110 V. or 1.5 HP @ 220 V. AC or DC. Has also manually operated push-pull on-off switch Cutler-Hammer Bulletin 9505.

BRAND NEW ..... **$1.75** ea.



TRANSCEIVER TRANSFORMER

Combination modulation and output transformer (This is Esse's 9D1003 which is used in several magazine articles) Pri: 10,000 ohm P-P 7C5's or equivalent at 79 Ma. Freq. 300-300 CPS.

Sec. #1: 6000 ohms 50 Ma. modulation winding. Sec. #2: 200 ohms .5 watt level tapped 3.2 ohm 3 watt level. Dimensions: 3-13/16" x 1⅝" x 1¾". Wire leads 4 to 6 inches long.

10 for $8.95. PRICE..... **$1.25**

0—5 MINUTE TIMER

Industrial timer, Model TD-5M. 115 V. 60 cycle, 1000 watt rating. Both normally open or normally closed contacts. Timer may be set at any timing between 0 and 5 minutes. Resets automatically upon completion of cycle

PRICE **$4.95**

ANTENNA RELAY 110 V. AC

Heavy Duty 1 KW 110 V. AC operated antenna relay. Has heavy silver bar type contacts allowing over ½" air gap when not energized. A truly rugged relay measuring 4" x 5" x 4½" overall. Just a fraction of government acquisition cost. Brand New..... **$1.95**

AN-80 ANTENNA

465 Mc. Antenna which may easily be trimmed for amateur use. Easily mounted for mobile use. Includes rubber gasket for rooftop. Matches 52 ohm cable, coax cable fitting included

NEW... **79c** ea.

CONDENSER KIT -- 25 Asst'd - 95c

Here is a useful kit of 25 assorted paper tubulars and micas, most of 600 V. series of well known mfrs. at less than 4c ea. You cannot afford to pass this bargain. They are not junk or seldom used sizes as most kits are composed of but honest to goodness quality merchandise.

ALL MERCHANDISE GUARANTEED. IF NOT SATISFIED, RETURN PREPAID & CASH WILL BE REFUNDED.

ESSE RADIO CO.

40 WEST SOUTH STREET
INDIANAPOLIS 25, IND.

The VHF-UHF News

FURMAN C. COBB

c/o CQ Magazine, 67 West 44th Street, New York 36, N.Y.

Apologies are offered this month to those anticipating further action on the trans-continental 144 Mc. relay attempt. Although many letters have been sent out there has been little response to the idea in some quarters. We are still working and hope to have a more favorable report next month.

VHF in Argentina

In the March 1948 issue of *CQ* a report on v-h-f activities in Argentina was presented by LU5CK. Javier Eduardo Poledo, LU5CK, of Buenos Aires, has sent another report through to *CQ* which I am privileged to publish below.

Fifty Megacycles

Without doubt, the best DX period on 50 Mc. was between June, 1949 and October, 1951, that is to say during the period covered by *Project RASO.** High sunspot activity during this period offered opportunities for great DX work, while the *Project RASO* promoted concentrated activity on the band.

The combination made it possible to take advantage of the rare "openings," which resulted in the great Pan-American DX work between LU's and W's, as well as with most of the other American countries. Every v-h-f man remembers the thrill of the first band openings during the early days of April, 1950, when numerous LU's worked W4FNR, W4IUJ, W5VY, W5JLY, W5BDT, and other W's. Later openings throughout the year resulted in LU contacts with all W call areas and even with Canada. Also in April, KH6NS duplicated the feat of KH6PP (March, 1948) of contacting stations in and around Buenos Aires from Honolulu. This path was also covered several other times during the year.

Although there were far fewer 50-Mc. stations active in Mexico, contacts between Mexico and Argentina were much more frequent than between the U.S.A. and Argentina. This indicates just how difficult a skip distance was covered by the LU-W contacts. The most-frequently-contacted Mexican stations include; XE1A, XE1FU, XE1GE, XE1KE, XE1QE, and XE2C.

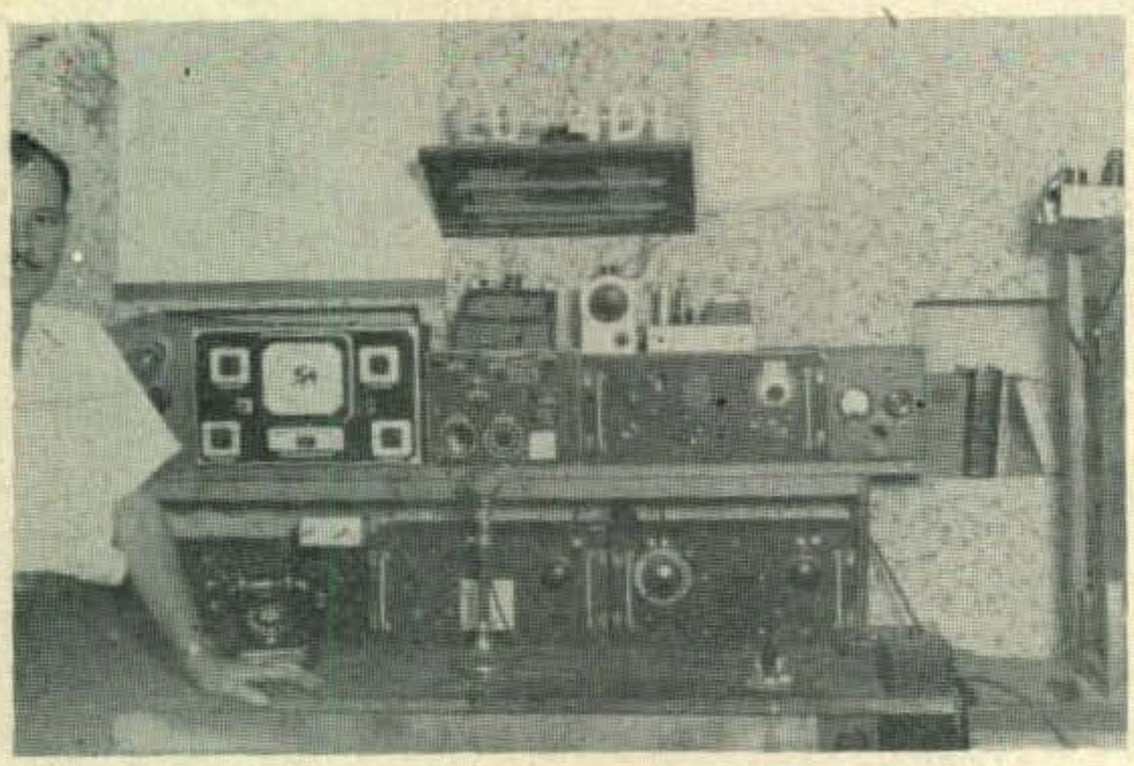
Other Central American and northern South American countries were comparatively easy to work (when there was any 50-Mc. activity). Signals were usually extremely strong, accompanied by a rapid fade. Some of the familiar calls worked in these countries include W5BSY/MM (operating in the Panama Canal and near Costa Rica), KZ5NB, TG9JW, TI2AFC, VP2GG, YV1AU, YV5AB, YV5AC, YV5AE, and YV5DV; HC1CA, HC1JW, and HC1OT; HK1CA, HK1DW, HK1DX, and PZ1A.

Gene Fontana, LU9MA, Mendoza City in the western interior of Argentina has no local activity. Gene depends entirely upon DX for his 50 Mc. contacts. However, he has a certain knack for knowing when the band will open. Many 6-meter operators in the U.S. have worked LU9MA.

Brazil and Peru were also frequently worked from the Buenos Aires area. PY1DS, PY1LQ, PY2AC, PY2PK, PY2QK, PY4CL, and OA4AE, OA4BC, OA4BG, and OA4DI were the most frequent stations. Unfortunately, none of them are now being heard. We are doubtful whether it is because of poor propagation conditions or the lack of 50-Mc. activity on their part. We are inclined to the latter presumption.

DX contacts with Chile have always been most frequent on 50 Mc. from Argentina. Besides the old

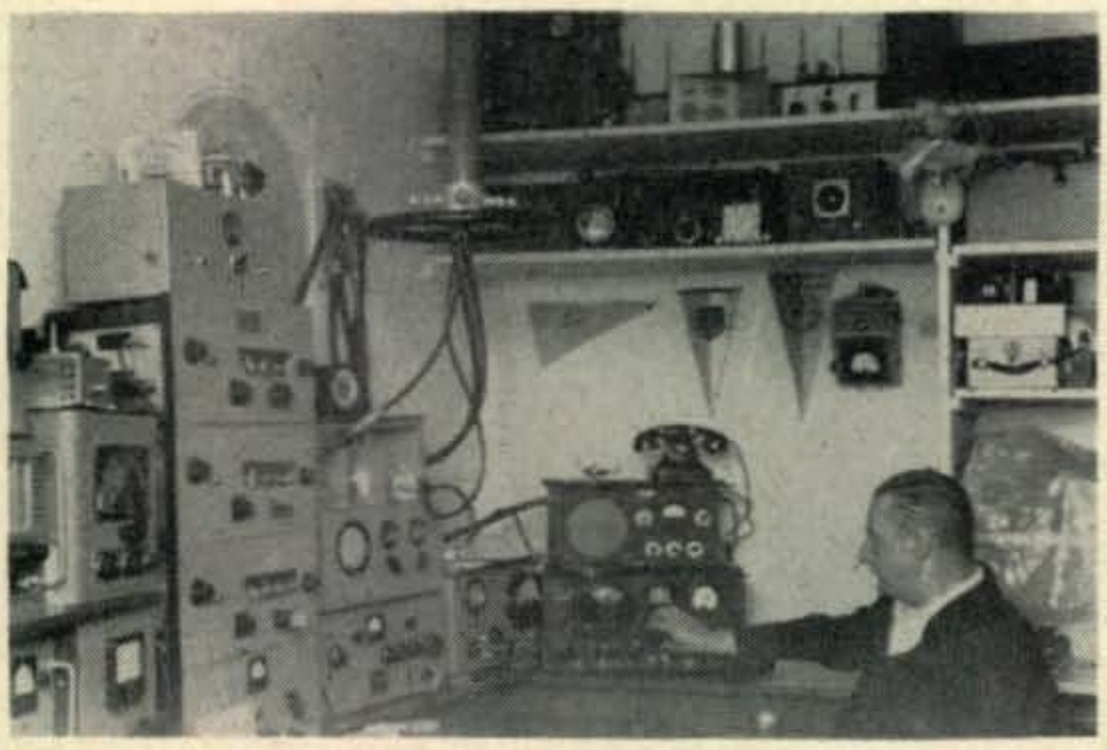
* Radio Amateur Scientific Observations Project. Sponsored by the U.S. Air Force and supervised by Oliver P. Ferrell, and initiated in order to learn more about how 50-Mc. signals are propagated.



This is Frank Emanuele, LU4DI and his strictly v-h-f station with equipment on 50, 144 and 420 Mc.

timers, CE1AH and CE1CQ, newer Santiago stations worked include CE3CC, CE3ET, CE3NS, CE3QC, and CE3QG. Signals were frequently so strong that they could be copied without an antenna on the receiver!

This brings us up to date. With the diminution of solar activity, regular 50-Mc. DX work has decreased to sporadic contacts with our neighbors in Chile—about 800 miles. As most active LU's have worked at least thirteen countries, and some as many as sixteen on 50 Mc., many are utilizing the breathing spell to investigate the higher frequency bands.



One of the most active v-h-f stations in Buenos Aires is operated by "Charlie" Dewey, LU4BJ.

Let me hasten to assure you that this interest in the higher frequencies does not mean that dear old 50 Mc. is dead in Argentina. There are many new stations to replace those who have moved higher in frequency. In Buenos Aires alone, there are at least fifty "chewers" on the band every day. In other localities, such as Rosario (Santa Fe Province), Mar del Plata, Balcarce, and Necochea (southeast of Buenos Aires Province), local radio clubs are sponsoring v-h-f activities. In addition, some of the low-frequency mobile gang are being sold on the advantages of v-h-f mobile work. And in Mendoza, Gene, LU9MA is always active.

Stations Active On 144 And 420 Mc.

Some of the more active 144-Mc. LU stations in the Buenos Aires zone are LU8AE, LU2AE, LU1AM, LU7AR, LU7AT, LU4BJ, LU2BN, LU8BQ, LU5CK, LU1DCK, LU1DDK, LU1DF, LU4DI, LU8DJE, LU6DO, LU4DP, and LU1DX. All but three of them are crystal controlled.

Those on 420 Mc. include LU6DO, LU8AE, LU1AM, LU7AT, LU4BJ, LU8BQ, LU1CG, LU5CK, LU4DI, LU8DJE, LU6DZD, and LU6DZH. Most of them use multi-stage transmitters and beam antennas. In spite of low power, they have secured excellent results.

Equipment Used

Technically, the equipment used by the LU gang is excellent. Practically all of it is individually constructed by the license holder, although there are some commercial communications receivers used in conjunction with home-constructed converters. Horizontally-polarized antennas are used almost exclusively. The most-popular 50-Mc. antenna is the four-element "Plumber's Delight."

Multi-stage transmitters, with either crystal-controlled or self-controlled oscillators are quite numerous on both 144 Mc. and 420 Mc. The scarcity and high cost of suitable v-h-f tubes, however, sometimes makes compromises necessary in the design of our equipment.

Representative LU Stations On The VHF's

A brief description of some of the active v-h-f stations will give an idea of the type of equipment used in Argentina.

(Continued on page 50)

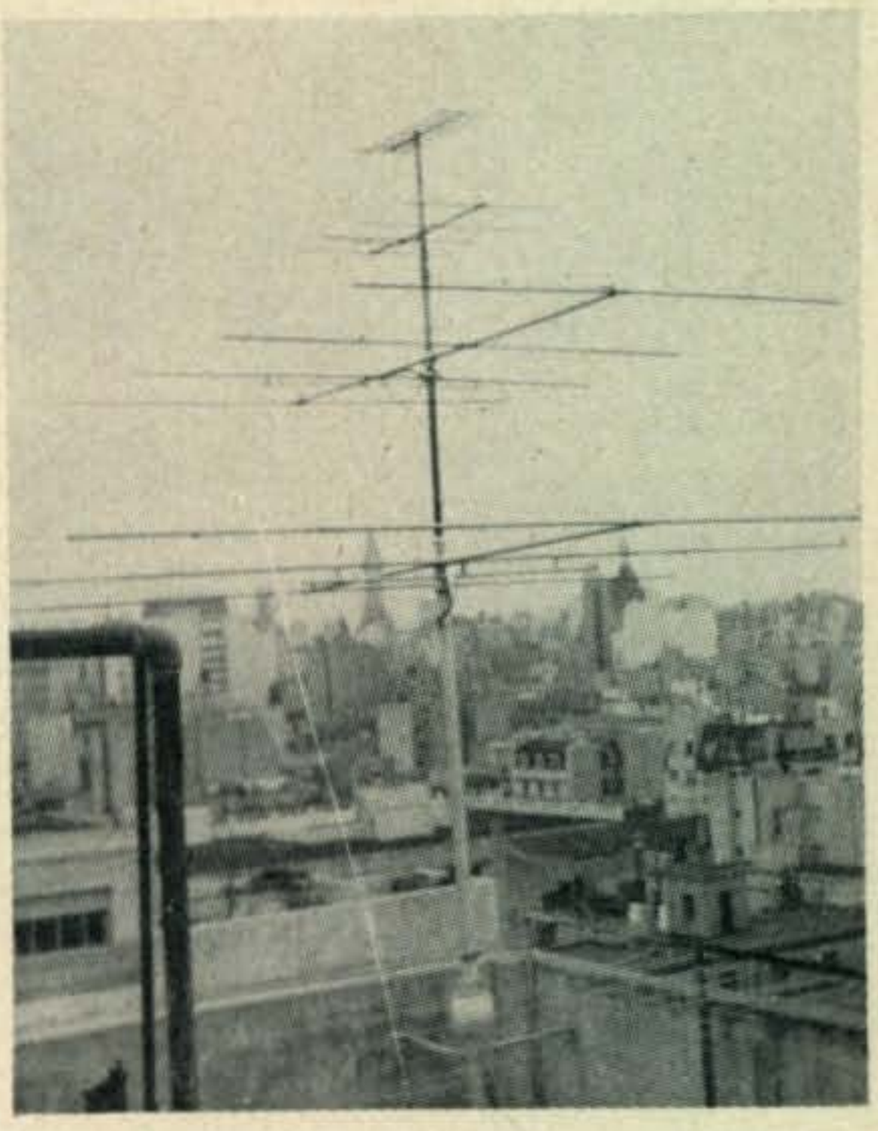
(from page 49)

LU4BJ. C. C. "Charlie" Dewey, City of Buenos Aires

Charlie works the frequencies above 28 Mc. exclusively. Located in a tall building in the center of Buenos Aires, his high noise level and the tremendous local interference from the many lower-frequency amateurs around him resulted in the decision to concentrate on the VHF's where he could erect high antennas. LU4BJ hates high power. All his transmitters run no more than fifteen watts to his favorite tube, the 832A. His basic transmitters are modified **522's.** The 420-Mc. rig consists of an 832A, driven by another 832A tripler, which is driven by a **522.** Output is a terrific five watts, feeding a ten-element Yagi, which develops a power gain of ten to twelve db.

The 420-Mc. antenna is fed with **gamma**-matched RG-8/U, and it is at the top of the antenna "Christmas Tree," formed of separate rotaries for the 28, 50, 144, and 420-Mc. bands. The hollow, self-supporting mast protrudes through the roof, 120 feet above the street level. All feed lines are brought to the operating position through the center of the mast.

Receiving equipment at LU4BJ includes a British **Eddystone** dual-conversion superhet, a **Hallicrafters** S-36A, and an **RME-152A** v-h-f converter. 420 Mc. is covered with a fourteen-tube, home-built superhet, using 29-Mc. and 5-Mc. i.f.'s, noise limiter, carrier meter, AM and FM detector, beat oscillator and similar features.



These are the antennas used by LU4BJ. Nicknamed "The Christmas Tree" it consists of 10-elements on 420, 4-elements on 144, 4-elements on 50 and 3-elements on 28 Mc.

LU8AE, Arcangel "Archie" V. Pardini, City of Buenos Aires.

Archie is very active on 50, 144, and 420 Mc. His 50-Mc. transmitter starts out with an 8-Mc. crystal and ends up with an 815 at seventy watts input. It drives push-pull 24G triplers to thirty-five watts on 144 Mc. The 50-Mc. transmitter is also used to drive another pair of 24G triplers, which drive push-pull 15E triplers to forty watts input on 420 Mc. A converted **BC-459A** is used in place of crystals, when v-f-o control is desired.

LU8AE's basic receiver is an **Eddystone 750,** with separate converters for 50 and 144 Mc. The latter converter uses one 6J6 as the mixer, and another as the oscillator. 420 Mc. is tuned with a much-modified, **war-surplus APS-13.** It has variable tuning, three stages of 30-Mc. I.f.'s followed by a 6AB7 second mixer into a low-frequency i-f strip, a 6H6 detector and a conventional audio system.

Ed, LU5CK

We'll be on hand next month, with the continuation of the story of Argentine DX accomplishments, plus other hot-off-the-wire features. 'Till then, don't forget to write.

PROPAGATION

(from page 43)

on WWV at **19½ and 49½** minutes past each hour and North Pacific forecasts are transmitted from WWVH at **9 and 39 minutes** past the hour.

These forecasts are based on information obtained from a world-wide network of ionospheric, geophysical and solar observatories. Data on the development of sunspots, solar erruptions, and other activities of the sun are funnelled into the NBS North Atlantic Radio Warning Service at Washington, D.C., and the North Pacific Radio Warning Service at Anchorage, Alaska. Radio soundings of the upper atmosphere, shortwave reception data, and similar information are also readily available. Trained forecasters evaluate the information and formulate the predictions.

In addition to these daily transmissions, advance forecasts can be obtained by mail. The likely periods for disturbed radio propagation conditions in the 25 days ahead are given in the CRPL-J reports, revised and reissued twice a week. These reports also include a forecast of the grade or quality of conditions for the first 7 days after issue. These advance forecasts are based on Sun-Earth relationships, especially for the first 7 days, and on the 27 day recurrence tendency of geomagnetic and ionospheric conditions. The CRPL-Ja (North-Atlantic) reports are available, at no charge, from the CRPL Warning Service, National Bureau of Standards, Washington, D.C., and the CRPL-Jp (North-Pacific) reports, from CRPL North Pacific Radio Warning Service, National Bureau of Standards, Box 1861, Anchorage, Alaska.

Similar forecasts are also available by requesting a collect telegram or by telephoning EMerson 2-4042, ext. 7015 (or TEmple 6-5277, 5:00 P.M. to 8:30 A.M. EST, and on Saturdays, Sundays and Holidays), in Washington, D.C., and Elmendorf 3-2211 in Anchorage, Alaska.

* WWVH is also shut down for maintenance at the following times:
5 Mc.—3rd Tuesday of each month 1400-1700 EST
10 Mc.—3rd Wednesday of each month 1400-1700 EST
15 Mc.—3rd Thursday of each month 1400-1700 EST

ZERO BIAS

(from page 13)

Oral argument was held at the League's request.

3. After receipt of the League's opposition, the Commission referred it to the Department of State for comment. By letter dated October 1, 1953, the Department submitted the following comment:

> "From your quotation of the ARRL's objection to the Commission's proposed amendment, it would appear that its objection is based on some unidentified reason within the realm of foreign relations which would make the Commission's proposed action inadvisable. Please be advised that the Department is unaware of any peculiarity in the current international telecommunication situation which would tend to bear out such a contention. Therefore, the Department perceives no objection to the Commission's proposed amendment as set forth in the Appendix to its Docket 10501."

4. Instead of discussing the *current* international situation at the oral argument, the League's presentation was confined to informal, unrecorded, and unreported discussions alleged to have been held in Moscow in 1946,[3] and at the 1947 International Telecommunications Conference at Atlantic City by A. L. Budlong, the League's Secretary and General Manager. In 1946, the League, unfortunately, pointed out in QST (the League's monthly magazine) that a loophole in the Commission's Rules and Regulations did not prohibit maritime mobile amateur operation in amateur bands above 25 megacycles (Tr. 16). Later in 1946 Mr. Budlong attended the Moscow Conference. While there, according to Mr. Budlong's account, he was approached informally by members of the British group, "at what turned out to be quite a party," who expressed concern over the QST disclosure (Tr. 18).[4] At the 1947 Atlantic City Conference, according to Mr. Budlong, the same concerns over maritime mobile amateur operation were expressed in "off-the-record" sessions, "in the corridors, over the coffee tables and over cocktails" (Tr. 19). In discussing the Atlantic City Conference, Mr. Budlong intimated that both the British and French were opposed to maritime mobile amateur operation (Tr. 19).[5] In 1948, the Commission amended its regulations to permit maritime mobile amateur operation in the 28.0-29.7 mc amateur band (Tr. 6).

5. The League's opposition and argument were based entirely upon hearsay and were wholly unsupported by any evidence. Representatives of the Maritime Mobile Amateur Radio Club have been unable to locate a single document or report of the Conferences which support Mr. Budlong's accounts (Tr. 35). The facts completely refute the League's position. The letter of the Department of State, quoted in paragraph 3 above, and the Commission's action in proposing to amend its Rules and Regula-

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3. The Moscow Conference in 1946 was a five-power conference between the United States, Russia, France, China, and Great Britain (Tr. 18).
4. Great Britain has since amended its regulations to permit maritime mobile amateur operation (Tr. 36, 38, 41).
5. Throughout his remarks, Mr. Budlong failed to identify a single country other than those named above who opposed or expressed concern over the problem.

tions conclusively establish that there is no current international situation which might make adoption of the proposal inadvisable. Actually, the facts fully support the desirability of adopting the proposed amendment. Great Britain, the nation which caused all or most of the difficulty at the Moscow and Atlantic City Conferences (according to Mr. Budlong), now permits maritime mobile amateur operation (Tr. 36, 38, 41). Amateurs of at least fourteen countries are known to be operating maritime mobile stations at the present time,[6] largely in the lower frequency 3.5, 7.0 and 14.0 mc amateur bands (Tr. 36).[7]

6. The League's contention that the subject proposal was of direct interest to only one-tenth of one per cent of the amateurs of this country is likewise not supported by the facts. At the present time more than 300 amateurs are operating in the maritime mobile amateur service (Tr. 8). When the extremely poor propagation characteristics of the 28.0 mc amateur band is considered,[8] the number of amateurs operating in this service is amazingly large. In addition, a substantial number of amateurs specialize in "dx" communications and value the opportunity to "work" maritime mobile amateur stations. It is interesting to note that the League supported the 1948 amendment of the regulations which authorized maritime mobile operation in the 28.0 mc amateur band (Tr. 34) and did not oppose the 21.0 mc amateur band proposal until more than a year after the proposal was first filed (Tr. 34-35).

7. Any Order of the Commission in this matter will receive wide circulation, both within this country and to foreign countries. The Commission is respectfully urged to summarize the League's position in the most general language to prevent a resurrection of anti-amateur feeling among foreign governments. All of the evidence and facts before the Commission fully justify and support adoption of the instant proposal. The League's arguments are nothing more than heresay unsupported by any documentary evidence and can best be characterized as the personal opinions of one man, Mr. Budlong. It is respectfully suggested, therefore, that the Commission adopt a simple order merely reciting the basic facts advanced by those supporting the proposal and containing the following comment upon the League's opposition:

> "The proposal to amend Section 12.91(b) was opposed by the American Radio Relay League, Inc., because of the limited number of amateurs who have availed themselves of the opportunity to operate maritime mobile amateur stations in the 28.0 mc amateur band. The Commission believes, however, that the propagation characteristics of the 21.0 mc amateur band are such as to warrant making that band available for maritime mobile amateur operation."

Respectfully submitted,
MARITIME MOBILE AMATEUR RADIO CLUB
By Robert M. Booth, Jr., Its Attorney

6. United States, Great Britain, Australia, Union of South Africa, New Zealand, Paraguay, Sweden, Ecuador, Norway, Greece, Panama, Finland, Netherlands and Belgium (Tr. 36).
7. Because portions of the lower frequency amateur bands are not available on a world-wide basis, the Maritime Mobile Amateur Radio Club has confined its request to the 21.0 mc amateur band.
8. Long range transmission on the 28.0 mc amateur band has been poor recently because of the 11-year sun spot cycle.

YL's FREQUENCY

(from page 29)

in from VQ4AQ on 14,240. W6QOG, Helene, and W6UHA, Maxine, had an FB QSO with her.

With the Clubs

We were happy to hear from KZ5AE that the QRMarys of the Canal Zone are still functioning as a club. New officers for '54 are: KZ5KA, Kay Howe, president; KZ5AE, "Sis" Bell, vice president; KZ5DW, Dot Webb, secretary. During the last year the club has lost three members to the W4 area: KZ5's AC, GQ and NN; and gained one new one, KZ5PL, Pat Macdonald. Among the members are KZ5ML, Martha, and CN, Bess, active on 15 meters. DG, Grace, has a beam on 15 and can be heard almost every day. She is proud of her Maritime Mobile certificate. DW, Dot, is taking extension courses at the Jr. College. AE, Sis, has been elected secretary of the CZ Amateur Radio Assn. Other YLs have been entertaining visiting Hams, among them SM5KP and DI9AA.

From W2EEO, Madeline, we hear the New York City YLRL held its December meeting at the Public Library, and big piece of business for the evening was elections. New officers for '54 are: W2IQP, Lil Klarfeld, president; W2IGA, Ruth Kalish, vice president; W2QGK, Sophie Lash, secretary; Helen Zuparn, associate member, treasurer. They also welcomed two new members: KN2EVU. Helen, and KN2DPN, Dot. January meeting was their annual luncheon with installation of officers. Those attending, at Susan Palmer's Restaurant: W2TBU, IQP, IGA, QGK, EEO, OWL, EUL, GPK, MVV, QGB, PZA, PUY, MEG, RTZ, UXM, KN2DPN, and several XYLs and guests.

W2BXT, Marie, reports that the Long Island unit of YLRL had its troubles trying to get together because two meetings had been called off because of bad storms. At a special meeting they held elections and officers for '54 are W2KDP, Dot Gutman, re-elected president; W2KAE, Lynn Lyra, vice president; K2CFF, Joyce Edelstein, secretary-treasurer. W2BXT, Marie, and W2SUR, Esther, are Board Members, and Esther and W2JZX, Vi, are delegates to the Federation of Long Island Radio Clubs.

W9BCA, Helen, P/C for the LARKs, says this Chicago club now meets at the Austin YMCA and some of the YLs have their dinner there for an extra hour of rag-chewing. The first of their series of contests to see which member could make the most contacts was won by W9MYC, Grace. She will be awarded a cup inscribed with her call, to be passed on until a three-time winner keeps permanent possession. WN9YXK, Rita, won the Novice trophy. The girls are soon to have LARK blouses to wear to radio affairs. They will be made alike with LARK and individual calls in a prominent position.

Here and There

W2BTB, Jeanne, was one of the Hams receiving special citation in the judging for the 1953 Edison Award. . . . Congrats to **W2KEB**, Georgie, on making BPL for Dec. . . . **W2NAI**, Marge, is manager of the 2nd Regional Net.

Congratulations to **W2SUR**, Esther, on the arrival of a baby boy on Jan. 13th. And to **W2ZPR**, Lil, on the arrival of her third son, David, on Dec. 10. **W3OQF**, Barbie, is happy with a "foster dotter" who arrived in January.

A note from **W6ETF**, Lucy, saying she and her OM expected to arrive in the U.S. the middle of Feb. after 20 months in Japan. While in Japan she used her OM's call, KA7VM, and handled quite a bit of traffic, including 276 messages taken during a carnival. They planned to install a new Elmac mobile rig and be operating all frequencies from Long Beach to their new home at Pope AFB in North Carolina.

W1FTJ was pleased to receive a QSL from CR7LU, Lucia, at Mozambique. This brings Dot up to 121 countries confirmed. . . . **DJ1AD**, Hilde's, daughter Margaret now has her call, DL6OSM.

W7SFR, Lorraine, reporting for the NYLON gals, says they have as a new member **W7FWR**, Mary Ann, who is manager of the W7 QSL Bureau. . . . **W7RHM**, Illeana, has been appointed CD amateur communications coordinator for Grays Harbor. Illeana (see June '52 CQ) has a Ham shack apart from the house and her father has built a ramp so she can get her wheelchair back and forth. . . . Congrats to **W7QY**, Lois, NC of the NYLONs, on making BPL. . . . Any gals who complain when the mail man is late should be in VE7AVF's shoes. Until recently mail at Spring Island, B.C., came by boat once a month. Now Lois gets it once a week, weather permitting, that is.

SK

Speaking of slow mail, don't be discouraged if your column editor seems slow in acknowledging some of it. It's just taking a while to catch up with us in all our moving around. One advantage for us, though, in addition to our getting thawed out in the sunshine, has been visiting with some of the YLs. We've been happy to renew our acquaintance with W7KOY, Gert; W7PMQ, Eloise, and daughter W7OUE, Rosie, and W7RIJ, Eva. All these gals are operating mobile. Gert and Eloise and Rosie also are happy over new Viking rigs for their home stations. We also met W7SHR, Edith, at a mobile picnic. She has had her ticket since '39, but most of her operating now is on 3865, the local net frequency.

Till next month, 33—WØSCF/7

DX NEWS

(from page 30)

EASTER ISLAND, CEØAA: CE3DG, Jorge, visited this QTH for twelve days or so around January 23. His work there apparently took up most of his time as only 35 QSO's were made under the call of CEØAA. Jorge installed CEØAC which will be operated on phone, 14,100 kc., by Dr. Dario Verdugo, who will be on the island for a year. The power is 40 watts and the receiver a S-76. He also installed CEØAD for the Chilean Air Force. This station used a BC-610 transmitter and will be active on phone and CW on the amateur bands. To date we have heard of no activity from these stations but will probably have more information in the next issue. QSL's should go via the RCC, Box 761, Santiago.

COCOS ISLAND, TI9: The boat MARY ELLEN II is due to leave the west coast about February 21, on a treasure hunting expedition to Cocos Island. About five weeks will be spent on the island. It had been noised abroad that W6OCP would make this trip but the sailing was delayed and he could not get further leave from his work. Thus, unless some expedition-minded Ham shows up at the last moment, it doesn't look like a W Ham will accompany this expedition. However, a Costa Rican Govt. radio operator must go along on these trips and we are trusting that TI2ES, or another TI Ham, will put Cocos on the air again. The Radio Club of Costa Rica is working on the matter. (Last minute word on the above item indicates that John, W6MHB, may sail with this expedition. Hope he makes it!)

DX Jottings

FB8XX has been appearing on 14,040 from 1530 GMT to 1615 GMT, and claims to be on 7040 each day from 1700 to 1800 GMT. Another 8XX QRG is 14,080. Joe is kept quite busy with traffic and cannot spend as much time on the Ham bands as he would wish . . . Dick Hatcher, **KC6AA**, Yap Island, has offered his services as Amateur Radio Coordinator for the Trust Territory of the Pacific Islands. This Trust Territory is made up of five districts, with the administration centers on Majuro, Marshall Islands; Ponape, Eastern Carolines; Truk, Eastern Carolines; Yap, Western Carolines and Koror (Palau), Western Carolines. Each have licenses for an official club station which we hope will be active soon. Presently active on phone and CW, 7 and 14 Mc. are: **KC6AA**, Yap; **KC6AF**, Yap; **KC6AG**, Ponape; **KC6KU**, Kusaie; **KC6UZ**, Truk; and **KC6AE**, Koror. Yap has a club station almost ready to go on the air. It has its own building (Typhoon proof), a fifty foot tower for the beam and KW rig under construction which will employ a Viking driving a 450TH and 810's modulating. KC6AA will be glad to handle QSL's for the above. See QTH's.

W9HUZ informs us that Judy, ten year old daughter of KC6AF, has received the first Novice license to be issued in the territory. The call is **WC6ZA** . . . Fadel, **YK1AH**, who is on daily from 1230 to 1330 GMT on 14,020 kc. (Sundays 0800/1000, 1230/1500 GMT), says lots of Syrian SWL's will soon receive their licenses to represent all Syrian districts of YK1, YK2, YK3, and YK4 . . . **VK1EG**, ex-VK1BS, should be active now from MacRobertson Land, Australian Antarctica. The supply ship was frozen in eight miles from the base . . . **VK1DY**, Heard Island, may be heard on 14,024 each day around 1300 GMT, conditions permitting . . . **W4TM** nabbed VU8AA, 14,070, 1455 GMT who claimed his QTH as HANIMADU Island. **G3IMV** also reports him on 14,040 at 1130 GMT . . . **OY1P** phones on 14223 and keys on 14103. He says **OY3GA** is NG! . . . **MP4QAH**, HALUL Island, claims to be a separate one. He may be heard on

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(from page 55)

14,132, A3. He skeds G4ZU . . . Regards Navassa Island, which KV4BD was scheduled to visit in March, **W4ZZ** states that he got pre-war DXCC credit for this one when he QSO'd K4NI there in 1928. QSL arrived in 1938!

Jim, **HSID** (W4VHL), ex-TA3FAS/W5HBQ, states that his operating is OK with the Thai Govt. (as long as Red China isn't contacted) but frowned upon by his own embassy. It seems a certain other embassy wants a Ham station for which permission has been refused and, so as not to create any ill feeling between embassys, acceptance of permission for HS1D to operate has been turned down. Thus HS is illegal to contact by W stations. For others, Jim says he is rockbound with a 7010 xtl and requests calls 10 kc. away from his freq. See QTH's . . .

From W6RW we learn that **HL1AA** has been active from Seoul. He is also "verboten." See QTH's . . . **KC6AA** may be heard on 7024 after 1300 GMT . . . **ZS2MI**, Marion Island, has been active on 14110 around 2000 GMT. T7 CW . . . Bob, **W4GMP**, has just received the first Yugoslav Ham license ever issued to a foreigner. The call is YU1GM. Bob will run a VIKING II on all bands and hopes to put a good signal into the USA with a variety of antennas. The QTH is Belgrade . . . **FY7YC** was QSO'd on 7015,1030 GMT . . . **FM7WD** was heard 7005, 0200 GMT . . . **LUØDDH** is "M" aboard Argentine SS President Peron . . . W6NZW heard **CR1ØAX** calling CQ 7020, 0700 GMT. No QSO's . . . ZK1AB says **VR6AC** is back on again. VR6AC also has 3.5 Mc. phone and CW . . . **ZB2I** was heard on 14077, 1245 GMT . . . **LZ2KAC** QSO'd 14,047, 1215 GMT . . . W2RDK nabbed "one" **FL8AD** on 7034 who said QSL via ARRL . . .

DX-ploits

Marv, **W6VFR**, moved out of a tie for third spot in the HR with G6ZO by adding CEØAA for No. 250 and 179 on A3 . . . Bob, **W3GHD**, moves to 245 with the addition of CEØAA, VQ7UU, VQ9UU and TI9AA. 11 additions put him on 181 in the "phone only" list . . . **W8NBK**, Arkie, adds 4W1UU for No. 244 passing WØYXO and W6AM . . . Al, **W8PQQ**, nabbed TI9AA for No. 241 and leapfrogged over W3JTC's 240 . . . **W6MX** upped to 240 with VR3D and ZS8D to pass W8BHW, W3GAU and W8JIN . . . Horace, **W6TI**, hooked VR3D for No. 220 which jumped him over W6ITA's 219 . . . **W6LW** received a QSL from AC4NC giving him WAZ . . . **W6LRU** comes up to date with 19 additions which include LB8YB, ZM6AA, MP4BBD and VP2GRO for 184 . . . Glenn, **W8KIA**, came up with FL8UU for No. 238 while **KV4AA** added TI9AA and VR3D to reach 235 . . . George, **W1GKK**, adds ZD7A, CEØAA, EAØAB, M1B, VQ6UU, VQ7UU and ZS9G to hit 221 . . . **W9LNM** came up with EA6AF for No. 220 which hopped him over W1JYH's 219 . . . **W9HUZ** added KC6AF and TI9AA, passing W9IU, W2HZY and W3JKO with 202 . . . Joe, **W6GPB**, passes WØEYR and VE3IJ by adding VQ5CL, ZS8D, VR3D, and TI9AA to reach 189 . . . Bob, **G6QX**, adds 12 with such as CEØAA, EA9DD, VS1CZ and CR5AF to hit 162 . . . Eric, **W6MUF**, adds VP9BF, LU4ZI, 5A3TR, ZP5AY, VP6AM, CP5EK, VR3D and VS1DZ to rest on 144.

Gil, **W1APA**, de-TVI'ed his PP 810's and added VP2DL and YN4CB for 138 . . . LU7ZM put Dixie, **W2ZVS**, on 162 while W3AYS added CEØAA, EA9DD and YI2AM to reach 141. ZD1SW gave Miles, **W6ZZ**, his No. 133 and 61st country on 21 Mc. He also reports that **W8BHW** now has worked 120 on 21 Mc. . . . Bert, **G8IG**, embellished his A3 total with F9QV/C (Corsica) for 184 . . . Don, **W6AM**, went to 170 on phone with MP4BBD and ZS9G. The former on 7 Mc. . . . **W6PCK**, goes to sea as "sparks" and submits a revised 28 Mc. A3 list giving him 35-152 . . . **W8JBI** nabbed 4W1UU . . . **G3AAM** rec'd QSL from AC4NC and now has 243 pasteboards for 248 worked . . . **W8DMD** rec'd pleasant surprise in the form of a QSL from LZ1DX/ZA . . . **W8KI's** new PP 810 final nabbed EI4J, F9IF, F8EL and GI4RY . . . **KP4TP/Mobile** nabbed KX6BH while driving along . . . **KV4BB** rec'd QSL from UP2KBC QSO'd Sept. 1953 . . . Chas, **W5RX**, received BERTA Certif. No. 723 . . . Mike, **W4ZAE** went to 97 with FL8UU, VQ3EO and EA9BC . . . Beda, **OK1MB**, received his A-1 Op. Certificate . . . Jerry, **W8BUM**, passed Mach. I with ST2AR, OQ5PU and CR6CZ. This gives him 101 . . . **ZS5MP** phoned with ZC3AB on 14,100 . . . **VE1ZZ** moves to 95 on 3.5 Mc. . . . **SM5KP**, Vic, QSO'd FB8XX, 14040 . . . **VQ8AR** skeds a CN8 on 14150, A3, 1730 GMT . . . **WØRLM** holds forth with a KW (PP 250TH's) on phone and a VIKING II on CW. Joe nabbed such morsels as VQ4NZK, CS3AC, SU1MR, KT1DD, CR6AR, ZE4JA and KX6AF on A3, in Jan., and also keyed with such as

CR6CJ, VQ4EI, ZE5JA and VK2ZA . . . **DL4ZC** (W4KE), Lloyd, worked 60 countries during his first two months in DL. Plans call for QRO to KW and five element antennas on 10, 15 and 20 shortly . . . Frank, **W2WC**, is quite happy with 3.5 Mc. where he picked up the following new ones: ZS3K, FY7YC, YU1AD, GD3UB, VP6EB, SM6ACO, SP3AN, CT2BO and 9S4AX . . . TI9AA was No. 137 for **W2BUY** . . . **W8HMI** is up to 111 on A3 . . . Phil, **W3LEZ**, has been "going to town" on 7 Mc. His ground-plane ant. accounted for VP8AW, VP8AK, VP8AQ, ZL3JA, VP2GRO, CN8MM, YU1AG and HR1AA, to name a few . . . **F9RS**, Charles, now has 135 confirmed with cards from SVØWG, EA6AU, EA9DD, OY2Z and LX1DP . . .

HONOR ROLL ENDORSEMENTS

(To Feb. 15 1954)

Phone and CW

W6VFR	40-250
W3GHD	40-245
W8NBK	40-244
W8PQQ	40-241
W6MX	40-240
SM5LL	40-233
W6TI	40-220
W6DLY	40-217
W6EFM	40-215
G8IG	40-213
LU8EN	40-203
G3DO	40-201
W6LW	40-196
W6LRU	40-184
OH5NK	40-145
DL1DC	40-145
W6BUO	40-142
W8KIA	39-238
KV4AA	39-235
W1GKK	39-221
W9LNM	39-220
W5FFW	39-204
W9HUZ	39-202
W6GPB	39-189
G6QX	39-162
W6LGD	39-160
W6MUF	39-144
W9ALI	39-132
W2GVZ	38-178
W6TXL	38-153
OZ7BG	37-173

Phone only

G8IG	39-184
W6VFR	39-179
W6AM	38-170
ZS6Q	37-192
W3GHD	37-181
G3DO	37-175
W1MCW	36-208
W6PCK	35-152
W4EPA	37-152
W1APA	37-138
W2ZVS	36-162
W3AXT	36-152
W3AYS	36-141
W6ZZ	35-133

Last complete HONOR ROLL appeared in the February issue.

Next complete HONOR ROLL will appear in the May issue.

Here and There

New officers of the Southern California DX Club are as follows: Pres: **W6VBY**. Vice Pres: **W6YY**. Sec: **W6VUP**. Treas: **K6CIT**. Director: **W6RW** . . . Officers of the Frankford Radio Club for '54 are: Pres: **K2CPR**. Vice Pres: **W3LVF**. Sec: **W3EVW**. Treas: **W3EQA** . . . The International Short Wave League, 86 Barrenger Road, London, N.10 says "To help well known DX stations and the QSL Mgrs. of small countries, the I.S.W.L. will be pleased to clear all your outgoing QSL cards, not only for G's, but cards destined for anywhere in the world. Cards for G, GC, etc. are forwarded to the station concerned within two days. The others will be dispatched with our own cards. All cards are cleared at least once a week."

With deep regret we note the passing of the following well known Hams: Harry Strang, **W3IL**. Clyde Hackett, **W6DBT** and Bob Hanley, **ZL2DF** (ex-ZK1BC). Bob Hanley met his death along with his wife and small daughter in a New Zealand train wreck on Christmas Eve (So. Calif. Bulletin).

Dimiter, **LZ1DP**, Chief op at LZ1KAB, wishes it known that he has NOT been instrumental in obtaining much needed QSL's from Russian stations as mistakenly reported and states that such requests must go via Central Radio Club, Postbox N-88, Moscow . . . Regarding the Cuban W.W.I. (Worked West Indies) Certificate, mentioned in March CQ: here are the revised rules: One dollar should be sent by applicant (If not a member of the Radio Club of Cuba) accompanied by a list and QSL cards confirming contacts as follow: Five cards from CO2-3 or 4, One card from CO1, CO5, CO6, CO7, CO8, KG4, KS4, VP2, VP4, VP5, VP6, VP7, KP4, KV4, **FM**, FG, PJ, HH and HI . . . **W3GHD** seeks present QTH of **SVØWA** of '48 . . . The yearly joint meeting of the Potomac Valley and Frankford Clubs took place in Philly on Jan 31. Present were 75 Hams including Bob, **W1WPO**, of DXCC.

Bob, VE7ACN is now K2GMO in East Orange, N.J. . . . Geo, **W6GAL/7**, is hitting 7 Mc. hard from Tucson, Ariz. Country No. 45 was KV4AA . . . **Ex-F7BA**, Clay, is now active as W2DPM/3 in Middletown, Penn. . . . Ted, **CP1BX**, visited W3PGB and W3FMC recently and then left for TI where he arrived on Feb. 19. He should be active now as TI2BX . . . **W6DLY** goes to new QTH in Arcadia, Cal. . . . **W3IYE** is on again with QRP rig from new QTH two miles south of old QTH in Wilmington, Del. . . . **W6DFY** stopped in at W7GHU for a bit of brasspounding . . . Buggy, **VQ2AB**, has new 2 element beam up now and has acquired a shiny new AR-88 receiver . . . Tom, **TI2TG**, may QRT in May and QSY

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to W6-land . . . **KV4AA** logged visits from: W7LRO and xyl, W2EOB, WØYTC, WØGEK, W9WAV, W1QYO and xyl, and W2BBK and xyl . . . **W2BZR/6** ops near Riverside, Calif. and awaits new K6 call . . . Karl, **W8ZY**, sports new PP 250TH rig . . . **W2HFP** moved from Westfield to Roselle, N.J. and landed 100 feet from W2DJT . . . **W4KKD/4** runs a bedside 40 watts while recovering from a bout with polio (Miami) . . . Henry, **ex-CP1BK**, is now on from W5DAI, N. Mex. See QTH's. He runs a VIKING II . . . Glad to see **W6MUR** on again after repairs to his plumbing. Bill is working on a ZS5, in Durban, to give ZS8 some CW activity . . . Mike, **W9FKC/4**, vacationed on the Florida Keys and visited W4RBQ. Another visitor at Buck's QTH was **WØELA** . . . **W4DGJ** now signs K6DOU near SF . . . Tex, **W4GXB**, would like present QTH's of VR1G, '51, FK8AI, '52. VQ3JTW, '50. VS1BJ, '50 and VS1DZ, '50 . . .

NEW ADDRESSES

EA9DE/Rio de Oro—Via EA2CA
FB8/Madagascar Bureau—Box 587, Tananarive, Madagascar.
HL1AA—Chong Hie Sun, 230 Changlimnong, Seoul, Korea.
HS1D—James D. Fry, MAAG Box "B," APO 74, c/o PM SF, Calif.
KC6AA—Dick Hatcher, Office of the District Administrator, Yap, Western Caroline Islands, Pacific.
KC6AF—Dr. Herbert Schwartz, Yap, Western Caroline Is.
KP4TZ—Sgt. Vince Roebuck, 7503 Army Unit Sigs. Ft. Buchanan, P.R.
KX6BB (Now W1KKZ)—Art Parker, 16 Barker St., Auburn, Maine.
OD5AB—Pere Jean Remonnay, Box 2904, Beyrouth, Lebanon.
OH2RY—F. "Ed," Lindstrom, Kaartokatu 3, Lonja, Finland.
TI QSL Bureau—Radio Club of Costa Rica, Box 535, San Jose, Costa Rica.
TI9AA—Via Radio Club of Costa Rica.
VE8OG—Via VE1FQ.
VK9WZ—Sgt. F. G. Anear, Base Sqdn RAAF, A426, Momote, Admiralty Is.
VP8AX—South Shetland Is. via RSGB.
VR3D—Ray, Radio VR3D, Fanning Island, Pacific.
W5DAI (ex-CP1BK)—Henry Smith, 1035 Circle Drive, Las Cruces, New Mex.
ZC3AA—J. Mortland, c/o Phosphate Co. Christmas Island, via Malaya.

Thanks to W4CEN, VK3FH, F9RS, W1RAN, W9HUZ and W6RW.

160 Meters

We have enough reports on this very interesting band to fill the whole column, but space limitations confine us to a brief round-up of activities here. Conditions were fair (W1BB) during the Jan. 17 test with QRN moderate. The following DX stations were heard: GW3ZV, CN2AO, KV4BB, KV4AA, VP7NM, G3PU, G2PL, HB9J and GC3EML. DX participation was probably cut down as the BERU contest was in progress at this time. ZS3K reports **KV4BB** as the only N.A. station heard over there this season (RST-349).

ZL1WW reports summer and fall QSO's with W8GDQ, W8ANO, W9NH, W2WWP and W1BB, plus a W8GDQ phone QSO! **KZ5DE** has been active on 1887 kc. and first W QSO was with W3RGQ . . . KZ5DE has also worked W2QHH, W2EQS, KV4AA, G3PU and plenty others . . . Bob, **WØNWX**, has a post war total of 15 countries and 5 continents as follows: W, VE, G, GW, EL, KV4, KP4, KG4, CN2, XE, VP4, VP7, ZL, KH6 and KC6 . . . **W9NH** has 13 ctys and 4 conts. **W9PNE's** score is 11 and 3 . . . **VE1EA** has worked HB9CM for the first HB/N.A. QSO. W1BB then followed for the first HB/W QSO. As reported from **W1BB** the Feb. 14 test was disappointing as the only DX heard was EI9J and G6BQ with very weak signals. DX stations known to be on were KP4KD, VP7NM, G6BQ, EI9J and G6QB. A partial list of W/VE stations on were W1BB, W1LYV, K2BWR, W2EQS, W3EIS, W1WPO, W1EF, W2GGL, W8FGB, W3PA, W1TCR, W8JBO, W4BRB, W9PNE, W3OKU, W3TBG, W8ANO, W1ZL, W4ZCM, VE1EA, W5WEH, W3RGQ and WØHNV . . . G3PU scored two "firsts" by nabbing VP7NM and KZ5DE . . . W2QHH made what was believed to be the first GC/W QSO when GC2CNC was worked. 'CNC runs 4½ watts!

Philo, HB9CM, reports KV4 sigs as only DX stuff heard on Jan. 17. HC9CM usually may be found on 1850 kc but uses 1760 at times . . . Vic, **YV5DE**, reports very good signals from W2HCW, W3EIS, KP4 and KV4

on Jan. 17 . . . **W4BRB** was heard working VP6EB and GW3ZV informed W3EIS that OK1AJB was calling him but QSO was not made . . . **KP4KD** nabbed VP7NM, GD3UB, G6BQ, EI9J, VP6EB, KZ5DE and assorted W's . . . This season's 160 conditions seemed to peak, east to west, on December 27 and then ease off to what might be called "normal" conditions with an apparent path swing from east to west to northeast to southwest around January 30. Don't give up because the scheduled tests are over as this band has "all year round" possibilities . . . Many thanks to W1BB, W3RGQ and others for their very complete "top band" reports.

73, Dick, KV4AA

NOVICE SHACK

(from page 28)

oscillator alone causes some crosshatching on channel 2 when the transmitter is tuned to 14, 21 or 28 Mc.

The conditions under which these TVI tests were conducted are undoubtedly more severe than those facing most typical installations. I do not think that TVI will normally be much of a problem with this transmitter, especially when a separate antenna coupler is used and there is a reasonable separation between the transmitter and TV receiver. This belief is bolstered by the comments of several users of *AT-1* transmitters.

Letters and General News

Soon after closing last month's column, the following came from Lennie, **W6SJR**: "Dear Herb, I passed my General on January 20, 1954. I want to know if I am the youngest Ham in the U.S. or maybe the world. I know there was an 8-year-old girl licensed in South Africa. Do you know her birthday? My eighth one was July 7, 1953." Does any one know the answer to Lennie's question?

Bob, **KN2EUH**, writes, "Dear Herb, Thanks for printing my letter in the January column. I have heard from about fifteen people so far. Three of them are my age (11) and have amateur licenses. They tell me a 6L6 gets about thirty states. I use a 6F6/807 transmitter at 35 watts, and I have sixteen states, Canada, and Puerto Rico. I am trying for a WN6 or a KN6 now. I don't want any more pen pals! The postage, hi."

F. J. "Tiny" Wengrzyn, **WØGDZ**, 1707 Third, Sioux Villa, Sidney, Nebraska, wrote a long and interesting letter, from which I shall quote excerpts. "Dear Herb, Now that I am no longer a Novice, I feel it is about time to write to you. I have been an avid reader of the **Novice Shack** since its inception. As a Novice I worked thirty-three states with 35 watts input to an **HT-17** transmitter, which is now the official stations of the Soo Radio Club, WØRTC. . . . We read your article on radio clubs and wish to disagree with your statement about holding meetings at monthly intervals. We hold meetings every Monday night and usually have a full turnout. More than that, in the last spurt of studying for Novice exams, we were there five nights a week. And I just gave the Novice exam to the other seven members. Perhaps I should explain why the Soo Radio Club has been so successful. We tell aspirants to the wonderful experiences of **Hamdom**, 'Sure, we'll help you. But, for the next eight weeks, we expect you to be at the club between 7:00 and 8:00 p.m. every night, Monday through Friday, to study for it. If for any reason movies, dances, or other social functions are more important to you than radio, we wish you luck and hope you have fun, but please don't waste your time and ours by dropping around when you have nothing else to do.' Sounds tough, Herb, but it works. . . . If there are any prospective Novices around Sidney, Nebraska who would like help, we will be happy to take them under our wing. They do not have to belong to the club. By the way, my wife doesn't think I am crazy. She is one of the club members waiting for her Novice license." **(They take their radio seriously in Sidney—Herb.)**

Getting right to the point, John **W9ZLF**, writes, "Dear Herb, My present peeve is the use of T E E E T or N E E T for BT."

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A short story. Al, **WN9AQA**, and his wife Norma, **WN9AQB**, obtained their Novice licenses together, and they took the General Class examination together. Unfortunately, Al's code speed was not quite as high as he thought it was; therefore he settled for a Technician class license, while Norma got her General Class license. Al told me on 3.9-Mc. phone (Norma controlling the switches) he thought he was ahead on the deal, because he had two licenses—Novice and Technician—to Norma's one. Be that as it may, he is obviously quite proud of Norma and will probably have passed his 13-w.p.m. code test before you read this.

Van, **WN4ADU/W4ADU**, writes, "Dear Herb, Since my last letter, I have made some changes in my transmitter. I now run 75 watts most of the time to a converted BC-458 and use an antenna tuner between it and the 375-ohm feeders of my 125-foot folded dipole. I am certainly pleased with the results. Since then, I have made a dozen contacts in eight states in less than fifteen hours of operation." **(Van's last letter reported his inability to work anyone!—Herb.)**

Mike Arnold, **WN3YDF**, 105 Penn Vista Dr., Pittsburgh 35, Pa., writes, "Dear Herb, Most people think Hams are strange 'creeps' with weak backs and strong minds. Not that I have a weak mind, I want to show I have a strong back. I am Golden Gloves, heavyweight Champion, 1952-1953, and I am going after the crown again this year. The enclosed picture was taken after I had just come in from roadwork. . . . I am in no hurry for my General ticket, as I want to try for WAS as a Novice. In two months operation, I have 35 states worked, with 30 confirmed. I run 25 watts input to a 6L6 driven by a 6AG7. I would like to meet other Hams who are boxers, both in and out of the ring, hi."

From Leslie A. Bannon, **WN9TZD**, 6260 North Chester, Indianapolis 20, Ind. "Dear Herb, I have had my ticket

Donna Moe, WN8ORP, Kalamazoo, Mich. She is fifteen years old and can be found most every afternoon after 1600 on 3729 kc. Besides radio, Donna is interested in music, wild life, stamp collecting, and cooking. Her father is W8LJZ, and her boy friend is W8MPD.

about 4½ months. In that time, I have worked 42 states, with 37 confirmed, plus Canada, Mexico, and Puerto Rico. My aim is to work all states as a Novice. I still need W. Va., Utah, Idaho, Nevada, Maine and Del. . . . My transmitter is a **Heathkit AT-1** and an **AC-1** antenna coupler. My antenna is 125 feet long, end-fed, seventy feet high on one end and thirty-five feet high at the other. Receiver is an **NC-125**, and I have a **DB-22A** preselector. I shall be glad to make a schedule on 3.7, 7.2, or 21.1 Mc. with anyone who needs an Indiana contact or QSL card."

Stanley, **W6IAH**, offers a bit of advice. "I am often the first W6 contact for Novices. They are anxious to get my card, and I want to send them one, but first I must have an address to send it to. Often their signals are quite weak, and they fade out before they get around to sending their address. And there I sit, wondering in what small town in W9 they are located. They are not yet in the Call Book, so I can do nothing more. . . . After forty-six years of operating on land, in the air, and under the sea, I feel I can give the Novice this advice: When you contact a distant station, start right

in like this: 'W6IAH de WNØXYZ RST579 QTH Hamville, Kansas, name Bob, 222 Blah Ave.' After you get this information across, you can describe your rig, etc., knowing that if you should fade out, the DX station has an opportunity to send you a QSL card."

Help Wanted

Here is this month's list of those desiring help in getting a Novice license:

George R. Martin, Box 29, Osage 4, W. Va. Married, father of four children. Apparently has good technical background. Wants advice on getting started in the right way.

Harold Burdick (13), 619 S. Adams, Sapulpa, Okla.

Thomas Doubek, 6318 Sidney, Houston 21, Texas. Wants to hear from those interested in radio up to fifteen years old.

Peter Clark (14), 3 Topland Road, Hartsdale, N.Y. Tel. WP 8-1635.

Sherman H. Rice (30), 605 Florence St., Maysville, Ky.

Terry Snyder (13), 82 Undine Road, Brighton, Mass.

Don Tucker (17), 5509 S.E. 43, Portland 6, Oregon.

Hyman S. Slo-Bodkin (18), 177 Rugby Road, Brooklyn 26, N.Y.

Leo Wesseling, 67 Baystreet, Woodstock, Ontario, Canada. (Father, 45, three sons and daughter all interested in becoming amateurs. How about Canadian readers, especially, helping them.)

Jim Busick (13), 617 Congress St., Toledo 9, Ohio.

Mike Arnold, WN3YDF, Pittsburgh, Pa., Golden Gloves Heavyweight Champion, offers this picture as proof that all Hams do not have weak backs to go with their strong minds. Mike hopes to meet many other Hams both in and out of the ring.

More Letters

From aboard The "S.S. Sonoma" in harbor of Sydney, Australia, Elmo, **W6NWU**, writes, "Dear Herb, This is from a seagoing Ham who has just gotten his General. In my voyages all over the world I have found it interesting to visit other Hams. The welcome and friendship they all show is wonderful. Some have lived in unbelievably rich mansions and others in grass huts, but they all treat me alike. This can be understood from QSO's over the air, but not realized like it is in personal visits. I have quite a collection of personal QSO cards. My latest is from FO8AB, Papeete, Tahiti. . . . Life on ship is pretty lonesome for a Ham, because hardly any one knows anything about radio. So I'd like to receive letters from other Hams. I promise to answer them all. Just write to my home address: Elmo Griffith, W6NWU, Box 494, Auburn, Calif. They will be forwarded to me promptly. By the way, I have two code machines, complete with oscillators and tapes, I shall be glad to lend to some one learning the code. Then they can be passed on to some one else."

Tommy, **WN3WST**, (15) writes, "Dear Herb, Using a 6L6, running about forty-five watts, I have worked 38 states, Canada, and Puerto Rico in four months of operation on 3.7 and 7.2 Mc. My receiver is an S-38C. I am now building a 6L6-6146 rig, and I have worked four YL's, hi."

Delaware is one of the rarer states. Here is information on two Novices there. "Dear Herb, I am Dave, **WN3WCY**, and I write for myself and Sam, **WN3VTT**.

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We are both in Wilmington, Del. Sam uses a **Heathkit AT-1** transmitter and an **S-52** receiver. He has worked thirty-two states. I use a **Hammarlund 4-20** transmitter and an **S-40B** receiver. I have worked fifteen states. We work 3.7 and 7.2 Mc."

Kent, **WN3WTO**, writes, "Dear Herb, Maryland has not been too well represented in the **Novice Shack**, so I thought I had better write. I run 50 watts to a pair of 6V6's on 3.7 and 7.2 Mc., and I have 30 states confirmed. I am trying for my WAS as a Novice. I'll also be on 145 Mc., when I get my transmitter and converter finished. My receiver is an **S-40B**. . . . At Hagerstown High School, we have nine Hams, six of whom are Novices. The radio instructor, Howard Grounds, W3VAM, inspired five of his students to become Novices."

Harry H. Montgomery, **WN8ORK**, 708 Boal Ave., Piqua, Ohio, writes, "Dear Herb, I am twenty-six and an ex-Air Force operator, and I have enjoyed every minute of my 5½ months as a Novice. I have had about 150 contacts in thirty states and two Canadian provinces, all on 3.7 Mc. It is no special record, but I am rather proud of it. As for QSL's, I have received in accordance with what I sent—100%—well 99% anyway. . . . My equipment includes a **Heathkit AT-1** transmitter and **AC-1** antenna coupler, and two receivers. One is the **S-38C** I started with, and the other is the **Hallicrafters Super Skyrider** I use now. I also have a **Bud** oscillator/monitor. . . . If there is any way that I can help any would-be Novices, I shall be glad to do all I can. I will answer all letters received."

That seems to be about the best possible note upon which to end this month's column. I'll be looking for **your** picture and letter. **73, Herb.**

BEDLAM ON ZANZIBAR

(from page 41)

would hear us on the band, zero-beat on the frequency of the station with which we were in QSO, and then call us incessantly throughout the conversation. One such nuisance kept this up for an hour while we were trying vainly to complete a QSO with G3YF. At last George sent "QRX" to G3YF, then (to the pest), "We will not answer anyone who calls us while we are in QSO with another station."

Taken at "Mkokotoni Point" is this photo of (left to right) George Breakstone, Johnny Carter and Ray Stahl.

The pest's response really shook us: "Thanks for coming back to my call. Please QSL!"

There were compensations, needless to say. We were especially happy to hook up (finally) with Hams who had been patiently chasing us for two or three days. We were sorry to make our QSO's so brief, but with many others stacked up waiting, we really had no choice. We met many old friends with whom we had previously chatted from VQ4-land, and made dozens of new contacts whom we hope to

(Continued on page 64)

(from page 62)

see again on the air. (Yet one never knows. We were the belles of the ball on Zanzibar, but Kenya is far from being such rare DX. As in the case of Cinderella, our gilded coach is once more a pumpkin!)

Highlights

Duly noted in our log are several memorable VQ1 highlights.

PY2CK (Jayme), a really first-class operator, volunteered to serve as a netting station, brought stacks of South Americans on to the frequency, somehow kept them from jumping the gun, and then introduced them one by one, restoring order from chaos.

SM5ARP (Carl) did the same with several Swedish stations and then wrote us a very fine business letter to help us clear up some confusion in our log.

VU2EJ (Aravind in Poona, India) and 4S7GV (Glen in Ceylon) kindly helped us to carry out tests of our aerials.

VQ2DC (Ron), VQ2DT (Dave), and VQ4RF (Frank) often broke in to tell us where to find interesting DX stations that were standing by for us.

W3TEM (Henry) bounced in excitedly, calling, "W1NZK . . . I mean VQ4NZK . . . I mean VQ1NZK." He finally got straightened out and we had a most pleasant QSO.

W4MKB (Joe) rushed home from his office in Nashville after W4AAW (Bill) had phoned to tell

Alternate Op!!

him that we were on the air and coming through in that QTH. Success—he got his new country!

Then there was W3MAC (Lew) who did the impossible—broke through the QRM on Kilowatt Alley with only 40 watts!

W1JMT (Francis) was sitting beside his receiver, reading the afternoon paper. He heard, "VQ1NZK calling," and—as he put it a few moments later—"his ears fell off." He rushed for his transmitter and came in like a bomb on Zanzibar.

At about 2130 GMT on October 14th we switched over from CW to phone and were astounded to hear W3KDD calling us on pure speculation—a shout to which we promptly replied. We would like to pay tribute to Dave in Arbutus, Maryland,—the World's Greatest Optimist!

At 0055 GMT on the 17th we signed clear with VP4LL and reluctantly pulled the big switch. The next day we flew back to Mombasa, where George,

Irene and I disembarked. Gioia, however, had developed pneumonia, so she and Johnny flew on to Nairobi.

The following morning the remaining three of us collected our borrowed hunting car and drove through the quagmire between Mombasa and Voi (seven inches of rain having fallen on the previous Monday). We reached Limuru around midnight, bogged down on the road, and walked the last mile to our headquarters at the Brackenhurst Hotel in a drenching downpour.

When we had recovered from our respective colds, flu, and pneumonia (and stopped scratching our mosquito bites), I totted up the score from Zanzibar: approximately 600 QSO's with some 500 different stations in 75 countries (to whom we say again, "Be patient and rest assured: we QSL 100%.). We did not do as well as we should have, but the experience was valuable, and next time we hope to profit from our past mistakes.

Next time! Never let it be said that we are not gluttons for punishment!

For the next three months we will be on a motion picture safari in various parts of Kenya, operating during the evenings (local time: GMT plus three hours) as VQ4NZK. About the first of February, 1954, we intend to sail for the Seychelles, where we will be calling the world for two or three weeks from VQ9-Land. Please listen and give us a shout!

Meanwhile, the very best of 73's and good DX to all from George, Johnny, and Ray. Cheerio!

Q - BOX

(from page 28)

For the sake of simplicity, the *Q-Box* has not been provided with a "Vernier" condenser, since this is mainly useful for capacity or inductance determinations by the frequency of resonance method. Neither does it have the extra terminals for connection of additional condensers in such problems, because all of these resonant frequency measurements can be more simply made with the GDO by itself. Actually, these "refinements" appear on the commercial instruments only to adapt them in a way for uses similar to those of the GDO. But we already have a GDO, so that the *Q-Box* has only to measure *Q*.

The method of operation is, first: To warm up the GDO and the VTVM, snap *S1* to the "*e*" position. The basic problem will follow the pattern that, for a given frequency of operation, we wish to compare several coils, shapes, *L*/*C* ratio, etc. The GDO coil for this range is plugged in, and its dial set to the desired frequency. The GDO is coupled into the *Q-Box* and coupling adjusted for the desired injection voltage, or *e* level.

The test coils are connected, *C1* resonanted, and *Q* is read (with the appropriate number of zeros added) from the VTVM. When close comparisons are being made, it is well to switch back

(Continued on page 66)

(from preceding page)

after each Q reading to make sure the injection voltage has not changed due to unsteady line voltage or the possible movement of the instruments.

Operational Accuracy

And how good will *Q-Box* measurements be? Will they be absolutely accurate? These are two questions a world apart. If you make the *Q-Box* carefully, using first class components, there is no good reason why its evaluation of the relation E/e should not be as good as any other, and within the limits imposed by the instruments you use with it. If should be noted that the $600-plus article does not give *absolutely* accurate readings. To *approach* such accuracy, a number of corrections are required. In actual practice, anybody living and working in a world of plus or minus 10% tolerances has small need for absolute accuracy. However, if you have access to a commercial Q-meter, or coil standards, results can be compared and the reference level for e checked. Any correction required can be made by using the value of e that allows the truest readings for Q over the significant range.

As to how good *Q-Box* measurements will be —I am sure anyone building one will find it the most useful addition to the bench since the invention of the VTVM and the GDO. With it, you can be faced with an array of possible coils for a job and easily, and with full assurance, pick out the one that will be best. If one coil reads 260, and another 275, you can bet that the higher Q reading obtained from the *Q-Box* will be just as authentic as a higher Q reading on any other instrument.

Is that blob of stuff worth using as a coil? You can't find out any quicker with the multi-buck instrument than you can with your sawbuck *Q-Box!* Happy revelations!

TEST MONITOR

(from page 19)

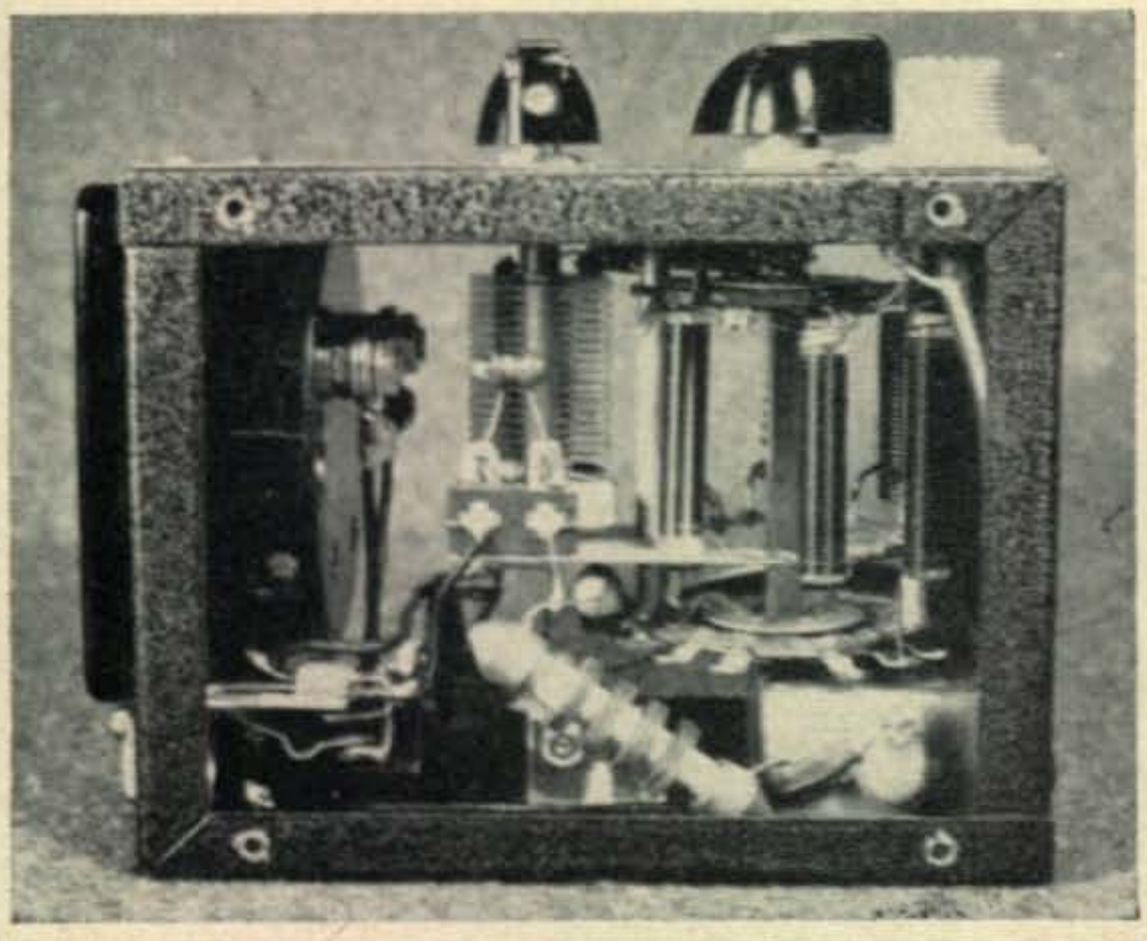
prevent shorts. Four inches from the end, remove the vinyl for about a half of an inch, baring the copper shield. Bend the end of the cable back in the form of a circle to the bared section. Wrap the protruding center conductor around the shield and solder. Solder quickly to prevent melting the polyethylene insulation of the coax. Protect the joint with *Duco* Household Cement or Scotch electrical tape. Install a standard coaxial fitting on the other end of the cable.

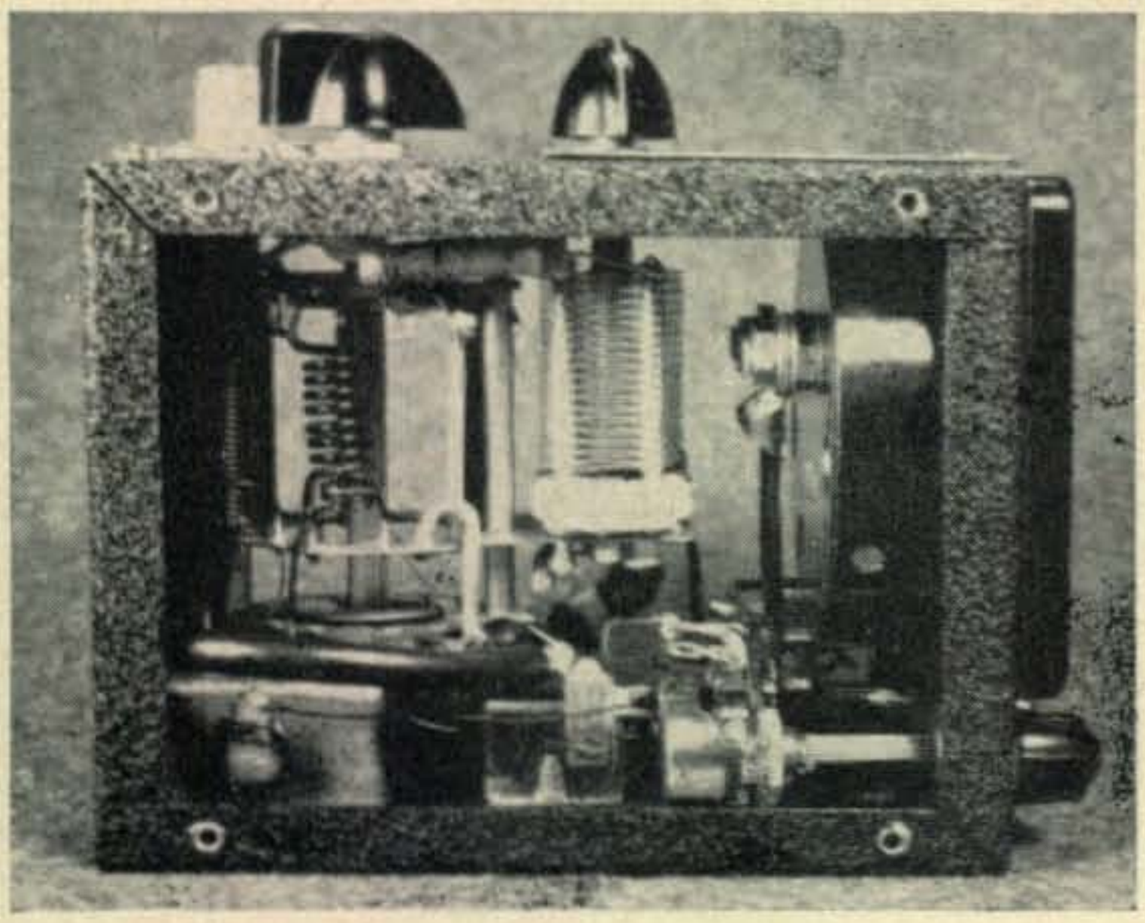
Calibration

I used a standard signal generator for frequency calibration, with an external 50-μa.

meter for a reasonance indicator. A calibrated grid-dip oscillator may also be used.

To calibrate the meter for measuring modulation percentage, a transmitter capable of 100-





Left- and right-hand views. Placements of the components may be easily spotted from these photographs. The potentiometer, R2, is mounted away from the front panel on an angle bracket to provide clearance for the meter. Also note the construction of the link for the highest frequency range. All coils are grounded to the copper ring.

per cent, sine-wave modulation and a cathode-ray oscilloscope or other means of indicating 100 per cent modulation is required. The 400-cycle signal from a standard service oscillator may be used as the sine-wave signal source.

The process is quite simple. Place the instrument near the dummy antenna of the modulated stage. Snap toggle switch to *a.f.* position, and resonate *C2*. Vary spacing between instrument and dummy antenna until *M1* shows full-scale deflection. Now with the maximum resistance of *R2* in the circuit, snap the switch to the *r.f.* position. Decrease resistance of *R2* until the deflection of *M1* is again full scale. Mark this setting of *R2*.

(from page 67)

To check modulation percentage, set *R2* to the marked point. Put toggle switch in *r.f.* position. Adjust tuning and coupling between instrument and transmitter for full-scale deflection of *M1*. Snap switch to *a.f.* position and modulate the transmitter.

Full-scale deflection of *M1* with sustained sine-wave modulation will indicate 100 per cent modulation, half-scale deflection, fifty per cent modulation, etc. With voice modulation, a peak deflection of seventy per cent indicates 100 per cent modulation. The potential uses of this meter appear to be numerous, and as you become more familiar with its use, you'll probably regard it as an indispensable part of your shack, and one that you could hardly get along without.

BREAK-IN KEYING

(from page 21)

R8 at minimum resistance, keying is hard—just on the verge of clicks. Then advancing *R8* produces softer and softer keying.

The length of time that the oscillator remains energized and the receiver silenced after the key is released is adjusted by means of *R5* from practically zero delay up to several seconds, as desired.†

† When the key is first pressed after a standby period, **C10**, across the coil of **Ry1**, must charge up through **R6**, which may "chop off" the first dot or dash. This tendency will be much reduced by connecting a large capacity condenser between the junction of **R6** and **Ry1**, and ground. Alternately, the relay coil may be connected directly to the 150-volt power source, eliminating the series resistor entirely—**Editor.**

BIAS-SHIFT MODULATOR

(from page 68)

the tube, and it would do no harm to cool the envelope of the tube with a small fan during transmissions.

General Conclusions

The operation of the modulator has been generally satisfactory and unspectacular. It does a fine job of modulating a kilowatt input, and seems to be undisturbed by different brands or designs of 304TL's that have been tested. Occasionally a 304TL will be found that will have a "hot spot" on the plate during operation, but aside from the odd appearance of the tube, it works as well as more perfect tubes. It is very interesting to hear the reactions of various Hams when they find out that a single 304TL is being used to modulate a kilowatt rig!

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DELUXE QSLs. Petty, W2HAZ, Box 27, Trenton, New Jersey. Samples 10c.

QSLs??? Samples 10c. Sackers. W8DED, Holland, Mich.

QSLs, Taprint, Union, Massachusetts.

QSL cards, hundred $1.75. Free Samples. Fitzsimmons Printing Company, 208 West Elk, Elizabethton, Tenn.

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Test Equipment:

TEST EQUIPMENT repaired and calibrated by factory staff. All makes. Hickok, Simpson, Triplett, Heath, etc. Prompt service. Douglas Instrument Laboratory, Norfolk Ave. & Shetland, Boston 19, Mass.

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PORT ARTHUR COLLEGE, Port Arthur, Texas, provides training in radio, radar & television necessary to pass FCC exams for phone and tel. licenses. 12-14 months. Start any level, low tuition with board & room at cost in dorm. Advanced students on-the-job KPAC (5000-watt station) training. Approved for Veterans. Write "Registrar" for catalog and info. New courses start every 5 weeks.

Personals:

PENFRIEND wanted by prospective Ham in Australia. Age 16. Interested in DX, swimming and American ways and ideas. Box BN, CQ Magazine.

I WOULD APPRECIATE your bringing this message of friendship to the attention of your readers. I am an Argentine radio technician and amateur, 34 yrs. old, and would like to exchange letters with colleagues in the U.S.A. I speak & write English, Spanish, French and Italian. I have a radio shop and am greatly interested in radio, electricity and TV. Joe Ma Francisco, 970 Mitre St., Canuelas, F.C.N.G.R., Province of Buenos Aires, Argentina.

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For Sale:

SELL: Elmac A54H transmitter with 40 meters and Morrow 3BR converter, both like new $145.00. VHF152A like new $50.00. W4TVN, 1487 Ponce de Leon, N.E., Atlanta, Georgia.

XYL OBJECTS—Like new SX71 $150; SX28 $125; BC221 with calibration book and power supply $95; BC474A $50; BC696 $20; power supply 1500 volt 1 amp. $85. M. D. Welch, 2640-50th S.W., Seattle 6, Washington.

SELL—Collins 32V3 transmitter like new, 35C-2 TVI filter, spare new 4D32 tube, 2 B&W Balun coils with antenna relay. Complete for $698. FOB Tacoma, W7JGN, 1524 Fawcett Avenue, Tacoma, Washington.

HALLICRAFTERS S-37 UHF AM/FM 125-210 Mc. $119.95; S-76 less speaker, $149.95; Hammarlund Comet-Pro $39.95; Mallard 20-meter converter $19.95; National 1-10 $19.95; HFS $110; NC-81X $49.95; NC-100X with speaker $79.95; RCA ARC-175 $75; RME-70 with speaker $89.95; Sonar MR-3 $39.95; Deltronic CD-144 $134.95; Harvey-Wells TBS-50D $99.95; Millen 90810 with tubes and coils for 2-6-10 $95; Sonar CFC $39.95; many other used, re-conditioned items available. Write for latest list to W1BFT, Evans Radio, Concord, New Hampshire.

JOHNSON VIKING II new July 1953, VFO, low-pass filter, Hallicrafters SX71 & speaker, DB22A preselector, JT-30 mike, Balun coils mounted, 3 relays, 40 & 80 meter dipoles, 1000 ft. new copperweld #14, other wire. New cost about $800. How much am I offered? Dr. C. J. Mahowald, WØNGO, Parshall, North Dakota.

PUT YOUR CW rig on phone with Sonar XE10 exciter $12.50. Supreme model 385 tube tester, analyzer $45. Riders Manuals Vol. 7-9-11-12-13-14. Gernsback 1 to 5—$49. A battery eliminator $6. Rola speakers 8" $2. Wanted: B & W "Band Hoppers"; Radio Handbook, late edition. Ed Tischler, 56 Carey Avenue, Wilkes-Barre, Pa.

REAL BARGAINS: New and reconditioned Collins, Hallicrafters, National, Hammarlund, Johnson, Elmac, Gonset, Morrow, Babcock, RME, Millen, Lysco, Meissner, others. Reconditioned S-38 $29; S-40A $69; S-40B $79; S-76 $129; SX-71 $169; SX-28A $159; SX-42 $179; NC-125 $129; NC-173 $149; NC-183 $199; NC-183D $299; HRO-50T1 $299; HRO-60 $399; VHF-152A $39; HF 10-20 $39; TBS-50D $99; Meissner EX $59; HQ-129X, 75A-1, 75A-2, 32V-1, 32V-2, Viking I, Viking II, many others. Shipped on trial. Easy terms. Write for free list and details. Satisfaction guaranteed. Henry Radio, Butler, Mo.

FOR SALE: Motorola P-69 receiver $12. T-17 push-to-talk carbon mike $3. Model 524 Aircraft receiver 200-400 kc. with tubes $6.50. Hallicrafters SX-23 receiver in good shape $65. Assorted Command parts $5. Frank Shopen, 4466 Bedford, Omaha, Nebraska.

TELEVISION SET suitable for monitor cheap. Want Multiphase or Eldico SSB Exciter. W4API, 1420 South Randolph, Arlington, Virginia.

NOVICE 25-watt transmitter kit, $19.95. Includes punched chassis, tubes, coil, 80-meter crystal, simple instructions. Shipping weight 6 lbs. Details free. Hart Industries, 467 Park, Birmingham, Michigan.

SELL: BC348-N, RME 10-20, converter $110. WØATP, 9312 East Gregory, Hickman Mills, Missouri.

SELL: Boehme automatic perforated tape keyer for Morse code, $95; Boehme ink recorder $125; 21A midget tape printer $45; #12 page printer with keyboard $150; 7-B tape transmitter $25; AR-88-D receiver $325; #241 Dumont Scope $245; APR-5A $145; APA-10 $125; SCR-511 Horsie Talkie, pair $49; NC-125 $145. Want: Collins 310, 32V, 75A, tech manuals, supply catalogs, test equipment. Will trade. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass., RIchmond 2-0916.

For Sale:

FOR SALE: Complete 1 kw. transmitter, built to commercial standards in closed rack. Remote Collins 310B-1 drives PP813's. Coils for 80, 20 and 10. D104 mike, self-contained speech amplifier and self-contained PP805's modulator. Best cash offer as unit. W9DGM, 1636 South Biltmore St., Indianapolis, Indiana.

COMPLETE VAARO-loaded whip antenna with 132XC mount now operating all bands, 3400 kc. thru 50 Mc. Excellent $25 complete. J. E. Howell, W4SOD, Lumberton, North Carolina.

BARGAINS: EXTRA SPECIAL: Gonset 10-11 converter $19.95; DM-36 10-meter converter $19.50; VHF-152 $49; HF-10-20 $59; S-40A $75; RME-45 $99; RME 2-11 $99.50; HRO Senior $99; SX-43 $129; S-76 $149; SX-71 $169; SX-42 $189; HRO-50 $275; 75A1 $275; 90800 exciter $22.50; HT-17 $32.50; EX Shifter $69; Globe Trotter or Globe Scout $69.50; TBS-50D $99; HT-9 $199; Globe King $295. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

SELL: Eldico TR-75TV $35; Hallicrafters S-38B $25. Peter Schwarzkopf, 25 Minetta Lane, New York 12, N.Y.

SELL or SWAP: Cleaning house. Have BC453 (Q5-er), BC696, BC454, SCR522, BC625 (2-meter receiver), transmitting and receiving tubes, transformers, etc. Want "Matchbox," tape recorder. Send for list. Paul Atwell, W8JVJ, 535 Capistrano, Toledo 12, Ohio.

SURPLUS UTC PA429 transformer, 600-525-0-525-600 volts 250 ma., 5V 3A, 6.3 VCT 3A, 7.5 VCT 3A tapped at 6.3 VCT 4A $6.75 each. 3x5 μfd. 400-volt oil-filled condensers $ .65 each. Have 4 brand new RCA 4E27/8001 tubes. Will sacrifice for $12.00 each. Express only, no COD's. Jack Hardwick, KRSN, Los Alamos, New Mexico.

DEVELOPMENTAL MODEL, Moniscope, appearing this issue. For Sale. $79.50. FOB New York City. Write Box OC, CQ Magazine.

420 CRYSTAL CONTROL converter. 6AJ4 tuned line RF, 6AM4 grounded grid mixer, 2-6J6 oscillator & multiplier. 16CB6 IF amplifier. Chassis is completely copper plated. IF frequency 11 to 15 Mc. Tunes 432-436 Mc. Coaxial input & output. Price $49.95 plus parcel post. Also 420 tripler amplifiers using AX9903 with ½ wave lines, $47.50. Palisade Electronic Co., 1025 Palisade Ave., Palisade, N. J.

COLLINS 32V-3 transmitter, nearly new, excellent condition, must sacrifice, $590. Write Box HP, CQ Magazine.

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WANTED: Sockets for 4-400A. Also H-P 206A oscillator. W4SOD Lumberton, North Carolina.

Wanted: COLLINS KW or KW1 in good working condition for cash, or trade for part payment—20 meter KW rig using all standard components and standard relay rack. Stephen Popp, c/o WIL, St. Louis 8, Missouri.

WANTED: Any or all issues Proceedings of the I.R.E.: RCA Review, RSGB Bulletin, & Wireless World, from Jan. '47 to date. State condition and price. T. M. Dale, Portsmouth, New Hampshire.

WANTED: SX-71, HQ129-X, S-40, etc., ART-13, TCS, BC348. Farr Electronics, Box 273, Lexington 73, Mass.

URGENTLY NEEDED: Pay cash for schematic, control head and plugs for BC373-A compass receiver. Allen Flitcraft, 78 Solon Road, Chagrin Falls, Ohio.

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WE NEED USED RECEIVERS: We give highest allowances for S-20R; S-40A, B; NC-57; NC-100; NC-125; SX-24; SX-25; HQ129-X, and similar receivers. World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

Want to buy NOVICE CRYSTALS for 80 and 40 meter bands ft 243 holders. Please state price and frequency. Stewart, Box 3784, Park Place, Greenville, South Carolina.

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WANTED: RTA-1B, APQ-13, ART-13, DY-17, CU-25, BC348-R, BC312, BC342, teletype, BC221, LM, ARC-1, keyboard perforator for CW or teletype, 32V, 75A, 310 exciter, technical manuals, catalogs, tubes, test equipment. Any electronic equipment traded for new Johnson Viking, Hammarlund, Elmac, Harvey-Wells, Gonset, National, Hallicrafters, etc. ALLTRONICS, Box 19, Boston 1, Mass. RIchmond 2-0048, 2-0916.

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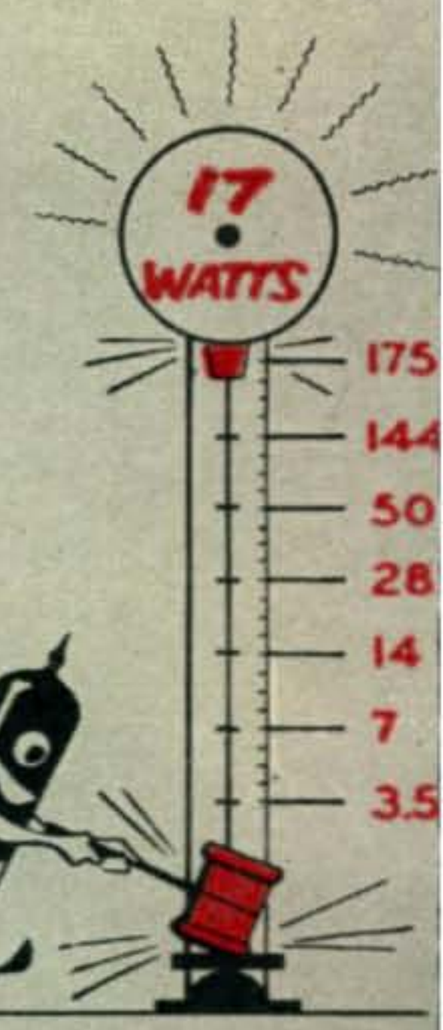

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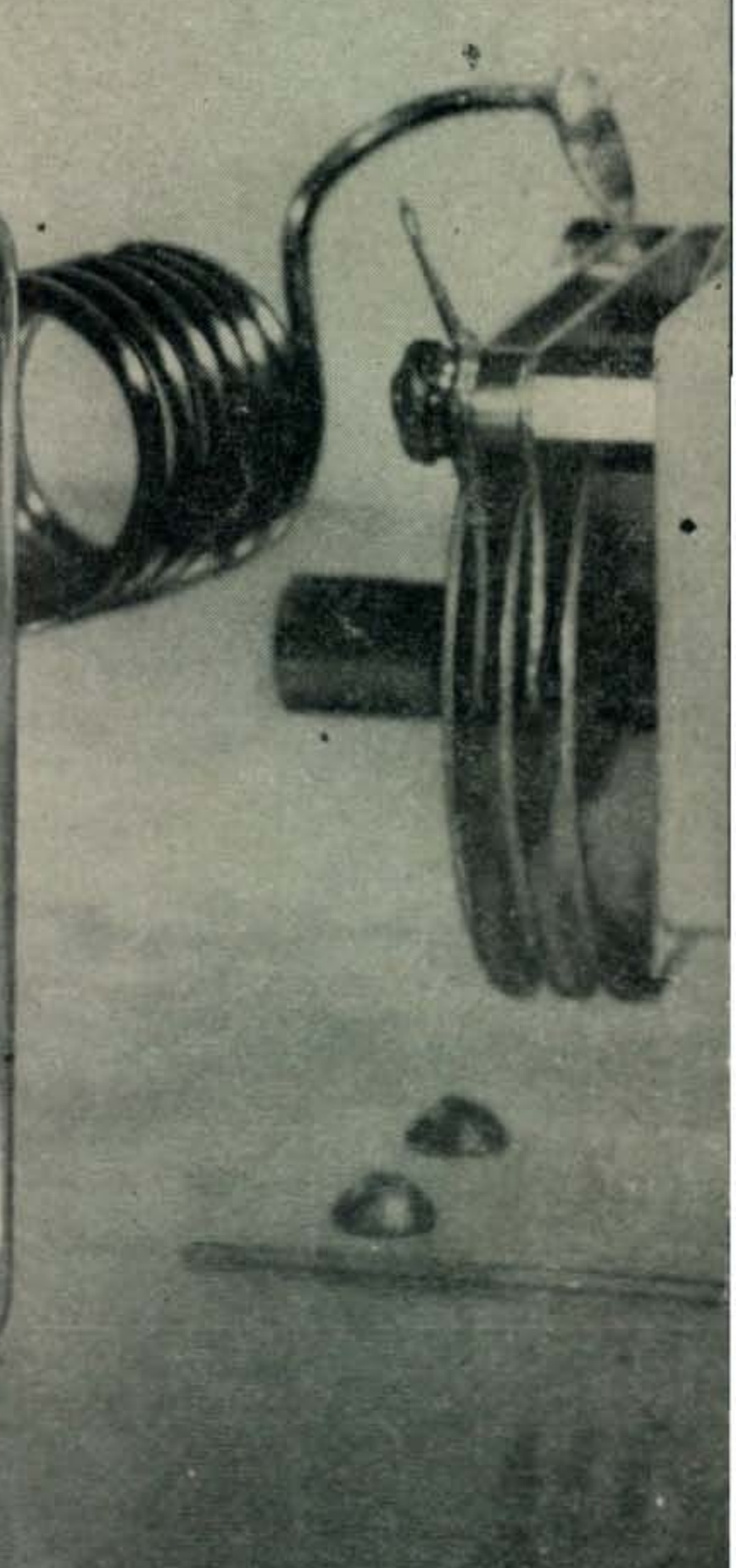

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