CQ

RADIO AMATEURS' JOURNAL

JUNE
1952

35c

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CQ RADIO AMATEURS' JOURNAL

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FEATURE ARTICLES

Departments

Miscellaneous

Feenix, Ariz.

Deer Hon. Ed:

DX conditions are really in dulldrums rescently, as you are undoubtless knowing if you getting printers ink off your fingers and turning on receiver. In fackly, it getting so bad that when calling "seek-you please megacackles 28" are lucky if even getting TVI. Scratchi are thinking about this sad state of affares and he deciding that sumthing must be done. After all, it big shame to wasting my geenyus on little problems when can helping DX men with big problem like this.

I are getting Hon. Brain in action, and have hardly shifted from first into second gear when getting big flash. Many years ago I getting 1/c idea about this problem, but never having chance to prove same. Maybe you are remembering it. You see, Hon. Ed., my idea are based on theery that reason many of the ultra-high freakancy signals do not getting bend back to earth from heavy-side layer are acct. because they having too much powder and are hitting it too hard. This making signals bore hole right through layer and out into space and nowhere places.

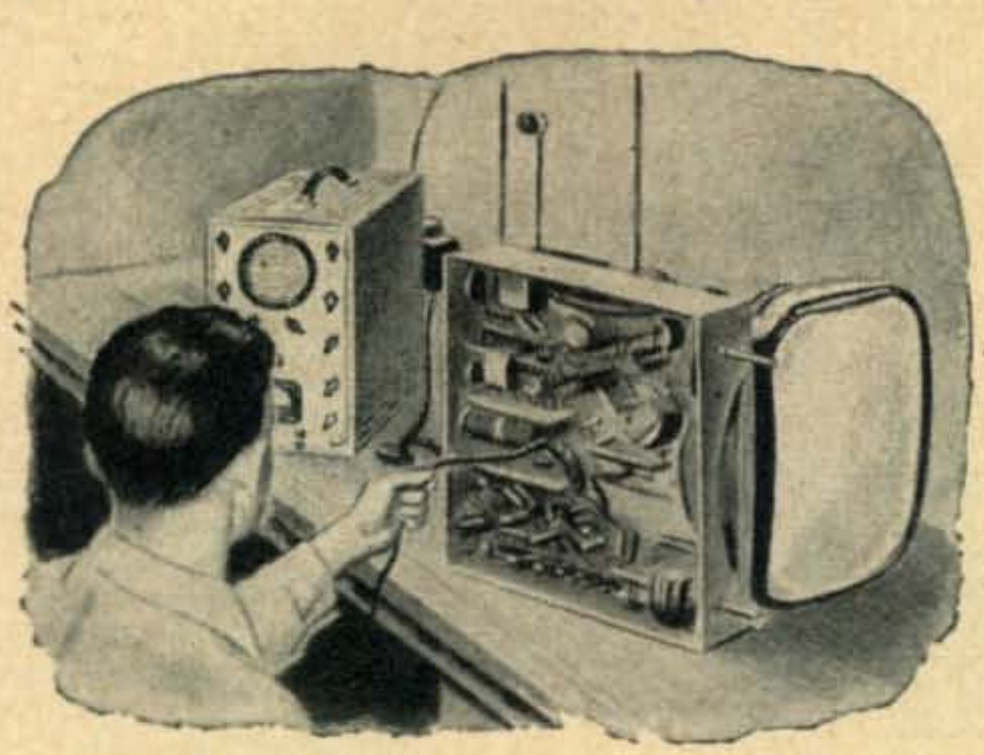
The books say that at 28 megacackles the wave will not return to earth if it hit heavy-side layer at too steep an angles, on acct. it will going right on through. Ah ha, Hon. Ed., that are proof, are you not thinking? (Hon. Ed., please getting your feet off the desk and paying attention, as this are hots stuff). So, all Scratchi having to do is sending out reel low powder signal, and it not having strength enuf to going through. In fack, by sending out signal so week it could not having enuf powder to penetrating hot butter, it would bouncing off heavy-side layer like rubber ball.

At this point I real enthused about idea, so running into shack and digging auto-transformer out of junk pile, which I are then wiring in a.c. line which feeding powder to kilowhat final. I turning on rest of rig, and turning knob on auto-transformer full way on. Next are calling short for-minute seek-you, and hooking sum guy in Oklahoma. Scratchi are asking him if he willing to take time to make test, and he saying FB, so off I went. I turning knob back slitely, calling him again, and he saying I'm louder. Doing same again, cranking knob back, and getting still better report. Hot Diggeditys, Hon. Ed., Scratchi's Splashy Sistem are working! I finally cranking knob all the way back, and getting S-9 plussedy-plus report.

Scratchi are then signing off, leaning back on orange crate chair, and pouring another round of cacktus jooce. You knowing, this idea are having

(Continued on page 68)

Here's your Opportunity



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Broad Band . . .

Editor CQ:

This is a reply to the letter of the Egyptian Radio Club appearing in May CQ relative to the use of 29.640 as a national calling and emergency frequency. It is somewhat difficult to interpret this letter due to the resolution appearing at the end in which all emergency corps are urged to contact their directors and insist that ARRL discontinue proposal of 29.640 as a national calling frequency **only.** This resolution is defective in that there is no proposal to be discontinued. Furthermore, there never has been a proposal to use 29.640 for a calling frequency **only.** Two years ago there was a proposal (and certainly not exclusively by ARRL—see 1950 CQ's), to adopt 29.640 as a national calling **and** emergency frequency. This proposal was adopted in October 1950 and since then has been established fact, not a proposal.

The resolution calls for emergency corps to continue present use of this frequency as a local net operating frequency. This is going to be quite difficult to accomplish as very few "corps" use 29.640 as a local net operating frequency. Something which doesn't exist can hardly be continued. The local net operating (rag-chew) frequency of almost all nets is **not** 29.640 kc, but an adjacent frequency, leaving 29.640 free as a calling and emergency channel.

The resolution thus calls for discontinuance of a proposal which doesn't exist and urges universal continuance of a practice which very few follow.

Since the adoption in October 1950 of 29.640 as a national calling and emergency frequency, clubs throughout the country have adopted this frequency for this exact specific use. Auto Calls (strictly a calling device) and squelch receivers have been spotted on 29.640. Some squelch receivers are located at non-amateur locations—police stations, BC stations, etc., where a 24 hour watch is maintained. These units are used strictly for calling purposes when no emergency exists. Once the contact has been established, the stations QSY to an adjacent frequency thus leaving the calling system available for other users. Now obviously, during skip periods, rag-chewing modulation on 29.640 will immobilize the Auto Calls and open the squelch receivers making them ineffective for use as a calling device.

As nearly as can be determined from its letter, the Egyptian Radio Club wishes to employ only one frequency, 29.640 for everything—calling, emergency and rag-chewing and further wishes everyone else in the nation to do likewise, then when short skip opens, 29.640 becomes useless for any purpose. Contrast this concept with the actual use in at least 25 cities where 29.640 is kept clear of rag-chewing and the frequency continuously guarded. A local "emergency" receives **instant** attention (it's not necessary to try to break into a rag-chew QSO). During skip periods these cities do not QRM each other. Should an emergency develop the frequency is instantly available; because it's already clear. No one has to be "run off" since all rag-chewing is done on adjacent frequencies. There's nothing new about this! For years ship operators have been contacting on 500 kc, then QSYing, leaving the frequency for other calls and emergency use. Consider what would happen if 500 kc were used to transact all business.

We should not like to ignore the "have proven, beyond any doubt, that the only way" - - - - and the "so-called emergency auto-calls". "Have proven" to whom, with very few employing this practice? One would have difficulty proving the Auto Call is "so-called" to the many, many hams who have employed it to obtain assistance **immediately,** even in the wee small hours of the morning when the band was devoid of stations.

The reason many mobiles have moved off this frequency is not the one given in the letter. These mobiles have moved their rag-chewing from 29.640 because they are "playing ball" on a national scale.

The FCC has not yet issued any regulations which concern the exact frequency 29.640, therefore no one is legally required to observe any amateur agreements. There does

(Continued on page 8)

(from page 6)

exist however, a **moral** obligation to respect a gentlemen's agreement. Those using 29.640 for rag-chew purposes when skip is open are unnecessarily blocking calling systems wherever this skip lands.

Since 1950 when the use of 29.640 was established the radio amateurs have made a lot of progress in the use of 29.640 as a calling and emergency frequency. Only a few remain who have not made the necessary arrangements to fulfill the spirit of the gentlemen's agreement. Newcomers are quick to adopt the use of 29.640 strictly as a calling and emergency frequency. Let's continue this progress, and above all, let's protest at the time of a proposal, not a year and a half after the proposal has become established fact.

R. V. Anderson, W3NL

Washington, D. C.

Kind of a dirty trick, isn't it? The QTH Is Gothenburg, Nebraska, and not

Skromtsklan, Verdalomsk, Latvorskz

. . and the call is W0EKP, instead of this one we picked out at random:

PU1RU

The rest is the McCoy, however. Enjoyed a swell contact with you on . .
W3AM Date 3-7 1949 on the 20 14 MC. band.
Wkd u wid: ☐ 350 watts to pr of T-55's, Class B TZ-40s, es Sig Shifter; ☑ BC-610 Exciter Deck, 100 watts (if ant was loading up); or ☐ Guthman Powerful Little 5-Watter. Rcvr: RME 45 with Howe Pre., es BC 454.
Pse QSL. Tnx. 73 & 88. Don Holmes.

re "PU Expedition"

Editor, CQ:

I have just read the story in your April issue by WØTKX, and note that he states a lot of things about PU that he apparently didn't get right at all. Some three years ago I worked a station in that country and have the card to prove it. I was afraid you wouldn't believe me so I am enclosing it under this cover. I had thought it was just another card from another country, and paid it no particular attention.

Warren M. Andrew, W3AM

Washington, D. C.

W4GHL W4RIZ

Southern Chess Net

Editor, CQ:

W4GHL and I are forming the "Southern Chess Net." The photos show W4GHL and W4RIZ during a radio match on 75-meter fone. We are now both playing and exchanging ideas. Incidentally, we use the word "Southern" as a challenge to players/hams above the Mason-Dixon Line.

W4GHL runs around 300 watts and W4RIZ about 150 watts. We would be very interested in new members for the net. Prospective members should write to me at Box 177, Smithfield, N. C.

John S. Townsend, W4RIZ

Smithfield, N. C.

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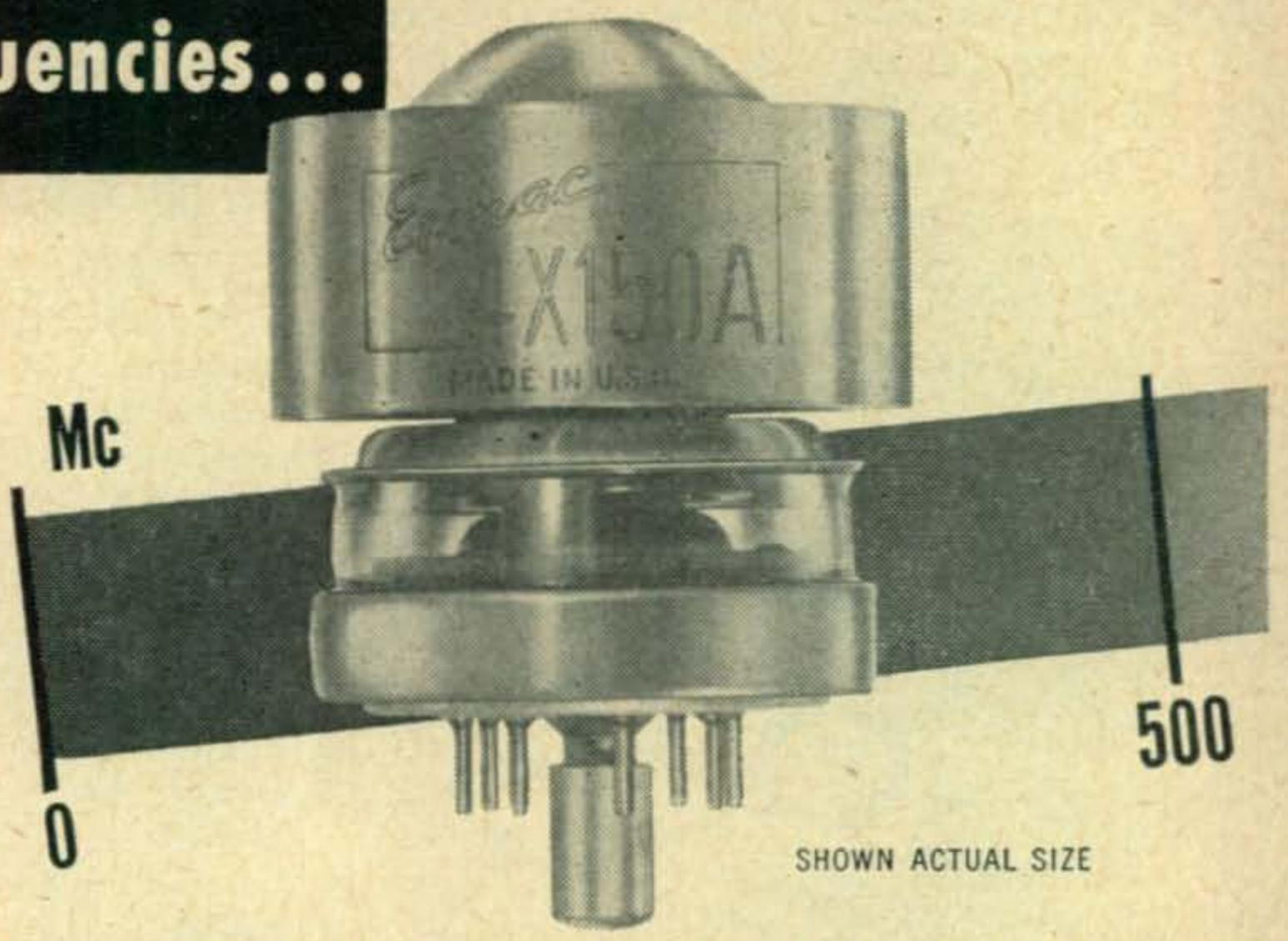
with EIMAC 4X150A!



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Requiring simple forced-air cooling, this general purpose beam tetrode has an oxide coated cathode and external anode. Wide application of the 4X150A in ground and airborne communications, video amplifiers, TV sound amplifiers, FM and TV r-f amplifiers, and STL and dielectric heating service is firm evidence of its outstanding dependability and performance.

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TYPICAL OPERATION

Radio Frequency Power Amplifier or Oscillator Class-C Telegraphy or FM Telephony

D-C Plate Voltage	1000 volts
D-C Plate Current	200 ma.
D-C Screen Voltage	250 volts
D-C Screen Current	30 ma.
D-C Grid Current	10 ma.
Driving Power (approx.)	1 watt*
Power Input	200 watts
Power Output	150 watts*
Heater Voltage	6 volts

*At 165 mc.
(Power output at 500 mc. 120 watts)

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"A Report to Amateurs"

At the regular weekly meeting of the Federal Communications Commission on 17 April 1952, the Commission considered and took action on four matters of high interest to radio amateurs.

You will find the essential parts of each FCC release set forth below. In addition, some historical and political background leading to this particular FCC action is discussed.

CQ urges each and every amateur to read this material carefully as it pertains to everyone. Amateur radio will be judged upon its individual and collective reaction to these situations which are not wholly the amateur's making, but which at the same time are a part of the present-day amateur radio political picture. —Editor.

Terse Summary

40 meter phone	7.2	to	7.3 mc
(open to General and Conditional Classes.)			
40 meter NOVICE	7.175	to	7.2 mc
10 meter FSK	7.0	to	7.2 mc
80 meter FSK	3.5	to	3.8 mc
20 meter FSK	14.0	to	14.2 mc
	14.3	to	14.35 mc
75 and 20 phone			
to be open to General, Conditional Classes			
FSK Standards Proposed			
New "Station Identification" Proposals			
ARRL Denied Two Untimely Petitions			

Docket 10073—FCC Release 52-323 (74327)

This action by the FCC denied the ARRL request for a delay in these proceedings (see *QST*, Feb., '52) mainly because the ARRL still has full opportunity to participate. Obviously, the ARRL has lost nothing through their delaying tactics, but the opportunity to join in the informal comment or ground-floor stage. This, as a matter of U.S. law, must be followed by the formal, proposed rule making stage that is now initiated. Since the ARRL asked for delay in filing comment until June 2, 1952, and since FCC has set July 1, 1952, as the closing date for comment on the proposed rules by interested parties, ARRL still has opportunity to act.

Says the FCC release in part: "It appearing, that a considerable number of comments was received from individual amateurs, amateur groups, and amateur clubs, and that on the basis of such comments a *Further Notice of Proposed Rule Making* is herewith issued in which specific amendments . . . are proposed . . . and in which a period of comment ending July 1, 1952, is provided; it further appearing, that, in view of the aforementioned *Further Notice of Proposed Rule Making*, in which the American Radio Relay League will be afforded full opportunity to submit comments within the time specified in its request for extension, to extend the time for receipt of comments relating to the preliminary issues in this matter as set forth in the original *Notice of Rule Making Proceedings* would delay, unnecessarily, the promulgation of essential rules; IT, THEREFORE, IS ORDERED, that the petition (of the ARRL) . . . IS HEREBY DENIED."

Docket 10073—FCC Release 52-324 (74328)

This release is a *Proposed Rule Making* which includes most of the new rules indicated in the "Terse Summary" box. These are specific proposals based on FCC study of the considerable comment received in response to their request of October 31, 1951. Further, FCC now asks comment by interested parties not later than July 1, 1952. Not only is FCC asking comment for or against the specific proposals, they are making it easy by indicating that they will accept and fully considered the statements issued by individuals as well as clubs. Such comment should be addressed to the Federal Communications Commission, Washington, D.C., and it should be marked at the beginning "Docket 10073." Finally, FCC states if any comments are received which appear to warrant the Commission holding an oral argument before final action is taken, interested parties will be notified.

Now, here is the dope, briefed for easier reading:

a. 40 meter phone. Proposes A-3 and narrow band frequency or phase modulation in sub-band 7200 to 7300 kc and available to all classes of licensees except Novice and Technician (i.e. Conditional, General, Advanced and Extra).

b. 40 meter Novice. Proposes to permit Novice Class operators A-1 in the sub-band 7175 to 7200 kc. No change in other Novice privileges. (Some early comment in Washington ham circles indicates definite feeling in favor of a 50 kc Novice allocation

on 40. Reason given is that the rugged QRM in the 50 kc wide 80 meter Novice band will undoubtedly be repeated in worse form on 40. Opinion was also expressed that the possible problem of Canadian phone in the Novice region could be minimized by moving the Novices 25 kc or so away from the end of the proposed U.S. 7-mc phone band.)

c. 80-40-20 meter FSK. Proposes to permit all classes of amateur licensees (except Novice and Technician) to employ type F-1 emission as follows:

3500—3800 kc
7000—7200 kc
14000—14200 kc
14300—14350 kc

(in other words, teletypewriter "jingle-bells" in all U.S. exclusively CW parts of 80, 40 and 20.)

d. FSK Standards. Proposed radio teleprinter standards. FCC tells *CQ* Magazine that these standards are perhaps more restrictive than many amateurs might desire, but are necessary in order that FCC monitoring stations can easily copy ham teleprinter signals. The intention is, of course, to avoid permitting what would amount to a "secret" form of communications within our ham bands.

Standards proposed are: Single channel, five unit (start-stop) code corresponding to *International Telegraphic Alphabet No. 2;* keying speed adjusted to 60 wpm (within range 55-65 wpm); deviation for FSK (F-1) 850 cycles (within range 800-900 cps); for audio FSK (A-2 or F-2), highest audio frequency not to exceed 3000 cycles with difference between mark and space adjusted to 850 cycles (within 800-900 cps).

e. Station Identification Proposals. In a complex and confusing write-up, *Section 12.82 (a)* of the present rules is to be changed. FCC claims the intent was to simplify and clarify this section as well as to make a couple of changes. A Philadelphia lawyer would have difficulty in interpreting the results in simple and general terms. The entire affair of *Section 12.82 (a)* is printed below in case you desire to suggest alternative language to FCC! But first, we comment on the changes.

Sub-paragraph (2) (i) could be onerous. In effect, it requires transmitting your call sign at least every 30 seconds while calling another station, while CQ'ing, tuning up the transmitter or a beam with an on-the-air signal, etc. (Perhaps—only perhaps—this will end long-winded CQs with no sign until the end!)

Sub-paragraph (3) means that an amateur using any technique OTHER THAN telegraphy or telephony will have to send his call sign by such method and, in addition, he must also send the same information by A-1, A-2 or A-3 as is convenient and appropriate for the frequency in use. In other words, FSK stations must sign by teletype and also sign using CW or phone on each call-up, end of transmission, etc. It is understood that this is once more a requirement of the FCC monitoring stations who need to identify "who-is-who" easily (sounds handy for non-FSK hams).

Here is the proposed replacement *Section 12.82 (a)* for your study and comment:

(a) All transmissions of an amateur station shall be identified by the transmission, by the properly authorized operator thereof, of the call sign assigned that station and the call sign(s) of the station(s), if any, with which communication is in progress or is being attempted, in accordance with the following minimum specifications:

(1) Each station which is actually engaged in an exchange of signals or other communications with some other station or stations shall transmit the required identification, as follows:

(i) At the beginning and at the conclusion of the series of transmissions constituting that exchange except that, if the entire duration of such exchange is less than three minutes, the identification need not be repeated at the conclusion of the exchange.

(ii) At the conclusion of any single transmission which exceeds three minutes' duration during such exchange, unless the identification has already been given during that transmission.

(iii) At intervals not exceeding ten minutes during the series of transmissions constituting that exchange except that, if the station is not transmitting when such identification becomes due, the identification shall be transmitted at the beginning of the first succeeding transmission by that station.

(2) Each station which is not actually engaged in an exchange of signals or other communications with any other station or stations shall transmit the required identification during its other transmissions in accordance with the following schedule:

(i) At intervals not exceeding one-half minute during all transmissions which are for the purpose of establishing communication with any other station or stations, or for the purpose of testing, adjusting or calibrating transmitting, receiving or other equipment, including transmissions for the purpose of determining signal strength, operating frequency, or other characteristics of the transmitted or received signal.

(ii) At the beginning, at the conclusion, and at intervals not exceeding ten minutes during the transmission of other authorized one-way signals or communications: including but not limited to signals for the control by radio of remote objects or equipment, general messages containing amateur information bulletins or code practice transmissions, etc.

(3) The required identification shall be transmitted on the frequency or frequencies being employed at the time and shall be either by telegraphy, using the International Morse Code, or by telephony, whichever may be authorized for use on such frequency or frequencies and appropriate to the type of emission being employed for the other transmissions. When a method of communication other than telephony, or telegraphy using the International Morse Code, is being used or attempted, the prescribed identification shall also be transmitted by that other method.

FCC Release 52-325 (74-330)

This action denies the ARRL petition to continue issuance of Advanced Class Operator licenses on the grounds that all issues presented in ARRL's petition were considered fully in the formal rule making proceedings of *Docket 9295* (which created Novice, Technician, Extra Class, etc. in 1951). While FCC doesn't say so, the following statements which are found in the *Docket 9295* final decision probably have direct bearing: "Objection . . . was directed for the most part to the requirement of a code speed of 20 wpm . . . on the grounds that this requirement would preclude many amateurs (from

phone privileges) . . . . Inasmuch as amateur radio activity contemplates many phases of the radio are in addition to radio telephony, it is desired that the holder of the highest grade of license shall be well qualified in more than one of its phases. . . . Comments received . . . . seem to indicate that a schism now exists among the ranks of the amateurs in regard to amateurs who are proficient in (phone and CW) operation. It is not the purpose of these rules to widen this breach in the ranks of the amateur but rather to cement together the various techniques employed in amateur radio into one license to symbolize a radio man who is highly proficient in all amateur phases of the radio art (speaking of the Extra Class license). It further appears that the type of emission or technique used in the operation of the amateur station would be an illogical dividing line between the various classes of operator licenses because of the almost limitless types of emission or techniques possible to the amateur."

Docket 10173— FCC Release 52-326 (74331)

It is proposed to permit all authorized amateur privileges to General and Conditional Class licensees. In effect, this will permit them to operate on the 75 and 20 meter phone subbands. It does not change Extra and Advanced Class privileges in the sense that they already enjoy "all authorized amateur privileges."

Says FCC: "The proposed amendments are (to eliminate) the necessity for new applicants after December 31, 1952, who desire (75 and 20 meter phone) privileges, to qualify for the Extra Class license as the only means by which to obtain these privileges. They are also designed to remove existing restrictions on the operation of (General and Conditional Class operators) which appears no longer necessary in view of the present state of the radio art and the general technical regulations which govern the operation of all classes of amateur stations."

Comment on *Docket 10173,* for or against, may be filed with FCC prior to July 1, 1952. It is stated that in this case original and three copies must be submitted.

Background — Docket 9295

In February 1951, all hamdon heaved a sigh of relief as the controversial *Docket 9295* was brought to a final decision. This great day was preceded by almost three years of strife within the amateur ranks. The ARRL fought with NARC and SARA on one side and, unfortunately and unsuccessfully, with FCC on the other. Individual amateur and FCC attempts to bring the three amateur groups together through compromise met with varied success, none lasting.

It was rumored that ultimately NARC and SARA horse-traded a little, including NARC agreeing to drop the 7-mc phone question if SARA would buy grandfathering Class A privileges.

It is doubtful if ARRL, holding aloof from compromise, realized this! But certainly 7-mc was known to be a touchy topic. In the meantime, poor conditions due partially to increasing foreign SW broadcasting in the upper end of 7-mc was reducing amateur accupancy.

Docket 10073

In mid 1951 the ARRL decided to re-open the 7-mc question by asking FCC to allow FSK in the 7.25 to 7.3 mc region. To the many who craved 7-mc phone and who were willing to compete there with the foreign broadcasters, this was the signal. NARC promptly followed the ARRL FSK request with a request for 100 kc of phone sub-allocation anywhere in the 7-mc band. SARA abstained. An individual California amateur, Mr. Robert H. Weitbrecht, filed a petition requesting F-1 FSK on all amateur frequencies below 27 mc.

On October 31, 1951, FCC released its informal request for comment on *Docket 10073,* entitled "Notice of Rule Making Procedures." Reply was requested not later than January 2, 1952. This request propounded seven questions concerning 7-mc sub-allocations and types of emissions. (See *CQ* Dec. '51 opp. page 52.)

Amateur Reaction

Considerable discussion was aroused in amateur circles, but nothing like the earlier furor over the original 1948 ARRL recommendations for an additional 50 kc for 75 meter phone and 16 wpm code exam for Class A which led to the Docket 9295 fight.

Monitoring of the high end of 40 in late 1951 did indeed reveal less than maximum utilization by CW amateurs and increasing interference by foreign radio-telephone and broadcast stations. Perhaps willingly or unwillingly, amateurs saw that 7-mc phone might be indicated.

Inspection of the FCC public record of comment received to date in *Docket 10073* shows general agreement that some portion of the high end of 7-mc could be opened to phone, with the most frequently suggested part being 7.2 - 7.3 mc. While opinion on FSK is not as unanimous as that on phone, it substantially indicated that: FSK should be permitted in the 7-mc band and other HF bands; should not be permitted in A-3 bands; and probably would not be a serious interference factor (in the opinion of most) because of the relatively few stations who are equipped to use it. ARRL did not submit any comment other than requesting a delay in the whole proceedings. A record of a poll taken in the ARRL West Gulf Division is noteworthy. (See *CQ* April, '52, page six).

FCC Reaction

Following a study of this same material and with the undoubted consideration of its own internal administrative problems, the problems of the military, the problems pertaining to international frequency allocation, and the State Department, etc., FCC has now released the four actions summarized earlier in this account.

FCC Final Action

The FCC is required by law to reach a final

determination as to what is best for the United States and the *Amateur Radio Service* in these proposed rule makings. Barring further comment from amateurs, that action would undoubtedly be to issue "as is" the proposed rules.

However, FCC is required by the *Administrative Procedures Act of 1946* (which binds all U.S. Government agencies) to allow opportunity for study and comment by *ALL* interested parties. FCC *MUST* consider the evidence presented to it for the record (by any interested individual or group) in arriving at a decision. And this means consideration by the Commissioners, not the staff of FCC alone.

If the problem indicates the need, the Commissioners might decide to hold an Oral Argument (done in the case of *Docket 9295*). Oral Argument is an informal hearing before a designated Commissioner or the Commissioners en bloc, with interested parties appearing as unsworn witnesses with rebuttal privileges. A Formal Hearing is the same except witnesses are sworn and have the right to examine and cross-examine. In either case qualified lawyers are handy, but not mandatory.

In any event, the FCC Commissioners must make a decision by study of the complete record. This must be on the basis of the written record, with or without oral argument, or formal hearing as is found necessary.

FCC's authority here is delegated to it by the Congress of the United States in the Communications Act of 1934. In addition, Congress requires that FCC obey the *Administrative Procedures Act of 1946* as mentioned before. It is this that makes it mandatory for the individual citizen to be heard as an interested party, if he so desires. This is not surprising under our democratic form of government. After all, we in the United States with our Constitution and its Bill of Rights, have long considered the inalienable rights of man as paramount to those of the State. This is in stark contrast to certain ideologies of today that consider the State supreme in all respects. That great leader and patriot, Abraham Lincoln, expressed for his fellow citizens through the centuries the great American heritage "Government of the People, by the People, and for the People!"

Returning to FCC, it may or may not be needless to say that the legality of its decisions can be challenged in the proper United States Courts.

The Record

Back to Dockets *10073* and *10173*. The period through July 1, 1952 is the time for comments and evidence to be submitted to FCC for the record. Whether this is done through associations, clubs, groups, or as individuals is a matter of personal choice and judgment. Whether you are in favor of, or against, items in these Dockets is also a matter of choice and judgment. As in any reasoned proceeding, well-founded and documented arguments carry more weight than simple "for or against" statements, or emotional outbursts. And, finally, if you don't voice your opinions, they cannot be considered.

Docket 10188—FCC Release 52-416 (75116)

Terse Summary

15 meter phone	21.0 to 21.1 mc and 21.35 to 21.45 mc
15 meter Novice	21.15 to 21.30 mc
15 meter FSK	21.10 to 21.35 mc

Delete use of 26.96 to 27.23 mc by Novice.

Delete possible use of 235-240 mc band.

Quadruplicate filing date August 1, 1952

On April 30th the FCC adopted a *Notice of Proposed Rule Making*. This sudden and somewhat unexpected appearance occurred only ten days before the 1952 ARRL Board of Directors meeting. Washington has, as this is being written, become a Mecca for League Directors and Officials en-route to West Hartford.

Undoubtedly many "thinking" amateurs will anxiously await the report of the 1952 Director's Meeting and hope that the ARRL will be able to regain their old position of very close cooperation with the Government. There is no question that the ARRL is a prime requisite for the furtherance and continuance of amateur radio. But, at the same time there is no question in the minds of many that the past few years have been hectic for the ARRL. It is rumored that considerable time at the meeting will be consumed by a searching self-examination and the appointment of a suitable "whipping boy." Whether or not this will solve immediate problems is debateable.

In any case, a forthright approach is particularly necessary, whether by an organization, or a single amater. The overall situation in amateur politics has changed within the past six years. It is not too late, and we hope that it shall never be too late, for the ARRL to face up to the issues at hand and act in a clearcut manner that will benefit the majority of radio amateurs.

In the paragraphs above we have presented "facts." As such they are incontrovertible. They should indicate certain weaknesses—all of them correctable, if you act now.

It's your move—make it a good one.

o.p.f.

San Mateo County Hamfest

The Amateur Radio Club of San Mateo County recently announced the date of their annual hamfest as June 1. This year the festivities will be held on the Coyote Point Picnic Grounds, at San Mateo, Calif.

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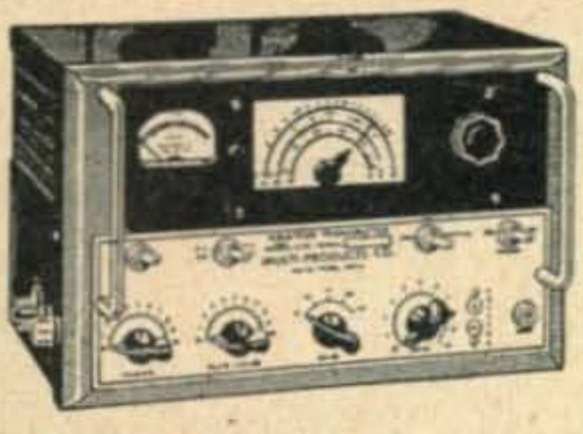

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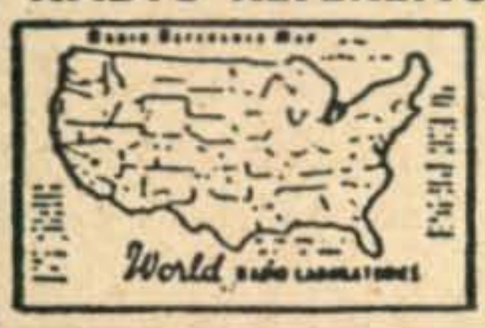

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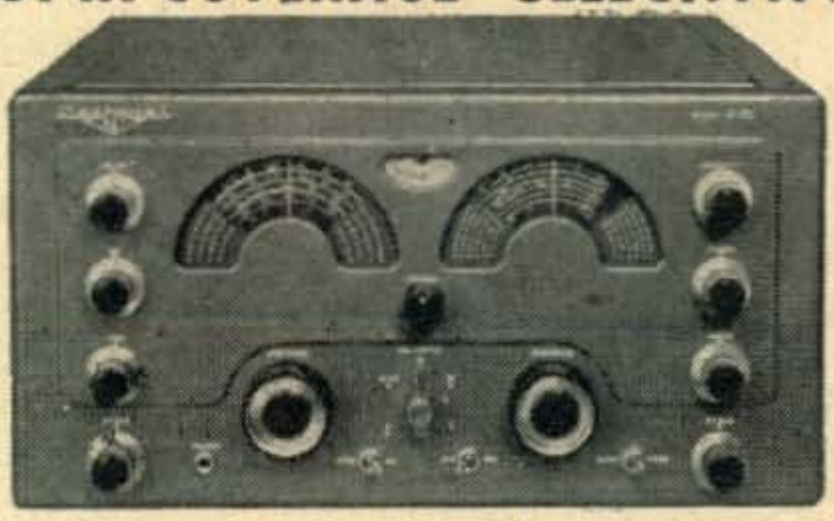

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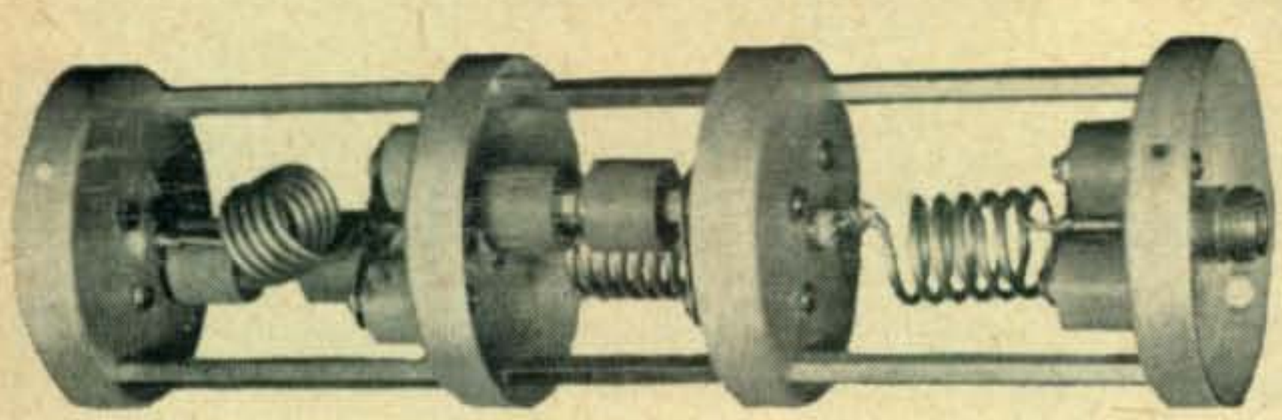

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If television antennae have sprouted in your vicinity, chances are your ham rig is subjected constantly to the suspicious glances of your televiewing friends and neighbors. Put their minds at rest by mounting a Collins 35C-2 low-pass filter on your transmitter.

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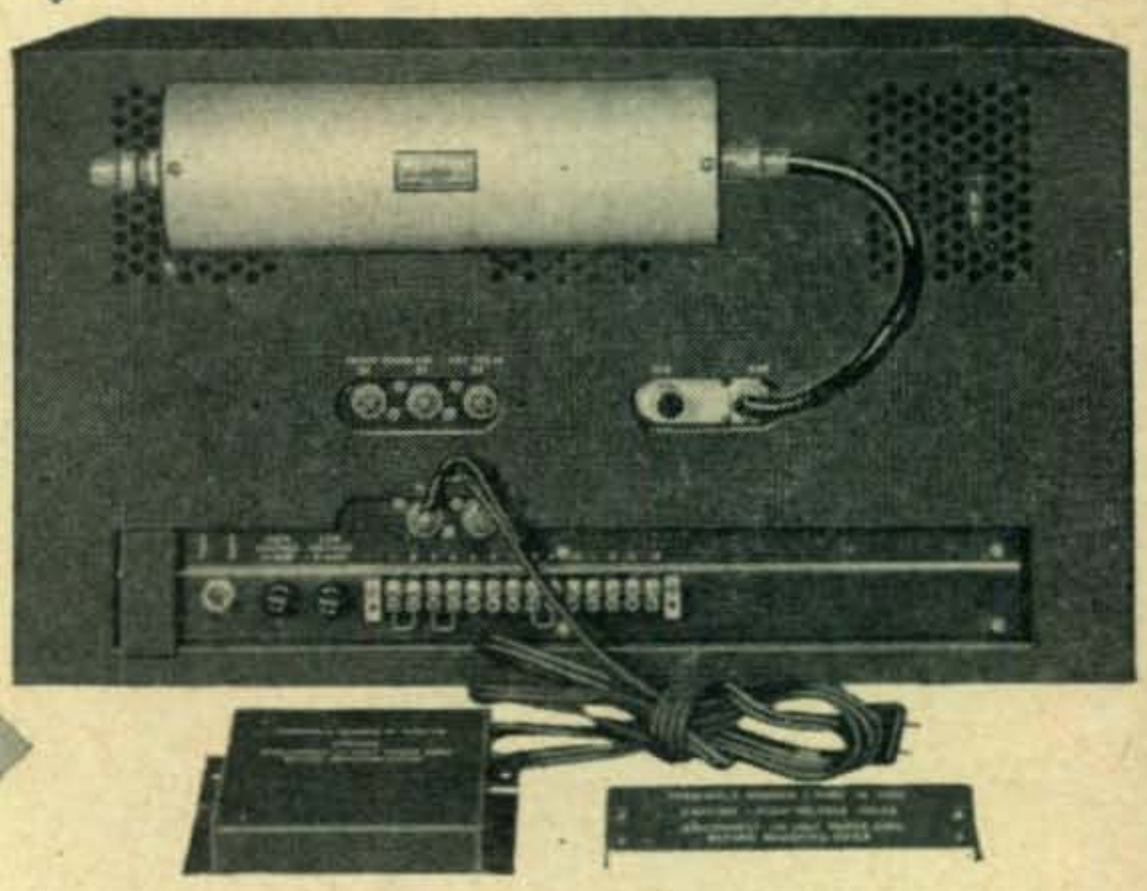
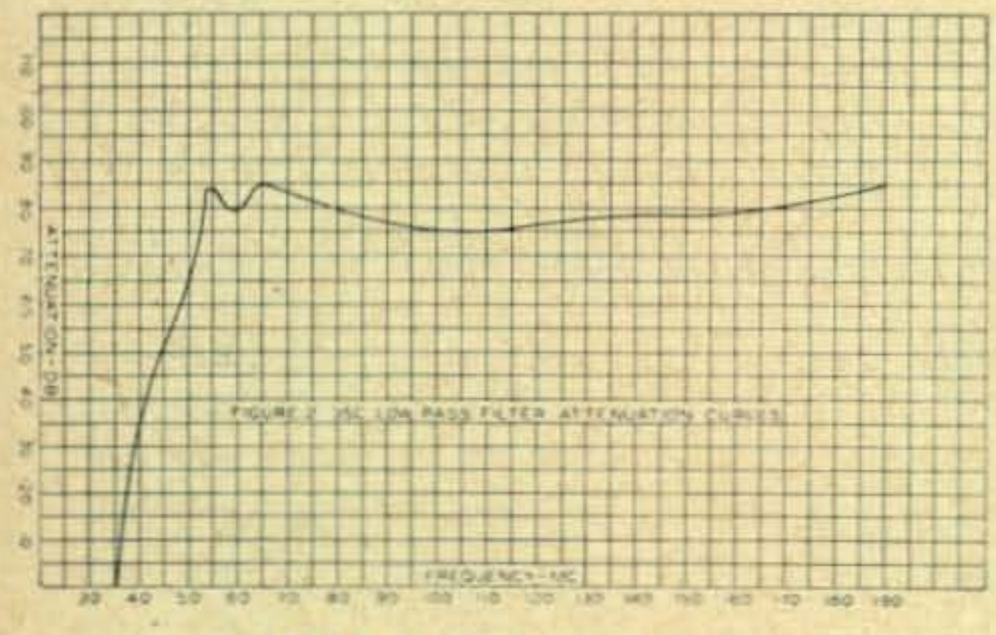


35C-2 Filter mounted on 32V-3 Transmitter



35C-2 attenuation curve

The 35C-2 is furnished with coaxial fittings to make installation easy. If used with a Collins 32V-3 transmitter, the filter is fastened to the rear of the cabinet by two readily accessible mounting screws. The coaxial fitting on the cabinet's back permits the use of a well shielded transmission line. The unbalanced output permits grounding the outer conductor of the line and the filter case.

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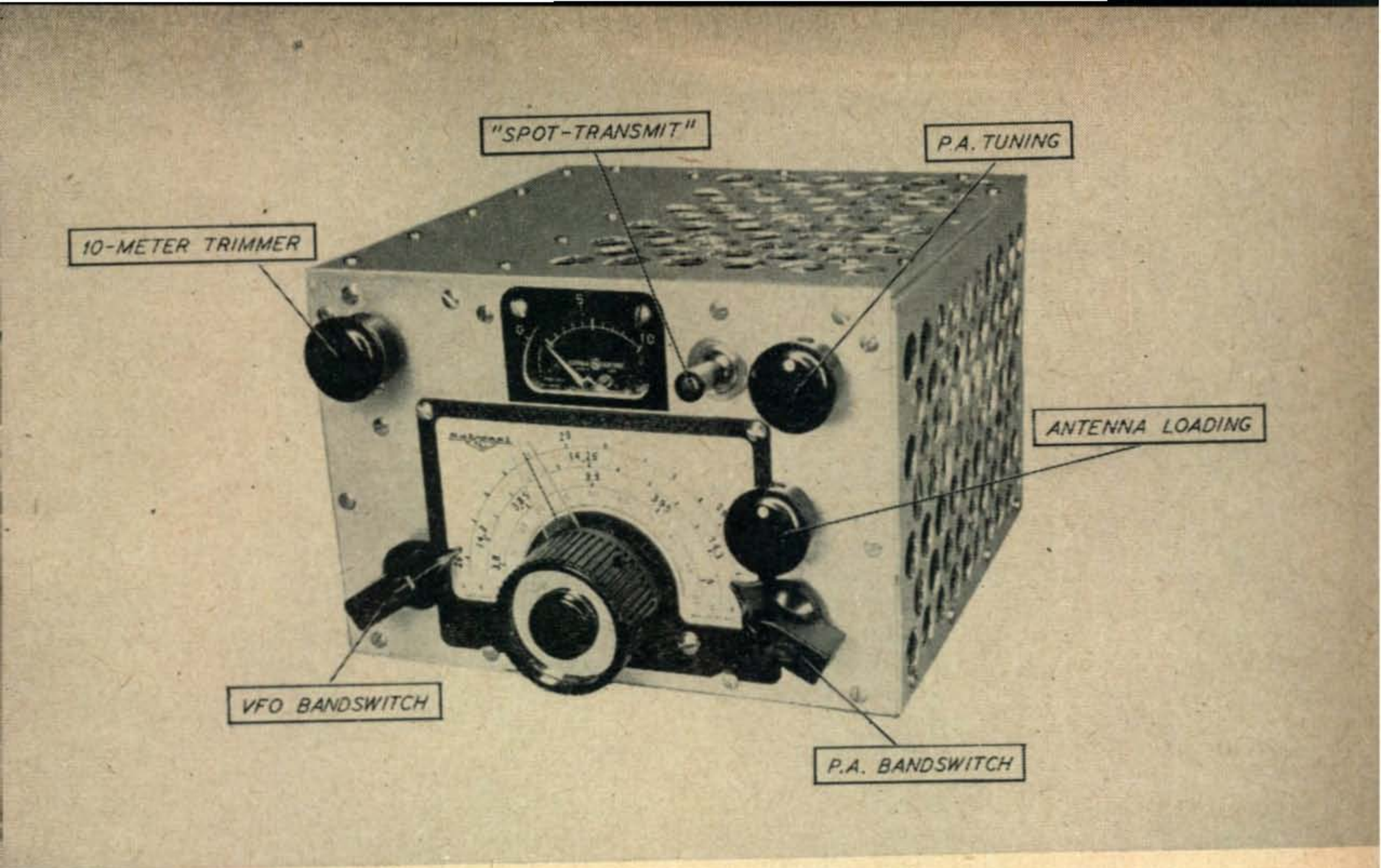


The transmitter is a complete unit with the important controls within easy reach.

The W2AEF Mobile Special

W. M. SCHERER, W2AEF*

Part Two of Two Parts

In the first part of this feature article (May, 1952, page 24) the author described the design of his bandswitching VFO controlled transmitter. In this second and final part W2AEF carefully outlines all of the necessary steps in the construction. For those who did not see the SPECIAL MOBILE ISSUE containing the first part they may still obtain copies from the CQ Circulation Manager at 50¢ per copy. —Editor.

The front and rear panels of the r.f. section, chassis and brackets are made of $\frac{1}{16}$" aluminum which may be cut and bent to shape in the home workshop. All necessary dimensions are given in *Fig. 2*. Holes, whose locations are not specified, may be conveniently determined by the builder during the process of construction. Inspection of the photographs, together with the data of *Fig. 2*, will aid in finding the method of assembly and the location of the various components.

The horizontal bottom piece is screwed to the bottom of the vertical section on which are mounted *V1, V2, etc.* The screw holes should be lined up so the VFO bandswitch brackets will be secured by the same screws. The bandswitch should be assembled and mounted on the brackets before the latter are secured. The bracket, shown at the right of *Fig. 3* is held in place by the bandswitch assembly and by the right angle bend, *K*. The latter should be bent and its hole should be located so that it may be secured to the screw at the bottom left of socket V3 (as shown in *Fig. 4*) which is mounted on ¾" pillars. Coil *L7* is mounted on the bracket in hole *L* which should line up with hole *L7* on the front panel. The *L7* slug is controlled from the front panel through a ¼" diameter bakelite rod in the

*Contributing Editor, CQ

end of which a small hole is drilled to pass over the threaded screw of the lug, and a set screw is used to firmly secure the rod. The other two bandswitch brackets are also secured along the vertical side of the chassis.

Ordinarily, the decks of a bandswitch are mounted so that the contacts and terminal lugs are at the rear of each deck; however, in this case, the switch should be assembled with the contacts and lugs reversed, so that they appear towards the front of each switch deck. This is necessary so the terminal lugs may be placed at the most convenient position for wiring. Reference should be made to the pictorial wiring diagram, *Fig. 4*, for added information on the switch arrangement. The reversal of the decks may require alterations in the switch stops, according to the switch assembly used. The switch shown in the photographs has not been reversed, since its terminal locations are different than those found on the standard switches specified in the parts list.

The center line and the distance from the front panel are shown in *Fig. 2* for the mounting of the VFO tuning capacitor. It should be mounted on right angle brackets, at front and rear, so that the center of the rotor is 7/8" from the vertical side of the chassis. The rotor should then line up with the MCN dial drive mounted on the front panel. A 3/8" hole must also be made in the vertical chassis directly under the capacitor, so a wire may be connected from the capacitor stator to switch terminal *4A*.

In the illustrated model a cover was made and placed over the VFO capacitor to keep out dust and dirt, and to prevent any possible feedback from the final amplifier to the VFO.

Dimensions of the assembly for the final amplifier tank components are shown in *Fig. 3*. The front bushing of *C24* is secured to the left bracket at hole *X*. The frame of the capacitor is also secured at holes *V* with 6/32 flat head screws. *C23* mounts in hole *W*, and may be secured at the bushing by lock nuts on both sides of the bracket, or by the feet already at the front of the capacitor. Flexible couplings, such as the Millen #39007, may be used between the capacitors and their extension shafts to the panel.

The final amplifier bandswitch, *SW-Y, SW-Z*, is mounted in hole *Z*. The switch deck should be in the standard position with the terminals at the rear of the deck. A 1/4" diameter bakelite rod is connected, by a sleeve type coupling, to the switch, and passes through hole *Y* and through hole *F* on the front panel.

The 4 mc inductor, *L10*, is cemented to the 1/4" lucite strip which should be placed along the inside of the inductor winding.

The entire assembly is secured to the bottom chassis piece at holes *S* and holes *R* at the right end bend of the piece supporting the lucite strip. These two *R* holes will fall just below the *V3* clearance hole. The screw through the lower *R* hole, at this point, also supports the tie point terminal strip to which is wired *R7* on the other side of the chassis. The exact location of the *S* and the specified *R* holes on the chassis should be made so that the controls to the front panel will be aligned with the components on the assembly.

Dimensions of the cutout for the meter are not given since several different types of meters may be used. The one shown in the photographs is a *G.E.* 1½" square unit, Type DN-1, Model ABC11, O-1 ma, 100 ohms resistance. The *G.E.* type #411X92 may also be used as well as the *MB Instrument Co.*, 1½" square Model 151, round Model 152 or the Dejur Ansco Model 112. Any other meter, having the specified electrical characteristics, may be used. Some 2" type meters may also fit into the space since the instrument is mounted in back of the panel with only the scale perceptible through the panel cutout.

On the rear panel, two banana jacks are insulated from the metal panel with polystyrene bushings, as indicated in the diagram. The other two jacks are grounded directly to the panel, but first they must be built up with an additional spacer to meet the level of the insulated jacks.

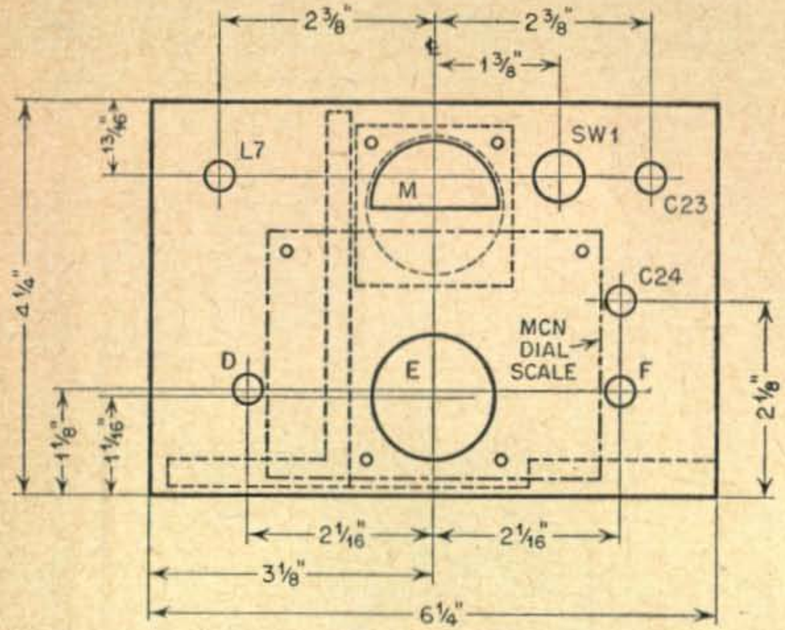
The side pieces and the top cover for the unit are separate pieces screwed in place individually. Measurements for these can be made after the other sections are assembled. Two holes should be made in the left side panel to provide access to the trimmers, *C1* and *C2*. Plenty of screws should be used to hold all the parts together, so the final product will be sturdy and vibrationless. Either 3/48, 4/40, or 6/32 screws may be used, with tapped holes employed instead of nuts. Plenty of ventilation holes should be made in the cabinet sections around the final amplifier. These may be neatly made using a 1/2" chassis punch.

Wiring

The components on the vertical chassis should be wired before the panels are mounted. Refer to pictorial wiring diagram, *Fig. 4*, as a guide. The ends of the leads to the power plug, *P2*, and also *R9, R9A*, should be left unconnected until later. *C7* lies flat along the chassis, while *C5* and *C6* stand edgewise on either side of *RFC1*. It is important that these capacitors, as well as all the other components in the oscillator section, be held firmly in place to avoid vibration. Leads to the bandswitch should be made as short and direct as possible, and with wire no smaller than #18. At *FT#1* and *FT #2* it is preferable to use feedthrough type capacitors (any size) such as the *Erie* style *362*. If these are not available, *National* type *XS-9*, or *Millen #32150* panel feedthrough bushings may be used.

All the 2.5 mh r.f. chokes are standoff mounting type. On *RFC2* the mounting base should be removed by heating it with a soldering iron. It will then fit in the space nicely and may be held in place with heavy wire leads. The ground connection for *L1* is made by soldering the bottom lead to the metal mounting at the base. On *L2* the ground is made at the inside of the form and to the mounting screw which holds the form in place.

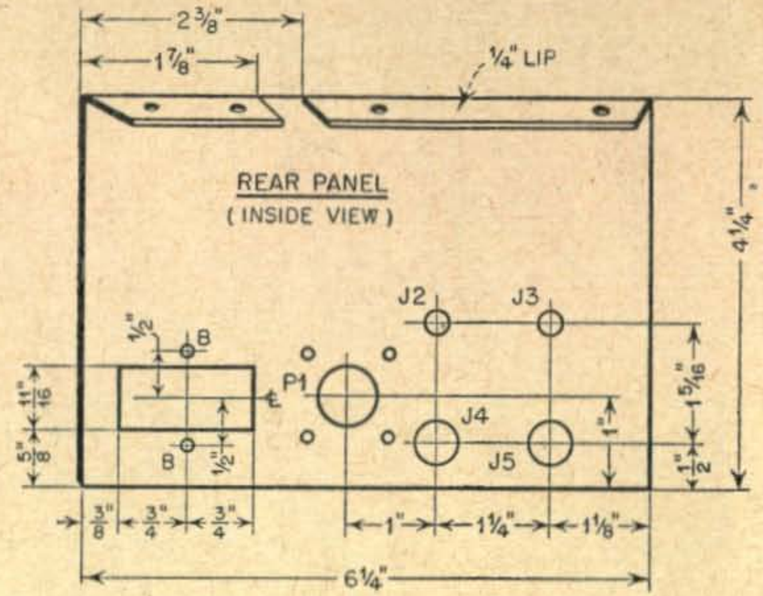
The bracket with *C1* and *C2* should be mounted

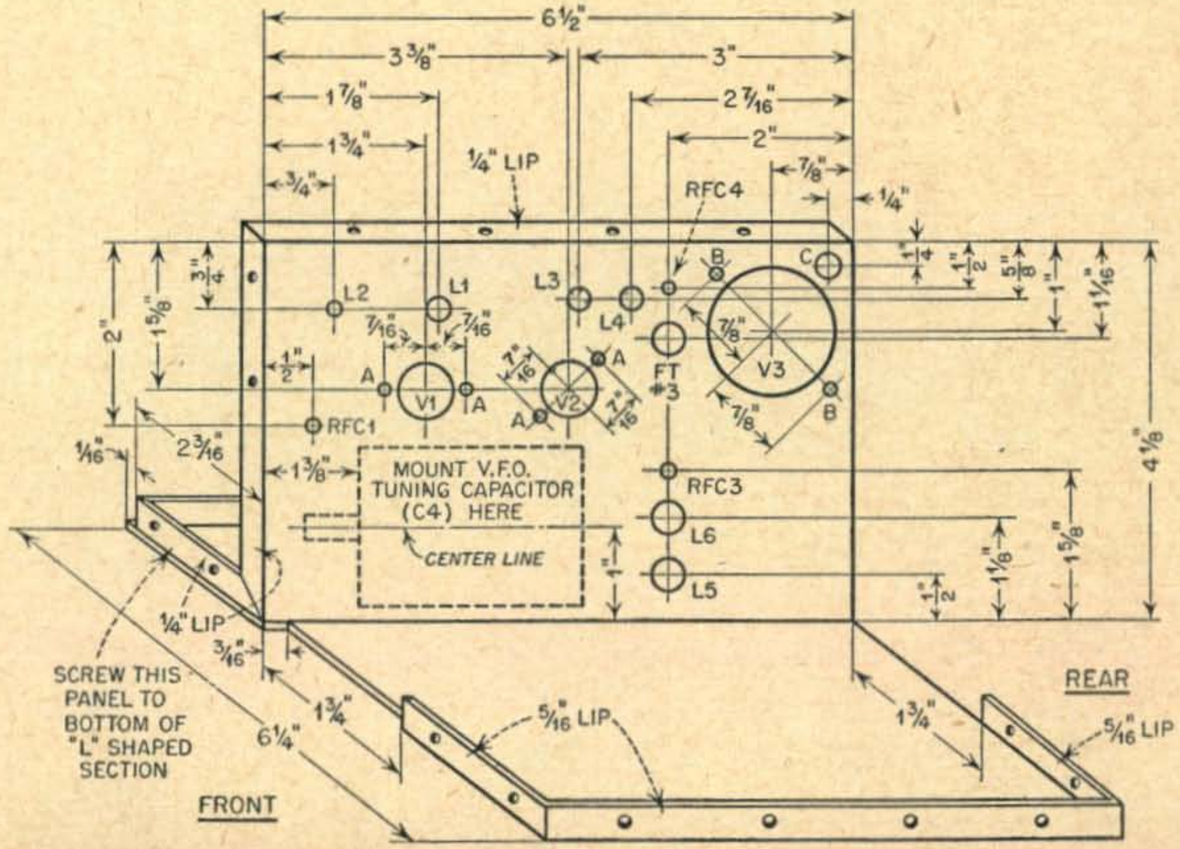


FRONT PANEL

LEGEND

A – No. 33 Drill
B, L2, RFC1, RFC3, RFC4 – No. 26 Drill
C, L1 – 5/16"
D, F, C23, C24, J2, J3 – 1/4"
E – 1 3/8" MCN Dial Drive Clearance
L3, L4, L6, L7 – No. 6 Drill
L5, FT #3 – 3/8"
SW1, J4, J5 – 1/2"





LEGEND
(Continued)

V1, V2, P1 – 5/8"
V3 – 1 3/8"
M – Cut out for meter will depend on particular meter used *(See Text)*

Dimensions for chassis assembly holes are not given – these may be better determined during course of construction – Ditto for other unmarked holes

MATERIAL – 1/16" THICK ALUMINUM

Fig. 2. General structural drawing of the panels and sub-chassis.

and wired after all the other components in the oscillator section have been wired.

The components of the final amplifier plate circuit should be wired after first mounting the front panel and the tank assembly. No special problems should be encountered after reference is made to the pictorial diagram and the photographs. A rubber grommet should be inserted in hole *C*, through which will pass the leads from *SW-1*. The rotor of *C23* should be grounded to its mounting bracket. The plate lead from *RFC4* to the tube should be made of flexible wire and should be only long enough to permit removal of the plate clip from the tube cap. The leads at both ends of the neutralizing capacitor, *C18*, should be made of #14 wire to firmly support it. Wiring between the final bandswitch and *P1* and the insulated banana jacks should be left until last, at which time the rear panel may be mounted and the connections may also be made to *P2*, *R9*, and *R9A*.

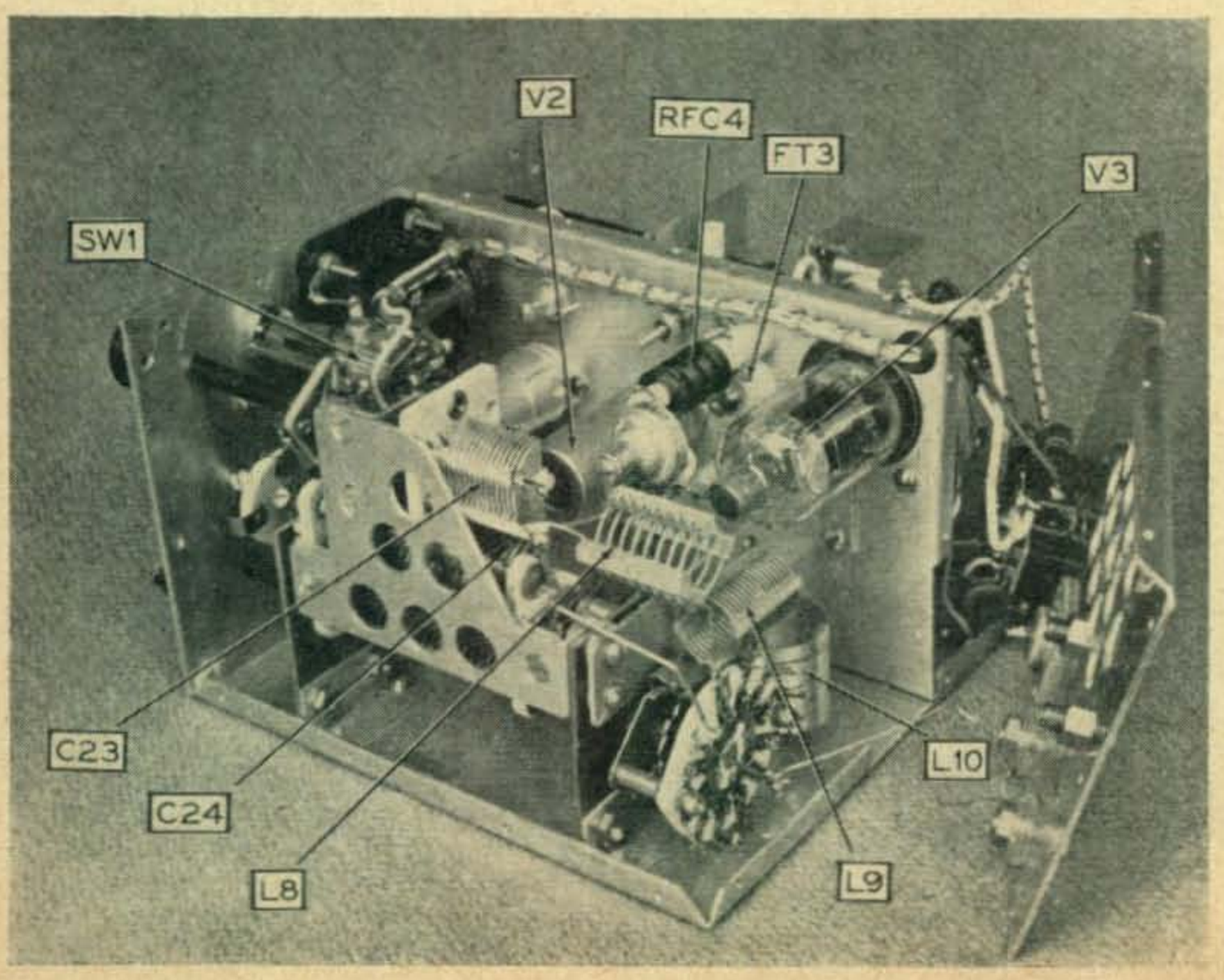
Constructional details are not given for the modulator and relay unit, since the layout and wiring are quite conventional. The unit shown here is built on a 7" x 7" x 2" aluminum chassis, but other sizes and layouts may be used to fit in any special space where the modulator is to be placed in the car. The writer's modulator fits nicely under the front seat.

Resistors *R12* and *R17* should preferably be mounted above the chassis where good ventilation is available. As a precaution against fire, they should be enclosed within a well ventilated perforated can or screen. Wire used in the class B plate and in the output circuits to the final amplifier should be insulated to withstand peak potentials of at least 1500 volts. From the parts list, it will be noted that high quality and higher power rated audio transformers are used in preference to the small 12 or 15 watt units generally used in mobile applications. In past tests, the small units have broken down under the high peak potentials and power requirements encountered with 400 to 500 volt operation when speech clipping was used.

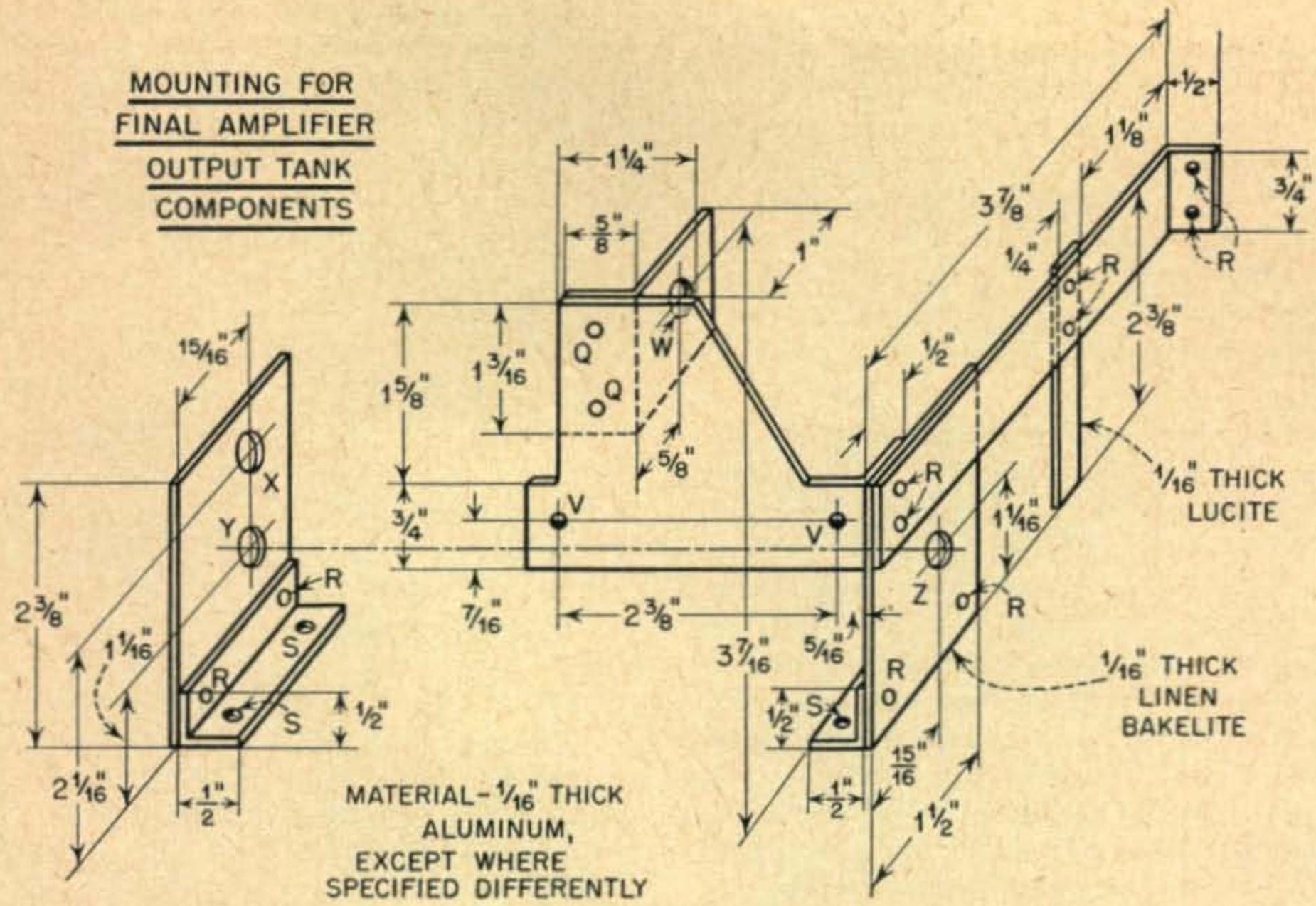
Alignment and Adjustment

Remove the left side panel and the top cover. If a grid dipper is available, all the inductors should be first checked as follows: Insert all the r.f. tubes in their sockets. Set the VFO bandswitch for 4 mc (maximum clockwise rotation), and set the VFO tuning capacitor at maximum capacitance. Adjust the slug in *L1* so resonance is indicated at about 1.9 mc. Then rotate the capacitor to minimum where the frequency should increase to about 2 mc. Then adjust the slug in *L5* until resonance is obtained at *3.9* mc. Next, rotate the bandswitch to the next counterclockwise position, or 14 mc. Proceed as above adjusting trimmer *C1* so that *L2* resonates from about 7.1 to 7.15 mc over the range of the tuning capacitor. Adjust slug in *L3* to resonate at 14 mc, and slug in *L6* to resonate at 14.25 mc. Now rotate bandswitch counterclockwise to 28 mc position, and adjust *C2* so that *L2* resonates from approximately 7.125 to 7.425 mc over the range of the VFO tuning. Adjust slug in *L4* to 14.5 mc, and tune *L7* (controlled from front panel) for resonance at 29 mc.

In the absence of a grid dipper, and also following the above prealignment, if made, proceed as follows: (this step is best done on the workbench, where an a.c. operated power supply may be conveniently employed). Connect power plugs as indicated in *Fig. 1* for a.c. power supply operation. The modulator section must also be connected, but its gain control should be in the off position. Do not connect pin *5* of *P3* and of *P4A* at this time. On *P3* remove the jumper between pins *7* and *8*. Connect the negative end of a milliammeter, having a full scale range of between 5 and 30 ma, to pin *7*



Compactness is the keynote in the design and layout of the "Mobile Special." This is a view principally of the final amplifier and the coils that constitute the tank circuit. Note positioning around the bandswitch.



LEGEND

K – See Text
L – No. 6 Drill
N – ¼" Drill
P – No. 33 Drill
Q – No. 26 Drill and Countersink
R – No. 26 Drill
S – No. 36 Drill, No. 6-32 Tap
Dimensions for location of these holes determined at builder's discretion
T – 5/16" for V.F.O. Bandswitch Clearance
U – ⅜" for Mounting V.F.O. Bandswitch
V – No. 26 Drill and Countersink – for C24
W – 5/16" for C23
X – ⅜" for C24
Y – 5/16" Clearance for Shaft to Final Bandswitch
Z – ⅜" for Final Bandswitch

NOTE – Line up W with C23 Hole on Front Panel
" " X " C24 " " " "
" " Y and Z with F Hole on Front Panel
" " L with L7 Hole on Front Panel

Fig. 3. Construction of the various bracket assemblies.

on *P3*, and the positive side of the meter to pin *8*, or ground, on the same plug. Place *SW-1* in down, or "spot" position, and lock up *RLY-1*, with a rubber band or string, so its normally open contacts are now closed. If a 6 volt d.c. relay supply is used, connected to *P4A*, the latter step will not be needed, since the relay will then be energized as *SW-1* is closed. Place VFO bandswitch in 4 mc position, and apply power. The VR-150, *V4*, should glow. Measure the potential at pins *1* and *2*. on *P2*, which should read 150, and about 210 volts respectively.

Listen in on your communications receiver, and readjust the slug in *L1* until a signal may be heard from 3.8 to 4 mc over the range of the VFO tuning capacitor. With the VFO set at 3.9 mc, readjust the slug in *L5* until the external meter reads 2.5 ma. Check the reading of the meter built into the transmitter. It should indicate a reading at one half scale. If it reads lower, file the carbon resistor, *R8*, at its center until the half scale reading is obtained. The full scale range of the internal meter will then equal 5 ma. This should be again checked by first removing the grid end of *R5*, so the slug in *L5* may be varied to give different values of higher grid current readings for the purpose of checking the two meters with each other. If the initial reading of the internal meter is higher than half scale when the external meter reads 2.5 ma, substitute another resistor at *R8*, as its value may be lower, depending upon its tolerance rating. Then proceed as above.

After the meter is calibrated, reconnect *R5* and peak up *L5*. The grid current reading should now be about 2.5 ma. Next, rotate the bandswitch to 14 mc, and readjust trimmer *C1* until a signal may be heard on the receiver from 14.2 to 14.3 mc over about 70 degrees of the dial. Set the VFO at 14.25 mc, and peak up grid current by first tuning *L6* and then *L3*. The grid current should now be above 3 ma, so tune *L3* to the low frequency side of resonance (clockwise) until the grid current drops to 2.5 ma.

Now, place the VFO switch in the 28 mc position, and adjust trimmer *C2* until the signal may be heard from 28.5 to 29.7 mc over the range of the dial. Set VFO at 29 mc, and peak up *L4* and *L7*. Set the VFO at 28.5 mc, and retune *L7*, but not *L4*. Note the grid current. Repeat the above step with VFO set at 29.7 mc, and again note the grid current. No less than about 2.5 ma of current should be realized over the range of the band while retuning *L7*, but not *L4*. If the reading is too low at one end of the band, slightly readjust *L4*, until equalization of grid current results over the band.

Remove power, and release *RLY-1*. Place *SW-1* in up, or "Xmt", position, and lock up *RLY-2* in the same manner as *RLY-1* was previously locked up. Connect a 25 or 40 watt lamp bulb to *P1*. Place the VFO switch at 28 mc, and set the VFO at about 29 mc. Place the final amplifier bandswitch at 28 mc (clockwise), and rotate the loading capacitor, *C24*, to maximum capacitance. Connect pin *5* of *P3* to pin *5* of *P4A*. Apply power, and if at all possible, it is advisable to reduce the plate potential to around 300 volts. Rotate the plate capacitor, *C23*, until resonance is indicated by the minimum current dip of the internal meter. This should occur at about one quarter scale reading. Rotate *C23* back and forth through resonance, and watch the external grid meter at the same time. It should peak to maximum grid current at the same time as the plate current dips to minimum at resonance. If this does not occur, adjust the neutralizing capacitor, *C18*, until this condition is realized. Note: Be sure plate power has been removed when capacitor *C18* is adjusted. If it is impossible to obtain neutralization, regardless of the setting of *C18*, either reduce or increase the value of *C19*. Neutralization should also be checked on 14 and 4 mc.[1]

The amplifier may now be checked at full plate potential. Adjust the loading by *C24* and retune to resonance with *C23* until the internal meter reads a little less than three-quarters of full scale at resonance. The lamp bulb should light, indicating the r.f. power into the load. Now remove power and disconnect the external grid meter. Connect pin *7* of *P3* to pin *8* on the same plug. Connect the positive side of a milliameter, having a full scale range of at least 100 ma, to pin *5* of *P4A*, and the negative side to pin *5* of *P3*. The existing lead between these two points will have to first be disconnected. Again apply power, and check the reading of the built-in meter with that of the external meter, both of which will be reading the sum of the screen and plate currents (the grid current also is included in the reading of the internal meter, but it may be discounted on this range). If the meters do not read alike (the full scale range of the internal meter should be considered as 100 ma), the value of *R10* will have to be altered accordingly. Decreasing *R10* will increase the meter reading, and vice versa. Remove the external meter and restore the normal pin *5* connections. With 500 volts applied, the correct loading is at a current of 70 to 75 ma as indicated by the meter. Under normal operation, the grid current should read between 2 and 2.5 ma when *SW-1* is in the "spot" position. On 28 mc this must be set by the panel control of *L7*. Where the current is higher than 2.5 ma, *L7* should be detuned to the high frequency side of resonance (counterclockwise).

Modulation should preferably be checked by means of an oscilloscope; however, observations of the lamp bulb load will provide an indication of modulation. With maximum modulation at the point at which there is no clipping, the lamb bulb will brighten moderately with speech input to the audio system. With clipping, the brilliance of the lamp will increase considerably.

After all the above adjustments and tests, give all the inductors, in the VFO and buffer-doubler section, a coat of polystyrene cement, or the equivalent. Then install the sides and top piece of the

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1 "How to Neutralize Your Single-Ended Tetrode Final." Bruene, CQ. Aug. '50.

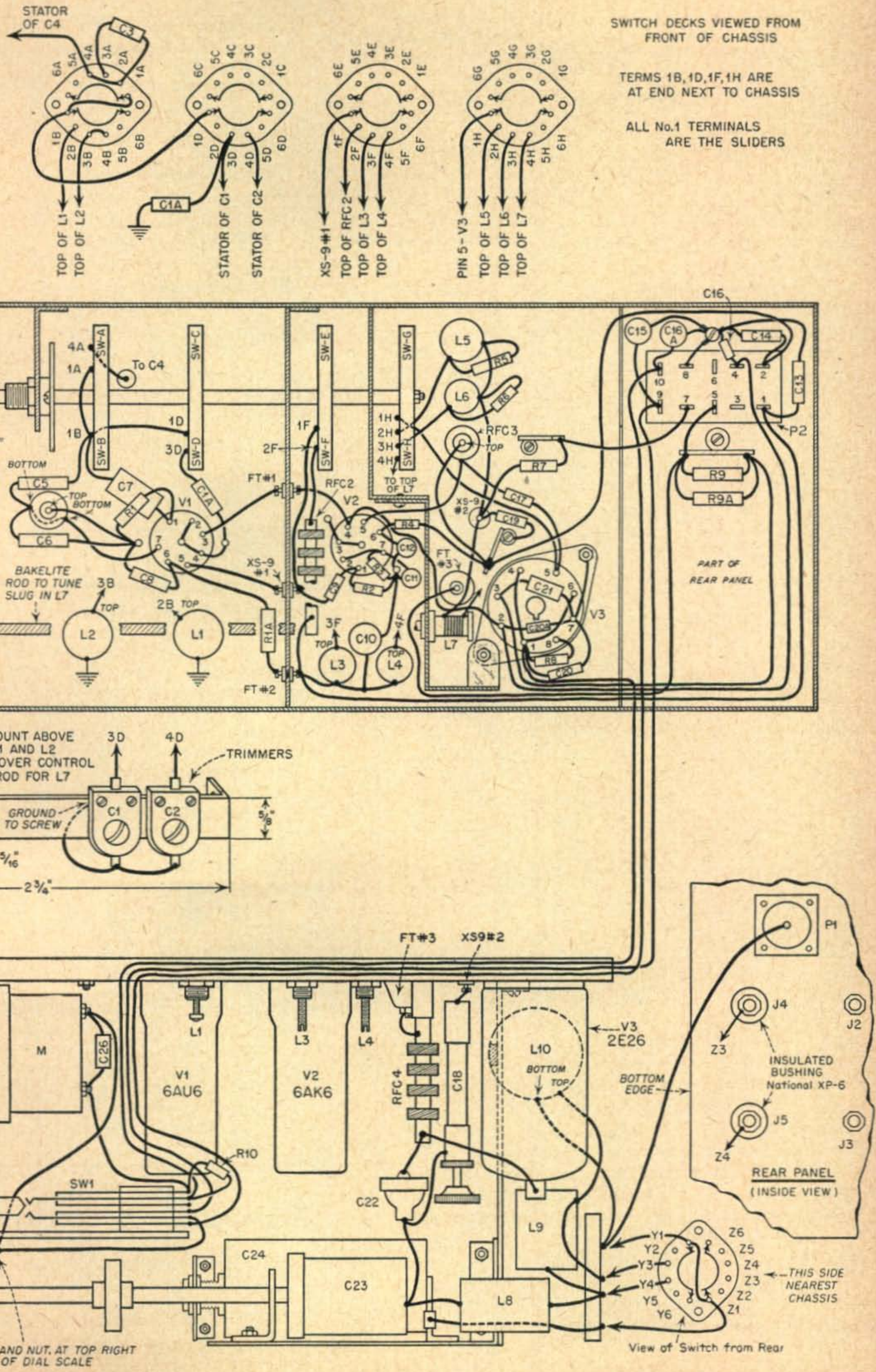


Fig. 4. Pictorial wiring schematic

r.f. unit, and calibrate the VFO, since it will have slightly been shifted by the installation of the side and top. Secure screw of *L1* slug with Glyptal or Duco cement.

Installation

When the installation is made in the car using the 6 volt battery source, connections should be made as shown for P4. At least #12 size wire should be used for the 6 volt heater leads, which includes the ground leads. Shock proof mounting of the model, shown here, was not found necessary to maintain stability, but, nevertheless, this step would be a wise precaution. As previously mentioned, on 14 and 4 mc, correct loading may not be obtainable over the range of *C24,* so padding capacitors may be inserted in the banana jacks provided for this purpose. In the author's installation, an additional 200 $\mu\mu$f is required for 14 mc, and 400 $\mu\mu$f is needed for 4 mc.

In some instances it may be desirable to make certain modifications. If a 300 or 400 volt supply is to be used, *R22* must be decreased until the potential at the screen of *V6* measures 225 to 250 volts, and *R12* must be decreased until potential at pin *2* of *P3* is approximately 200 volts. Tube *V4* should still glow after this change.

Resistance *R23* will also have to be decreased, and should be done while using a 'scope to check the modulation. With 400 volts, the final amplifier loading should be adjusted to where the meter reads 65 to 70 ma, and with 300 volts, it should be 60 ma. In both cases a lamp bulb may be used as a dummy load. Apply tone modulation, and reduce the size of *R23* until the maximum obtainable modulation is just under 100%. When 300 volts is used, the OZ4 negative peak clipper may not fire and conduct, in which case it will be necessary to short out this tube.

The type 1635 tube may not be easily obtainable in some localities, since it falls in the category of special purpose tubes. A 6N7 may be used instead with 300 volts operation, and for higher potentials a pair of '46's or an HY31Z double triode may be used. The '46's are 2.5 volt filament type tubes having a current drain each of 1.75 amperes. For mobile work, their filaments may be connected in series, and the total drain will equal that of one tube. The center tap of the input transformer, *T2,* should be connected to the midpoint connection of the series filaments instead of to ground. A 0.3 ohm resistor should be placed in series with the outer leg of each filament.

The HY31Z is an instantaneous heating filament type tube, drawing a current of 2.5 amperes. The filament may be switched on and off during operating periods by connecting one side of the filament to the hot side of the 6 volt supply, pin *7* of *P5,* and the other side to pin *2* of *P5.* Both type tubes operate at zero bias, and they draw about 30 ma more plate current than the 1635.

A carbon microphone may be used by disconnecting *R16* at the point marked *X, Fig. 1,* and then connecting the secondary of the microphone transformer between the top of *R16* and ground. The ground end of *R21* should be opened up and returned to ground through the microphone and the transformer primary, in series. A 4 to 8 μf capacitor should also be connected from the bottom of *R21* to ground. Microphone potential may also be obtained from the 6 volt supply source through a suitable filter.

The new type 6146 tube has been reportedly placed on the market since the completion of the *Mobile Special.* If it is desired to use this tube in place of the 2E26, space will permit its installation. The *V3* clearance hole will have to be made larger, and a different supporting arrangement will be necessary for the *V3* socket. At 500 volts, the 6146 may be operated at a power input of a little over 50 watts, but it will require higher plate current drain and an additional .45 amperes of heater current. Resistor *R8* will have to be doubled to make the full range scale of the meter, in transmit position, equal 200 ma. Audio power requirements will also be higher, and it is suggested that the type '46 or the HY31Z tubes be used as the modulator.

ARRL West Coast Gulf Division Convention

The Gulf Radio Club of Corpus Christi, Texas, has announced that the twenty-second annual ARRL West Gulf Division Convention, will be held at the Robert Driscoll Hotel, during June 28th and 29th. For those who arrive early, the ball will begin rolling on the evening of Friday, the 27th, with a pre-convention get together at the K.C. Hall, where there will be plenty to eat and drink for everyone. This will be an excellent opportunity to renew old acquaintances and organize your schedule for the balance of the fest. A very interesting program has been planned, featuring speakers, contests, special group meetings, a dance and a banquet. The XYL's schedule will include, among other things, a style show, a tea at the home of Mrs. W5GZ, and a boat ride on beautiful Corpus Christi Bay. Also, for those who wish to advance to a higher grade or start out with a new license, FCC amateur examinations will be given on Saturday morning. Registration is $8.00 per person. A special prize drawing for those who pre-register before June 14 will be held at the banquet. Make your reservations for quarters as early as possible. Send your Pre-registration and reservation requests to the Gulf Radio Club, P.O. Box 2073, Corpus Christi, Texas.

New N.A.R.C. Prexy

During the Board of Directors meetings of the National Amateur Radio Council, Mr. C. C. Richelieu, W1JR was unanimously voted as President of the NARC for the next term of office.

W1JR will be remembered as a Director of the ARRL during the period when he held the call W9ARE.

The Silicon Crystal Noise Generator

WILLIAM L. ORR, W6SAI*

Photos by W6RDR

Twelve years ago a "noise generator" article would have made the author a likely candidate for the straight jacket. Today there is a big field of application for just such a device. So big that we have rushed into print this latest and greatly improved version of the silicon crystal noise generator. It is so simple that it could be "thrown together" in a half-hour. —Editor.

On the DX bands and on the very high frequencies the amount of noise generated by the receiver becomes a limiting factor in weak signal reception. The problem, therefore, is to design a suitable front-end for the receiver that contributes the least amount of noise and the maximum amount of signal amplification. A great many "ham hours" of time have been spent putting cascode r.f. stages in receivers, pulling out 6SK7's and putting in 6AK5's, and building grounded-grid preselectors.

The baffling enigma in such undertakings is that it is very hard to determine whether such improvements merely boost the gain (and noise) of the receiver or actually hold the set noise down while giving a lift to the signal. Many fellows have become extremely unhappy wher they have found out that their new preselector-creation will not allow them to read a signal that is pushing S6 on the receiver meter.

Noise Generators

Some time ago a simple thermionic diode noise generator was described for amateur use in determining the efficiency of the input circuit of of the receiver.[1] This noise generator consisted of a vacuum tube diode operating in a temperature limited condition. This means that there is sufficient plate voltage to saturate the available filament emission, and that if the plate voltage is increased the plate current will remain constant. Control of the plate current can therefore be regulated by varying the filament voltage. Certain diodes, when operating in this interesting condition will generate a substantial amount of "hiss" or random r.f. noise. This hiss is of a very steady amplitude and may be used for measuring the sensitivity of the receiver. The easier it is to hear a given amount of diode hiss over the inherent receiver noise, the more sensitive is the receiver. The diode hiss is proportional to the diode plate current, so a measurement of the excellence (or lack of same) of the receiver may be found by comparing the diode current to the amount of hiss heard in the receiver output.

A very well shielded signal generator could be used instead of the diode tube, but signal generators emit a signal on the order of milliwatts, and it requires expensive shielding and attenuation circuits to get down to the microwatt level that is needed for a signal-to-noise check. Some form of generator that starts from zero signal and works up is much better than one that starts with too much signal and works down!

The diode tube noise generator has never quite "caught on," since it has three basic faults:

1. The choice of the diode tube is critical. Only a few of them (the most expensive ones, naturally) will work above about 50 mc. This washes out the two meter band where a noise generator is sorely needed.
2. The diode generator needs both a filament and plate supply. It also needs some means of controlling the filament supply over quite a large range. This calls for a variable volt-

*Contributing Editor, CQ

age transformer or a high wattage rheostat.
3. If the supply is a.c. operated, trouble will be encountered with line pickup of stray radio signals that will introduce an error into noise measurements. Batteries will add weight and cost to the unit.

The Silicon Crystal

An excellent substitute for the saturated diode tube is a silicon crystal. When a small current is passed through a silicon crystal in the direction of highest resistance a constant r.f. noise of small amplitude is generated.[2,3] No filament supply is needed, and the exciting voltage for the crystal may be obtained from a few flashlight cells. The silicon crystal is the only type that will perform this feat. Geranium crystals will not work. This washes out the 1N34 type crystal. The war surplus 1N21 and 1N23 silicon crystals are excellent performers, and are still available on the surplus market at low cost. They have been used for noise generators up to 3000 mc.

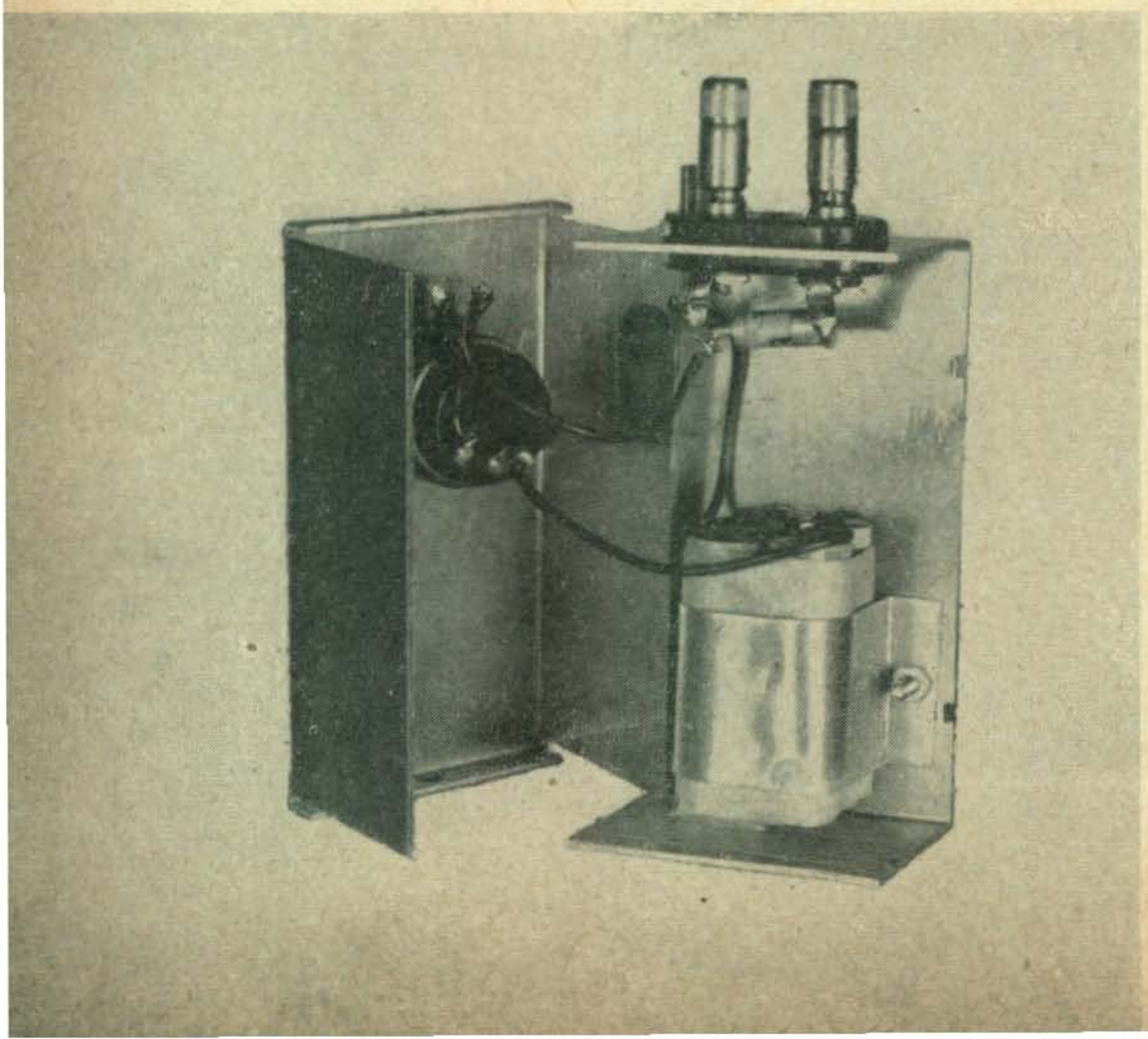
The crystal diode noise generator is a relatively high impedance source of noise, while the diode tube can be considered as a low impedance constant current generator. This fact must be taken into account when one uses the crystal type generator. All comparative signal-to-noise measurements must be made at the same impedance value. A comparison cannot be made if different impedance loads are used. Since most hams have one standard feed line value, the generator can be set for this value and no trouble will be encountered. This is a fairly small price to pay for such a handy device!

Construction of a Crystal Generator

Where else can you get so much for so few parts? Look at *Figure 1!* The noisy crystal and *C* form a closed circuit at radio frequencies, placing the generated noise directly across the antenna terminals of the receiver, which are connected to the terminal strip *T*. Across *C* is placed the d.c. current supply. A maximum current of six milliamperes is needed, so four small "pen lite" cells will last for over a year. The current is controlled by *R*, the calibrated potentiometer, and the switch *S* (mounted on the back of *R*) is used to turn the unit off when it is not in use. The whole generator is built into a small metal box that acts as a shield can for the unit. A ground terminal lug is bolted to one top corner of the box to connect the box to the receiver ground terminal so that no r.f. potential will exist between the generator box and the receiver.

The silicon crystal and the condenser *C* must be mounted to the terminal strip *T* by very short leads. Extreme care must be taken when the wire leads are soldered to the crystal. The crystal should be held with a damp rag and the connections made very quickly with a hot iron. If you hold the crystal tightly in one hand, I assure you that you will not let it get too hot! If you are foxier than I was, you might take a *Littelfuse* holder and convert that into a crystal holder. I was too lazy to do this, and took the easy way out. Since the flashlight batteries will last their shelf-life in this unit it is permissible to wire them right into the circuit. Be sure to tape the exposed ends of the battery so they

1 B. Goodman, "How Sensitive is Your Receiver," QST, Sept. 1947 page 13.
2 S. N. Van Voorhis, "Microwave Receivers," Vol. 23, Radiation Laboratory Series, McGraw Hill Book Co., NYC.
3 W. I. Orr, "A Practical Crystal Noise Generator," Radio and Television News, June, 1951.



A peek inside the box shows why you can build this noise generator in only a few minutes. The crystal is carefully soldered to extremely short leads directly below the binding posts. Four penlite batteries are wired and soldered in series to supply all of the necessary working voltage.

will not short out to he case. A small metal clamp can be used to hold the batteries in place.

If the receiver has a coaxial receptacle input, a matching plug may be put on the noise generator and connection made between the two with a short piece of coaxial line.

Only one thing is missing now. A composition resistor equal in value to the desired line impedance at which the measurements are to be taken is placed across the output terminals of the noise generator. A small one-half watt resistor will be satisfactory. If the coaxial plug and line are used, this resistor should be mounted inside the generator. The unit is now complete and ready for operation.

Operation of a Generator

A typical test set-up for the checking of signal-to-noise ratio of a receiver is shown in *Fig. 2.* As mentioned before, the resistor *R2* is a non-inductive composition resistor having a value equal to the input impedance of the receiver, or to the chosen impedance at which the checks are to be made. The noise generator is connected to the receiver and the case of the generator is grounded to the chassis of the receiver. An output meter* is connected to the

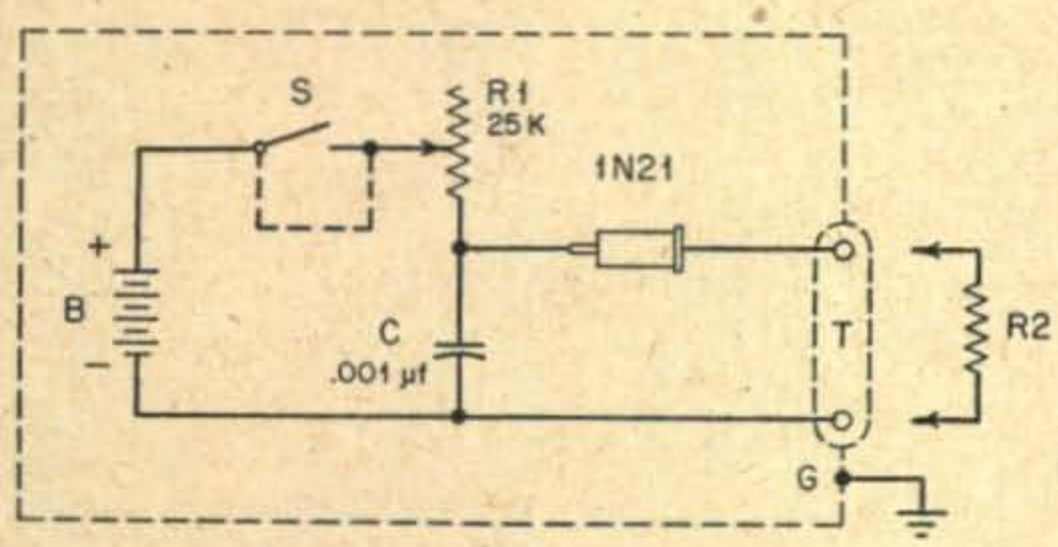


Fig. 1. Wiring schematic.

audio circuit of the receiver and the receiver is adjusted as follows: The AVC and BFO are both turned *OFF.* The R.F. GAIN control is placed full on, and the AUDIO control is advanced until a reading is obtained on the output meter. This arbitrary reading is taken as the zero reading, or reading of natural receiver noise. There should be no pickup of random signals in this noise, or readings will be in error. (If you don't get any noise from the receiver under these conditions, the overall gain is too low; you don't need a noise meter, you need a new receiver!)

The noise generator should now be turned on, and the knob turned until the receiver output meter registers a 3 db increase. (This corresponds to a voltage increase of 1.41 times the "zero" or original value.) The potentiometer reading on the dial scale now becomes the criterion of signal-to-noise ratio for that particular receiver. The less the reading (more resistance in the diode circuit), the better the signal-to-noise ratio of the receiver being tested.

* Any meter capable of reading a.f. output signal of the receiver; usually the "output" range of a multimeter across the speaker output terminals will give sufficient reading.

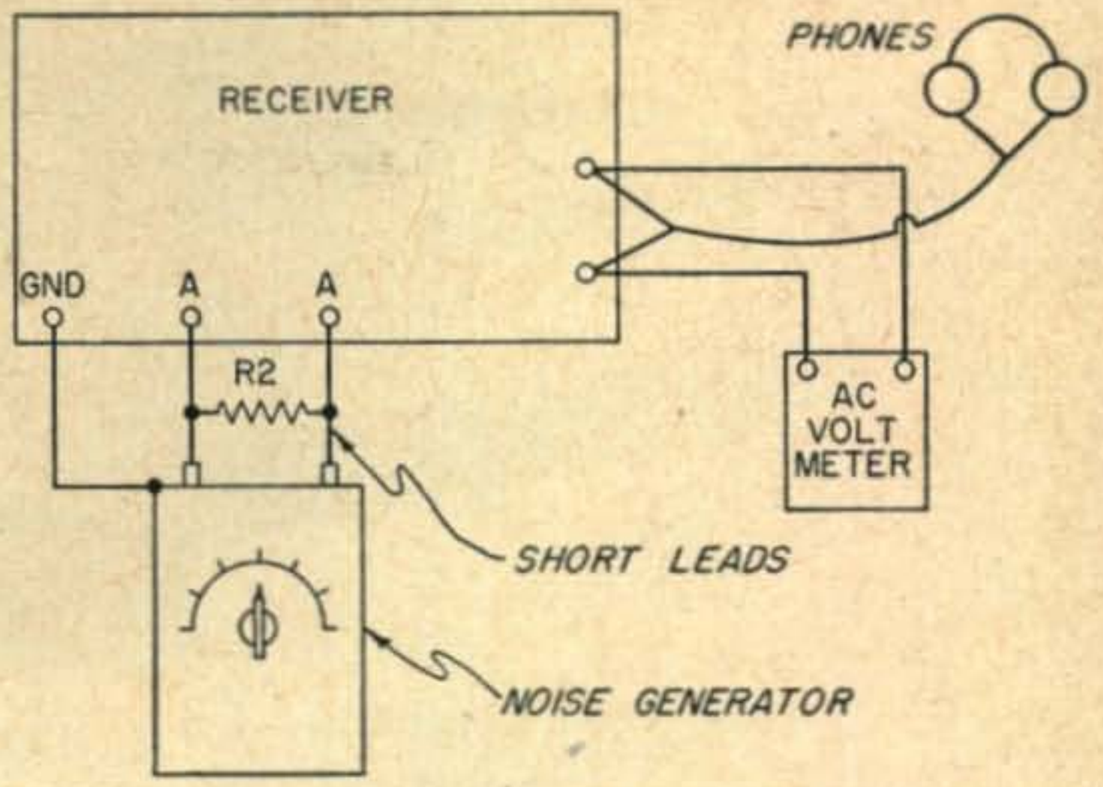


Fig. 2. A typical setup for signal-to-noise ratio measurements.

The readings taken with this unit are arbitrary and cannot be referred to as "so many db above thermal noise." But they do give a ready means of comparing various changes that are made in the receiver. Different receivers may be compared under the same conditions, using the same load resistor.

You will find some startling things that may turn up during receiver checks. Some receivers simply refuse to "put out" when a 52 ohm input load is used. This is a handy thing to know if you contemplate a new reciever—especially if you are using RG-8/U feedline! Some receivers will exhibit plenty of gain and "hop" but will fall down badly when this acid test is used. Others will have good signal-to-noise ratios at some frequencies, and poor ratios at other frequencies. Some cannot be aligned properly at both ends of the bands! You might also find that maximum signal-to-noise settings of the r.f. padders and trimmers do not coincide with the settings for maximum gain. This will really throw you for a loss if you are aligning your receiver by the signal pickup method! If the receiver is aligned by ear, it would not be aligned for best signal-to-noise ratio.

By using this noise generator it is easy to obtain the maximum results from your particular receiver. If these maximum results are not good enough for you, it will give you a reliable guide for testing the efficiency of the changes that you make.

P. A. R. C. Hamfest

The Pensacola Amateur Radio Club will hold its annual hamfest during Sunday, June 29. Advance information indicates that approximately three hundred hams and their families, representing the southeastern states, will be present to renew old acquaintances and acquire new ones in this all day affair which will take place at the municipal recreational area, Saunders Beach, Pensacola, Florida.

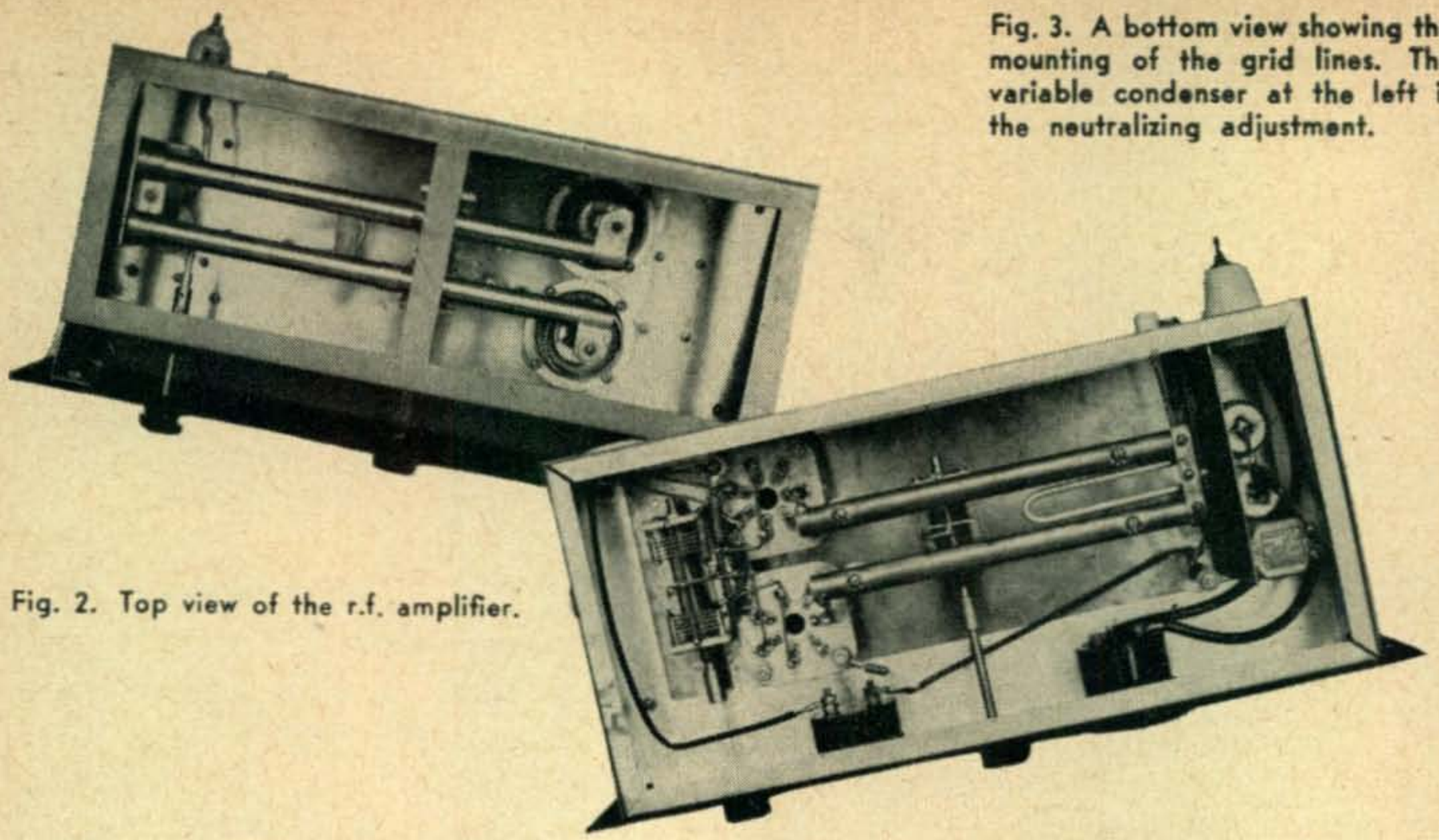


Fig. 2. Top view of the r.f. amplifier.

Fig. 3. A bottom view showing the mounting of the grid lines. The variable condenser at the left is the neutralizing adjustment.

A HIGH POWER FINAL AMPLIFIER FOR 144 MC

MERRITT KIRCHOFF, W2FAR** and DAVID D. BULKLEY, W2QUJ*

This is the companion unit of the two-meter VFO described in the February issue. The circuit details have been carefully divided into two parts in order to enable a non-VHF enthusiast to make the most of the modulation circuit. —Editor.

No longer do the low-power war-surplus VHF transmitters of the immediate post-war period appear to suffice for two-meter operation. Higher power is needed for DX and Contest Work. True, rotatable directive antennas with tremendous power gain are widely used on the 144 mc band, but they present the problem of continual rotation while searching for a contact, due to their narrow beam width. This drawback is particularly undesirable for applications in Civil Defense or Disaster networks, where it is imperative that the control station be capable of maintaining communication with stations in all directions.

When used in conjunction with the VFO-controlled exciter described in the February, 1952 issue of CQ Magazine[1], it is possible for the operator to select any power input required, up to a maximum of 400 watts. Either FM or AM may be chosen as the mode of operation for speech intelligence; the exciter embodies the necesary reactance tube FM modulator, while a high level AM modulator to plate modulate the final r.f. amplifier is described in this text. Although designed for use with the aforementioned exciter unit, any VFO or crystal-controlled exciter delivering 20 watts of r.f. power on 144 megacycles may be used to drive this final.

Employing two Eimac 4-65A pentodes in a screen neutralized circuit, this amplifier will find many applications in the two-meter band. Long lines are employed for the inductance elements of the grid and plate circuits of the stage to provide stable, easily adjustable tank tuning facilities.

The type 4-65A pentodes ordinarily do not require neutralization in a well-shielded circuit at frequencies below 110 megacycles. However, at frequencies above 110 megacycles the screen-lead inductance introduces some feedback and it is necessary to series tune the screens to ground.

The modulator with its associated speech amplifier provides over 200 watts of audio power to plate

**Columbia Broadcasting System
*International Telephone and Telegraph Corporation

[1] *"A Complete 144-Mc VFO with NBFM," page 19.*

modulate the r.f. amplifier. The vacuum tube complement consists of a single 6SJ7 employed as the microphone input stage, followed by two 6SJ7's in push-pull, which drive the push-pull 813's used in a class AB_1 modulator circuit. The fact that class AB_1 requires less drive than the more popular class B mode of operation far outweighs the small reduction in efficiency and results in a considerably less complex speech amplifier. As the class of service of this modulator requires no current be drawn by the grid circuit it is in itself a limiting circuit and performs the task of a clipper sometimes used in a speech amplifier. Drive from the push-pull 6SJ7's is accepted by the 813's only up to the value equalling the grid bias (75 volts) ; if greater excitation than this value is applied, a limiting action takes place. Shunt feedback is employed which improves the linearity and reduces the harmonic distortion to a negligible value.

R. F. Amplifier Layout

The front panel layout as seen in *Fig. 1* presents a very pleasing appearance. The antenna loading link control is located in the upper left-hand corner and the plate tuning control in the upper center. The lower center control is for grid tuning while that at the lower right is for adjustment of the screen-neutralized circuit. The left hand meter reads final amplifier plate current and the right-hand meter reads grid current.

Figure 2 shows a top view of the amplifier; here the simplicity of layout may be seen. The plate tuning condenser is beneath the long lines and is in approximately the center of the picture. The antenna loading link is directly beneath the long lines at the left side of the photograph; only the ends of the link and its center insulator may be seen.

The shield around the amplifier may easily be constructed from a piece of sheet copper or sheet aluminum 17 by 15 inches. Two bends are made to provide the three shield surfaces, 17 x 6½ (top), 17 x 4 (front), and 17 x 4 (rear). The two 17 x 4 inch portions are provided with ½ inch lips bent under to allow attachment to the chassis. Two 7½ x 5 inch holes should be cut in the 17 x 6½ inch plane of the shield to allow access to the tubes and the long lines as well as to provide ventilation. No shielding is provided at either end of the shield assembly.

Speech Amplifier and Modulator Layout

The speech amplifier and modulator, as shown in *Fig. 4*, are mounted on a chassis 17 x 13 x 3 inches. The power supply for the modulator screen voltage and the speech amplifier plate and screen voltages are also mounted on this chassis. The power supply occupies the right-hand third of the chassis, the speech amplifier and modulator tubes the center third, while the modulation transformer occupies the left-hand third of the chassis. The two 813 modulator tubes are located in the upper center of the photograph, with the three speech amplifier tubes below them. The 6SJ7 microphone input amplifier is located in the center with the push-pull driver tubes on either side. In order that a small power transformer may be used to obtain the required voltage for the screen grids of the 813's, a bridge rectifier circuit is employed.

The three high vacuum rectifier tubes used in this circuit are mounted in the lower right-hand corner of the chassis, directly above the power transformer. The remaining components are filter chokes, filter condensers and filament transformers associated with the power supply. Plate and screen voltages for the three 6SJ7 speech amplifier tubes are obtained from series dropping resistors connected to the bridge rectifier circuit just mentioned. 75 volts of modulator grid bias is obtained from a small selenium rectifier power supply mounted underneath the chassis. A VR75 voltage regulator tube is employed to stabilize this grid bias voltage. This tube may be seen directly below the three speech amplifier tubes.

High Voltage Power Supply Layout

A tube complement was chosen wherein adequate audio power would be derived to modulate the required r.f. power, and yet operate from the same power supply. The high voltage power supply is a standard full-wave power supply circuit employing a pair of type 866A mercury-vapor rectifier tubes. Telephone-type mounting is used wherein the heavy components are mounted on a vertical chassis which

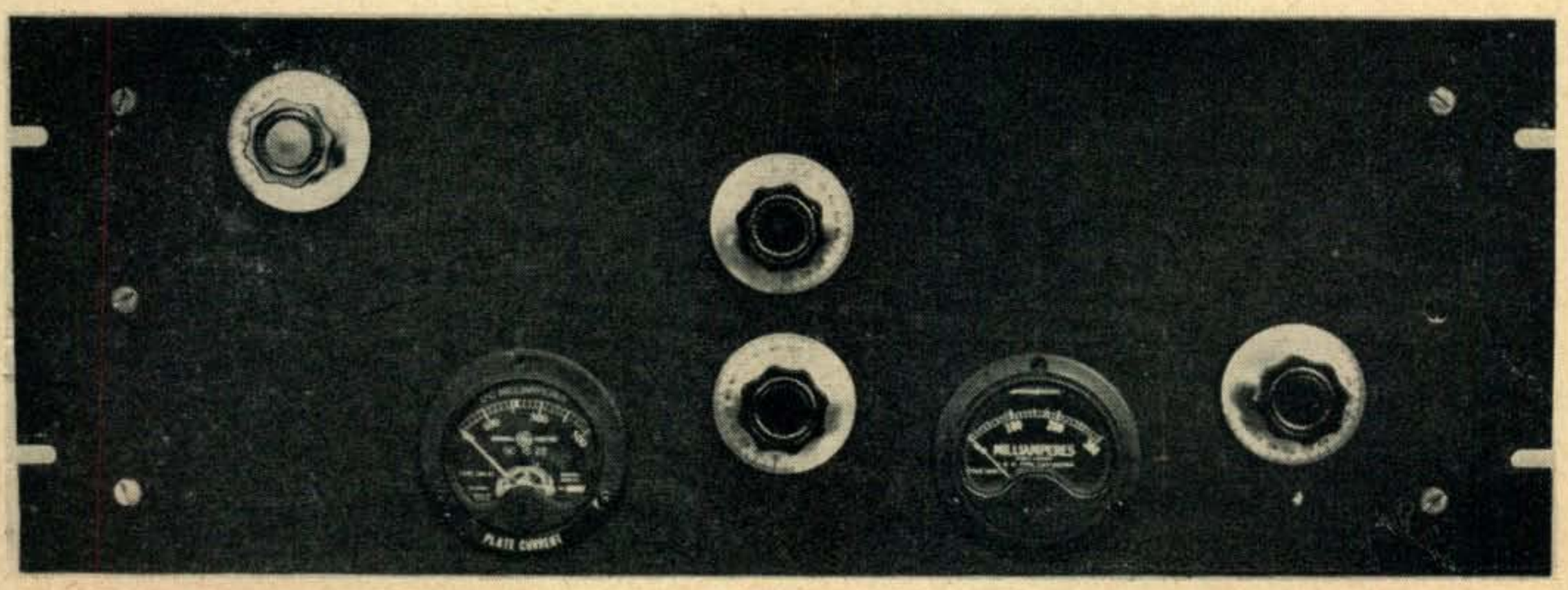
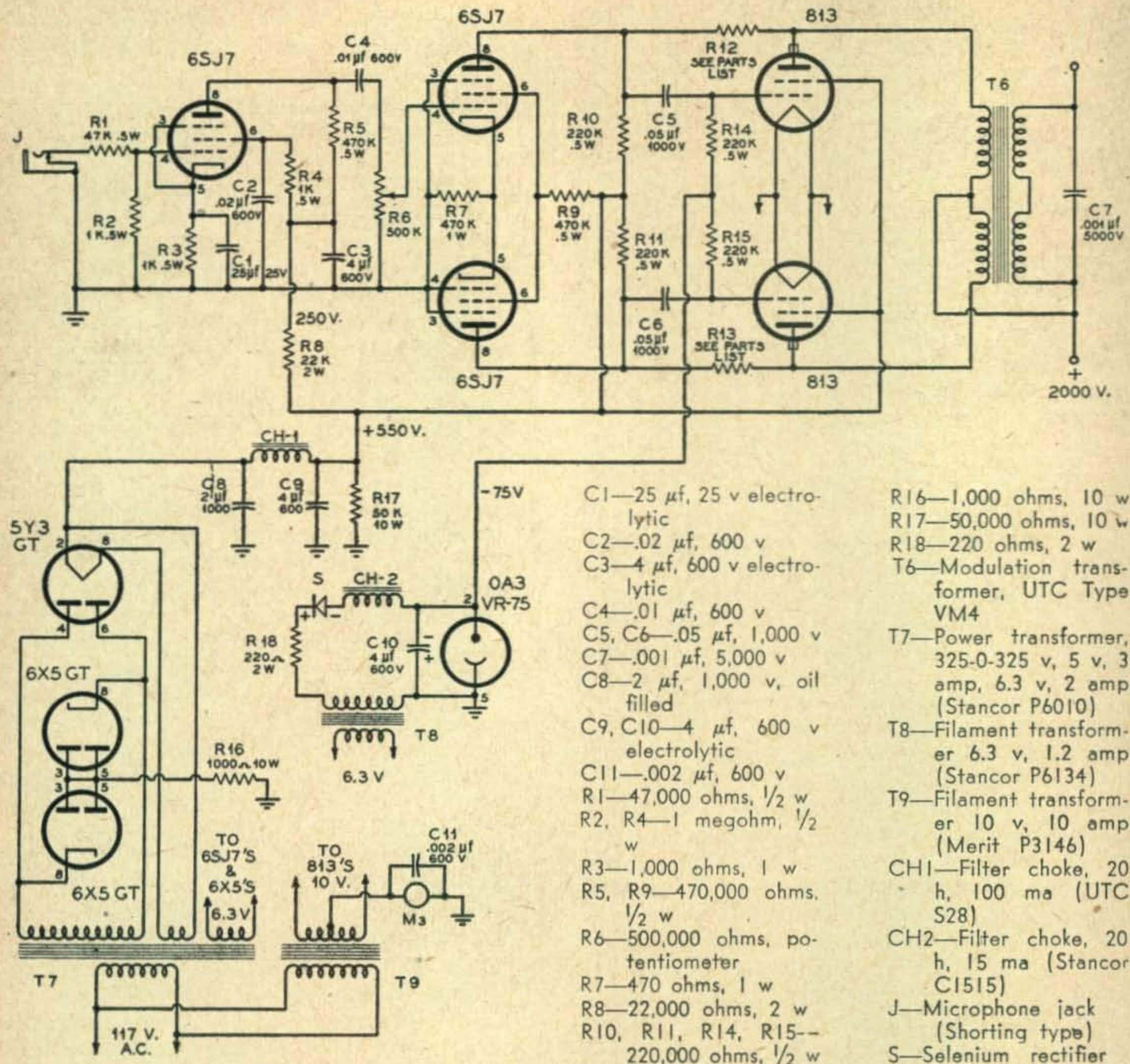


Fig. 1. Front panel view of the long lines high power final amplifier. All of the necessary tuning controls and adjustments are on the front panel within easy reach of the operator.



Speech amplifier and high power modulator circuit schematic.

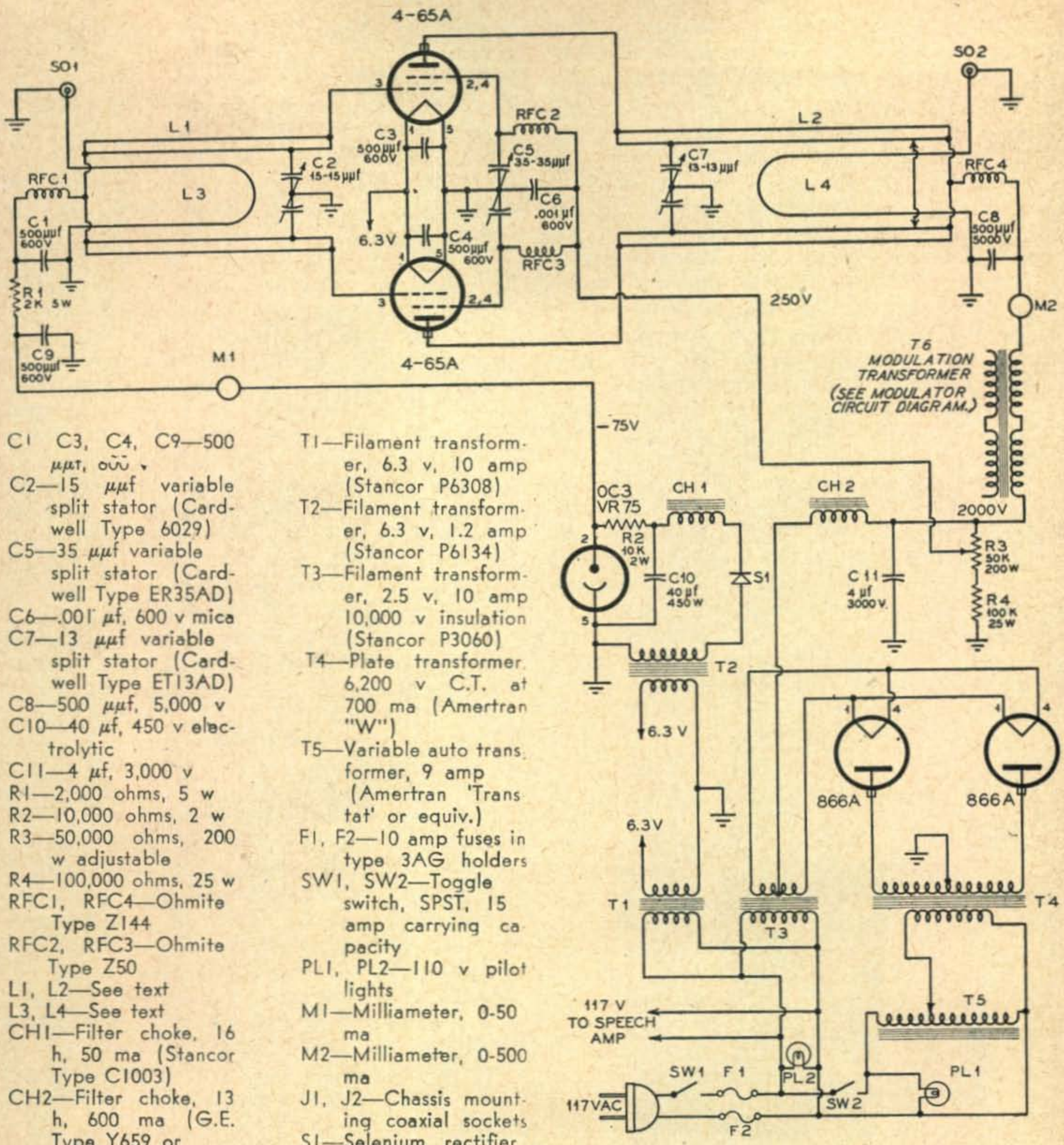
C1—25 µf, 25 v electrolytic
C2—.02 µf, 600 v
C3—4 µf, 600 v electrolytic
C4—.01 µf, 600 v
C5, C6—.05 µf, 1,000 v
C7—.001 µf, 5,000 v
C8—2 µf, 1,000 v, oil filled
C9, C10—4 µf, 600 v electrolytic
C11—.002 µf, 600 v
R1—47,000 ohms, ½ w
R2, R4—1 megohm, ½ w
R3—1,000 ohms, 1 w
R5, R9—470,000 ohms, ½ w
R6—500,000 ohms, potentiometer
R7—470 ohms, 1 w
R8—22,000 ohms, 2 w
R10, R11, R14, R15—220,000 ohms, ½ w
R12, R13—each consists of six 1 w 470,000 ohm resistors in series
R16—1,000 ohms, 10 w
R17—50,000 ohms, 10 w
R18—220 ohms, 2 w
T6—Modulation transformer, UTC Type VM4
T7—Power transformer, 325-0-325 v, 5 v, 3 amp, 6.3 v, 2 amp (Stancor P6010)
T8—Filament transformer 6.3 v, 1.2 amp (Stancor P6134)
T9—Filament transformer 10 v, 10 amp (Merit P3146)
CH1—Filter choke, 20 h, 100 ma (UTC S28)
CH2—Filter choke, 20 h, 15 ma (Stancor C1515)
J—Microphone jack (Shorting type)
S—Selenium rectifier (Federal 100 ma)
M3—Milliameter, 0-300 ma

in turn is secured to the rear of a standard relay rack as shown in *Figure 6*. Removal of the front panel permits access to all wiring. The rectifier tube sockets are mounted on metal bushings and are placed between the front panel and the telephone-type chassis. Access is afforded to these tubes through a small door in the front panel. Holes in this small door permit proper ventilation of the tubes as well as permitting the tubes to be viewed 'glowing' while in operation. A *Transtat* continuously variable autotransformer is connected in the primary circuit of the high voltage power transformer. This permits reduction of power while tuning the transmitter or when maximum power is not required. The *Transtat* is not essential; a 150 watt incandescent light bulb could very easily be placed in series with the primary of the high voltage power transformer to effect reduction of the power while tuning, etc.

Construction

Construction of all units is quite simple and no difficulty should be experienced in the amplifier itself, if due care is given to the symmetry of the circuits in the long lines.

The grid circuit long lines (*see Figure 3*) are made of two 9-inch lengths of copper tubing ⅝-inch in diameter. They are spaced 1½ inches apart, center-to-center, and are secured to the chassis by means of two-inch standoff insulators at points approximately two inches from either end of each line. The ¼ inch holes tapped in the underside of each line permit utilization of ¼ inch tie rods (screws with their heads removed) to attach the lines to the threaded holes of the standoff insulators. The shorting bar, located at the left-hand end of the lines, is made from a strip of copper 2¼ inches long by ⅜ inch wide. It is secured to the extreme ends of the lines by means of 3/16 inch screws passing through the upper wall of the line and held



C1 C3, C4, C9—500 µµf, 600 v.
C2—15 µµf variable split stator (Cardwell Type 6029)
C5—35 µµf variable split stator (Cardwell Type ER35AD)
C6—.001 µf, 600 v mica
C7—13 µµf variable split stator (Cardwell Type ET13AD)
C8—500 µµf, 5,000 v
C10—40 µf, 450 v electrolytic
C11—4 µf, 3,000 v
R1—2,000 ohms, 5 w
R2—10,000 ohms, 2 w
R3—50,000 ohms, 200 w adjustable
R4—100,000 ohms, 25 w
RFC1, RFC4—Ohmite Type Z144
RFC2, RFC3—Ohmite Type Z50
L1, L2—See text
L3, L4—See text
CH1—Filter choke, 16 h, 50 ma (Stancor Type C1003)
CH2—Filter choke, 13 h, 600 ma (G.E. Type Y659 or equiv.)
T1—Filament transformer, 6.3 v, 10 amp (Stancor P6308)
T2—Filament transformer, 6.3 v, 1.2 amp (Stancor P6134)
T3—Filament transformer, 2.5 v, 10 amp 10,000 v insulation (Stancor P3060)
T4—Plate transformer 6,200 v C.T. at 700 ma (Amertran "W")
T5—Variable auto transformer, 9 amp (Amertran 'Transtat' or equiv.)
F1, F2—10 amp fuses in type 3AG holders
SW1, SW2—Toggle switch, SPST, 15 amp carrying capacity
PL1, PL2—110 v pilot lights
M1—Milliameter, 0-50 ma
M2—Milliameter, 0-500 ma
J1, J2—Chassis mounting coaxial sockets
S1—Selenium rectifier (Federal 100 ma)

Wiring schematic of the final amplifier.

in place with nuts inside the line. A 3/16 hole is drilled in the center of the shorting bar and a lug fastened to it to provide the connection for the grid bias circuit.

The input link, seen between the lines at the left-hand end, is made from a 12 inch length of 3/16 inch diameter copper tubing or rod. The tubing is bent into a "U" shape and one end is soldered to the coaxial socket *SO1* mounted on the rear edge of the chassis while the other end is secured to a small standoff insulator and is grounded. The link should be bent so it will occupy a plane parallel with the long lines; the exact distance from the lines will have to be ascertained when the circuit is in operation and should be set approximately ¼ inch below the long lines assembly. Adjustment information will be covered later.

A small shield separates the grid lines from the high voltage leads going to the plate cirucit. This is done to eliminate the possibility of self-oscillation due to feedback at this point in the circuit. This shield is made from a piece of sheet copper 5⅜ inches long by 3 inches wide; a ¼ inch lip is bent on the long side of the shield in order that it may be attached to the chassis.

At the left-hand side of the photograph in *Figure 3*, the lines are terminated in bus bar leads secured to the copper tubing by 3/16 screws going through

one wall of each tube. Appropriate lugs are attached for soldering to the bus bar leads. The bus bar leads then go to the grid pins of the two r.f. amplifier tubes.

The plate circuit long lines are made in approximately the same manner as the grid circuit long lines, but with different dimensions. The lines are made of copper rod (tubing will suffice, although may get hot if the amplifier is not loaded to the antenna properly) each 12 inches long and ⅝ inch in diameter. The rods are mounted 1¾ inches apart, center-to-center, and 2¾ inches above the chassis. They are supported at the end nearest the tubes on 2¾ inch ceramic standoff insulators (these may consist of two 2 inch standoff insulators with ¾ inch cone standoff insulators mounted atop them). The left ends of the long lines are mounted on a bracket 2¼ inches high and 2¾ inches wide with a ¾ inch lip at the bottom to permit securing to two 1 inch high voltage feed-through insulators. The shorting bar is made from a strip of copper ½ inch wide and 3½ inches long. It is bent to form a "yoke" that will fit over the lines. To secure this "yoke" in position, a strip of copper ½ inch wide and 2 inches long is placed beneath the lines. A 3/16 hole passing through the center of the "yoke" passes into a 3/16 tapped hole in the securing bar and holds the entire assembly rigid by compression. As may be seen in *Figure 2*, the lines are mounted so that direct connection may be made to the plate heat-radiating caps of the tubes by means of two straps, each made of ¾ inch copper strip approximately 3¼ inches long.

The antenna link may be made from a 12 inch length of copper tubing ¼ inch in diameter. This tubing is bent into a "U" shape to fit ¼ inch below the long lines and parallel to them. In order to control the adjustment of this link from the front panel, one end is fitted into a standard ¼ inch shaft coupling and this shaft coupling is attached to a standard panel bushing. The shaft then passes through the front panel where the control knob is attached. A short length of flexible copper braid is soldered to the antenna link at the point where it attaches to the panel bushing. The other end of this braid is attached to the forward wall of the amplifier shield, thereby completing this important ground circuit. The free end of the antenna link terminates in a length of flexible copper braid soldered to it, the other end of which is soldered to the coaxial antenna output socket *SO2*, mounted on the rear wall of the amplifier shield.

To preclude the possibility of the antenna link being turned too far and thereby touching the lines and short circuiting the high voltage power supply, a piece of lucite rod ½ inch in diameter and 2¼ inches long is sawed lengthwise *almost* from end to end; a small amount of material is left intact at one end to hold the rod in one piece. This piece of lucite now is slipped snugly over the end of the antenna link and cemented into place. This arrangement allows the link to be brought within ⅛ inch of the lines and yet prevent direct contact.

The two 4-65A tube sockets are mounted below the chassis by means of ¾ inch metal bushings. Standard 829B shields are used. *Johnson* type 122-101 tube socket assemblies may be used which provide a means of mounting without the necessity of metal bushings since the socket and shield are one integral unit. The two screen connections on each tube should be connected together with copper straps.

The modulator is assembled in a straightforward manner. The three tubes used in the bridge rectifier circuit are mounted to provide a compact assembly as well as to isolate the power supply unit from the speech amplifier portions of the circuit, thereby eliminating the hazards of hum pickup.

The small half-wave selenium rectifier power supply used to obtain 75 volts of grid bias for the 813 modulator tubes is located to the left of the center of *Fig. 5*. A 6.3 volt filament transformer *(T2)* is used "backwards" (i.e. 6.3 volts a.c. is applied to the secondary of the filament transformer from one of the filament transformers in the power supply, and the "isolated" 117 volts output is obtained from the primary) to obtain 117 volts a.c. for the power supply; this arrangement eliminates the annoyance of having the chassis above ground potential.

Construction of the power supply is not unusual

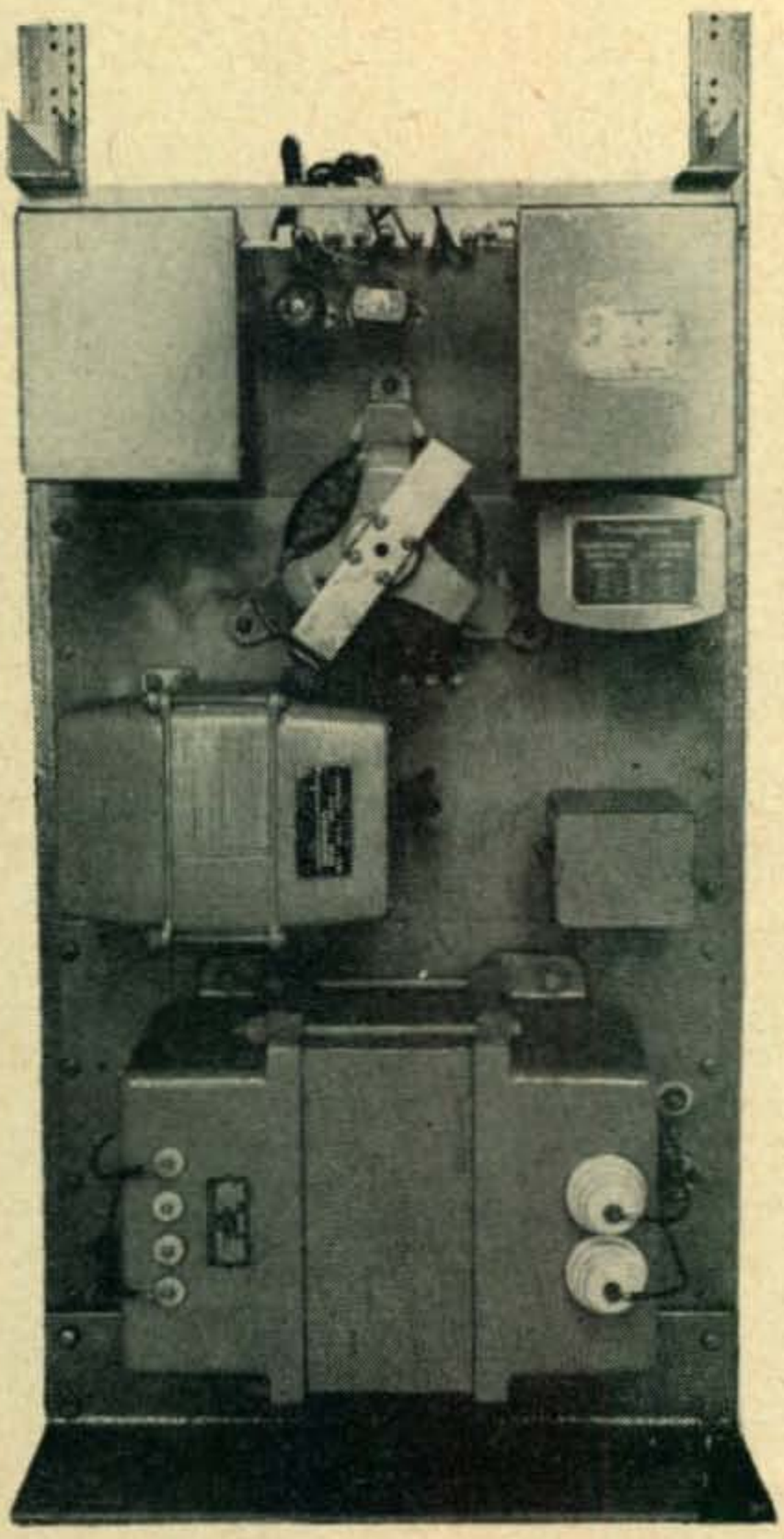


Fig. 6. Rear view of the power supply components mounted in a telephone-type fashion so that all of the heavy units are secured to a vertical chassis.

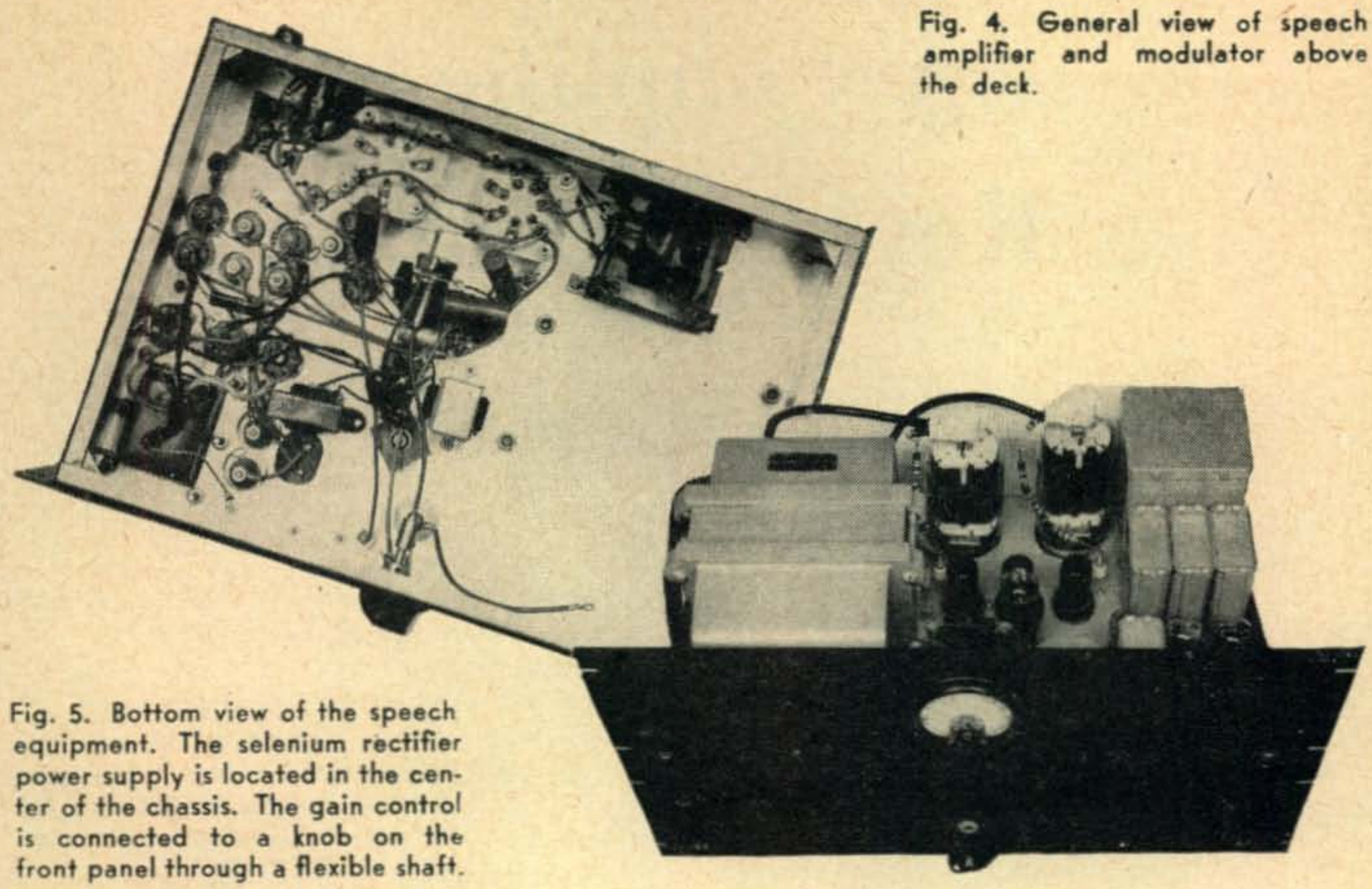


Fig. 4. General view of speech amplifier and modulator above the deck.

Fig. 5. Bottom view of the speech equipment. The selenium rectifier power supply is located in the center of the chassis. The gain control is connected to a knob on the front panel through a flexible shaft.

with the exception of the telephone-type "single-sided-mounted" rack assembly wherein all components which seldom need maintenance are mounted on a flat chassis plate secured to the rear side of a standard relay rack. The more expendable components such as bleeders, etc., are mounted on the front side of this chassis plate; access to these components is easily obtained by simply removing the front panel.

Operation

Tuning up operations for the r.f. amplifier are extremely simple. As shown in the photographs, the shorting bars for both the grid and plate long lines are secured at the extreme ends of their respective assemblies.

After making the usual routine check-over for wiring errors, the various power supply connections may be made. Excitation is then applied through the amplifier coaxial input socket *SO1*. With excitation the grid circuit of the amplifier may be resonated for maximum current reading on *M1* while tuning *C2*. Plate and screen voltages to the final r.f. amplifier should be removed while making this adjustment, but grid bias voltage to the 4-65A's should be applied. The grid input link *L3* should be adjusted to provide optimum drive as evidenced on *M1*. This is done by bending *L3* away from or closer to *L1* until a reading of 30 milliamperes is obtained on *M1*. After succeeding neutralization and plate circuit resonating operations have been performed, it may be necessary to readjust *L3* in order that the correct amount of grid drive is supplied to the 4-65A's.

The next task is to properly neutralize the amplifier. This is accomplished with the aid of a rectifier type wavemeter or a grid dip meter tuned to the transmitter frequency and loosely coupled to the plate lines. Excitation is applied to the input of the amplifier with the plate and screen voltages off. The screen neutralizing condenser *C5* should be adjusted for a minimum amount of feedthrough of r.f. energy as indicated on the wave meter or grid dip meter. The setting of the screen neutralizing condenser is very critical, but with care, a position can be found that will hold over most of the two meter amateur band.

Once neutralizing is completed, the plate voltage may be applied to the final amplifier tubes. *All* plate tuning operations should be effected with a dummy load connected to the coaxial antenna output socket *SO2*. Further, initial tuning operations should be performed with the plate voltage reduced to 650 to 850 volts so that out-of-resonance plate current will not damage the tubes. The final amplifier plate circuit should be brought into resonance with *C7* while watching *M2* for the "dip" or minimum. When resonance has been obtained, the amplifier may be fully loaded to the antenna by adjusting the antenna link *L4* for optimum plate current reading on *M2*. With a plate voltage of 2000 volts d.c., the amplifier may be safely loaded to 200 milliamperes.

After the r.f. amplifier has been correctly tuned, the modulator may be connected and plate voltage applied. The normal standing plate current for the modulator, as indicated on *M3*, is between 40 and 60 milliamperes. When full modulation is applied, the peak plate current should be no higher than 140 to 160 milliamperes. Careful aural scrutiny should be made of the modulated signal for hum, and if present, should be removed by one of the prescribed methods described in standard amateur handbooks.

A Simplified Keying Monitor

JOHN W. WATERLOO, W3NVI/MM*

If you were a CW man out in the middle of nowhere with a severely restricted number of radio components how would you go about building a keying monitor? Easy, says Radio Officer Waterloo of the "Atlantic Exporter." All you need is a fistful of ham ingenuity and a couple of neon bulbs. —Editor.

Recently, I began thinking of building a keying monitor for regular commercial use on board ship. After checking all available publications for some sort of a simple monitor I could not find any that suited either in size or price. One particular job seemed to require as many parts for its construction as a small transmitter.

The parts used in the construction of the monitor described here were "borrowed" from different sources. There is a possibility that many substitutions can be made by anyone on shore with a generous junk-box. The most important thing is the unit shown in *Fig. 1*, exactly as I built it.

The power for this unit is obtained from the receiver and this is only a milliamp or so. If your receiver can't spare that much, better throw it out.

How It Operates

Now for the operation—I placed one G10 1 watt neon *A* near the antenna insulator on my transmitter. This placement is not critical as long as the bulb is close enough to ionize when the transmitter is keyed. Any coupling (proximity) of the bulb from weak to very vigorous ionization will operate the unit in the same way. Actually only very light coupling is necessary.

The ionization of the neon bulb *A* acts as a keyer for neon bulb *B* which is a standard neon type audio oscillator. When *A* is ionized by keying it provides a path for the D.C. to reach *B* which oscillates at an audio rate with the frequency depending on *C1, R1, R2* and to a certain extent on *C2*. The plate voltage used will also affect frequency to some extent. With the values shown in *Fig. 1* and a supply voltage of 90 the frequency of oscillation is about 500 cycles. If you want to raise the frequency reduce the size of *C1*.

The output of neon oscillator *B* is coupled to the grid of the last audio in the receiver by condenser *C2*. This condenser is deliberately kept at a small value to prevent any loading on the audio grid. The value shown gives ample coupling.

It might be pointed out that the supply voltage for this unit can be anything from a minimum of about 70 volts, to a maximum of about 120 volts when using neon bulbs with a starting voltage of about 65. In other words, the voltage must at least be high enough to cause bulb *B* to operate when ionization takes place in bulb *A* when keying the transmitter. If the voltage is over about 120 then both bulbs might operate at all times whether or not the transmitter is keyed. Any voltage within the range stated above will give the same operation and is not critical.

A volume control could be used as resistor part of *R1* or *R2* but it was decided to keep the unit compact. *R2* could be split up into three one meg resistors and *C1* tapped at any point along *R1* and *R2* in case a lower audio level of monitoring is desired. In fact, *R1* and *R2* can be divided as your personal requirements demand, but the total should be around four megohms. Once the tap for *C2* is determined, however, it will not be necessary to make any changes.

One big advantage of this monitor is the fact that r.f. does not have to be piped around. I found it unnecessary to do any r.f. bypassing on the parallel rubber lamp cord that I used. The unit was checked on my commercial transmitter, which has an output of 200 watts, with no sign of any r.f. being picked up and carried along the cord. The unit should be coupled to either the final amplifier, antenna tuning unit or even the antenna itself. The lamp cord (or whatever you might use) can be any convenient length. Any cord that has high leakage resistance can be used. The cord is not critical in this respect.

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*SS Atlantic Exporter, Atlantic Refining Co., Box 7709, Philadelphia, Pa.

In case of a weak low frequency motorboating when not keying reverse connections to *A*, *B*, or both. This is caused by a slight capacitive current flow when both bulbs are connected in the same polarity with respect to the power supply. Changing the polarity of one or both bulbs will completely clear this up. I suggest using sockets for the type neon bulb used. With the bayonet type socket, just remove the bulb, give it a half turn and reinsert.

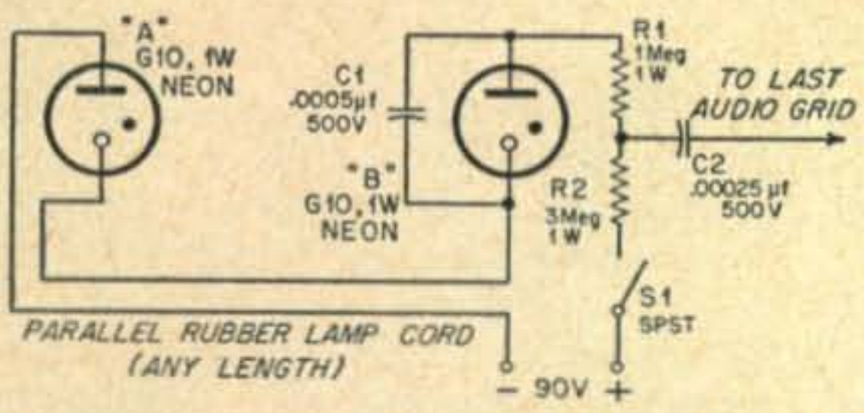

Fig. 1. By allowing your r.f. to ignite neon bulb "A" a circuit is complete which applies plate voltage to another neon bulb in a relaxation audio oscillator.

Fig. 1 shows the installation as I used it on an a.c./d.c. receiver without B— grounded. The circuit can be changed so that B+ would be connected to the lower connection of *A*, the top connection of *A* connected to the lower terminal of *R2*. The lower connection of *B* and *C1* should then be connected to B— and ground. Switch *S1* should then be moved to the B— supply lead. Of course the old connection to the bottom of *A* should be removed.

A companion unit used to deaden the first audio of the receiver when keying (or any time the transmitter carrier is on) is shown *Fig. 2*.

As in the case of the pickup neon tube in *Fig. 1*, tube *A* acts as a conductor when ionized by r.f. In this case, however, it conducts a negative bias voltage to the first audio grid through resistor *R1*. Condenser *C1* is used to give any desired receiver

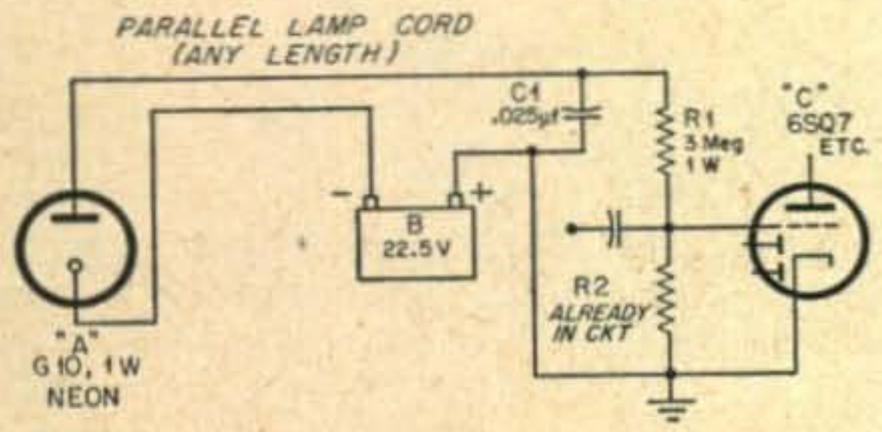

Fig. 2. The same idea can also be used as a receiver silencing gadget. The battery will easily last for its shelf life as the current drain is under one milliamp.

recovery time. By changing the value of *C1* this recovery time can be adjusted from practically nothing to any desired period. I found that the values shown in *Fig. 2* (except that I used 18 volts of "borrowed" bias batteries) gave a delay of about one half second. In my particular installation the controlled tube was A 6SQ7 with a grid resistor of 10 megs.

In *Fig. 3* is shown a suggested connection for other high Mu Triode audio circuits. Tube *V1* shows the usual connection for such a stage. In this case I think it would be necessary to add condenser *C2* and resistor *R3* to the existing circuit. Otherwise, if *R1* happened to be near the off position only a small part of the total bias voltage available from the battery would be applied to the tube grid. This because of the voltage dividing effect of *R2* and *R3*. Keep *R3* as large as possible and *R2* no larger than necessary to prevent any loading of grid of *V2* by condenser *C1* in *Fig. 2*. Of course, if *R2* were made too small there would be audio loss to ground and also a deepening of tone. These values should not be critical, because with a 22½ volt battery for bias there should be plenty of control voltage to cut off *V2*. I suggest for *R2* and *R3* a value of anything up to about 3 megohms. I would like to point out that due to lack of parts and circuits the only arrangement I tried is the one in *Fig. 2* and it worked perfectly.

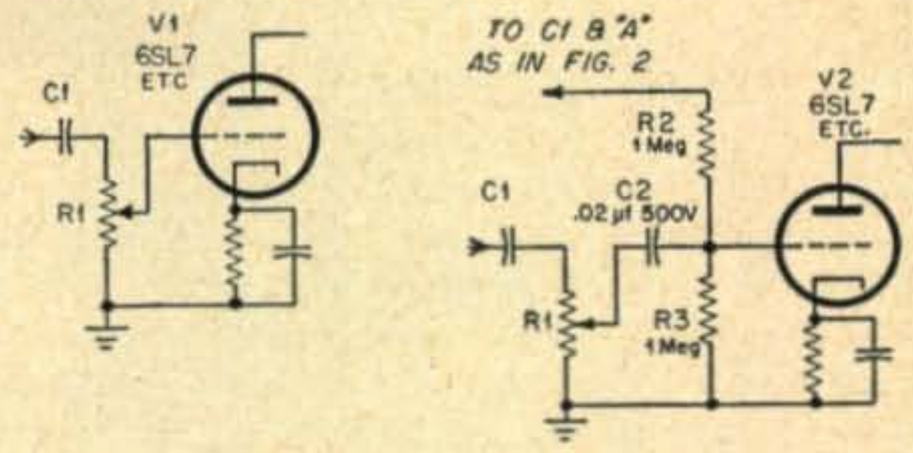

Fig. 3. Alternating wiring to be used experimentally with high-mu audio triode stages.

I suggest using a miniature 22½ volt battery for bias; only a fraction of a milliamp is drawn in operation so life should equal shelf life. Of course, this bias voltage could be obtained from the receiver but to keep the unit simplified and with the long life of the battery it is impractical to rob any plate voltage from the receiver.

Alberta Hamfest

The "Stampede City" of Calgary, Alberta, will be host, during the fifth and sixth of July, to another gala Annual Alberta Hamfest. Held under the joint sponsorship of the Calgary Amateur Radio Association and the Alberta Provincial Amateur Radio Association this year's festival will be located at the Harris Sky Rooms. Why not make it a real weekend by staying for the world famous Calgary Exhibition and Stampede, which occurs on July 7th? If you need accommodations write CARA, P. O. BOX 196. Pre-registration is $4.00 until June 16th, and $5.00 thereafter. Mail registrations to O. E. Wilson, treasurer, P. O. BOX 196.

A Monthly Department Edited by HERB BRIER, W9EGQ*

It does not take an amateur long to discover the importance of his transmitting antenna, and its importance is easy to understand. It *radiates* the power generated by his transmitter into space, and part of the power is then intercepted by a remote receiving antenna and fed to the receiver, thereby establishing a communications circuit. How this is done is impossible to understand without some knowledge of alternating current (a.c.) theory.

Fundamental Theory

Electricity travels through space at a speed of 186,000 miles per second, usually expressed as 300,000,000 meters** per second in radio work. An electric current flowing in a conductor produces a rotating *field* around the conductor. (See *Fig. 1.*) Current flow in one direction produces a clockwise rotating field, and current flow in the opposite direction produces a counter-clockwise rotating field.

An electromagnet demonstrates that these fields contain power. The many turns of wire around the iron core concentrate the field in the core, which is then used to do work by its ability to attract other magnetic materials.

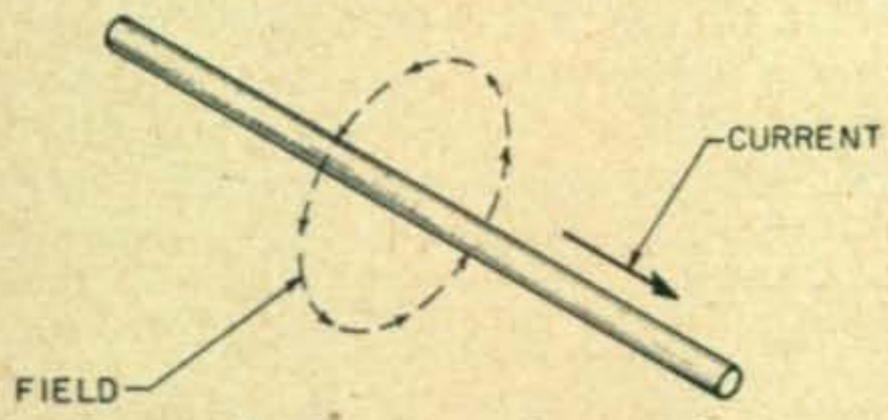

Fig. 1. Current flowing through a conductor produces a rotating field around the conductor.

If the direction of current flow reverses periodically, as it does in sixty cycle house current, it is called *alternating current* or a.c., and the accompanying fields build up and reverse direction of rotation in step with the current. Radio frequency (r.f.) currents are a.c., like house current, except that their *frequency* of alternations is measured in thousands and millions of cycles per second. For the remainder of our discussion, we will use a frequency of 3,700,000 cycles, or 3,700 kilocycles (kc), remembering that we could have used 27,000 kc or 145,000 kc just as well. *Figure 2* represents a.c. of any frequency.

A frequency of 3,700 kc is "in" the eighty meter amateur band. The relationship between 3,700 kc and eighty meters is both important and easy to understand. We know that an electrical current travels 300,000,000 meters per second and that an a.c. wave of 3,700 kc makes 3,700,000 complete cycles in one second; therefore each cycle takes 1/3,700,000 second, and by dividing *speed* by *time*, we obtain the *distance* traveled during one cycle, thusly:

300,000,000/3,700,000=81.09 meters

81.09 meters is the *wavelength* of a 3,700 kc current. Similarly, we find that a 27,000 kc signal has a wavelength of approximately eleven meters, and a 146,000 kc signal one of approximately two meters.

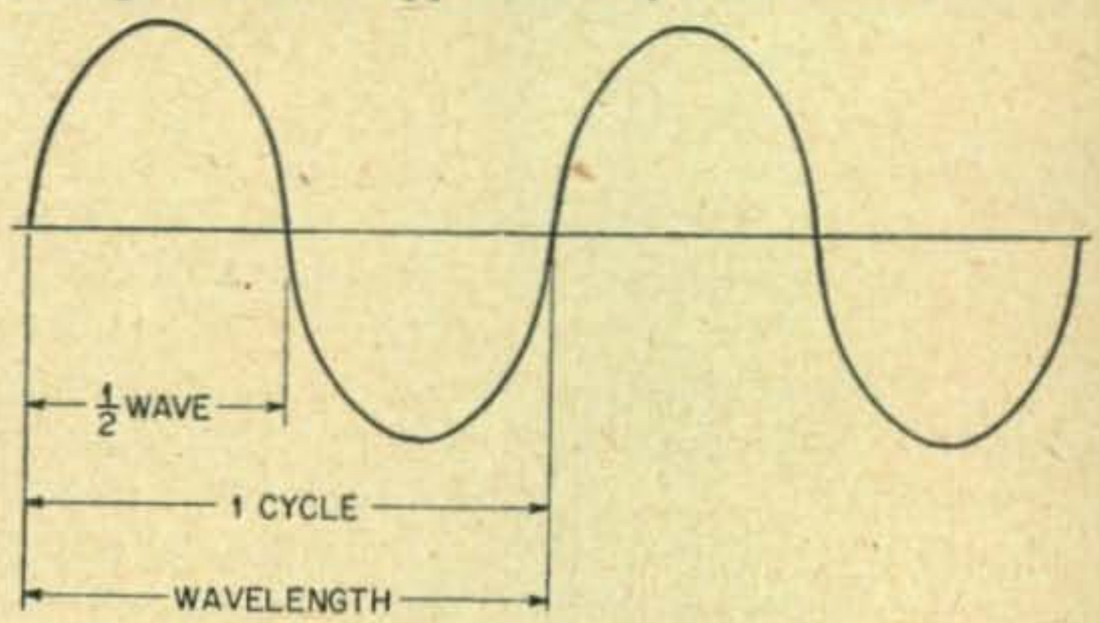

Fig. 2. Sine waves of any frequency.

We can now tie these pieces of information together. When the current flowing in a conductor is direct current or low-frequency alternating current, the resulting fields stay close to the conductor; however, when the frequency is high enough, the fields fly away from the conductor, never to return. *Figure 3* represents a conductor in free space carrying radio-frequency currents. Each concentric circle indicates a rotating field thrown from the conductor. These fields, called radio waves, contain power, which is lost to the conductor. In other words, the conductor is *radiating* power: it is acting as an antenna.

Designing An Antenna

While any piece of wire carrying radio-frequency currents will radiate some power, certain lengths will do so better than others. With the aid of *Fig. 2*, we can easily decide what a good length might be. We see that each half cycle is a duplicate of the next, except that they are 180 degrees out of phase—another way of saying they are going in opposite directions. Now suppose we cut a length of wire a half wave long and hang it in the air. (*Fig. 4.*) Assume that it is being excited at end *A*.

The current flows down the wire, reaches its maximum amplitude at the center, where the radiated field is also the strongest, and decreases to a minimum at *B*. A very interesting thing now happens. There is no more wire on which the current can

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** a meter is 39.37 inches.

travel, but it reverses direction at this point anyway; therefore it starts back up the wire, as shown by the dotted line, arriving at *A*, where it again reverses direction, just as another cycle of power begins to flow into the wire.

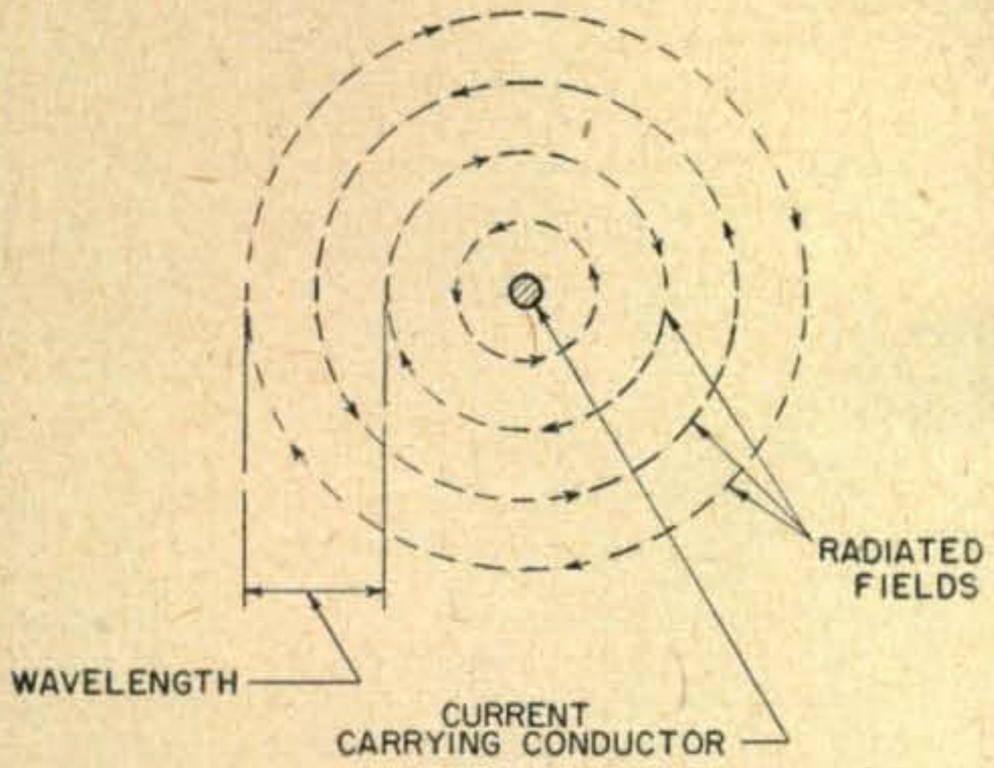


Fig. 3. This is how a conductor in free space radiates while carrying r.f. The fields called "waves" expand in all directions at the speed of light—300,000,000 meters per second.

If the wire is longer or shorter than a half wave, the returning current will arrive at *A* either too late, or too soon, to be reinforced at just the right time by the next incoming cycle of power. This reduces the radiating efficiency of the wire, or antenna, as we will now call it, although I repeat that almost any piece of wire carrying r.f. current will radiate after a fashion.

A properly-designed half-wave antenna is one of the most efficient electrical devices in existence. Very nearly one hundred per cent of the power delivered to it is radiated. Whether the radiated power goes where it will do the most good depends on the location of the antenna, its height, whether the frequency used is correct for the time of the day and the year or the distance to be covered (see April *Novice Shack*), and dozens of similar variables.

A convenient formula for determining the length of a half wave in space is:

Length (feet) = 492/Freq. (mc), or
492,000/Freq. (kc).

Radio waves do not travel on an antenna quite as ast as they do in space, for a variety of reasons, one of them being the loop at each end of the wire where the insulator is fastened. At frequencies up to thirty megacycles, the sum of the various shortening effects average about five per cent; so the formula for determining the length of a half wave antenna is:

Length (feet) = 468/Freq. (mc) or
468,000/Freq. (kc).

145-mc antennas are usually supported only near the center; consequently, end effects are somewhat less, and the formula below should be used on "two."

Length (inches) = 5540/Freq. (mc)

The following table gives the lengths of half-wave antennas for the centers of the three Novice bands. They will work well any place in the respective bands.

Frequency	Length (to the nearest inch)
3725 kc	125' 7"
27,100 kc	17' 3"
146 mc	38" (3' 2")

Feeding The Antenna

The simplest way to put power into an antenna is to connect one end of it directly to the antenna tuner in the transmitter. The biggest objection to doing so is that part of the antenna is then close to objects capable of absorbing power and distorting the radiated pattern. Although the losses so introduced may be tolerated on 3,700 kc, they are usually prohibitive on 27 and 145 mc.

More efficient is to erect the antenna in the clear and bring power to it by means of a feed line. Among the many possible feed systems, center or end-feed with a two-conductor feed line is usually the most practical. Ideally, the currents in each conductor are equal and out-of-phase, thereby minimizing radiation from the line. This condition is easier to obtain with center feed, because each conductor in the feed line is equally loaded, than with the unbalaced loading of end feed.

Another advantage of center feed is that the fifty to seventy-five ohm center impedance of a half-wave antenna can be matched directly by low-impedance parallel-conductor or coaxial line. With a transmitter of low harmonic output, such a line may be link coupled to the final amplifier tank coil.

The impedance at the ends of a half-wave antenna is quite high—estimates varying between 2,000 and over 10,000 ohms. Attempts to feed such a high-impedance point with low-impedance line results in excessive losses and, sometimes, breakdown of the line insulation. An open-wire line, consisting of a pair of *number 12* or *number 14* wires spaced two to six inches, is more practical for end feed. Although the impedance of such a line is between 400 and 650 ohms, resulting in a rather large mismatch when used for either end feed or center feed, the losses in an open-wire line are usually so low that increasing them two or three times still results in only a comparatively small percentage of the transmitter output being lost. An antenna tuner is almost always required with open-wire line.

We may use 300-ohm "ribbon" in place of open-wire line, and, although its losses are higher, especially when the mismatch is great, they are tolerable if the line length is not too great. *Figure 5* shows how it may be used to center feed a "folded dipole" antenna. This type of antenna construction raises the effective center impedance of the antenna by a ratio of four to one; therefore the 300-ohm line impedance is fairly well matched to the antenna.

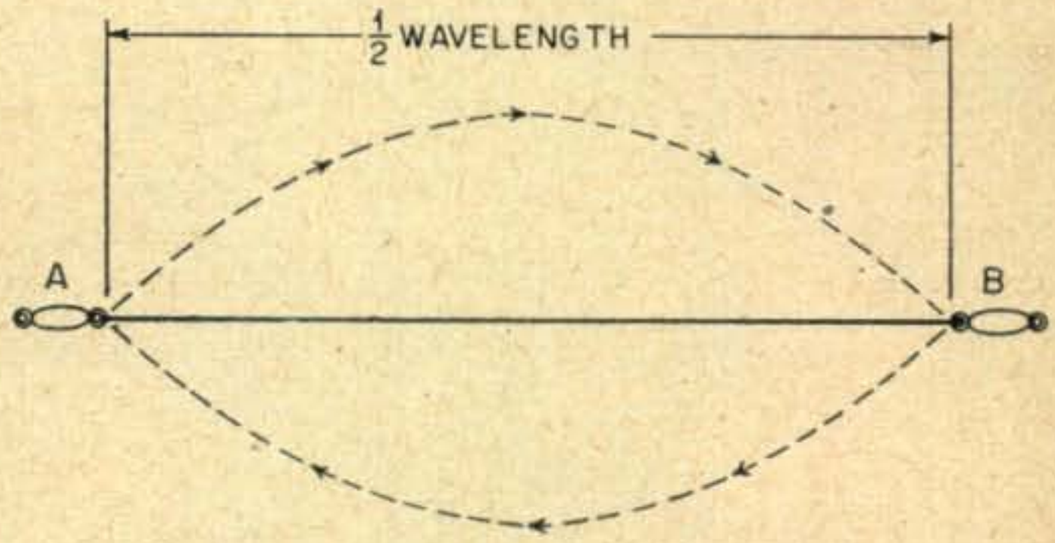


Fig. 4. Current distribution on a half-wave antenna. See text for details.

Before concluding this discussion, a few words about antenna height are in order. First, there is no one "best" height. About all that can be said is that a height of around thirty-five feet usually gives excellent all-around results, with antennas as low as ten or fifteen feet from the ground often working well. Where one's primary interest is DX, heights of fifty feet and more may be desirable.

Next month, I will discuss antennas longer than a

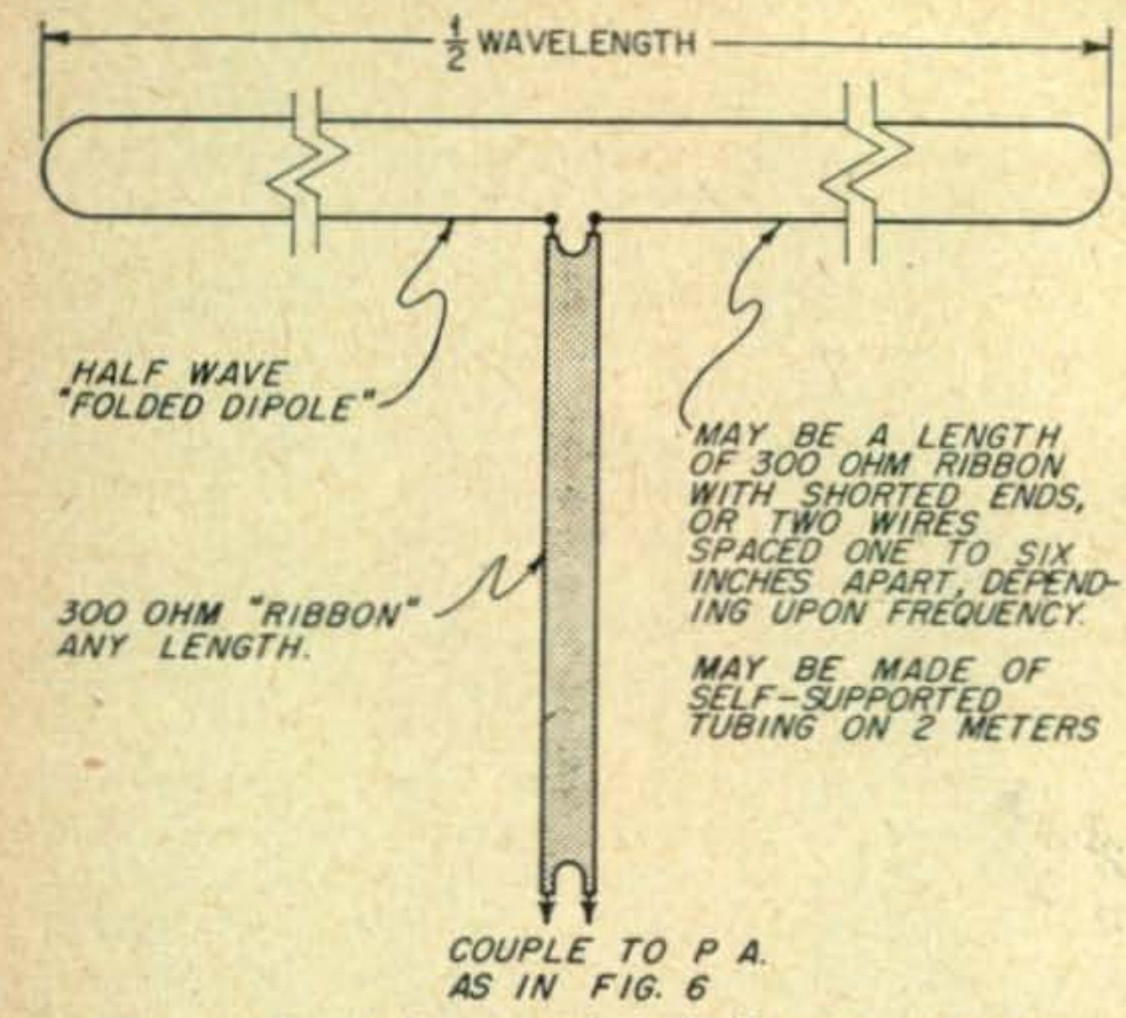


Fig. 5. Typical center-fed half-wave antenna.

half wave, antennas for 3,700 kc where space is limited, and simple beams for 27 and 145 mc.

Letters And General News

First of our letters is one from Mr. Fritz A. Franke, Assistant Radio Sales Manager, **The Hallicrafters Co.**, answering some questions about the **Hallicrafters Co.** Novice WAS Contest. ". . . The contestant for our Novice Contest must work all QSL's under his Novice Call. The day the 48th state is worked under the Novice Class License is the determining point in the contest, but we at Hallicrafters will not pass the validity of the QSL cards involved as we feel that ARRL's WAS Contest Committee should be the deciding judge in qualification.

"The awards of prizes will not be made until the official closing day of the contest . . .": Fritz A. Franke, Assistant Radio Sales Manager.

Merit, W6NLO/WN6NLO, is the one who had the balloon-supported antenna mentioned in a previous **Novice Shack Column.** Reading his experiences with the second one is enough to make one's hair stand on end:

"I was having a ragchew with a buddy of mine across town, when one of my friends saw the wind blowing the wire from my balloon antenna. He took about two steps, and the balloon took the final dive. All he could see then was a red hot wire and then a vapor trail which had just been my antenna. I was running about 10,000 volts to my 807! . . . At the time I was running the illegal limit, I was adjusting the loading. When I saw my kw antenna relay vaporize, heard my 807 crack, and felt a drop of molten metal hit my foot, I knew that something besides the crystal was cooking in my rig. Wow! What a close call. . . . I hope that hearing what happened here will warn others thinking of putting up a balloon antenna will make sure there are no high-voltage wires around first."

Bobby Clute, WN9ONA, not yet nine years old and licensed for over ten months shows his sister Nancy, six years old how to make a few contacts. Nancy expects to have her own call before she is seven.

Merit has worked forty-three states, and KZ5 and and has a 15-WPM code certificate. He is in High School and doesn't have much time for ragchews after baseball practice.

Bobby Clute will be nine years old June 8, 1952, and has been WN9ONA since July 24, 1951, making him one of the youngest amateurs ever licensed. His record may not last much longer, however, because his sister, Nancy, who is just six years old, can already copy the code at a speed of six words a minute, and she is now studying theory. Their adopted father, Ladd Smach, W9CYD, reports that Bobby will soon take his General Class examination and that Nancy expects to have her Novice License before she is seven. . . . Both Bobby and Nancy started learning the code to put messages in code in Ladd's lunch box. He would read them and write answers, which he puts in the box, while eating his lunch. The children would then be anxious to meet him when he came home from work; so they could read the replies. . . . WN9ONA runs sixty watts input to an 807, a half-wave antenna, and a NC-57 receiver, and operates mostly in the 3,700-kc Novice band. . . . The helping hand behind Bobby and Nancy is Ladd Smach, W9CYD, a ham since 1924. Among the many others he has helped get licenses are WN9OHU and WN9OGP, both of whom have now obtained General Class licenses. Ladd offers his help to anyone interested in amateur radio. He has complete equipment for testing Novice transmitters and receivers. He also has a complete station, consisting of an HRO receiver, 150 watt c.w. transmitter, and a sixty-watt, ten-meter phone transmitter. . . . Ladd's address and phone number are: Ladd Smach, W9CYD, 6145 W. Eddy St., Chicago 34, Ill. Telephone: Palisade 5-7367.

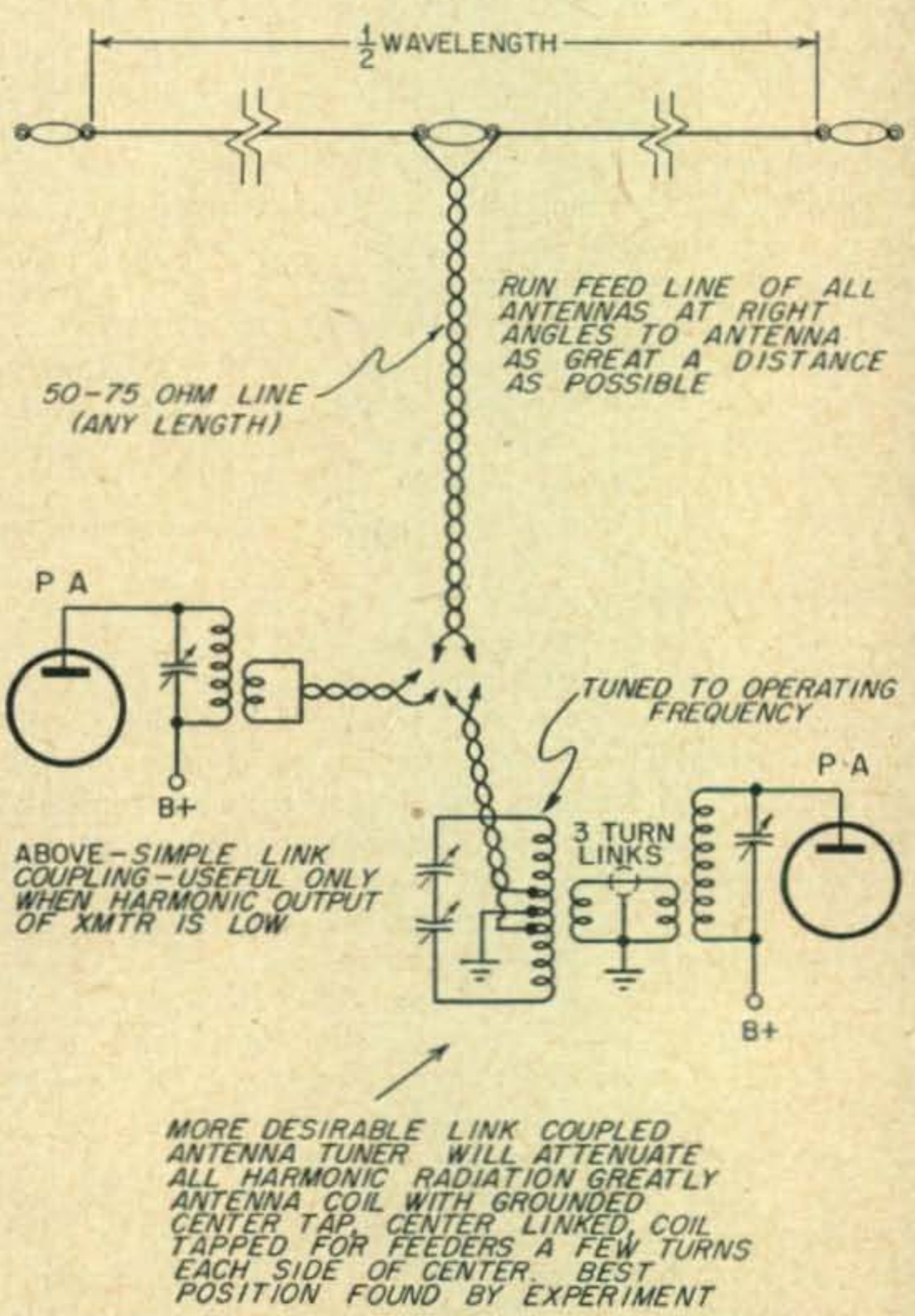


Fig. 6. Two of the most frequently used methods of antenna coupling. On the left a simple link and on the right with the antenna tuner.

Rudy, WN9PZT, has worked forty-five states in three months operation on 3,700 kc, with sixty watts input to an 807. Receiver is an NC-183.

(Continued on page 56)

Ionospheric Propagation Conditions

Forecasts by GEORGE JACOBS, W2PAJ*

June marks one of the four important phases of the earth's yearly journey around the sun. Because of the earth's tilt in the solar system, the overhead position of the sun apparently moves from 23½ degrees south latitude to 23½ degrees north latitude and back again in an annual cycle or one year. The sun reaches its most northern point of its apparent travels on June 21, and this day is called the "summer solstice." Meteorologically this day marks the beginning of northern summer and brings with it warmer and longer days. At the summer solstice not only is the sun at its most northern point, but also at its greatest distance from the earth. On July 3rd the earth is 94½ million miles from the sun, on January 3rd it is a mere 91½ millions away. These astronomical phenomena have a direct effect on shortwave radio propagation conditions in the northern hemisphere. Because the sun is furthest from the earth, the intensity of ionization is considerably weaker than during the winter which means that peak daytime MUF's are at their lowest values. However, since the hours of daylight are increased, ionization occurs for a considerably longer period of time, so that the daytime frequencies (20 meters) are usable for more hours a day than during the winter. Since there are fewer hour's of darkness, there is less time for the layers of the ionosphere to de-ionize and therefore night time usable frequencies are highest during this period. *(See Figures 1 & 2, Page 25, CQ, August, 1950).* More realistically this means that hardly any ten meter activity is expected; considerable 15 meter activity; 20 meter activity almost around the clock; some 40 meter activity and very little 80 meter activity.

You will notice in the *Propagation Tables* that the 15 meter band has been added, and the 80 meter band dropped. Any 80 meter openings that may occur on a circuit during the summer should occur between the same hours that 40 meter openings are possible, but to a far less degree.

Sunspots

The sunspot numbers continue to decrease, with this month's forecast based on a smoothed (12 month running average) number of 42.

In June there is a considerable increase in Sporadic E activity, and frequent "short-Skip" openings are expected on 10 and 15 meters with increased ionospheric openings on 6 meters.

General Propagation Conditions—June, 1952

EUROPE:

With peak daytime MUF's at their yearly minimum no 10 meter openings are expected. . . . Not much is expected of 15 meters, although there is the possibility that the band will open on exceedingly good days. The paths that are most probable are from the eastern and south central USA to southwest Europe and North Africa. . . . Twenty meters should remain open about an hour later in the day than it did during May, and circuits should be possible from all areas of Europe to all sections of the USA. . . . Forty meters should be considerably noisier during June. Some fairly good "all dark" circuits are expected on propagationally quiet nights. . . . Not much activity expected on eighty, high noise levels and increased absorption will permit very few openings. These infrequent openings will occur only during the dark hours.

SOUTH AMERICA:

As we enter the sunspot low period, the summer peak MUF's are not high enough to permit consistent 10 meter openings even to South America and very few ten meter openings are expected this month. . . . Fifteen meters will take up where ten has fallen off, and many good circuits are expected, during the daylight hours, from all areas of the USA to all areas of South America. The same goes for twenty meters. To many areas twenty meters should be open almost around the clock. . . . Forty should provide some openings to Central America and the northern countries of South America during darkness. Less frequent openings, and of a much noisier nature, are expected for eighty.

AFRICA:

No ten meter openings are expected. . . . Fifteen meters is just on the MUF, but is above the noise and absorption level (LUF) so that some openings are expected from most areas of the USA to South and central Africa. . . . Daytime absorption and atmospheric noise levels are extremely high on 20 meter circuits during June and openings to Central and South Africa will be infrequent, with best openings expected during the dark hours, that is, when both control points of the transmission path are in twilight or darkness. More frequent openings are expected to North Africa. . . . Some 40 meter openings are expected, but not too many DX possibilities to Africa expected for 80 meters.

AUSTRALASIA:

Some fair ten meter openings are expected to the Pacific coast area of the USA, with more frequent fifteen meter openings to all areas of the USA. . . . High absorption will keep signal levels down on 20 meters, but the band should open to all areas of the USA, with varying reliability, for the period of over eighteen hours a day. On the all dark paths, some fair 40 meter openings are expected, but not many for eighty.

ASIA:

No ten meter openings expected to any Asiatic Area. . . . On 15 meters an occasional opening of a very erratic nature, just above the noise level with heavy fading, is possible between east and central USA and the Near East, Far East and South East Asia. More stable and more frequent openings to the Far East and South East Asia should be possible from the Pacific coast. . . .

On 20 meters, some openings are expected to all areas of Asia from all sections of the USA. On many days signals will be extremely weak, picking up somewhat after local sunrise and again a few hours after local sunset. . . . High noise levels and absorption will not permit many openings on 40 meters or 80 meters except possibly from the Pacific coast to the Far East or from eastern USA to the Near East.

All circuits from an Easterly direction favor East and Central USA QTH's while signals arriving from a westerly direction favor Pacific coast QTH's.

Ionospheric disturbances and poor radio conditions are expected June 1, 14-15, 21-28. Periods of exceedingly good radio conditions will most probably occur June 3-5, 10-12, 17-18.

**A monthly department. Address all correspondence to 3620 Bedford Ave., Brooklyn 10, N. Y.*

EAST COAST TO: (Centered on Washington, D.C.)	10 Meters	15 Meters	20 Meters	40 Meters
	ALL TIMES IN G M T			
Scandanavia	Nil	1830-2130 (0-1)	1100 2000 (2) 2000-0130 (3)	0200-0400 (1)
Great Britain & Western Europe	Nil	1900-2100 (0-1)	1000-2100 (3) 2100-0130 (3-4)	0200-0600 (1-2)
Balkans	Nil	2000-2230 (1)	1000-2200 (1-2) 2200-0200 (3)	0100-0500 (1-2)
Central Europe	Nil	2000-2300 (0-1)	1000-2100 (2) 2100-0200 (3-4)	0200-0400 (1-2)
Southern Europe & North Africa	Nil	2000-2300 (1-2)	0930-2100 (3) 2100-0200 (4)	2300-0700 (2-3)
South Africa	Nil	1530-1830 (1-2)	0500-0700 (1-2) 0930-1800 (1) 1800-2100 (2)	0000-0500 (2)
Near East	Nil	1900-2100 (1)	1000-2100 (1-2) 2200-0200 (3)	0000-0300 (1-2)
Central America & Northern South America	Nil	1700-0200 (4-5)	1000-0000 (3-4) 0000-0500 (4-5) 0500-0800 (3)	2300-1000 (3-4)
South America	1900-2230 (1-2)	1500-0130 (3-4)	0900-2300 (2) 2300-0900 (4)	0000-1000 (2)
Hawaii	Nil	2300-0300 (2)	1200-0400 (2) 0400-0800 (3-4)	0500-1200 (2)
Oceania	Nil	2200-0300 (3-4)	1300-1430 (2) 2000-0300 (1) 0300-0700 (2-3)	0500-1300 (2)
Guam	Nil	2300-0200 (1)	1200-1500 (2-3) 1500-0400 (1) 0400-0600 (2-3)	0800-1200 (1)
Japan	Nil	2300-0130 (1)	1200-1430 (2-3) 1430-0300 (1) 0300-0500 (2)	0900-1000 (0-1)
India	Nil	Nil	1100-0000 (0-1) 0000-0230 (1-2)	Nil
Philippine Islands & East Indies	Nil	2000-2300 (0-1)	1000-1300 (2) 1300-0000 (1) 0000-0300 (2)	Nil
West Coast USA	Nil	1500-0200 (3-4)	1400-2200 (3) 2200-0400 (4-5)	0200-0900 (4) 0900-1200 (2-3)

CENTRAL USA TO: (Centered on St. Louis, Mo.)	10 Meters	15 Meters	20 Meters	40 Meters
	ALL TIMES IN G M T			
Great Britain & Western Europe	Nil	1930-2100 (0-1)	1030-2230 (2) 2230-0130 (3)	0230-0600 (1)
Central Europe	Nil	2100-2300 (0-1)	1030-2300 (2) 2300-0200 (3-4)	0300-0500 (1-2)
Southern Europe & North Africa	Nil	2000-2300 (1-2)	1000-1300 (3) 1300-2000 (2) 2000-0230 (3-4)	0130-0600 (2)
South Africa	Nil	1600-1830 (1-2)	0500-0700 (1-2) 1000-1800 (1) 1800-2100 (2)	0100-0500 (2)
Central America & Northern South America	2100-2300 (0-1)	1700-0200 (4-5)	1100-2300 (3-4) 2300-0600 (4-5) 0600-0900 (3)	0000-1100 (3-4)

CENTRAL USA TO: (Centered on St. Louis, Mo.)	10 Meters	15 Meters	20 Meters	40 Meters
		ALL TIMES IN G M T		
Hawaii	Nil	2300-0330 (3)	1500-1800 (2-3) 1800-0400 (1-2) 0400-0700 (4)	0500-1200 (2-3)
Oceania	Nil	2200-0400 (3-4)	1330-1500 (1-2) 2000-0500 (1) 0500-0830 (2-3)	0700-1300 (2-3)
Japan	Nil	2000-0600 (2)	0500-1400 (2-3) 1400-2000 (2) 2000-0500 (1)	0900-1200 (1)
Philippine Islands & East Indies	Nil	2300-0100 (0-1)	1300-1600 (2-3) 1600-0400 (1) 0400-0500 (2)	Nil
India	Nil	Nil	1300-1600 (1) 1600-0000 (1-2) 0000-0400 (1)	Nil

WEST COAST TO: (Centered on Sacramento, Calif.)	10 Meters	15 Meters	20 Meters	40 Meters
		ALL TIMES IN G M T		
Europe	Nil	2000-2300 (0-1)	1230-2300 (1-2) 2300-0200 (2-3) 0200-0600 (1-2)	0400-0600 (0-1)
South Africa	Nil	1400-2200 (0-1)	1200-2100 (1) 2100-0200 (1-2) 0530-0800 (2)	0300-0600 (1-2)
Central America & Northern South America	Nil	1700-2000 (1-2) 2000-0300 (3-4)	1300-1700 (4-5) 1700-0100 (3-4) 0100-0600 (4-5) 0600-0900 (3)	0300-1200 (4)
South America	2100-0200 (1-2)	1800-0400 (3-4)	1200-0100 (2) 0100-0500 (4) 0500-1030 (3-4)	0300-1100 (2-3)
Hawaii	Nil	2200-0400 (3)	1600-1800 (4) 1800-0400 (3-4) 0400-0800 (5) 0800-1200 (2-3)	0500-1300 (4)
Oceania	2200-0500 (2-3)	1930-0600 (4)	1800-0500 (1-2) 0500-0830 (2-3)	0600-1300 (2-3)
Japan	Nil	2000-0600 (1-2) 0600-0830 (2-3)	1500-1800 (3) 1800-0500 (2) 0500-1200 (3-4) 1200-1500 (2-3)	1000-1200 (1-2)
Philippine Islands & East Indies	Nil	2200-0200 (1-2) 0200-0800 (2-3)	0800-2000 (3) 2000-0800 (1)	Nil
Marshall Islands	Nil	2100-0630 (3-4)	1500-1700 (3) 1700-0600 (2) 0600-1100 (3-4) 1100-1500 (2)	0700-1400 (2-3)
Guam	Nil	2000-0300 (3) 0300-0630 (4)	1430-1800 (3) 1800-0700 (1-2) 0700-1100 (3-4) 1100-1430 (2-3)	0900-1200 (2-3)
India	Nil	0200-0600 (2)	0900-1600 (2-3) 1600-0700 (0-1) 0700-0900 (1-2)	1100-1300 (1)

Symbols for Expected Percentage of Days of Month Path Open:

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

A Monthly Department Edited by LOUISA SANDO, W5RZJ*

Here are the results of the YL/OM contest held the end of February. . . . Congratulations to W4SGD on the score she piled up, and to W1BFT for hanging onto top position among the OMs for the third straight year. This means that Varl will retain for the second year the gold loving cup donated by W8UDA. FB, Carl! . . . For top place awong the YLs in this contest, Kay will receive the silver loving cup, donated by W1BFT, and last year won by W6YYM. The two next highest scorers, both YL and OM, will receive certificates from YLRL. . . . In reporting the scores, W3LSX says W4SGD made all but three contacts on 75 meters, those three on 10 phone. . . . W3JSH operated all CW, and W3QPJ mostly CW. . . . Top scoring OMs used both phone and CW.

Here are the higher scores:

YL Scores		OM Scores	
W4SGD	9760		
W3JSH	5850	W1BFT	684
W3QPJ	5166	W4CKB	322
W1FTJ	5022	W8AJW	294
W3OQF	4743	W4NTT	280
W9JUJ	4352	W1BBN	186
W1SCS	3021	W2MHE	160
W7HHH	2850	W2BBK	150
W9JTX	2117	W4KL	120
W3PVH	1840	W9ADM	117
WØCXC	1780	W2CIH	80
W7KCU	1501	W2NIY	77
W1QON	1377	W9CXY	54
W3NHI	1288	W2GKN	48
W6FEA	1265	W8YGR	36
W3CDQ	1056	W8PM	35
W2YTI	1050	W9RCB	35
W8GJP	777	W2UAP	35
W1SRQ	645	W1JYH	30
W4UTO	468	W1ONV	30
WØBIC	336	VE3AVS	30
W6JPI	330	W5LIU	30
W7FWR	168	W9FYM	21
W7PEF	168	W4MMD	21
W2BNC	108	W2BIK	20
W1LYR	70	W5AWT	18
W6NAZ	36	W4MVM	15
W2OWL	21	W8DAD	12
WN1UPZ	16		

**Address all letters and correspondence to 959C 24th Street, Los Alamos, New Mexico.*

Welcome to a New YL

It is always good news to hear of another YL receiving her ticket and getting on the air. When that YL is a shut-in who is fighting to regain lost health, then it is especially heart-warming. Such a YL is Illeana Schumacher, of Melbourne, Wash. Illeana is in the third year of her fight to recover from polio. Both her legs have been paralyzed since September 1949 and she spends most of her time in a wheelchair. But her world is radiply expanding, for since the middle of March Illeana has been on the air as WN7RHM.

Illeana's station had been ready and waiting for her for a couple of weeks. With the friendly spirit so typical of the ham fraternity, some 40 hams and XYLs with jr. ops, from Bremerton, Everett, Seattle, Olympia, Aberdeen, and way points descended upon Illeana's home the first Sunday in March, bringing with them a gift transmitter. They strung up an antenna, put the rig on the air, and promised to "see you on 3.7 mc." Then they sat down to consume the twelve apple pies, two cakes, gallons of coffee and ice cream Illeana's mother had provided for the occasion.

It all started a year ago. Illeana wrote to the FCC asking for help in getting into ham radio. The FCC referred her to W7CZY, SCM, and through him and W7NRB she was introduced to W7AVM who helped her study theory and pick up the necessary 5 wpm code speed. The North Seattle Radio Club took Illeana under its "radio wing" and W7AWP built the transmitter from parts and with funds donated by other hams.

All the helping hams and their families signed Illeana's guest register. Among them: W7AVM, HUY, NQB, HF, SJ, KZ, CPE, WN7QXH, NRB, CZY, CV, CBE, LDZ, KZP, PQD, FWD, FWR, LFA, JQY, OND, HUL, NJA, AWP.

From now on until Illeana can one day remove her leg braces she'll be pounding the key at WN7RHM as the only way she can get out in the world—be looking for her. Welcome to ham radio, Illeana!

Here and There

Our thanks to W7FWR for sending the photograph and the newspaper article with the story of Illeana. Mary Ann also has had some nice publicity on her own account recently, when *The Sunday Olympian* published photographs and a story about the Tatro family and their radio hobby on the occasion of Mary Ann's OM, W7FWD, being awarded a silver key for many years of faithful participation

in ARRL activities. Mary Ann also is a faithful worker for she is QSL Manager for the Northwest. At present her files are bulging with some 60,000 cards awaiting their owners!

We are sorry to have to pass on this news, received from W1BCU. Peg reports that W6SLT, Edna McGeorge, XYL of W6EU, has become a Silent Key.

A QSL from W9KA gives one answer, at least, to the query, "*Do You QSL?*" in March CQ. W9KA was licensed in 1926 and since then he has sent a card to *every* station worked. "That means thousands of cards," says Roy, "and I have a collection of thousands received, too, but I still get a kick out of every new one I get whether it be DX or local."

W3MSU, Ethel, was in charge of setting up the Washington Radio Club station, W3CAB, at a recent Service Show at American University. W3CDQ, Liz, and W3LSX, Kay, each took a night to operate the station. Kay reports lots of interest in the exhibit and demonstration and says all went well—except during brief periods when the adjoining exhibit demonstrated a Tesla coil and X-ray!

A number of YLs turned out for the IRE Convention in NYC in March, among them W1BCU, W3MSU, W3AKB and W3LSX.

In our mention in this column in the April issue of the husband and wife ham teams in Alburquerque, we find it should have been six out of the seven YLs, instead of five as we said. The OM of WN5UDB. Charlotte, is WN5UDD.

Club News

Doings of the Los Angeles YL Club have been faithfully reported all year by W6WSV. Now Carol has resigned as Publicity Chairman. The reason—W6WSV and W6WSW are the proud parents of a fine little boy, Michael Kevin, who arrived April 11th. Congratulations, Carol and Dick! Bet your little Marcia thought the Easter bunny brought something really wonderful.

"That's about the biggest news this month from our club," reports W6CEE, Vada. "We gave her a shower just three weeks before. Had a swell turnout and Carol was so pleased. Those who attended were May England, ex-VE3QL (hostess), her mother, and May's two daughters; W6UHA, Maxine; W6MFP, Agnes; W6WQK, Ruth; WN6CQV, May; her daughter Joan, who has at last received her call, WN6OBZ; W6AVF, Mary; W6NLM, Beulah, and myself."

Six of the Los Angeles YLs, W6KER, JMS, LBO, MFP, UHA and CEE, helped the Inglewood Amateur Radio Club in the booth they had at the Hobby Show the latter part of March. One of the days they had a wonderful setup and got Japan traffic to Japan in five minutes or less. The station at the Hobby Show was in contact with W6HQX at Camp Pendleton, on 75 meters, where another operator was in contact with JA2MB, on 20, and the traffic flowed right through.

QRU?

We're always looking for material of interest to and about YLs. Do you have any news of your own activities, know any especially interesting YL personalities, or have any thoughts or suggestions you'd like to pass on to other YLs? We'd be most happy to hear from any or all of you.

Field Day

The Los Angeles YL Club is planning to go out on Field Day as a club this year. "We are going to allow the OMs to go along to do the cooking, babysitting, and be technical advisers!" adds Vada. The club hasn't received its own call from the FCC yet—they have applied for the late Helen Cook's call, W6MWO,—so will probably operate under W6NLM.

Other YL clubs undoubtedly will be operating as separate units during Field Day, and many many of you YLs will be giving the OMs an assist. Let's have reports from you—send along any info you want—the club you operated with, bands worked, scores, etc. And please do send along photos. Let's have a real YL report on Field Day.

Don't forget to study the recent FCC Dockets pertaining to amateur radio. All of us have an opportunity to voice our personal opinions and feelings by writing directly to the FCC. This month's editorial will give you some of the background material on these proposals.

Here are a few of the Washington State hams who got together to set up a gift transmitter for WN7-RHM, Illeana Schumacher. L. to r.: W7FWD, Assistant SCM; W7NRB, Section Phone Manager; WN7-RHM; W7CZY, SCM; W7-AWP, builder of the gift transmitter; W7FWR, Mary Ann, QSL Bureau Manager; and W7AVM, who taught Illeana the necessary theory and code for a license.

Gathered by DICK SPENCELEY, KV4AA*

By now the long awaited 21-mc band is a reality and early comers should have a pretty good idea how it ticks. We put up a plumbers delight beam for this band and were right on hand for the grand opening. In this way we hope to be able to give 15 meters a good coverage in the July issue so that a general idea of what to expect may be printed. Conditions being what they are, not too much can be expected, consistently, from any one of the DX bands. It is anticipated that the 21-mc band will combine some of the good, and bad, qualities of both the 28-mc and 14-mc bands with a leaning toward 14-mc characteristics. Thus, it should have real, low power, DX possibilities while remaining open for much longer periods than 28 mc. . . . . And when this solar cycle, they tell me about, starts righting itself. . . . Oh Boy!!!

Without further ado let us plunge into the scuttlebutt of the day which, at least, has quantity if not too much quality. The following items do give rise to some interesting DXing.

No stranger to DXers is E. Savundranayagam, VS9ES, of Colombo, Ceylon. (photo courtesy W9ABA)

At Time Of Writing

I1AIV reports I5OC, with I5RP, is now active in Galcaio, Italian Somaliland. QRG 14100 kcs. See QTH column. . . From **LU5AQ** we hear that VR6AC has been on Sundays with an RST 596 signal. VR6AC, John, runs a KW and QSO's with LU5AQ, LU7CD and W6SAI were reported. Time 1300z, QRG 020 and 060. See QTH column. . . . **TI2TG** reports VU5AB 060 2340z short path. Tom also nabbed W7DLY/KS6 0254z 14135. . . . **PY1DH** hooked HS1SD 1035z 060 who said QSL via ARRL. . . . From **W7BD** we hear that VS1EV will go to VS4 land June/July. Mac also heard one VS5DU 090 1700z. . . . **W6HJV** was heard calling VQ6BFC 020. . . . **WØELA** received letter from Brunei advising that the Resident Commissioner had been transferred to Singapore, but the local Wireless Engineer stands ready to give Clyde all assistance upon arrival. . . . **W3ADZ** reports ZP2AC putting in an S9 signal on 14100 then QSYing back to A3. . . . **EA1AB** reports EA8AW still in Canaries. Looks like the Rio de Oro/Ifni biz fell through. . . . **YA3UU** heard by W3JTC 1200z 095. Also was heard in VK QSOing some lucky G's and SM's. G3AAM advises that G4CP has handled a couple of YA3UU cards and one of the happy recipients was SM5KP. Jack also advises that YA3UU probably QRT now. . . . **VK4QL** reports VK2QZ/P9 was heard 7mc operating from Trobriand group but figgers this will come under the regular VK9 status. . . . **VP1AA**, after short layoff is resuming activities, 14001/VFO. . . . From **KG4AF** we hear that W6KYG recd QSL from LB4R who turned out to be in Jan Mayen. He is back home at LA4R now . . . . **YN1AA** reports W6EWC now active as YN1WC 28/14 and 7 A3 only. See QTHs. . . . **KG4AF** recd QSL from C9AM (as have others) mailed from Box 22, Matsusaka, Japan. C9AM states he terminated operation from Changchun, Manchuria on Aug. 1st, '51. . . . **ZL1PV** nabbed one OD5AB, we understand this is new prefix of AR8. . . . **ZM2MI** closed shop Apr. 30th. . . . No dope recd on the status of VQ9AB or OP5QL. The former was heard on 095 giving his QTH as Seychelles, the latter says QTH St. Helena QSL via R.E.F. . . . On **OP5QE** we figgered Mick might be on the prowl again as OP is apparently a legit Belgian prefix. . . . **CP1BK** has been showing up on low end 14mc 2330/0030z. Henry runs 30 watts and is old (1935) CT2BK. His QTH is 13,000 ft up. Nice place for underground beam!! See QTHs. . . . **W7BD** skeds VP8AJ, Antarctica, daily, 0015z 14008/14128.

From **ZL1HY**, Dave, reports that he was trying to arrange trip to Union Island with **ZM6AK** but ZM6AK returned to ZL before arrangements could be completed. 1HY has not given up, tho, and will see what may be done when his six weeks vacation comes around at end of year. Dave hopes to sell the Union Is. idea to ZL1MB and ZL1MP who are also 'remote spot' minded. . . . **W8ZWX** is looking for a rare QTH in the Caribbean area during summer vacation. We promptly recommended T19 (Cocos) as about the only thing left down this way. TI2TG offers license help to any one "TI9 minded". . . . **W3CRA** nabbed VR6AC and read the riot act about those using phoney calls!!! Aw if he's OK Frank he will come through with a QSL to prove it. He also reports VQ8CB may be heard from VQ9CB in July which confirms rumors we have heard. . . . **HB9AW** (FP8AW) plans Clipperton Island operation some time in July. Call will probably be FO7AW. . . . From **F9RS** we have several nice items as follows: FL8BC and PX1YR are rebuilding and should be on by now.——FB8AX, Terre Adelie, French Antarctica is now in operation.——FH8AB is definitely a pirate. There is no "Box 10" Wallis Is. and Huon Is. is uninhabited.——Two Madagascar stations now active

A monthly department. Address all correspondence to Mr. R. C. Spenceley, Box 403, St. Thomas, Virgin Islands. U. S. Air mail rates prevail.

FB8BB and FB8BC, two others have applied for license, FB8BD is not official.——FD8AA has been very QRL but will be going strong now. FD8AB works Xtl 14030 20 watts.——FF8AB is now only CW man in Dakar and is on 14 mc between 0700/0900 and 2100/2400 GMT.——F9RS has received the log from FB8ZZ covering the period from Jan. 13 to Feb. 8 covering QSO's with the following W's: 1FTX, 1HRI, 2GWE, 2YTH, 3OCU, 3JKO, 5ZD, 6KUR, 7GUI, 8ZZU, ØAIH, ØELA, ØNIA and ØTKX. QSLs have gone forward. FB8ZZs' log for 1951 not yet received.——QRT are F8EX/AR (Now in Paris), FF8AC, FF8DA and soon FQ8AE and FQ8AF.——AR8AB has new call, it is OD8AB!!!——FM8AD is spending three more months in France and then may go to FY8AD.——ZB1AJX (G3AJX) has returned to G.——FA8RB will go to FF8AL.——FA9IO will leave Western Sahara and go to Algeria.——FU8AA active on 7mc only. ——A new one for Martinique is FM7WH. See QTHs.——An embellishment in FQ land is FQ8AP. See QTHs. . . .

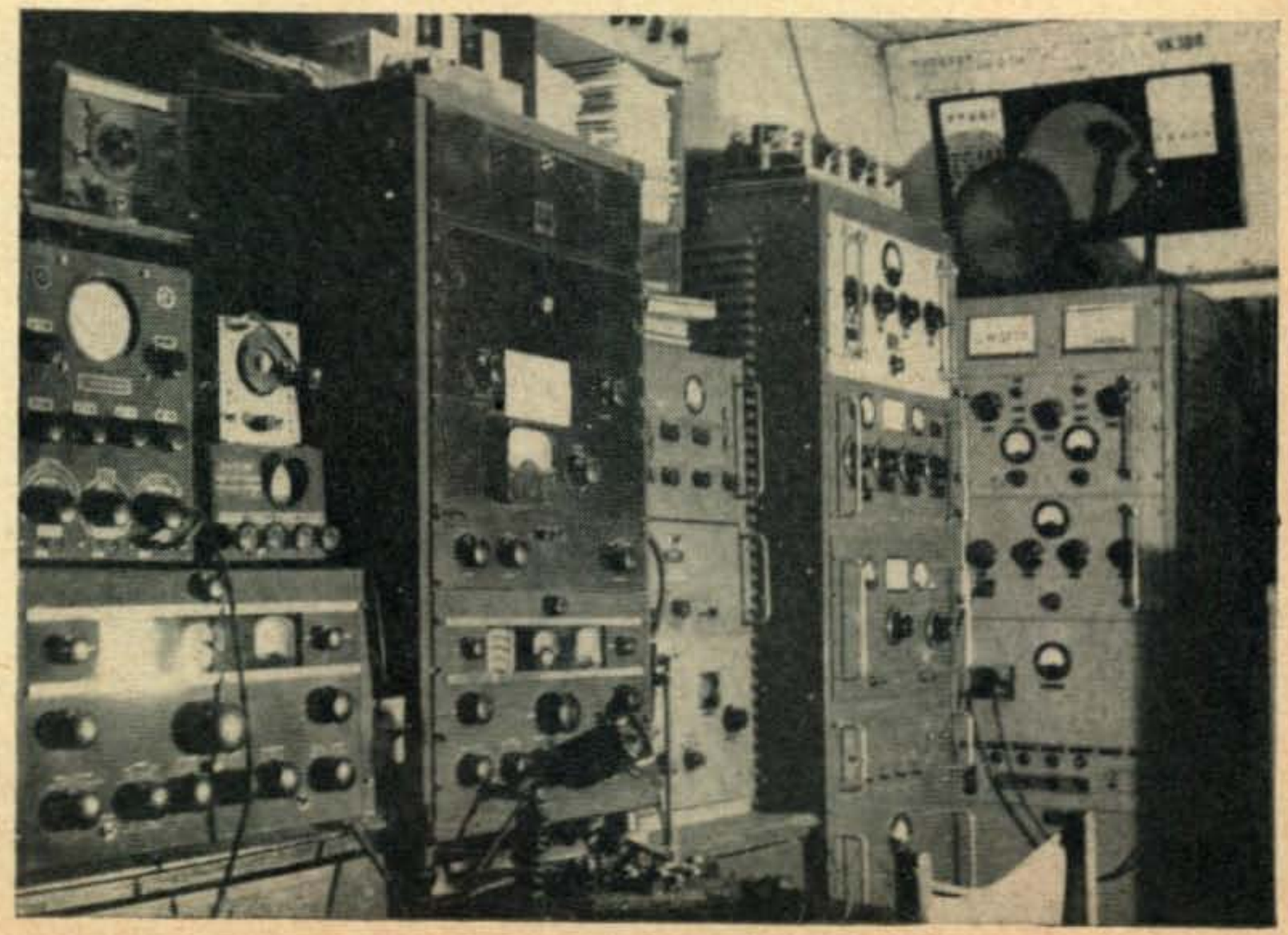
From **W4GXB** and via direct letter we are informed that F7BB, Jim, and F7AS, Dave plan Andorra operation for a few days in June. 28,14,7 and 3.5 mc will be covered A1/A3 depending on cdx. Call should be PX1BB. Jim has also obtained the Monaco call of 3A2AQ and should have been operating there in April. 14 mc A3 predominating. See QTH column. . . . **W4TO**, Buck, reports via MI3RR that some of the MI3 lads plan a trip to FL8!! Nice, nice. . . . **W4TO** advises that ZD4BC is none other than ZS6HW, he will be there 14 month Xtl-1009. Also, the FD8AB QSL is really something to look at. . . . **ST2HK**, ex G4HK/VQ4HK writes he is setting up shop in Khartoum, Sudan and will be the only ham active there with the possible exception of ST2TC in Malakel. All QSLs should go via RSGB until permanent ST QTH is acquired. . . . **KH6AKV/KJ6/KM6/KW6** reports VR1A going strong on Betio, Tarawa, Xtl 068 1000/1100z. Another ham is expected there shortly. . . **W9OSY/8** and **W2YNI** plan DXpedition to Africa in summer '53. They seek license data and procedure. . . . **VK3XO** reports Heard Island gang, VK1NL, VK1KJ and VK1DG arrived home amidst big celebration. Three new men were dropped at Heard. From VK4FJ we hear the Macquarie gang followed soon after. Roy has 1250 VK1BS QSLs ready for Bill to go to work on. 1BS hopes to settle down at VK2BS. . . . **VK4QL** reports ZK2AB active now and KH6QY/KC6 now uses straight call of KC6QY (Ponape). . . . **C3RA** was heard recently by VK3CX clg CQ W. . . . **PK5AA** now on way home. . . . **W3DKT** A3'd ZP4AB and ZP4AF within minutes. They are father and son combo, both in Ascension with separate rigs. 0400/0500z 275 kc. . . . **GI5UR** heard LB3OC calling CQ LA so OC could be a nice one. . . . **W9FVK** and KG4AF report W6OME enroute to TA where the call of TA2OME will be kilowatted out. Andy hopes to be on July 1st and will make good use of 21 mc. . . . **W8UPN** helps with the VP8 puzzle submitting list of VP8 bases as follows: Base A, Port Lockroy, Grahamland, VP8AJ (Antarctica) Base B, Deception Island, South Shetlands, VP8AK. Base D, Hope Bay, Grahamland, VP8AL. Base F, Argentine Islands off Grahamland, VP8AN. Base G, King George Island, South Shetlands, VP8AO, and Base H Signy Island. South Orkneys, VP8AE. . . . We might add that **VP8AU** and **VP8AT** are on South Georgia and there is no present activity on the South Sandwich group. . . **VP8AP** left Signy Is. and is now in the Falkland Is. awaiting 60 watt rig from Dundee. Dave will use the VP8AP call in F.I. . . . **VP8AE** will visit East Lynn and Ohio next summer's vacation.

New Certificate

The U.R.E. (Union de Radioaficionados Espanoles), Aparatado 220, Madrid, Spain offers the "ESPANA DIPLOMA". . . . We quote:

> "The Union of Spanish Radio Amateurs, willing to reward the merit of the amateurs excelling better in the communications with the EAs, to stimulate the interest of the international and patriotic traffic and at the same time to symbolize on a title the gratitude and friendship towards the amateurs of all the world, creates the "ESPANA" Diploma, whose mission will be to distinguish with the pride of its noble heraldic strokes, the testimony of their excellent technical merits and be a script of universal fraternity."

Rules for obtaining this certificate for hams outside of Spain, are briefly: Applicant must show confirmation of 125 QSO's with separate EA stations in Spain's nine districts with at least 3 QSO's for each district, A1 or A3. All contacts must date after January 1st, 1952. QSLs need not be sent to U.R.E. if. . . . we quote: "This requisite can be substituted for a certification of the Associations who have reciprocity with this U.R.E. for the expedition of diplomas" . . . . again we quote: "In excepcional occurrences the "Espana" Diploma will be granted with an honourable character to the Spanish and Foreign Amateurs who have distinguished themselves in the communications field, or that have proved great social or tech-



This is part of the setup at GW3FSP. All the equipment has been home designed and built. Transmitters cover all bands from 1.8 to 144 mc. Antennas range from a 6-element Yagi to 270 foot Zepps. 173 countries have been worked, 18 on 1.8 mc.

nical merits" . . . . EA9 and EAØ districts will be counted as a unit. . . . Don't fake your QSLs as, we quote once more: "In any case, the U.R.E. decision will be definitif and without appeal." (We think you get the general idea.)

This will give you an idea of what's behind that big signal from Guantanamo Bay. Burt Fisher, KG4AF (W6EHV) has worked 150 countries in the last few months and racked up 2085 QSO's in the recent ARRL brawl. Burt runs a full gallon.

Exploits Here and There—

W6GDJ goes to 40-210 with KC6QY and VP2GH (Windwards) . . . **W2INE** nabbed OX3BQ, OE13HP, KT1CC and CT1BY. . . . Chas. **W1FH** adds VS2CE under the Singapore-Malaya split making him 40-247. . . . **VK4FJ** adds a few such as KC6DX (Truk), FI8KVA, HI8WF, VP2LE, MP4KAD and VQ8CB giving Roy a 39-190 total. . . . **LU5AQ** submits long list of QSO's which include KW6BB, FD8AA, CR9AF, KL7PI, VS7XG, VS6BA, JA8AB, 5A2TL, 3V8AB, CR7AG and KX6AH. . . . **EA1AB's** new beam is really hot. Javier reports 12 new ones which include VS9AC, VU2JV, VQ4HJP, AR8AB, FB8FR, ZP2BB and CR7CD adding up to 38-139. . . . Active on 3.5 were YU1AD, HE9LAA, TI2PZ and MP4BAE. . . . **YN1AA** nabbed some new ones in MI3LK, FO8AB, FK8AI, ZS6AAC and LU4ZI. . . . **G6YQ** went to 199 with FR7ZA and ZD6HN. Geo. has 185 cnfmd. . . . **TI2TG** finally added ZS2MI and went on to hook up with VP2SG and VP2GH. . . . **W2GLM** snuck up on FQ8AF, see QTHs. . . . **LU6AX** comes thru with HH3L and HI6TC while KG4AF rises to 150 with KJ6, FO8 and SVØ. . . . **W7HXG** nabbed FQ8AA and then FQ8AF. When it rains it pours, Lee. Also heard was FB8BE 14100, 1600z. . . . With help from W7BD; W2CTO and KV4AA latched on to VP8AJ. . . **OE13HP** is ex W7MYG running 400 watts and 75A1 Rx in Salzburg. See QTHs. . . . **W2BJ** nabbed HE9LAA while W7BD hooked OY3NR. . . . **GM3CSM** recd ZD6HN card and then wkd ZD6DU. . . . **G5DQ** hrd VQ4HJP, ZS3K and ZE3JP on 3.5 and QSO'd VP6AA and MD5GO. . . . **YU1AD**, Mirko, grabbed LZ1KAB, ZS2MI, ZD9AA, FB8BE (See QTH's), FI8YB and FK8AH on 7/14. On 3.5 1AD worked ZD4AB, PY1AIK, CT2BO, SU1FX and CN8FN. . . . **W1ZL** nabbed ZS3K 3506 while A1, **W2WZ** made it 221 with KH6QY/KC6. . . .

Jim, **W5FXN** got No. 146 in VP8AJ. . . . **VP7NM** added ZK2AA for No. 155. Chas. plans to resume activity now after QRL layoff. . . . **W5AVF** added VP8AD (Port Stanley F.I.) on 045. . . . **PY1DH** hooked HZ1MY, see QTHS. . . . **OH2RY** goes to 174 with 9B3AA, FB8BB and others. Nice going Ed. . . . **WØTKX** went to 169 with LZ1KAB and MI3RR. LZ1KAB seems to QSL OK Bob. . . . . **W1ZL** made it 195 with FD8AB and VP8AP. Carl got a kick out of nabbing LU1EP on 3.5. . . . Tommy, **G6QB** comes up to date with 17 additions putting him at 40-212. . . . **W1RAN** added CP1BK for 127. Ned needs FM7WF QSL. . . . **W6MUF** rises to 137 with such stuff as ZK2AA. HR2HZ, KH6QY/KC6 and VK1BS. . . **W4OEL** QRP'd with ZS5KF, VQ4CM, OE13HP and GW5FN. . . . Our reliable correspondent **W4KE** reports QSO's on 3.5 with FA8BG, KP4KD, XE2G, KG4AF and KV4AA. 7 mc was good for numerous and sundry VK's and ZL's while OQ5RA, EA9AP, FF8AG, TG9CR, EL2A, CT3AA and 9S4AX were nabbed on 20. . . . **XE1AC** added ZS2MI A3 for No. 214 putting A1 on top position in Phone Honor Roll. On CW FD8AB and ZS2MI boosted A1 to 222. . . . **OZ7BG** rises to 155 with FZ7AA, VK1BS, VQ8AD and EL2R. Nice going Eric. . . . **W6TI** nabbed CR4AD for 205. . . . **VK4HR** adds 9B3AA, VP2MD and VS2CY. Harry patiently waits for QSLs from VP2GB and WØOZW/KS6. . . .**W7BD** now skeds MP4BBD after 28 year wait for MP4 QSO. . . . **W3MZE** adds 9 including KG6FAA, PX1AR, KR6HC, CP1JB and VP5BP putting Earle on 150. . . . **WØFID** nailed VS7XG and MI3US. . . . Pat, **W2AIS** made it 106 with ZK2AB on 7010. . . . **VE2BV** bagged VP2SE, ZP4AF and HI6EC. . . . **VK2ACX** ups to 222 with 12 new ones which include VP8AJ, EAØAB and FL8BC. . . . Lindy, **W8BHW** lands on 231 with VQ1RF, HC8GI and MP4KAE while Dick, **W6ATO** hits 160 with ZD2HAH, GC4LI, FY7YB, VK1BS, VK9XK and FN8AD. . . . Buzz, **W9ABA** arrives at 166 with C3AB, GD3UB and ZK2AA. . . . **W8FRD's** 20 watter pulled in PY7WS for continent No. 5. Al also nabbed KZ5CS on 3.5. . . . **W6RLN** goes to 196 with FB8BB, MP4BBD and VP5BF, nice gg KC. . . . We have a few items on 160 meter operation—Clarry, **VE1EA**, in a recap of the past season shows a total of eleven overseas contacts. Hopes for better conditions next year. . . . **W2QHH** informs us that VP4LZ now has xtl on 1982 and was on in April——Besides nabbing ZL1BY in contest. **WØNWX** also QSO'd XE1OK, KH6IJ and KH6QY/KC6——**W5MET** also nabbed KH6IJ on 160——**W7LNG** QSO'd KH6IJ, KH6AEX and KH6MG in test.

LU—Z

From LU5CK we are advised of Argentine activities in the Antarctic zone with government licenses issued as follows:

South Orkney Islands:
Laurie Island—LU1ZA, LU2ZA, LU3ZA, LU1ZG and LU2ZG.
South Shetland Islands:
Deception Island—LU1ZC, LU3ZI, LU4ZI, LU5ZI, LU6ZI, LU7ZI, LU8ZI and LU9ZI.
Palmer Islands—Melchoir Archipelago:
Observatory Islands—LU1ZB, LU3ZH, LU4ZH, LU5ZH and LU6ZH.
Argentine Continental Antartica, Grahamland, Margherite Bay, General San Martin Base-LU1ZD, LU1ZJ and LU2ZJ.
Argentine Continental Antartica, Grahamland:
Punta Proa—LU1ZE, LU2ZE, LU3ZE and LU4ZE.
(The above are credited on WAZ listings.)

Flora & Fauna

Our collective hats are off to W8EKK who lost the use of both hands through a nerve injury. This does not deter Jack from CW operation as he keys the transmitter aurally through a three stage voltage amplifier. Being of the silent sex Jack's jaws tire after QRQ stretches of mouthing dot and dashes into the mike which necessitates QRS at times. We vouch for the quality of his code however, and would go so far as to recommend this system to a lot of glass arms we hear about the band. W8EKK recently nabbed FD8AD for No. 140!

Our "Welcome home" and "Well done" goes to Al Hix now back in business at W8PQQ. Al enjoyed himself thoroughly while spreading happiness via his exploits at 7B4QF, PX1AR, 3A2AC and F7AR. Hope you are the first to snag PX1BB and 3A2AQ with the new 75A2 A1!

(Continued on page 65)

W. A. Z. HONOR ROLL

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TELETYPE

A Bi-monthly Department Edited by WAYNE GREEN, W2NSD*

What are you getting out of ham radio? Let's face it, this is a hobby, not a business, and should provide the interest and excitement with which to balance off a day at the office or on the street-corner. Whatchu been doing, eh? Like most of us, I suppose that you don't get on the air as much any more. You know, you hear the same people on there all the time, etc. Nuts. Now, on teletype we get into the darndest discussions. I suppose it has something to do with the type of people that go in for new fangled gadgets like that (my machine is dated 1917), but most of all I think it is the challenge of sitting at a typewriter. Somehow that automatically turns whoever is sending into an author, not just a fellow swapping signal reports. Excitement? You bet, lots of it. check with some of the fellows listed here as to their feelings in the matter.

Printers Available

Interest in amateur teletype has whipped itself into a frenzy in the last few months and I have been expecting to get word at almost any time that the supply of equipment is running short. As you may know, most of the teletype equipment in use by amateur stations comes from the commercial users of teletype equipment. The system normally works like this: When an amateur puts in an order for a printer with the VHF Teletype Society (W2BFD), this order is relayed (with the money) to whatever company has a printer available for replacement nearest the amateur. A new teletype printer is then sent to whatever office needs the replacement and the old printer is taken off the line and sent back to the company repair shop where it is checked. The machine is then packed and shipped to the amateur who has ordered it. The process usually takes about six weeks, which is lickety-split for a complex operation in the commercial world.

At present, this is the only standard method of getting printers since all of the wire companies have contracts with W2BFD for the disposal of all of their equipment. The only hold-out in this well-ordered scheme of things is the Bell Telephone Company. They apparently have a contract to the effect that they cannot sell their used machines and have to junk them. This is quite short sighted and I hope that this can be changed so that we will be able to take advantage of the thousands of used machines that they discard every year. An interim understanding might be made for the use of some of the many printers that they have in storage if they would lend them out to amateurs, keeping actual ownership to themselves. Hundreds of machines could be kept in good operating condition in this way.

Address all letters and correspondence to 1379 East 15th Street, Brooklyn 30, N. Y.

Now and then some of the gang find a machine in a junk yard somewhere, ransom it and refurnish it. This happens often enough to keep a lot of the fellows scouting around just to make sure. Say, if you know where there are some machines available I sure wish you would let me know about it so that I can try to get them into amateur hands.

Frank White, W3PYW, of Silver Spring, Md., writes: "We grind away down here. New beams, higher power, new exciters, new receivers. I was thinking back the other day as I was in a four way with W4JCV Leesburg, Va., W3PKF Frederick, Md., and W3LMC Baltimore. We were passing it around, using both phone and teletype with Q5 signals at all stations at all times; well here is what I was thinking: First time I worked W4JCV the signals were Q3; first time with W3LMC they were Q2, and Frederick, I barely heard him for months, and finally worked him. Now we sit on a frequency and bat it around just like the telephone and forget the not too distant past when it was otherwise. I wonder how often this is duplicated elsewhere? Do fellows work a station, barely work it that is, and call it a day, or do they constantly try to improve and get better signals? This gang down here is always on the go. No lousy dipole antennas, no converted 522 receivers, no 522 transmitters; every one is making, or has a low noise converter, at least 500 watts input, at least ten elements, and RTTY equipment to match. We are enjoying RTTY on two meters and the friends we have met. We spend our time making new gear and talking to these friends. The new bug is FSK on two meters. We believe that we can work DX constantly if we use FSK. Isn't this much better than sitting around waiting for the FCC to give us a new deal on a silver platter?"

Model 21A

At present, Western Union is getting rid of quite a bit of their multiplex equipment and there are a lot of the model 21A typing units becoming available for amateur use. These units are particularly intriguing because they are so compact and silent in operation. They print on strip paper and are operated entirely by means of solenoids. That's right, no motor, The whole unit is quite small and should be dandy for any unusual people that might want to try mobiling with a printer under the dashboard. The darned things only cost around $25 too. Of course, there is a drawback to these contraptions, naturally. They don't have a built-in distributor, being designed to work in sets from one single gigantic distributor. These distributors were offered to us at a very reasonable price but we turned them down after one look for they require a derrick and a truck to move and would just about fill a normal ham shack. A much simpler solution to the problem is to make your own distributor or to use the receiving distributor from the model 12 or tape equipment. There are at present a hundred or so of these gadgets in use around the

country in ham shacks and most of them run very nicely. There are, I believe, still a few of the instruction books available which were printed for the west coast gang a while back. They cost a couple bucks and W6CLW probably has 'em.

Polar Relays

The polar type relay is a natural development of the mark-space type of signaling. A normal relay depends upon a spring to return the contact arm to the de-energized position, a good solution to the problem in on-off or c.w. circuits where current flows through the relay coil only when the key is down. In a polar circuit the current is not keyed off and on, but is merely reversed in direction, making it possible to eliminate the spring in the relay and have the reversing current swing the contact arm of the relay back and forth. Relays of this type are capable of much higher speeds of operation than the spring return types since there is only the inertia of the small contact arm and the friction of the bearings to contend with.

Polar relays generally have either one or two coils. The single coil relays *(C & D)* require the current in the line to reverse while the two coil relays *(A & B)* can be operated by changing the relative currents in the two coils or by connecting the coils together to make one. The Wheatstone Associated Press type 1B made by Morkrum Kleinschmidt, Chicago (*A* above), has two 120-ohm coils and a screw mechanism for rotating the mark and space contacts slightly so that the contact arm is right in the center. Writes Doane of Indiana: "I believe this has been improved on quite a bit by W.U. engineering developments, namely by making both the upper and lower bearings almost friction free and putting in a lower thrust plate of quartz. This makes the relay suitable for 60 cps and higher at about 85% efficiency." TheWestern Electric 215A (*B* above) has two 80 ohm coils and a handy plug in base. This unit is considerably smaller than the Wheatstone and much more plentiful, so naturally it is in wide use for amateur teletype. These units cost from $5 to $6.50. The 206AH (*C* above) has a single five ohm coil and is useful for special circuits where only a low voltage is going to be used. A flashlight battery will run this easily. Relay *D* is one that is marked D-162716GB. This relay has one 24-ohm coil. Not pictured, but currently available for $3 is the W.E. 239GY which has two 180-ohm coils and one 1145-ohm winding. This is also in wide amateur use. Also available is the W.E. 206L which has a 500-ohm coil. This is listed as selling for $4 in good condition and $2.75 slightly scratched. The marks and spaces come along at a pretty fast clip in teletype and special relays such as these are needed to follow them.

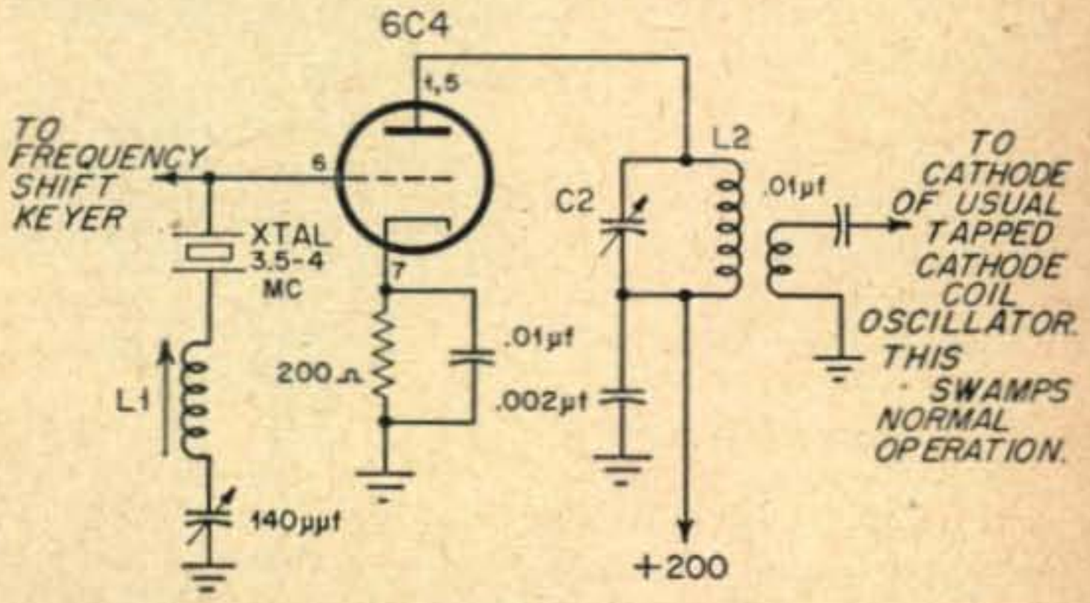
Frequency Shift Keying

The standards now in use for both commercial and amateur radio teletype call for the mark signal to be 850 cycles higher than the space frequency. This is just the opposite from the custom with AFSK where the mark signal is 2125 cycles and the space signal is 2975 cycles, 850 cycles higher than the mark. The reason for this double standard is that since the local oscillator in the receiver is usually higher than the received frequency there is an inverting of the received signal, thus making the space seem higher than the mark when tuning. You don't have to understand this really, just take my word for it blindly.

Since frequency shift keying has been, to all extents and purposes, denied to the amateur operator there has been little experimenting with it, and less put in print. The field is not wholly barren for the commercial stations and the armed forces stations have been using teletype for some time and have some circuits which do nicely as a foundation for amateur

These are a few of the polar relays commonly found in teletype equipment.

experimenting. Some of this equipment found its way onto the surplus market, and may have gotten to your shack. The Collins 709D-1, Press Wireless 05/FR and the AN/FGC-1 are good examples of this. The circuits used in these exciters have formed the basis of most of the amateur design done so far.



L1 — 80 TURNS #30 OR #32 WIRE ON XR-50 SLUG TUNED COIL FORM. (3.5 MC.)

L2 & C2 — TUNED TO CRYSTAL FREQUENCY.

The W4OLL series crystal tuned circuit idea.

The simplest method of frequency shift keying an oscillator is by putting a diode across it and keying the diode*. This will cause adequate shift in a VFO for operation on the fundamental, but a crystal oscillator normally will require doubling or quadrupling before the full 850 cycle shift is realized. One

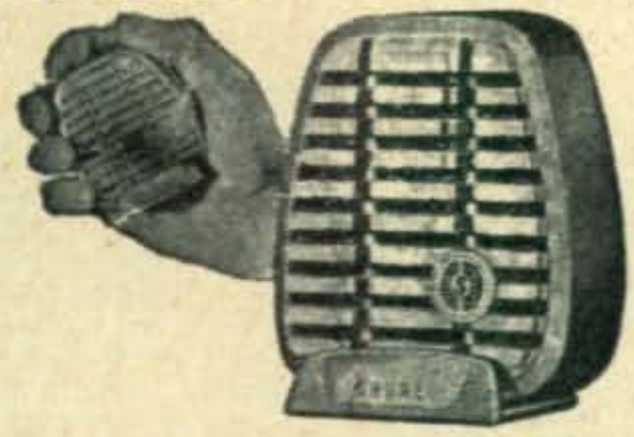
(Continued on page 59)

*"Simple Frequency Modulator," Weitbrecht, CQ, April, 1952.

The Newcomer's Buyway

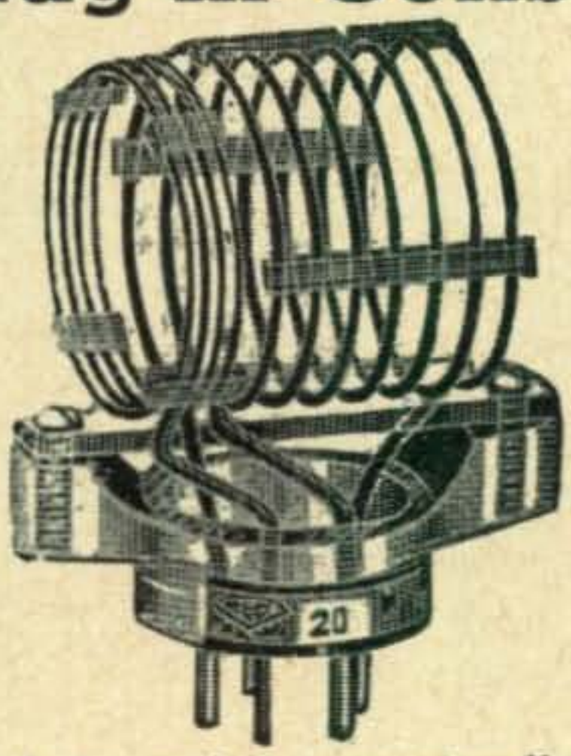
Advertising

"The Hercules"



In amateur radio, just like lots of other hobbies, there are all kinds of gadgets and accessories which one acquires in time as a matter of course. However, probably the first item a radio amateur requires, after obtaining his basic receiver and transmitter, is a dependable microphone, so voice "contacts" can be made. Regardless of whether you are a new-comer or an old-timer in amateur radio, the new Controlled Reluctance mike, the "Hercules" (manufactured by Shure Brothers, Inc., 225 W. Huron St., Chicago, Ill.) warrants your consideration. It is a hand-held magnetic unit that provides clear reproduction, high speech intelligibility, high output and ruggedness at an amazingly low price. Being magnetic, this mike is practically immune to varying conditions of heat or humidity. The "Hercules" can be used indoors or outdoors, fits snugly in the hand, sits firmly on a desk or can be placed on a stand. There are two models with an output level of 52.5 db below 1 volt per microbar. Model 510C "Hercules" lists at $15.00 while the Model 510S, which has a built-in switch, lists for only $17.00. The "Hercules" has a die-cast case, with a Metallic Green finish, See the "Hercules" at your Distributor or write Shure Brothers for further details.

75 Watt Plug-in Coils



The Novice will soon find that he can depend upon products that have been "proven best by test." The Bud 75 Watt transmitter coil with Polystyrene Base gives you improved performance, better appearance and long lasting quality. Polystyrene has proven superior to porcelain for many reasons, including far greater resistance to breaking or cracking—the Q of the coil is exceptionally high due to the extremely low power factor—pins are moulded in place and always remain perfectly aligned —sharp corners are eliminated, no danger of chipping—transparency adds to smooth, modern appearance.

Bud 75 watt coils are furnished with fixed or adjustable center links and fixed or adjustable end links. They are air wound, mount into 5-prong tube sockets and can be used on bands from 6 meter to 160 meter. Some are designed for use in circuits using Pentode tubes with high output capacity. See the complete Bud line at your local distributor.

BUD RADIO, INC.

2118 E. 55th ST. CLEVELAND 3, OHIO

Eldico's "PrivateTutor" Novice Radio Course

This frank letter from student Frank A. Rogers of Bernardsville, N. J., tells why the Eldico course is your best buy:

"... I thought you might like to know that your 'Private Tutor Radio Course' is in a very large measure responsible for my newly acquired call, WN2NIC. I have been on the fringe of Amateur Radio for over 25 years ... in all that time I never quite reached the stage of confidence with the code which would get me into the examiner's office. Then, in just two weeks' time with the Private Tutor records I passed the Novice tests and now sport my new call! I feel that the code course is the best yet, the recording is excellent and the signals are clean and readable throughout. I certainly recommend this course to anyone interested in getting on the air. You are to be commended for this boost which you have given to Amateur Radio."

We wish to thank Mr. Rogers for taking time out to tell us about his experience with our course. Write today for FREE Brochure on the unique Eldico "Private Tutor" Novice Radio Course. Eldico of New York, Inc., Douglaston, L. I.

OUR COVER

First RASO Presentation from USAF

During the three year period from May 1949 until May 1952 a group of over 500 conscientious radio amateurs in the western hemisphere have been quietly working on Project RASO. Subsidized by United States Air Force funds through the Geophysical Research Division of the Air Force Cambridge Research Center, Project RASO (or literally Radio Amateur Scientific Observations) was conducted by Radio Magazines, Inc., under contracts AF19 (122)-72 and AF19(122)-242.

In charge of this work for Project RASO was the present Editor of CQ, Oliver P. Ferrell, ably assisted by L. A. Rubin, W3MQU.

Project RASO was the greatest endeavor ever made by the U.S. Government in the procurement and use of amateur observations. The total number of individual reports submitted by the RASO Observers was in excess of 5000. The total number of observations forwarded to the AFCRC was well above 100,000.

As a matter of public recognition for the outstanding work accomplished by the radio amateur participants in Project RASO the U.S. Air Force on May 5th presented **Certificates of Appreciates** to all the amateurs in the project.

In the photo Mr. Rick Emerson, W3OJU accepts the first certificate on behalf of all the participants from Brigadier General Ivan L. Farman, Deputy Director of USAF Communications. At the left is Mr. N. C. Gerson, project scientist representing the Air Force Cambridge Research Center.

The full story of Project RASO will be told in a forthcoming issue of CQ.

the VHF news

Gathered by
W. E. "BILL" McNATT, W9NFK*

March 30th Aurora

Thanks to W2YXE and W8KZT for the following reports on the March 30 Aurora, although it was not of very great intensity or scope. W2YXE, Troy, New York, reports that he heard W1BCN, W2AZL, W2PAU, W3LZD, W3PYW, W4AO and W8LPD all calling CQ; he worked W3LZD, W3PYW and W2AZL. "Some Aurora," Paul comments.

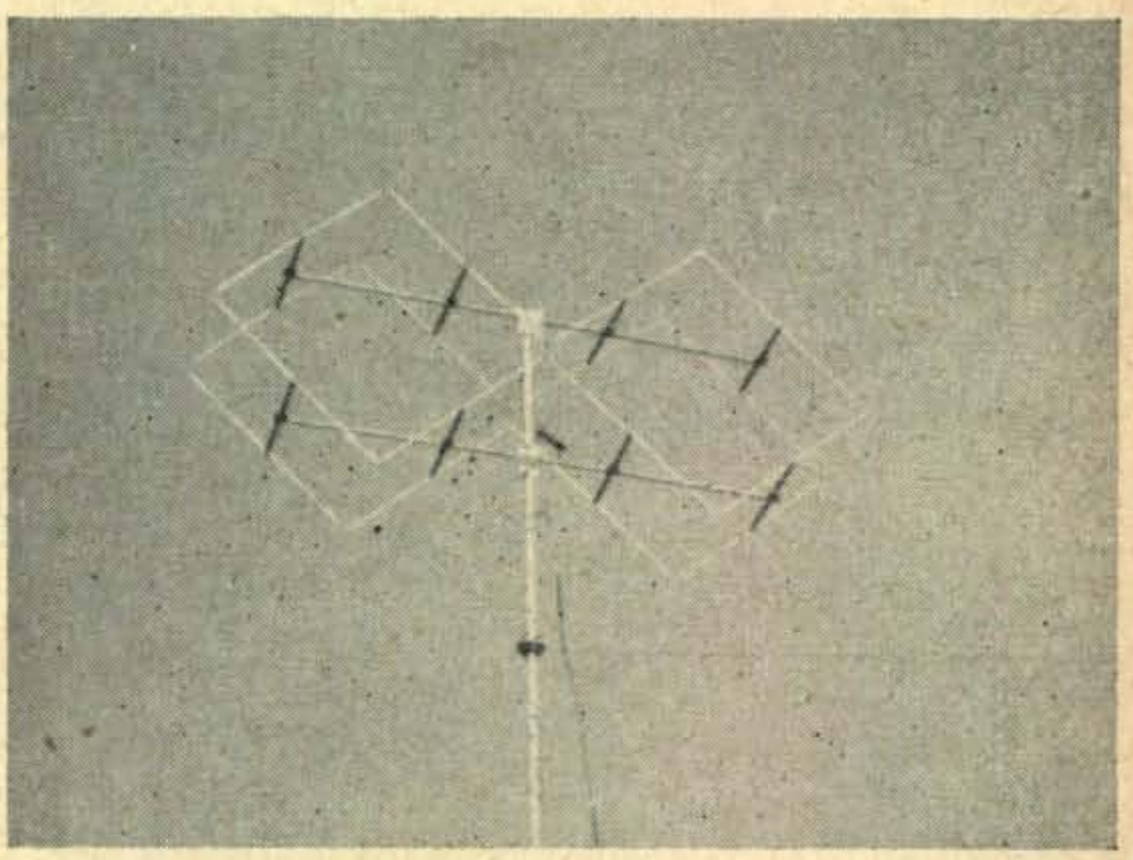
W8KZT, Len Clift, Cheviot, Ohio, worked W9VZP and heard W8NQD and VE3A?? on March 30; Len had worked "Boles," W9VZP, on March 5th, also.

Six Meters

Phil Patterson, W5SFW, Amarillo, Texas, reports that HC1FS, Quito, Ecuador, is probably on 6, now, with a 50-watt v.f.o. into a "cubical quad" antenna. XE1GE is also reported active, again. XE1PY, "Rusty", will have an HFS and expects to be on 6, soon.

At W5SFW, 6 has been pretty well closed—as has 10—since the New Year's day opening to California. Activity in the southwest is expected to improve, however, as three stations are to be on in Santa Fe, New Mexico, this summer. The local gang is also readying itself for the season; W5MJD has new QSLs and would like to send some to Kansas, Nebraska, and some New England states for WAS. So far, Joe has cards from *all* of the states worked! W5SFW will appreciate cards from those guys in Kentucky and Wyoming. . . . W5MJD is rebuilding to an 829B bandswitching final; AM, NBFM and CW. . . . W5WX finally got an outside antenna, but we don't know if he's going to use it to watch pictures or work 6 meters. . . . W5SFW will operate portable 5 from the shop, using 35 watts into an 807 to a folded dipole 10 feet high. Phil hopes to work W5LIU, Lubbock, Texas, 100 miles south. He would also like to work W5IOW, Ada, Oklahoma, who is reportedly on 2 and possibly 6; is W5CUH still on 6? Let us know.

W5LIU says, "Several of us offer the suggestion, change the magazine title to *CQ, The VHF Man's Journal*, because of the length of the column!" Herb resumed activity on 6 in January, using the old 815 rig from last summer, a VHF-152 and the 3-element beam used by W5KCP, last year. On March 26, a weak, fading carrier was heard on 50.2 mc at about 2000 CST; it was probably XE1GE, since he was reported on at the time via XE1PY on 10. On May 30, W5LIU will return to Ft. Worth and resume activity on 6 and 2, using an 829B. Herb started on 6 in 1946, following W5FRD on the band, and he was quite active during 1947 and 1948, accumulating 24 states and 3 countries; last summer, he picked up 5 new states to bring the total to 29 states. In the meantime, W5LIU has been attending Texas Tech which holds a "one-way record" of about 60 feet on 10,000 mc.



This is the 16-element Zig-Zag array of W5TAK. The elements are made of aluminum clothes line and the booms are ½" thin wall conduit.

"With the guiding hands of W5DFU and W5CVW found *once again* on 75—as well as W5KCP prodding me," says W5LIU, "I am looking forward to the VHFiest summer ever. By the way, WØZJB, on 75 the other day, commented that his 50 mc. WAS was blushing and curling at the corners because he was on 75!"

W2ZUW, John Dinter, Bliss, New York, also reports that 6 meters in western New York state has not been up to par during the past few months . . . "Even many of the Toronto gang are missing." However, John did manage to get 4 new states for a total of 35 during the past winter, Kentucky, Maryland, Delaware, and New Jersey were worked on aurora openings—all this on 20 watts. W2ZUW will now be happy to work 5 stations in New England on 6, now. John also operates W2PTC, Cattarugas, New York.

On April 10, W9EWO, Lebanon ("*Lee*-banon"), Indiana, heard W9MFH working W4RBK, Kentucky, on c.w. W9ASM and W9MHP were also active.

**Address all mail and correspondence to 2433 Elder Lane, Franklin Park, Ill.*

VE3 activity on 6, according to VE3DER, Iris Weir, is picking up; several new fixed and mobile stations have been heard. The only openings observed have been of the aurora type. However, by the time you read this, Iris feels that "good, old sporadic E layer skip should be active, again." The Toronto 6-meter Emergency Net still operates on 51 mc. So, during openings, please don't forget to tune that frequency; watch especially for mobiles, VE3DER requests.

"The Southern Ontario and Western New York V. H. F. Group" met on May 16. Editor Ferrell was the speaker, discussing *"The Three Years of RASO."*

220 Mc Activity

W1TUL, Malden, Massachusetts, writes, "I notice in the April, '52, issue of *CQ* you announced W8WRN is on 220 mc. I just want to report that, in the Boston area, W1NI, TUL and WN1VAE—who hopes to be 'technician," soon, are going to 220 mc. W1TUL is licensed as technician and Novice. P.S.—WN1VAE is 14 years old; I'm *13*—hi!" (Glad to hear from you, Dave!—*VHF Editor.*)

W8WRN, Ken Myers, Columbus, Ohio, now has the 220 mc gear in its own shielded cabinet with independent power supply. Ken comments, "W8BFQ told me, recently, that Jerry rebuilt the W8WJC-W8BFQ 220 mc rig; as soon as crystals and tubes are put into service, 300 watts input will be applied to a pair of 4-65As. WRN had better get busy with the new 220 final. No other local is set-up for 220 mc. However, W8HQK, Cincinnati, Ohio, plans to have some gear ready, soon."

W5FEK, Waldo Townley, pops up with the report that 220 mc is the "big news" on the Gulf Coast. On March 28, W5ONS, Victoria, Texas, first received W5BDT, Austin, on 220 mc at a distance of 124 miles. W5BDT uses 75 watts, and W5ONS uses a home-spun 6BK7 crystal-controlled converter and a single bay 5-element beam. A number of contacts have been made; during some of them, Penn's signal pushed past the S9 level. As a result of the "word" being passed around, some of the 2-meter gang have been planning on 220. W5FSC has completed a 220 mc converter and is rebuilding the whole antenna array so that the 6, 2 and 1-1/3 meter beams will work effectively on top of the 65-foot tower. Bud's signal should be predominant. W5PMM also has plans for 220 mc. W5FEK is interested, but still has a few other projects to complete.

The 420 Mc Report

W6OJF, Huntington Park, California, says that 420 mc activity is pretty good in southern California, but the gang would like to have more company. At least a dozen stations are active every night in the metropolitan area, including W6CFC, Bell; W6OJF, Huntington Park; W6-AFA and W6OCU, Downey; W6ABN, Long Beach; W6ZW, La Cresenta; W6GWX, Montebello; W6NNN, Bell; W6DKN, Fullerton; W6NBK, Burbank, and W6DQJ, Rivera. Any of these stations will be happy to assist other hams in getting on 420.

Glenn, W6OJF, observes, "We have found 420 mc to produce results more consistently than 144 mc, with regular contacts between Santa Barbara (150 miles) and San Diego (100 miles)."

The group listed has pioneered the band in this area, and averages 20 to 30 hours of operating time per week. Much has been done in developing crystal-controlled converters and transmitters as well as in antenna experimentation. At present, W6BYE, San Diego, is rebuilding his rig. The stations using crystal control generally modulate an outboard tripler driven by the 2-meter rig. Modulated oscillators consist of surplus radar gear such as the APQ-2 or 9; surplus receivers popular with the 420 mc gang are the TPS-2 coaxial lines; APS-13 and ASB-5.

W2QED, Seabrook, New Jersey, reports that 420 mc activity continued low during March. Ken says his activity for April was expected to suffer because of the expected "harmonic"——congratulations!

Ken Bowles, W2QKW, visited W2QED and compared notes on r.f. amplifiers and other gear for 420. Projects are also under way for 6 and 220 mc at W2QED. . . . Stations worked on 420 mc during March at W2QED: W3RKQ, W2BLV, W3BSV, W2HEK, W2EH and W3NAG for a total of 20 contacts, of which three were one-way.

In Woodhaven, Long Island, New York, **W2MWB** offers a useful means of locating the 420 mc band. Since TV receivers are more common in the home than UHF frequency meters or signal generators, the TV receiver can be used as a signal source. Any TV receiver having an i.f. system at 21.25 mc may be tuned to channel 9 in order to obtain a check point at 426 mc. Other check points may be had at 438 ad 450 mc quite easily by switching to channels 10 and 11, respectively. The test signals are produced by 2nd harmonic radiation from the TV receiver local oscillator operating at fundamental frequencies of 213, 219 and 225 mc. The radiation has been measured in several instances, and some sets have produced as much as 250 microvolts because of chassis resonance. The second harmonic will, of course, be weaker but is still sufficiently strong to be detected at a distance of 20 feet or more from the set.

Wes, W2MWB, also points out that you may therefore use the TV oscillator harmonic as a combination frequency check and signal generator source. The "attenuator" consists of increasing the distance between the TV

If you attend the Turkey Run this year you might meet these well-known DX men who attended the 1951 affair. L. to r.: (front) W9-ZHL, W4MKJ, W9LJV, W5-FSC, W3JAV; (rear) W9-ZHB, W9HKQ, W4BYN, W4HHK and W3NKM. (photo W9ZHL)

set and the 420 mc receiver, so that a very weak signal may be thus obtained for tune-up and other sensitivity improvement measures. Finally, a distance will be reached where the signals from neighboring TV receivers will be received. At this stage, a directional antenna may be employed to minimize the number of signals received and also to act as an additional attenuator in order to further improve sensitivity tests. A corner reflector array for 420 mc is surprisingly small and usually convenient to use within the shack for test purposes. Use of a corner reflector permits the dipole to be adjusted easily for best match to the transmission line.

An inexpensive wavemeter can be constructed from a piece of 300-ohm line and a 100 $\mu\mu$f (Bud MC1875) variable condenser. Calibration points for the wavemeter may be obtained from your 420 mc super-regen as a transfer device from the TV receiver.

The more advanced 420 mc man who has a superhet receiver of the BC-799 variety can achieve the "feel" of a communication receiver by modifying the oscillator, according the W2MWB. A long-lines oscillator, using a 6J6, tuned at the "far end" with a split stator condenser, is noise free and tunes nicely. A b.f.o. can be added to the 420 mc receiver if you have a low frequency receiver: simply tune the low frequency receiver to approximately 30 mc. The BC788 i.f. section will detect the oscillator and produce a heterodyne with a signal coming in from 420 mc.

Remember, your 420 mc beam is quite directional—and it is possible there may be 420 mc stations in several directions——so call and listen in many directions. House-to-house contacts have been made over distances of 200 miles on 420, proving that mountain tops are not required for contacts.

"420 mc is easy, when you know how," says W2MWB, "You know how, now; let's hear your signal!" Wes operates on 434.5 mc, 9 PM EST, Saturdays, Sundays and Mondays. His address is 9121 82nd Street, Woodhaven, Long Island, N.Y.

I believe an examination of the log of any station that has been consistently active on VHF for several years would reveal one important fact that is usually overlooked: we have too great a turnover of stations. In other words, our problem is not so much one of interesting new stations (in the band), but rather of keeping a reasonable percentage of the ones who become interested by themselves, and who give VHF a trial. What might constitute a reasonable percentage, I do not know; but, at least one-third seems in order. If one accepts that figure, I can assure you that we would have very much better activity in this area, if we had retained that many.——"A Reminder"

W8WRN, Columbus, Ohio, has the 4-element 420 mc beam working. The 8-element job (8 half-waves in phase with screen reflector) is under way. Recent tests with W8CPA show the need for better receivers and outside antennas!

Iris Weir, **VE3DER**, Toronto, reports that VE3DAL is an enthusiastic newcomer to UHF, but is handicapped by a poor location in downtown Hamilton. At present, he uses an 832 tripler driven by a 522 and has not been heard in Toronto. He will shortly be using a pair of 8012s and a parabolic reflector array 70 feet high!

VE3AQG has a much better location, Hamilton Mountain. He is preparing an APS-13 on 420. . . . **VE3EAB**, Hamilton, is also building 420 mc gear. Who will make the first Hamilton-Toronto QSO on 420 mc?

In Toronto, **VE3BQN** now has his "super-dooper" crystal mixer converter operating and will soon replace the 6J6 transmitter with a pair of 8025s. . . . **VE3DHG** erected the square corner reflector and will have the 8012s on, soon. . . . **VE3AIB** has the 6J6 converter working quite well. The transmitter is a pair of 8012s in a parallel-plate oscillator. The antenna is a corner reflector. Schedules with W2ORI are always solid, regardless of conditions. . . . **VE3DAN**, an old hand at 420 mc, is now forced to improve his equipment because of the stiff competition for the best 420 mc signal out of Toronto!

Two Meters

The very welcome, usually warm and early spring weather in most of the country produced propagation conditions that were ahead of the activity level. The old plaint, "Many a night the band is in excellent shape, but there's none of the gang on at 200 to 300 miles," is being heard more frequently. But, it's expected that by the time this is read activity will be about normal.

VE7FJ reports that Vancouver, B.C., two-meter activity is supported by about 14 stations in the area and that the most consistent activity comes from VE7FY, VE7ADF, VE7AIA, VE7BQ, VE7IG and VE7FJ. Heard less frequently are: VE7AGL (mod. osc.) and VE7UA. Inactive for some time: VE7DU, VE7AME, VE7AEZ, VE7ABG, VE7AIW and VE7FN.

VE7AIM moved to California, so he won't be heard for some time; it'll take five years for him to get his citizenship papers. . . . **VE7BQ** gets out very well with 350 watts into the new p.p. 4-125A final, using Rothman modulation. The gang is watching this system closely. . . . **VE7AVF** also gets out well, using constant modulation. . . . **VE7FY** is swapping the 832 for an 829B. . . .**VE7AIA has the first 2-meter mobile in the Vancouver area, and** gets out very well. . . . **VE7JG** plans a new beam with 8 half waves on each side of a screen reflector. One side will be vertical; the other side will be horizontal so as to avoid the flip-flop problem. . . . **VE7UA** returned to two meters after a year's absence. . . . **VE7AFB/7**, Civil Defense station at Abbotsford, worked VE7FJ for their first two-meter QSO. VE7AFB/7 is the temporary call of the Fraser Valley Amateur Club pending assignment of its own call.

VE3DER reports from the Toronto area that an early occurrence of good inversion nights indicates that this will be a busy year on two. Many new VE3s and W2s have been heard. Iris hopes that the tropospheric openings will not bypass the VE3s as they did last year.

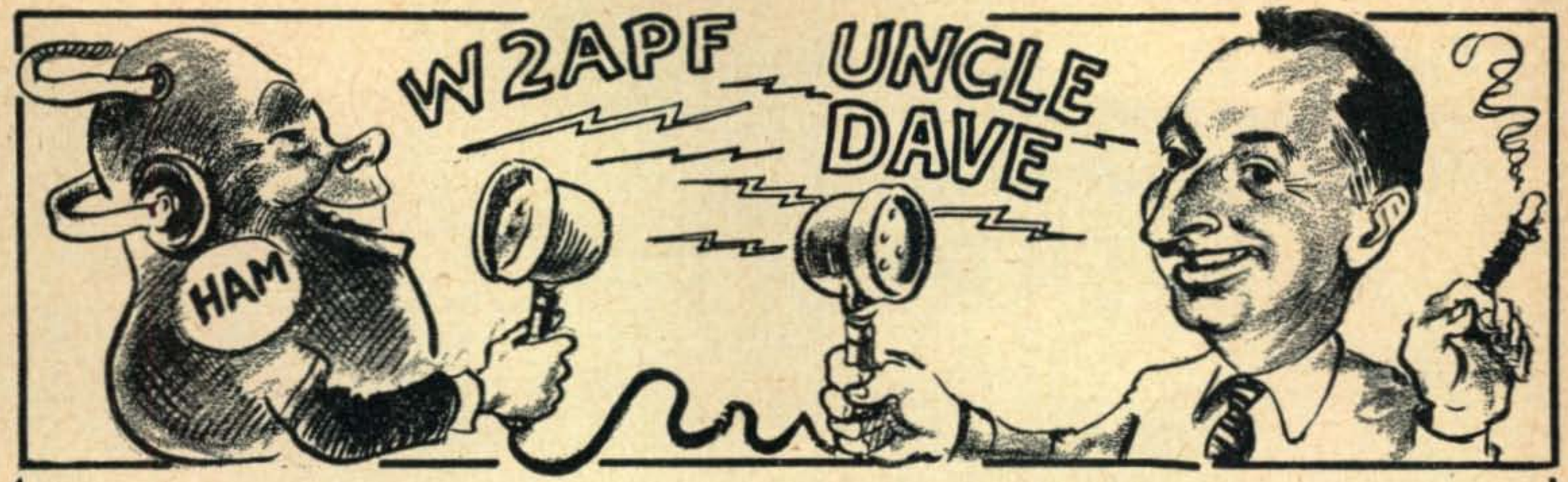
"It will be a big help if the DX will put their beams towards Toronto during favourable conditions," VE3DER requests. She adds, "So far, the 'Canadian Capers' section of 'The VHF News' has reported activity principally in Toronto, Hamilton and vicinity. Surely there must be VHF activity in Ottawa, Windsor and other areas in the Dominion. We would be interested in hearing from you. Please send your reports to me; the address is: Mrs. Iris Weir, VE3DER, 209 Yarmouth Road, Toronto, 4, Ontario." (**VHF Ed. Note:** Give the gal a hand, fellows! Thank you.)

W2s On Two

RTTY Editor **W2NSD** is on 144 mc with teletype and phone; Wayne will also work 6 meters. . . . **W2ZUW/W2PTC** plans to return to 2, but the date is indefinite because of business requirements. . . . In Rochester, **W2ZHB**, reports that the only real DX during the winter occurred during the several good aurora openings. . . . **W2UTH** picked up two new states by working W1HDQ and W4AO. Other locals worked W2PAU, W2NLY and W2PV. It was observed that the low-power stations do not work out very well on aurora openings.

Activity in western New York has been exceptionally good, this year, according to W2ZHB. Some reasons advanced for this are: (1) Washout of 10 meter activity because of TVI and poor propagation conditions (the local TV station is on channel 6). (2) Local aggressive promotion of 2-meters by the Rochester VHF Group. The ham club put on a VHF-night program and the VHF Group sponsored demonstrations and exhibits of VHF gear, gave talks on antennas, propagation, converters and general VHF practices. This meeting created wide-spread interest. (3)Appearance of 2 meter stations in small towns surrounding Rochester, up to 70 miles away, that can be worked consistently. Examples are

(Continued on page 61)



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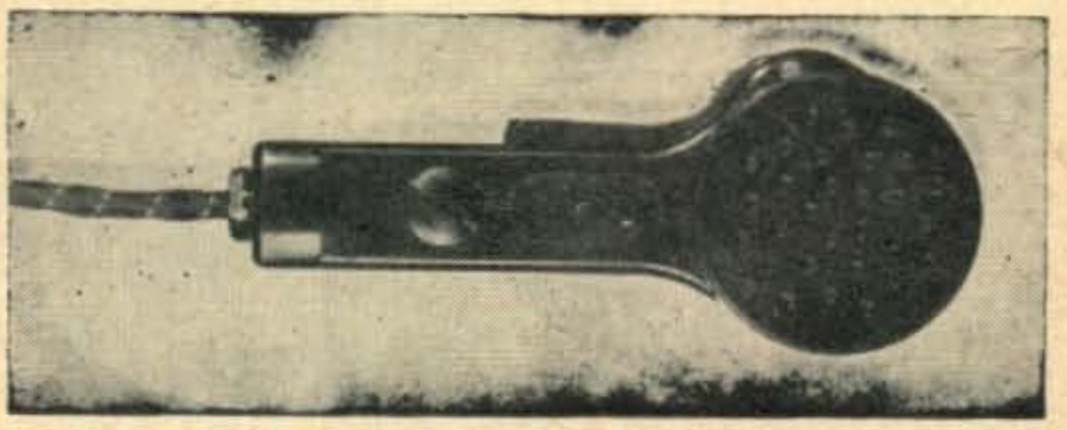

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NOVICE SHACK

(from page 38)

Art, WN4TVQ, is fourteen and is in the ninth grade. He runs seventy-five watts on 3.7 mc, and has worked 34 states, plus CO,KP4, VP7, and VE3, and has a 15 WPM code certificate.

Tom, WN8HEV/W8HEV, (Novice-Technician) has used his seventy watts, maximum, to garner thirty-three states on 3.7 mc.

Dick, W3SUJ, got his Novice License in December, 1951, and his General Class license March 7, 1952. Between January 1 and March 7, he worked twenty-one states plus VE2 and VE3 with twenty-five watts input on 3.7 mc. His antenna should interest others with limited space, being 125 feet of bell wire bent to occupy about sixty feet of space. . . . Dick is thirty-two years old, married, and has two children.

Saul, WN2HNG, takes me to task for a poor guess. Bob, WN2HNI, is his son, not his brother, as I had surmised in a previous column. Bob has passed his General Class examination, and he is now in the Navy.

I am glad to be able to publish the last two items, because, every so often, I get a letter from a Novice or prospective Novice, saying that he is X years old, and he feels self conscious about getting a Novice License at his age. The feeling is unwarranted. While there are many Novice licensees less than fifteen years old, there are also many over forty and fifty, with the average age being around thirty-two.

Ira, WN2HMR, reports that a serious epidemic has reduced Novice activity around his section of Brooklyn. Too much hamming and not enough studying resulted in several severe cases of **report-carditis**—unpleasant, but seldom fatal. Ira solved his receiver problem by purchasing a new HRO.

Question Box

Apparently, a large number of Novices are receiving Advisory Notices from the F.C.C. about second-harmonic radiation between 7,400 and 7,500 kc, and all of them are anxious to avoid getting another. Question number one is: How can I eliminate harmonic radiation from my transmitter?

Answer: Reduce harmonic generation in the transmitter output stage to a minimum and prevent harmonic transfer to the antenna. To achieve the first, use minimum grid drive and bias voltage that produces normal output from the final amplifier, which with an 807 or similar tube occurs with about 45 volts of bias and three to four milliamperes of grid current. This bias may be obtained from a single 45-volt battery or a 15,000 ohm, one-watt grid resistor. Also, increasing the final amplifier tank capacity will help. A minimum of 150 $\mu\mu$f of capacity is desirable for the 3.7 mc band, and up to 300 $\mu\mu$f better. Most commercial "80-meter" coils tune to 3.7 mc with less than 100 $\mu\mu$f across them. Remove turns from the coil, a few turns at a time, until the circuit tunes with the condenser plates nearly completely meshed. Substitute a tank condenser of higher capacity if necessary.

A link-coupled antenna tuner is good insurance that harmonics generated in the final amplifier will be attenuated before reaching the antenna. See *Fig. 6.*

Question: Harmonics from the horizontal oscillator of my TV receiver ruin reception on 3,700 kc by putting rough signals every fifteen or sixteen kilocycles across the band, what can I do about it? —WN2HMR.

Answer: Remove the antenna from the television receiver. If the interference disappears or decreases,

(Continued on page 58)

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(from page 56)

a *high-pass* filter, installed in the TV antenna leadin as close to the tuner as possible, should eliminate the trouble. If the interference is being radiated by the power lines, a 0.1 μf hy-pass condenser (manufactured by *Sprague* and several other companies) in each side of the 115-volt line of the TV set will help. Ground cases of the condensers to receiver chassis. Direct radiation from components in the receiver itself is usually very difficult to eliminate, requiring extensive shielding of the offending leads and components.

Until next month. Keep the pictures and letters coming.

73, Herb

The Word From MARS

USAF MARS and Canadian AFARS have agreed on a semi-weekly schedule between the Headquarters USAF MARS Station AIR and Headquarters Canadian AFARS Station CHT20. These schedules take place between 1100 and 1200 hours EST on Monday and Friday each week. These schedules which were recently established are the first radio contact with Canadian AFARS and will serve as a valuable link in coordinating the two programs and promoting the already friendly relations between Canadian and U.S. amateurs.

A meeting between the Chief and Assistant Chief MARS, USAF, and representatives from the office of Chief Controller, RCAF Air Force Amateur Radio System was held for the purpose of discussing the affiliation of USAF MARS and RCAF AFARS in the event of a national or international emergency.

At this meeting it was decided that coordination between these two activities would provide extended area coverage for handling emergency traffic to both systems and would also serve to stimulate membership interests in both programs.

As a result of the meeting, additional MARS AFARS contacts via radio will take place between certain designated MARS stations with the Air Defense Command and Area Coordinators of AFARS. Necessary coordination to complete the arrangements for initial contacts between stations are now in the process of being completed through correspondence between the stations involved.

Contacts between stations will take place on Air Force MARS frequencies which have been allocated to the Air Defense Command. AFARS Headquarters in Canada is presently clearing those frequencies for this purpose.

Information on routing of message traffic to Canada via MARS-AFARS network will be published when final arrangements have been completed.

TELETYPE

(from page 49)

of the gang has apparently cured this misery by putting an inductance in series with the crystal, thus allowing plenty of swing on the crystal fundamental.

A circuit sent in by W4OLL goes one better and has a series tuned circuit in series with the crystal. This, he claims, allows a wide variation of the xtal frequency. This circuit should lend itself to FSK'ing nicely.

To align: a) Set C1 for minimum capacity and adjust C2 for oscillation at xtal frequency.

b) Then set C1 for maximum capacity and adjust the slug in L1 so that the output frequency is pulled downward a maximum of five kilocycles (at 3.5 mc.; 10 kc. at 7 mc.).

Fine frequency adjustment is then possible with C1. WARNING:- If the crystal frequency is pulled further than the limits stated above (varies with activity of crystals to some degree), the crystal will lose control and the circuit will oscillate as a low grade Clapp oscillator using the crystal holder capacity as one of the elements.

Mars

Both the Air Force and Army MARS have assigned frequencies for FSK teletype operation and several of the teletype members have taken advantage of this to get started on the lower frequencies. These authorizations are quite advantageous for still another reason: no QRM. They are outside the amateur bands and have no competition. A letter from Major Charles C. Mack, Chief, MARS, USAF, says that they are contemplating using standard frequency shift on 20994 kc, 7635 kc, 6997.5 kc, and 14405 kc. They have fifty model 28 teletypewriters on order for a world-wide MARS teletype network. They already have Collins KW-1 transmitters going to Tokyo; Hamilton AFB, California; Offutt AFB, Omaha, Nebraska; Colorado Springs, Colorado; Pentagon, Washington. D.C.; and Europe. In a few months they should have a fine teletype network going.

The New Rules

If you have progressed through this magazine in a normal manner then you are no doubt already familiar with the most exciting news in the field of amateur teletype—the proposed regulations issued recently by the FCC. These rules set up standards for operation that are identical with those now in use by amateur teletype stations and by most commercial teletype stations. They further open all c.w. frequencies in the amateur 80, 40, and 20 meter bands to type F-1 or frequency shift operation with teletype. The actual frequencies involved are 3500-3800 kc, 7000-7200 kc, 14000-14200, and 14300-14350 kc. In addition to all of those frequencies there is a special assignment in the new 15 meter band of 21.1 mc to 21.35 mc for F-1 emission. This 15 meter authorization is separate from the 20-40-80 meter regulation though and requires a separate letter to the FCC for discussion of it.

There has been some mud slinging from certain groups to the effect that if amateur teletype is permitted to operate in the lower frequency bands that there will be a lot of QRM. This allegation might be true except for three important factors which all interested should consider before getting emotional. First, there are only a limited number of amateur stations in the world that

are able to use teletype because of the rarity of the equipment. At present there is enough equipment to go around to all interested stations, but this can not be the case for long. It is highly unlikely that there will be more than 400 amateur teletype stations active in the next two years. This is an optimistic estimate but it should suffice to illustrate that there should not be any great amount of QRM from such a small group. Secondly, since teletype has grown up as a commercial venture it has not had to compete with QRM, therefore the circuits which are being used are not designed to meet such a difficulty. This means that the teletype stations have a greater interest in eliminating QRM than the c.w. men. Some day in the future we will no doubt be able to work teletype through almost any type and strength of QRM, but we can't now! Teletype stations will be avoiding QRM wherever possible and will attempt to operate where there is a minimum of QRM. Thirdly, since one of the main points of interest in amateur teletype is the auto-start feature whereby a message can be left at another station without the operator even being present, almost all teletype operation will be on one frequency in each band. The high degree of stabilization necessary for teletype operation and auto-start control makes it an absolute necessity for stations to use temperature controlled crystals for both the transmitter and receiver. The drift of ten or fifteen cycles will throw the whole works out of kilter. Thus you can see the picture a bit clearer. The teletype stations will be avoiding QRM as much as possible and will therefore set up networks on the clearest frequencies possible. Almost all teletype operation will be on these single frequencies in each band. What complaint can there be to this plan?

There is one bonus factor involved in getting RTTY in the lower frequency bands. For several months I have been receiving mail from the West coast and Alaska saying that the high end of 40M and large parts of other bands are all but unusable because of the QRM from harmonics and spurious frequencies of commercial and military teletype stations. It has been our experience that when amateur TT stations get in such a band that they check up on any and all RTTY signals heard and get in touch with the offending companies whenever unauthorized signals are encountered. W2CFT has had quite a bit of experience with this problem and has been responsible for quite a bit of QRM removing on 20 meters. This service alone might well more than pay the way for the amateur RTTY networks. Any of you who have worked 75 meters should appreciate this for there are frequently spurious signals in that band from various TT stations.

At any rate, we should certainly extend a friendly hand to the FCC for the wonderful work they have done in the last couple of years. They have shown a real interest in the amateur and his problems and seem to be moving ahead steadily in their desire to help the amateur. The FCC has asked that all amateurs interested in the dockets now in question to write to the FCC and state their feelings in the matter and to present any evidence that they can in support of their views. Here is democracy at it is written in the text books, don't let it languish. If you have any interest in the matters you have a duty to write to the FCC and put in your vote.

Quite a few letters have come in asking how soon the proposed rules will go into effect. This depends upon your answers to the proposed rules. If there are no serious arguments against the rules they might be put into effect as early as September. The necessity for extended oral argument could push them off until next year.

Summary

If you are interested in teletype why not drop me a note to that effect and I can let you know who is active in your area that might give you some help. If you have any teletype equipment that you want to get rid of I have a long list of people that will be tickled pink to get it and will pay the current ham price for it.

Pro or con, you should write to the FCC and let them know what you think about the proposed regulations. The deadline for comments on the 20-40-80 meter FSK rules and the 40 meter phone rules is July 1, 1952. The deadline for the 15 meter FSK, Novice, and phone proposals is August 1, 1952. Send your letters to the Secretary of the FCC, Washington 25, D. C.

VHF NEWS

(from page 54)

W2SPU, Moravia; WN2ILQ, Kings Ferry; W2TQY, W2CJQ, W2TIO and W2TII, Newark, and W2FLZ, Ontario. These stations work into the Rochester area, consistently, and are attracted to it because it is the center of local activity on ordinary nights. (4) Because increasing activity itself encourages more activity, the gang knows that there are many stations to work, and the process snowballs!

A number of novice licensees have appeared on the local scene, reports W2ZHB. **WN2ALL** runs 30 watts input to an 832 final and is experimenting with the 16-element "zig-zag" array, per "CQ", January, 1950. . . **WN2AKM** uses a 5-over-5 beam and a 522. . . . **WN2EYB** has a Harvey-Wells on 2. . . . **W2UTH**, president of the local club and EC for western New York, is limited in operating time but usually gets on for the aurora openings. . . . W2QY, EC for Monine County, is another nominee for the "Faithful Few on VHF!"

New on two is **W2FLZ**, Ontario, about 25 miles from Rochester. He uses a 2E26 as a doubler, 9 watts input. . . . **W2SNI** has a Harvey-Wells on 2. . . . **W2ZUR** improves reception of some signals by beaming towards a water tower 200 yards away. . . . **W2RLV**, Honeoye Falls—of 6 meter fame—is back on two.

W2OWF was the first local station to work W1HDQ; this occurred during a late fall aurora opening. . . . **W2ZHB** is using a compressor ahead of the modulator. . . . **W2UXP** now has an 829B final, an 807 p.p. modulator and the 16 element beam; Joe really puts out a signal. . . . **W2UAD** has his "zig-zag" array indoors, but says it works fine. . . . **W2PBC**, Perry, New York, modulates the screen grid of his 829B final. . . . **W2YUE** runs 1 watt to p.p. 958As and works all stations within a radius of 40 miles with no trouble. Jack now uses a crystal-controlled converter. . . . W2SPU, 1300 ft. elevation, near Moravia, worked W2NLY during a slight opening. Bob plans some 420 mc. work.

VHF CD Station in Franklin Institute

W3PBR, Mason Frankenfield, Havertown,, Pa. announces that the Havertown Township Emergency Radio Net is sponsoring a two and ten meter station, in the

(Continued on page 62)

(Dick Rogers)

(from page 61)

Franklin Institute in Philadelphia. W3ADV, club member, is trustee of the station and is in complete charge. The station will be operated only by members of the club, so authorized by W3ADV. It is on display to visitors of the Institute.

The VHF-operator population of Silver Spring, Maryland, was increased by at least one when Floyd Forest, W3SLI (**ex W4FBJ**), came on 2 and 6, again. Building beams, converters for 2 and 220 mc and de-TVI-ing the rigs have kept Floyd very busy.

"Activity on 220 is nil, but about 6 stations are planning to be on; as for two, activity is spotty—most of the regulars are rebuilding, or putting up new beams. Some will be vertical, and some are to be horizontal, especially—horizontal—at W3SLI!!! 16-elements on 2; 4 elements on 6. 100 watts input," says Floyd.

"By golly, **why** doesn't the gang spread out on aurora openings?" W3SLI pleads. "I called my bloomin' head off on 144.828, as did W3AIR, on March 30. And, there the whole gang is, on the **low** end, QRMing each other! Tell 'em to tune up in the band. a little! **S-P-R-E-A-D O-U-T!!** (Attaboy, Floyd; you tell 'em; I'm tired.——**VHF Ed.**)

"I'm on 144.828 mc every night 'til midnight and after," says Floyd. "Give my regards to the midwest VHF gang, especially W9EHX who is first to come through on aurora, here, and last to go out!"

Topics On Two Along The Gulf

The Port Neches report: **WN5TFW**, John Naff, is back on the day shift at work, so is again active on 2 in the evenings. Just after the last report, a very good opening occurred on March 11. W5ONS, W5CIX, W9IVU —all about 200 miles were heard very well; W5DSB, W5STP, W5JBW, W5AOA and W5PMM were worked. PMM's 35 watts to a 15-element beam really puts out a signal. WN5TFW made up for lost time on March 20th, 0729EST, by working W5MWW; good reports, both ways. W5AJG was heard. W5TAF, Houston, was worked, the same day. Propagation, however, was erratic during March because of so many cold spells.

W5JBW rebuilt his beam to 16 elements, silver-plated copper driven elements and aluminum reflectors. . . . Several local WN5s are working on gear for two. . . . WN5UJP, Lake Charles, Louisiana, is heard frequently.

Steve, ex-HC2OT has been on 2 with the call **W5DR**, Houston, and has worked quite a number of the gang. He is scheduled to go back to South America, according to WN5TFW, so maybe the 6-meter DX signal will be heard, again. W5ON, W5GLS and W5BHO visited WN5 TFW during the zone 2 STEN picnic at Port Arthur, April 6. W5FSC is apparently trying to work 220 mc DX; he's not heard on 2. (Why, Beck!——**VHF Ed.**)

The Gulf Coast Emergency Net continues active with W5QIO, W5QME, WN5TFW, W5JBW, W5AOA, W5EVQ, W5MKP and W5GIX. See you at Corpus Christi on June 28 and 29.

W5FEK reports from Houston, reports that "Yawn Patrol" activity is beginning to rise. W5s AJG and ABN, Dallas, and MWW, New Boston, are heard quite regularly. . . . **W5VY** is back on 2 meters in San Antonio with his high power. Pat's return to San Antonio is very welcome. . . . **W5JLY** is also back on 2. . . . One of the new stations in San Antonio, **WN5UNU**, has worked W5TAF and W5FEK, Houston, with about 75 watts to an 829B. . . . New 2-meter stations in the Houston area are W5MJT, W5JEN, mobile; W5AEQ, W5BR, W5EIB and WN5VDA. W5CIX, Cuero, has a 4-65A transmitter but needs a good converter. A W9——/5 may be on.

The Coastal Emergency Net now boasts 33 active members in the Houston area. The group recently participated in a recent CD simulated emergency. . . . **W5AYU** is working on an all-driven element beam for two. . . . **W5ONS** took me to task for reporting he "wasn't active"; he's on almost every morning, but beams towards Austin. . . . Grace, W5FEK's XYL is fighting the code to get Novice class.

VHF Field Day DX

The Purple Glow VHF Club, Albuquerque, will operate stations on two and six meters on top of Sandia Crest, 10,600 feet, during VHF field day. June 7th and 8th, 1952. A 40-meter rig, 7155 kc., will be used for local schedules and liaison. All activity will be under the call. W5RFF/5. For schedules, write or wire: W5CA, Dave Middelton, Tijeras, New Mexico.

"VHF Astrology?"

Ralph W. Kastner, SWL, New Braunfels, Texas, has done some correlation of the occurrence of openings on 6 and 2 with planetary relationships, using published information regarding openings.

Mr. Kastner states, "Doing research work on the VHF bands, working with dates given in 'The VHF News' section when 2 or 6 or both bands were very good, I find that . . . whenever the Moon is parallel to Pluto, VHF bands are very good. This also holds true when the Moon is parallel Mercury. The tables I use (American Astrology Ephemeris and Aspectarian) show that these aspects occur on the following dates:

JUNE	JULY	AUG.
6, 10,	2, 3, 8,	4, 6, 9,
19, 23	9, 14, 16,	12, 17,
	21, 24,	20, 25, 27
	28, 30	
SEPT.	**OCT.**	**NOV.**
1, 2, 6,	1, 3, 6,	2, 7, 16,
8, 14, 17,	11, 13,	17, 19,
19, 23, 28	19, 20,	21, 29
	25, 26.	

"Tune 2 or 6, or both, on these dates and find out what you can about openings. Please send your results to Ralph W. Kastner, P.O. Box 134, New Braunfels, Texas." (**VHF Ed. Note**: Before anyone gets excited, we are not advocating astrology; Mr. Kastner has an idea to present to you, and it's the main function of this column to present news and ideas.)

W5TAK, Petal, Mississippi,—near Hattiesburg—believes this is the first report on two-meter activity from his area. A total of 5 stations are active, W5FGE, W5KYC, W5NUV and WN5TIW, all in Hattiesburg: W5TAK is in Petal. The group has been active since the latter part of 1951; all operate on 145.98 mc. with converted 522s, except W5TAK who uses 3 watts input to p.p. 6AK5s! All stations except W5TAK use ground-plane verticals. W6ESY's 16-element "zig-zag" array (CQ January, 1950) was the basis for W5TAKs simplified version. Nightly roundtables are held, but as yet no "outside" contacts have been made. "Could it be the vertical polarization?" inquires W5TAK. (**VHF Ed. Note**: Horizontal has been suggested.)

TURKEY RUN VHF MEETING

Turkey Run State Park, Indiana

The annual summer meeting of midwestern state VHF men will again be held at Turkey Run State Park in late July. Write to Charles Hoffman, W9ZHL, RFD 6, Terre Haute, Indiana, for particulars.

The "zig-zag" beam at W5TAK is made from aluminum clothes-line wire. The supporting structure is made from ½-inch thin-wall conduit. The mast is 1¼-inch and 1-inch pipe, telescoped to give a total height of 30 feet. The suarter-wave matching section is #16 wire, spaced with "Toni" curlers. Cost, $3.50; results, good! Transmission line, 300-ohm twin lead.

In The Northwest

W7HEA, Toppenish, Washington, now has the two-meter rig well under way. A 4-125A final and a 5-over-5 horizontal beam will replace the ARC-5 and vertical groundplane. The two meter rig will be completely independent of the rigs on six and ten meters. "Plan on working 2 and 6 at the same time," says Bish. "I have a pet theory that new records will be set on two this

Ohio Observations

year, and I am going to see if some of them can't be brought up in this neck of the woods!"

W8WRN, Columbus, attended the Dayton Hamvention and found a gang of VHF men present: W8LPD, W8PTF, W8ZFO, W8SDJ, W8SNY, W8MGA, WN8HOH, WN8INQ, WN8HQK, W8MFV, W8WAB, W8CPA, W8BAX and W9MBL. . . . **W8GAB/W8MFW**, East Sparta, have a beautiful new set-up with a new home, a new 80-foot tower with a big platform on top, and an elevation of 1300 feet. The whole ham station is in the top floor of the house. . . . **W8WRN** is stymied for a new location. No houses available at the right places. At the right places, no land for sale. . . . **WN8HPB**, Canal Winchester, is on with a Millen transmitter, homebuilt converter and a 5-over-5 beam. Locals active on Monday nights, again: W8ABO, W8UZ, W8WAB, W8CPA, WN8HSZ, W3NMB/8 and W8WRN. . . . **W3NBM/8** has a new crystal-controlled converter. . . . **W8CPA** is getting good results from the 6BQ7 converter. . . . **W8LPD** has the 4-125As ready for DX; WN8HOH also has a pair ready——when he passes the general class ticket.

In And Around Chicago

Jack Woodruff, **W9PK**, is working nights but manages to get in a bit of activity, anyway. He reports that W9CX and WN9PPA are on fairly regularly from Oak Park; both use 522s. . . . **WN9OKF** had feedback which he calls his "barnyard flock," but keeps it under control most of the time. Leo was again hospitalized for a couple of weeks; is back home until about July when he will again return to Wesley. In the meantime, the new beam is working out very well and Leo is very active. . . . **W9TQ**, religious keeper of schedules, is revamping the whole station, including RTTY. . . . **W9IMQ**, also good schedule keeper, has new Viking VFO, works 40 to keep in contact with his nephew, W9DRN and W8JGA occasionally operate during the day, but are on mostly at nighttime. . . . **W9PK's** beam will go higher. . . . **W9EQC** moved the shop to the house and now carries on business, gardening, hamming and organ-playing day and night. Although he bought the Hammond organ for the XYL, Dick plays it more than she does. When he moved the optical lens business to the home, W9EQC received a generous offer from pals W9BFY and MOE, that they'd send all the beer-bottle bottoms right out so he could meet the summer demand for dark glasses!

W9NVK is active in Racine; W9BBR, likewise in Waukegan. . . . Rumor has it that **W9TKL** will return to 2. . . . **W9JBH** works 75 phone but has 147.5 mc FM as does W9UXS, also Libertyville. . . . **W9LJV**, Waukesha, now has 147.5 mc gear. . . . **W9FPE/9**, Fort Sheridan, is active when time permits. . . . **W9UMG** wants to change his beam, even though it does a swell job.

The Novice class license has done wonders for local 2-meter activity around Chicago. Now, if the boys will just keep up their code and get the general class license, the whole effort will be a success. W9EQC reports first contacts with WN9QHK, WN9RNE, WN9PUO, WN9RXS, WN9SEF, WN9QEP, WN9PPA and—the first WN8 contact—WN8HKH, Bangor, Michigan, on April 15th.

WN9REM, Downers Grove, has been about the most active of the Novices, according to W9EQC, who says Walt deserves a good hand. WN9QGU, DeKalb, WN9PWR, Union, are also regulars. In the Peoria and Springfield area, old reliables W9EHX, W9BPV, W9LF, W9MAL, W9KQX, W9ERC, W9SUV and W9KPS keep the band busy. Indiana stations W9HKQ, W9KLR, WN9OKR, W9GZH and W9HDB are heard and worked regularly. In Lebanon, W9EWO heard W9BPV, W9NSF, W8BFQ, W9GSY, W9SUV, W9DPY, W9EHX, W9LF, W9MTV, W9KOY, WØKYF, WØYIX, and W4JDN. Norm worked W9NSF, W8BFQ, W9GSY, W9BPV and W9SUV. The opening occurred on April 10th in the early evening. W9MBI, W9ZHB and W9HKI have been heard on 2, again, frequently.

In the Chicago area, new stations on 147.5 mc FM are: W9VQS, W9KQT, Chicago: W9SZ, Lemont. Others are scheduled. The Medical Emergency Net drills are held weekly on Sunday mornings, 10:00 and Monday evenings, 9:00. W9CPF, Chicago, was hospitalized by lead poisoning, and is taking it quite easy during recuperation.

DX and Overseas News

(from page 46)

W4BO reported to the FCC Powder Springs station that a Mexican commercial was invading the low end of 20. They obligingly phoned XE and chased the Mex down to 13995 KC where he belonged. Nice going Chas.

W2AGW visited W6 land recently. Howie hopes to find a soft spot in KS6AA's traffic armor so that he will condescend to give us drooling east coasters a QSO!

K2BU spent a nice evening with W2CTO and W2IYO while KV4AA received visits from W4OSU, W9PQL (S.S.Alcoa Puritan) and Grahame Niude, son of ZS6TC (VQ1RF) aboard Yacht "Yankee".

W4LVV reports lack of activity on the part of FG7XA is due to lack of a receiver. A fund has been started for this purpose and contributions are limited to a dollar or less. FG7XA is assuming transportation and duty costs. Contributions should be sent to the Dade Radio Club, Box 104, Miami, Fla.

From W6PYH we hear that PK4DA recently arrived at W6UZX. Arie was guest of honor at a dinner given by the No. California DX club on April 24th.

W1QF reports Commander McQuade is now senior chaplain aboard U.S.S. Missouri. Mac is better known to us as W1NM. Dick also regrets to report the passing of W1PCC who was active on 3.5 and 14 mc phone.

W7MRX (KR6EK, J2UUU) is now home and, thus, is not acting as KR6 QSL mgr. Howie say all KR6 cards should go to the Okinawa Amateur League, APO 331, care of Postmaster, San Francisco, Calif.

Ed Ballard, AJ4AB/ST2AB, ST2HL (USAF Solar Eclipse Expedition to Khartoum '52) wishes to thank VQ4RF, 5A2TH, CN8FB and the MI3US gang for their help during the expedition. Ed feels that QSLs have been slow in coming in due to lack of QTH info. See QTH column.

KH6AKV/KJ6/KW6/KM6 (W2BXS) writes he is enjoying his job as radio op on a small freighter operating out of Honolulu to the various islands. Every chance Jack gets the rig goes ashore on those rare spots.

As reported from FOC bulletin, it's G5UW bound for VK7 land not G5US . . . sorry!

Bob Hatcher, SWL Mgr for the "United States SWL Bureau" wishes to advise that his bureau takes care of all SWL cards. There is no charge or membership fees. SWL's are requested to supply the bureau with preaddressed envelopes with postage affixed for use in returning incoming verifications to them. QTH is: 23 South Blvd. Richmond, Va.

From VE2BV we hear that VE7HC is now flying the Pacific with a Canadian airline and meeting much of the DX he used to work. . . . Don also reports old G5LI has been fortunate in having the call VE2LI assigned to him. George won't be on for a while, tho.

Don, W6AM and the XYL, W6MA, plan European sightseeing tour in June. Countries to be visited are: G, GM, F, EA, I, HB, DL, PA, SM and OZ. Don hopes time will permit meeting up with some of the DX gang.

Last minute items: From VE1GJ we hear that Bob, 4X4CJ seeks W QSO's on 7 and 3.5 mc. He runs 60 watts and is on these bands each Friday 2200/0400 GMT. . . . Bran, KL7UM, seeks where-

abouts of SU1HR (TWA, Cairo '47) for that QSL. He also needs one from VQ8AX to complete his WAZ. . . . any help???

YV5AK bemoans the QSL situation. Manuel QSL's religiously and has received a total of 17 cards covering 258 contacts between Sept. to March '52. He feel QSLing first is a mistake and at his QTH we agree. The rare ones will come through Tony if you keep after them. . . . International Reply Coupons do help in some cases.

From OQ5RA we hear that Andre Lippens, better known as OQ5LL, will visit Washington, D. C. for three months, arriving May 15th. He looks forward to meeting the gang there and may be located at the following phones: Executive 4950 on Extension 4015.

QTH COLUMN

OX3BI (ex OX3GG) Robert Biloon c/o HQ and HQ Sqdn. APO 858 c/o P.M. N. Y.
MP4KAE Box 54 Kuwait, Persian Gulf.
VQ2AB (during vacation, May to December) 10 Arlington Road, West Ealing, London w13.
MI3LK Karl, P.O. Box 374, Asmara, Eritrea.
CR4AL Raul Fernandes, Sal Island, Cape Verde Is.
TTICW Box 36. Tannu Tuva. Asia
VP8AJ Port Lockroy, Grahamland, Base 'A' via Port Stanley, Falkland Is.
FI8KVA S/de Faultrier, IP 999-77, Hanoi, French Indochina.
SP9KKA Roman Krakow, via Box 320, Warsaw.
HC8GI Via G.R.C. Box 784, Guayaquil, Ecuador.
KB6AT Bill Winters, 461 Oaklet St., Salt Lake City, Utah.
VS9AA Mr. Abbott, Officers Mess, RAF, Khormaksar, Aden.
CP1BK 'Henry' Box 255 Copiapo, Bolivia
FB8BE Box 86, Tamatarive, Madagascar.
FQ8AP Serge Cansvenc, Box 218, Brazzaville, AEF, Africa.
AJ4AB/ST2AB Ed Ballard, 955 Elmwood Road, San Bernardino, Calif.
AP7—ex IIIR Doct. Eng. Robert Ognibene, Papermill c/o Incos Chandraghona (Chittagong-East Pakistan)
FM7WH Remy Gricolat, Hotel de la Nationale, Bd. Gen. de Gaulle, Fort de France, Martinique, FWI.
KR6's Okinawa Radio Amateur League, APO 331 c/o PM, San Francisco, Calif.
PX1BB/3A2AQ/F7BB Lt. Col. Jim Ligon, Chateau Melleray, St. Denis-en-Val, Loiret, France . . . or . . . Via F7BB c/o R.E.F.
I5OC (I5RP) Onofrio Carleo, c/o Post Office, Galcaio, Italian Somaliland. Africa.
VR6AC 'John' Rock Harbour, P.O. 2, Pitcairn Island, Oceania.
LZ1KAB Radio Club, Box 830, Sofia, Bulgaria.
VP8AJ 'Jeff' Port Lockroy, Grahamland, Base 'A', via Port Stanley, F. I.
YN1WC (W6EWC) Box 346, Managua, Nicaragua, C.A.
OE13HP (W7MYG) Hal Potter, APO 168, c/o PM. NYC.
VS7RSC Box 907, Colombo, Ceylon.

Thanks to I1AIV, LU5AQ, F9RS, W7MRX, YN1AA, W1DPJ, W1RAN, VK3XO, VK3KB and the West Gulf Bulletin.

To those of you who are ready to buy (or even to sell), these Reports will give you the latest price changes as well as the new and discontinued products. This monthly summary of the market is supplied by RADIO'S MASTER, The Industry's OFFICIAL Buying Guide, published by United Catalog Publishers, Inc., New York City. A complete description of each product is found in RADIO'S MASTER 16th Edition.

ANTENNAS & ACCESSORIES

Amphenol—To their 21 series RG/U type transmission line added RG-42/U; RG-114/U; RG-122/U; RG-125/U; RG-130/U and RG-131/U . . . added 4 type BNC connectors . . . 34 RF (series 82) connectors . . . 12 UHF (series 83) connectors . . . 16 replacement plugs . . . reduced prices on most of the 21 series RG coaxial cables and the 184 series packaged twin-lead . . . reduced 14-056, twin-lead transmission line and 14-316, remote control wire.

MISCELLANEOUS RADIO, TV AND ELECTRONIC PARTS

Aerovox Corp.—Increased prices on Duranite Molded Tubular Capacitors P88-1600 Volts.

Littlefuse, Inc.—Added 14 Four AG Slo-Blo fuses.

Mallory & Co.—Increased prices on 22 replacement magnesium-copper sulfide rectifier stacks.

Sangamo Electric Co.—Added 11 type MMT Electrolytic capacitors and 11 type BTE Electrolytic capacitors.

RECORDING EQUIPMENT, SPEAKERS, AMPLIFIERS, NEEDLES, TAPE, ETC.

Jensen Mfg.—Added type "C" bass reflex cabinets model C-81 (in Blonde and Mahogany) speaker size 8" at $25.00 net . . . model C-121 (in Blonde and Mahogany) speaker size 12" at $33.16 . . . C-151 (in Blonde and Mahogany) speaker size 15" at $41.33 net . . . added type "J" Peridynamic cabinet model J-81 for 8" speakers at $6.23 net . . . model A-402 crossover network (crossover at 4000 cycles; 16 ohms impedance input) at $6.75 net . . . model RP-302, high frequency unit (compact "super-tweeter," maximum power rating 30-40 watts speech and music signal when used with A-402 crossover network. Impedance 16 ohms) at $33.60 net.

TEST EQUIPMENT

Electronic Measurements—Added #106 Kit at $23.90 net.

R.C.A.—Added master volt ohmyst WV-87A at $112.50 net.

TUBES—RECEIVING, TELEVISION, SPECIAL PURPOSE, ETC.

G. E.—Increased prices on 51 radio receiving tubes . . . 9 transmitting and industrial type tubes. Decreased prices on 52 radio receiving tubes . . . 23 transmitting and industrial type tubes.

National Union—Reduced prices on 22 radio receiving type tubes.

R.C.A.—Increased prices on 30 receiving tubes . . . receiving tubes 6BL7GT at $2.40 list, 12BH7 at $2.40 list and 25BQ6GT at $3.40 list.

Sylvania—Decreased prices on radio receiving tubes. Increased prices on radio receiving tubes 14F8, 7F8 to $3.00 list each, 6V6 to $3.50 list . . . special purpose tube 6AS7G to $4.85 net and general purpose cathode ray tubes 3AP1A, 3KP1 and 5BP1. Added radio receiving tubes 6AG, 6BX7GT, 6U8, 6X5, 6X8 special purpose tubes . . . 12 general purpose cathode ray tubes and 10 subminiature tubes. Withdrew 10 radio receiving tubes . . . and subminiatures 5897, 5898, 5900 and 5901.

SCRATCHI

(from page 4)

tremendus possibilities. For instance, high-powdered man having no advantage over low-powdered man—it strickly a case of vice-versa. Of course, it are simple for high-powdered man to solve problem. All he having to do is redooce powder and he all set. If he not modulating strong enuf, all he having to do is turn down gain control, and he going up in signal strength at other end.

To preventing amchoors from having too strong signals and hogging the hole band, are probably going to make necessary a new law from FCC which say no amchoor can using less than 5 whats, otherwise some wise guy are going down to few tenths of what, and what chances are 500 whats going to have against that kind strong signal. Too much QRP and all you would have is QRM. Novice Class amchoors would having to always run more than 500 whats in order to keeping QRM off the band.

One problem I thinking of is going to be big headache, and that is the backwave on c.w. Station with back wave would be louder with key up than with key down, resulting in slite confewsion in copying. Maybe reel answer to this is using relay which not keying transmitter when key is pressed, and which turning on transmitter when key are up. Howsomever, are going to have to thinking more on this problem before deciding what to do.

Before applying for patent on Scratchi's Splashy Sistem, and announcing revolutionary new idea to lucky old world, I are deciding I better make a few measurements on what happening with own rig. So, turning it on, after first checking to see if auto-transformer are in same place as when getting S-9 plussedy-plus report. Taking quick look at final current—Hokendoke!! it are about one-half ampere! Quick-like snatching out voltmeter to measure final voltage—Sacremento Boulevard!! it are about 2500 volts. How come? By the beard of my great-uncle from Osockme, of all the stoopid . . . I'll be a . . . well for . . . do you know what I doing Hon. Ed? I hooking up auto-transformer backward, so getting full powder all time I thought I had low powder!

Well, it looks like idea not working. Maybe heavyside layer not heavy enuf this time of year. Maybe . . . say, do you think we could getting FCC to raising powder limit from one to ten kilowhats, just till DX conditions are improving?

Respectively yours,
Hashafisti Scratchi

Missouri Emergency Net Picnic

All hams, YLs and XYLs are invited to attend the fourth annual picnic of the Missouri Emergency Net. Scheduled for Sunday, June fifteenth, the picnic will feature a fish fry, to be held through the noon hour. The picnic grounds are situated at the Kaiser State Park, near Eldon, Mo., on the lake of the Ozarks. If you wish to come early, please contact WØTGG at Eldon, Mo., for cabin reservations. Advance registration will be $1.50 per person from WØAZL of Sedalia, Mo., and tickets at the gate will be $2.00.

The Private Life of CQ

Putting the "SPECIAL MOBILE ISSUE" together turned out to be a task of no small proportions. We blush with shame to admit that a number of errors have been reported—all of which appear to be the fault of the editorial department.

One of the big problems in handling "errata" for the reader has been collating the errors and their corrections that appear in subsequent issues. Quite often, and naturally enough, the correction is forgotten by the reader at a later date because of the very reason that it did appear in a later issue. The *CQ* staff has given this considerable thought and has evolved an idea that is being tried out below.

Note that the corrections have been simplified and "boxed" in order to permit them to be "cut" out of the magazine and pasted in with the original article. A convenient method is go cut out the correction and attach it with cellophane tape at the top of the page by folding the tape over the top and down the other side.

The 4 on 1 Converter
(on page 39)

L8—1.7 - 5.3 mc oscillator coil (Meissner 14-1063)

A Low Pass Mobile TVI Filter
(on page 44)

Tune coil "A" to 58 mc.
Tune coil "B" to 71 mc.
Tune coil "C" to 54 mc.

"28-9"
(on page 47)

L2—13T #18 enamel (National XR-50 coil form, or equivalent)
L3—9T #18 1⅛" long ¾" dia. (B. & W. #3010)

Mobile With The ARC-5/SCR-274
(on page 58)

Add .002 μf as screen by-pass on 1625 final.

Mobile With The ARC-5/SCR-274
(on page 60)

Change plate blocking condenser from .0004 μf to .001 μf and remove rotary tuned antenna inductance from circuit.

Mobile With The ARC-5/SCR-274
(on page 61)

The speaker coil in the schematic (Fig. 7) is NOT 500 ohms. The primary of the transformer is 500 ohms.

Classified Ads

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

WANTED: your attendance at the Mid-American and Dakota Division ARRL Convention, September 5, 6 and 7, 1952, Nicollet Hotel, Minneapolis, Minn.

WANTED: top prices paid—Navy Selsyns 1F, 1G, 1CT, 5F, 5G, 5CT and BC-348, BC-221, AN/ART-13, AN/ARC-1, AN/ARC-3, RTA-1B. Lectronic Research, 719 Arch St., Philadelphia.

BARGAINS: New and used, Collins, Hallicrafters, Hammarlund, National, RME, Gonset, Lysco, Mallard, etc. Write, Dossett, W9BHV, 855 Burlington, Frankfort, Indiana.

WANTED: Pierson KP-81 receiver in good operating or repairable condition. Cash or trade. Eugene A. Wille, W9EKU, 3435 North 47 Street, Milwaukee 16, Wisconsin.

ANNOUNCING ARRL New England Division Convention and Hamfest, sponsored by Hampden County Radio Club, at Eastern States Exposition Grounds, West Springfield, Mass., Saturday, June 14, 1952. Registration and banquet, $5. Registration only, $2. Send checks to Albert Jackson, W1OBQ, Treasurer, P.O. Box 221, Springfield, Mass.

THREE K-7 GUN MOUNTS for sale. Perfect beam rotators. $10.00 each. Perfect condition. Described in Surplus Conversion Manual, Second Edition. Harry Harris, W6FRM, 2616 Castle Heights Ave., Los Angeles, 34, California.

TELETYPE midget printers, transmitters, polarized relays, sold only to licensed amateurs under rules of V.H.F. Teletype Society. Write for information and prices. Will trade. Arrow Appliance Company, 25 Harrison Court, Lynn, Mass.

WANT: Test equipment with TS-or I-prefix. TCS, ART-13, ATC, DY-12, DY-17, BC-1306, PE-237, BC-639, RA-42, RA-34, BC-348, BC-312, technical manuals. T. Clark Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass.

FOR SALE: Two newly-converted T-69-20-A Motorola transmitters, one for 75 and the other for 10 meter fone complete with power supply, control head, cables, Master Mount base and antenna with Mallard 75 meter loading coil. Merely exchange plug-in r.f. units to go from one band to the other in 60 seconds. Original cost $155.00. Will accept best over $100.00 crated f.o.b. Sheboygan. Terms C.O.D. Reason for selling—XYL says no rig in forthcoming new car! W9LXC.

GOING TO TRY for an amateur radio operator's license? Check yourself with a complete coverage multiple-choice type test similar to those used by the F.C.C. Surecheck tests with answer key, Novice Class $1.50; Conditional and General Class $1.75; Advanced Class $2.00. Order your time-tested surecheck test today. Amateur Radio Supply, 1013 Seventh Ave., Worthingham, Minnesota.

CRYSTALS, Ham or Novice. Immediate delivery from stock. Mounted in FT-243 holders, ½" pin spacing. Novice 3700-3750 kc, "Ham" 1975-2000 kc, 3500-4000 kc, 7000-7350 kc, 8000-8200 kc. Your choice of frequency, plus or minus 5 kc, $1.00 each postpaid. Potter Radio, 1314 McGee, Kansas City 6, Mo.

QSLS—Brownie, W3CJI, 431 Chestnut, Emmaus, Penna.

GOIN' FISHING? Contact Hams Haven: the rendezvous of Northwestern Ontario. Write Jack B. Connor, VE3AFH, Eagle River, Ontario, Canada.

GLOBE KING 400A, 400 watt CW or phone transmitter, 80 thru 10 meters, $299.00. RME. VHF. converter $59.00. Both items like new used less than fifty hours. W5RJR, 2351 North Akin, Texarkana, Texas.

10-20-40 ELEMENT 2-meter aluminum Brownie beams. Made to order. Write W3LMC, 4330 Glenmore Ave., Baltimore 6, Md.

WANTED: Super-Pro cabinet; state price and condition. W1BIC, 198 Millrock Rd., New Haven, Conn.

WANTED: Millen 90810 transmitter in good condition with 2-meter coils. Write price wanted to "Doc" Hagerthy, W1RYM, Scarboro, Maine.

QSL CARDS? Samples 20c. Sackers, W8DED, Holland, Michigan.

FOR SALE: Hallicrafters Model S40A in excellent condition. Interested in buying a larger model. Price $60.00. Charles Kennel, Box 217, Fairview, Montana.

T.V.I. METER SHIELDS @ 70c. 17" TV 20 tube w/CRT chassis 52 model, new but repaired, $85.00. Perfect for T.V.I. monitoring . . . DX-630 Chassis (cascode tuner) latest improvements, $139.95. Write for full details. Duro Electronics Inc., 623 E. 2 St., Brooklyn, N.Y. W2MRM.

CRYSTALS: Low drift, high activity, tailor made. 3500 to 8500 kilocycles—FT243's. Desired frequency within 5 KC. $1.00 each. Hundley Crystal Co., 2951 No. 36th St., Kansas city 4, Kansas.

FOR SALE: RME HF 10-20 converter, 20, 15 and 11-10 meters, $69.00, factory guaranteed; also Gonset "6-15" converter covering 6, 10, 11, 15 meters, actually 3 converters in one, 8 tubes, like new, $59.00. W9LWS, Cuba City, Wisc.

MOBILE TRANSMITTER: Stancor ST203A with all tubes except 2S26, $52 value for $38. New PE103 dynamotor, with ten foot cable, $23 express collect. 250 watt modulation transformer, UTC S22, $27 value for $18.50 FOB. Otho Warner, W4JBA, 4212 South Second Street, Louisville, Kentucky.

BARGAINS: EXTRA SPECIAL! Motorola P-69-13 Mobile Receivers $29.50; Globe King $315.00; HT-9 $199.00; HRO-50 $275.00; Lysco 600 $109.00; SP-400X $249.00; HRO-7 $199.00; Collins 75A1 $275.00; HRO-5T $175.00; SX-71 $159.00; HRO senior $119.50; RME 2-11 $99.50; RME-45 $99.00; Meissner Ex Shifter $59.50; S-40A or SX-16 $69.50; VHF-152A $69.00; HRO-10-20 $59.00; SX-24 $69.00; Globe Trotter $79.50; Meissner Signal Calibrators $24.95; MB611 Mobile Transmitter $29.00; 90800 exciter $29.50; RCA Chanalyst $79.50; XE-10 $14.95; and many others. Large stock trade-ins: Free trial. Terms financed by Leo, WØGFQ. Write for Catalog and best deal to World Radio Laboratories, Council Bluffs, Iowa.

HAMMARLUND 400 SX $225, also BC 221 Frequency Meter 110 V, $50. J.G. Hagen, 1315 So. 29th St., Birmingham, Ala.

WANTED TO BUY: Compact high power phone transmitter band switching 75-20-10. Only interested in Quality Job. Send details and price first. W3LIG, National Bank Bldg., Corry, Pa.

QSL CARDS printed, Atlantic Press, Clifton, N.J.

ANNOUNCING Chicago Hamfesters Radio Club Eighteenth Annual Picnic at Frankfort Grove, Illinois, August Tenth, 1952. Donations $1.50.

BARGAINS: New and reconditioned Collins, Hallicrafters, National, Hammarlund, Johnson, Harvey-Wells, Gonset, Elmac, Morrow, RME, Lysco, Millen, Meissner, others. Reconditioned S38 $29.00, S53 $49.00, S40A $69.00, S40B $79.00, SX43 $119.00, SX42 $199.00, SX62 $199.00, SW54 $35.00, NC57 $69.00, NC173 $139.00, NC183 $199.00, HRO50 $249.00, HQ129X $139, RME45 $109.00, Meissner EX $59.00, Bandmaster Sr. $89.00, Bandmaster De Luxe $99.00, DB22A, HF-10-20, VHF152A, HRO7, HRO50-1, SP400X, Lysco 600, Collins 75A1, 32V1, 32V2, others. Shipped on trial. Time payments. List free. Henry Radio, Butler, Missouri.

WANTED: APR-4, other "APR-", "APS-", "APT-"; ARC-1, ARC-3, ART-13. BC-348, BC-221, etc..; TS-12, 13, 35, 120, 146, 155, 174, 175, other "TS-", particularly microwave equipment, Spectrum Analyzers; G-R, Ferris, etc. units; 723a/b, 3C22, all tubes; manuals, meters, parts, cable. Quick cash, top price; or trade 35mm cameras, TV, ham gear. Littell, Farhills Box 26E, Dayton 9, Ohio.

10 & 20 METER BEAMS $23.25 up. Aluminum tubing, etc. Willard Radcliff, Fostoria, Ohio.

FOR SALE: General Radio Class C-21HLD Primary Frequency Standard. Excellent condition. $1475. W6ITH, Moraga, Calif.

SELL. BC610 Components, f.o.b. Grand Island, Nebr. Modulator deck wired. Less tubes and modulation transformer. Good condition. Exciter deck. Wired. With two tuning units. Less tubes. Good condition. Make me an

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CQ Ad Index

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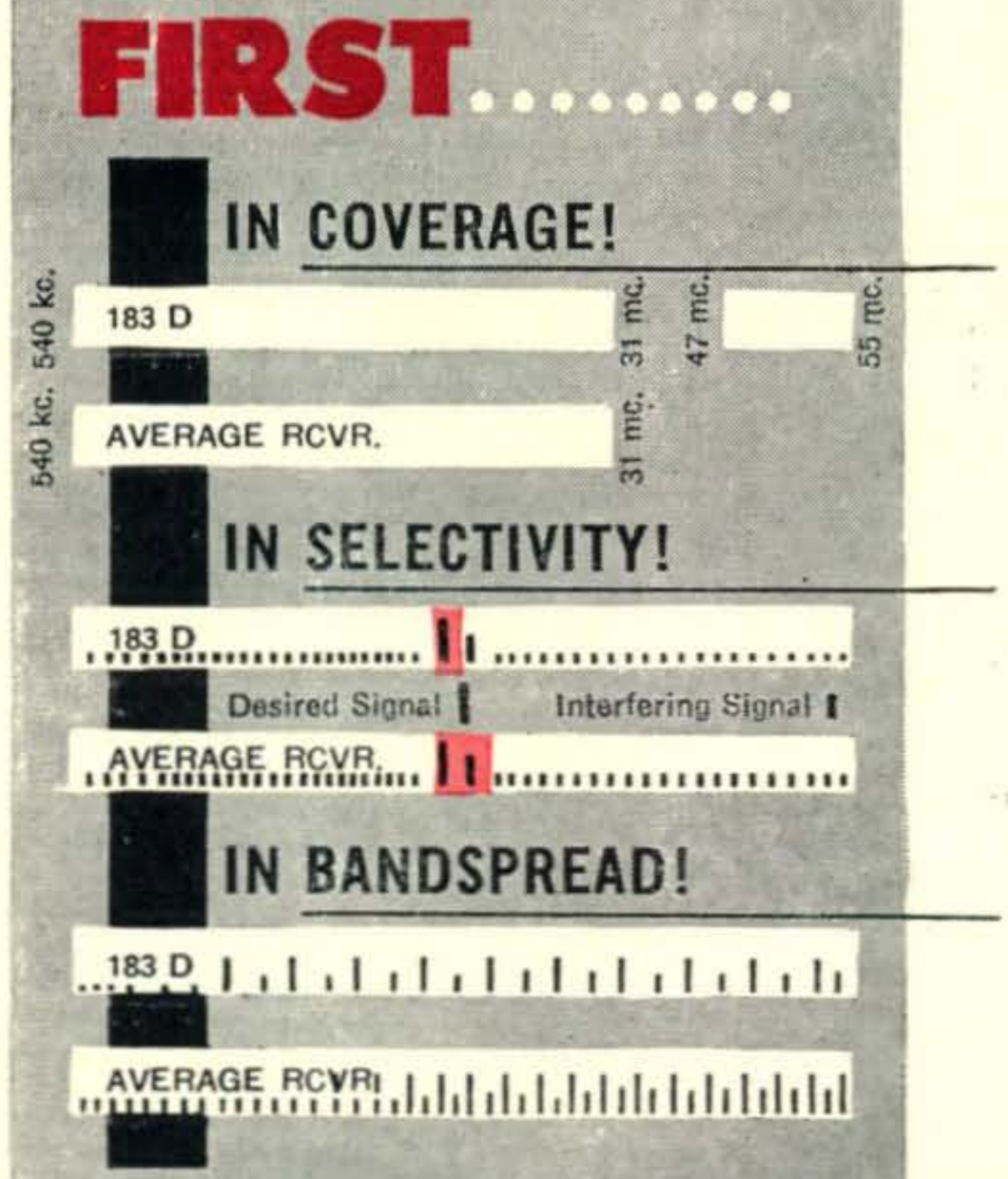

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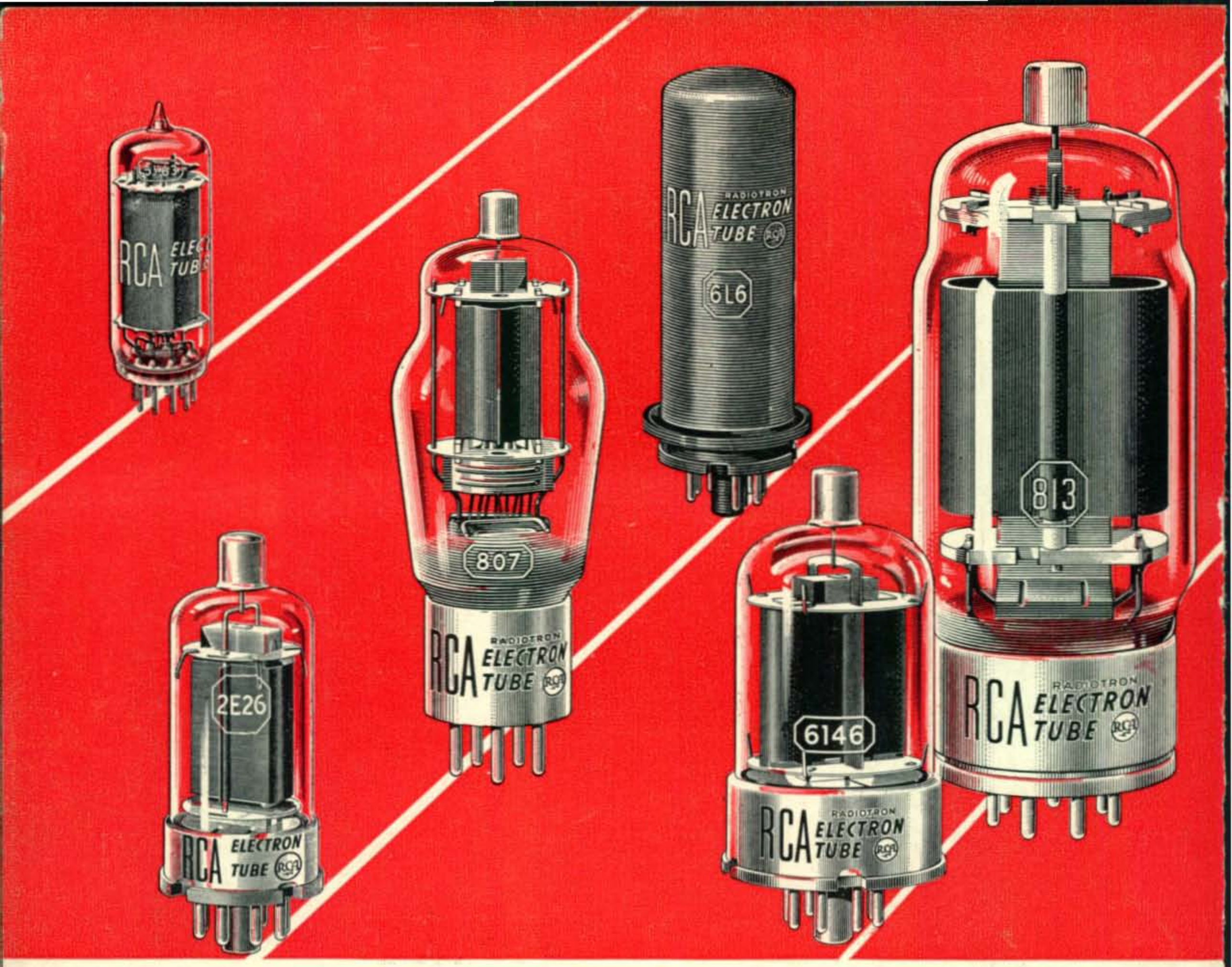

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SIMPLY STATED, beam power tubes combine good output efficiency with low drive requirements.

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. . . since high driving power is *not* a requirement, there is less chance of TVI.

. . . if economy is a factor, remember that most beam-power-tube circuits can use simple, inexpensive, low-voltage power supplies.

. . . beam power tubes are superior for quick-change, multi-band transmitters because they seldom require neutralization in well-designed circuits.

. . . the fact that plate voltage can be changed without affecting other circuit adjustments makes it simple to reduce power for local QSO's.

. . . beam power tubes operate efficiently as frequency multipliers, drivers, finals, and modulators.

There you have the reasons why beam power tubes lead all other types in modern transmitter design.

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