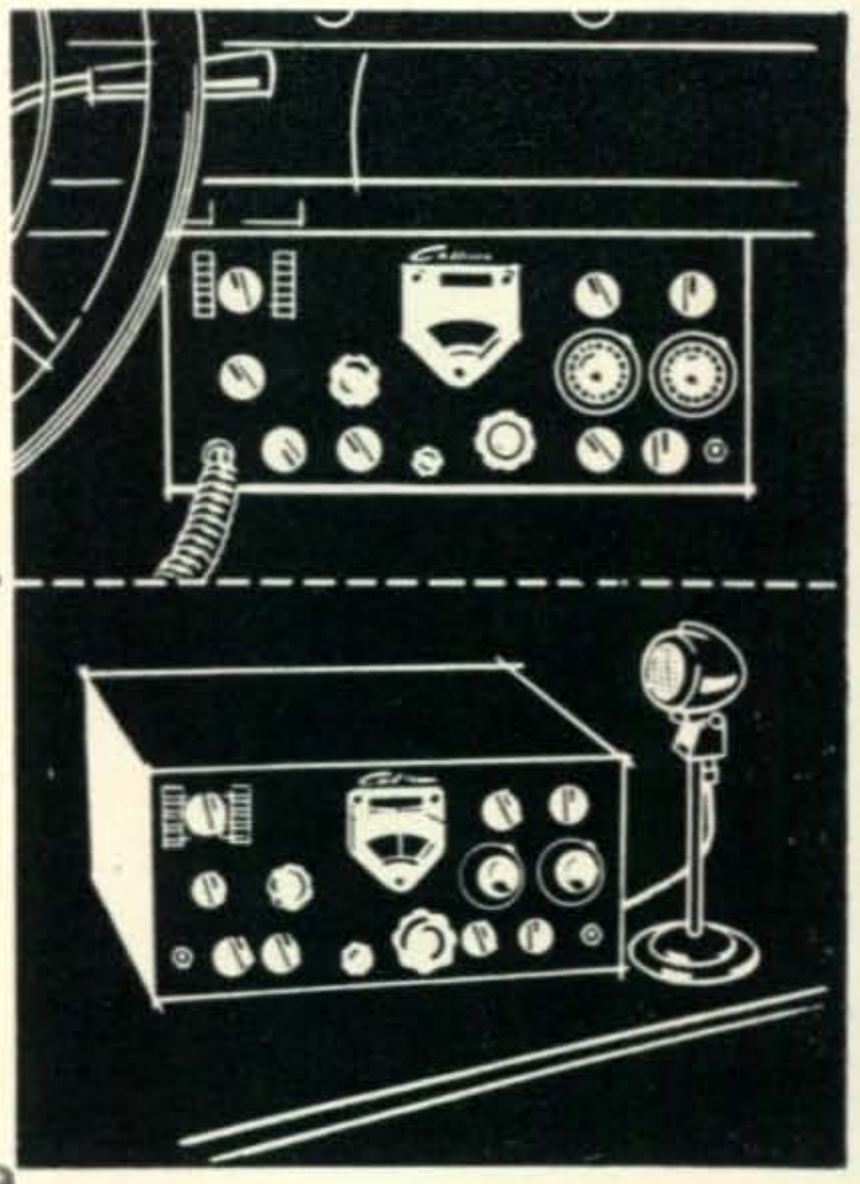
MAY
1957
50¢

CQ

RADIO AMATEURS' JOURNAL

CQ Tests the new NC-109

NEW *from Collins*



FIRST *Mobile SSB Mobile Transceiver*

KWM-1

for complete Mobile, Fixed use

NEW and FIRST — that's the best description of the revolutionary KWM-1, the first mobile transceiver and the first to offer SSB. And this 14-30 mc 200 watt package is equally adaptable to fixed use with simple removal from a convenient mounting tray under the dashboard.

Utilization of common components in both transmitting and receiving functions results in a saving of both space and cost and, in the case of frequency-determining components, assures exact coincidence of transmitted and received signals. Frequency stability and readability is comparable to that of the KWS-1/75A-4. The panel meter serves as an S-meter during receive and multimeter during transmit. Break-in CW using VOX circuits is built-in, as is a side tone for monitoring CW. Ten 100 kc bands are available anywhere in the 14-30 mc range.

These are a few of the features in the all-new KWM-1. Ask your Collins distributor for details. Limited quantities available in August.

NET PRICES

KWM-1 Transceiver	$770.00
516E-1 12 vdc Power Supply	248.00
516F-1 115 vac Power Supply	103.00
312B-2 Speaker Console with phone patch and directional wattmeter	146.00
312B-1 Speaker in cabinet	25.00
351D-1 Mobile Mounting Tray	22.00

Collins CREATIVE LEADER IN COMMUNICATION

COLLINS

For further information, check number 59 on page 126.

There's a PR for every Service!

AMATEUR

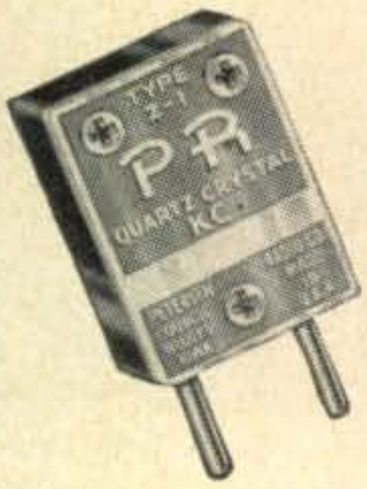
40, 80 and 160 Meters, PR Type Z-2

Rugged. Low drift, fundamental oscillators. High activity and power output. Stands up under maximum crystal currents. Stable, long-lasting, permanently sealed.....**$2.95 Net**

20 Meters, PR Type Z-3

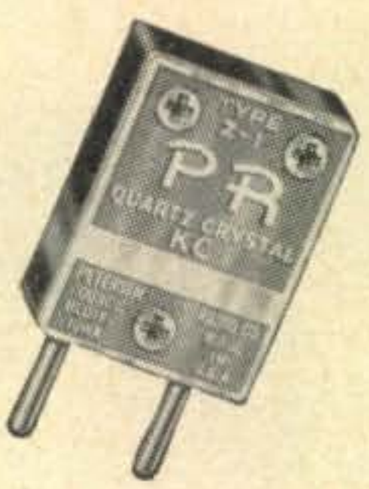
Harmonic oscillator. Low drift. High activity. Can be keyed in most circuits. Stable as fundamental oscillators. Fine for doubling to 10 and 11 meters or "straight through" 20 meter operation.....**$3.95 Net**

COMMERCIAL



COMMERCIAL, PR Type Z-1

Designed for rigors of all types of commercial service. Calibrated .005 per cent of specified frequency. Weight less than ¾ ounce. Sealed against moisture and contamination. Meets FCC requirements for all types of service.



SPECIAL TYPES

Type Z-1, AIRCRAFT

3023.5 Kc., .005%.....**$3.45** Net

Type Z-1, MARS and CAP

Official assigned transmitter frequencies in the range.
Calibrated to .005%. 1500 to 10000 Kc. **$3.45** Net

Type Z-6A FREQUENCY STANDARD

To determine band-edge. To keep the VFO and receiver properly calibrated.

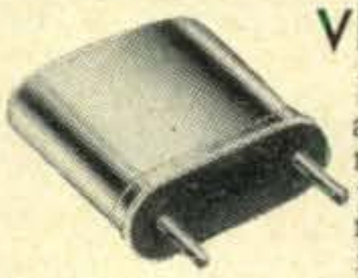
100 Kc. . . . . **$6.95** Net

Type 2XP

Suitable for converters, experimental, etc. Same holder dimensions as Type Z-2.

1600 to 12000 Kc. (Fund.) ±5 Kc. . . . **$3.45** Net

12001 to 25000 Kc. (3d Mode) ±10 Kc. . . . **$4.45** Net



VHF Type Z-9R

For Lear, Narco and similar equipment operating in the 121 Mc. region, requiring crystals in 30 Mc. range.

Each . . . . . **$4.95** Net

Type Z-9A RADIO CONTROLLED OBJECTS

27.255 Mc., .04% . . . **$3.95** Net

Type Z-1 TV Marker Crystals

Channels 2 through 13 . . . . . **$6.45** Net

4.5 Mc. Intercarrier, .01% . . . **2.95** Net

5.0 Mc. Sig. Generator, .01% **2.95** Net

10.7 Mc. FM, IF, .01% . . . **2.95** Net

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Authors would do well to send for the CQ Style Sheet which will explain our confused system of abbreviations and symbols. The article "Author Author" (October 1952 CQ) tells all about how to write articles for CQ, how much we pay, etc. Reprints of this article are available from CQ if you have been improvident in keeping up your radio library.

CQ Certificates:

The WPX Award is granted for two-way contact with certain number of amateurs in different prefixes of the world. Full details are contained in the WPX Record Book which is available for 15c from CQ. Application forms are free.

The WAZ Award is granted for contacting all of the amateur zones of the world. Current standings of amateurs working for this award will be found in the DX column. A DX Zone map of the world is available free from CQ. Send stamped envelope.

Technical Information:

CQ has no one available to answer technical questions. Please check the 11-year cumulative index which was published in the January 1956 CQ for information about articles in past issues of CQ. The December 1956 CQ yearly index will bring you up to 1957. Most back issues are available at 50c each from us, check our "Back Issue" ad for details on those not available. Reprints of the Cumulative Index are available free.

Our Cover

CQ is very thorough in their tests of new equipment.

←For further information, check number 78 on page 126

CQ, The Radio Amateurs' Journal

May, 1957
Vol. 13, No. 5

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The world's finest ham equipment in kit form . . . designed especially to meet your requirements!

Heath amateur radio gear is designed *by* hams—*for* hams, to insure maximum "on the air" enjoyment. Good design and top-quality components guarantee reliability. Heathkits are easy to build and are easy on your budget! You save by dealing direct, and you may use the Heath Time Payment Plan on orders totaling $90.00 or more. Write for complete details.

HEATHKIT

DX-100

TRANSMITTER KIT

PHONE AND CW

- *Phone or CW—160 through 10 meters.*
- *100 watts RF on phone—120 watts CW —parallel 6146 final.*
- *Built-in VFO—pi network output circuit.*
- *Easy to build—TVI suppressed*

MODEL DX-100

$189.50

$18.95 dwn., $15.92 mo.

Shpg. Wt. 107 Lbs.

Shipped motor freight unless otherwise specified. $50.00 deposit required on c.o.d. orders.

The Heathkit DX-100 phone-CW transmitter offers features far beyond those normally received at this price level. It has a built-in VFO, built-in modulator, and built-in power supplies. It is TVI suppressed, and uses pi network interstage coupling and output coupling. Matches antenna impedances from approximately 50 to 600 ohms. Provides a clean strong signal on either phone or CW, with RF output in excess of 100 watts on phone, and 120 watts on CW. Completely bandswitching from 160 through 10 meters. A pair of 1625 tubes are used in push-pull for the modulator, and the final consists of a pair of 6146 tubes in parallel. VFO dial and meter face are illuminated. High-quality components throughout! The DX-100 is very easy to build, even for a beginner, and is a proven, trouble-free rig that will insure many hours of enjoyment in your ham shack.

HEATH COMPANY BENTON HARBOR 12, MICHIGAN

A Subsidiary of Daystrom, Inc.

For further information, check number 71 on page 126.

HEATHKIT DX-35
TRANSMITTER KIT

PHONE AND CW

MODEL DX-35

$56.95

Shpg. Wt. 24 Lbs.

$5.70 dwn., $4.78 mo.

This transmitter features a 6146 final amplifier to provide 65 watt plate power input on CW, with controlled-carrier modulation peaks up to 50 watts on phone. Modulater and power supplies are built in, and the rig covers 80, 40, 20, 15, 11 and 10 meters with a single band-change switch. Pi network output coupling provides for matching various antenna impedances. Employs 12BY7 oscillator, 12BY7 buffer and 6146 final. Speech amplifier is a 12AX7, and a 12AU7 is employed as modulater. Panel control provides switch selection of three different crystals, reached through access door at rear. Panel meter indicates final grid current or final plate current. A perfect low-power transmitter both for the novice or the more experienced amateur. A remarkable power package for the price. The price includes tubes, and all other parts necessary for construction. Comprehensive instruction manual insures successful assembly.

- *Phone or CW—80 through 10 meters.*
- *65 watts CW—50 watts peak on phone—6146 final amplifier.*
- *Pi network output to match various antenna impedances.*
- *Tremendous dollar value—easy to build.*

BRAND NEW

HEATHKIT DX-20
CW TRANSMITTER KIT

MODEL DX-20

$35.95

$3.60 dwn., $3.02 mo.

Shpg. Wt. 18 Lbs.

- *Designed exclusively for CW work.*
- *50 watts plate power input—80 through 10 meters.*
- *Pi network output circuit to match various antenna impedances.*
- *Attractive and functional styling—easy to build.*

Here is a straight-CW transmitter that is one of the most efficient rigs available today. It is ideal for the novice, and even for the advanced-class CW operator. This 50 watt transmitter employs a 6DQ6A final amplifier, a 6CL6 oscillator, a 5U4GB rectifier and features one-knob bandswitching to cover 80, 40, 20, 15, 11 and 10 meters. It is designed for crystal excitation, but may be excited by an external VFO. A pi network output circuit is employed to match antenna impedances between 50 and 1000 ohms. Employs top-quality parts throughout, including "potted" transformers, etc. If you appreciate a good signal on the CW bands, this is the transmitter for you!

HEATH COMPANY BENTON HARBOR 12, MICHIGAN

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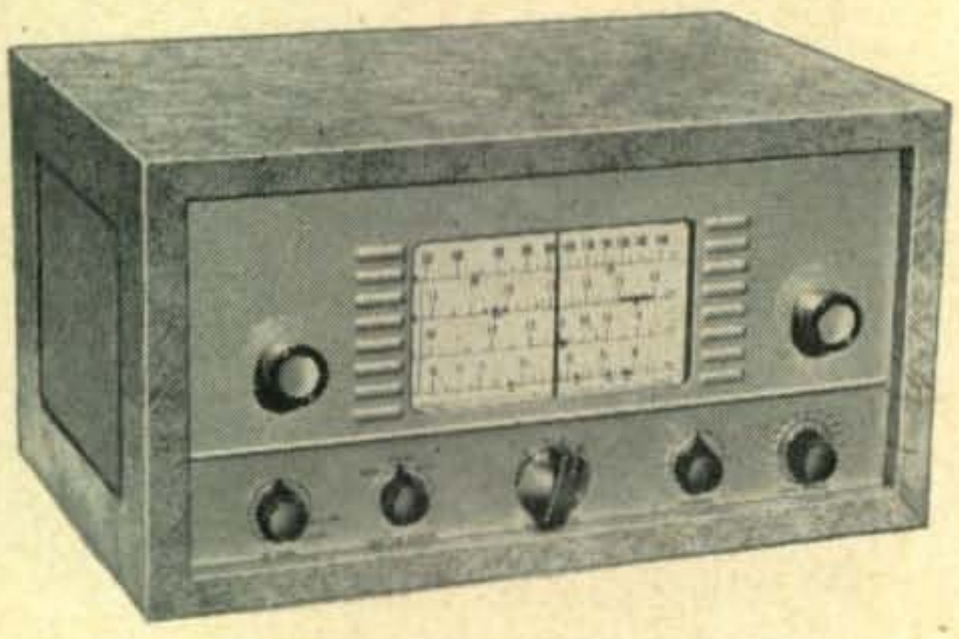
For further information, check number 71A on page 126.

HEATHKIT

COMMUNICATIONS-TYPE, ALL BAND

RECEIVER KIT



This receiver covers 550 kc to 30 mc in four bands, and is ideal for the short wave listener or beginning amateur. It provides good sensitivity and selectivity, combined with fine image rejection. Amateur bands are clearly marked on the illuminated dial scale. Features transformer-type power supply—electrical band spread—antenna trimmer—separate RF and AF gain controls—noise limiter—headphone jack—and AGC. Has built-in BFO for CW reception. Shpg. Wt. 12 Lbs.

MODEL AR-3

$29.95

incl. excise tax (less cabinet)

$3.00 dwn., $2.52 mo.

CABINET: Fabric covered cabinet with aluminum panel as shown. Part 91-15A. Shipping Wt. 5 Lbs. $.50 dwn., $.42 mo. $4.95

(A) HEATHKIT VFO KIT MODEL VF-1

Covers 160, 80, 40, 20, 15, 11 and 10 meters with three basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Requires 250 VDC at 15 to 20 ma, and 6.3 VAC at 0.45A. Incorporates regulator tube for stability and illuminated frequency dial. Shpg. wt. 7 lbs. $1.95 dwn., $1.64 mo. **$19.50**

(B) HEATHKIT GRID DIP METER KIT MODEL GD-1B

Continuous coverage from 2 mc to 250 mc with prewound coils. 500 ua panel meter for indication. Use to locate parasitics, for neutralizing, determining resonant frequencies, etc. Will double as absorption-type wavemeter. Shpg. wt. 4 lbs. $2.00 dwn., $1.68 mo. **$19.95**

(C) HEATHKIT ANTENNA IMPEDANCE METER KIT MODEL AM-1

The AM-1 covers 0 to 600 ohms for RF tests. Functions up to 150 mc. Used in conjunction with a signal source, will determine antenna resistance and resonance, match transmission lines for minimum SWR, determine input impedance, etc. Shpg. wt. 2 lbs. $1.45 dwn., $1.22 mo. **$14.50**

(D) HEATHKIT "Q" MULTIPLIER KIT MODEL QF-1

Functions with any receiver having IF frequency between 450 and 460 kc that is not AC DC type. Operates from receiver power supply, requiring only 6.3 volts AC at 300 ma (or 12.6 vac at 150 ma), and 150 to 250 vdc at 2 ma. Simple to connect with cable and plugs supplied. Provides extra selectivity for separating signals, or will reject one signal to eliminate heterodyne. Effective Q of approximately 4000. Shpg. wt. 3 lbs. $1.00 dwn., $.84 mo. **$9.95**

HOW TO ORDER...

It's simple—just identify the kit you desire by its model number and send your order to the address listed below. Or, if you would rather budget your purchase, send for details of the Heath Time Payment Plan for orders totaling $90.00 or more.

HEATH COMPANY BENTON HARBOR 12, MICHIGAN

A Subsidiary of Daystrom, Inc.

For further information, check number 71B on page 126.

Feenix, Ariz.

Deer Hon. Ed:

This are a most confewsed gentlefellow riting to you. Hokendoke!! am I confewsed. Ether that, or are being lotsa confewsed peeples in this Hon. Country. Can you imagining, she thinking we smoking diffrunt kinds of sigarets. Not only that, we all having tee-v sets and barreis of meters.

Of coursely, I confewsing you, Hon. Ed., if I are not explaneing reel quick-like. So, I explaneing reel quick-like. You seeing, are times in every fellers life when he having to do his civic dooty. Are most honored to doing self-same civic dooty yesstiday. Are out raising money for local Hon. Boy Scouts.

Are doing reel fine ackchewally until it happening. I just shoodn't have accepted her invitayshun. Are collecting from this nice little old lady, and she saying I looking hot, and woodn't I liking some nice iced tee and cookies. I saying okey, and that when trubble starting.

As we eating and drinking, cookies and tee that is, she asking me what I doing to keeping out of mischef. I telling her I Hon. Amchoor Radio Operaytor. She coming rite back and saying I can't possibly be amchoor, on acct. I not old enuf. All amchoors are reel old peeples, she saying. I asking howcomes she getting this impreshun and she saying she having short-waves reseever and she listening to amchoors, and she knowing all about them. Just sitting and nitting for hours listening to amchoors.

So, then she saying that I better sitting and listening on acct. she going to telling me what amchoors are like! First of all, she saying, they all having there radio equipment neer there house in old beeten-up bilding they calling a shack. Any, of coursely, they are all reel elderly peeple with bad eyesite.

Amchoors also smoking two diffrunt kinds sigarets she not heering of before, and, they all yewsing lots and lots of wye-el (whatever that can being, she saying). Now, in this shack amchoors are having lots of bottles, cupple barrels of meters, and reel large switch with lever to operating it which they thinking so much of they giving it speshul name. Hon.

Ed., are crossing my hart and hoping never to making WAZ if this aren't what she saying!!

Of coursely, she going on, all this she are understanding like peechy, but she are confewsed about cupple things, and she not thinking I are reel amchoor, but if I can answering questshuns maybe I convincing her.

For eggsample, she asking, are amchoors having any oil wells around, and if not howcomes they always talking about there rig? And also, howcomes they all seeming to be related to each other, on acct. they all having a Hon. Ant Enna.

Howcomes also they not chewing gum instead of rags—or what are this rag they all chewing? And lastly, who are this Cuty-H all amchoors talking so much about?

At this point I not deciding whether to trying to sneek quietly out or whether it better if I calling Hon. Man in White Coat. Howsumever, as I sitting there munching my eleventeenth cooky I reelizing this nice little old lady are reely just a nice l.o.l who been listening on amchoor bands and I beginning to seeing how she getting her ideas.

She thinking amchoors all reel old. Well, on fone bands everybuddys calling evrybuddy else Old Man. Reel large switch—pulling big switch!! And lever amchoors liking so much they giving it speshul name—Hon. Ed!! aren't everybuddy saying "Handle here are Pete" and so forths??

But howcome she thinks we have barrels of meters? You don't think . . . calling seekyou twenty meters!! Oh no!! Oh my Sacred Ant Fuji!! Still not figyouring out the two diffrunt kinds of sigarets we smoking, so asking nice l.o.l about this. Hon. Ed., this you never figyouring out in hundred yeers!! She thinking we smoking Cue-Five and Ess-Nine sigarets!! You know, she are rite. Aren't we always saying "Sigs here Cue-Five, Ess-Nine?" Aren't we? Most sertainly we are.

You know how this ending up? She handing me five bux for Hon. Boy Scouts, putting for more cookies in pocket, patting me on hed and telling me not to worrying, I growing old some day and then I can be amchoor too.

Letting me know whether you thinking this funny or not. I'm worried.

Respectively yours
Hashafisti Scratchi

Space Patrol Net

If you dig astronomy, radio or optical, and would like to talk with or about the spacemen who have arrived recently check in with the interplanetary Space Patrol Net which congregates on 3950 kc every Monday evening at 9 p.m. CST. Net control is W5NEW.

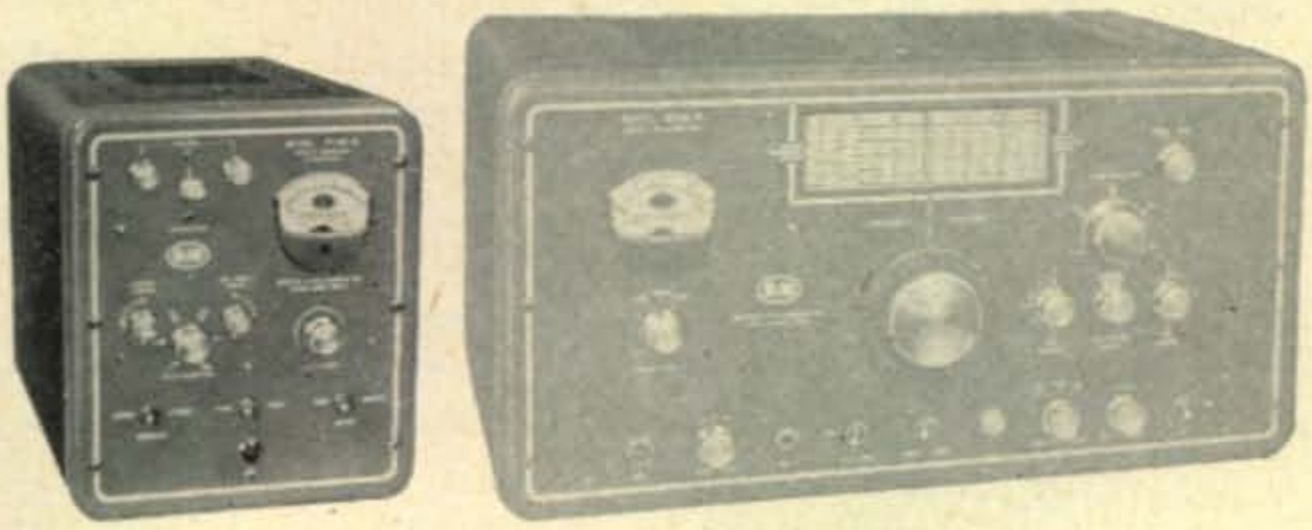
B&W TRANSMITTER GROWS WITH THE RADIO AMATEUR

5100-B

Start with basic Transmitter

Ideal for the oldtimer and beginner alike. It's a complete medium powered transmitter as it is . . . over 140 watts AM phone . . . 180 watts CW. Completely self-contained including power supply, VFO, and integral band-switching. Covers all ham bands 80 through 10 meters. YOU CAN ADD SSB AND A 1 KW FINAL TO THE 5100-B AT ANY TIME.

Net Price . . . $475.00



51SB-B

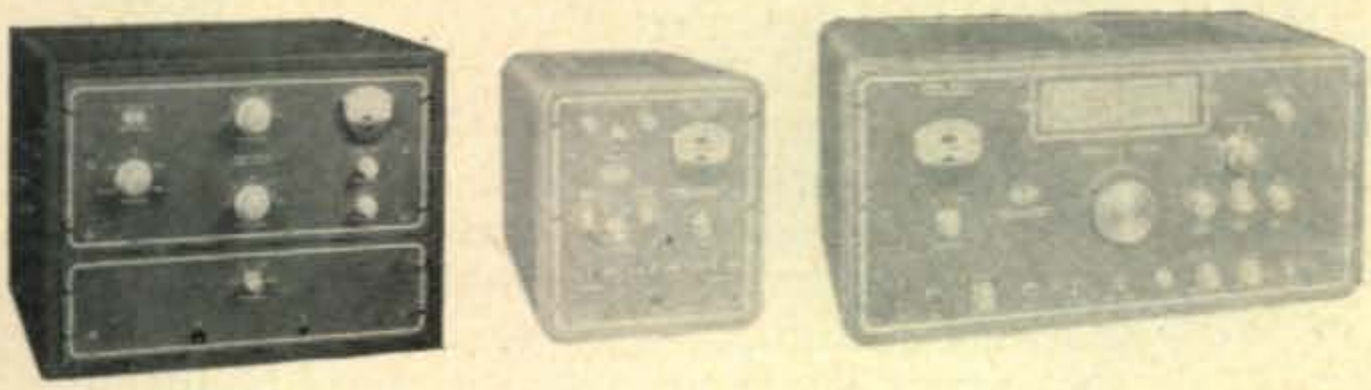
Add SSB Generator

If you want to enjoy top quality single sideband, just plug the 51SB-B into the back of the 5100-B transmitter* and you're on the air with a commanding signal. The many features of the 51SB-B include voice-operated control, selectable sideband with a flip of the switch, speaker deactivating circuit, and TVI suppression.

Net Price . . . $265.00

*If you have a Viking I or II, Collins 32 V series, or other commercial or composite home-built rig, get the Model 51SB. It's similar to the 51SB-B, but contains a power supply which you'll need with transmitters other than the 5100-B.

Net Price . . . $279.50



L-1000-A

and then tie in 1 KW Final

When you're ready to go the limit—1 kilowatt of power—all you need to do is to add the L-1000-A. This grounded grid linear amplifier will stand out in signal eloquence whenever the going gets rough. The pi-network output gives you precise adjustment of tuning and loading from 80 to 10 meters. It's rated at 1000 watts peak envelope power SSB, 875 watts CW, and 375 watts linear AM phone.

Net Price . . . $460.00

All these B&W units are housed in attractive cabinets with a blue-grey wrinkle finish. Panels are finished in the distinctive B&W rich semi-gloss grey, with white lettering and border stripes. They're expertly engineered to assure you of long, trouble-free operation as well as ease of control and tuning.

Prices subject to change without notice

B&W

BARKER & WILLIAMSON, INC.
Bristol, Pennsylvania

For further information, check number 53 on page 126.

EDITORAL
WAYNE GREEN

. . . de W2NSD

NEVER SAY DIE

Phone Patches and the Law

Many amateurs may be interested in the recent decision of the United States Court of Appeals in Washington, D.C. in the Hush-A-Phone v U.S. wherein the Court directed the F.C.C. to direct the Telephone Company to amend its tariffs in regard to foreign attachments. Since the F.C.C. appears to have accepted the decision of the Court it would seem that there no longer is any complete outlawry of all foreign attachments. Thus it would seem that the way is paved for completely legalized phone patching. The phone companies should soon file new tariffs to cover this type of installation.

Third Party Traffic: Definition

In the January editorial I attempted to define third party traffic and managed to stumble into the usual pit provided for those that don't read the fine print carefully. Reuben E. Gross, W2OXR (a lawyer) squared me away on it and I hasten to get this into print for it looks like we have all been missing the boat through the same misunderstanding that I perpetuated in January. Article 42 of the Atlantic City Treaty says: "It is absolutely forbidden for amateur stations to be used for transmitting international communications on behalf of third parties." Think that over for a minute and you will see that there is nothing there to prohibit you from sending a message to anyone in any country via an amateur in that country. Thus I could send a message via a G to a friend in London without qualms. I could not send a message for a friend of mine to England though, it has to be *my* message.

Troubles

I've been listening to your troubles for quite a while now, how about you taking a few minutes to share mine? No? OK, skip down to the next break-head and continue there. Still with me? Well, you see, it's like this . . . most of you folks are pretty understanding about things. There are a few . . . there are always a few . . . that get fighting mad about things, "cancel my subscription" and such, whenever something that they feel strong about happens to get mistreated . . . or they think maybe it has been mistreated.

Like for instance I mentioned in the February editorial that maybe there weren't very many SWL's. Four people sat down and wrote in letters explaining that perhaps there were more than I was aware of. Two wrote scathing insulting letters which would have been more appropriate if I had suggested that SWL'ing was a definite sign of feebleminded-ness or euthanasia for SWLs. But no one has taken the trouble to get together some facts and prepare an article to tell all of us what gives in this phase of radio.

Like for instance the Blind Your Friends blurb in the November issue which promoted a photo flash unit. One fellow took the trouble to notify a national police chiefs association, the Treasury Department and glory knows who else that CQ was trying to promote crime, bootlegging, and delinquency. We still have cigar butts around the office from the horde of officials that descended.

We still have a lot of fallout around from the Navy deal, I'll tell you about that in a year or so.

The W2NSD Hamshack

Every month when I sit down to zip out a few well chosen phrases for the editorial I am tempted to expound (brag?) on my own shack. But every time I start to thinking about it there are so many projects that will be finished in a few weeks which will make things so much better that I put it off until I can have more to talk about.

For instance, right now I have a tower in place out back which will eventually support a three band beam. I have been holding up this installation while looking around for a 20 foot section of pipe to hold a 32 element two meter beam up over the three bander and enough out of the way so the interaction wouldn't kill me. In the interim I stagger along with a 24 element two meter beam and folded dipole for 20M.

Rig-wise I suppose that I should have a shiny brand new kilowatt. As I mentioned a couple of months ago I use the Phasemaster II/BC-458 exciter and a pair of 813's for about 500 watts on 20M SSB. This works out fine and keeps me in touch with almost all the SSB gang around the world. On 75M I have an old monster kilowatt rig, a one band affair, starting with the Millen Vari-Arm VFO and ending with FP-265's. This uses *the old* National 600 power supplies and modulator.

For all-band custom mobile operation
THE EIMAC CERAMIC 4CX300A

For the discriminating amateur who insists on high power mobile operation with a minimum of space, Eimac's new 4CX300A is the answer. Of ceramic and metal construction, this radial beam power tetrode is another of the Eimac tubes "that can take it". Smaller than a tennis ball, a single 4CX300A will take 500 watts input in SSB, or 300 watts in Class C AM service from 160 through two meters. Its ruggedized construction insures longevity and consistent output under the most trying conditions. The Eimac 4CX300A will deliver its rated output whether it rides in smooth comfort in a high priced car, or is bounced around in an old time jalopy.

Its small dimensions give the amateur an opportunity to build high-power mobile equipment in small space. Its low driving power requirements in all classes of service (zero watts SSB, 2.1 watts AM) minimizes the size of exciter equipment.

Eimac, with its reputation for building "ceramic tubes that can take it", has the mobile operator's answer to the "right" tube in the powerful 4CX300A.

For further information on the 4CX300A, contact Eimac's Amateur Service Bureau, or visit your Eimac distributor.

EITEL-McCULLOUGH, INC.
SAN BRUNO · CALIFORNIA

Eimac First for mobile de luxe

Eimac

For further information, check number 62 on page 126.

4CX300A TYPICAL OPERATION

Class C Plate Modulated

Plate volts	500	1000	1500
Plate current, ma	200	200	200
Grid current, ma	22	19	17
Driving power, watts	2.7	2.3	2.1
Plate power input, watts	100	200	300
Plate power output, watts	75	160	250

SSB Class AB¹

Plate volts	1000	1500	2000
Peak RF grid voltage	50	50	50
Driving power, watts	0	0	0
Zero plate current, ma	100	100	100
Max-signal plate dissipation, watts	125	150	175
Max-signal plate power output watts	125	225	325

Remember that rig? (Say, does anyone have a picture of the "600" around. I was talking with some of the fellows up at National and they don't even remember ever making the thing. But I remember it.)

That KW sure works out well though, even with my plain folded doublet. I've worked WAC on 75 and a total of about 50 countries. Nowadays I use it mostly for talking with Sam, W1FZJ and for an occasional round-table with Homer, W1KPL and other locals. 20M SSB gives such perfect QRM-less QSO's that I don't have the fortitude to beat my way through the QRM any more on AM.

On two meters I use that Gonset Communicator and the Gonset Linear. If aurora opens up or I need some extra punch I switch in a 500 watt amplifier (the RCA FM rig which sold for $30 a few years back.) Receiver now is the Tapetone converter feeding the National 300. I've worked fifteen states with it so the signal must be OK. On six meters I use the National converter with the "300". The rig is a converted 522 and three element beam. Works out fine when the band opens.

For AM on 20M and occasional sorties on 10 and 15 meters I use the DX-100. I'll do more on those bands when I get the beam in place.

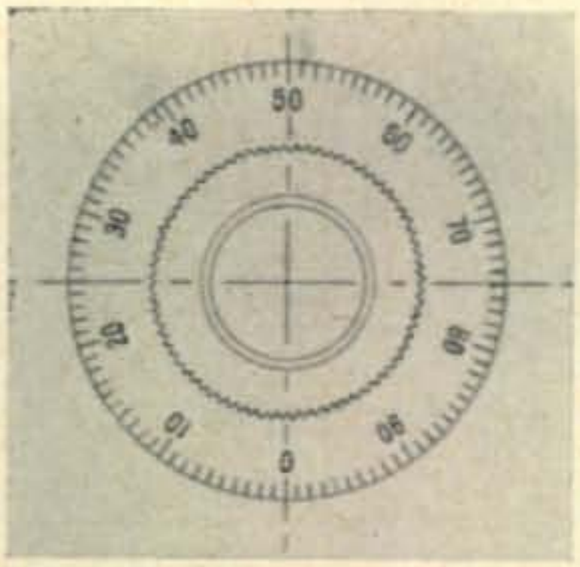
Ham Equipment Deductible

Bob Forman, sent in a copy of a letter from the Chief of the Individual Income Tax Bureau which points out that the cost of radio equipment which is required for Civil Defense or is used in rendering volunteer services to the Red Cross will be deductible for the year that the equipment is purchased. For fuller details point your accountant at section 170 of the Internal Revenue Code of 1954, Rev. Rul. 56-508, I.R.B. 1956-42, 8, and Rev. Rul. 56-509, I.R.B. 1956-42, 11.

CQ Deadline

If you have a convention, hamfest, big picnic, QSO Party, or any other big deal coming up which you want the whole world to know about aforehand why not at least try to get it mentioned in CQ? If you get the information in in plenty of time and it doesn't get lost in the mess on my desk we might con a few extra victims for you. CQ goes on the press about the tenth of the month and gets mailed about the twenty-second. Our deadline for normal operation is the twentieth of the month preceding publication, which gives us a few days to rewrite your item, get it set in type, proof-read, set into page form, rechecked, and sandwiched into the magazine. We can, if there is an emergency, bypass the first few steps and set the item directly into page form as late as the first of the month.

[*continued on page 110*]



New heavyweight champion!

Hallicrafters new SX-101 receiver employs heaviest chassis in the industry . . . offers selectable side-band . . . has complete coverage of seven bands.

It's all amateur—and as rugged as they come! Hallicrafters presents the complete answer to ham reception, with every essential needed for today and for the future.

First—built like a battleship. Bigger. Heavier. Second—a marvel of stability—the result of 22 years of experience and development. Third—it brings you a long list of new features:

- **Complete coverage of 7 bands—160, 80, 40, 20, 15, 11-10 meters.**
- **Special 10 mc. pos. for WWV.**
- **Exclusive Hallicrafters upper/lower side band selection.**
- **S-meter functions with A.V.C. off.**
- **Tee-notch filter.**
- **Local oscillator output available for use in heterodyne V.F.O.**

PLUS: Band in use individually illuminated...built-in crystal calibrator...antenna trimmer...dual conversion...full gear drive from tuning knob to gang condensers...five steps of selectivity from 500-5000 cycles...sensitivity—less than 1 microvolt on all bands...direct coupled series noise limiter...50 to 1 tuning knob ratio...and many more.

NEW

FROM

hallicrafters

CHICAGO 24, ILLINOIS

WHERE THE BEST IDEAS IN COMMUNICATIONS ARE BORN

For further information, check number 69 on page 126.

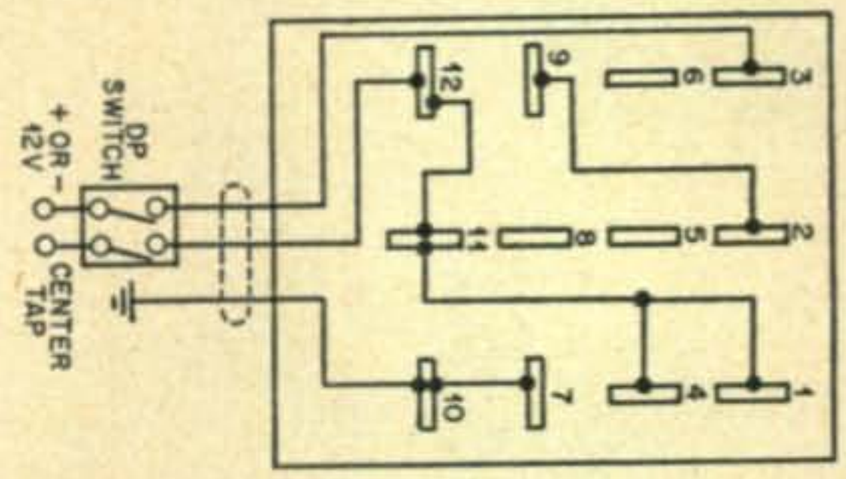
Letters . . . to the editor

Communicator Notes

Gentlemen:

I enjoyed your article on Communicators very much and am sure it will help us to get the best out of them. However, I believe one more thing should be added for those who have six volt models and have changed to twelve volt cars.

We have solved this by center-tapping the battery and making up a third cord with a double pole switch. This arrangement allows both halves of the battery to be used; one half for filament, and the other, for B plus. Thus, the drain on the battery will nearly balance out. The power switch on the communicator is by-passed by this arrangement; and the line cord switch used instead.



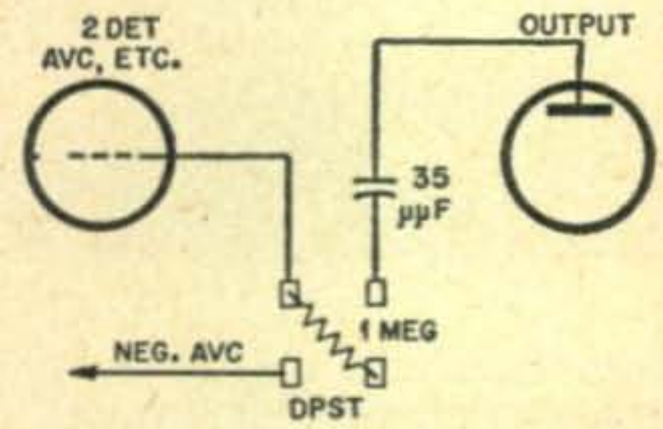
The accompanying drawing shows the Jones plug connections. No other change is made in the communicator.

Richard Zirger W8IJL
Tiffin, Ohio

Conelrad

Dear Wayne:

I feel that this should be passed on to the readers of CQ. It is a cute item for a Conelrad monitor. It was handed to me by W4BEU. I tried it and it works swell. It is a very simple thing. The negative AVC on the 2 ed



det keeps it from oscillation, but when the station goes off the air it goes into oscillation. If you stand back you can hear it all over the house.

James R. Rollans K6EEB
Buena Park, California

Maps

Gentlemen:

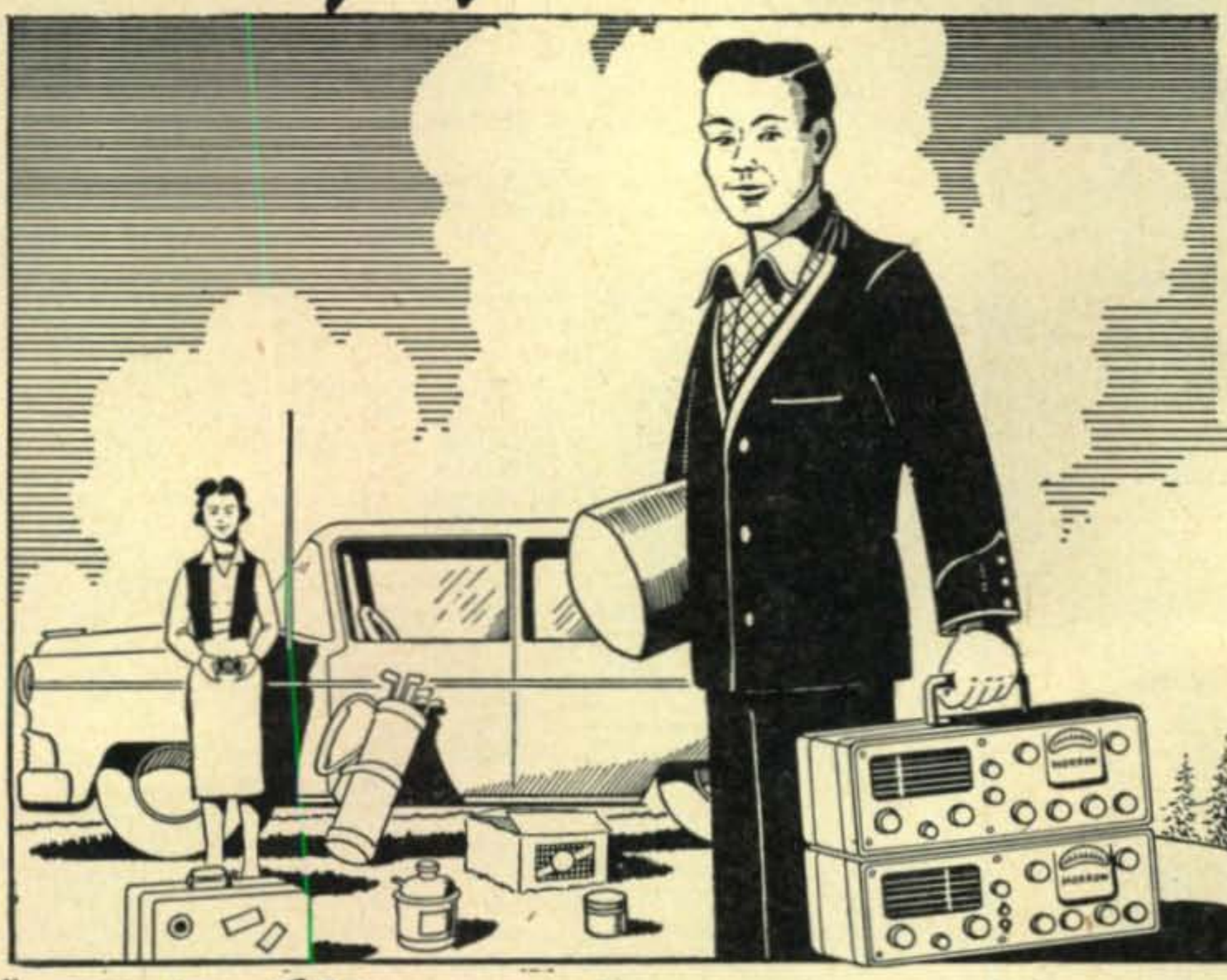
As a matter of general interest to the Ham fraternity the U.S. Navy Hydrographic Office has issued a color map titled "Antarctic Area Stations During International Geophysical Year 1957-58. This map is quite detailed and shows the locations of all the different antarctica stations by nationality. Included on the map is an "Index of Stations" keyed by number for ease of location of all the different nations participating in the Antarctica IGY Program. The "Index" also indicates the latitude and longitude of all participating stations.

This map is very useful to hams who are interested in locating the geographical positions of ham activity in the Antarctica and contains detailed data not normally found on commercially available maps.

The word "stations" as used herein is not to be construed as "radio Stations" but as "bases of operations".

THIS YEAR . . .

Enjoy a Morrow Vacation!



Take *Morrow* along, too, and have a wonderful vacation. Do your hamming enroute and also use as a portable station. Please the XYL by working the home QTH.

MB-560A:	**60-watt Transmitter,** built-in VFO and modulator	$214.50
MBR-5: or **FALCON:**	**Deluxe Receiver,** S meter, 100 KC crystal standard, noise balance squelch	224.50
	Receiver with Broadcast Tuner as an accessory, serves for Conelrad Monitor, selective bandpass: narrow 2.8 KC, broad 9.2KC; with BCT	189.00
	MBR-5 and Falcon have 1 microvolt sensitivity for 16db signal to noise ratio on 10 meters, excellent frequency stability.	
TV-600:	**High Voltage Vibrator Power Pack,** 600 volt, 200 ma, features silicon rectifiers	79.50
RVP-250:	**Vibrator Power Supply** for receiver and exciter of transmitter	39.95
CBM6 or 12:	**Cable** for interconnecting above units	9.95
MK-N1:	**Modern Cylindrical Microphone**	16.95
MLV-50:	**Remote Control Antenna Tuner**	24.95
SH-7:	**Speaker** for mobile installation	11.50
RTS-600S:	**AC Power Pack** with speaker for portable use of MB-560A and either MBR-5 or Falcon	107.50
CBF7-7 / **CBF8-8**	**AC Cable** for RTS-600S	9.95

All Prices Are Amateur Net

Prices and specifications subject to change without notice.

SEE YOUR JOBBER

QUALITY AND PERFORMANCE

MORROW

radio manufacturing co.

2794 Market St. Salem, Ore.

For further information, check number 79 on page 126.

This map costs 25c plus postage and is known as "H.O. 16429A". It is obtainable from any Hydrographic Office Sales Agent. There are numerous sales agents throughout the country, however the following agents are listed for general coverage throughout the U.S.

Geo. E. Butler Co. 356 California St., San Francisco, Calif.

R. H. John Inc. 2218 Market St., Galveston, Texas.

C. S. Hammond and Co. 1 East 43rd St., New York, N.Y.

Hal Godfrey W6EYY

Blush

Dear Glorious, Exalted, Honorable Editor of CQ:

I would like to say "please find the enclosed money order for ten years subscription to your lovely magazine" but right now I can't even afford a one year subscription or for that matter even the next issue. (I just spent my last dime on a resistor.)

Instead, I will tell you what I think of your exceptional, topnotch, glorious, etc., scroll. A few years back (the month after you became editor) I purchased a CQ and enjoyed it immensely. After your newer and bigger issues came out I enjoyed them even more. I don't mind paying the extra price, because it's really worth it.

Anyway, I am wracking my limited vocabulary to find words to continue praising your magazine, your staff and you. If I might say, you and your staff are swell editors, have a very good humor and can write with the best of them (Shakespeare, etc.).

There are a few things I would like to ask you: One, why don't you put a picture of your smiling countenance in some part of your sparkling column? Two, please get Jean Shepherd to write more often. I heard him one Sunday night and ever since I have been yelled at to turn the radio off. (It's only 3:00 a.m., Mom!) Three, On my way to school I think I pass a ham's QTH in Fairfield, Connecticut on North Benson Road. The only antenna I can see is a two meter colliniar array. Four, Why don't you start something to get a giant radio show to show the public what ham radio is. Lastly, is it possible for a poor person like myself to visit the high-class gold-plated office of your illustrious magazine when I am in New York?

As I said before, I really enjoy reading your magazine . . . wish it came out more often.

Gene Racho
Riverside, Conn.

One: Picture of me? At last, someone asked! That's all I have been waiting for. Thank you, thank you, thank you. Now look at the front cover. I'm standing, Art's kneeling.

[continued on page 104]

Contest Calendar

Frank Anazlone, W1WY
14 Sherwood Road
Stamford, Conn.

May 4-5 Dutch PACC Phone
May 5 USSR CW
May 18-19 Helvetia 22

Not much contest activity left. The PACC and Helvetia 22 were covered last month.

Via the grapevine and W3ASK, our propagation editor, (no he didn't use a crystal ball) we learned of a contest being sponsored by the Central Radio Club of the USSR. It will begin at midnight May 5th and continue for 12 hours. No mention was made if it's GMT or local time. Since the USSR boys have been participating in outside activity, it is assumed that this contest is open to all. This might be your chance to get those elusive Zones 18 and 19.

73, Frank, W1WY

vy fb!

New

HAMMARLUND HQ-110

- DOUBLE CONVERSION!
- 6, 10, 15, 20, 40, 80 AND 160 METER BANDS!
- SEPARATE SSB LINEAR DETECTOR!
- Q-MULTIPLIER!
- DUAL DIALS!
- CRYSTAL CALIBRATOR!
- CRYSTAL CONTROL!
- SEPARATE STABILIZED BFO!
- DIAL SCALE RESET!

Hammarlund's done it again.
Here's a real sweetheart for the amateur...

The **HQ-110** incorporates all the features you need at a price that's hard to believe. Only through **Hammarlund's** exclusive production techniques could so much receiver be offered at so low a price.

It's **VY FB OM**—so get all the details right now—you'll be amazed at what Hammarlund's done this time...

For further information, check number 70 on page 126

VY FB-
YOU BET! WRITE
FOR COMPLETE
BULLETIN...

$229.00*

*Optional Telechron automatic clock-timer $10.00 extra.

Established 1910

HAMMARLUND

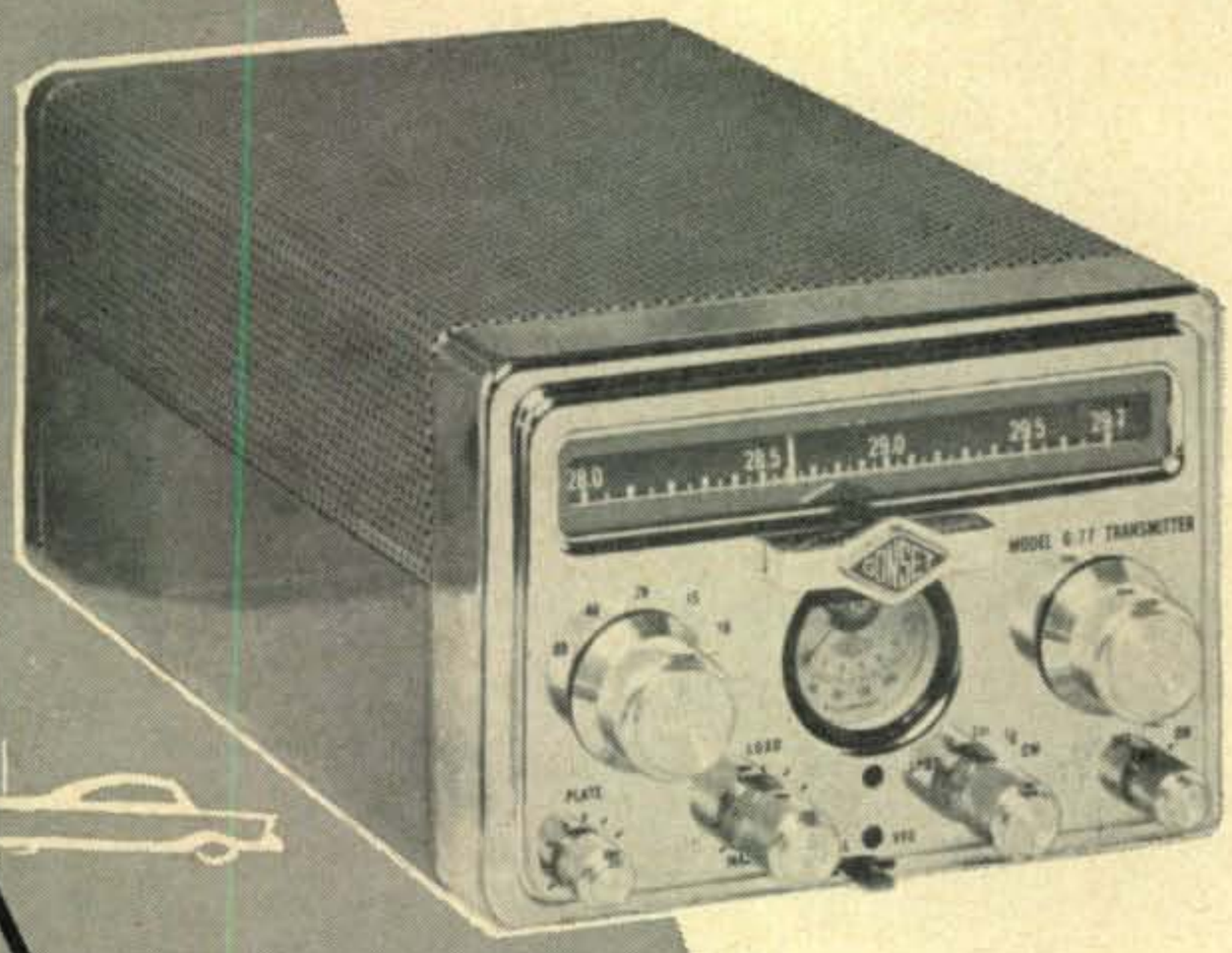
HAMMARLUND MANUFACTURING COMPANY, INC., 460 W. 34th ST., N.Y. 1, N.Y.

Export: Rocke International, 13 E. 40th St., N.Y. 16, N.Y.

Canada: White Radio, Ltd., 41 West Ave. N., Hamilton, Can.

now... G-77

Gonset's outstanding new mobile transmitter



Now . . . in compact combination . . . all the desirable features essential to superior mobile operation

Small—easily mounted—
6½" wide, 4¼" high, 9" deep.

Exclusive design assures exceptionally low battery drain . . . eliminates troublesome high-current relays.

Operates on 6 or 12 volts.

Uses heavy-duty vibrator . . .

Has output voltage of 500-600, full load . . .

G77 Transmitter with Power Supply.

Many features, including dry rectifiers, eliminate rectifier standby drain, greatly minimize overall drain . . .

A "Hot", effective and efficient modulator permits fullest modulation . . . has integral speech clipping . . .

FREQUENCY RANGE: 80-40-20-15-10 meters . . .

FREQUENCY CONTROL: VFO or crystal. (Switchable). Each band is spread over calibrated dial scale . . .

POWER INPUT: 50-60 watts. (Modulated) CW provisions.

OUTPUT CIRCUIT: Pi network. Output tube, type 6146.

CONTROL: Full press-to-talk. Built-in antenna relay.

Now in stock at your Gonset distributor

GONSET . . . . . Burbank, Calif.
DIVISION OF L. A. YOUNG SPRING & WIRE CORPORATION.

GONSET

For further information, check number 66 on page 126.

Hamfests...

Rome, New York

If you are within a couple hundred miles of Rome you will be sending $4 right away (May 20th deadline) so as not to miss the Rome Radio Club Hamfamily Day (4th annual) on May 26th at Becks Grove, about 10 miles out of town. They have an all day party for the whole family, complete with door prizes for everyone and ending up with a steak and (yes, *and*) chicken dinner. Send $$ to W2MSM, F. E. Chrestien, 110 W. Locust Street, Rome, New York.

Silver Springs, Florida

The Silver Springs (Florida) Radio Club has announced that their annual Hamfest for Southeastern Hams will be held June 1-2. All sorts of entertainment has been arranged so get in touch with Mack Britton, W4DVR, P.O. Box 112, Silver Springs, Florida, for more details.

Oklahoma

The Northfork Amateur Radio Club is holding its 5th annual Hamfest at Quartz Mountain State Park in Southwest Oklahoma on May 4-5. Write Vern Street, Carter, Oklahoma for info.

Fresno

The Fresno Amateur Radio Club announces the 15th annual Fresno Hamfest to be held May 11th at the Fresno Memorial Auditorium. There will be technical talks, transmitter hunts, code contests, mobile judging, XYL's luncheon, evening banquet with prizes. Tickets are $6.00, write to Steve Weber W6QON, 1448 East Richert, Fresno, California.

New London

The Tri-City Radio Council is running their 13th Annual Hamfest at the Crocker House on State Street in New London, Connecticut on May 4. Attendance is by reservation only and is limited to 225 so write Bob Chapman, W1QV, 28 South Road, Poquonuock Bridge, Connecticut on the double.

Hamfest and Conventions Roanoke

The Blue Ridge Amateur Radio Society will hold their Third Annual Hamfest on Sunday May 19th at the Lakeside Amusement Park, Salem, Virginia. Starts 7 p.m. Saturday. Dinner 1 p.m. Sunday, $1.50. Registration $1.25 c/o W4FNT, Box 2002, Roanoke, Virginia.

A frank statement about the future in Field Engineering

At first glance, Field Engineering may not seem to possess the potential and stature often associated with other engineering activities.

At *Hughes*, however, nothing could be further from the truth.

Men who undertake the responsible task of evaluating Hughes-produced military equipment in the field are in the enviable position of becoming thoroughly familiar with the complete design and operation of the advanced electronics systems involved.

Essentially, Field Engineering embraces all phases of support required to assure maximum field performance of Hughes armament control systems and guided missiles. E. E. and Physics graduates selected for this highly important and respected phase of our engineering activities work with the armed forces and airframe manufacturers at operational bases and plants in continental United States and overseas.

The knowledge, background and experience so gained assure unusual opportunities for more specialized development in other divisions of the Research and Development Laboratories at Hughes. In fact, few openings in engineering today offer the rewards and opportunities which are available to the Technical Liaison Engineers, Field Engineers, Technical Training School Engineers, Technical Manuals Engineers, and Field Modifications Engineers who comprise the Field Service and Support Division.

Engineers and physicists selected for this highly respected phase of our activities at Hughes enjoy a number of distinct advantages. These include generous moving and travel allowances between present location and Culver City, California. For three months before field assignments you will be training at full salary. During the entire time away on assignments from Culver City, you'll receive a generous per diem allowance, in addition to your moving and travel expenses. Also, there are company-paid group and health insurance, retirement plan, sick leave and paid vacations... and reimbursement for after-hours courses at UCLA, USC, and other local universities.

E.E. or Physics graduates who feel they are qualified to join the Field Engineering staff at Hughes are invited to write for additional information about this exciting and rewarding opportunity to establish a challenging career in electronics. Write to:

THE WEST'S LEADER IN ADVANCED ELECTRONICS

HUGHES

RESEARCH AND DEVELOPMENT LABORATORIES

Scientific Staff Relations • Hughes Aircraft Company, Culver City, California

For further information, check number 85 on page 126.

Pittsburgh

The Breezeshooters Net announces the Third Annual Hamfest to be held May 12th at The Lodge, North Park, Pittsburgh, Penna. Lots of door prizes, starting with a 75A4 . . . registration Free, donations accepted. Write W3SIR for more scoop; Harold Link, 57 Royal Street, Pittsburgh 12, Penna.

Kansas

The Hi-Plains Amateur Radio Club will hold its Eighth Annual Hamfest on Sunday May 19th. Grand prize is an Elmac AF-67. Lots of other prizes too. Registration fee is $1.00. Everyone is asked to bring a covered dish and his own table service for the noon meal. Coffee and iced Tea will be furnished. Brings your QSL's too. Write J. F. Goddard KØEWW, Publicity Director, Ingalls, Kansas for more information.

Central Mass.

The Central Massachusetts Amateur Radio Association will hold it's 9th annual Gabfest at the U.S. Army Reserve, North Lake Ave., Worcester, Massachusetts. Registration & dinner, $3.50 in advance, $4.00 at the door. Registration only, $1.50. Transmitter hunts, FCC Exams, lectures and many other activities will be held. The date is tentatively set for May 11, 1957. For further information, write Harry Miller Jr., W1DRD, 141 Austin St., Worcester, Mass.

Rock Island, Ill.

Big annual Mississippi Valley Hamfest, on Sunday, May 26th, at the Rock Island County Conservation Club Grounds on Big Island, Milan, Illinois. fun and prizes for all. Tickets are $1.50 advanced registration or $1.75 at the gate. Write Art Strobbe, W9BUE, 714—5th Street, Rock Island, Ill.

Eastern Mass.

Ham-picnic May 26, 1957 at Norumbega Park in Newton. Prizes—contests—amusement facilities for children—refreshment stand—talk-in stations on 2, 6 and 10—prize participation fee $1.00—starts at 9:30 A.M.—prizes drawn at 4 P.M. Tickets bought before May 18 are eligible for a special Early Bird prize drawing. Write Albert E. Coolen, W1PJ, 46 Lexington St., Everett, Mass.

Publicity Chairman, W1MEG
FEMARA

Madison, Indiana

Ham Picnic Sunday May 26, 10 A.M. to 4 P.M. Poplar Grove, Clifty Falls State Park, Madison, Ind. No Registration fee just the usual Park entrance charge. Only a short drive from Cincinnati, Louisville or Indianapolis. Plenty of Shelter come rain or shine.

[*one more on page 24*]

BLILEY NOVICE BAND CRYSTALS

AX2

BAND	MULTIPLIER	CRYSTAL FREQ. RANGE	TYPE	PRICE
80 Meters	1	3700.0 to 3750.0 kc's	AX2	$2.95
40 Meters	2	3587.5 to 3600.0 kc's	AX2	2.95
40 Meters	1	7175.0 to 7200.0 kc's	AX2	2.95
15 Meters	1	21,100 to 21,250.0 kc's	SR10	8.50
15 Meters	3	7033.33 to 7083.33 kc's	AX2	2.95
15 Meters	6	3516.66 to 3541.66 kc's	AX2	2.95
2 Meters	6	24,166.66 to 24,500.0 kc's	SR10	8.50

SR10

Bliley CRYSTALS

BLILEY CRYSTALS FOR SPOT FREQUENCIES IN NET OPERATIONS

MC9

TYPE	APPLICATION	TOLERANCE	PRICE
MC9	3 mc-12 mc experimental frequencies	±.03%	$6.50
SR10	12 mc-27.5 mc experimental frequencies	±.03%	8.50

SR10

Bliley CRYSTALS

BLILEY CRYSTALS FOR AMATEUR · EXPERIMENTAL CITIZEN'S BAND · SINGLE SIGNAL FILTERS

KV3 SR10 CF6 AX2 MC9

TYPE	APPLICATION	TOLERANCE	PRICE
KV3	Reference Frequency 100 kc	±.005%	$8.50
MC9	Marker Frequency 1000 kc	±.05%	8.00
MC9	13.6275 mc (Multiplier to 27.255 mc) CITIZEN'S RADIO SERVICE (CLASS "C")	±.04%	5.50
SR10	27.255 mc (3rd Overtone Crystal) CITIZEN'S RADIO SERVICE (CLASS "C")	±.04%	5.50
CF6	455 kc — 456 kc — 465 kc Single Signal Filters	±5 kc	4.50
AX2	1800-1825 kc; 1875-1900 kc; 1900-1925 kc; 1975-2000 kc	See Note A	3.75
AX2	3500-4000 kc; 7000-7425 kc; 8000-9000 kc	See Note A	2.95
AX2	14-14.5 mc	±10 kc	3.95

Note A: We will supply to integral spot frequencies (no fractions) as ordered; calibration ± 500 cycles in factory test oscillator.

NEW HIGH STABILITY PACKAGE WITH 100 kc AND 1000 kc CRYSTALS

This compact temperature controlled package provides a high stability reference source at both 100 kc and 1000 kc. Precision reference for general amateur use.

TYPE	DESCRIPTION	STABILITY	PRICE
TCO-2L	6.3V Oven	75°C±5°C	$ 9.00
BH6A Crystal	1000 kc	±.0002%	12.50
BH9A Crystal	100 kc	±.0005%	11.00

TCO-2L

Crystal units described are calibrated in recommended oscillator circuit—adjustable to zero beat (at 75°C) in this circuit.

BLILEY ELECTRIC CO. UNION STATION BUILDING ERIE, PA.

Major producers of crystal units, crystal ovens, oscillator assemblies and solid ultrasonic delay lines for commercial and military equipment.

For further information, check number 56 on page 126.

Stolen, as usual, from

AUTOCALL

The bulletin of the
Washington, D. C. Mobile Radio Club

You shouldn't really have to look at the answers to last month's Puzzlers, but here they are anyway. #1: a) connected in parallel —5000 ohms. There is no change in the turns ratio. b) Connected in series—20,000 ohms. Since there are now twice the turns the impedance will be two squared times.

Puzzler #2: Bill and Henry got there 15 minutes early. John was 20 minutes late, Joe was 15 minutes late.

#3 Puzzler: Eleven tubes at $3.70 and fifteen tubes at $2.30.

Easter Puzzles below:

Problem No. 1:

We have the following hams, their transmitters and the states in which they live:

Cal	Collins	California
George	Gonset	Georgia
Mac	Morrow	Maine
Nat	National	Nevada
Wayne	W.R.L.	Washington

(Note the initials)

1) Each man owns the transmitter with the initial of the state where the transmitter is that has his initial.
2) No man owns a transmitter or lives in a state with his initials.
3) No transmitter is located in a state of the same initial.
4) Cal owns the W.R.L.
5) Wayne lives west of the Mississippi.
6) George owns the Collins.
7) Who owns what transmitters in what states?

Problem No. 2.

A man went into a hardware store to buy a certain article. He could buy 1 for 25c; 1000 for $1.00 and 56 for 50c. What was the article? (This Autocall crowd has no conscience).

Problem No. 3.

A lady orders 1¼ pounds of cheese and lays down some money which will exactly pay for it. The man puts a slab on the scales and says, "That's 25c too much." The lady said, "Cut the slab in half" and picked up a dime. How much is the cheese per pound?

Charlotte, N.C.

Charlotte, N.C. Swap Fest—May 26, 1957. Ist Prize Hammarlund Receiver—Everybody invited. Y'all come.

"I'M WITH UNIVAC"

People sit up and take notice when you say you're with Univac.®

The mere mention of this world-famous organization sets you apart as someone interesting and important. And rightly so . . . for Univac engineers and technicians are involved in some of the most fascinating scientific work of all time. Their achievements in the field of automatic data processing and automation have revolutionized concepts of national defense, manufacturing, business procedures, communications and transportation.

The special pride you feel when you say "I'm with Univac" is just one of the satisfactions of a career with this world-leader in the field of electronic computers. Investigate the unusual opportunities offered by a career with Univac as a Field Location Engineer or Technician.

Immediate openings for: **FIELD LOCATION ENGINEERS • FIELD LOCATION TECHNICIANS**

Send complete resumé to:

Remington Rand Univac

DIVISION OF SPERRY RAND CORPORATION

at any of these three plant locations

MR. D. A. BOWDOIN
Dept. MP-21
2300 W. Allegheny Ave.
Philadelphia, Pa.

MR. R. K. PATTERSON
Dept. MS-21
1902 W. Minnehaha Ave.
St. Paul W4, Minn.

ROBERT MARTIN
Dept. MN-21
Wilson Avenue
South Norwalk, Conn.

® Registered in U.S. Patent Office

For further information, check number 87 on page 126.

Check them all...you'll find a Viking transmitter gives you more!

More communication power!

More operating features!

More in engineering and construction!

Yes, dollar-for-dollar and feature-for-feature, you'll find just what you've been looking for in one of these 4 Viking transmitters. Top performance isn't simply a matter of watts. Only carefully integrated equipment design can be counted on to develop effective power that punches your signal home, every time. That's what we call "communication power" . . . and your Viking transmitter delivers it in *full* measure!

Punch your signal home...with one of these 4 Viking full-power amateur rigs!

"ADVENTURER"

This compact and completely self-contained 50 watt CW transmitter was used to earn the first novice WAC. (Worked All Continents) Effectively TVI suppressed, the "Adventurer" puts 50 watts of power into a rugged 807 transmitting tube. Instant bandswitching 80 through 10 meters... operates by crystal or external VFO control. Wide range pi-network output—no antenna tuner needed. Designed for easy assembly—with tubes, less crystals and key.

Cat. No. 240-181-1..Kit....Amateur Net $54.95

"RANGER"

This popular 75 watt CW or 65 watt phone transmitter delivers a solid signal! As an RF and audio exciter, the "Ranger" will also drive any of the popular kilowatt level tubes. Self-contained . . . effectively TVI suppressed . . . instant bandswitching 160 through 10 meters. Operates by extremely stable, built-in VFO or crystal control. Easily assembled—with tubes, less crystals, key and microphone.

Cat. No. 240-161-1..Kit....Amateur Net $214.50
Cat. No. 240-161-2..Wired .Amateur Net $293.00

"VALIANT"

Here's power to slice through terrific QRM . . . a transmitter engineered for outstanding flexibility and performance! 275 watts input on CW and SSB*, 200 watts phone. Instant bandswitching 160 through 10 meters—operates by built-in VFO or crystal control. Final amplifier uses three 6146 tubes in parallel. TVI suppressed—timed sequence (break-in) keying —low level audio clipping—built-in low pass audio filter —self-contained power supplies. With tubes, less crystals, key and microphone.

Cat. No. 240-104-1..Kit....Amateur Net $349.50
Cat. No. 240-104- 2 Wired..Amateur Net $439.50

"FIVE HUNDRED"

Over a half-kilowatt of *full* communication power! Rated 600 watts CW . . . 500 watts phone and SSB*—conpact RF unit designed for desk-top operation—power supply/modulator unit may be placed in any convenient location. All exciter stages ganged to VFO tuning—also may be operated by crystal control. Instant bandswitching 80 through 10 meters —TVI suppressed—high gain push-to-talk audio system—low level audio clipping. Pi-network output will match a wide range of antenna impedances. With tubes, less crystals, key and microphone.

Cat. No. 240-500-1..Kit....Amateur Net $699.50
Cat. No. 240-500-2..Wired .Amateur Net $879.50

*P.E.P. input with auxiliary SSB exciter

Certified for matching funds by the FCDA on factory wired and tested models for crystal controlled operation. Requires use of Johnson 250-20 Low Pass Filter and on frequencies above 7 mc., the "Valiant" must be used with a Johnson "Matchbox" Antenna Coupler. (Cat. No. 250-23).

E. F. Johnson Company

2929 SECOND AVE. S.W. WASECA, MINNESOTA

For further information, check number 75 on page 126.

An "edited" editorial appearing in the
Auto-Call, publication of
The Washington Mobile Radio Club, Inc.

R. V. Anderson, W3NL
2509 32nd St., S.E.
Washington 20, D. C.

the FCC and IRAC

In conversations heard on the air and in correspondence, it is evident that a great many amateurs do not have a clear conception of how radio regulation in this country is accomplished. With an International "allocations" Conference coming up in 1959, it is more important than ever that each amateur should know the general organization for radio regulation.

We need go back only a little beyond 20 years — 1934 to be exact—to find the basic document of all present radio regulation in this country. In that year, Congress gave us the Communications Act of 1934 (as now amended), which will be referred to hereinafter as the *"Act."*

The *Act,* in effect, sets up two communication regulating authorities. The one with which we are most familiar is the Federal Communications Commission (FCC). The other one, believe it or not, is the President of the United States. The radio spectrum which each regulates is set forth in Part 2 of the FCC Rules which among other things lists the uses of the various frequencies in the U. S. and designates some as non-government and others as government. Those designated non-government are regulated by the FCC, and those designated as government are regulated by the President. While there must of necessity be a close correlation between these two regulatory bodies, they are independent of each other and within its purview, each may proceed without reference to the other.

In the government regulated portion of the radio spectrum, you may be sure that Mr. Dwight Eisenhower doesn't personally assign each frequency. Under the Office of Defense Mobilization we find the *Inter-Department Radio Advisory Committee* (IRAC) which handles these matters for him. IRAC is composed of representatives of the various government departments and agencies having an interest in radio regulations, — Army, Navy, Air Force, State, Justice, Treasury, etc., to name a few. IRAC is, in effect, the "FCC" for the government allocated portions of the radio spectrum. Surprising as it may seem, the FCC does not allocate to itself the frequencies which it uses in its own operations; it is a government service and must go to IRAC for its own frequencies.

A corollary document which should be mentioned is *"The Final Acts of the International Telecommunications and Radio Conferences, Atlantic City, 1947,"* ratified by the United States on June 8, 1948 (modified by Buenos Aires 1952) which, being a mouthful for even a graduate phone operator, we will refer to simply as *"Atlantic City, 1947."* This document details all the agreements entered into by the signatory countries on the use of radio frequencies throughout the world. The FCC has used portions of this document in preparing its Part 2 of the FCC Rules which covers frequency allocations and Radio Treaty matters; general rules and regulations. It is this document that brings the Department of State into an important position in dealing with radio regulation in the United States. If any question arises involving Atlantic City 1947, then it is a "treaty" matter and properly comes within the purview of the Department of State.

In all of our thinking about radio regulation we must therefore visualize two independent authorities—the FCC for non-government regulated frequencies and IRAC for government regulated frequencies with the Department of State concerned if any matters of international agreement are present.

Possibly one of the greatest misapprehensions existent among the radio amateurs today is the relationship of MARS, the Navy amateur system, CAP, etc. to the amateur. These are all government services, regulated by IRAC: the amateur is a non-government service, regulated by the FCC. There is *no relationship whatever* between MARS, for example, and the amateur service. MARS requires that one be a licensed amateur before operating on these military frequencies but this is a self-imposed requirement (possibly because each regulating authority must insure

[*continued on page 109*]

SURPLUS

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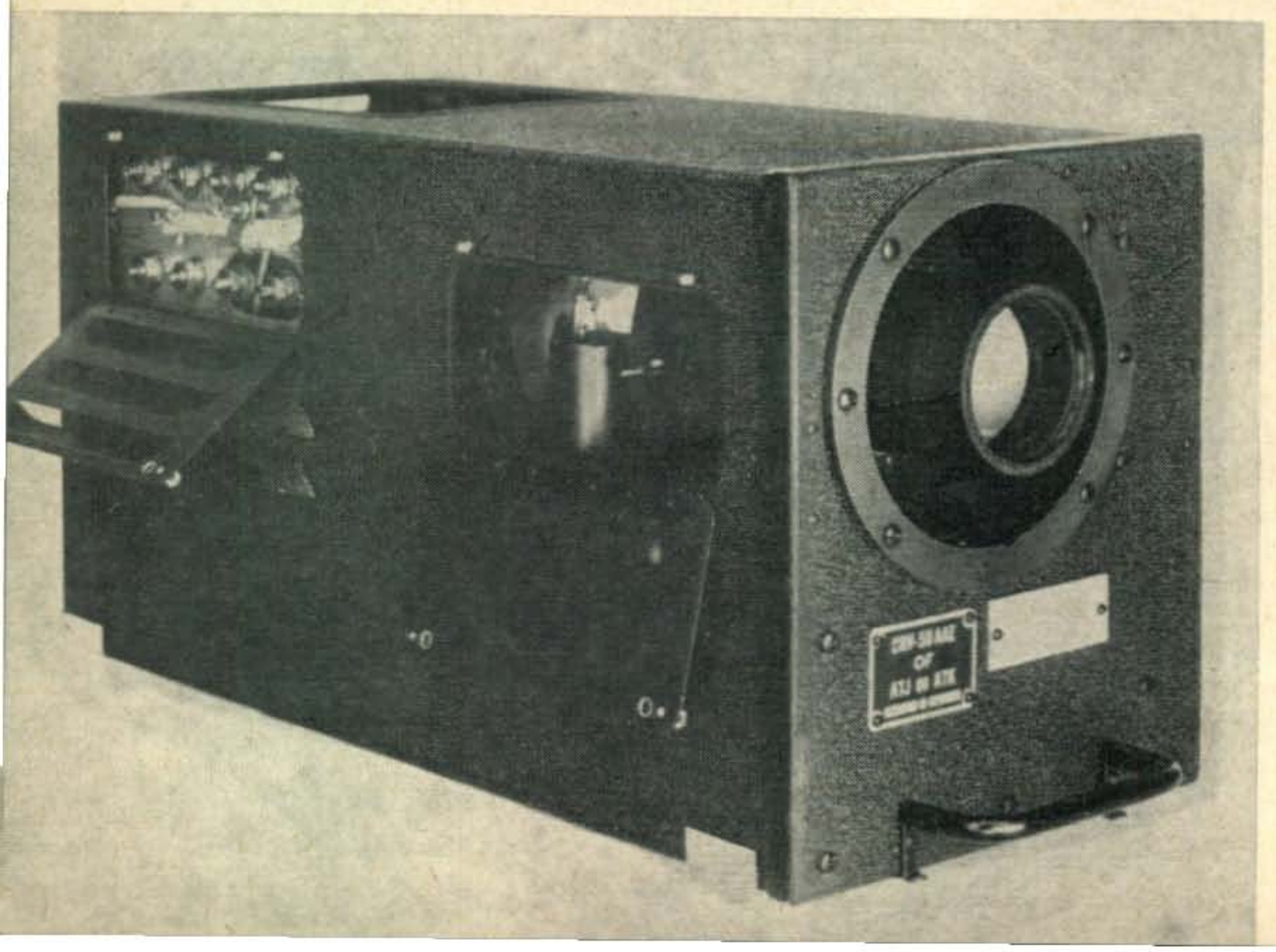
Many of the old timers will no doubt remember the "rash" of interest that was shown in amateur television before the Second World War. Many experimenters constructed cameras from articles by Lamb that appeared in early 1940 issues of QST Magazine. These cameras were rather simple devices, but produced extremely good pictures in view of the techniques at that time. Interest subsided, more or less, until 1950 when Popkin Cluarman, W2LNP, wrote his "Simplified Ham TV Station" series for Radio and Television News. This system used the "flying spot scanner" technique to produce pictures from photographic negatives. A few years ago, QST again printed an article on a modern version of the 1940 cameras using the RCA 5527 iconoscope.

With the exception of these few articles, little has been presented on the construction of equipment for amateur television use. Although interest in amateur television appears to be on the upswing, lack of communications between interested parties has prevented an exchange of information on "who is doing what." Several months ago, I tossed out a few "feelers" to see if there was any interest in a conversion of a war surplus "guided missile camera." Needless to say, the response was overwhelming and as a result of these letters, and the interest shown by the writers, CQ Magazine is presenting the conversion of the war surplus ATJ/ATK Block III television camera. These cameras, designated the CRV-59AAE, were built by RCA for use in early guided missiles on pilotless aircraft.

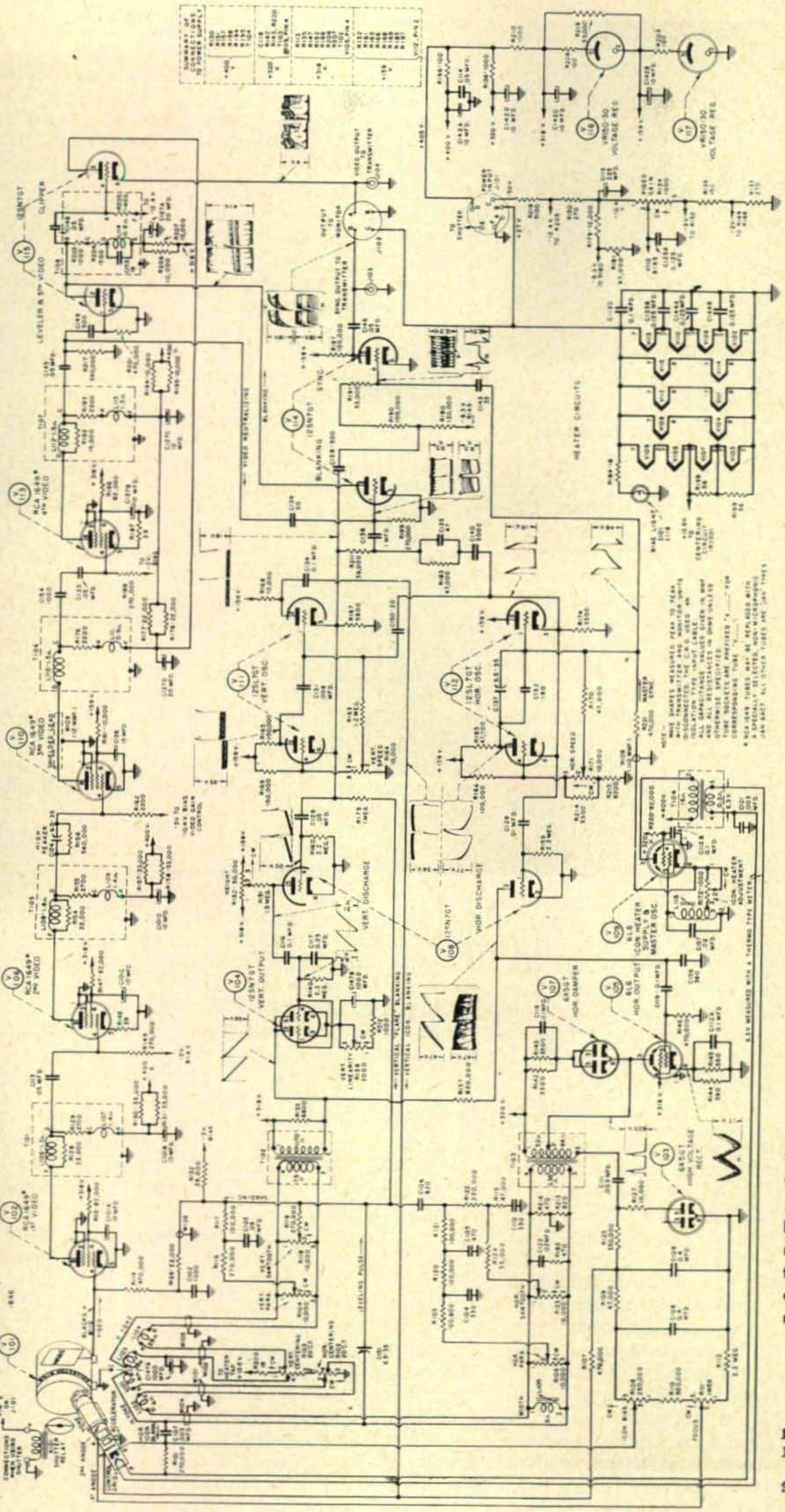
Actually, the original purpose of using the cameras in a guided missile has fallen by the wayside. As planned, a "pilot" riding in a mother plane would direct the missile against an enemy aircraft by remote control while watching a television monitor. However, the missile speed was usually so great the reaction time of the "pilot" produced a rather poor "batting average." Television cameras have found many other applications in the military, though. Drone planes, using cameras of the ATJ variety, were used in the South Pacific to collect air samples during the atomic bomb and hydrogen bomb tests. Even today, television cameras are being used to study control surfaces on airplanes and guided missiles. Cameras are even used to monitor mid-air refueling operations so that both pilots can see the mating of the fuel receptacle.

The conversion presented here modifies the camera to operate from the 117 volt power lines and provides a 1.4 peak to peak video signal that can be used to modulate a 420 megacycle



RCA TV Unit.

HAM TV



Schematic diagram for the CRV-59AAE ATK/ATJ television camera. Note that a 75 ohm resistor must be used on the end of the video coaxial cable or no current can flow in the second half of V115.

Parts to go in camera

1—100 mmfd silver mica capacitor
2—22 ohm, 2 watt resistors

A picture of a picture of a picture of a picture of a picture

television transmitter. It is not within the scope of this article to describe transmitters for the 420 band, but a simple Channel 3 transmitter is described that will allow you to test the camera on your television receiver or the ATJ can be used as a "closed circuit device."

How it Works

Let's take a closer look at this fabulous device for creating TVI (television images). Starting with the lens, light passes through an F1.9 telephoto and is focused on the mosaic of an 1846 iconoscope. Most of the stock cameras have an orange filter operated by a shutter. This can be switched in by remote control to clear up the image when the drone is flying through clouds and haze. The mechanism should be removed unless desired. The focused light falling on the mosiac of the pick-up tube places a charge on the "globules" that compose the light sensitive surface. When the mosaic is scanned by a beam from the electron gun, these globules release secondary electrons that are collected by a signal ring around the perimeter of the iconoscope. The current flow through the signal resistor (R114) is in direct proportion to the amount of light striking the mosaic. This very tiny signal (the video signal) is amplified by five video amplifiers, 4-6AC7's and 1-12SN7. The second half of the 12SN7 (V115) is used as a cathode follower and has no gain. The output of this tube produces about 1.4 volts peak to peak across a 75 ohm terminating resistor located at the end of the video cable.

Two 12SN7's are used as a *random interlace sync generator*. V111 functions as a vertical oscillator and vertical blanking generator. V112 is used to generate the horizontal sweep and the horizontal blanking pulses. The output of V111, which is a poor sawtooth wave, is fed to ½ V108 which acts as the vertical discharge. The output of the discharge tube is of the correct waveshape to drive the vertical scanning amplifier, V104, a 12SN7. The output of V104 is impedance matched to the deflection yoke and drives the scanning beam in a vertical direction. The output of the horizontal oscillator also acts in a similar manner. V112 drives a discharge tube for sawtooth wave shaping, and this in turn drives the horizontal output tube, V105, a 6L6. A 6X5 is used as a damper tube to suppress horizontal ringing. Another 6X5, V103, is used to rectify the horizontal scanning pulses to produce high voltage for the iconoscope. The horizontal scanning pulses are coupled to the deflection yoke and scan the iconoscope in a horizontal direction.

An operational defect of the iconoscope is its inability to produce an evenly illuminated output from all areas of the mosaic. To avoid or minimize this fault, horizontal and vertical signals are modified to produce plus/minus sawtooth waves and plus/minus parabola waves. These signals are applied to the grid of the first video amplifier (V102) through R114 and used to counteract variations in *shading*.

Synchronizing is obtained by shaping the vertical and horizontal square waves so that a proper blanking shape is obtained. This blanking signal is applied to the plate of the 5th video (½ 12SN7) and is used to blank the monitor during retrace time. The blanking signal is also differentiated, shaped and fed to the sync output jack. Sync time, therefore, corresponds to the leading edge of the blanking signal.

Special filament ckt

One unusual aspect of these cameras is worth noting. To avoid pickup of "crud," in the video amplifiers, from the filament of the iconoscope, they were heated by high frequency a-c. Since most aircraft electrical systems contain noise and since the video amplifiers have about 80 db of gain, it was necessary to build a high frequency oscillator to supply filament voltage for the "ike." The 6L6, V109, is used for this. Some variations in cameras exist at this point. In the camera that I have, the 6L6 filament generator receives driving power from the horizontal oscillator running at 15,750. In effect, the heater generator amplifies what ever frequency is generated by the horizontal oscillator. Other models of this camera have a horizontal oscillator coil in the grid of the heater generator. This coil is shown on the camera schematic as L115. In this model, the heater generator is the master oscillator and provides master sync to the horizontal oscillator. You can establish which type of camera you have by locating a coil to the rear of the 6L6 heater generator. If your camera does not have this coil, the heater generator derives its sync from the horizontal oscillator, not vice-versa. Conver-

sion differences will be described later.

Converting the Camera

I say this about all conversions, but *this one* is actually quite simple. The camera itself can be converted in an hour or so. Another four hours to construct the power supply and the camera is ready to adjust.

The ATJ camera filament circuit was operated from the aircraft d-c system, originally. The only part of the low voltage circuit that *must* be operated from d-c is the centering circuit and the bias light. Therefore, in this conversion, the d-c circuits were separated from the filaments and the tube heaters supplied with 24 volts a-c. To further simplify the camera power supply, the d-c for the centering and bias light was obtained across a resistor in the B minus lead of the high voltage (plus 405) power supply. In addition to these changes, the time constant of the oscillators were modified so they would run at the standard frequencies i.e. 15750 and 60 cycles. To avoid extra dangling cables, the video was connected to a spare lug on J101. All signal and power leads connect to J101 which requires only one cable to connect the camera up.

Start the conversion by replacing the two 56 ohm resistors across V103 and V107 filaments with two 22 ohm, 2 watt resistors. Remove R200, 18 ohms, mounted below V117, the VR-150-30. Disconnect the wire from TB-112 to the shutter assembly and remove this assembly. Also, if your camera has a lens heater, remove this too. Next, clip the black wire that is soldered to TB-112, pull the wire back and re-route it through the hole in the chassis nearest V117. Connect this black wire to pin 4 of V117. Now, B minus flows through the centering pots and is connected to pin E of J101. Locate pin 7 of V113 and note that there are two brown wires on this terminal. One of the wires goes to the front of the camera and the other goes to the rear. Remove the one that goes to the front of the camera and connect it to pin 4 of V117. This supplies the B minus voltage to the bias light. Next, remove the jumper between pins A and F of connector J101. F should connect to the chassis for a camera ground. Connect pin A to the video jack adjacent to J101. The lead from pin A to the power supply now carries video.

To change the frequency of the horizontal oscillator, replace C132 (180 mmf) with a 100 mmf silver mica. This capacitor is located between pins 1 and 5 of V112. The frequency of this oscillator can be varied by adjusting either C137, R171 or both, as necessary to bring the horizontal oscillator up to 15,750 cps.

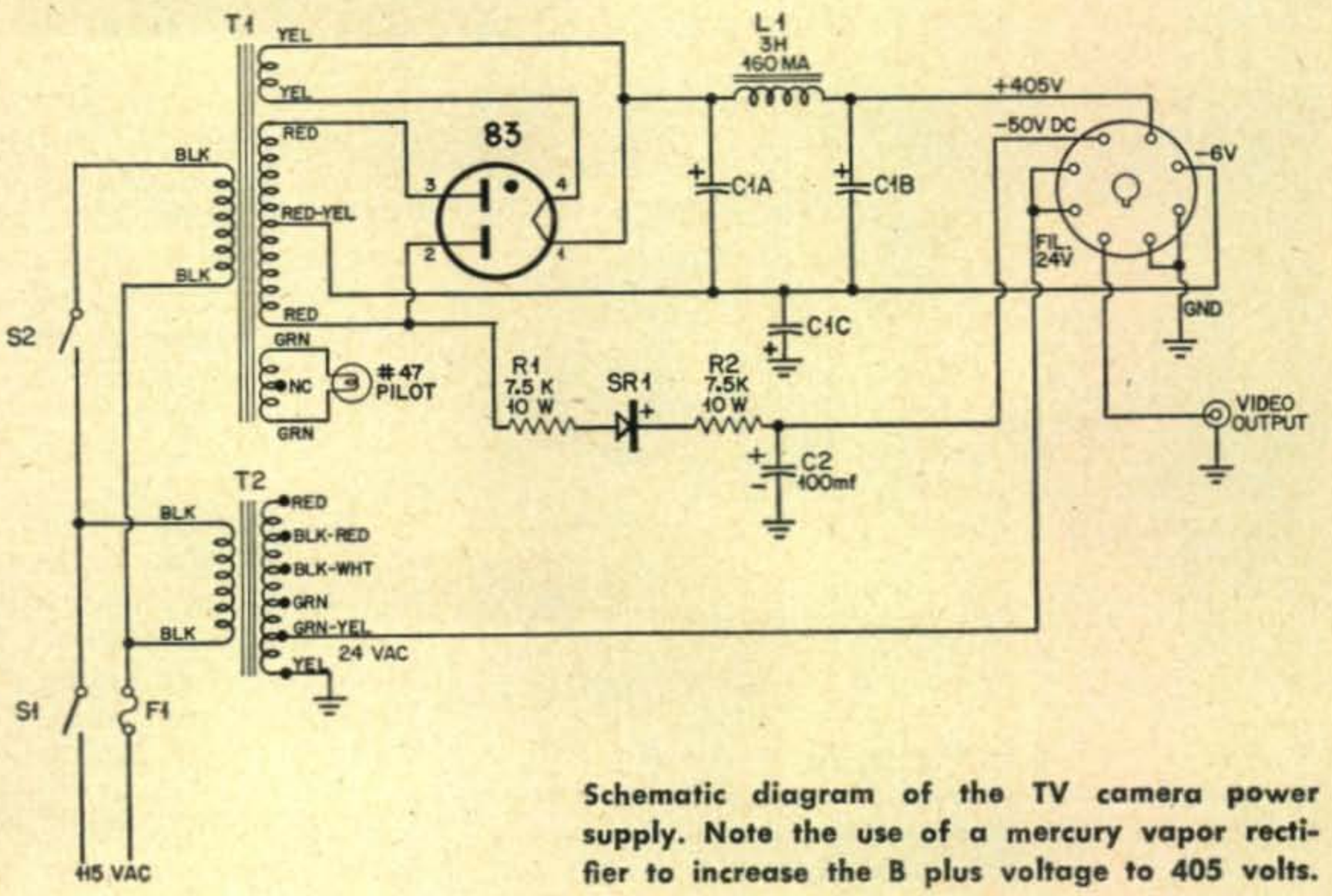
The vertical oscillator frequency may be changed to 60 cycles and locked to the power line at the same time by connecting a 1 meg resistor from pin 1 of V111, the vertical oscillator to pin 7 of the same tube. This supplies approximately 12 volts R.M.S. of 60 cycle signal to the vertical oscillator. This effectively clamps the oscillator to the power line and the frequency cannot be varied even by rotating R164, the vertical speed control. This completes the modifications to the camera. Next step, wire up the power supply.

The Power Supply

The 28 volt a-c filament circuit requires

Parts list for the camera power supply

C1a—10 mfd, 450 volts (Sprague TVL-3752)
C1b—30 mfd, 450 volts (part of C1)
C1c—150 mfd, 50 volts (part of C1)
C2—100 mfd, 50 volt electrolytic
F1—3 amp slo-blo fuse and fuse holder
L1—3 Henry, 160 ma filter choke (Triad C-13X)
PL1—8 pin male plug (Amphenol 86PM8-11)
P12—Mate to J101 (usually supplied with camera)
R1, R2—7.5 K, 10 watt resistor
S1, S2—SPST toggle switch
SO1—8 pin tube socket (Amphenol 168-015)
SR1—50 ma selenium rectifier
T1—700 volt ct. @ 160 ma., 5 volts @ 3 amp., 6.3 volts @ 5 amps. (Triad R-16A)
T2—24 volts @ 3 amps filament transformer (Triad F-61U)
V1—83 mercury vapor rectifier tube

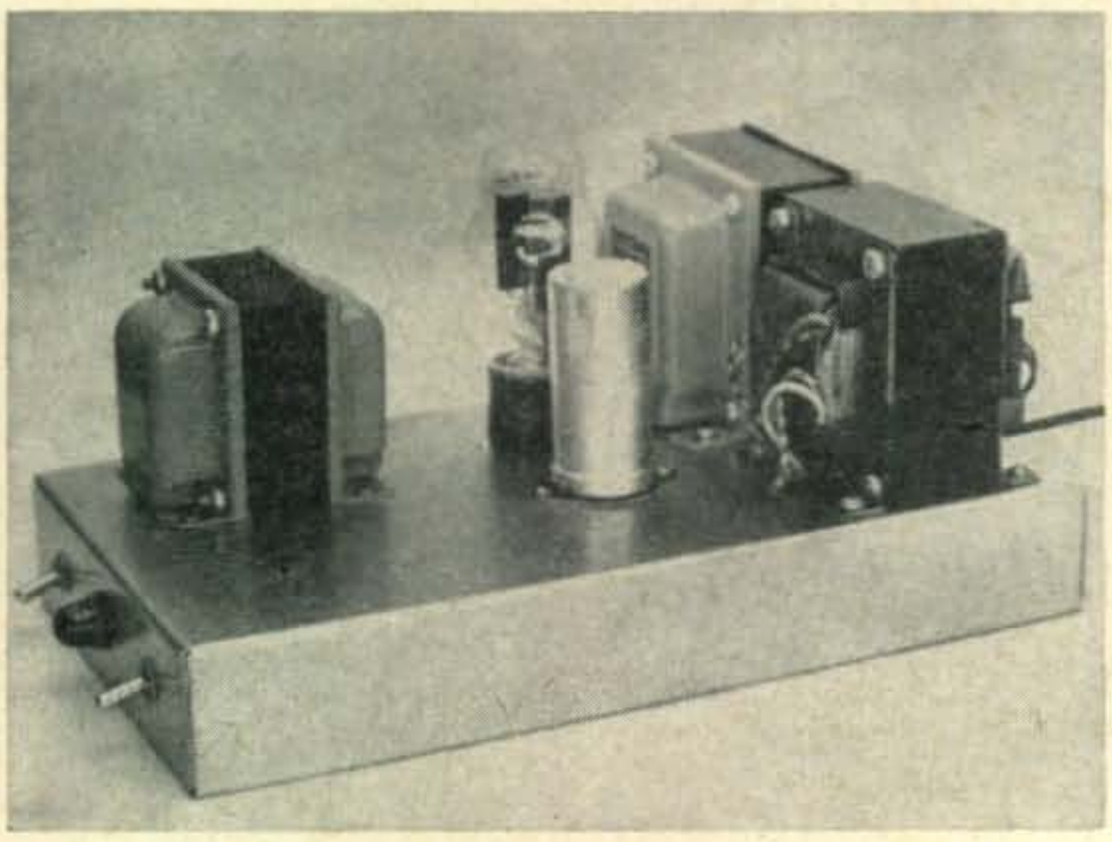


Schematic diagram of the TV camera power supply. Note the use of a mercury vapor rectifier to increase the B plus voltage to 405 volts.

W6TNS and XYL

approximately 2.8 amperes and this voltage is supplied by a F-61U Triad Dry Disc rectifier transformer. A B plus potential of 405 volts at 150 mils is required to operate the camera. This voltage with such a current requirement is a little awkward and I was unable to obtain it using the same power transformer with a 5U4GB rectifier. It was determined that the voltage "lost inside the rectifier" accounted for the inadequate B plus voltage and a type 83 mercury vapor rectifier was installed. When the VR-150's were removed, the B plus voltage rose to about 420 volts. Upon re-inserting the VR-150's the voltage dropped to a very smooth and well regulated 405 volts.

The B minus voltage flows through the wire between J101-E and pin 6 of the 8 pin power connector on the power supply. Once the camera conversion has been made, the complete circuit for B minus is through the two centering resistors, R102 and R103. The current flow through these resistors develops



The 117 volt ac power supply for the ATJ/ATK television camera. The Channel 3 transmitter could be constructed in the clear area forward of the electrolytic.

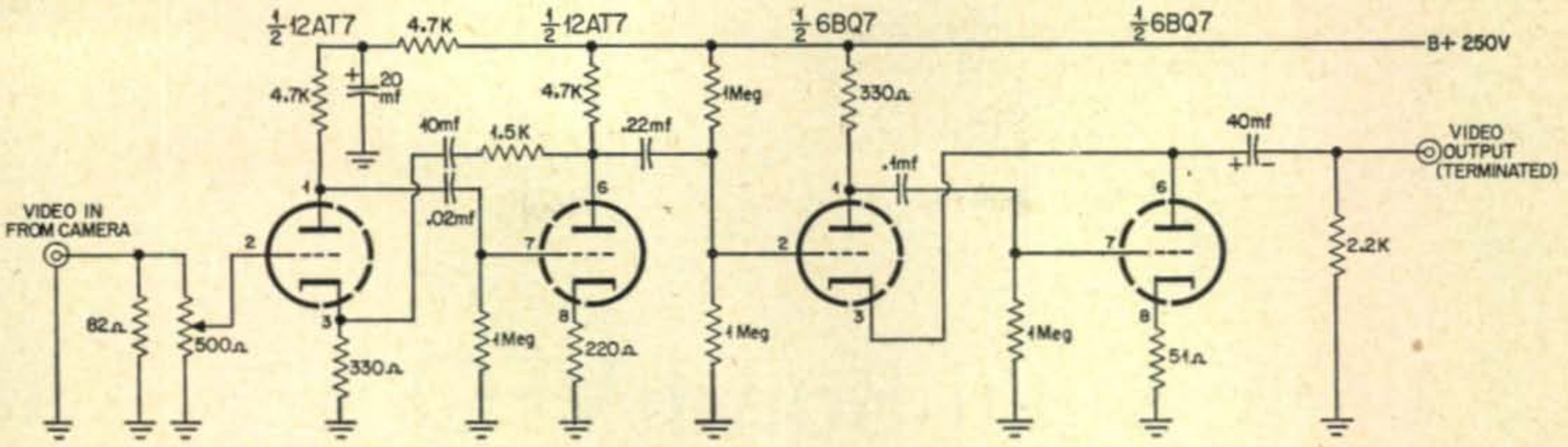
approximately 6 volts across them which is more than enough to accomplish centering. The total current drain of the camera is a surprisingly low 150 ma under normal operation. The power supply also provides minus 50 volts for the bias circuits. This voltage is obtained by rectifying a small amount of the high voltage a-c in a 50 ma selenium rectifier. The long time constant of R2 and C2 supplies almost pure d-c to the camera. Pin 1 of the 8 pin camera power plug (which connects to pin A on the camera plug) provides a video outlet at the power supply. This lead will supply video information to a monitor, ham band transmitter, or to the Channel 3 transmitter to be described later. To operate the camera, the filament switch should be energized first. If S2 is operated first, nothing will happen, for the switches are in series. The camera filaments should be allowed to warm up for at least 2 minutes before turning S2 on. You will notice that when voltage is applied to V1, the 83 rectifier, there will be a blue flash inside the tube. Thi is th ignition of the mercury vapor and is normal. Although the 83 should work into an inductive load i.e. choke input, the old war surplus 83 has functioned for about 50 hours in the camera power supply and shows no sign of stopping.

When wiring the power supply, be careful to connect the 10 mfd section of C1 in the A position (filter input), the 40 mfd section to the filter output (B position) and the 150 mfd, 50 volt capacitor should be connected in the C position. Interchanging these capacitors, or operating the supply without the camera connected would undoubtedly ruin the C section of the capacitor.

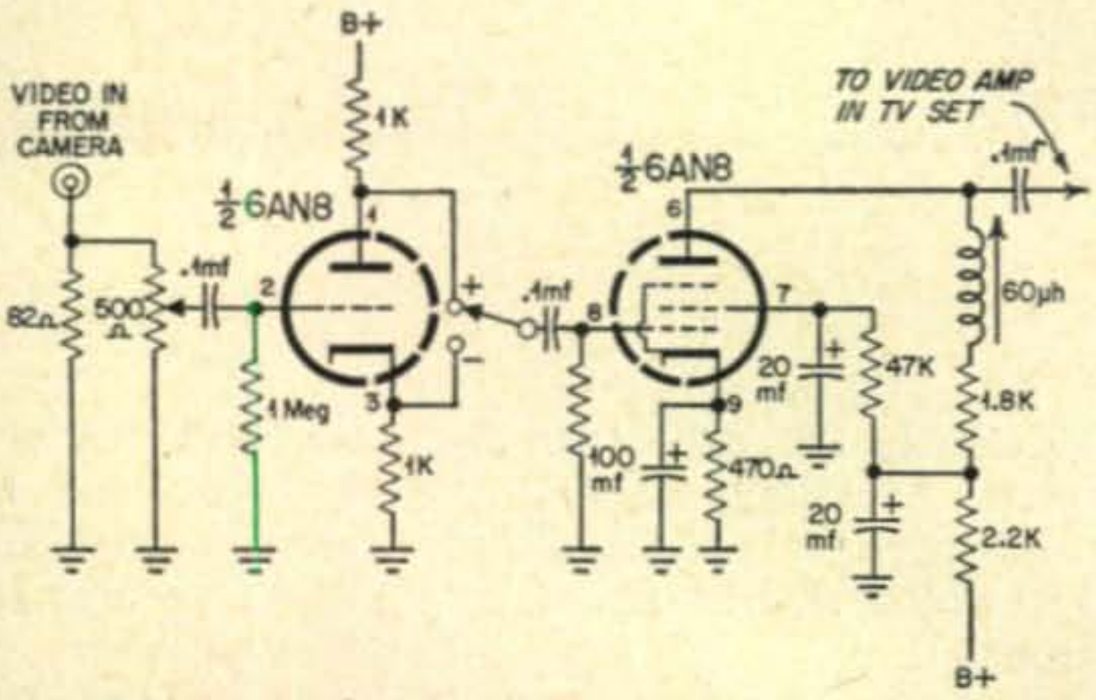
If the camera is to be used directly into a monitor, it is unnecessary to provide sync pulses. However, if the picture is to be transmitted over the air, it will be necessary to place sync pulse on top of the blanking pedestal. If you use the AXT-2 companion transmitter modified for 420 operation, this is accomplished automatically. For other systems, sync can be inserted by installing a 7-45 mmf rotary ceramic trimmer between pins D and A of the monitor power connector, J102. This inserts a small amount of sync into the video output and is adjustable by varying the setting of the capacitor.

Adjusting the Camera

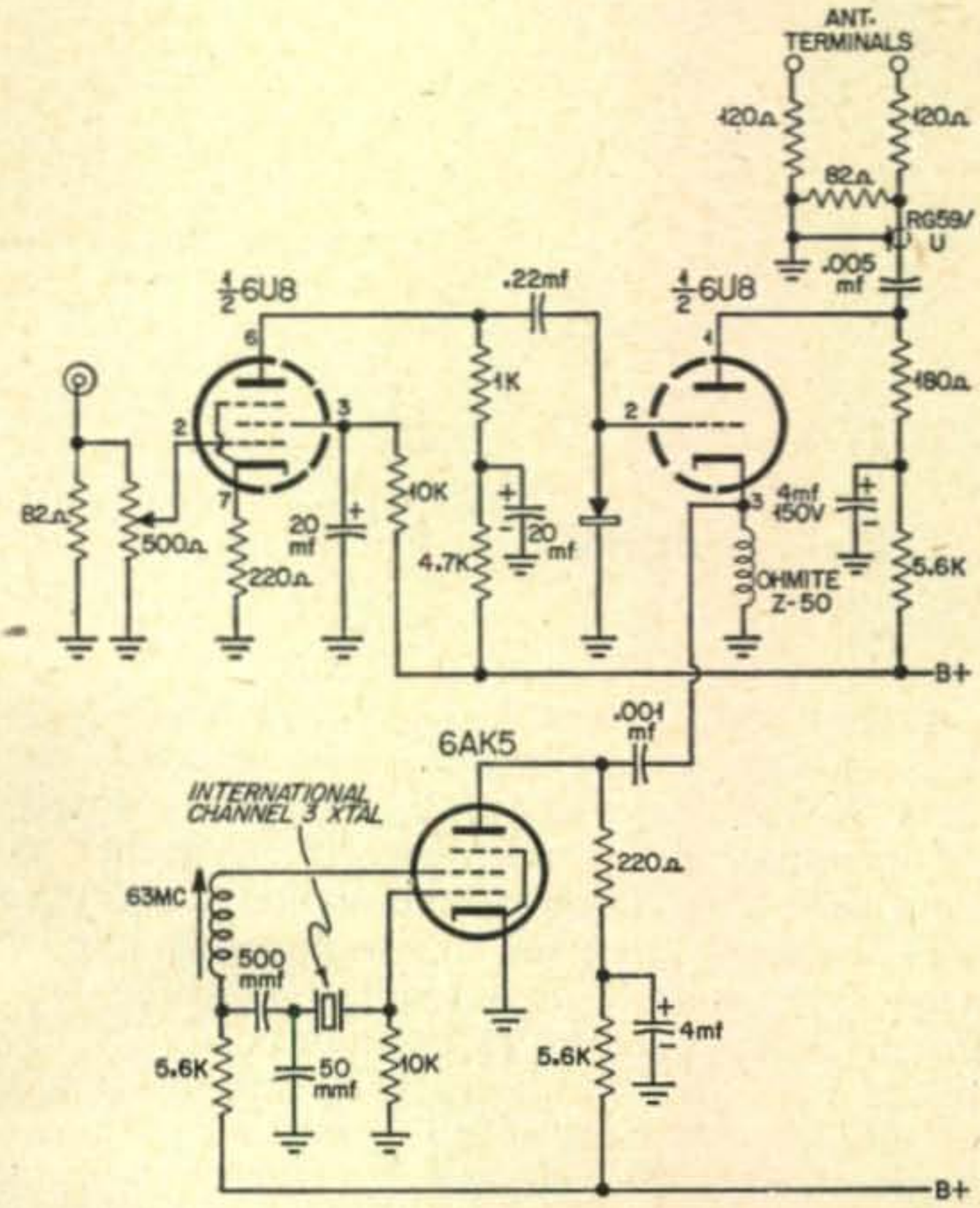
The camera should be aimed at a sunlit object for the preliminary adjustments. Before applying power to the camera, turn the bias potentiometer to full counter clockwise. Also, turn the filament voltage potentiometer (R172) to full counter clockwise. Turn on the filament switch and allow the filaments time to warm up. After two minutes or so, turn on the plate power switch. Allow another minute for the filament generator to warm up. Connect an



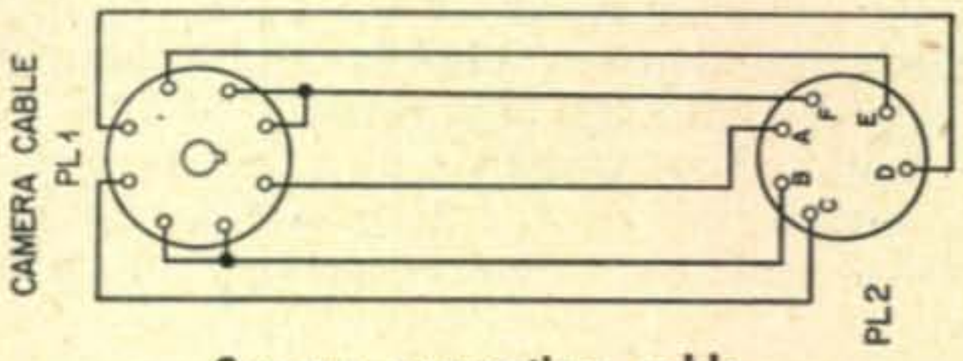
Unity gain distribution amplifier for long coaxial lines.



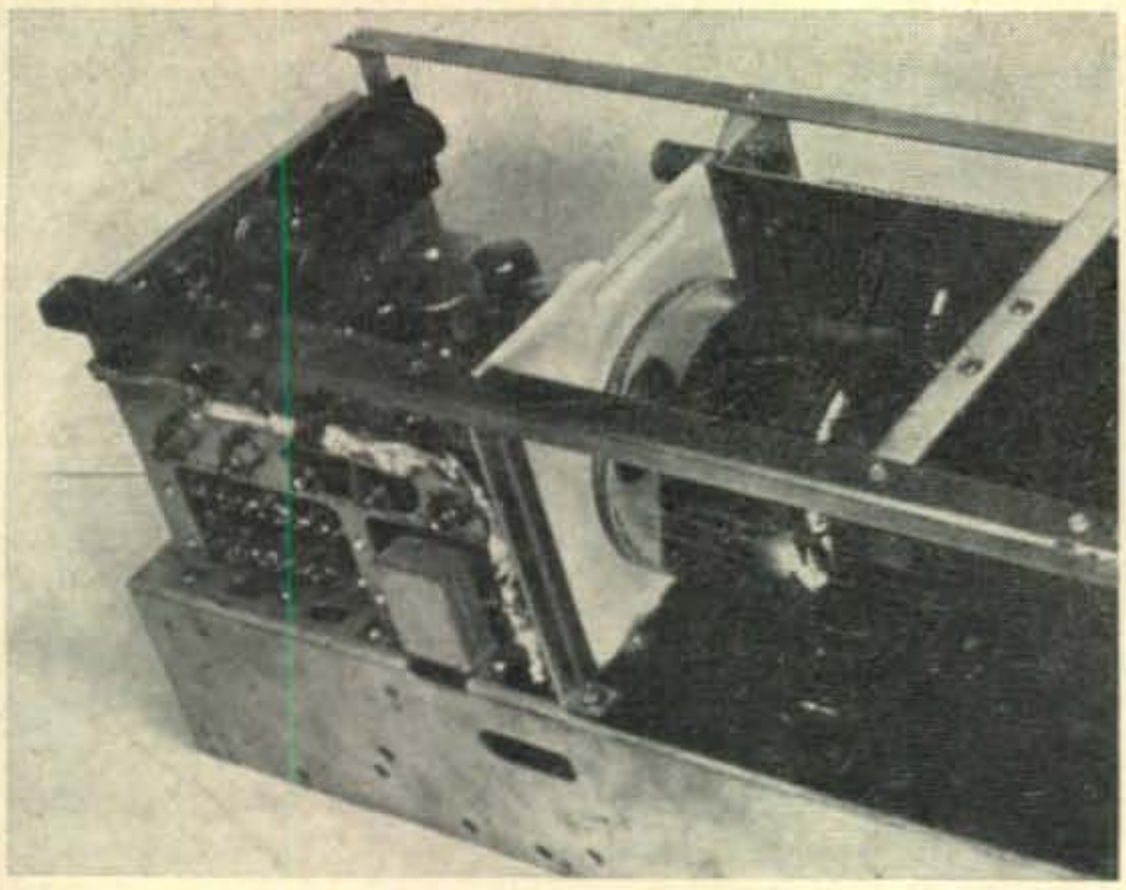
A video coupler for connecting to a standard TV set. The fixed grid resistor is 500 ohms, not 82. The pot is 100 ohms not 500. The second resistor is 470K.



Channel 3 video transmitter. The fixed input grid resistance is 500 ohms, not 82. The pot is 100 ohms, not 500. Make sure + is ground on the grid rectifier.



Camera connecting cable.



Side removed to show adjustment controls.

accurate a-c voltmeter to pins 3 and 4 of T104. *Do not* use a multimeter with a chemical rectifier (copper ovide, etc.) Rather use an accurate, wide frequency vacuum tube voltmeter such as the Heath V-7A and slowly turn R172 clockwise until the filament voltage reads 6.3 volts. Make this adjustment very carefully for, if you burn out the filament, a new tube will cost about 50 dollars. Most surplus stores check filaments before shipping the cameras, so one would have trouble "conning" them out of a replacement.

If you are observing the video output of the camera on a monitor, you will no doubt have series of near horizontal lines on the screen. Since the vertical is locked to the power line, you do not have to worry about locking it. Adjust the horizontal hold control (R171) until these black lines "stand up straight", or lock in with the monitor. If your camera has the oscillator coil in the heater generator circuit, adjust this coil rather than R171 for synchronization. R171 will then act as a rear panel vernier for the oscillator coil.

[*continued on page 98*]

A familiar circuit in new dress, this three stage "all-band" exciter will intrigue the most particular builder and operator. Part 2 of a series.

Multi-Band VFO

using Printed Circuit Techniques

E. L. Klein, W4UHN
5902 Brunswick St.
Springfield, Va.

Etched circuit boards lend themselves very well to low power stages, and without the need for undue ingenuity, may be adapted, for example, to the multi-band VFO-exciter as described here. Originally designed as a unitized module intended to be plugged into a larger transmitter, this exciter may be operated independently as a low power transmitter with the addition of an output tuned circuit. In addition, when operating requirements so indicate, it may be employed as a desk-mounted VFO to control an existing transmitter.

The main purpose of the etched circuit board in the multi-band VFO is to provide means for the neat and rigid mounting as well as interconnection of components including resistors, condensers, chokes and tubes. Frequency determining components of the VFO are mounted separately in a shielded compartment to provide the necessary thermal and electrical isolation found necessary in current practice.

Circuit

While not substantially different from the various oscillators, buffers and doublers widely used by amateurs today, this integral exciter incorporates many features demanded by the most particular operator. Excellent stability is afforded by the Clapp oscillator, voltage regulation and solid construction. The oscillator may be keyed for break-in, and the output amplitude is controlled by varying the screen voltage on the multiplier tube.

Referring to the circuit diagram in *fig 2*, it will be seen that type 5763 tubes are employed as the oscillator, buffer and multiplier tubes. A voltage regulator tube, type 0A2, is used to hold the oscillator screen voltage at 150 volts, and its necessary ignition voltage is adjusted by a 10 watt adjustable resistor in series with the B+ lead. Isolation of the oscillator is provided by a type 6C4 cathode follower and type 5763 buffer, thus preventing varying loads imposed by the subsequent multiplier from changing the oscillator frequency. Variable inductor, L2 in the buffer grid circuit, allows for necessary peaking at the mid-point frequency of the most-used band.

Detailed operation of the oscillator-exciter will be evident from an inspection of *fig 2* and by reference to the ARRL Handbook in which this circuit was previously described.

Tuned Circuit Construction

In *fig 4*, the rear cover of the 2½ by 2½ by 4 inch Flexi-Mount box has been removed to show the method of mounting the tuned circuit parts. L1, in this case, is a 68 uhy coil removed from a surplus BC-746-A Tuning Unit having the marking, 3735 kc. It consists of 77 turns of #30 wire close-wound on a ¾ inch diameter form, and is cemented to a ⅜ inch square polystyrene piece which in turn is screwed to the bottom of the tuned circuit compartment.

To the left of L1 is the band spread, or main tuning condenser, C1. One stator and one rotor have been removed to provide approximately 250 kc coverage on 80 meters thru 180 degree rotation of the *National* SCN dial. Padder, C3, is soldered directly to C1.

Band setting is accomplished from the front panel by C2 which is mounted behind the coil. Reference to an accurately calibrated receiver or a crystal secondary frequency standard will

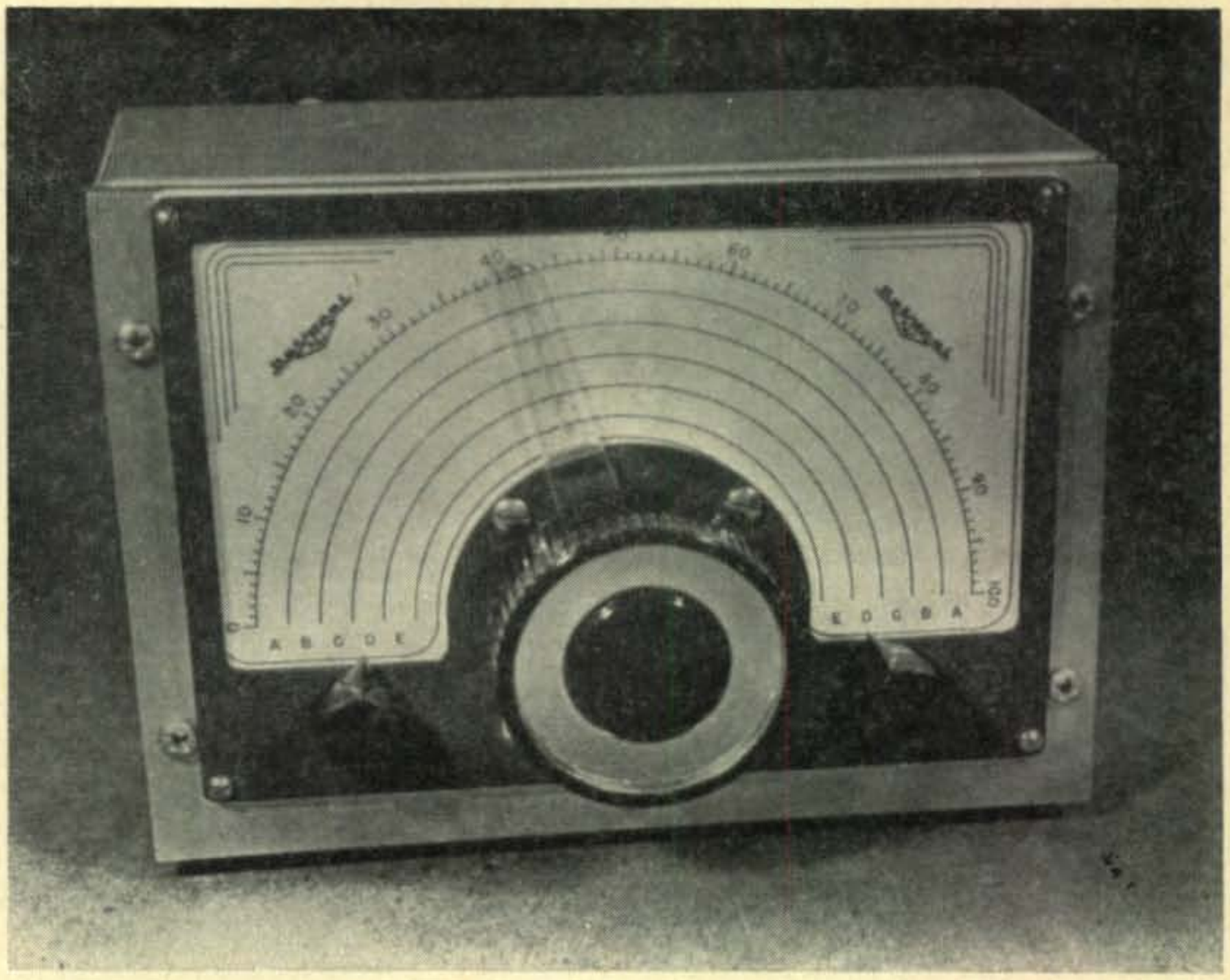


Fig 1—Completed multi-band VFO ready for calibration and dial markings. Small knob at left controls band-set condenser, C_2, and right-hand knob operates the drive control.

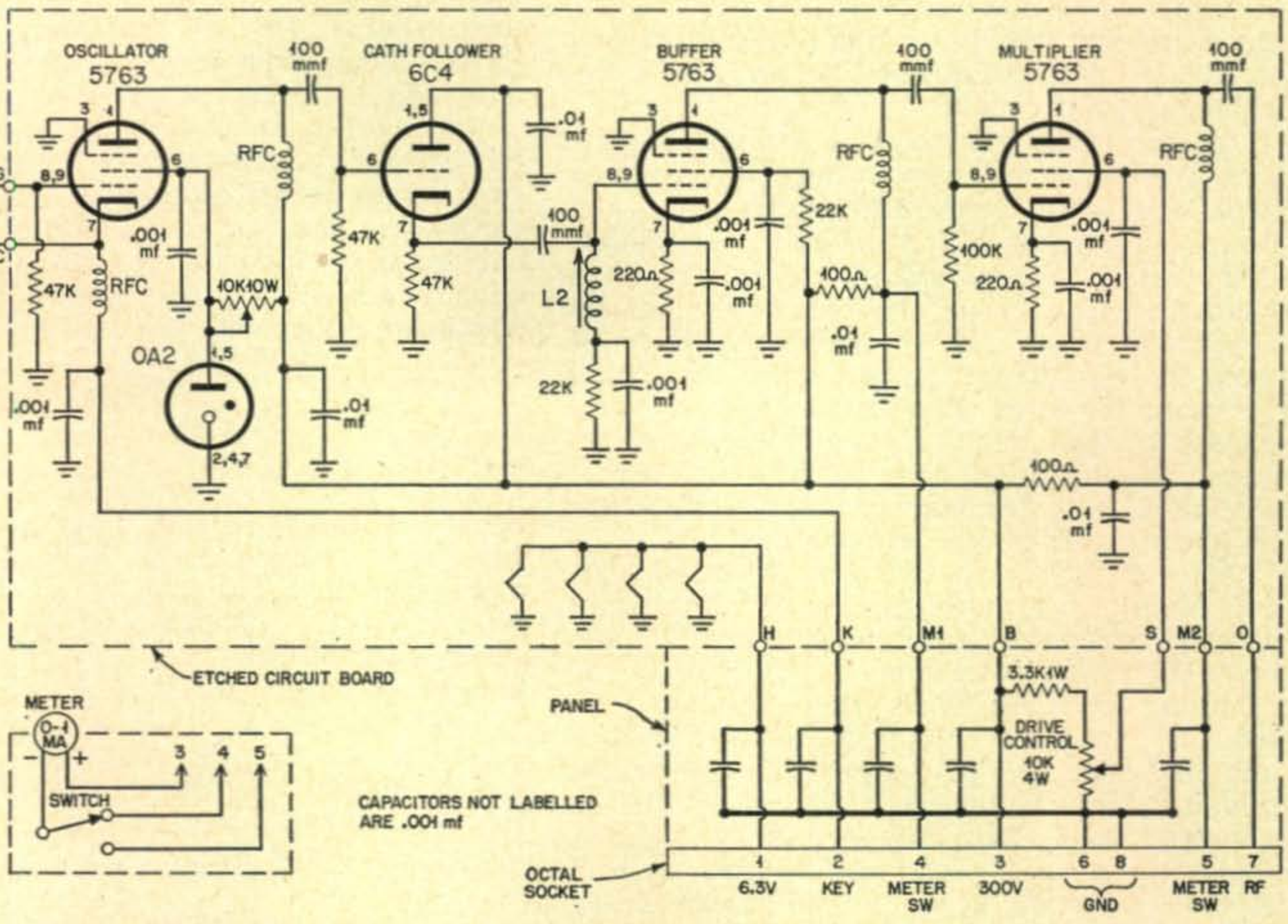


Fig 2—Schematic of the wiring and components contained on the etched circuit board. To the left are the frequency determining coil and condensers. All condensers on the panel are .001 mfd. Line 4 on the meter is M1. Line 5 is M2. Pin 6 or 8 should also connect to the chassis ground.

Parts List

C1 Tuning condenser, 10 mmfd, Hammarlund HF 15 with one stator and one rotor removed.
C2 Band Set condenser, 35 mmfd, Hammarlund HF 35
C3 20 mmfd silver mica
C4, 5 1000 mmfd silver mica
.001 mf condensers are disc ceramic or mica
L1 68 uhy
L2 69 uhy—J. W. Miller 4511
All resistors are ½ watt, except as noted
RFC 2.5 mhy, National R-50

Coil Data

L1 68 uhy, 77 turns #30 enameled wire close wound on ¾" dia. form
L2 69 uhy, Honeycomb wound on ¼" ceramic form, slug tuned. J. W. Miller 4511

permit the following two useful settings to be ascertained: Setting 1.—Lower part of 80 meter cw band, 40, 20, 15 and 10. Setting 2.—Upper part of 80 meter cw band and 75 meter phone band.

The 1000 mmfd silver mica voltage divider condensers, C4 and C5 can be seen above L1, mounted directly to the *Useco* type 1430 feed-thru insulators. Due to the close proximity of the tuned circuit to the type 5763 oscillator tube, it is unnecessary to use co-axial cable for this interconnection as is usually done. Any possible small change in capacity between these leads is effectively "swamped" by C4 and C5.

Circuit Board Fabrication

Previous articles, (Amateur Fabrication of Etched Circuit Boards, CQ, April 1956 and Use of Printed Circuit Kits, CQ, November 1956), have adequately described the techniques employed in producing etched circuit boards. In order to eliminate all drafting and layout work for the constructor, a full-size, accurate scale illustration of the circuit board pattern has been reproduced as *fig 5*. It is suggested that this illustration be photographed to obtain an accurate negative for use in the photoengraving process.

As an alternate method of making a negative, a piece of red ruby cutting film supplied with some of the better printed circuit kits can be placed over *fig 5* and the circuit configuration traced with a sharp instrument. Such hand-cut negatives are also called "mechanical negatives". Also, one of several methods of hand-applying an ink or tape type resist could be used. However, due to the relative complexity of this circuit and the need for accurate placement of parts in such a compact assembly, it is recommended that preference be given to the photoengraving method.

After all holes are drilled in the etched circuit board, it is thoroughly scrubbed with an abrasive cleaner or steel-wool to remove the etchant "resist." Assembly of all parts and soldering of their leads should follow immediately. *Fig 6* identifies each component and indicates its placement on the etched circuit board. From *fig 3* and *4* it will be apparent that this compact design necessitates the careful placement of parts as well as their assembly to the etched circuit board in a pre-planned sequence.

Front Panel Construction

Principal structural support for the various parts of the exciter is furnished by the front panel. Although a ¼ inch thick aluminum panel was used in the model illustrated, it is presumed that ⅛ inch or 1/16 inch thick material would serve equally as well. *Fig 7* shows the drilling plan for all holes in the front panel. The 2½ inch diameter centrally-located hole accommodates the protruding planetary drive mechanism of the main tuning dial. Sizes and treatments of all other holes are indicated below the drawing.

Assembly

Logical assembly practice dictates that the etched circuit board and the tuned circuits be fabricated independently. Therefore, after being separately assembled, they are each mounted to the front panel. Five one inch long sleeves fit over 1¼ inch long #6-32 round head screws to secure the etched circuit board in place.

External connections made with color-coded hook-up wire terminate at the seven eyelets functionally identified on the wiring diagram, *fig 2*, and phantom drawing, *fig 6*. Maximum strength can be obtained from these external connections only if the wire is inserted into the etched circuit board from the side opposite the etched wiring pattern.

Power leads and meter switch connections are brought in through the male octal plug seen in *fig 3*. Two ¼ inch aluminum bars, 2 inches long, support the ears of the plug mounting plate and are in turn bolted to the tuned circuit compartment cover. Disc ceramic RF by-pass condensers of a nominal .001 ufd capacity prevent escape of unwanted RF energy via the power leads. In cases where additional shielding is required, the radio frequency output may be made via a co-axial connector rather than pin 7 of the octal power plug.

Cabinet

A standard 5 by 7 by 3 inch deep aluminum chassis is used for the VFO-exciter cabinet. Because the tubes extend beyond the 3 inch chassis depth, a 1½ inch by 6 inch slot must be cut in the cabinet-back to provide for them. A simple box fabricated from perforated aluminum covers the slot allowing necessary ventilation while at the same time maintaining intergrity of the shielding. A female octal socket mounted in the cabinet back engages the male plug discussed earlier, completing the power connections.

Operation

When first placing the exciter into operation, it is desirable to individually check each stage in succession, starting with the oscillator stage. Obviously, no errors should be encountered in the wiring if the etched circuit board pattern is photographically reproduced from *fig 5*. However, it is suggested that the last three tubes be removed when preliminary checks are being made on the variable frequency os-

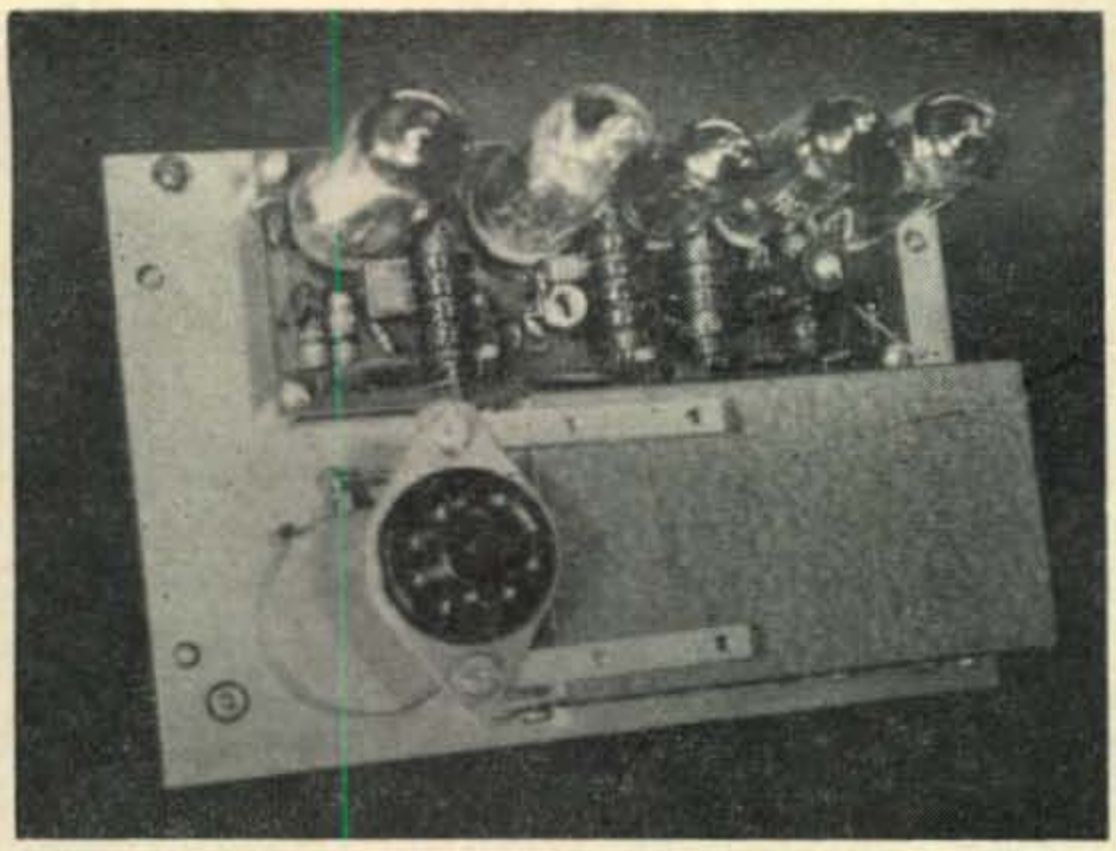


Fig 3—Relative placement of etched circuit board, tubes, drive control resistor, tuned circuit compartment and octal power plug is shown.

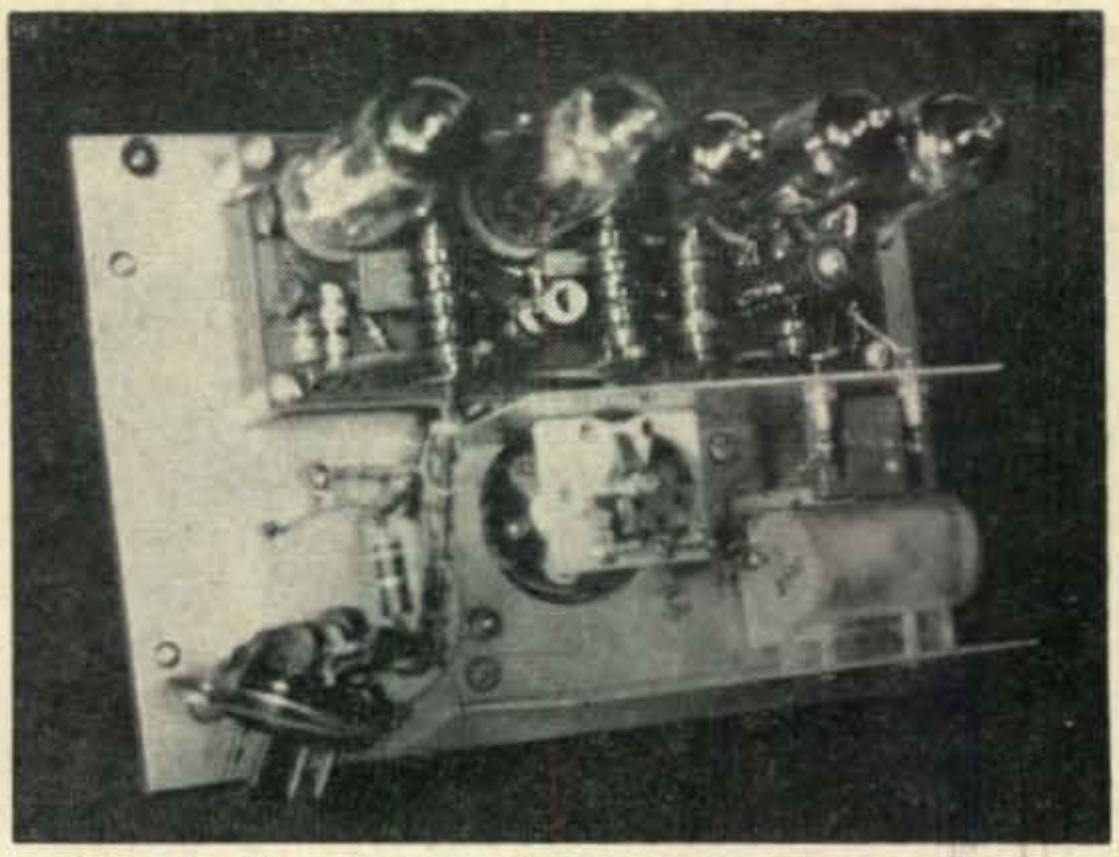
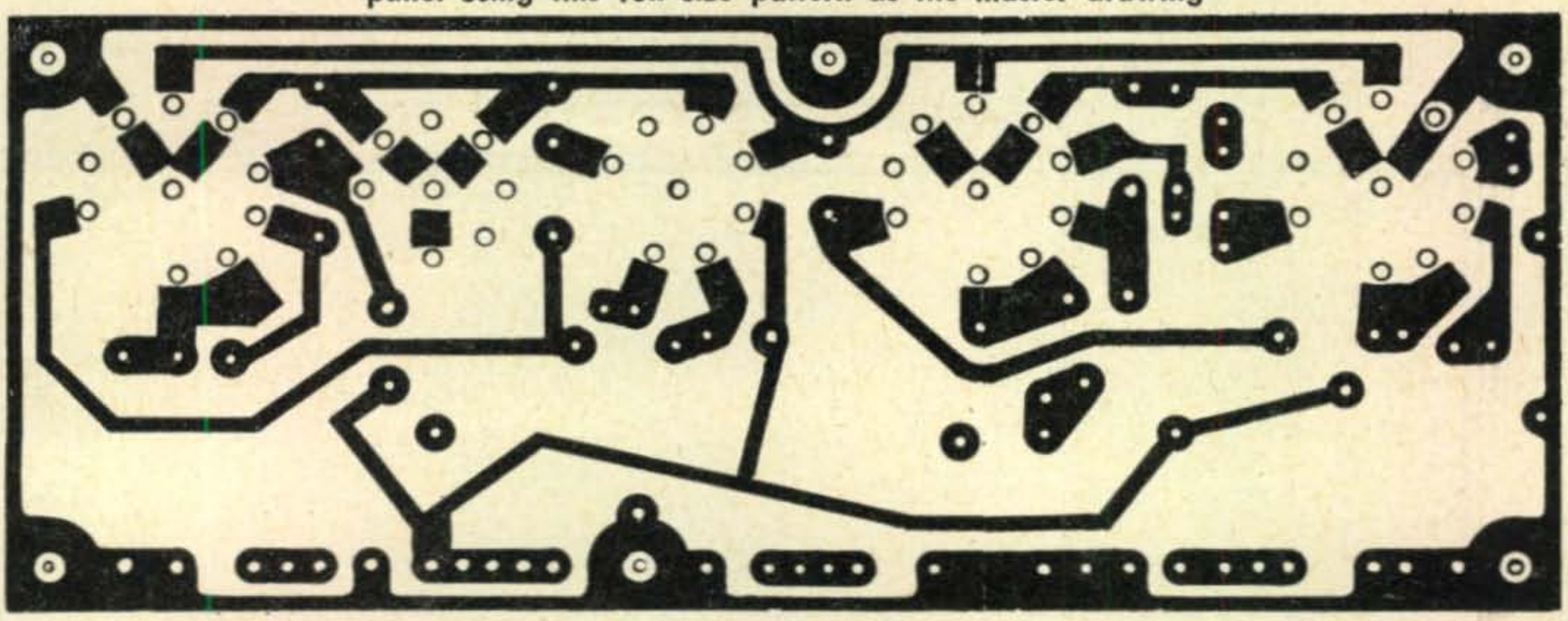


Fig 4—The tuned circuit compartment. Most efficient use of space is made, yet adequate clearance is provided around the coil, L_1. Use of a separate compartment improves mechanical rigidity and provides desirable thermal isolation of the frequency determining components.

Fig 5—Etched circuit board for the VFO-exciter may be photoengraved in a copper-clad phenolic panel using this full size pattern as the master drawing



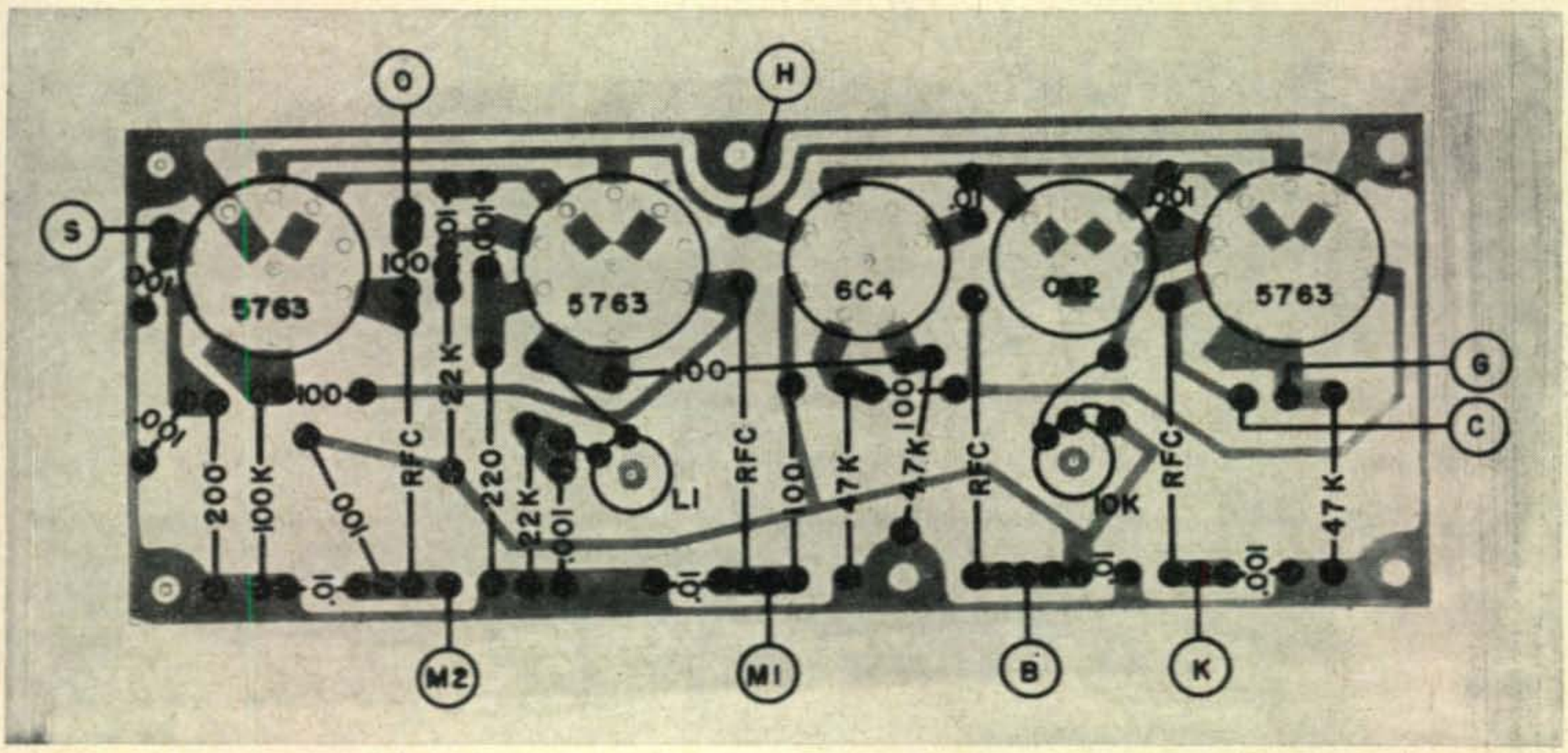


Fig 6—Assembly of tube sockets and other components on the etched circuit board is illustrated here. External connections correspond with symbols on wiring diagram.

cillator. The type 0A2 voltage regulator tube should always be left in place to prevent the oscillator screen voltage from rising excessively.

With 300 volts B+, 6.3 volts, the meter switch and key connected to the octal plug, the tubes for subsequent stages are inserted and their supply voltages verified. L2 may then be adjusted for maximum r-f voltage as indicated by a small neon bulb held near the buffer plate terminal. While no significant manual adjustment can be made based upon meter readings at terminals M1 and M2, those meter readings will, however, reflect normal operation of their respective stages. The milliammeter reading in the M2 position will vary somewhat depending on the setting of the drive control, and may therefore serve as a relative indication of the amount of drive if a grid meter is not provided in a subsequent stage.

"Key-up" checks should be made for parasitic oscillations in the last two stages. No such complaint was encountered in the model described here, even when operating on the fundamental oscillator frequency without doubling. If such spurious operation is found to exist, it may be corrected by fitting the buffer and/or multiplier tubes with appropriate tube shields rather than incurring the inconveniences or neutralizing.

Final calibration of the dial and marking of its face are done as the last operations before "on-the-air" checks. Needless to say, TVI prevention practices dictate that the drive control be not advanced beyond the position which gives adequate minimum drive. Once the operator has become acquainted with this compact and reliable variable frequency exciter, he will no doubt retain it as a standard unitized module in all future transmitters. Likewise, it is hoped he will be stimulated to additional favorable experiences with etched circuit boards. ■

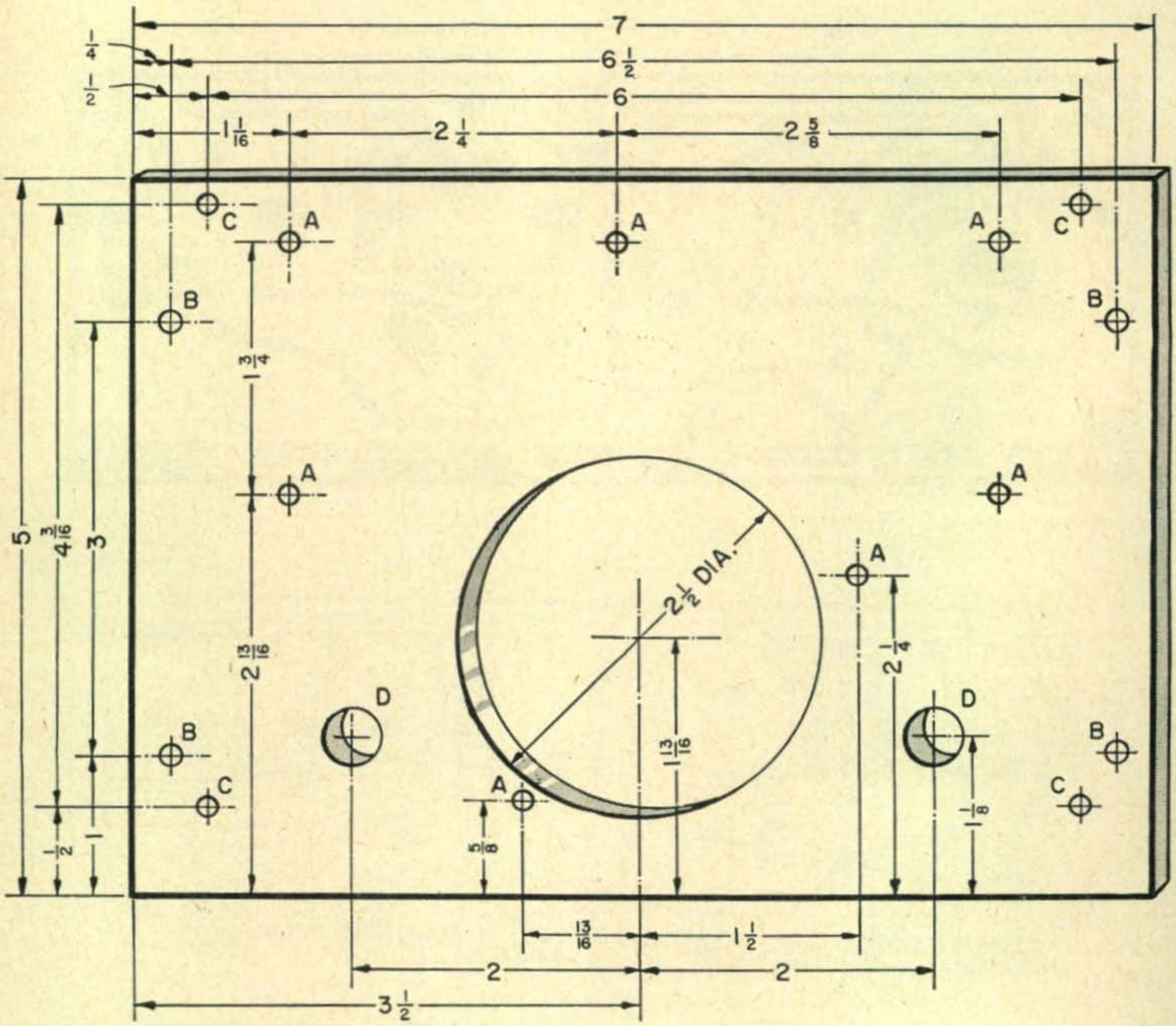


Fig 7—Panel layout showing location of holes. Large cut-out at center provides clearance for the planetary drive mechanism of the SCN dial. Other hole sizes are as follows: A-#6-32 tap, B-#28 drill to clear #6-32 screws, C-#33 drill to clear #4-40 screws, and D-⅜ inch diameter.

Silencers, Auto Radios, and Printed Circuits

William I. Orr, W6SAI

I might have guessed it. No sooner had I picked up the phone than WWQ began to pour his tale of woe into my ear. "Do you have a dull razor blade?", he asked.

"Why, no", I replied cautiously. "What do you want a dull razor blade for, little Toot?"

"To cut my throat", he said. "My new Chevvy has a 12 volt radio with a printed circuit, and I'm going nuts trying to hook my converter and TNS noise limiter to it".

I decided to toy with him a bit. "Well, for a smart feller like you, that should be a snap. If you just buy that well-known Mobile Handbook by that well-known authority . . ."

He broke me off abruptly. "But a printed circuit!!", he wailed. "I can't even make connection to the darn thing. *And* it's twelve volts."

"Yes," I replied soothingly, "and you probably don't even have the schematic do you? It's *printed* right on the board, you know." As an after thought I added, "That's a joke, son".

"Thanks, Dad", replied the hopeful mobileer. "I'll be right over and turn this problem over to your capable hands with pleasure".

And by George! he did. Not more than ten minutes later WWQ rolled up into the driveway in his brand new, sparkling station wagon.

"Not a bad pile of tin", I admitted grudgingly. "Suppose you pull that radio and we'll put it on the bench and have a look-see."

"Please be careful", asked WWQ. "The finance company won't like the idea of you ruining their brand new receiver."

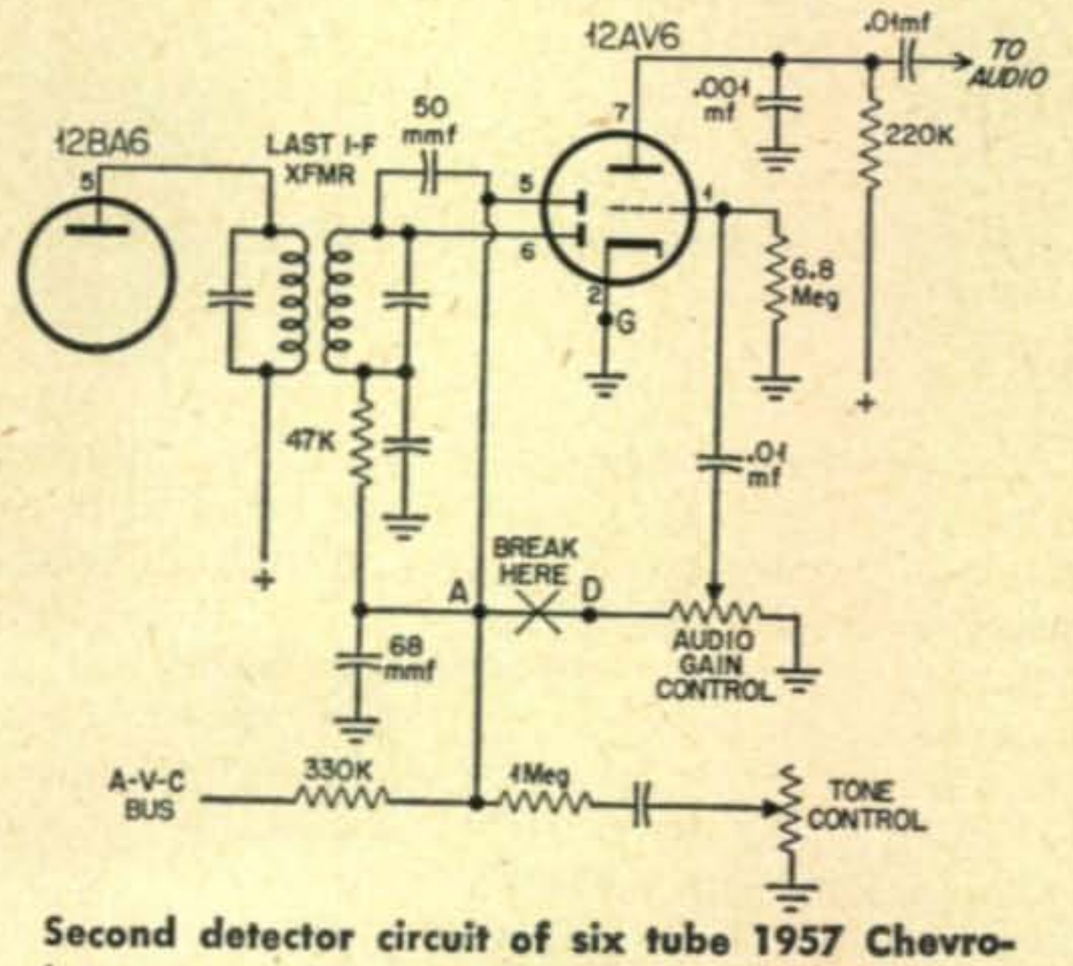
We pulled the receiver and took it into the garage and dropped it on the bench. Upon removing the top and bottom protective covers from the receiver I admitted, "You sure are right. It *is* a printed circuit. And there's no schematic."

"Darn receiver is so new that nobody around here has the schematic", replied WWQ. "What do we do now?"

"First of all, if we hold the receiver up to a powerful light we can see right through the circuit board. As you note, the components are mounted on one side of the board, and the printed silver strips that make up the wiring are on the opposite side. The leads of the components project through tiny holes in the board and make contact with the strips. At that point the lead is soldered to the strip. Now, with a little care we can sketch out the circuit of the second detector. Hand me that pencil".

• • •

"Boy, that's a Doozie!", said W6WWQ. "Never saw a second detector circuit that



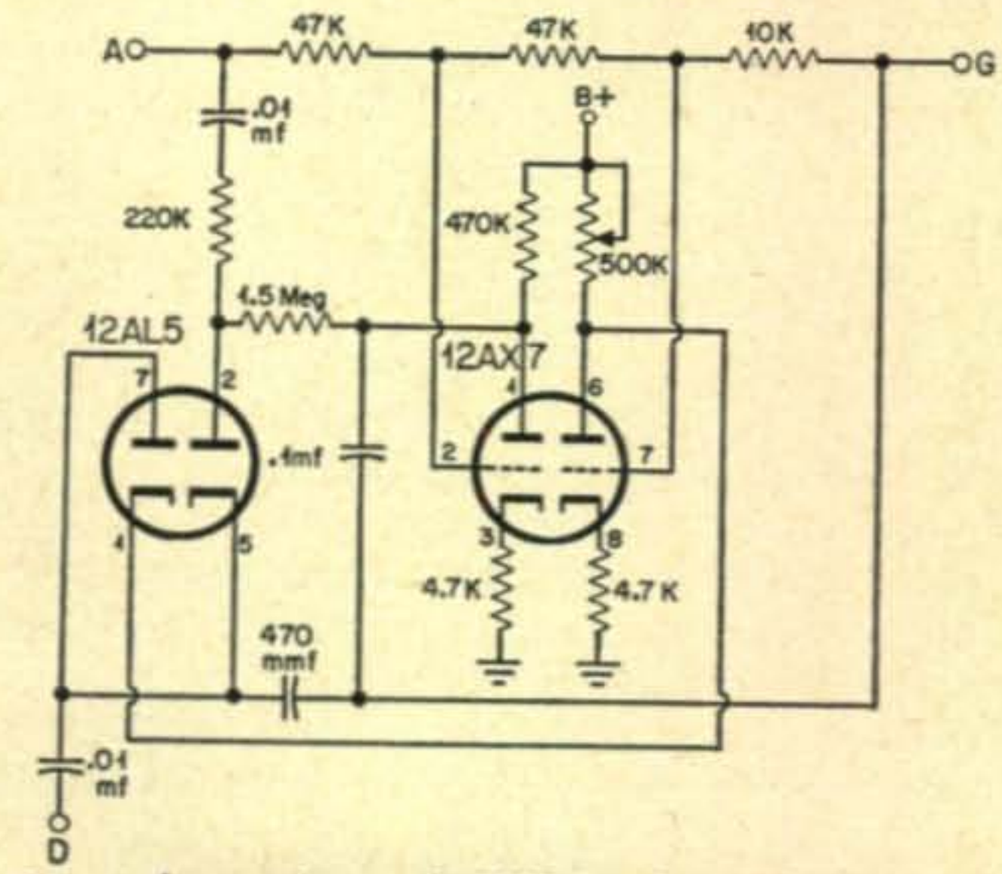
Second detector circuit of six tube 1957 Chevrolet auto radio, model 987573, showing TNS connections.

looked like *that!*"

"Well, it's a version of the one shown on page 88, *fig 21* in the new Mobile Handbook", I replied. "You might say they are first cousins. One diode (pin 6) of the 12AV6 is the second detector, and the other diode is the avc rectifier (pin 5). Lot of the new car radios have this circuit (See *fig 1*). This circuit works real keen-o with the TNS, since the avc and detection circuits are isolated to some degree. Now, here is the TNS circuit (*fig 2*). Problem is: How do we graft it on to the circuit of the car receiver?

"Well, we can take the B-plus from the 'hot' end of the 15K resistor at the center of the set, and we can take ground from one of the mounting bolts of the printed circuit board

[*continued on page 106*]



12 volt version of TNS, using 12AX7 and 12AL5 tubes. All resistors are ½ watt, all capacitors are 600 working volts.

More on Grounded Grid (vol II)

Norman R. McLaughlin, W3LNT ex W6GEG
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For amateur purposes at least, the subject of grounded grid amplifiers would seem to have been adequately covered. But, 'fan mail' continues in abundance. While such mail is most flattering, albeit, answering every letter, as is the custom, is nothing but hard work! What follows, with what has already been published in CQ, (1) should provide answers to about every conceivable question that might arise when getting a GG amplifier on the air.

To begin with, any old tank circuit will do. If you like series feed or shunt feed it makes little difference. Use the tank with which you are most familiar. Pi networks are excellent for interstage as well as output coupling and are highly recommended.

Simple tank circuits have been shown in schematics simply to de-emphasize the output circuit. The difference between GG and conventional amplifiers is in the *input,* and it was intended that emphasis should go there. While those very simple tanks work well there are more convenient LC arrangements, to be sure, particularily for bandswitching.

Next is the matter of LC ratios. It is not intended to debate the value of high Q here. Since it can be shown empirically that tank circuits with Q's of 12 or more work very well in linear amplifiers that fact alone will have to suffice as justification. Here again that tank circuit in the old rig will probably work quite satisfactorily.

Now, before pens are whipped into a frenzy inquiring about how to determine a Q of 12 or more, here is a convenient rule of thumb which, although not original, is a good rule to follow when in doubt. *Use coils cut for one band higher in frequency than would be normally used.*

Thus, for 75 meter operation 40 meter coils should be used. Forty meter operation requires 20 meter coils, ad infinitum. Obviously such practice requires using larger than normal tuning capacities. Most manufactured coils for 40 meters resonate on 75 meters with about 225 mmfd across them.

Because of the short duty cycle in SB, much smaller coils can be used satisfactorily. Five hundred watt coils just loaf in SB with a KW input. In fact, 150 watt coils are satisfactory too but long tune up periods with a KW of carrier inserted (or ditto of tones) must be avoided.

Regarding the efficiency of grounded grid amplifiers, it would appear that such questions are not very well thought out. Efficiency, if we are discussing the same subject, is primarily a function of the plate circuitry. Since this segment of the circuit remains constant without regard to whether input be GG or conventional, how can efficiency be any less in GG?

The efficieny we refer to is usually defined as;

$$E = \frac{P_o}{P_i}$$

where
E is in percent
P_o is power output
P_i is power input

There are other degrees of efficiency to be sure, but writers inquiring about efficiency appear to have the above in mind. Just in case the above does not settle the question once and for all, perhaps C. E. Strong (2) will remove any doubt with;

"The efficiency of a driver and a grounded grid power amplifier can be somewhat higher than for an equivalent combination utilizing a normal amplifier circuit owing to the improved efficiency in the output circuit. This results from lesser output capacities and also from the fact that there is no necessity to provide a load resistance to insure stability of the driver, since the latter is loaded by the output resistance of the final amplifier."

And, if that doesn't cinch it, be reminded that much of the driver power appears in the output of the driven amplifier. Scotch amateurs are certain to appreciate this condition!

Interelectrode capacities, unless tubes are specificially designed for GG, are based on conventional circuitry. Thus when such tubes are used in GG those values no longer pertain. Likewise, tube characteristics which depend upon those values are no longer valid.

It is generally accepted that grounded grid circuitry causes interelectrode capacities to be reduced to approximately half of their conventional circuit value. Such reduction makes possible use of tubes on frequencies considerably higher than their original design limits. This same reduction in capacities makes it possible to use several tubes in parallel at frequencies at which a single tube would work poorly in a conventional circuit.

The 6AG7, for example, is given a maxi-

mum frequency rating of 10 megacycles. Few amateurs who operate 6AG7's in GG on 20, 15 and 10 meters will agree with that limit. Take the case of W4KEJ from whom we'll hear later.

TVI, when GG amplifiiers are properly operated, is non-existent. Tests made with receiving tubes in GG described recently (3) were made on a plain chassis completely without shielding and within 30 feet of a TV set that used indoor rabbit ears! With the exception of tests made with 350B's, no trace of interference could be found. The search for interference was even extended to TV channels upon which no TV stations operated!

This is not to say that a GG amplifier can not create TVI. Improper loading of driver and/or final plus the excessive drive that is usually applied under such conditions can and does create excessive harmonics, spurious radiations and everything else any improperly operated amplifier is capable of generating. This condition is no fault of GG circuitry. The trouble lies with the operator. Good as it is, grounded grid circuitry can not cure cockpit trouble!

Many articles have been written, at least two by this writer, (4) (5) that describe loading and operating linear amplifiers. Application of practices outlined in any of these articles will clear up any tendency toward TVI.

Just today a note arrived from W4KEJ that should be a shot in the arm to those who are but timidly contemplating a GG amplifier. Ray Spinks' home QTH is in Columbus, Georgia, but he spends most of his time operating maritime mobile aboard the SS MORMAC DOVE. He had just pulled into Rio de Janeiro when he mailed the following;

"Dear OM - After several unsuccessful attempts to get on SSB I was about ready to give up. Then your article (3) on the 6AG7's appeared in CQ. It looked so simple that I thought *even I* couldn't go wrong.

"I built up the linear and have had excellent results. My only error was in building a small power supply. However, I knock the KWS-1 boys out of their ivory towers when I tell them I'm running four 6AG7's with only 500 volts on the plates—and into a vertical whip!

"Many, many thanks OM for your very timely article. Look for me on 15.

73

Ray"

This enthusiasm is not expected to create a Bear market in KWS-1's. Instead, it should point out that the little guy with but a few coins jingling in his jeans instead of wads of that green stuff, can lash up a fist full of 6AG7's and with as little as 500 volts on their plates start passing inferiority complexes to the Kilowatt Kids!

Seriously, it is hoped that this supplement to what CQ has already published on grounded grid amplifiers will give courage to those who have had trouble getting on SSB because of stability difficulties in linear amplifiers, money problems or similar hindrances. While sufficient information is contained in these articles to get any one on the air, no letter requesting additional info will go unanswered. However, do yourself and the writer a favor.

See if you can't find your answers in these articles *before you write*. The odds are 100 to 1 that what you want to know is in one of the references below.

References:

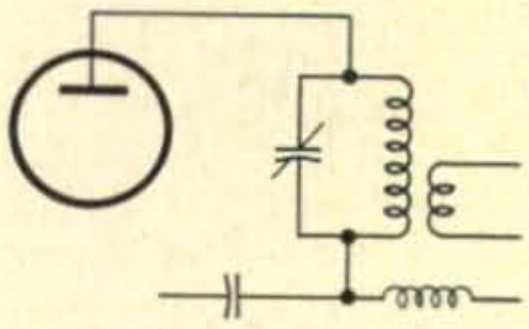
(1) Grounded Grid Linear Amplifiers, CQ, July 1955 p. 28 More on Grounded Grid, CQ, September 1955 p. 16 Receiving Tubes in Grounded Grid SSB Finals, CQ, September 1956, p. 19

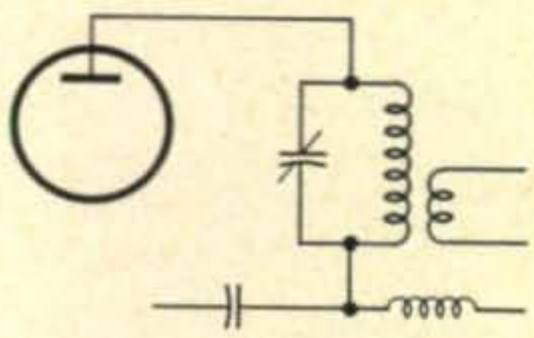
(2) Inverted Amplifiers, Electronics, July 1940, p. 14

(3) Receiving Tubes in Grounded Grid SSB Finals, CQ, September, 1956, p. 19

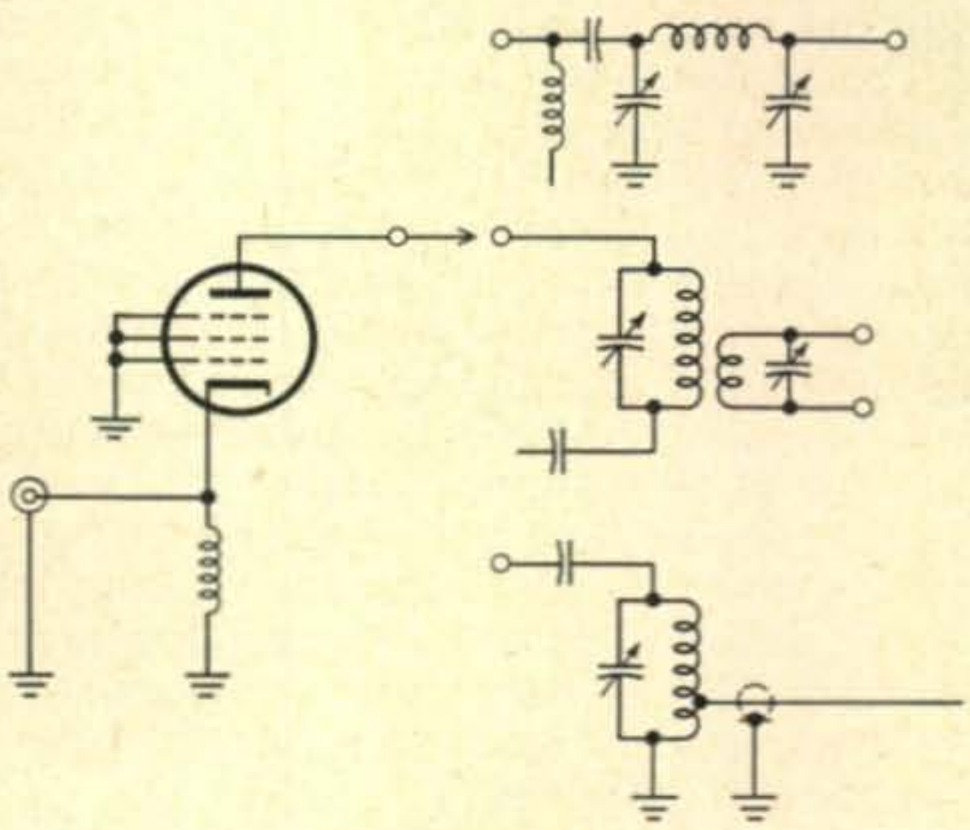
(4) Grounded Grid Tune-Up Tip, CQ, December, 1955 p. 68

(5) Linear Tips, CQ, March 1955 p. 17





Here are the output circuits of a conventional and a GG amplifier. With equal input, which one will have the greatest output and therefore the highest efficiency? Why?



The difference in Grounded Grid is in the input. Use any old tank circuit that has worked well for you before in the output. Any of the above will do a good job, and, of course other tank circuits will, too.

Mobile operation in North America has advanced with Gargantuan strides. The fundamental appeal of hamming from a four wheeled QTH has made it a well developed facet of amateur radio. Its popularity is however restricted to a degree by the fact that the mobile signal is in most instances an "also ran" when compared with the fixed station variety. Many a hapless ham has proven this to his own satisfaction by talking himself hoarse while attempting to scissor through the barbed wire of "nailed down 75 meter KWs" with an inadequate instrument. Since the radiation efficiency of the mobile antenna cannot easily be increased beyond the stringent limits imposed by practical factors, the only path to better communications lies in higher power. We aren't revealing any secrets; a good number of the mobile brethren have gone QRO. Even the mobile KW is no longer an item for Ripley. However, there has been little published on the subject, so we present here three versions of the "bigger and better" mobile transmitter.

. . . as compiled by W3NSA

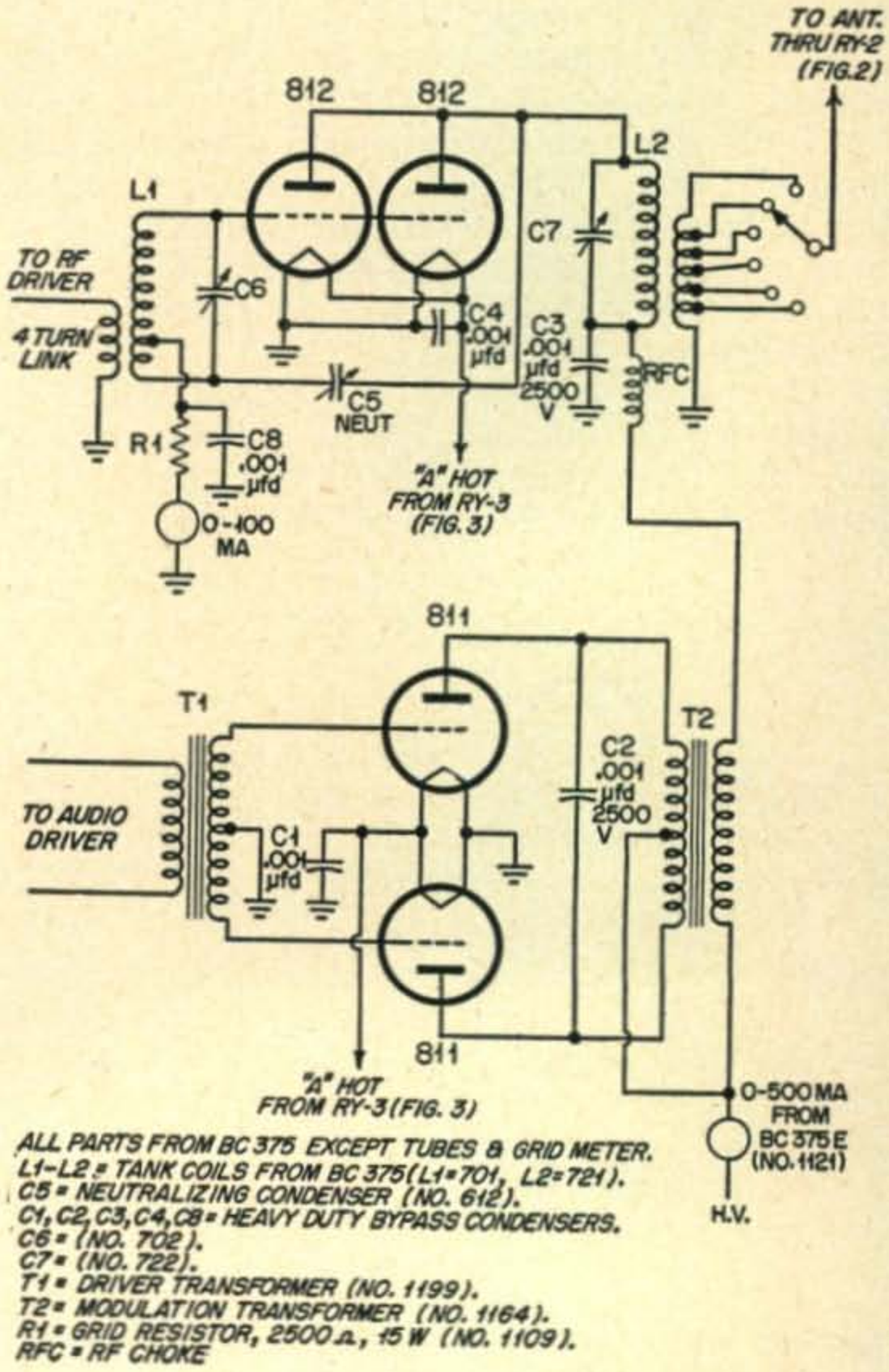
Notes on High Power Mobile

Dr. Raymond Allen Cook, W4JOH
Department of English
Georgia State College
Atlanta 3, Ga.

Here is a description of a really inexpensive method of going mobile with greatly increased power. We used the little rig in the car (an 807 modulated by 6L6's) to provide both audio and RF excitation for a 350 watt final. Since the BC375E is so readily obtainable and inexpensive, we used the components from it almost exclusively in construction of the big rig. As a matter of fact, the only items not from this source were the tubes, tube sockets, relays and coaxial connectors. The total cost, except for tubes, came to less than twenty dollars.

The tuning unit (TU-6-B) from the BC375E, covering the range 3000-4500 kc, seemed the most logical foundation unit with which to start, for it contained most of the components for the r-f section and already had the proper L/C combination for seventy-five meters. But this particular unit presented a slight problem: The coils were mounted vertically in the unit rather than horizontally under the tuning condensers, thereby leaving no room to mount the tubes. After an hour of unscrewing and tightening nuts and bolts, the coils were remounted directly beneath the tuning condensers, leaving the unit with the same appearance as most of the other tuning units of the BC375E. Care was taken not to disturb the leads running from the final pick-up link to the coupling switch. Instead, the leads were twisted into a semicircle while the coil was being moved beneath the final tank condenser.

Low cost, instant heating filaments, and the fact that they fit well in the spaces left by the tank coils were the considerations which influenced us to choose 811's as zero-bias modulators and 812's for the final amplifier. Since the tuning units were designed for use with a single-ended amplifier, the 812's were wired in parallel. A straightforward grid-neutralized circuit *fig. 1* was employed, and a four-turn link was wound around the cold end of the grid coil, which originally served as the oscillator tank coil in the BC375E. A tap for



ALL PARTS FROM BC 375 EXCEPT TUBES & GRID METER.
L1-L2 = TANK COILS FROM BC 375 (L1=701, L2=721).
C5 = NEUTRALIZING CONDENSER (NO. 612).
C1, C2, C3, C4, C8 = HEAVY DUTY BYPASS CONDENSERS.
C6 = (NO. 702).
C7 = (NO. 722).
T1 = DRIVER TRANSFORMER (NO. 1199).
T2 = MODULATION TRANSFORMER (NO. 1164).
R1 = GRID RESISTOR, 2500 Ω, 15 W (NO. 1109).
RFC = RF CHOKE

Fig 1. Final and modulator circuit. L1-L2 should read (L1 = 601, L2 = 621). C6 = No. 607, C7 = No. 627.

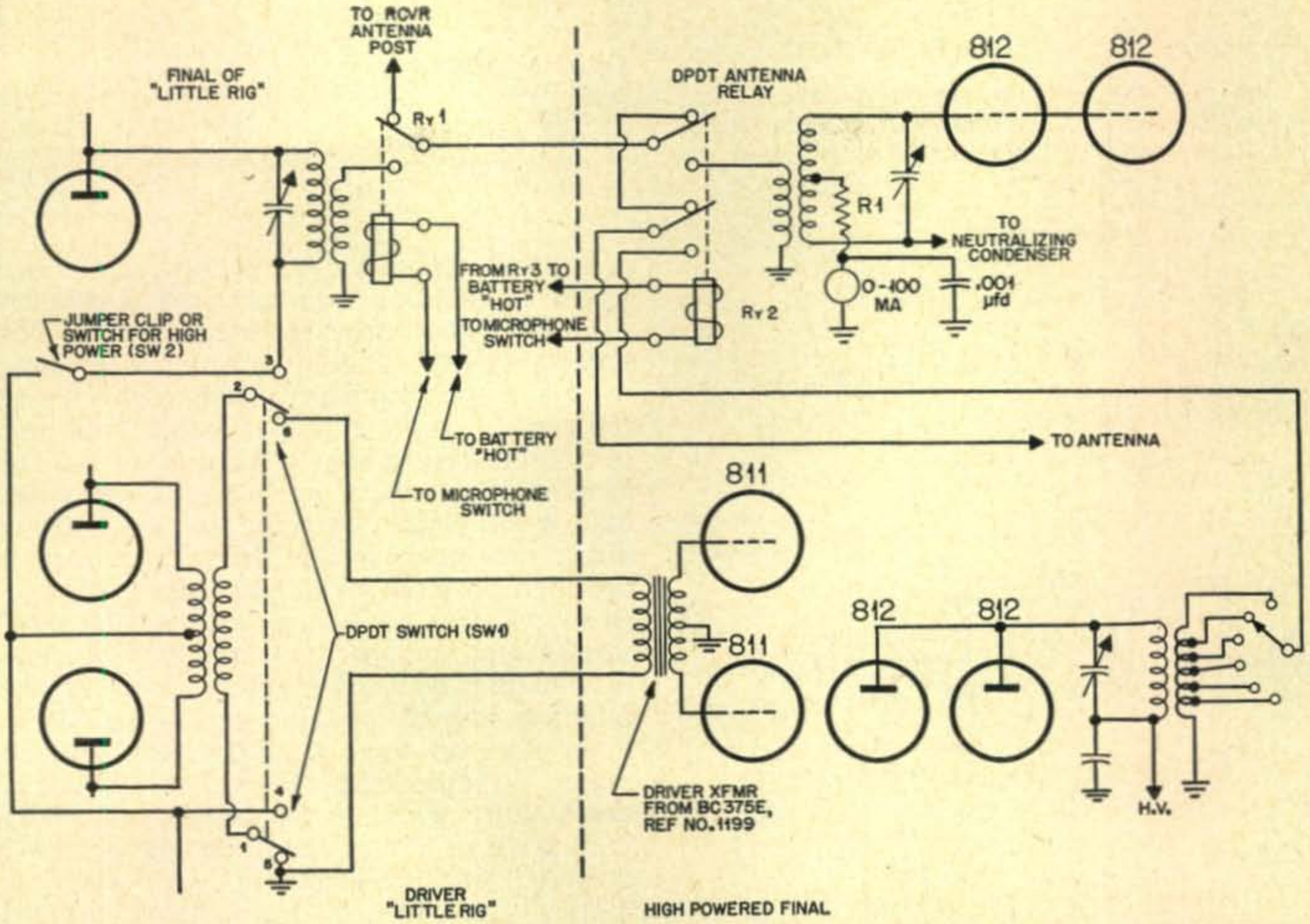


Fig 2. RF and audio connections between driver and high power.

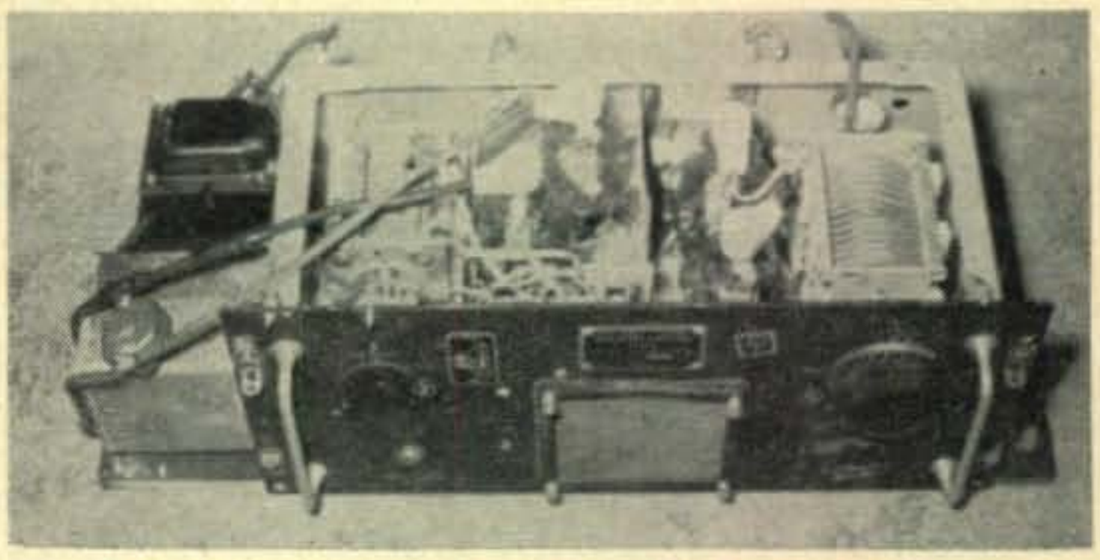


Fig 4. Front view showing final on right and modulator on left.

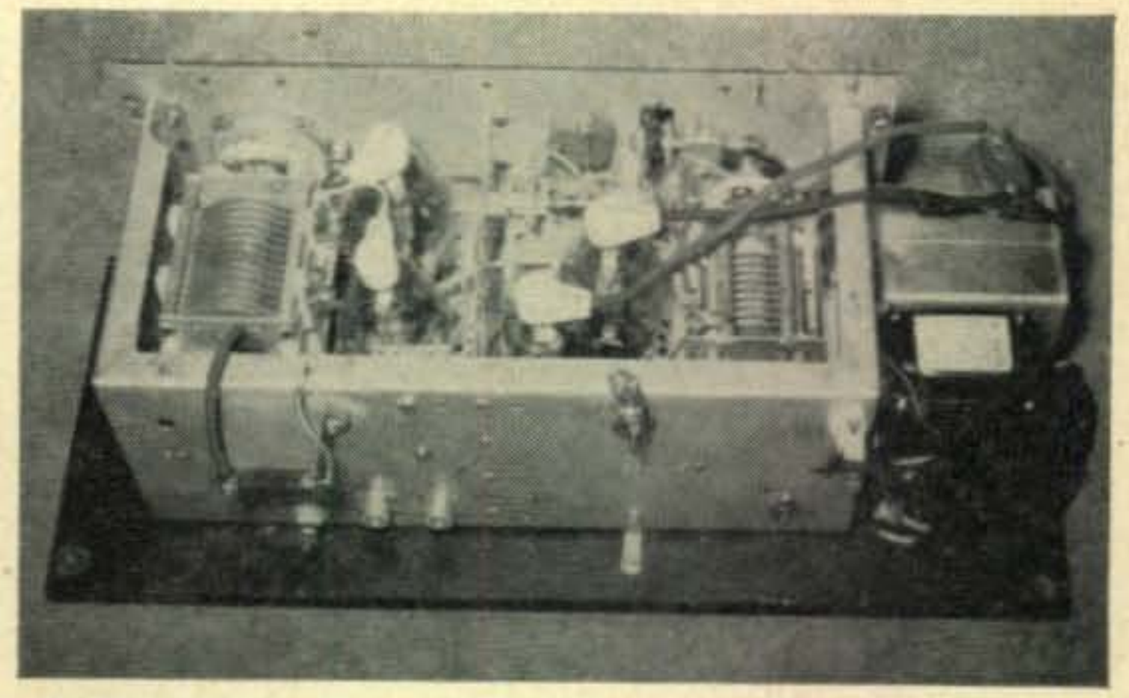


Fig 5. Back view. The filament transformers are to the left.

the grid bias lead is made on the grid coil half-way between the two lower taps already on the coil. Changing the grid bias lead to this tap will make it possible to neutralize the 812's with ease.

Since the tuning unit is not large enough to accommodate the driver and modulation transformers, they are mounted on the outside of the tuning unit. (*Ref numbers 1199 and 1164*).

Though the primary impedance of the driver transformer is in the order of 22,000 ohms, causing a considerable mismatch between it and the output of the modulation transformer in the little mobile rig, no difference in voice quality could be noted when another transformer of exactly matching impedance was tried. Therefore, we settled for the BC375E transformer as an item already at hand and in keeping with idea of using as many surplus parts as possible.

Connections

The coaxial fittings, filament connections, and the high voltage terminal are mounted on the back of the tuning unit. The hole on the front of the tuning unit left after removing the band change switch (*No. 602*) is fitted with a closed circuit jack from the grid resistor of the final to ground so that a grid meter may be plugged into the jack for tuning-up procedures. In like manner, a hole may be drilled on the right half of the tuning unit to accommodate a heavy duty jack which may be used with a milliammeter for tuning the final. After the initial tuning, the grid and final currents are read from meters mounted under the dashboard of the car.

The modified tuning unit may easily be

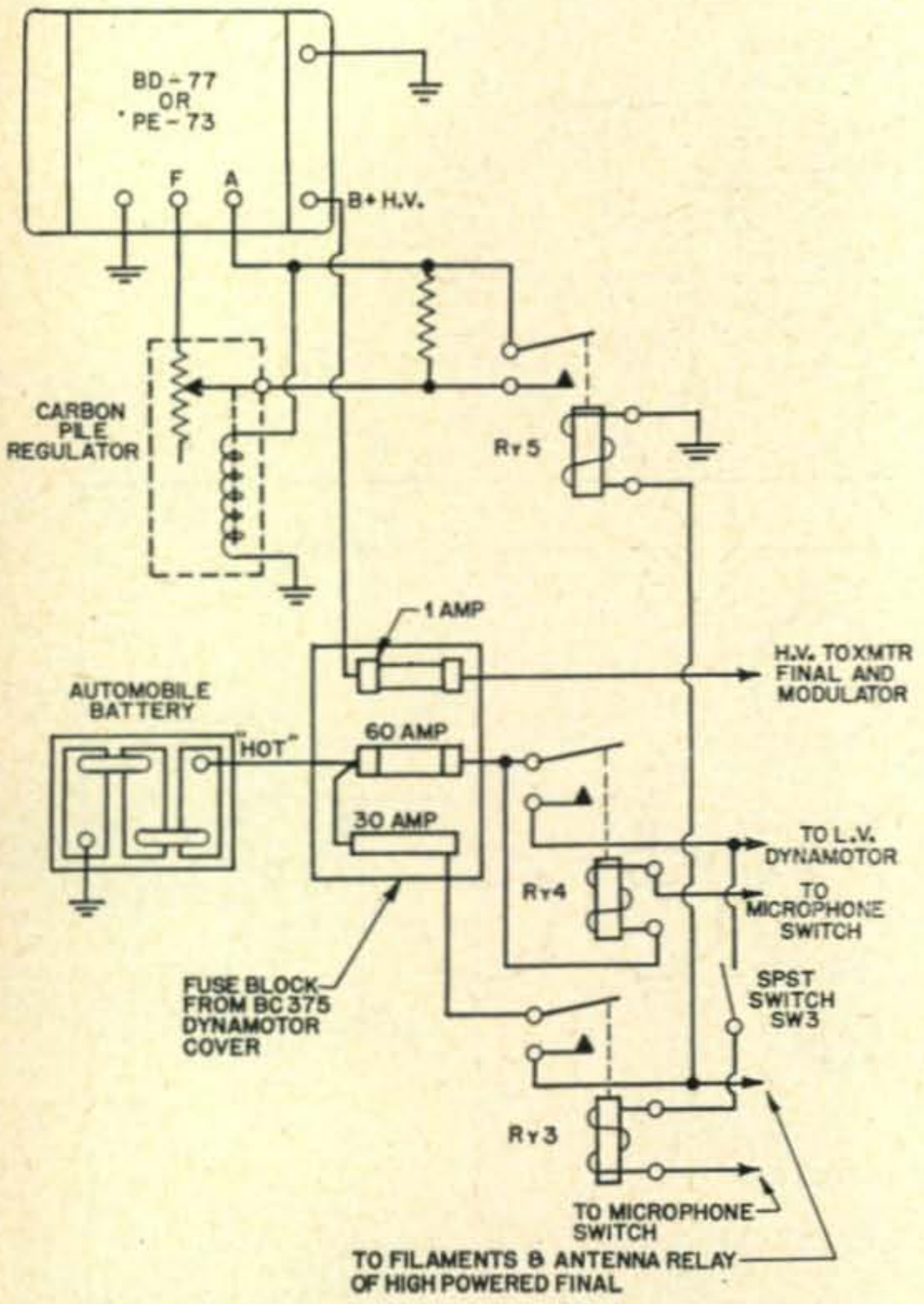


Fig 3. Control circuit diagram: RY-3, 4 and 5 are auto starter switches. RY-3 and 4 must have both sides of the relay coil ungrounded, otherwise the back surge of voltage from the low voltage dynamotor will hold RY-3 and 5 closed for a moment or so, leaving the final without excitation.

mounted by bolting it to a piece of plywood. The plywood is drilled at the four corners to match the corner holes in the shock mount (*FT-151-A*) provided for the BC375E. The shock mount itself is mounted at the rear of the automobile trunk and is ready to hold the high-powered rig. One-quarter-inch bolts and wing nuts make it easy to remove the rig from the shock mount quickly should adjustment or repair be needed. The unit may be covered by its original cover with four ½" bolts and one-inch specrs. The spacers are necessary because the tubes are too tall to permit the cover to mount flat upon the tuning unit. Since it would be advantageous to be able to switch quickly from the little rig to the big one, especially for the purposes of getting comparative signal reports or for emergency operation should something go wrong with the high powered rig, provision was made so that either the little rig or the two rigs together could easily be put into operation. A reference to *fig. 2* will show how this switching process is accomplished.

A heavy-duty DPDT ceramic switch is connected to the output of the modulation transformer in the little rig as shown in the

Parts List

From the BC375E

L1-#601
L2-#621
C1, C2, C3, C4 and C8-#1108 and #1117
C5-#612
C6-#627
T1-#1199
T2-#1164
R1-#1109 2500 Ohms, 15 watts.

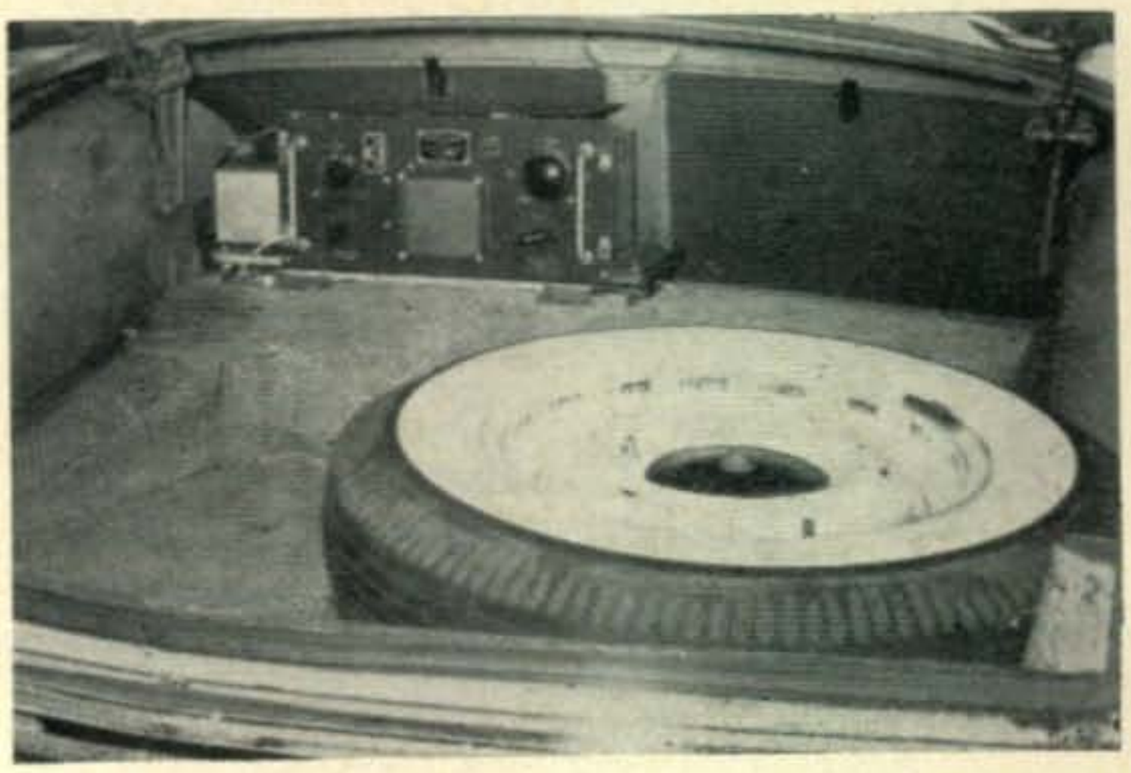
diagram. Because the leads between the output of the modulation transformer and primary of the driver should be shielded so as to reduce the possibility of feedback, coaxial line was used and the braid grounded to the frame of the car. A jumper clip or switch should be connected between contacts 3 and 4 on the DPDT switch (as shown) in order to provide the final with voltage when the switch is thrown to direct the audio to the driver transformer of the high powered modulator tubes. This jumper switch may be incorporated on the modulation output switch if an extra set of contacts is available. By further reference to *fig. 3*, one may see that by opening or closing SW3, the high powered final may be taken out of or placed in operation. Thus, by throwing the combination switches SW1-SW2 and SW3, operation from either the little rig or the high powered final is available, with audio automatically provided by the switches.

Power Supply

Naturally, in order to run more than three hundred watts to the modulated final, a source of considerable voltage and current must be provided. Again the BC375E is ready to furnish the necessary power. The PE-73C (28 volts) or the BD77 (14 volts) supplied with the BC375E (See *fig. 3*) may be connected to provide power by a belt from the automobile engine. Since this conversion is covered in full detail elsewhere (William I. Orr, "A High Power Mobile Supply," *Radio Amateur's Mobile Handbook*. New York: Cowan Publishing Company, 1953, p. 22 ff.), no description of it will be given here.

The low voltage connections to the high powered rig should be of very heavy gauge wire, number 4 or heavier being adequate. The ground return of the filaments should be run

Fig 6. Installation in trunk of car.



back directly to the battery terminal so as to reduce voltage drop to a minimum. All circuits should be adequately fused by utilizing the fuse block from the cover of the PE-73C or BD77 dynamotor.

After all components are mounted and the wiring is completed, the high-powered unit is ready to be tested. If the facilities are available, all checking should be done on the bench in order to conserve battery power and gasoline. On the other hand, all of the testing may be done in the automobile, provided there is plenty of gasoline in the tank and current in the battery. With the high voltage lead disconnected and adequate drive provided to the final, the 812's should be neutralized by adjusting the neutralizing condenser C-5 until the grid current shows no dip when the final tank condenser is tuned through resonance. The high voltage lead should now be connected to the final and the carbon pile regulator set so that the belt-driven dynamotor develops only about 600 volts. After the rig has been tested at this voltage to determine that there are no "bugs," the regulator may be reset to provide about 1250 volts at 50 miles per hour, and the final tubes loaded to about 280-300 milliamperes. As the rig is tested under full power, the audio gain required can be determined and controlled by the gain control on the little rig.

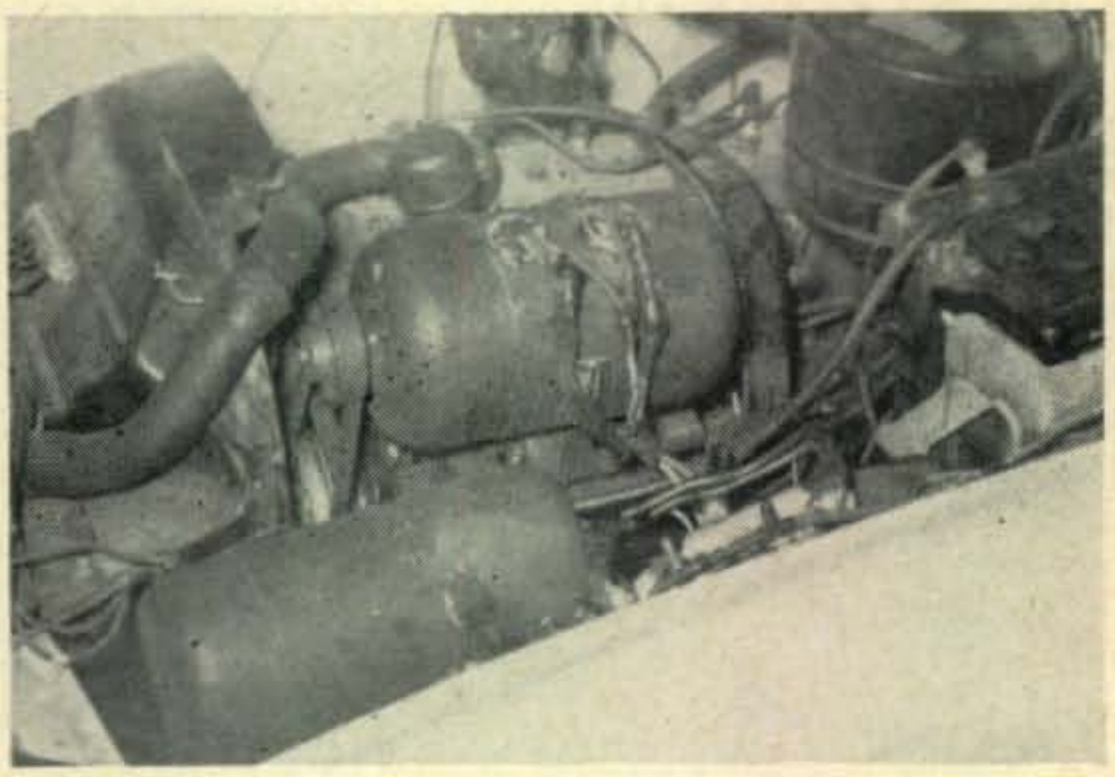


Fig 7. PE-73-C dynamotor installed on 1953 Studebaker Champion.

The high-powered final in no way compromises the all-band operation of the little rig as it may be cut off at will leaving the little rig to operate normally on the other bands for which it was designed. And even though the unit described here is restricted to 75 meter operation, other tuning units of the BC 375E could be connected to cover other bands. ■

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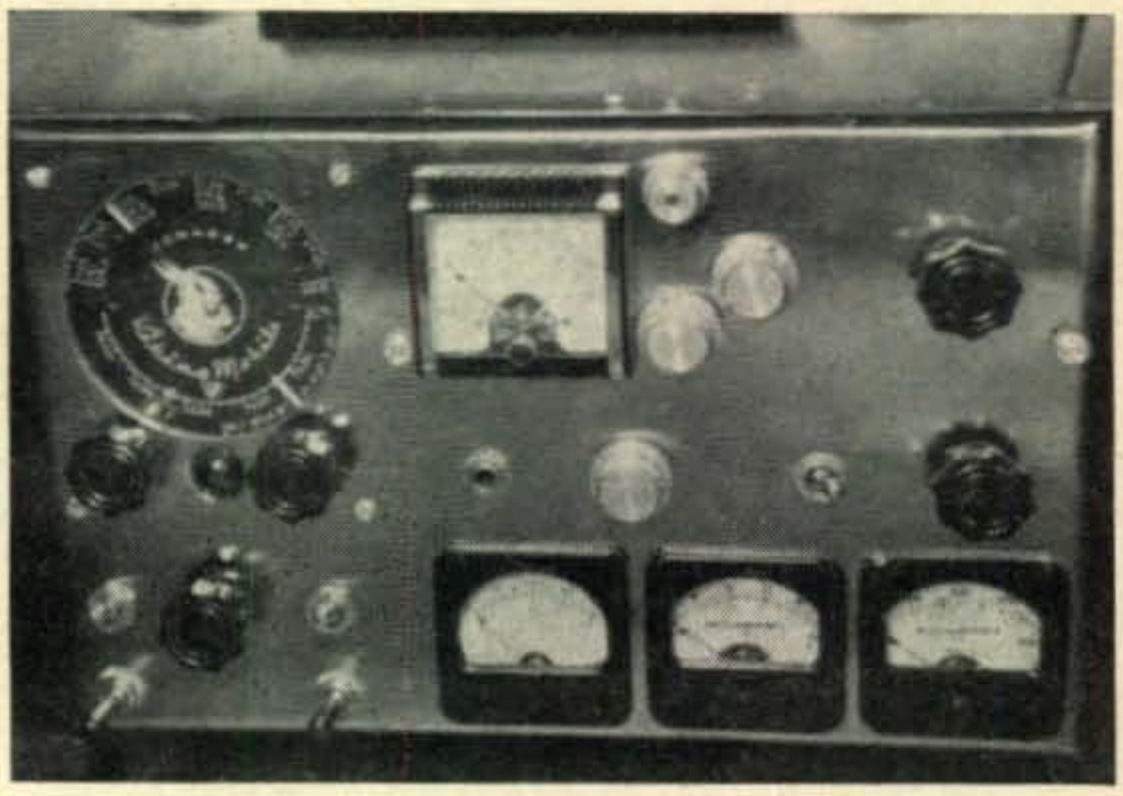
The search for a means of producing a really outstanding mobile signal resulted in this layout for an 800 watt rig. Installed in a 1953 Mercury, it does not inconvenience passengers and leaves ample space for luggage.

A VFO exciter unit is mounted under the dash. The modulator and final are mounted in the trunk along with the high voltage power supplies. Remote controls are used for tuning the final and the antenna center loading coil. These controls and all meters are incorporated into the exciter unit for operating convenience. (*fig 8*)

Primary Power

Since surplus 28 volt equipment is available and reasonably priced, a 28 volt 200 amp. type P-I aircraft generator was selected for primary power. This unit is mounted on the block of the engine and driven from the crankshaft. The minimum RPM of the generator is 2500 and it must be *"geared up"* to give full output at a fast engine idle. This is accomplished by means of a jackshaft and a proper choice of pulley sizes. A 5″ type "B" automotive air conditioner pulley replaced the standard sheave on the engine crankshaft. Power is transmitted from this sheave to a 3″ pulley on the jackshaft by means of an extra heavy duty "B" belt. On the other end of the jackshaft of a 6″ type "B" double groove pulley is used. Two type "B" belts carry power from this pulley to a 2½″ double groove pulley on the generator. A little multiplication will show that the generator will make like a turbine at 50 or 60 MPH but it has shown no adverse effects after many hours of operation. The generator and jackshaft are assembled as a unit. This assembly is swiveled so the generator and main drive belt can be engaged or disengaged from the crankshaft

Fig 8. Close-up of the dash-mounted exciter unit which includes remote controls and metering for the final.



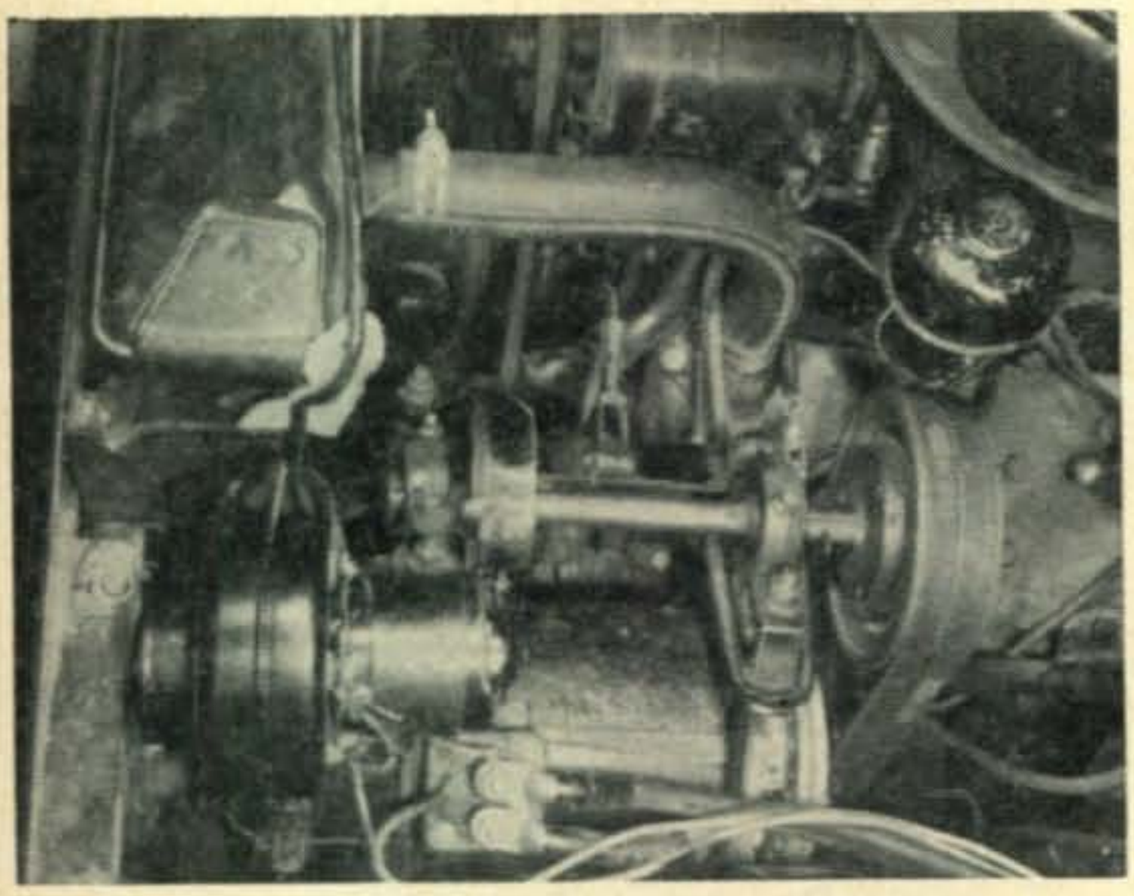


Fig 9. The 200 ampere generator and jackshaft.

pulley when desired. Generator engagement is controlled from the driver's postion by means of a salvaged emergency brake cable and handle. Belt guides keep the main belt in alignment and away from the crankshaft pulley when the generator is disengaged. (*fig 9*)

A surplus carbon pile regulator controls output of the generator. (A good description of these regulators can be found on page 40 of May 56 CQ.) With proper adjustment, the regulator holds the voltage output constant over a wide range of speeds. With the regulation attained, it was found that storage batteries were not needed for satisfactory operation of the rig. Power is carried from the generator to the trunk space by means of two 200 amp. welding cables. These cables are relatively small for their current carrying capacity, and good flexibility with rugged insulation makes them well suited for mobile use.

High Voltage

High voltage is obtained from four surplus PE-73 dynamotors. Each of these units has a rated output of 1000 volts at 350 ma. In practice, the current rating proved to be conservative and better output can be expected. The units are paired off and hooked in series to supply 2000 volts to the modulator and final.

Difficulty was experienced in getting all the PE-73's to start at the same time. When keying all four units simultaneously, the starting load was great enough to cause objectionable lowering of the primary voltage. This voltage drop caused erratic and slow starting of the dynamotors. After some experimenting, a sequence control system was employed utilizing the starting relays in the PE-73's. When the first starting relay is energized, it in turn keys the second starting relay and so thru to the last. Use of this system resulted in fast, smooth dynamotor starting while minimizing voltage drop in the primary system.

Low Voltage

A regulated 300 volt supply is used for the exciter unit and approx. 375 volts is provided for the final screen supply. This voltage is obtained from two smaller, surplus, 28 volt dynamotors. This gives the rig a grand total of six dynamotors.

The Final

The final amplifier uses a pair 813's operating in push-pull. The circuit is conventional except the filament hook up. Contrary to standard or good practice, the filaments of the 813's are hooked in series. Since the primary source is 28 volts and the filaments in series require 20 volts, a means of dropping the additional 8 volts was needed. The idea of using a carbon pile regulator in the place of a dropping resistor seemed interesting, so it was tried. The regulator served well and affords a reasonable degree of regulation to the filaments. Despite long hours of service, the 813's have stood the test well. Small reversible motors are geared to the shaft of the grid and final tank tuning condensers to serve with the remote controls. A third motor is connected to the final tank link coil for variable loading of the final by remote control. The final covers 80 thru 10 meters and band changing is by means of "plug in" coils.

Fig 10. Looking into the trunk.

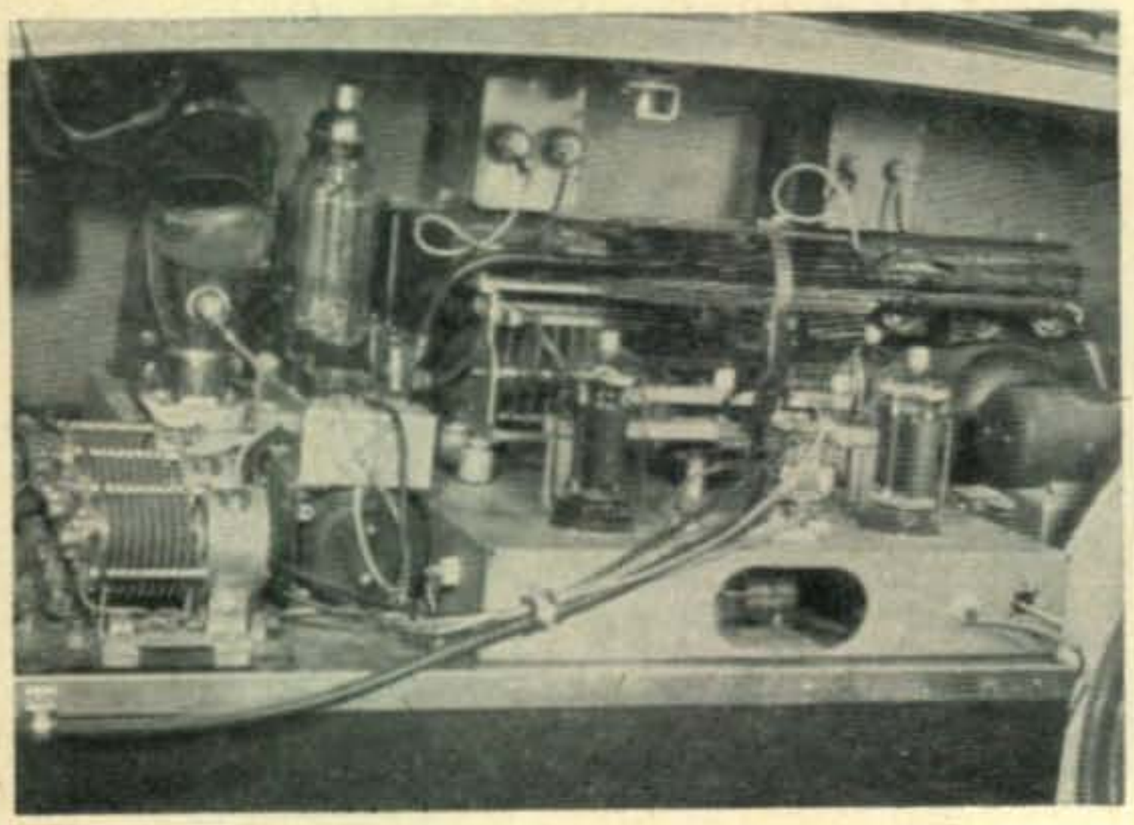
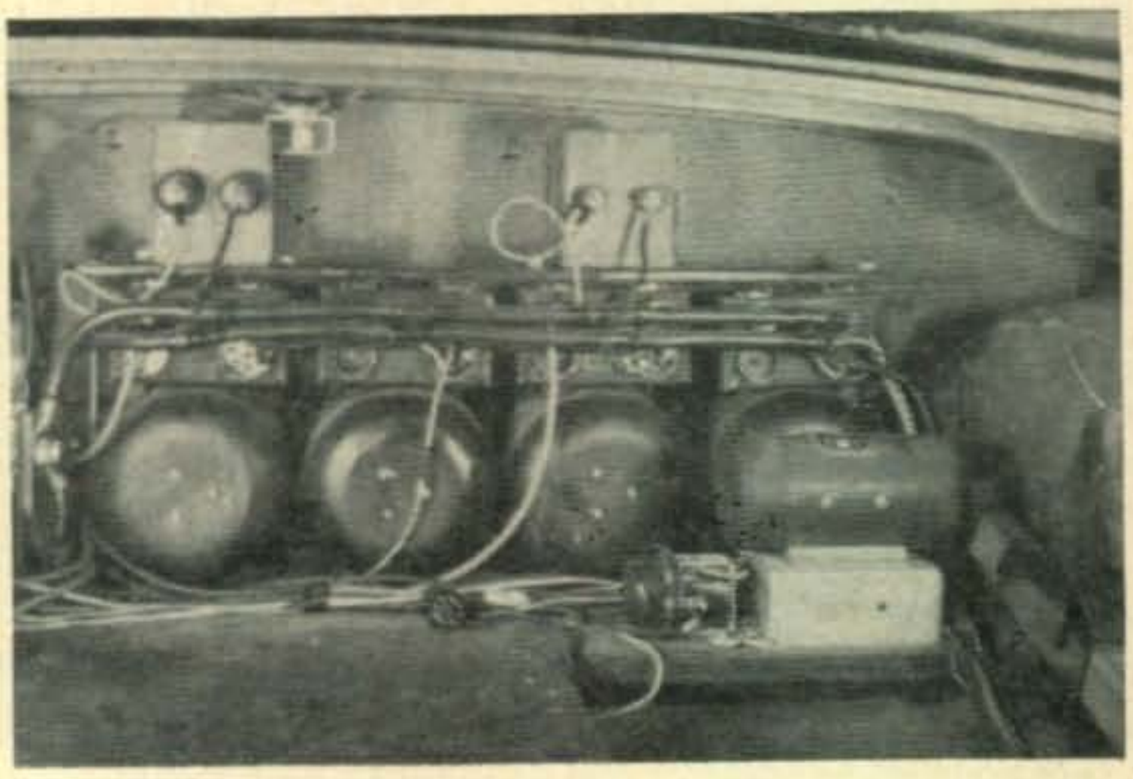


Fig 11. The PE-73s.



The Modulator

The modulator operates Class "B" and uses a pair of HF-300's. The main reason for using the HF-300's was the fact that they were on hand. Drive and low level clipping is obtained from a speech amp. built into the exciter unit. The modulator fairly loafs along with 100% modulation on the final. The filament supply is acquired in the same manner as for the final. This gives the rig a total of three regulators. These are mounted in a straight line and it was found that forced air circulation through the units would greatly stabilize their performance. A small squirrel cage fan is used for this purpose.

Fig 10 shows all the units in the trunk in operating position. Note the voltage regulators and the source of cooling air for them. The two small dynamotors can also be seen here. Is *fig 11* the final has been removed to show the location of the four PE-73 dynamotors.

Despite the rather unorthodox methods of utilizing equipment, there have been no major component failures and the rig requires only a reasonable amount of maintenance. ■

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Transmitter exciter designs by W6EI and W6DMN

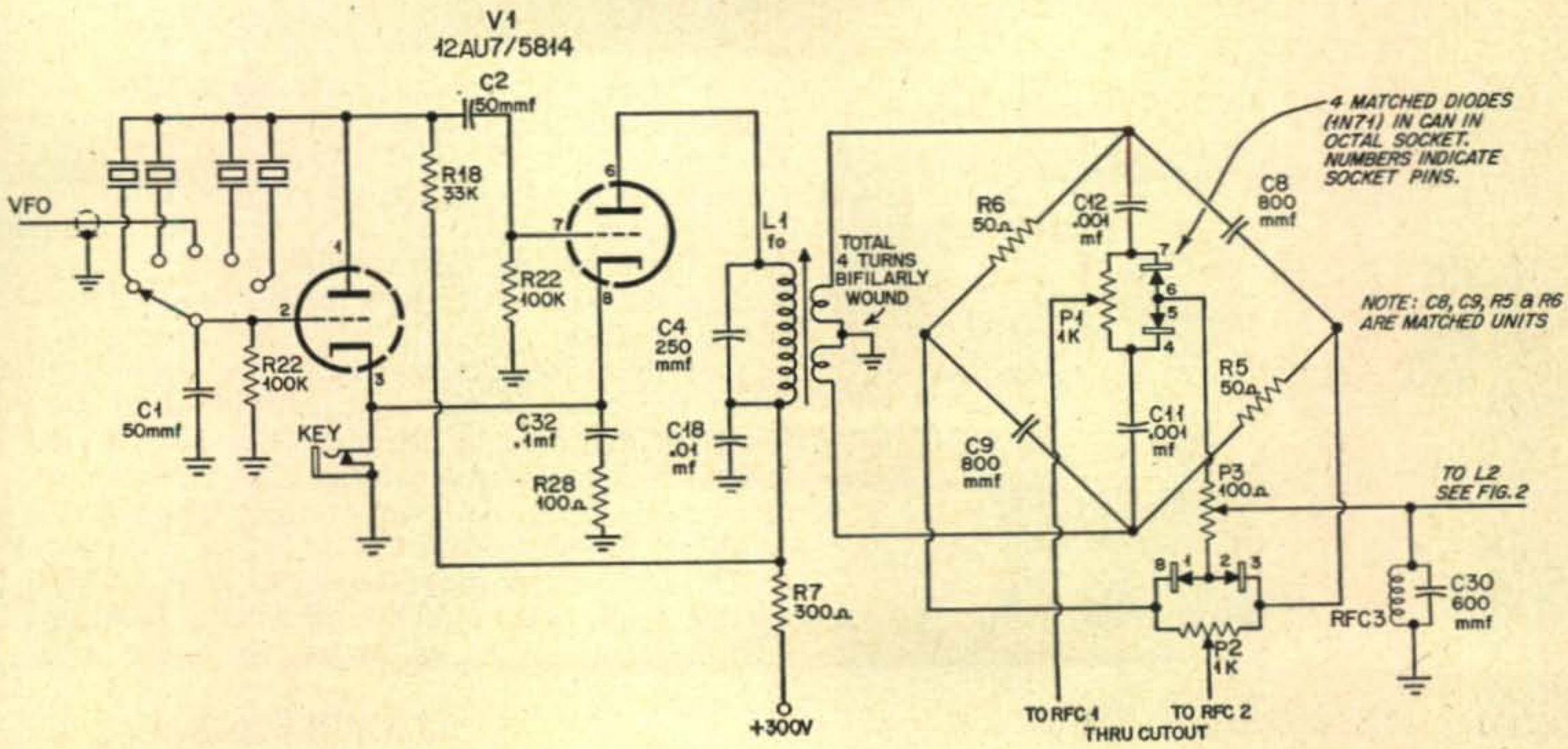
The mobile man need not be denied the communications advantages of SSB. This rig provides a peak input of 250 watts to a pair of grounded grid 807's and does a fine job of overcoming the inherent losses of the mobile antenna. Others use the same exciter (output of the 6CL6) to drive water cooled 4X150A's running a full KW peak input. However a thousand volts is much more easily obtained in the mobile installation than three thousand so we settled for the lower power.

Basically, the exciter is the "SSB, Jr." (Nov-Dec 1950 "G.E. Ham News") but it has been simplified and improved by W6DMN "Buddy" Alvernaz, Jennings Radio Mfg. Co., San Jose, California. The revisions consisted of eliminating two transformers and redesigning the r-f phase shift network. The latter now permits QSY across the entire band without realignment. The exciter drives a pair of grounded grid 6AG7's which are followed by the 807's. This business of grounded grid following grounded grid may be a bit unusual but the fellows who have tried it find that the system is quite satisfactory. Grounded grid operation requires a minimum of components; this, coupled with the excellent linearity of available tubes like the 6AG7 and the 807 or the 837, 1625, etc. makes it a worth-while proposition. Circuit values are given for 75 meter operation as this is the most popular band for SSB mobile. The exciter is shown in *fig 1* below and the grounded grid stages in *fig 2* and *4* on the following pages.

Tube Modification

807's or 1625's must be modified for grounded grid operations since they have the beam forming plate connected to the cathode internally. If this connection is made in the base of the tube it is a simple operation to disconnect the beam forming plate lead and tie it to the grid but if the connection is made within the envelope itself it is obviously impossble to effect the modification. In some tubes there is a connection within the envelope even though two leads come down to the cathode

Fig 1. RF OSC Phase shift and bal modulator



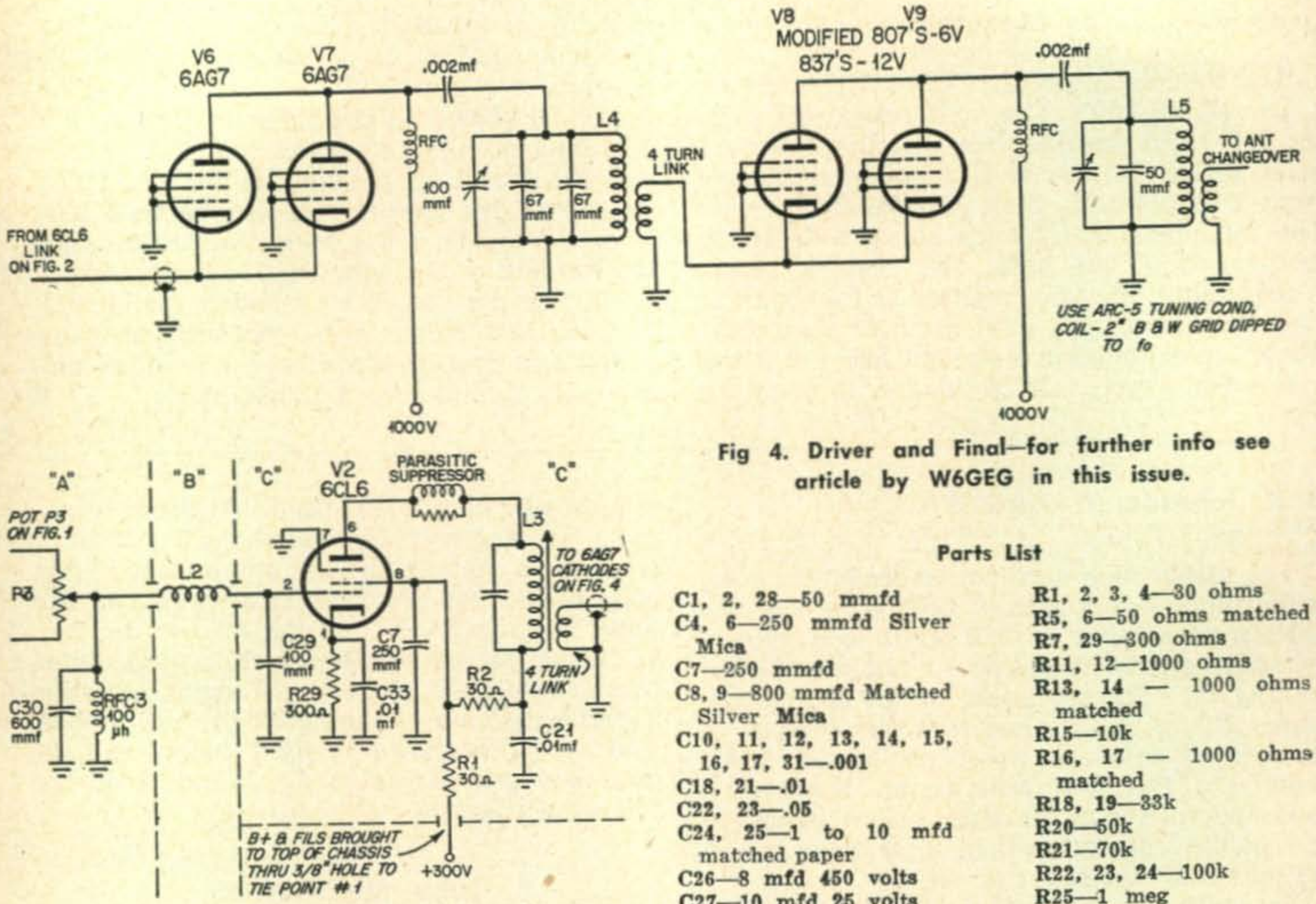


Fig 2. Exciter output stage. This can be used to drive a pair of 4X150's to a kw or to drive the ckt in fig 4.

Fig 4. Driver and Final—for further info see article by W6GEG in this issue.

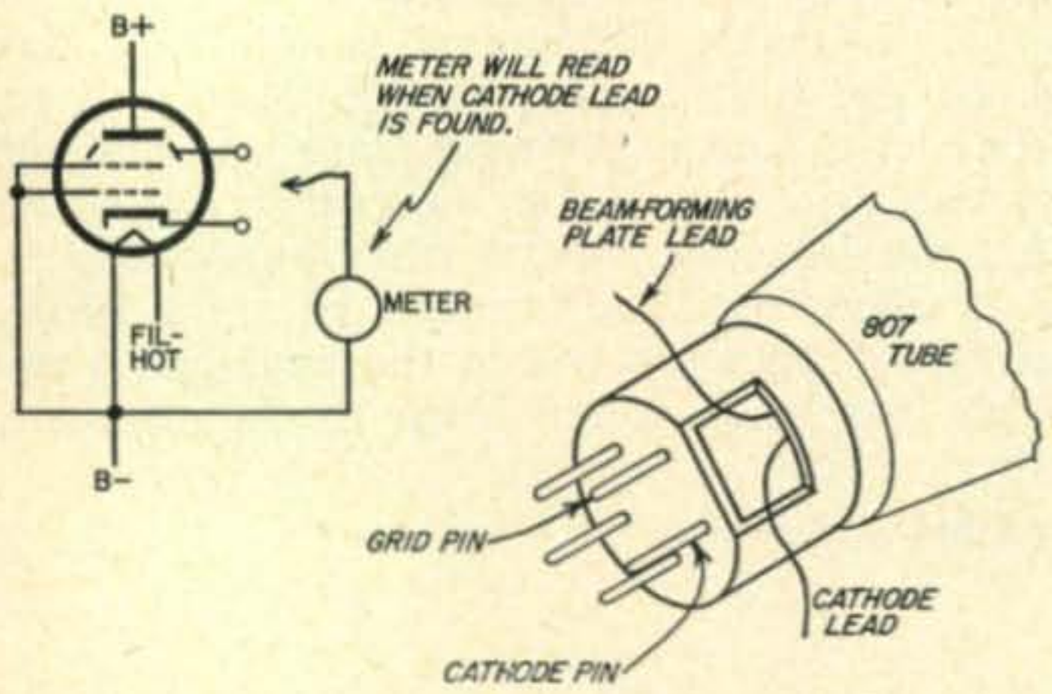
Parts List

C1, 2, 28—50 mmfd
C4, 6—250 mmfd Silver Mica
C7—250 mmfd
C8, 9—800 mmfd Matched Silver Mica
C10, 11, 12, 13, 14, 15, 16, 17, 31—.001
C18, 21—.01
C22, 23—.05
C24, 25—1 to 10 mfd matched paper
C26—8 mfd 450 volts
C27—10 mfd 25 volts
C29—100 mmfd
C29—600 mmfd
C32—.1 mfd

R1, 2, 3, 4—30 ohms
R5, 6—50 ohms matched
R7, 29—300 ohms
R11, 12—1000 ohms
R13, 14 — 1000 ohms matched
R15—10k
R16, 17 — 1000 ohms matched
R18, 19—33k
R20—50k
R21—70k
R22, 23, 24—100k
R25—1 meg
R26—20k
R28—100 ohms
R30—2 megs

P1—1000 ohms
P2—1000 ohms
P3—100 ohms
P4—2500 ohms
P5—25,000 ohms
P6—500,000 ohms
L1—slug-tuned for F_o with 4 turn c.t. bifilary wound link
L2—slug-tuned for F_o
L3—slug-tuned for F_o with 4 turn link
L4, L5—air-wound for F_o

RFC 1, 2, 3—100 mh
T1—Stancor A-53-C
Audio phaseshift network
Filament switch—SPST
Varistor—1N71
SW 1, 3—DPDT
SW 2—DPST
Meter switch—SPDT
Tune/Operate switch — SPDT



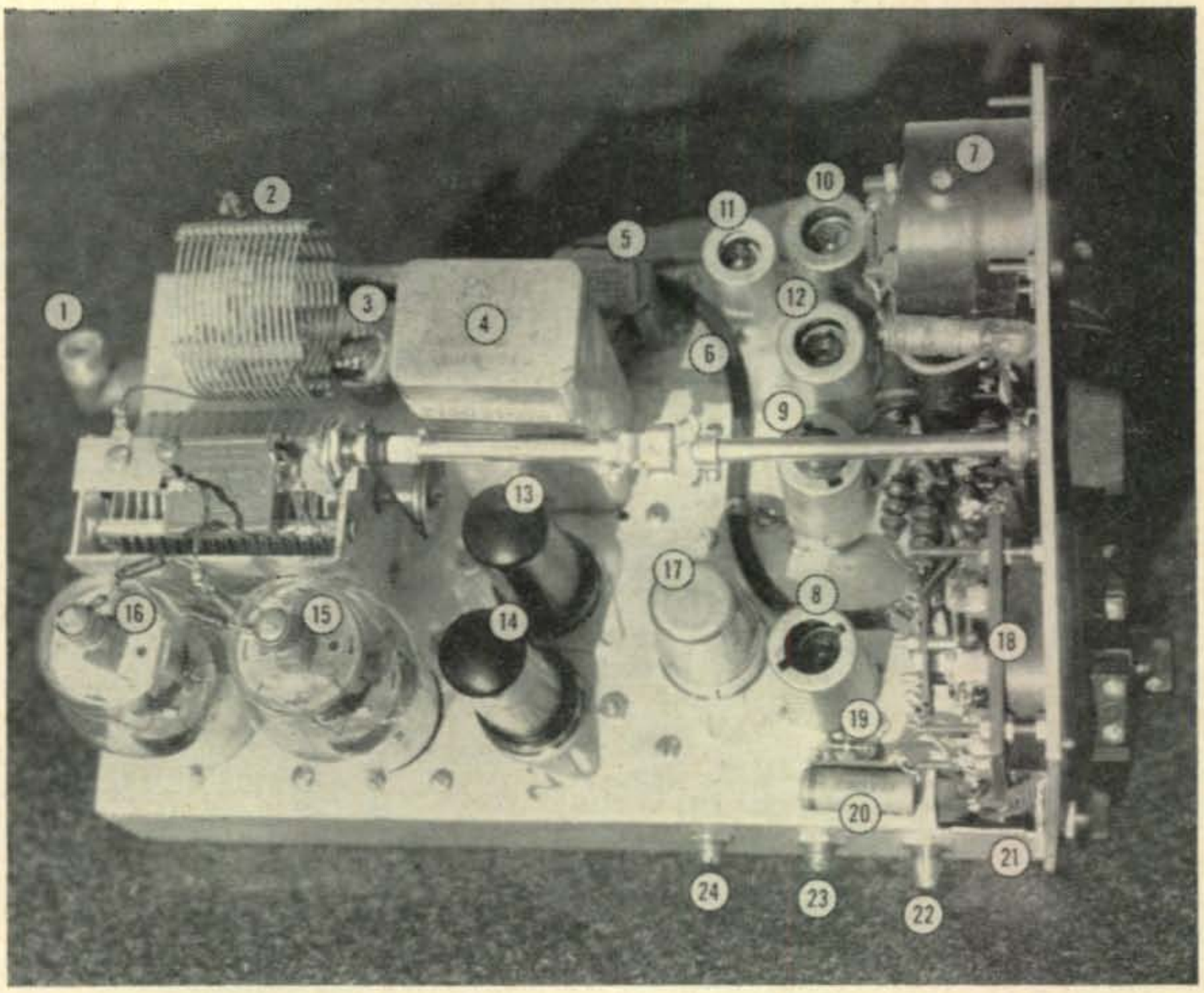
Conversion of 807's and 1625 for grounded grid.

pin so after disconnecting both leads check for lack of continuity between them to be sure that the tube may be modified. Apparently all RCA tubes have this inside the envelope connection, but National Union, Sylvania and G.E. tubes have been successfully modified here.

The diagram will show how this operation may be carried out. After a slot has been sawed out of the base, the two leads are unsoldered from the cathode pin. The cathode lead may then be identified by the use of the illustrated circuit and reconnected to its pin. The remaining lead is from the beam forming plate and is soldered to the grid pin.

The transmitter measures 7" wide by 6" high by 11" long. (Component and control locations can be seen in the photographs. These mea-

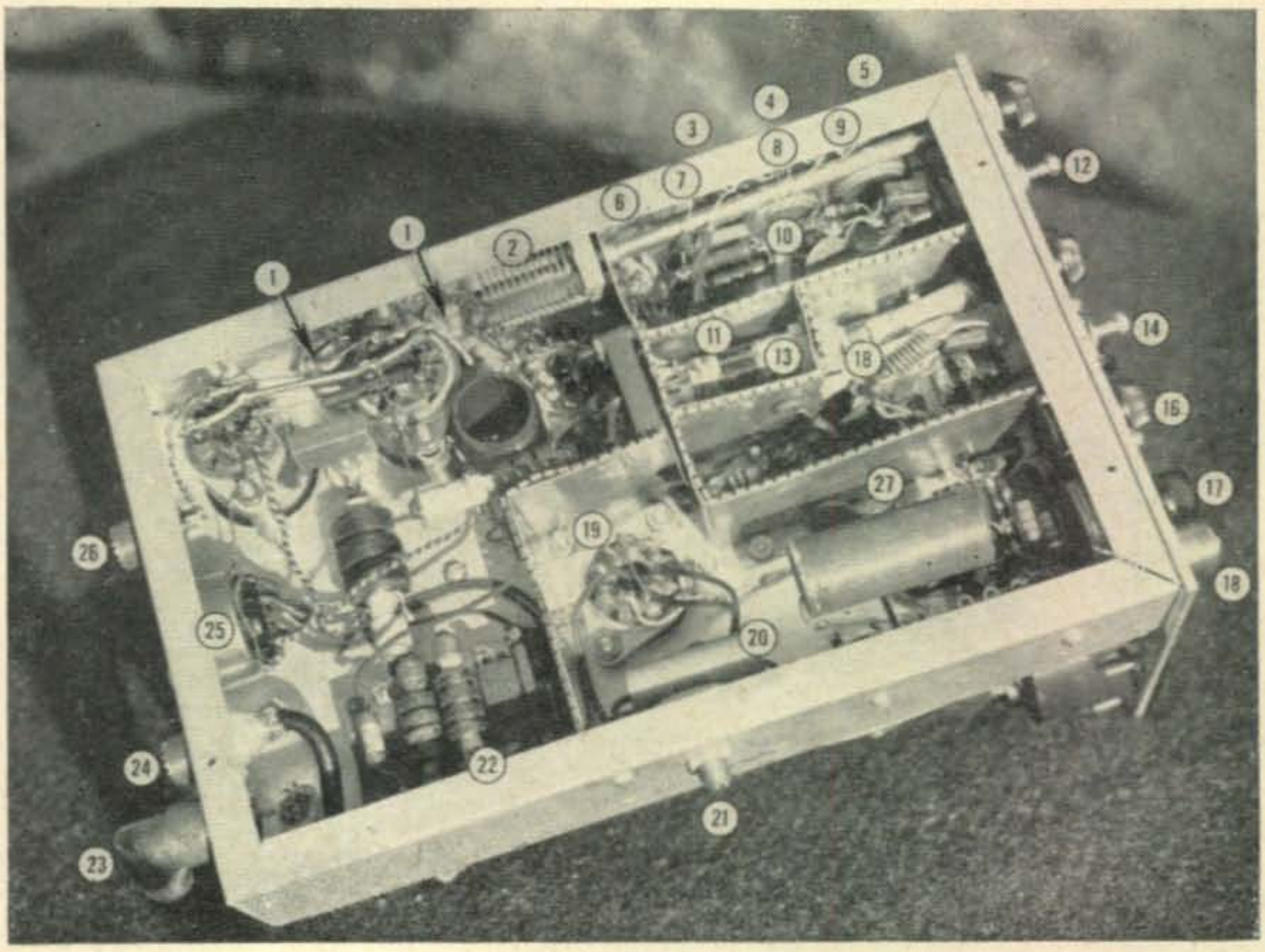
Left: front of transmitter.



1. Ant connector
2. B & W 3709
3. Ceramic 50 mmfd used for padding and coil standoff.
4. Audio phase-shift
5. A-53-C
6. VFO input cable
7. Meter
8. V1
9. V2
10. V3
11. V4
12. V5
13. V6
14. V7
15. V8
16. V9
17. N71 (4-IN34's in can)
18. X-tal & VFO switch EF Johnson
19. R28
20. C32
21. Chassis Cutout
22. P1
23. P2

surements permitted it to slide right into the Johnson Viking transmitter case which was already installed in the car. The front panel of the Johnson Viking rig is 7″ high but we restricted the panel height on this unit to 6″ so that it would also fit into the dash of a 1952 or '53 Ford in the position normally occupied by the speaker grille. The 6″ height decreed that the 807's and the Central Electronics audio phase shift network be sub-mounted. Lakeshore Industries of Manitowoc, Wisc. manufactures a much shorter network physically and if used could have been mounted at chassis level. (their PS-Jr.)

Two PE-103's with their outputs in series provide the high voltage for the 6AG7's and the 807's. Plate supply for the exciter is tapped from one of the PE-103's and stabilized at 300



1. Padders for 6AG7 tank
2. APC
3. P3
4. P2
5. P1
6. C11
7. C12
8. C16
9. C17 (under chassis lip)
10. "A"
11. "B"
12. L1
13. L2
14. L3
15. L4
16. P5
17. P6
18. Mike recpt.
19. Audio Phase shift network.
20. C27
21. P4
22. Wattmeter components
23. Antenna Terminal
24. VFO input
25. Power Plug
26. This fitting used on prototype for test purposes.
27. Audio Section

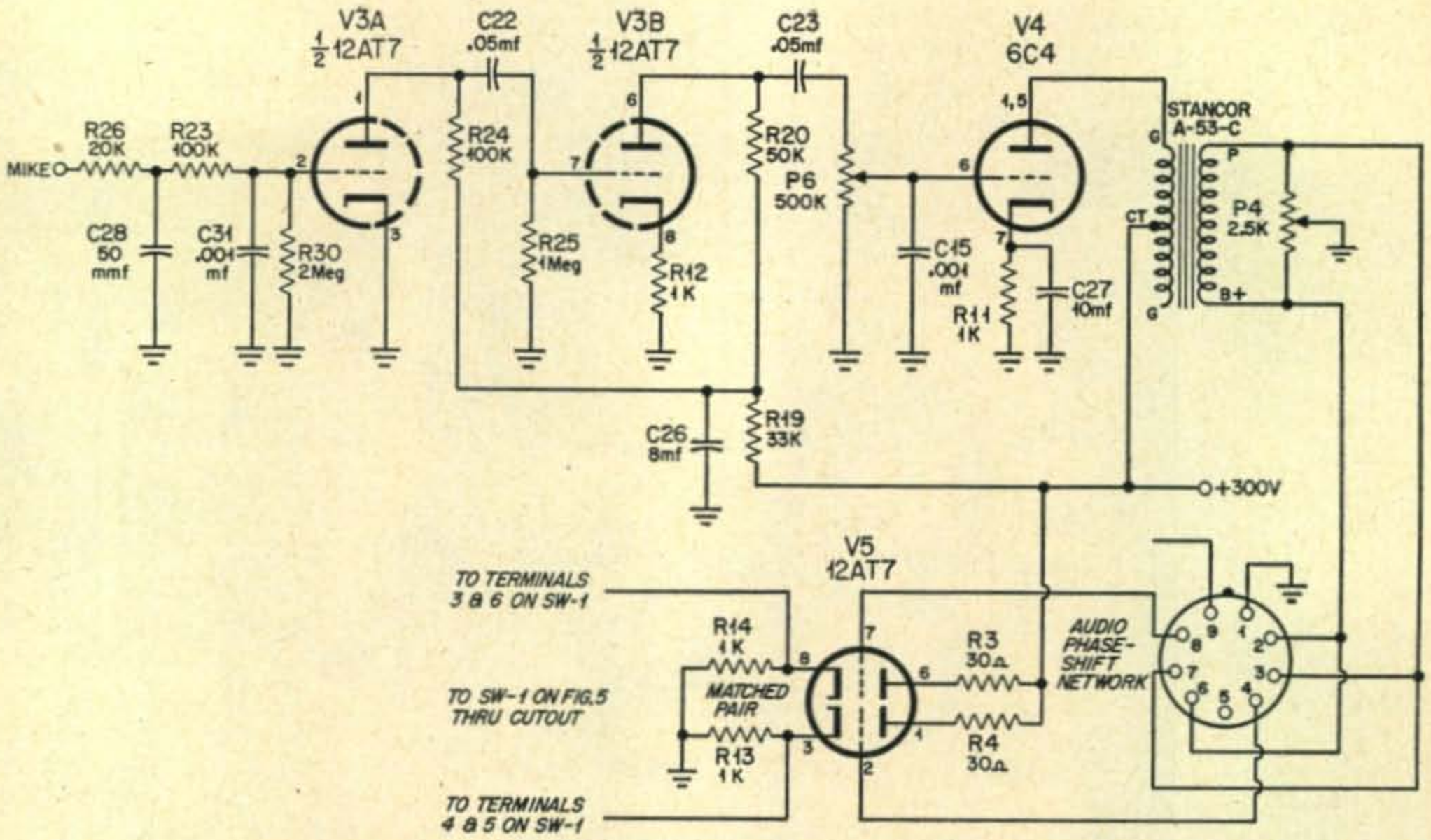
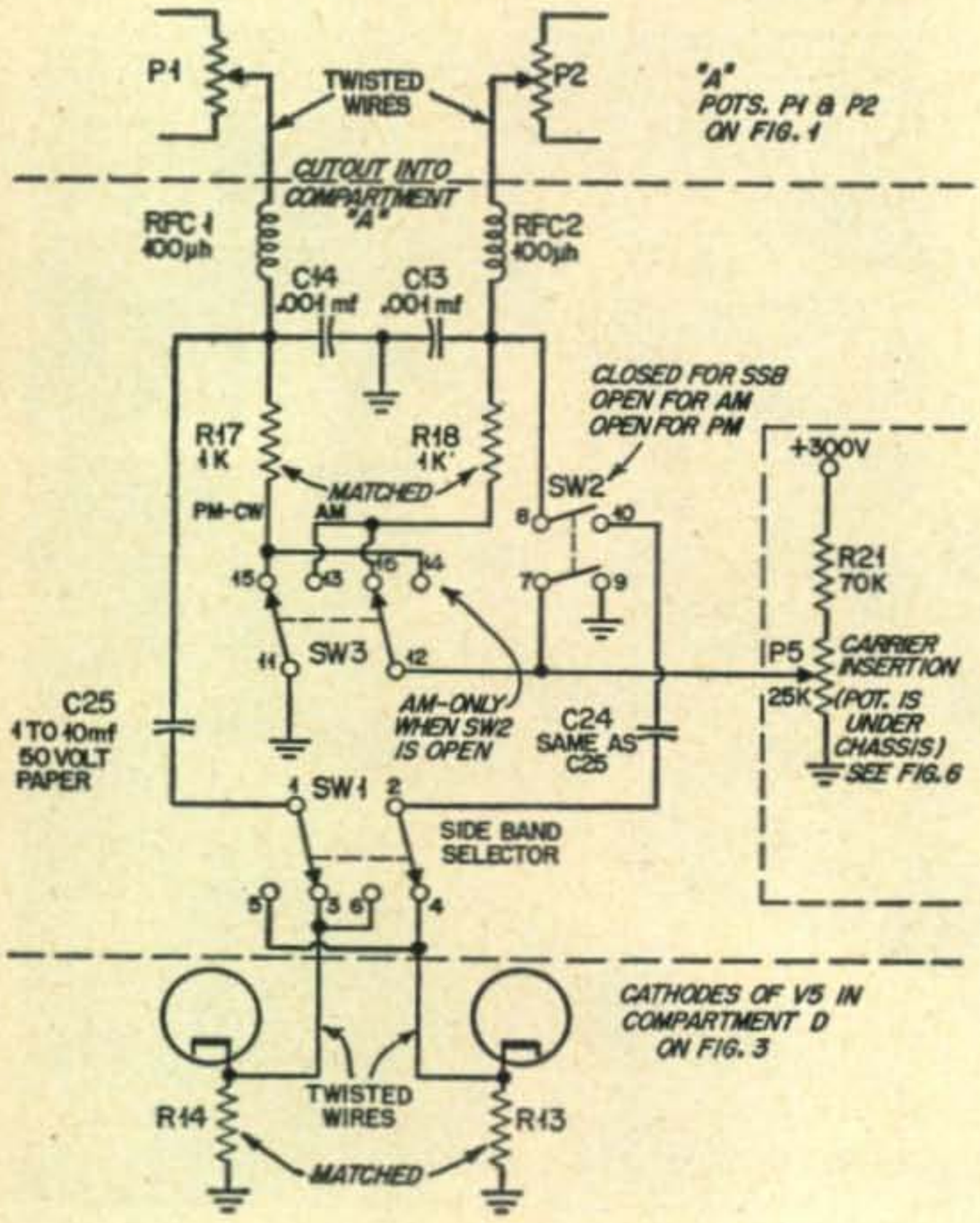


Fig 3. Audio and audio shift circuits located in shielded compartment (bottom photo #'s 19, 20, 27).

volts by a pair of VR150's. (*fig 6*) Plenty of filter is required since the load varies at an audio rate; 50 mfd on both the low and high voltage supplies is the minimum. Surplus condensers with ac ratings can be used in dc circuits at up to three times the rated value. Units rated at 600 volts have been used here in the 1000 volt supply with no mishaps yet.

The control circuit in *fig 7* offers the choice of allowing the dynamotors to run continuously or to be turned on for each transmission by means of the foot switch. This is a necessary refinement since the starting load of the dynamotors would rapidly discharge the best battery if they were constantly keyed during break-in operation. With constant operation, they spin quite freely during stand-by periods and draw very little current. Initial calls are usually made with the switch in the normal position, but with contact established, when one is attempting to match the rapidity of the voice-controlled fixed SSB stations, we transfer to the run position.

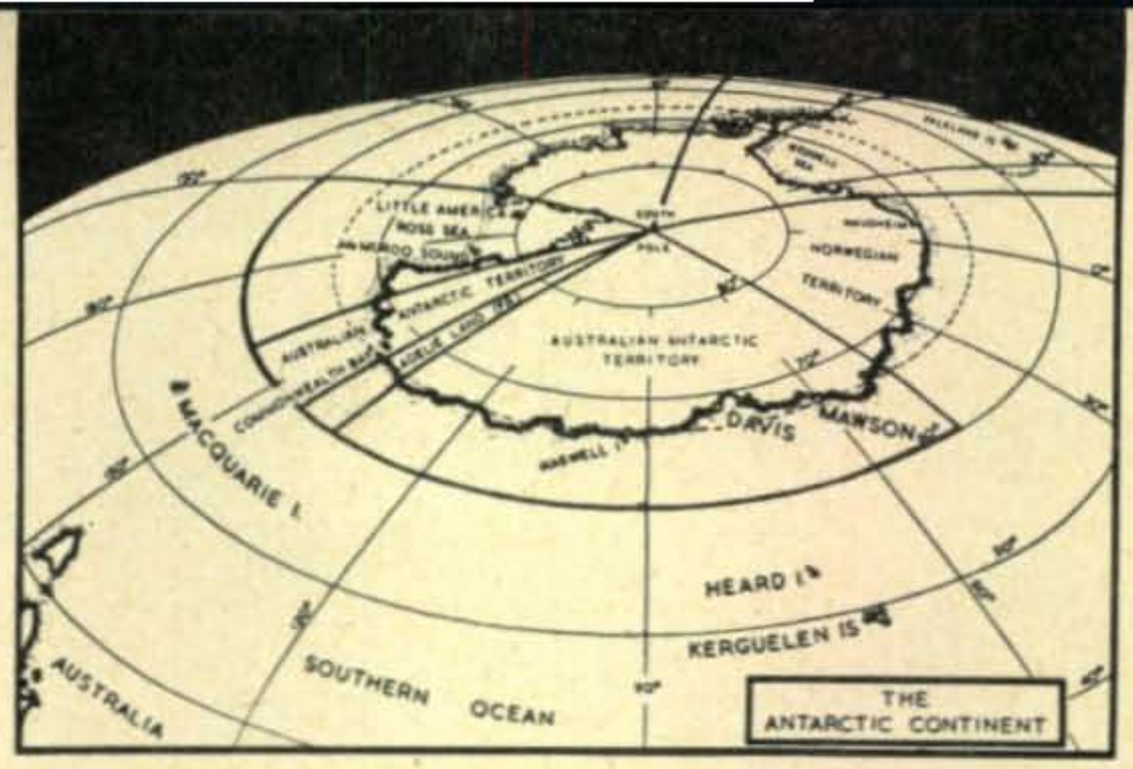
Fig 5. Function switches on back of front panel.



Alignment

Alignment of phasing-type SSB transmitters is covered in detail elsewhere (See *Single Sideband Techniques* by Jack N. Brown, W3SHY published by Cowan Publishing Corp.) so we won't delve into it here. Tuning is done with the Tune/Operate switch in Tune position, the function switch AM/SSB in AM position and the meter switch in the Drive position. The system shown in *fig 5* facilitates tuning of the exciter since drive to the grounded grids cannot be measured in the usual manner. A sampling of RF is taken from the cathodes of the 6AG7's and after rectification is read on the meter when the meter switch is in the Drive position. Tuning is simply a matter of adjusting L1, L2, and L3 for maximum deflection of the meter. The PA position of the meter is used primarily to obtain a rough indication of power input and also to be sure that the plate dissipation of the tubes is not exceeded. Tuning

[*continued on page 102*]



This map clearly shows Australia's three VKØ bases—Mawson, Davis and Macquarie Island in respect to the Australian continent. The map was prepared by the official photographer of the A.N.A.R.E. A. Campbell-Drury who operated the first amateur radio station at Heard Island in 1947.

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VK's . . . Australians in Antarctica

Australia has always been well to the fore in Antarctic DX, which has never been easy due to the sporadic operating of the stations and the frequent ionospheric storms. This year with much more activity in the area due to the many countries participating in the International Geophysical Year (more popularly known throughout the world as the IGY), Australia has a bigger party of scientists in the icy south than usual. For the first time the DX stations operating there have had their prefixes changed from VK1 to VKØ.

If you're lucky enough to work them (they'll be active on all DX bands, phone and c.w. this year) don't panic when they fail to reply to your air mailed QSL. They will not hit civilization until next year, so they will have to bring the thousands of QSL's which were filled in during their sojourn south back and mail them when they return to Melbourne, Australia early in 1958.

The Australian Antarctic station's new prefix, VKØ, has already been noticed on the DX bands as some of the 11 holders of these rare titles were operating within days of their reaching Antarctic territory during February '57. Formerly the prefix for Antarctic was VK1, but this has been amended and VK1 is now used only by the Australian Capital Territory, Canberra in south-eastern New South Wales.

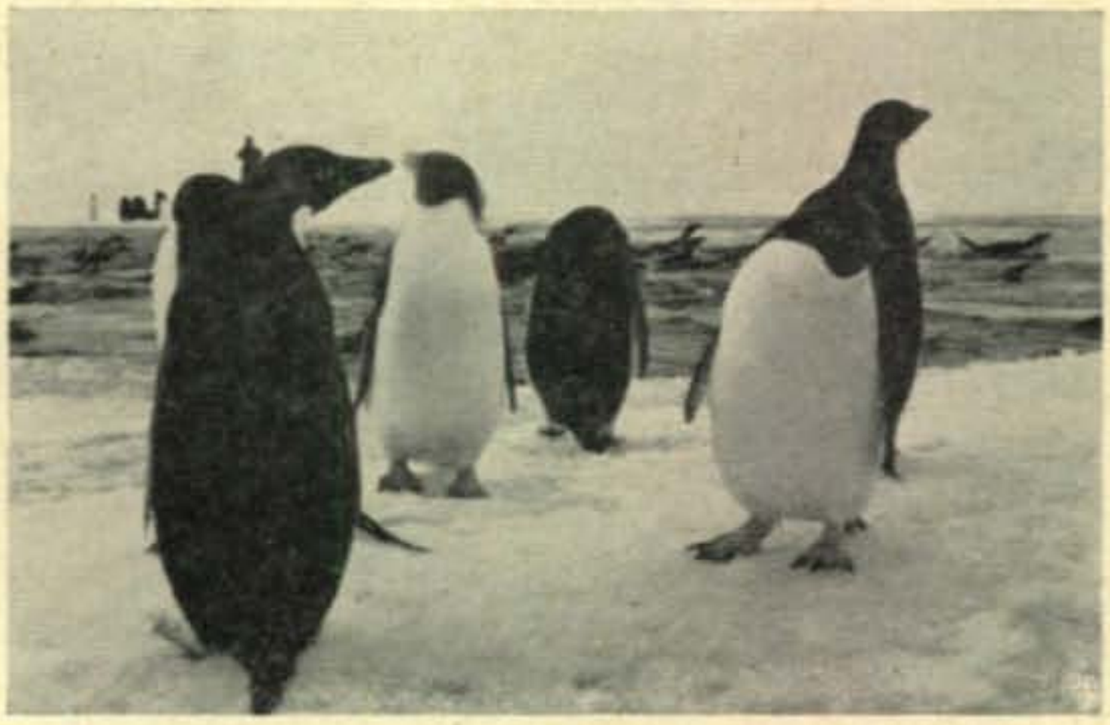
With DX conditions expected to be near their peak this year, thousands of DX men throughout the world should have little trouble including VKØ among their rare ones, for Australia has greatly increased its Antarctic scientific efforts for the IGY. The parties at the three Australian bases (see map) Macquarie Island, Mawson and Davis are the largest since the establishment of the Australian National Antarctic Research Expedition ten years ago. The number of amateur radio licenses, 11 in all as mentioned above, is also the greatest number to be taken out in one year. The majority are young scientists operating an amateur radio station for the first time.

Of the 11, some seven fall into this category. The remaining four have previously held licenses, two of them in the Antarctic on previous 'tours' of duty. They are all unanimous on one point—they are keen to work as many countries and stations as their spare time from scientific projects will allow.

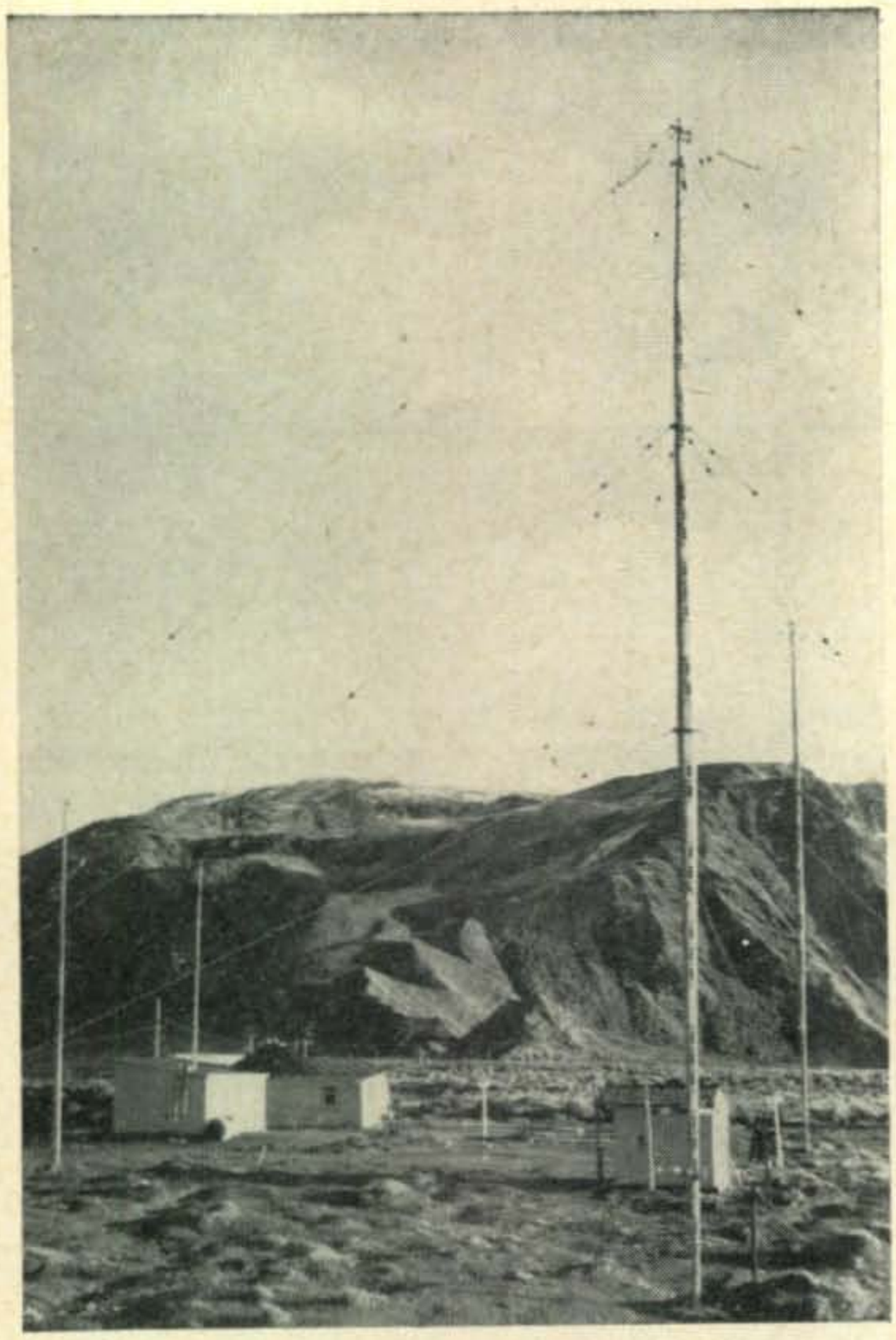
Macquarie Island, 900 miles south of Hobart, Tasmania is familiar to most DX men under the previous VK prefix. The two stations operating on the island this year are:

VKØAA, W. J. Stewart who, prior to going south operated the novice call VK2ZBS from Canberra; and

Macquarie Island, rough, rugged, cold and always windy. Two VKØ's will operate from there this year.



"CQ DX" surely not old man. Fancy these Australians over there having to put a "DX" on to their CQ's.



VKØCJ, C. J. McNaughton operating a station for the first time.

Macquarie Island was uninhabited except for the occasional visit by sealers and whalers until the A.N.A.R.E. set up a base in 1947 for meteorological and ionospheric research. Although contacts with Macquarie Island can still not be regarded as 'easy', the island is very well known among the DX fraternity. Oddly enough, during the lull in conditions

Among the most versatile of all equipment in the Australian sector of the Antarctic, the weasel is used for carrying ashore all the equipment including the amateur radio transmitters. Under Australian Post Master General regulations the Australians can not operate the commercial radio gear on the amateur bands and must each take their own transmitter and receiver.

Radio antennas at Macquarie Island. A lazy "H" erected in 1943 by Robert Gurr, VK1GR is still used for 'stateside' contacts. This antenna was the reason why contacts were possible during the lull in conditions a few years back.

MAWSON, one of the world's loneliest outposts where eight Australians are operating VKØ call signs this year. At least two of them are planning a Vee beam from pole extreme left. The Kista Dan, Danish polar ship which takes men south each year stands at anchor.

1951-55, Macquarie Island stations were all very active and gave the new country to thousands on 14 mc c.w.

Mawson, named after Sir Douglas Mawson, Australian geographist, Antarctic explorer and University Professor, is 2000 miles southwest of Perth, Western Australia. It is the world's first permanent base on the Antarctic and will have eight amateur stations operating from there this year. Two of them holders of former licenses including one from Heard Island. The stations are:

VKØDC, R. R. L. Callow. Previously operated VK1DC on Heard Is.

VKØAS, D. H. Johns. Previously operated VK7DX from Hobart, Tasmania.

The following are operating an amateur station for the first time: VKØAC, C. S. Nilsson; VKØAS, A. H. Sandilands; VKØCJ,

Field party inland from Mawson halts on ice beneath a giant imprisoned ice berg.

Weasels and sledges in the field inland from Mawson where Australia set up the first permanent Antarctic base. Frequently during this year's operations which include a considerable amount of field work the Australian VKØ's hope to operate portable on these trips.

C. J. McNaughton; VKØJP, J. D. Pinn; VKØPK, P. King; VKØRR, R. G. Arnel; VKØZN, B. E. Shaw.

Davis, named after Captain J. K. Davis, another Australian veteran of Antarctic exploration who, incidentally, was with the party which rescued Lincoln Ellsworth in the late 1930's is some 300 miles further east along the Antarctic coastline from Mawson. It was set up this February and manned by only three men. The only station operating from Davis is VKØAB by A. C. "Charlie" Hawker formerly VK3IB but remembered by DX men as VK1AC at Macquarie Island four years ago. He was very active at Macquarie Island during his sojourn south and it is hoped he will be as active this year. His QSL card, depicting the new base, will be a prize in any one's collection.

Heard Island, some 850 miles north of Mawson was occupied by the A.N.A.R.E. from 1947 until 1953. It gave many of us a new country but is now no longer occupied although stores are kept there for an emergency and the Australian expedition calls each year for a routine check. Charlie Hawker was

Well known holder of Macquarie Island call in 1953 J. L. Ward (VK1JW) points to his prize during mid-winter's day celebration in their mess. His prize is a different type of bottle than used in his transmitter.

hoping to operate portable from there when the Danish polar ship Kista Dan, which was taking them south, called in January, but the weather was too rough for him to land. Only a handful went ashore.

Leader of the A.N.A.R.E. Phillip G. Law, although not an active radio amateur, is intensely interested in the work and, as in previous years, has given the VKØ's all the encouragement as he sees in the hobby a great morale booster to men who could become lonely in their spare time He has urged them when in contact with the outside world to speak of the International Geophysical Year and what Australia is doing as her contribution to science. So, to the scientifically bent, and most of us lean a bit this way, this year, and the next, should give us ample opportunity to not only talk with some of Australia's top scientists but discuss their work and how they are going about doing it 'down under'.

The VKØ's too are having a little competition among themselves to see who works the most countries during their year's sojourn south. Present record is held by Bill Storer, VK1EG who in the initial year of operation at Mawson worked 101 countries.

Oklahoma Convention

The Tulsa Amateur Radio Club announces the Oklahoma State ARRL Convention to be held on the campus of Northeastern State College, Tahlequah, Oklahoma on June 1-2. Registration fee of $6.50 includes one night's lodging, two meals, banquet and all convention activities. Send money to Phil Garver W5ZBI, Box 3322, Tulsa, Oklahoma. Pre-registration is necessary.

Pictures: courtesy of Homestead Air Force Base Photo Lab.

Instant Sideband

James P. Bonner, W4EFH
Route 1, Box 423L
Homestead, Florida

Many more amateurs would enjoy the benefits of sideband were it not for the complexity of building an SSB exciter or the expense of the commercial units. The John Costas (W2CRR) article in the February 1957 CQ certainly changed all that when it introduced double sideband.

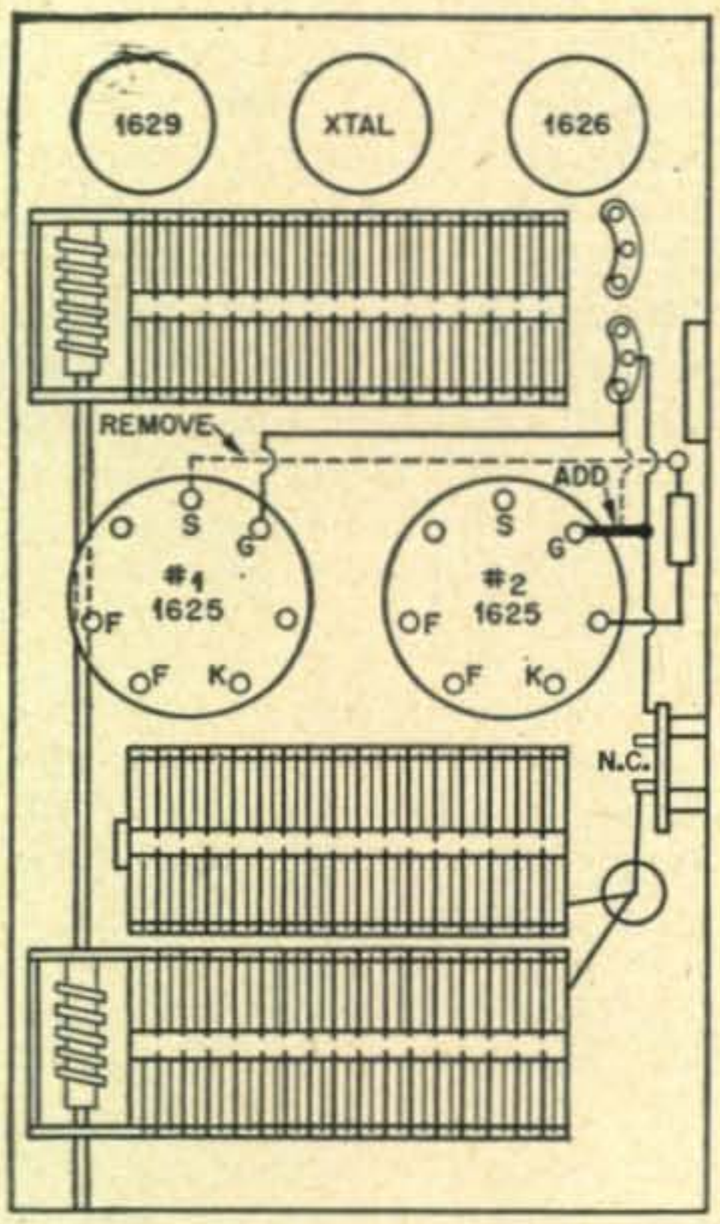


Fig 1. Wiring changes of BC-696 for DSB operation.

The article headed me for the work bench, Command-set (BC-696) in hand. The March 1957 CQ featured a 100 watt mobile conversion of the ARC-5, but I did the whole job even quicker and simpler. The whole conversion shouldn't take but a few minutes. All there is to it is the removal of two wires, the addition of a couple of bypass condensers, a wire jumper, and a screen modulating transformer.

Basically what you have to do is run the grids in push-pull, the screens in push-pull and the plates in parallel. Since all three are in parallel to start with you have to modify the grid and screen circuits. If your unit has not yet been converted at all you will want to wire the filaments for 12 volts instead of 24 volts (see *fig 3)*. You will also probably want to take out the relays and add them to your junk box, you won't need them in the rig.

Remove the screen connections to the 1625's *(fig 1)*. Take out the entire wire, it won't be needed. Remove the wire from the grid connection of the #2 1625 socket, cut it off where it connects to the wire going to #1 1625 grid. . . as shown by the broken line in *fig 1*. Connect a wire from the #2 grid to the neutralizing condenser. Make this connection to the terminal of the condenser that has the black wire connected . . . heavy line in *fig 1*.

If you don' happen to have an audio amplifier or modulator around the shack you can build up something like *fig 2* which will serve adequately. The trick is to have a push-pull output transformer, ground the center tap and run the output to the two 1625 screens. A .0005 (at least 600 volts) condenser from each screen to ground will bypass any stray r.f.

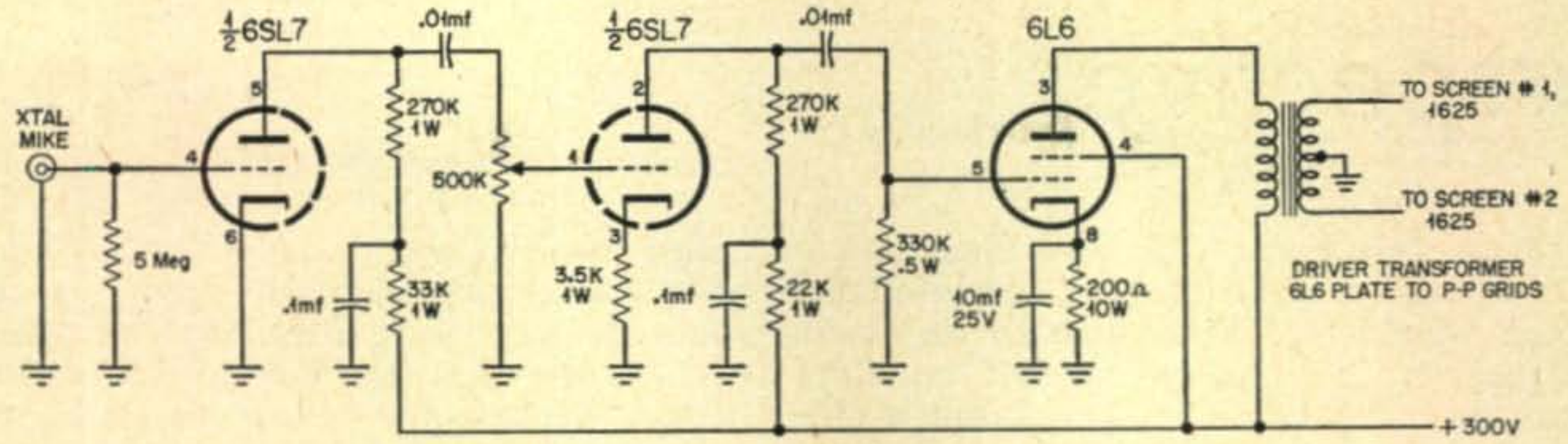


Fig 2. Modulator for BC-696 Transmitter.

Tuning Up

The final may be operated with from 300 to 750 volts on the plates, it is not critical. You can tune up by whistling in the mike, putting in an audio tone, or by temporarily removing one of the 1625 tubes from its socket, putting 250 volts dc on the screen audio driver transformer center tap. Tune the antenna circuit in the customary manner, remove the d.c. from the screens, replace the 1625 tube and you are ready to go.

So there you are on sideband. Double sideband, to be sure, but at least you have gotten away from that arch enemy of the kilocycles: heterodynes. Many of the SSB gang won't know you are using DSB unless you tell them. Come on, get your feet wet. ■

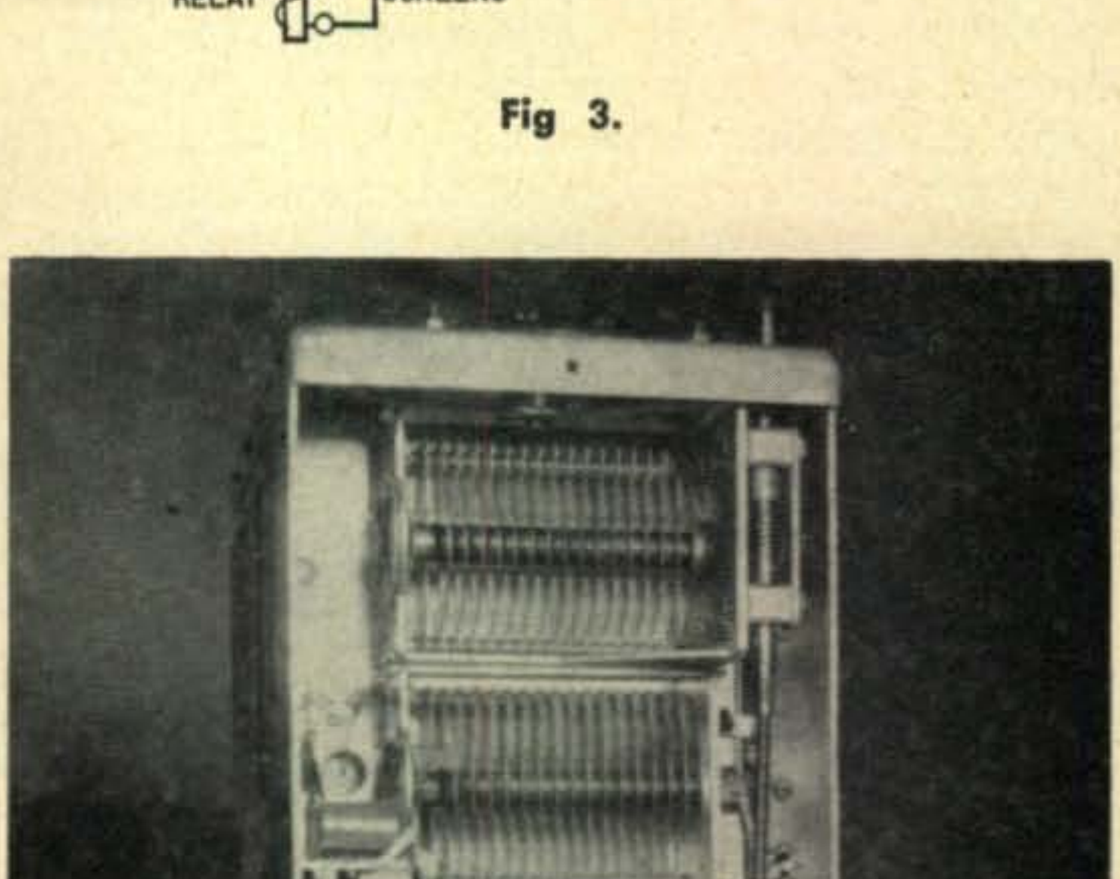
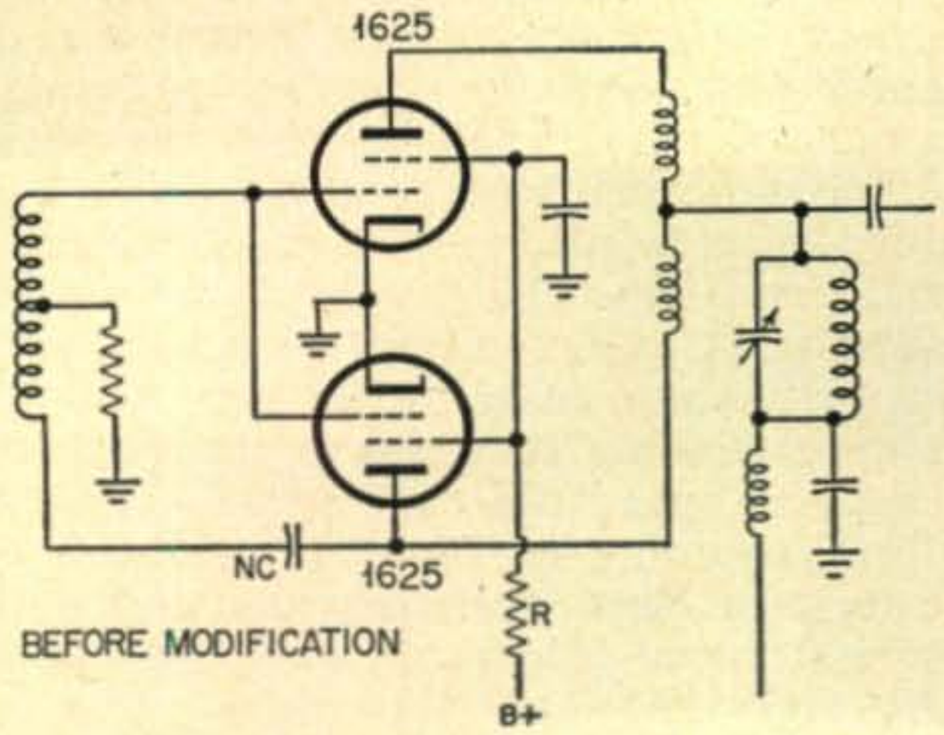
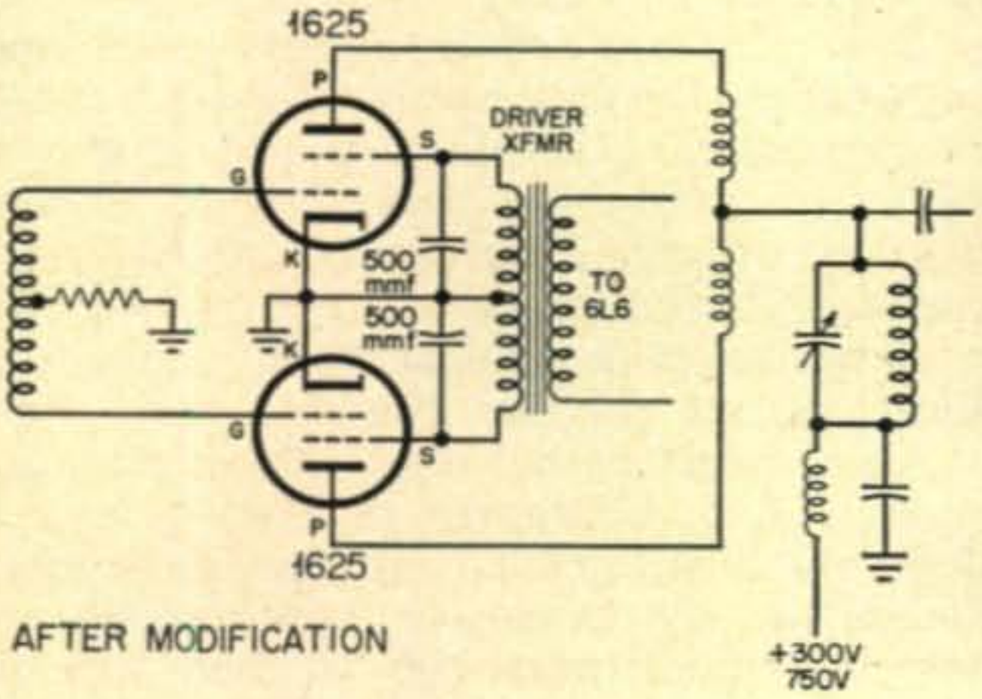


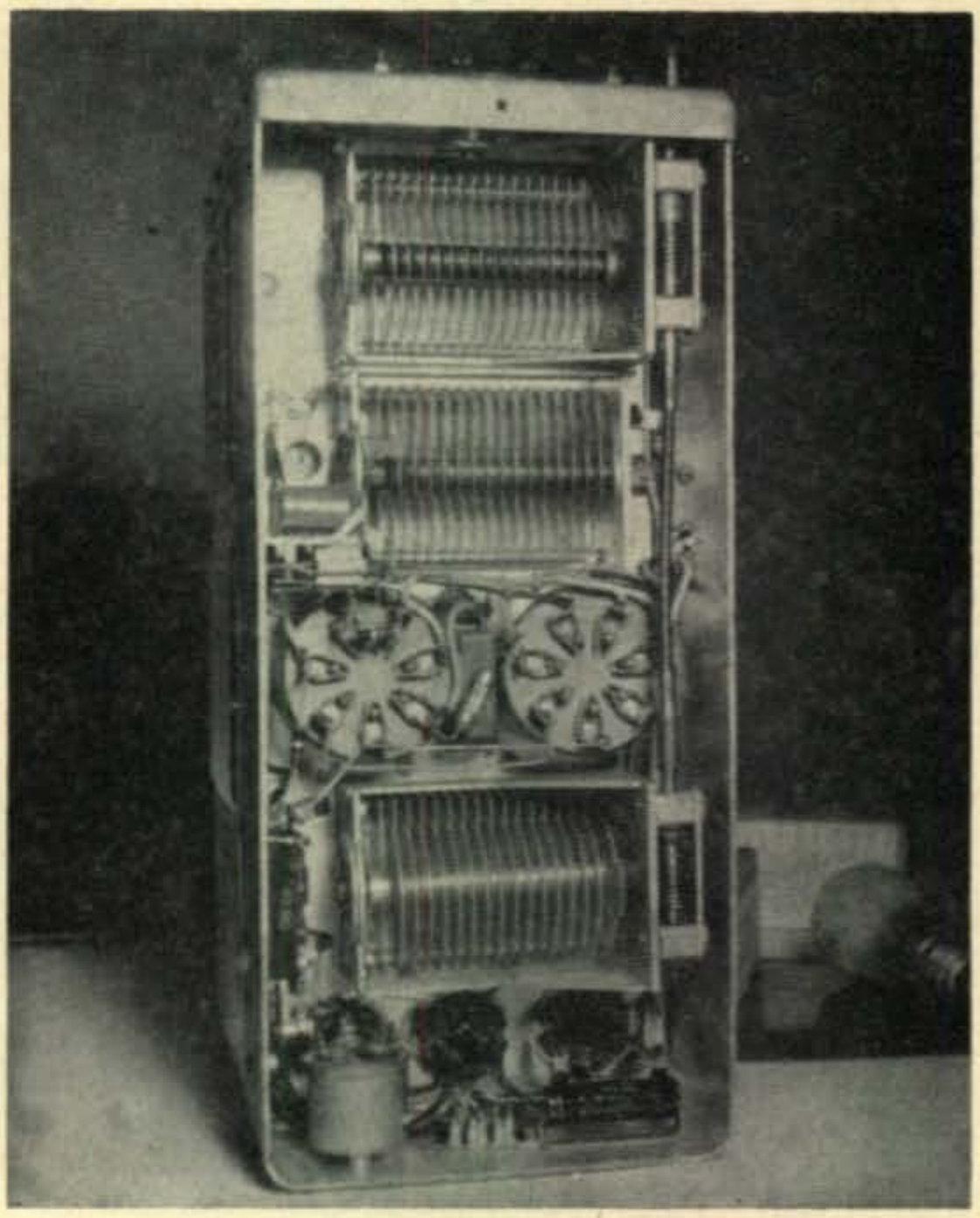
Fig 3.



You start with this . . .



and end up with this.



Showing converted BC-696.

Perspective

Jean Shepherd, K2ORS ex W9, 8,
4-QWN, W3STE

There are few hams with any imagination about the hobby, who haven't occasionally wondered what it would be like to sit down at the receiver in some typical DX country, listen to the band, and then knock out a CQ or two. Perhaps just to have that unusual, to W stations, feeling of being a highly desirable contact, or maybe to get another slant on our poor old tired hobby. And I'm afraid that more than a few of us have felt just a little tired of the sport since the post-war flood of assembly line equipment and cheap KW-plus rigs in the hands of operators with plenty of signal but no technique, and little respect for, or knowledge of, the traditions and creative aspects of the hobby. But I digress.

A couple of weeks ago I was in Amsterdam, Holland, poking about the city, gathering impressions, drinking coffee, and getting set to record my radio show on tape for WOR. Radio Netherlands, where I was to record, is located at Hilversum, a lovely town about 30 miles from Amsterdam. Holland is an interesting place for Americans to see because it just doesn't look the way we expect it to, and hence is full of surprises. Hilversum, for example, looks much as a respectable wealthy tree-lined mid-western American town might appear on the day the inhabitants were celebrating a Dutch Festival. The Radio Netherlands studios presently are located in a series of old Victorian mansions exactly the same as those old white and green houses that still stand everywhere in America as a sort of last remnant of the Booth Tarkington Period. They are planning a multi-million dollar radio and TV center which will, of course, kill the old mansions, but "progress" usually destroys beauty everywhere, even in Holland. I took the Commuter's Special, they have them there too, out of Central Station in Amsterdam, immersed in a crowd of Dutch business men and pink cheeked women shoppers rushing home from the city for dinner. By the way, the Dutch are enormously friendly people and really like Americans and are very curious about America. An American is easily spotted by the Dutch even before the American opens his mouth to speak. Our haircuts, complexions, clothes, and almost everything about us gives us away. In some European countries, this is a disadvantage, but in Holland it is the opposite. As I've noted, they really *like* us, and enjoy the chance to show off the English that almost everyone there has learned in school. This means that even a short train ride in Holland is enjoyable because sooner or later someone will speak and time passes quickly.

After 45 minutes or so, the conductor called the Hilversum stop which turned out to be a station that matched almost exactly any suburban stop along Philadelphia's Main Line even to the slot machines loaded with Dutch Milk chocolate, the yellow naked light bulbs, and the slightly grimy window boxes. However, instead of a line of station wagons driven by suburban-type wives, there was the usual Dutch line of high-necked black bicycles, a few one-lung motorbikes, and a scattering of Lambretta's and Vespa's, waiting for the commuter crowd, both men and women, I might add. Sometimes it seems as though there are more bikes than people in Holland. The crowds skim along the streets like a silent flock of starlings. Elderly dignified matrons, distinguished bank officer-types, teen agers holding hands from bike to bike, bricklayers, everyone pedals. However, since I have been bikeless since the age of seventeen, and was loaded with tapes and other impedimentia, I took an Opel cab out to the studio site. We can't have everything. In the reception room I was met by a girl who looked startlingly similar to her fellow Dutchwoman, Audrey Hepburn. As I've said, this is a great country. She offered me coffee, the Dutch brew a superb cup, and we sat on the leather chaise lounge to talk. We had arrived at the point where I was about to offer her a chance in American movies, when in came the engineer who was supposed to tape my show. I flushed slightly, straightened my tie and introduced myself to him. He was Jan Walraven, PAØPCA, a short slight blondish sort of bachelor with a sense of humor. I followed him up a winding staircase to studio 5, where we were to spend the next seven hours, more or less, recording my four hour show to be broadcast in New York the following Sunday evening. I was flying all over Europe with KLM and they had volunteered to fly my tapes back to the States from wherever they were done. In Holland, the Royal Dutch Airlines (KLM), is a sort of national pride and joy hence their word is almost a command everywhere. On that account, Radio Netherlands, a state controlled radio setup, was anxious to bend over backward to help me. Before recording, I nosed around the control room a bit looking over the equipment. Much the same as in a typical well-financed U.S. station, except for the brand names, Philips and Telefunken with some EMI stuff around. The only U.S. equipment I saw were a few old Presto tables. Hans told me that the U.S. material was too expensive there and, in many cases, just didn't come up to their broadcast standards. As an example of that, I found they used exclusively the 15 ips tape speed

for all their work in contrast to the standard U.S. practice of 7½ ips in most broadcast work. They were amazed when I wanted to cut at 7½ since only home recorders use that speed in Holland. This caused a brief crisis as they had only one old tape recorder capable of cutting 7½ and that hadn't been used for over two years. It was dusted off, greased, loaded up with tape, and we opened fire. It seemed as though that poor old recorder broke down every fifteen minutes at least. It was located in a recording room remote from the studio and everytime the phone rang, there was sonmeone named Leo on the line who would say "hold it, the damn thing's slipping again", in Dutch. This went on until 4 A.M. when the last minute was recorded and the tapes were wrapped for the plane ride home. Since Radio Netherlands is a 24 hour a day operation, 4 A.M. isn't an unusual hour to be doing radio shows for these boys, especially since they followed the Dutch custom of plenty of hot coffee, rich cream and great ham sandwiches all through the working time. They were fascinated by a free wheeling U.S. radio show done off the cuff and with considerable candor, because everything they do on their radio shows is strictly scripted, passed on by several bureaus, and is extremely bland with no opinions on anything whatsoever expressed. As I've said, Radio Netherlands is a state outfit, and as such, feels that they are not to do much other than straight news, music, and drama. They have no high flying Godfreys or Steve Allens who can say pretty much as they please. Eminent literary or political figures occasionally give talks that, of course, express their opinions, but they have no TV or radio personalities who can do the same. In that respect, all state owned radio setups, including the BBC, are similar. I had the opportunity to record in most of the operations over Europe and found they were all impressed by the fact that I could speak as I felt about almost anything that came into my mind without the benefit of Script Approval Departments, which are standard in all the layouts I encountered.

By the time we had left the building, it was about 4:15 A.M. and I had over two hours to kill before the first train back to Amsterdam. It is just as dull in a Dutch town at that hour as it is in a typical U.S. burg of the same size. Nothing but street lights glowing weakly through a light early morning fog. Jan was wide awake though and suggested we go to his place for a drink and maybe to work the rig a bit if any of the bands were open. We hopped in his ancient Prefect and took off for the shack. It was a top floor two room apartment in one of the old Victorian houses about ten minutes away from the studios. Jan said that he had looked for a place where he could put up a decent wire for over two years, apartments are hard to get especially for bachelors. We had to tip-toe up the backstairs, which creaked mercilessly, in order to get to his rooms. It was exactly like a bachelor apartment back home, a few pictures of girls on the wall, slightly messy, books strewn all over a tiny desk, sloppily made bed. I had to keep telling myself, "look you're in *Holland*, this is not Manhattan", in order to keep some perspective. The minute I saw the rig though, I no longer had to keep this up. Jan poured out a couple of glasses of Dutch apricot brandy and began to show me his layout. For the first time in a decade at least, I felt that here was what ham radio is all about. He had some of the most beautiful pieces of equipment I've ever seen and not a unit was factory made, including the receiver. The receiver was a lovely job to behold and as hot as a Ford in reverse going up Pike's Peak. Double conversion, xtal controlled oscillator, bandswitching from ten to 160 meters, and as quiet as a 75-A-4 on a moonlit winter night. We first briefly listened to forty and then swung down to twenty which sounded good. Incidentally, Jan had worked on this receiver for the better part of two years, modifying, refining, rewiring, until it was really as stable and hot as anything I've ever played with including the above mentioned 75-A. He had even constructed the sheet metal cabinet from scratch as well as the band switching assembly and wound his own if's, all because components are expensive and comparatively rare in Holland. The Guilder goes only a third as far as a dollar, but is just as scarce for a Dutchman. His transmitter was the same as the receiver. Neat, completely bandswitching self-contained, AM CW on all bands, running the legal Dutch power limit of 150 watts. Extremely flexible and completely TVI'd. He really had genuine reason to be proud of the station since it was truly his own creation and not something that could be picked up in ten minutes over the counter. In contrast to his apartment, the rig was neater than the proverbial pin. He asked me if I preferred phone or cw on twenty. I chose cw, sat down at the desk, knocked out a couple of V's on the old-fashioned bar-type railroad style key, and started to call CQ. I can't begin to describe the peculiar feeling of power that comes with signing a DX call on twenty. A giddy swirling in the head, and a fairly justified suspicion that you are in a position to bestow great riches on the peasantry. I signed with a lovely stylized AR K and began to tune the band. Have you ever dreamed of dropping a dry fly on the surface of a virgin mountain stream loaded with trout that had been starved for a week? The band was alive and crawling with W's most of whom probably felt that they weren't getting out of their back yards, since many DX stations just don't work W's. They are so plentiful on the bands that working a W is like fishing for sunfish in a lake loaded with small mouth bass. On

my frequency, in the middle of the high end of 20, it seemed as though fifty or more California KW's had homed in and were droning away frantically calling PAØPCA until the frequency rang like a Chinese gong in an echo chamber. I tuned the receiver off the frequency and the hornet's nest and wandered toward the high end. As I did so, I could hear dribs and drabs of lesser W fry, the rock-bound, hopelessly calling PAØPCA, even though they were 40 kc off freq and sounding like tiny spring peepers in a marsh dominated by bull frogs. For too long, I myself had hour after hour called big-time DX, with my puny 200 watts and W call, only to be ignored in favor of some joker running 2.5 kw into a 16 element beam. The W2's, the most plentiful of W's, have it even rougher than the rest since most European DX men will, if they have to work a W, ignore the common W2 in search of the rarer W7 or W6, or anything for that matter but a W2. For that reason, I finally chose a tiny W2 about 35 kc off frequency, who apparently was calling PAØPCA with the same hope of success that a 16 year old pimply-faced youth feels when mooning over the image of Marilyn Monroe in the neighborhood movie house in Zanesville, Ohio. I waited patiently until his overlong call had ended, gave him a good report at least four S units higher than he deserved in order to make him the biggest man in the neighborhood, and stood by. When he came

[*continued on page 75*]

Pse QSL Tnx

Ray De Vos
West Trenton, New Jersey

Have you seen my card yet? It is a real beauty and bound to win any contest in which it is entered. The card is printed on pink super-glossy stock with a gilded border. The call letters are in heavy black block print with a red border and run diagonally across the whole card. For background we have first a semi-circle consisting of all the colors in the rainbow superimposed upon an outline map of the U.S. The upper right hand corner bears the likeness of an eagle and the upper left hand corner has an indian head in full war regalia. In the lower right hand corner is a Mickey Mouse with earphones and an oversized mike, and in the lower left hand corner two poles with an antenna strung between them and lots of underwear hanging from the wire (this is always good for a laugh). I had some difficulty with the report form but after much thought and deliberation I managed to cut it down to 650 words of fine print. There was no room for the usual RST so I had that printed as 599 since I never heard of anyone giving any other report, and the date had to be omitted, but by checking the stamp cancellation you can always get the date of the QSO. Call me some time when you hear me on. I'll send you a QSL you will be proud to hang on your wall.

I am sure you have heard something like this before. You can hear it at any ham gathering. Now, in my own case, as happens to every other amateur sooner or later, I began to run out of QSL cards. The cards I had been using were bought some years ago and there really was not much that was distinctive about them; the usual horror with large block print call letters and a bolt of lightning presumably intended to strike the unfortunate recipient of my missive. There was also much printing; address, name, rig, antenna, power, most of which was by now no longer applicable. In a way I was glad these cards were going fast. I become uncomfortable at the thought of filling them out and ashamed at having to send a card with deleted information and ink-scribbled corrections. This time, I promised myself, I am really going to get a card which will be truly representative of my station and myself, something original, showing thought and care, not cartoon style or too stuffy. But where to get it? Looking through the classified section of a well known radio magazine I found innumerable invitations to send for QSL samples, some free and some for as much as 25 cents, most though were 10 cents. I selected 23 printers at a total outlay of $1.55 not including stamps and resigned myself to waiting. Exactly three days later came my first reply. This was it! With trembling hands I tore open the envelope and looked. . . . Blocked call letters and the all too familiar bolt of lightning. For the next three weeks I was struck by lightning daily and even had a few eagles fly my way. In the event I might feel lost, some kind souls added a map of the United States. The call letters settled down to three styles; plain block letters, block letters in color with a funereal border or vice versa, and block letters slanted and shaded, all sans serif (you can look that up!). To date I have received 176 samples and if they were all laid end to end they would add up to the dullest and most monotonous array of QSLs ever assembled. Incidentally, I "worked" 36 states, 5 countries (real DX) and I SWL this way. As expected, Utah and Nevada were not represented.

I finally decided to tabulate this mess and came up with the following. The quickest reply to my request was 3 days, the longest 26 days. One printer has not answered as yet, but I have given up on him. I guess he does not want the contract. The least number

of samples received was one, the most 15. The cheapest cards per 100 would cost you $1.25 while the most expensive run about $7.50. You can increase the latter figure by adding another color and making a change in the report form. This can get pretty costly considering the final result. Eleven out of twenty-three offered to pay the postage on my little order. Only six printers promised delivery within a specified number of days ranging from 4 to 21. It is difficult to determine how long I would have to wait as far as the others are concerned, but you cannot say they promised anything. Significantly only two printers made no charge for putting the report form on the back of the card. The remainder either added one color charge or else quoted an additional charge of approximately $1.00 per 100. Seven printers did not list this service as available and I suppose they would not do it for love or money. Almost the same situation prevailed as far as changes in the report form were concerned, the only difference being that here twelve out of the twenty-three could not be bothered doing anything like that. Actually, it must be acknowledged that almost any printer will do any QSL job you want provided you are willing to pay for it. However, it is not the purpose here to show what the printer can do, but merely to indicate what he offered to do at quoted prices.

In my day I have received some QSLs, not as many as I have sent of course, but I could not help noticing that invariably the W's and K's ran true to form, that is, they were sending me copies of the samples I received. Some hardy souls dared to depart from the conventional pattern by the addition of cuts, but even the cuts are monotonous; a pseudo-comical round headed creature banging a key (the sender, no doubt); an outhouse with antennas purporting to illustrate the shack (and I believe it); indian heads, flags, globes and other totally unrelated subjects. By no stretch of the imagination can these cards be called truly representative of the sender, at least I hope not. It is not always the printer's fault however. Most amateurs in the need of cards buy the commercially assembled ones because they are cheaper and less trouble to order. On the other hand, to make a card of your own is not an impossible task and costs only little more than some of the super glossy overly-decorated non-entities offered for sale. It follows that if no one bought the hackneyed jobs, soon the printers would stop selling them and be far more willing to take orders for cards of your own design.

The simplest and perhaps the most personal QSL is the photograph. A picture of your layout with yourself somewhere about, either operating or just sitting facing the camera. This conveys far more to the recipient than a description of your equipment by commercial code designations. After all, the equipment may not be half as important as the way you have arranged it for ease of operation and appearance. The latter information can never be conveyed by simple statements and certainly the average QSL card leaves no room for such comments. There are a few amateurs now using the photo QSL and it is always a distinct pleasure to receive but unfortunately there are too few taking advantage of the photo method. Many hams think nothing of spending money for photographed Christmas cards but balk at the idea of doing the same for a QSL. The Christmas card winds up in the wastebasket after having performed a service of dubious value while the QSL remains a permanent record of an enjoyable QSO either on the shack wall or in your files. The DX station will appreciate your photo QSL far more than you can realize. If he is as curious about your equipment as you are about his, and you can satisfy him, you stand a better chance of getting a card in return.

Then we have the more impersonal sketch card. Here the sky is the limit, but it should be borne in mind that the simpler the design the more effective the result will be. Our experts in this field are the advertising agency artists. If you need some ideas take a look at *Fortune* magazine and note how some of the better known national products are advertised by means of sketches. Some of these could very well be applied to QSL cards and the resulting card would surprise even the most blase of QSLers. Your local printer can help you with the details of composition. The final result will be a matter of your tastes and likes, but at least it will be your own card.

It is known that not all amateurs are in favor of exchanging QSL cards, and that is understandable. It takes some effort and expense to do something for the other fellow. But for those who consider it a part of amateur radio, why not make it a more pleasurable activity for both the sender and the addressee instead of mailing the dull and unending series of lightning bolts, eagles and maps of the U.S. Well, here's where 23 QSL printers cancel their subscriptions to CQ. ■

(In all fairness to the QSL'eries I would like to point out that most of them will make any kind of a card for you that you want and do it cheaper than your local printer can. I have always had my cards printed by a regular QSL printer, even if I have to have my own plates made up and sent to him. I expect that the dull samples are being sent because that is what sells best. In fairness to the author I might point out to the QSL'eries that the last time I sent out for a round of samples I particularly mentioned that I was only interested in something ususual and different . . . I got the same cards that Ray did, and that was from 30 different printers . . . Ed.)

DX

R. C. "Dick" Spenceley, KV4AA
Box 403, St. Thomas,
Virgin Islands

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

No. 338
WØHX LEWIS C. BAIRD 40-170
No. 339
KH6PM FRED B. HARTMANN 40-225
No. 340
I1AY PIPPO FONTANA 40-157
No. 341
W8DAW RUSS WHITEHURST 40-237
No. 342
W6AM DON C. WALLACE 40-221 (PHONE)
No. 343
W6CG CARL F. SCHULTZ 40-196

WØHX is the 11th WØ to acquire this award while KH6PM is the 11th KH6. I1AY is the 4th Italian on the WAZ lists and W8DAW is the 14th W8. W6AM is the fifth station to qualify for the "Phone only" WAZ and also holds a WAZ certificate for cw/phone. W6AM and W6CG are Nos. 122 and 123 from W6-land which keeps the somewhat one sided Californian monopoly of WAZ up to par.

To the ever-growing HONOR ROLL we welcome the following newcomers:

W4ML,	Tom,	39-220	
W7FB,	Lloyd,	39-201	
W6OUN,	Bill,	39-164	
W2ABM,	Roy,	38-196	
K6IYJ,	Bill,	38-140	
W2AYU,	Walt,	36-152	
W9YSQ,	Harry,	36-148	(Phone)
SM5KV,	Olle,	36-128	
CT3AN,	Jose,	35-181	
K4BVQ,	Frank,	35-159	(Phone)
W8ESR,	Bill,	35-131	

BRITISH VIRGIN ISLANDS, VP2VG: With the advent of this Qth's new status as a Crown Colony and a "new one" ham-wise, Bill, KV4BB, lost no time in fulfilling a dream of his by putting this rare spot on the air. As a guest of Bill Bailey, VP2VG, and accompanied by Clarence, KP4DE, KV4BB covered the forty miles from Saint Croix to Buck Island, Tortola, by small motor boat in four hours and got on the air at 1943 GMT March 7th. On Saturday, March 9th, he was joined by Lloyd, W2CAA, who plugged many cw gaps. So as not to detract from the full VP2VG story, which we hope to have shortly, the following table gives a birds-eye view of accomplishments:

VP2VG—March 7th to 12th with KV4BB, KP4DE and W2CAA.
Time on the Air: 68½ hours: 46½ SSB/AM, 22 cw.
Equipment: Hallicrafters HT-32 (100 Watts), SX-100 Receiver, 2½ KW Gas Generator.
Antenna: W3DZZ all-band trap doublet (Ten feet off ground).
Number of Contacts: 1905: 932 phone, 973 cw.
Countries Worked: 53: 28 phone, 40 cw.
First Contacts Phone: KV4AA, W2JXH, W4IYC, K4ECC, W3MAC, W2CMM, G6LX, W9SWR, W8DLD/Mobile, W3-HLX, W9DZY.
First Contacts cw: W3LMA, W8BRA, W4ML, K9BVR, K4GMT, W2GVZ, W4HA, W3-MDE, W8GLK, W4AAU.
"Firsts" in W Districts, Phone: W1BGA, W2JXH, W3MAC, W4IYC, K5EZX, W6AM, W7UDG, W8DLD/Mobile, W9-SWR, WØQVZ.
"First" in W Districts, cw: W1DHO, W2GVZ, W3LMA, W4ML, W5CUQ, W6MJP, W7GKM, W8BRA, K9BVR, WØGUS.
First VE: VE3DIF cw, VE4NI phone.
First African: ZS6BW cw, CN8MM phone.
First Oceania: VK3YL cw, ZL3IA phone.
First European: G3AYO cw, G6LX phone.
First So. American: YV5FL cw, PY2CK phone.
First Asian: VS2FF cw, OD5BZ phone.

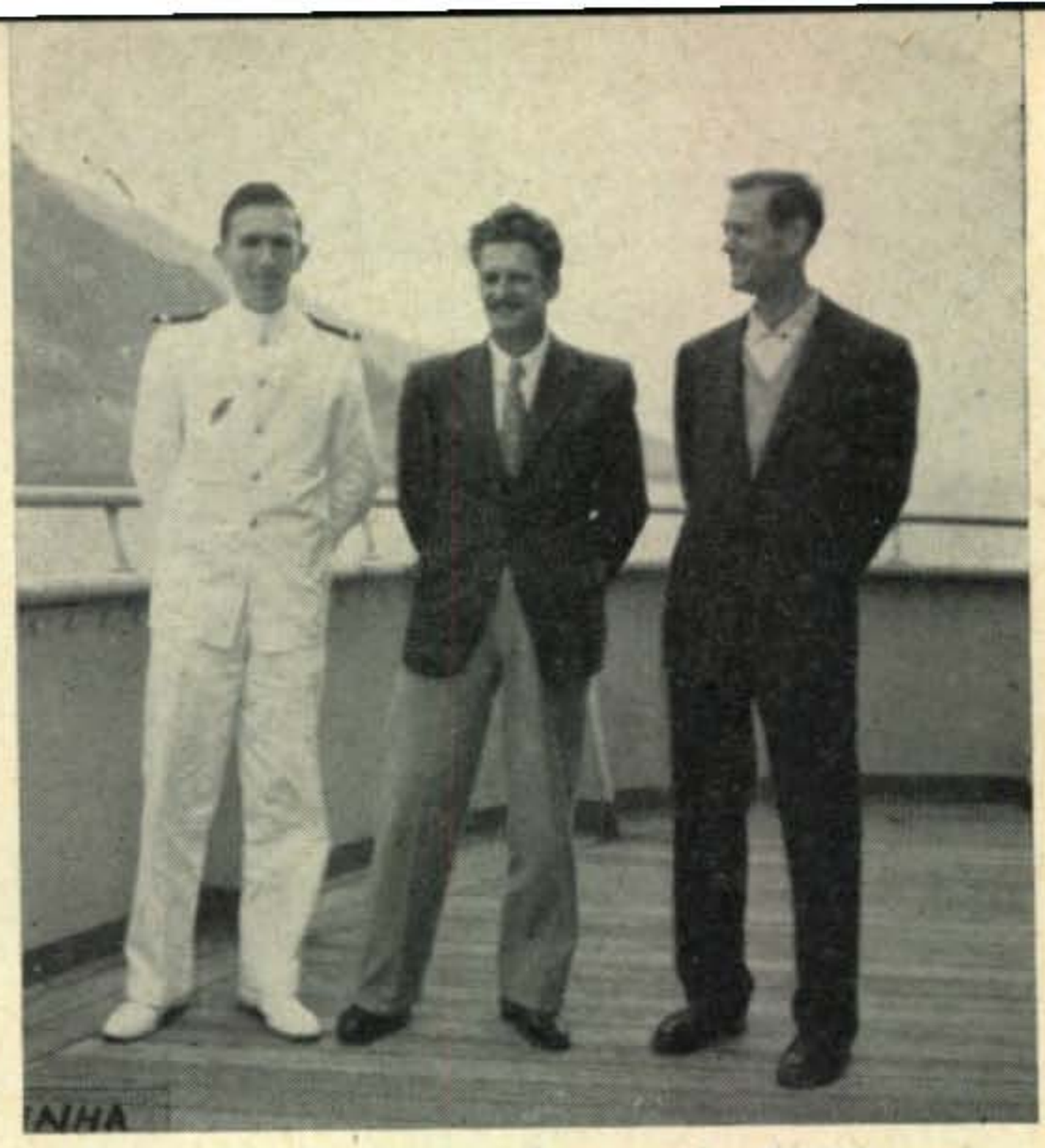
CAYMAN ISLANDS, VP5BH: DX'peditioning to Grand Cayman Island were Messrs W4KVX, W4OMW and W8EZF. Action was due to have started on the evening of March 20th and have lasted a week. Activity was scheduled on all bands SSB/AM and CW with a HT-32 rig. The call VP5BH was to have been used unless their own call was granted before arrival.

DX Notes

Dave, W6VX, was on the air as VQ9VX for a couple of hours on February 26th at the Seychelles. Conditions were poor on 21 mc and no W's were heard. A few contacts were made within a 1500 mile radius before Dave had to dash back to the SS CARONIA . . . WØGDH ran 100 watts at HH2DX for ten days ending March 2nd. 715 contacts were made in all continents except Asia while WAS was stymied by Wyoming . . . HH2LC has been heard regularly on 14096 . . . A

GHANA, Formerly Gold Coast (ZD4) is a new country and credit will be allowed for WAZ immediately for QSO's dating after March 4th.

welcome cw addition, worked near 14080, is HI8BE. He is Burke Edwards of the American Embassy in Ciudad Trujillo and he will be there for three years. (ex-W3BKZ) . . . MP4BBA has been doing some rapid fire DX'ing on the low end of 14 mc. See QTH's . . . DL4AAP (W6GHM) plans DX'pedition to San Marino this Summer if license can be obtained. He may get together with Bob, ON4QX, who has similar plans . . . Doc, W2BBK, planned to arrive in KV4-land on March 20 and hopes to spend 2nd half of cw contest at VP2VG . . . FM7WR is on most mornings, 1130 GMT, 14095. The same goes for FG7XE on 14035 . . . ZA1AB rides again, 14015, this time giving his QTH as Box 42, Tirana. Another good one, according to W6YY, is ZA1KUN who is on phone, 14,135, around 0530 GMT (Box 55, Tirana) . . . K2AAA advises us that the shipment of the SSB-100A to EA9DF, for use in IFNI, has met with considerable export red tape but he assures us that it will go forward when clearances are obtained (May have been shipped by now) . . . VQ6LQ reports that new ones in VQ6-land are VQ6AB, VQ6AC and VQ6UE (VE7UE) . . . The new 150 watt station in the Comoros should be on by now . . . FB8BX, Island of Nossi Be, counts allee samee as Madagascar . . . G4CP informs us that Lee Grant, VS9AG ex-ST2NG, is cw only and will operate from Aden on even dates in March and odd days in April. See QTH's . . . ZS6AJO plans visit to ZS8 for one of the contests next year . . . SVØWD, Crete, was worked on 14081 at 2015 GMT. See QTH's . . . As this is read VQ8AD (ex-VQ8CB) should be on from VQ4-land . . . W6QL reports ZC3DU coming through on 14060 at 1500 GMT . . . Pipe dream or not DL4AAP reports UT3KAA on 14002 at 1400 GMT giving QTH as Lhasa, Tibet! . . . W1CWX reports LA8FZ/P, Hopen Island, 14015. If good this counts same as Spitzbergen . . . CE9AS was on from Chilean Antarctica, 14050, 2300 GMT. QSL via CE Bureau . . . A letter from the OM of W6IIM advises that Ken, ex-W6JOT/ex-K4EVP, has received the call letters HS1A, in Thailand, and is on the air. He may be found on 14180, A3, around 1600 GMT. QSL's go via W6FKH . . . Other Thai stations heard recently are HS1MQ, 21 mc A3 and HS1WR 14 mc cw . . . YN4CB leaves for the U.S.A. in March but YN4HA will stay on with his rig . . . K2AAA reports probable operation of an SSB station on As-



Dave, W6VX, (right) chats with ZS2FW and ZD9AC (center) as the RMS CARONIA anchors off Tristan da Cunha during his globe circling voyage in which he was on briefly as VQ9VX in the Seychelles.

cension Island (ZD8) for two days during the last of April. A month later a permanent one may be there . . . It must be assumed that ZD9AF is a four legged striped phoney (QTH probably Venezuela). Cards have been returned from the ZS bureau to that effect. He will be scratched from your WAZ lists . . . C2KAA has been heard claiming Peking as QTH. QSL via Box 88 Moscow . . . Doubts have been expressed re recent operation of VU5AB who sed QSL via VU2AX . . . We understand that Fletchers Ice Island, near the North Pole, will be manned again. This may result in some new KF3 activity . . .

DX'ploits

Don, W6AM, takes the top spot with an imposing 274 total with the addition of VP2VG. His phone went to 221 with UN1AB . . . Walt, W6MX, nabbed OH1ST/Ø, VP2VG and CR5SP to hit 270 while Jesse, W3KT, rose to 267 (203 phone) with UR2KAA, UA1CB, SVØWE, VP2VG, CR1ØAA and ZC5AL . . . Howy, W2AGW, is also 267 with VP2VG as Jim, W8JIN, is another 267 thanks to OH2AA/Ø and VP2VG . . . Dewey, W6VE, nabbed IT1ZQ, UM8KAA and OH3RA/Ø thereby going to 263 as Jack, W6NTR, hits 248 with OH1ST/Ø, UO5KBR and UN1AB . . . Nosey, KH6IJ, submits new list moving him up 30 to 248 while Ed, W6LDD, ups to 244 with HKØAI, IT1AQS and VP2LU . . . Bob, W6NGA, moves to 222 with VO2BR and ZD9AE as Wally, W7ENW, keyed with ZD2DCP, OH1RT/Ø, EA6AW and YA1AM for a 212 total . . . John, W4CYY, sends new list with a 211 tag while Keith, W6RLN, goes to 210 with XE4A and VK9RW . . . Shelley, W6BAM, nipped 4X4FA

and LZ1WD for 204 as a new list from Helmut, DL1AU, moved him to 197 . . . Bill, W5ASG, slid to 269 with VP2VG and also upped his phone total to 205 with UQ2AN and VP2VG . . . Ross, W9RBI, goes to 259 with UM8KAA and OH1ST/Ø and A3's with UAØKAD for 39-240 on phone while Stan, W1CLX, moved to 255 with UM8KAA, VK1RW and OHØNB . . . Howy, W2QHH, rests on 251 thanks to OH2AA/Ø, SVØWO and VP2VG as Hal, W3OCU, hits 241 with OQ5CZ, IT1TAI and PJ2ME . . . Bob, WØQVZ, snagged YA1AM, FC8CF, SVØWO, I5RAM and UM8KAA to reach 226 while Carl, W1ZL, goes to 221 with KR6SA, VR4AA, PJ2ME, IT1ZGY and VK9TW . . . Pat, W2GVZ, made it 220 thanks to VP2VG as Bob, W6DBP, rose to 215 with UM8KAA, UN1AA, YA1AM and ZD4BQ . . . A new list from Lee, W8CED, puts him on 211 while Ray, W9VIN, moved to 208 with UG6AB, CR1ØAA, OH1NA/Ø, ZC5JM, ZD4BQ and VP2VG . . . New list from Sam, W3AXT, puts him on 199 as same from Tony, LU5AQ, adds three zones and 29 countries for a 39-195 total . . . Carl, W4NBV, ups to 187 with UL7FA, ZD9AF, VQ8AB and FS7RT while Bob, W2AYJ, hits 185 thanks to FB8BR, ZD3A, OH1RT/Ø VP2LU and ZC2CS . . . Juan, KP4CC, hooked UAØKJA for new zone as Carl, W1BFT, moved to 203 with UI8AG, BV1US, ZD9AF, OH1ST/Ø FB8BR, VU2JB, UL7GL and KC6CG . . . Wilson, W3WU, adds ZA1AB, 5A2TY, YI2DX, IT1AGA, VP8BK, FS7RT and OH1PI/Ø for 196 while Skip, W9YSX, ups to 175 with such as VR6AC, M1B, TA3US, KB6BD, CR4AS, ET3RL, UF6KPA, AP2Z, VR3G, HS1MQ (new zone) and ZS9G . . . Bob, W6YMH, comes up with UR2AO, ZC4IP, UN1AA, EA6AZ, VK9AJ, CN2AO, UO5AA, UD6DD, FM7WP, ZD3A, UP2KBA and UC2CB for a 169 total while Bob, W8TLL, adds 23 including such as BV1US, UF6AM, ZD1FG, ZS9O, TG9MR, UL7GL, YA1AM, GD3FBS, KX6AF and AP2Q for 164 . . . Aleta, K6ENL, hits 156 with GC2FZC, OY7ML, FB8BR, 4S7WP, OH2WI/Ø and UI8AG as Dixie, W2ZVS, adds 7 to reach 196 . . . A new list from W9NN puts Bob on 174 while Mike, W8LY, 28 Mcees to 136 with MP4BBL, IS1FIC, VQ3AC, 3V8FA, VP2JC and UAØLA . . . Bill, W2HO, hits 167 with FS7RT, UC2CB and ZD9AF as Zane, KA5ZS, adds VR3G and OD5AV for 71 . . . Lew, WØHX, hooked ZC4IP, XE4A and M1B for a 170 phone total . . . VP2VG was No. 231 for VK3CX . . . W3UXX collected WAVE Certificate No. 162 plus Czech S6S, Finnish OHA, Argentine 101 and British WBC/60 awards . . . Kurt, K6LSG, ran 30 watts to nab such as HB9GX, G8FC, CX2FD, DL1FF, PJ2AV, PJ2ME, WB6BE (Novice on Canton Is.), XE1PJ, ZK1BS, VS6CO and KV4AA for a 34 total . . .

For those of you who can read sideways here is the latest WAZ Honor Roll and a complete Russian Alphabet so you DX'ers can figure out more of the c.w. from U-land.

→

Here and There

Bandi, ex-HA5KBA/HA5BM, is temporarily stopping with relatives in Union City, N.J. and may be reached via W3AXT. He is having 2000 QSL's printed and has the HA5KBA logs with him and means to QSL to all as fast as he can catch up with them . . . We are happy to report that W8EKK's condition is much better after recent surgery . . . FK8AO left for France on April 2nd . . . VU2JA is ex-MP4BAF. He watches for Nebr. Colo., N. and S. Dak . . . VP4LZ is now W4HKY . . . Bill, W2BUV, now signs W2BIF, a call he held in 1927 . . . When WØUQV visited the IRE convention a get-together was held at W2BBK domicile. Present were WØUQV/XE4A/FP8AN, W2AQT, W2GT, W2JT and K2JXB . . . K6INI, ex-TI2TG, received stack of QSL's from the Radio Club of Costa Rica for one TI9AA who signed that call last year. Just another phoney we presume . . . We read somewhere that Fatty Fung, VS6CG, had passed on as a result of injuries in a car accident. VE7VC informs us that Fung is very much in the land of the living, having arrived in VE7-land in March, and will take up permanent residence there . . . VS1GX looks for N.H. 14010, 1200/1300 GMT . . . We regret to report the passing of Fergie, G2ZC, on Christmas Eve and Armando, CR5AA, on Feb. 12th in Lisbon . . . W1BOR's logging company operates six 60 watt mobile stations and two 90 watt fixed stations on 49.22 mc nbfm. He reports that conditions were such, between Oct. 1st and Jan. 15th, that they were able to converse S9 with stations on this channel all along the west coast from California to British Columbia. Company call is KCE-609 . . . The USCG ship ICEBREAKER took ZL5AA's logs to N.Z. covering QSO's up to March 10th. These cards should be forthcoming shortly . . . HR1LW is due to close down and come to W3-land . . . Answering a query from KA5ZS re KAØIJ and KG6IG, the Bonin and Volcano Islands are in Zone 27 (not Zone 25 as in callbook). They count together as one country. KAØ and (old) JAØ have been used in Iwo Jima and KG6IG from other nearby islands. We believe the call series KG6IA-KG6IZ was designated for use on Tinian and Saipan in the Marianas (also Zone 27). The use of KG6IG in the Volcanos is OK by us as it is the QTH that counts! . . . KV4AA was happy to report visits from W3BFK, W1NNB, K2QLX, K2PSN, WN2VGH and K2HCE . . .

Russian/English Alphabet

Russian Capital	Russian Lower Case	English Pronunciation	International Morse
А	а	a	A
Б	б	b	B
В	в	v	W
Г	г	g	G
Д	д	d	D
Е	е	e	E
Ж	ж	zh	V
З	з	z	Z
И	и	i	I
Й	й	i OR y	J
К	к	k	K
Л	л	l	L
М	м	m	M
Н	н	n	N
О	о	o	O
П	п	p	P
Р	р	r	R
С	с	s	S
Т	т	t	T
У	у	u	U
Ф	ф	f	F
Ц	ц	ts	C
Ч	ч	ch	– – – ·
Ш	ш	sh	– – – –
Щ	щ	shch	Q
Э	э	é	· · – · ·
Ю	ю	yu	· · – –
Я	я	ya	· – · –
Ь	ь	–	X
Ы	ы	y	Y
Х	х	kh	H

WAZ HONOR ROLL

WAZ

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W6DZZ 265
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W8PQQ 265
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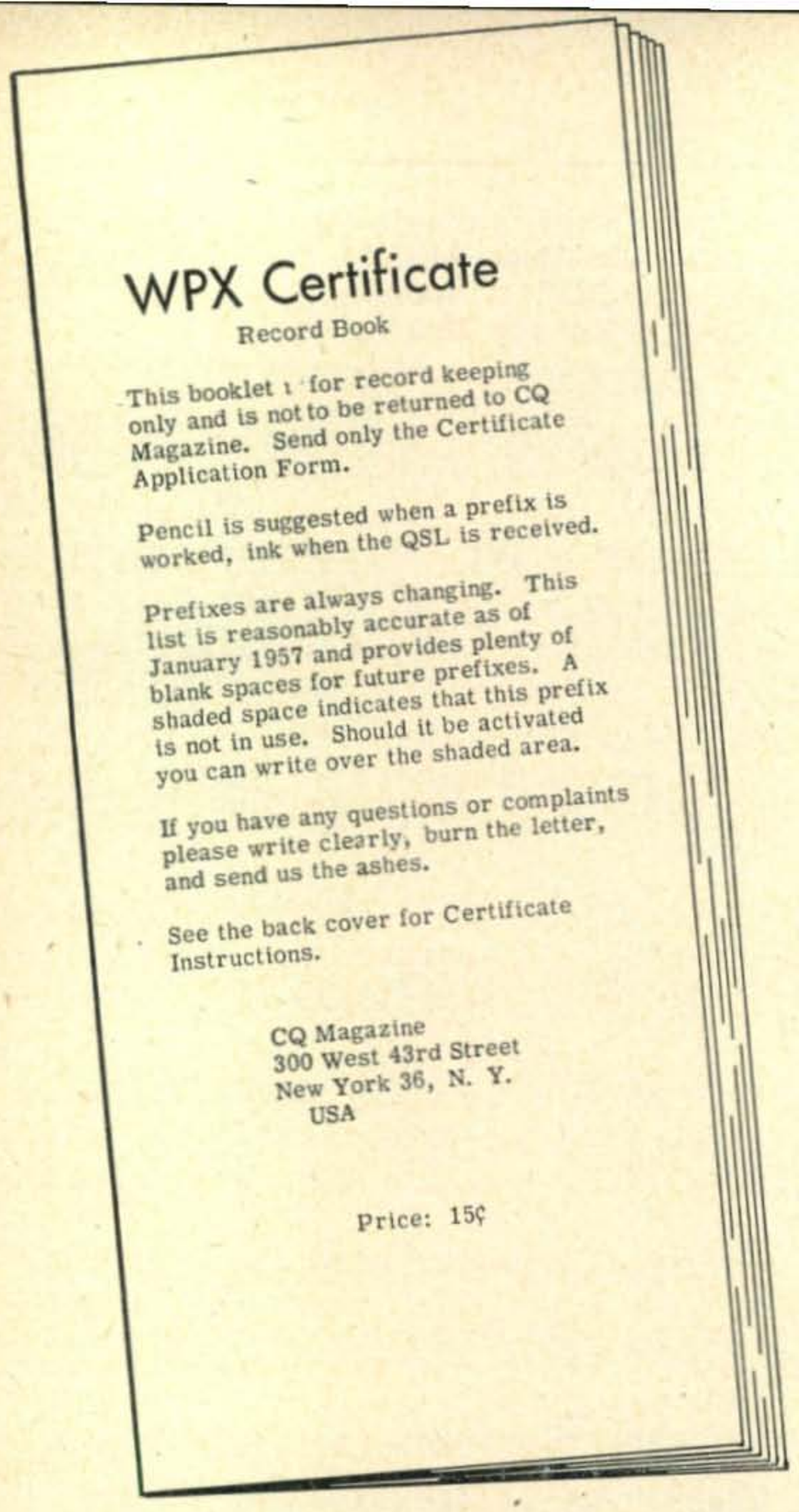
Last Complete HONOR ROLL Appeared in the January Issue.

Next Complete HONOR ROLL Appears in the September Issue.



This record book lists every prefix in use today and has a place for you to fill in the call letters of the stations you contact using them. See January CQ page 83 for details of the WPX Certificate. Send 15c in money or stamps (foreign or U.S.) for each booklet.

Last Minute Items

W4KVX, W4OMW and W8EZF concluded their very successful operation from VP5BH, Grand Cayman Island, on Mar. 27th. Some 4000 contacts can be shown for their all band, phone and cw, around the clock activity after a week's stay. Approximately 2500 contacts were made in the last half of the DX contest alone. We wish to echo the sentiments of all those who added the Cayman Islands to their lists with a resounding "WELL DONE!" . . . Those needing GHANA might watch for ZD4CB, 14125, A3 and ZD4BF on 14 and 21 mc A3 or SB. GHANA counts as a new country from March 4th 1957 . . . W1KFV moved to Fla. and is hitting the DX trail again as W1KFV/4 . . . YI3AA and YI2DX have been heard on 14081 around 2000 GMT . . . FW8AA has been heard again (Wallis Island), 14340, 0930 GMT . . . VK2ACX says that activity is expected from VR6TC on 14015 while VR6AC should be heard on 14143, A3, on Wednesdays, Saturdays and Tuesdays between 0600 and 0700 GMT . . . W9KOK has received logs covering AC3SQ activity for 1956 (sigh!) . . . If promised gear reaches EA9DF before April 15th he was due to be on from IFNI at that date . . . Reports reach us that FB8CD, Comoros, was due to go on around March 29th (150 watts) . . . VK3GX worked C2KAA with the latter claiming a power of 2 watts . . . KC4USH has been very active on cw, 14080, from Cape Adare. Re QSL's, no ship until next January! . . . LU4AQ reports Korea activity (FCC Ban) from HL2AC, Chong, Box 1072, Seoul, on CW and HL2AJ, Chuin, National University, Seoul, on phone . . . Missing QSL's for KC6CG, Ulithi Atoll, may be requested from Ed, W2UDI . . . WØDEX has decided to abandon efforts to get to Pitcairn (VR6) and concentrate on American Samoa, KS6, for DX'pedition this Summer. Transportation to this spot is also difficult and suggestions are welcome . . . Art Godfrey, K4LIB, who was mighty popular as K4LIB/FQ8 on SB (some cw) wound up his big game jaunt to French Equatorial Africa, complete with KWS-1, on April 2nd . . . Yves, FF8AJ, now keys from Ouagadougou, Haute Volta. QSL's go to the airport there (French West Africa) . . . K6IUW advises that a new station is getting dug in, near the North Pole. But—he is being bootlegged by a couple of fellows who also sign KL7, KG1, VE8 etc. The genuine station is Bill, who knows ham procedure. An application of 15 WPM cw will make the fake boys fold in a rush. Those who work the bootleggers can advise KL7MF who can squelch them. Further word identifies Bill as T-Sgt. William F. Settle Jr. (WL7BVS). He will be in KF3-land from 60 to 90 days until relieved by another radio op . . . JR6A tried to impress upon VK3KB that he is a legit Jap station on Okinawa! (?) . . . Notes from John, W6YY, state that a real rare one is Shen, C3MH, who operates ten watts phone on 14199 around 1600 GMT. Won't give exact QTH but says he is the only Chinese ham on the air. QSL via W6YY . . . ZC5RF is on 14150, phone, from Br. North Borneo . . . TA3US is again giving the boys phone contacts from Turkey . . . Lucies, XW8AC, continues considerable phone activity from Laos and says that Marcel, XW8AB, is not on cw very much due to press of government work . . . Missing any Russian countries?—watch for the big UA contest on May 5th—! . . . Business seems to be picking up for Danny Weil in his campaign towards YASME II with many lecture dates. He should be in the New York area as this is read. Want him to visit your club? Let W2NSD or KV4AA know. KV4AA may be QSO'd on 14080 between 1730/1815 and 2030/2115 EST, daily . . .

73, Dick, KV4AA

What is a radio ham? He is the neighbor next door, your newsboy down the street, your grocer, perhaps your family doctor or your favorite movie star. He is, in short, anyone who owns and operates his own personal short-wave radio station. A few advanced amateurs even have home television transmitters but they are not commonplace as yet. Give 'em time!

There are more than 140,000 of these short-wave amateur radio stations in the United States. Another 60,000 hams are scattered throughout every portion of the globe, civilized or uncivilized . . . behind the Iron Curtain, on frozen Arctic wastes, on Pacific atolls, in the heart of Africa s steaming jungles.

Ham radio started near the turn of the century. America owes her leadership in the fields of radar, TV and radio to the ceaseless experimenting which goes on in "hamshacks" throughout the land. Most hams, though, are not professionals. They are school children, business men, or retired men and women. The hobby is a Godsend for the sightless and handicapped, providing them with a magic carpet to the far corners of the world, right at their bedside.

Somewhere in the United States, every hour of every day the year around, a new ham gets on the air for the first time. That's how fast the hobby has mushroomed since 1951, when the Federal Communications Commission first issued the "Novice Class" license. The most truly democratic of all hobbies, ham radio has infiltrated into tenement flats in Brooklyn, cowboy bunkhouses in Wyoming, millionaires' penthouses in Hollywood . . . and the house next door or down the street. At the rate of more than a thousand per month, your neighbors are discovering that ham radio is inexpensive, safe, takes very little room in the house, and provides a gigantic "party telephone line" with the whole wide world as close as your loudspeaker.

What is this Novice Class license, and why did Uncle Sam start urging his nephews and nieces to take advantage of it?

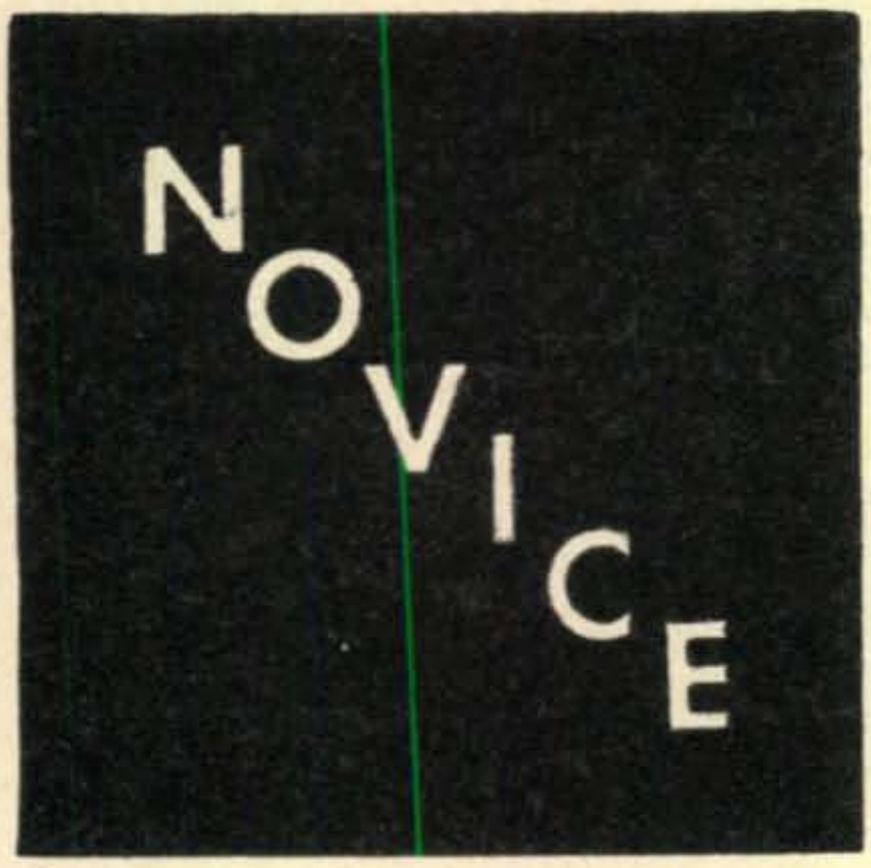
The Novice Class examination is a simple one which you take in your own home . . . a few questions requiring a beginner's knowledge of basic radio theory and governmental regulations, plus the ability to send and receive International Morse code at the rate of twenty-five letters (or five words) per minute. Upon passing this test the applicant is assigned a station call, just like the broadcasting or TV station in his home town. As a Novice or apprentice, you can broadcast on the air for one year only. During that year, however, you usually pick up enough additional skill to pass your "General Class" license, which is good for as long as you wish to keep it operative, merely by renewing.

There is a very definite and practical reason why our government wants Dad, Mother, Brother, and Sister to take up ham radio, of course. This is a push-button age. America's survival in a scientific era may well depend on its technicians. There is no easier way to embark on a career in electronics and allied fields than Amateur Radio.

Ham radio is a friendly, neighborly, happy hobby. Why don t you join us?

Vy 73, Walker A. Tompkins, K6ATX

Donald L. Stoner, W6TNS
P. O. Box 137
Ontario, California



These words were written by Tommy, K6ATX, as a note to his book *SOS At Midnight*, and are something that I have wanted to say for some time. K6ATX says it so much more eloquently than I could, that I was unable to resist passing it on to you. Tommy's book is most unusual and should be of special interest to beginning hams. This book is the first fiction written that revolves entirely around ham radio. Although the plot is not likely to take place in your home town, it does show what *hams* can do under similar circumstances.

The setting for the story is Santa Bonita, Calif. (a fictitious town patterned after Santa Barbara). The principal character is Tommy Rockford (who is given the authors' call, K6ATX and his name). Tommy inadvertently deciphers a morse code message for two members of the "Purple Shirt Mob" a gang of Southern California smugglers (also fictitious,

naturally). Upon realizing something is "phony" he and his friend Doc Baldwin, K6CRJ (in real life, Nils Bolduan) follow the smugglers to the pickup point for a dope shipment. Jigger O'Dell discovers that Tommy has followed him and he later kidnaps (or hamnaps?) K6ATX, but not for revenge. Rather, Jigger wants Tommy to repair a smashed transmitter at the smugglers' hideout. Tommy only has a short time to make the repairs and is under constant surveillance by the smugglers, who plan to "rub him out" after the repairs are complete. How does it end, you ask? Not on your tintype, why, that's like telling you how the movie ends when you go to see a whodunit.

The attention paid to small details in the story (such as Tommy's *Heath DX*-100 and Doc's *Gonset Communicator*) make you feel that you are right there with them. All the call letters used in *SOS At Midnight* belong to real people, only the names are changed "to protect the innocent", as they say. You may not realize it, but it is not legal to make up an amateur call for any reason. Therefore, it was necessary for the author to obtain permission to use real calls, from the amateurs, and from the FCC. When you are issued an amateur call, it is yours for life, or as long as you renew, and no one else has one exactly like it.

Tommy has a lot of fun giving calls to the characters in the story. As an example, he refers to "one guy here in town, W6ULS (Used Lip Stick), who got his Novice ticket when he was past eighty". However, Tommy is just kidding, Merle got his Novice license when he was only 45.

If you're looking for a book with a "ham flavor" (no pun intended) to read while waiting for the DX to come in (or any other time, for that matter), this is it. If you only know a little about ham radio, *SOS At Midnight* will fill in the details. Want to get your girl, wife, sister, mother or father interested in Amateur Radio? Give them a copy of *SOS At Midnight* and it will be "a lead pipe cinch".

SOS At Midnight is available at all the better bookstores across the country. Many of the radio stores have it at "amateur net price" which will cost you somewhat less than at a bookstore. If you have trouble locating the book, drop a card to K6ATX or myself.

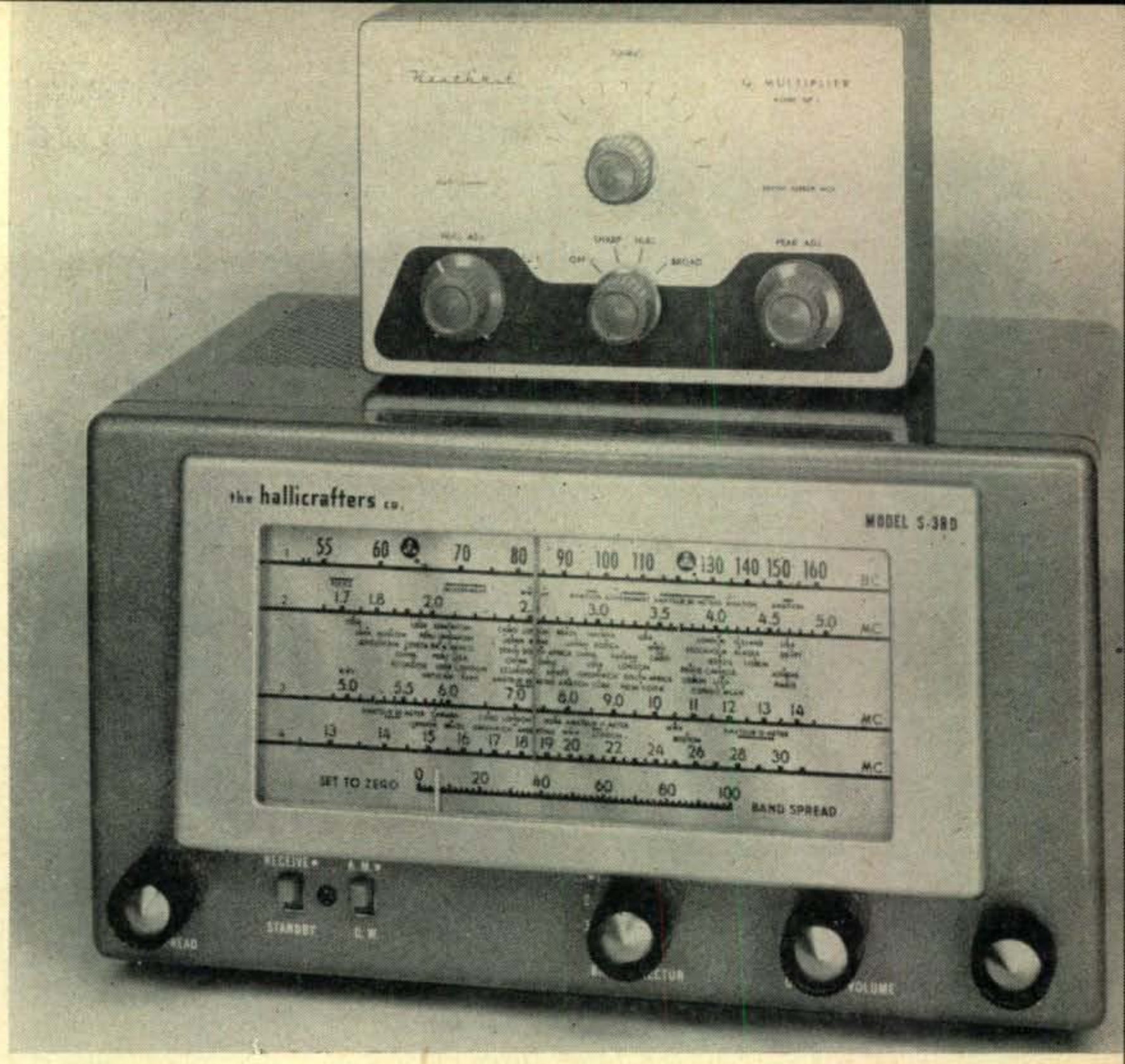
MARC Sparks

Last, but not least, I want to thank The Michiana Amateur Radio Club, Inc. 1127 Congress Avenue, South Bend 15, Indiana for the copies of the MARC Sparks that they have sent me. Since this end of the country is my ole stomping grounds, I always enjoy hearing what is going on back there. This month's issue had some excellent information on "Amateur Radio Operation and Interference to Television Receivers". Thanks fellows.

Who's Being Heard in Europe

In an effort to constantly improve The Novice Shack, I have "adopted" a European correspondent. Tima Popovic, YU1FR, SWL-YU1-RS-357, Banat-Novo-Selo Yugoslavia. Here is the latest from Tima: "The lack of self confidence probably prevents most of the Novices from thinking of their signals being heard DX-wise. They only listen to strong signals and work each other instead of taking advantage of the really nice DX possibilities offered by the 21 mc band, thus losing a lot of fun. I would suggest to the WN/KN fellows to listen more attentively to weak signals. Perhaps it would work out in some cases. I also think that the WN/KN gang will be interested in knowing that their signals are received here both well and often. So, I am listing below a few recorded during the past several weeks."

Jan. 20 between 1615 and 1830 GMT: WN1MKA, TPQ, IQV, JFL, MIW, MDO, LTN, NKV, LMI, IRQ, KN2-YBF, SBT, SXO, UFM, WN2-UAF, VIJ, TBQ, KN2-VAB, UAP, WN3-HET, GGL, HEA, IOX, GRV, IRI, GLE, KN3IXX, KN4-JMS, LEX, ICK, GLT, KJN, LGK, KRB, JFE, JPC, LEA, KKB, JFZ/4, JWZ, UMH, LGI, IFB, KN5-IAX, IBZ, EJS, KN6UDC, WN7EBX, WN7FYW, KN8-AME, ANG, APW, CFH, KN9-DLJ, GLC, DAF, EMQ, GBD, ERU, IUV, WN9DZK, KNØHZL, HKH, IEW, HBS, HYX. January 22, between 1500-1800 GMT: WN1-KGR, OTI, OBJ, LJO, IQQ/1, KN2-UMI, UWY, SMU, UME, VOD, ROR, TXT, UDM, VUV, UMH, VOL, SJM, VCQ, KN4-KJN, JHI, LNM, HZK, LXJ, JYF. January 23, between 1700 and 1746 GMT: KN1AGS, WN1-LEG, MOI, KN2TBP, KN4-KTR, MAT, KIC, IYX. January 27, between 1546-1742 GMT: WN1-KCI, MIX, KN2-SDD, SLZ, WN3-GLZ, JMU, FIM, KN4-IYO, KDB, JFZ, KID, KDA, MAW, KN8-AKB, CDE, KN9CRD, KNØ-GNS. January 25, between 1300-1744 GMT: KN1AAK, WN1LGI, KN1AIK, KN2-SEM, TSE, RRU, WN3-FIW, JFM, KN4-COO, MGL, LER, JGD, KN8-CLN, DRZ, BGR, CIT, DEQ, KN9-CSS, EOO, DCY, CVC, DXE, KNØEUW. January 29, between 1530-1700 GMT: WN1OJH, WN1AFR, WN3-JMU, JSD, KN4-LEM, HQS. January 30, between 1600-1711 GMT: KN1APQ, WN1OJJ, KN2U-ZA, WN3-GRO, FJF, WP4AIR, KN4IJY, KN-8ARL, KN9-EXB, SKR, KNØGUJ. February 7, between 1600-1741 GMT: WN1JGR, KN1-ADL, KN2-RLG, RYO, SLO, SNK, WN3-JMP, IXM, JGR, IGV, KN4-MRI, MAQ, WN7-FGW, KN8BXO, KN9-DMG, GPY, HNG, CPE, RRY, KNØHNG. February 8, between 1700-1745 GMT: WN1MHG, KN1ANT, KN2-SMS, JFB, WN3IXM, KN8DMH, KN9-ELH. February 19, between 1700-1735 GMT: KN1-AWQ, OTI, WN1-OJD, KIG, KN2VQZ, KN4JQI, WN8BAR, KN8-CQV, CXQ, KNØ-HWK.



The Hallicrafters S38D as modified for use with a QF-1 "Q" Multiplier.

Gad, I didn't think that there were that many Novices on 15 meters! Tima advises me that he will send lists of stations heard in Yugoslavia periodically. His letter continues "By the way, I have about 300 SWL cards left, if anyone of the WN/KN's listed would like to have a card with the report on his signals, he has just to send me a QSL card with the request, either direct or via the bureau. I will answer all cards 100%". So fellows, if you're on the list, drop Tima a QSL card and get one from Yugoslavia.

Net News

The Dixie Teen-age Net (DTN) meets daily at 1600 EST on the frequency of 7207 mc, type A3 emission. All interested people can contact K4CDZ, net chief, or myself. The purpose of the net is for rag chewing, net procedure training and traffic. All teen-agers are invited to call in at the net time. 73's Nields DeVire, "Neal" K4JAK.

John Edwards, KN2TNW, 71 Armour Rd, Mahwah, New Jersey, would like to contact anyone interested in starting a Novice Net.

Adding the "Q" Multiplier to AC/DC Communications Receivers

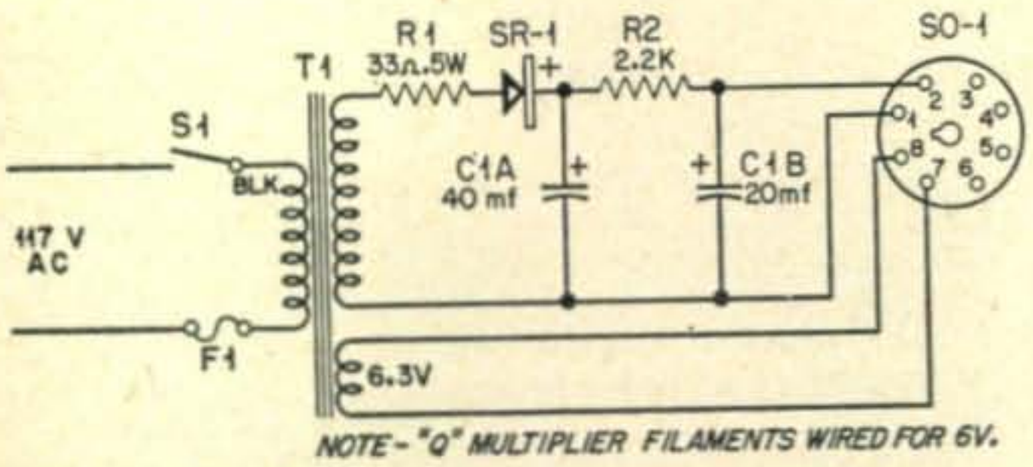
I have received many letters from owners of ac/dc communications receivers such as the Hallicrafters S-38 and the National SW-54. They desire to add a "Q" Multiplier such as the Heath QF-1 to their receiver but are stumped as to how to go about it. As you probably know, one side of your 117 volt ac power line is grounded every so often along the line, for lightning protection. In addition, one side of the power line is usually connected to the chassis on an ac/dc radio because it is common to the negative lead of the power supply and the cathode and grids of the various tubes. You can plug in the line cord in such a manner, that the ungrounded side (the "hot" side) of the 117 volt power line is connected to the chassis of the receiver. You have a 50-50 chance of connecting it in this manner and under such circumstances, a hazardous potential exists between the chassis of the receiver and any grounded piece of metal.

The manufacturers avoid this condition, by neatly enclosing the chassis in a case that is fully insulated from the chassis. The back is covered by a piece of ventilated material. When making any changes in the receiver (such as adding a "Q" Multiplier), do not attempt to defeat their efforts to protect you.

Since the S-38 series receivers are so very popular, I decided to establish the best method of adding a "Q" Multiplier to this receiver. I found that this modification (usually found in only the most expensive receivers) made a fair DX "ether sucker" out of this popular receiver.

Notice

"Panic", an NBC-TV production, will feature Ham radio saving a man from a flame ridden building . . . make sure and tune in Tuesday night, May 14th.



Schematic diagram for the Heath QF-1 power supply. When using such a supply, it is possible to modify an ac/dc communications receiver to use the Q Multiplier.

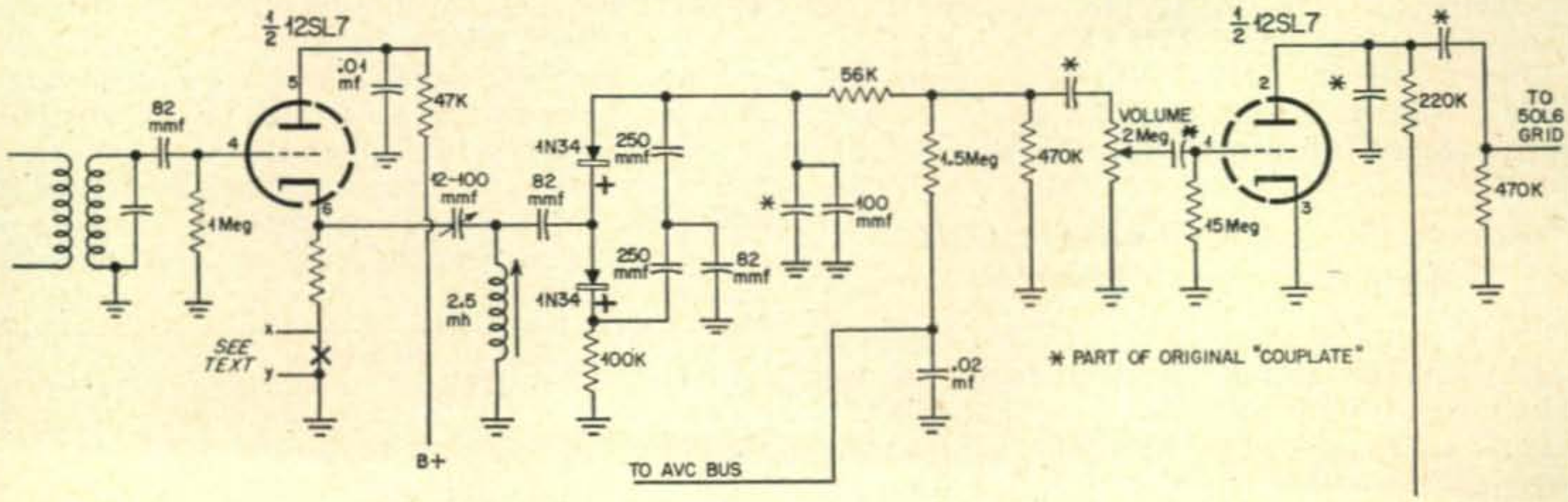
First, locate pin 3 (plate) of the 12SA7 tube and note that there is a wire connected from this point to the i-f transformer lug. This is the point that the "Q" Multiplier is connected to. To make the signal connections, locate a place on the rear apron that is near the 12SA7 tube, and mount 2 *Johnson* No. 111-103 Nylon binding posts about an inch apart. The cutout area for the serial number makes a pretty good spot on the S-38D. From the terminal binding post closest to the 12SA7, connect a .001 mfd disc ceramic capacitor to the 12SA7 plate connection on the 1st i-f transformer. Connect another .001 mfd disc capacitor between the other binding post and the chassis. This is the extent of the changes to the communications receiver. Since the capacitor will disturb the alignment somewhat, it will be necessary to "touch up" the tuning of the 1st i-f transformer. To do this, tune in a weak station and adjust the bottom and top slugs (or two screws on top on some receivers) with an insulated phenolic alignment tool. The slugs should be tuned for maximum volume. *Do not* monkey with any of the other adjustments for they were correctly set at the factory. Strip back the insulation on the shielded cable from the QF-1 and un-braid the shield. Tin both the shield braid and the center conductor. Connect the center conductor to the binding post that has the capacitor to the 12SA7 plate (the left one, if you followed the above instructions) and connect the braided conductor to the other binding post.

The "Q" Multiplier obtains its power from an auxiliary power supply such as the one shown. Although I had planned on a step-by-step construction project, I got so long winded about other things, that we did not have room for it. The supply is straight forward, and no difficulty should be encountered with it. The components were mounted on a 5 in. by 7 in. by 2 in. chassis (*California Chassis* A-101). An 8 pin octal socket mounted on the rear apron is used to mate with the QF-1 cable connector. Using the components specified, will produce a B plus voltage of approximately 160 volts.

The operation of the Q Multiplier is exactly the same as when used with other receivers. It increases the selectivity many fold. Incidentally, it is unnecessary to modify the Heath QF-1 and it should be adjusted in accordance with the Heath manual.

I received a letter from Homer E. McCoon, 127 W. Main St., Phelps, N. Y., about some changes that he had made in his receiver. Although I have not had time to install them in the S-38, and test them out, Homer sounds like he knows what he is talking about. He describes himself as "an electronic grease monkey on the Sylvania TV tube production line at Seneca Falls". He writes: "One thing which I don't see much of in your magazine is improvements on low price receivers. I rather doubt that all hams are in a position to pay $200 for a receiver. My set is an S-38B and the 35Z5 has been replaced by a germanium voltage doubler and an OB2. We used to have line voltage that varied from 98 to 115 volts, other wise I do not think the VR tube would be worthwhile in this set. It supplies the B plus to the 12SA7, 12SK7 and the Q Multiplier. The full doubler voltage goes to the 50L6 and 12SL7 that was substituted for the 12SQ7. The enclosed diagram may help to explain this last change. Believe it or not, this circuit more than doubled the AF output voltage of the 1st audio stage. I tried the diode doubler detector first, but it loaded the i-f stage so that it was too broad tuning. The cathode follower stage takes care of that problem very well, in fact the S-38B is almost too selective now."

Schematic diagram of the modifications suggested by Homer McCoon in the text. The cathode resistor is 1K.



Referring to the schematic he says: "The cathode circuit of added i-f stage works as shown, but it might be better with the grid resistor returned to "x" and more resistance, say 5K ohms, added between "x" and "y". The L/C ratio should be as high as possible to match the detector load, I used a 2.5 millihenry coil and a 12- 100mmfd trimmer. A half wave voltage doubler circuit should work as well without the blocking capacitors and resistor. For other similar sets with minature tubes, the 12AX7 should work with the same component values."

Many thanks for the information, Homer, I am sure that many of the readers who have "experimenters blood" in them will be very interested in your changes. However, if any questions should arise in the readers mind, please fire your questions to Homer, not to Hallicrafters Company or myself.

I would like to take this opportunity to thank the Hallicrafters Company who so kindly supplied me with the S-38D so that I could test the Q Multiplier modifications.

Letters

VE3EGG (Ham and Egg), Ernie Crump, writes about a very nasty situation.

Dear Don: I hear a lot of Novices on 20 cw, right in the QRM amid all the DX. You should help the Novices correct this as it could be a very embarrassing situation. I hope none of you have QSL's from the FCC. Inside of an hour just tuning the band, I heard about 10 Novices, mostly KN4's and KN9's plus one or two WN2's, KNØ's and KN5's. I looked for the address' of these fellows in the Summer 56 call book, but most are not listed, so I couldn't tell them to watch out. Better check your rigs, as 40 meters isn't the only band you are getting out on. Best of luck and good DX to you Vry 73's Ernie, 64 Barrie St. Galt, Ontario. *I am well aware of the situation, Ernie, but it is human nature for a person to think "it can't happen to me" I would suggest that each and every Novice reading this have a friend across town check his second harmonic radiation. He might be able to hear it weakly, if he is close enough, but it should be at least 100th the strength that the fundamental is.*

From the "information requested" pigeon hole comes:

Your Feb. 57 CQ showed a beautiful 55 ft. mast built for $15 by Edward Marks. I know a pix tells a lot, but wouldn't it be better to also give us a line drawing showing some detailed specifications? Details save us time, experimentation and risk. F. A. Duncan, W3NB. *Roger OM. How about it, Ed, can you supply the Novice Shack with the details?*

Parts list for the Q Multiplier power supply.

C1a, C1b—40-20 mf electrolytric can (Sprague TVL-2425)
F1—1 amp fuse and fuse holder
R1—33 ohm, ½ watt resistor
R2—2.2K, ½ watt resistor
S1—Single pole, single throw toggle switch
So1—8 pin octal socket (Amphenol 168-001)
Sr1—25 milliampere selenium rectifier
T1—135 volts @ 15 ma., 6.3 volts @ 0.9 amps (Triad R-2C)
Miscellaneous parts required—Chassis 5 x 7 x 2 (California Chassis Co. A-101) power cord, assorted nuts, bolts and washers.

Roger Franke, K9AYK, 1229 South 21 Street, Manitowoc, Wis. has a good suggestion:

Dear Don: How about a little information on how to set up a station properly? By that I mean how to set it up so you have only one switch to flip to go from transmit to receive. My biggest problem when I got my Novice ticket was where should I put my transmitter and receiver so I could have them right at hand for crystal changing and tuning and how should I hook them up so I don't have to throw three switches to go from transmit to receive. My rig is a DX-100 and an SX-71. I operate all band 15 to 80, QSL 100% and will be glad to give any Novice a sked for a new state. I am looking for those 10 states consisting mostly of W7 and W5 areas. I would like to make a sked with someone in Florida. I wish to extend my best wishes to you, Don, and just keep writing a good column such as in the March issue. Very best regards, Rog. *Ah, I'm blushing Rog. Thanks for the suggestion on one switch control. I will do you one better, see the column next month. "The Octopus" controls the receiver, transmitter and the antenna with the code key, no switches!*

A letter and a photo arrived from Cliff Hall, WN1NYK,13. He says:

Dear Don: The rig here is a DX-35, HQ-100, a long wire on 80 and a folded dipole on 40 and 15. I would like 15 meter skeds with hams in New Mexico, Arkansas, and Idaho for "WAS". Cliff Hall, 25 Park Avenue, Webster, Massachusetts. *Fine business, Cliff, your station photo is around here someplace, but you should have been in it too.*

Jim Potter W9GXC describes an unusual station. He writes:

Dear OM: I am a Novice Technician with *all* home brew gear. The receiver, not yet completed, uses the front end of an AR-2. The 6146 x-mtr runs 30 watts to a long wire. As soon as my monetary situation brightens, I hope to have a bandswitch xmitter running 75 watts on 40 and 15 with 90 watts on 6 meters. I did at one time have the thing running 75 watts on 40 cw (7186) but the 6X5's in my bridge rectifier power supply developed internal heater cathode shorts. So much for that. I have had one contact but lost him in the QRM. My lack of contacts in one month on the air is probably due to the fact that I stuck the 6AG7 and 6146 into convenient holes in the chassis and wires are going every which way. 73 OM, Jim Potter, K9GXC, 203 Court Street, East Peoria, Ill. *Sorry to hear that you have been popping 6X5's, Jim. You can avoid this trouble if you use a separate 6.3 volt filament transformer for each 6X5. This avoids the high heater cathode potential and the tubes will last indefinitely.*

Help Wanted

Elmo W. Kangas, Box 165 San Jose Br., Bisbee, Arizona (31) needs help with code and theory for his General.

Kenneth J. Montgomery, FT3 USS Colleton (APB-36) S-3 Div., South Boston Annex, Boston 10, Mass., would like to meet a ham in Boston and he needs help with his code and theory. The phone number is Devonshire 8-8926 or 8-8928.

Paul Prato, 1314 W. Missouri, Phoenix, Arizona (age 13) would like help with the code and theory and advice on getting started in ham radio.

Jim Goralski, 1823 Van Camp, Omaha 8, Nebraska would like help with the code and theory and to meet an experienced ham.

That puts the cork in the bottle for this month. More news follows next month in addition to information on constructing the T2FD antenna and "The Octopus" (a device for controlling your station with your key).

73, Don, W6TNS

RTTY

Amateur Radioteletype Channels

National, FSK 3620, 7140, 27,200, 29,160, 52,600 kc.
National, AFSK 27.2, 147.96, 144.138 Mc.
Area Nets:

California	147.85 Mc.	AFSK on AM
Chicago, Ill.	147.70 Mc.	AFSK on FM
Detroit, Mich	147.30 Mc.	AFSK on FM
Washington, D.C.	147.96 Mc.	AFSK on AM
	147.495 Mc.	AFSK on AM
New York City	147.96 Mc.	AFSK on AM
Livingston, N.J.	146.30 Mc.	AFSK on AM
Buffalo/Niagara	147.50 Mc.	AFK on AM
Boston, Mass.	147.96 Mc.	AFSK on AM
Seattle, Wash.	147.00 Mc.	AFSK on AM
Spokane, Wash.	147.15 Mc.	AFSK on AM

Byron H. Kretzman, W2JTP
16 Ridge Drive, High Hills
Huntington Station, N. Y.

Why RTTY? A W6 once opined in a letter to a friend of mine that RTTY offered little of the dramatic elements of DXing and offered only dull lifeless QSO's. My friend promptly sat down at his typewriter and gave the W6 a few reasons why he liked RTTY: "I told him about the terriffic people who are on, and the interesting, intelligent QSO's that ensue. It takes quite a bit of personal drive to go to the trouble of building a converter and associate equipment, a trait that separates the men from the boys, a sort of a filter that insures fine contacts from those who make the grade. RTTY takes the ability and the desire to learn. All together, radioteletype is similar to SB in that once you get on with it you find a splendid gang there with you.

"The next point I made in my sales talk was that plenty hams are almost illiterate, and the practice of sitting down to a typewriter to talk would be quite helpful. If you doubt this, write to any radio editor. He probably can tell you.

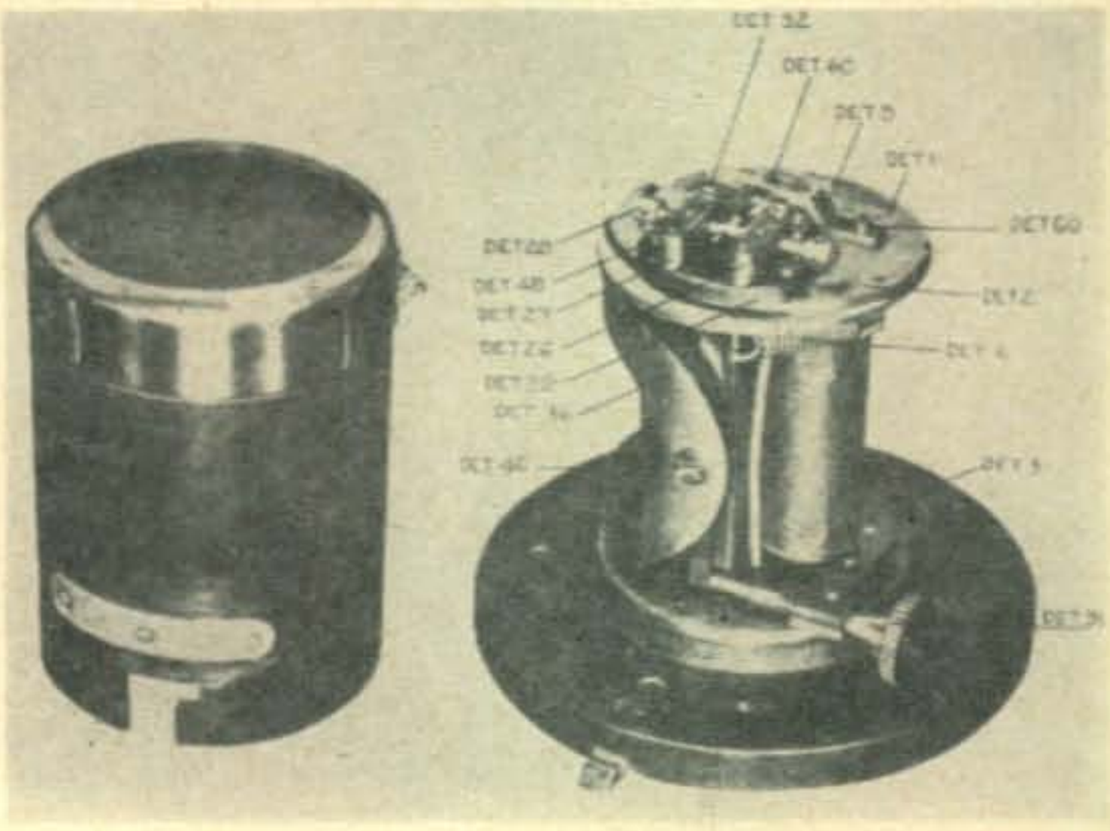
"Then there are the topics of discussion. Ouch! Listen in on any phone band for a few minutes and tell me what you hear—ham radio. Did you ever try to make one single new QSO without telling the other fellow what equipment you were using? I'll bet you would be tongue-tied in less than 30 seconds. You doubt it? All right, hero, try it and see for yourself. If you have a tape recorder around the shack try recording different QSO's you hear on the band and play them back a few times. This miserable state of affairs has probably come about as a result of our spending years learning how to talk with people, and then suddenly being confronted with a one-way method of communication. The result is that we learn a certain spiel and stick to it, thus sounding nice and glib. Until we figure some way to work duplex again I think that this problem will remain largely unsolved for voice communication. In writing we have a completely different story. We are all used to writing our communications one way. RTTY is like writing a letter to someone, only he gets it as you type it. What you say is permanently recorded and you have all the time you want to phrase your words in the way you want them. Thoughts are fun when they are expressed well. Writing is fun when you have something to write about. On RTTY we spend a lot of time and thought on what we say. The results are wonderful.

"The experience of RTTY operating leaves a lasting mark on the operator. I can usually tell just by reading the first paragraph of a letter whether the sender is an active RTTYer or not. The fellows that are ordering machines send me postcards and five line letters. The active operators send me two page interesting letters.

"Another factor that I pointed out is that since RTTY is such a new field in amateur radio there is a lot of experimenting to be done. This has attracted many of the most active minds in amateur radio. As the months go by I find more and more of the same call letters that I have been seeing on top in other ham activities appearing in the RTTY ranks."

Those most eloquent words were written five years ago by a pioneer RTTYer, and ap-

Combination Wheatstone Relay 1-F, Assembly. Wheatstone Polar Relay 1-B.



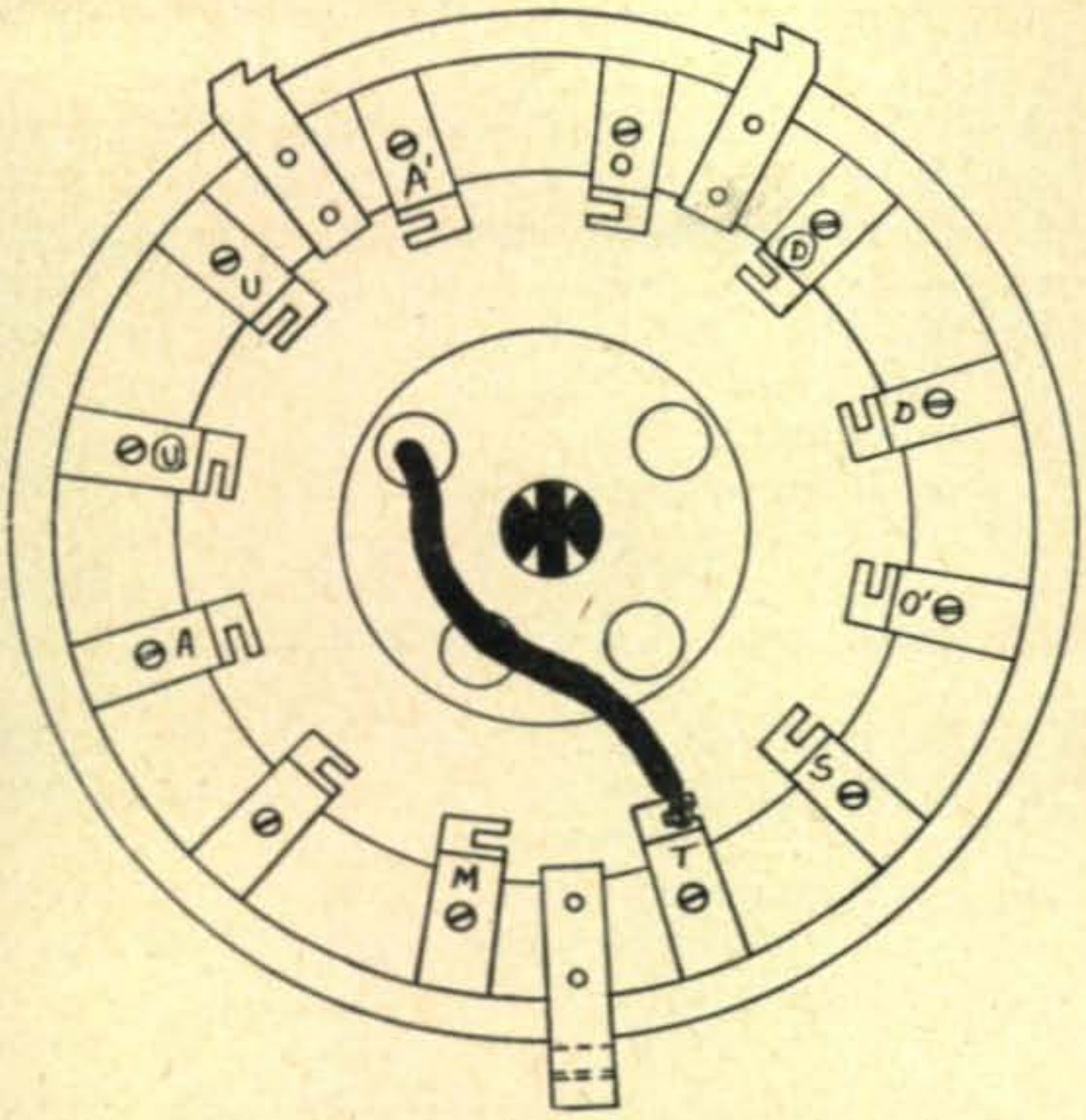


Fig 3 Wheatstone Polar Relay 1-F, Base Connections.

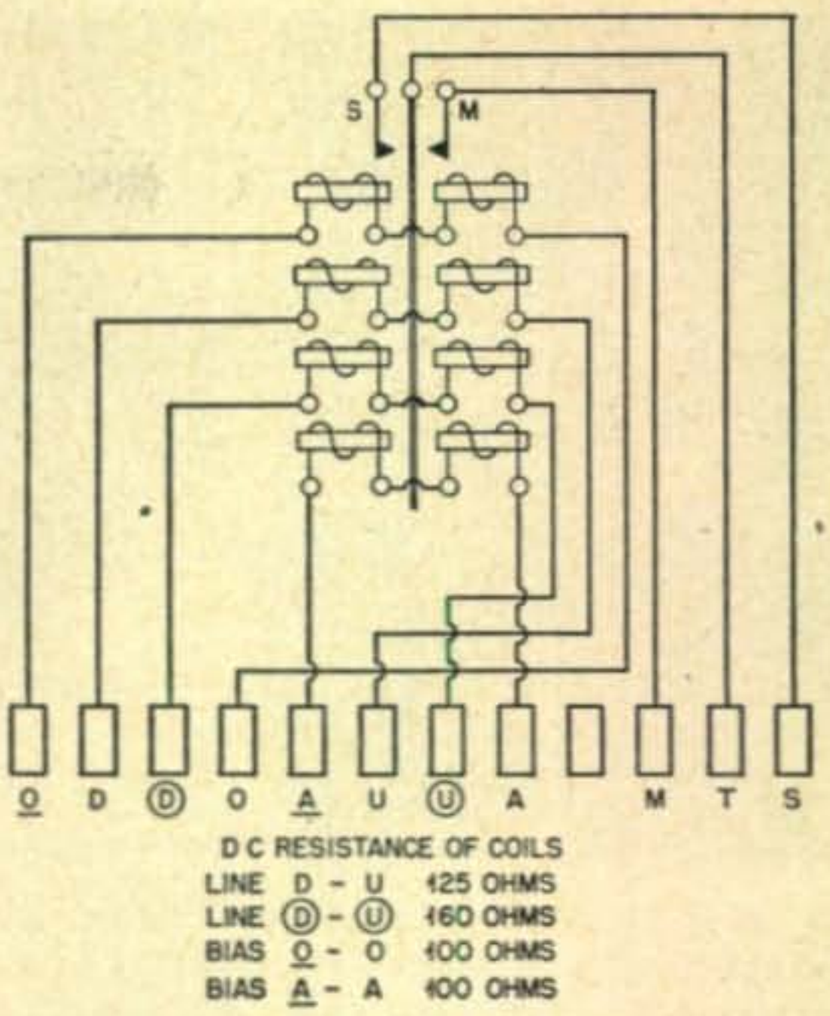


Fig 2 Combination Wheatstone Polar Relay 1-F, Schematic Diagram.

peared in *CQ* in the October 1952 issue. *(Here is where I find out whether or not Wayne reads this stuff.)*

Polar Relays

Back in the October 1956 issue, this column gave detailed instructions on the care and feeding of polar relays, mainly the WE 215A and 255A. Since then we have received word from W2ITQ and W5PCN that the older Wheatstone relays, dispensed one by one with Model 12's years ago, were now being retired from service by *WU* in fairly large numbers. It appears probable that a quantity will wind up in RTTY.

The diagram of the Fork standard as shown last month is incorrect.

The correct diagram is shown below. Mark your April copy now.

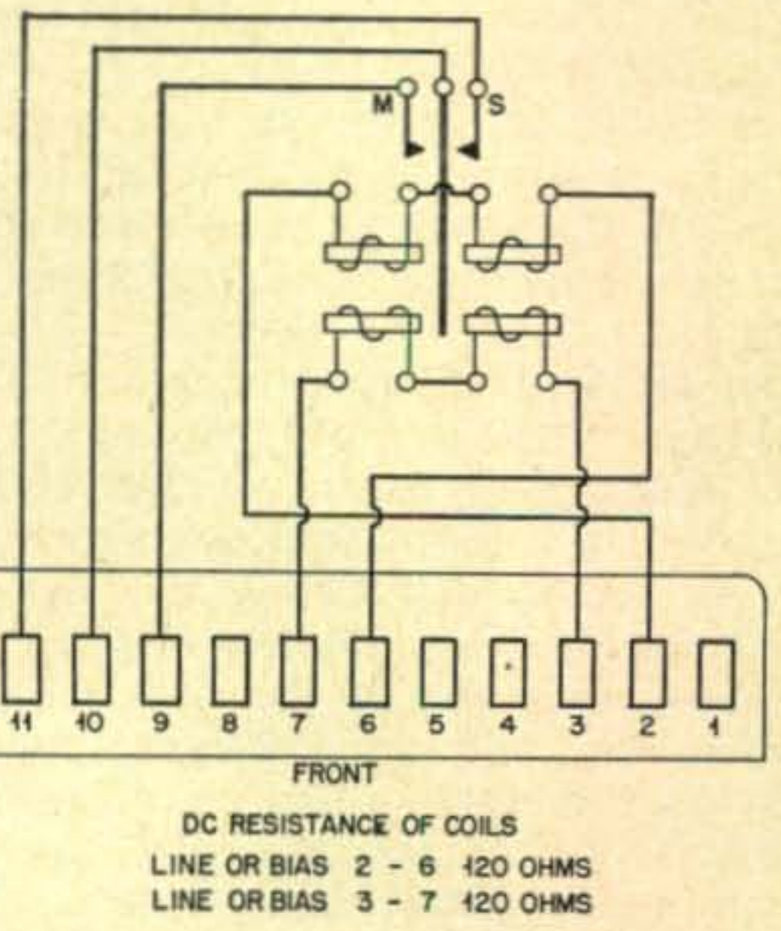
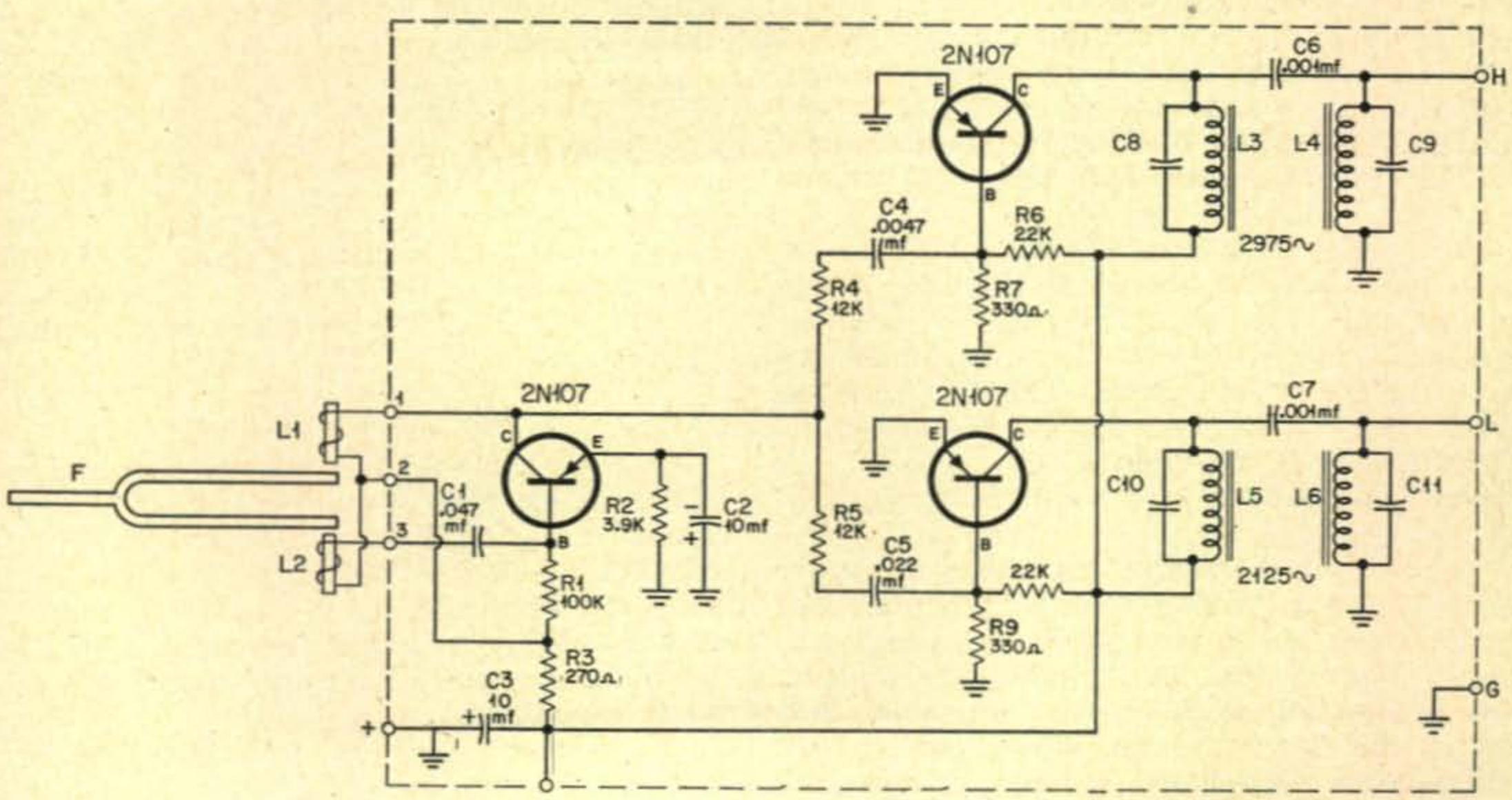


Fig 1 Wheatstone Polar Relay 1-B, Schematic Diagram.



Joe Juel, W9BGC, Northlake, Illinois; one of the outstanding Chicago-area RTTYers; active on 2-meter AFSK auto-start, plus 80 and 40 meter FSK.

The Wheatstone polar relays are good relays, with carboloy contacts and the 1-B and 1-F are quite useful when mounted in a *vertical* position, the position that they were designed to operate in more than 35 years ago. The 17-B relay, which may be available from time to time, was designed for horizontal operation.

The relays that were supplied to RTTYers years ago with the old Model 12 machines were generally Wheatstone 1-B relays. These were designed to fit into a finger-type socket such as shown just below the relay itself in the accompanying photo. *Fig 1* shows the schematic diagram of the 1-B relay and also indicates that the actual connections, un-numbered on either the relay or the socket. Electrically, both coils are similar and may be used interchangeably as operate or bias windings. For polar operation, or as in direct connection to an RTTY converter, terminals *3* and *6* are connected together and *2* and *7* each go to a plate of the d-c amplifier/keyer tube. For neutral loop operation (60-ma), one winding is used as the operate or line coil, and the other winding has in it a continuous current of one-half the line current, or 30-ma.

The combination Wheatstone 1-F polar relay is mechanically similar to the 1-B, except for the base mounting. Electrically, these relays have four coils—two line coils and two two auxiliary or bias coils. The line coil terminals are D-U and *circled*-D—*circled*-U. With these coils in series, U to *circled*-D, the relay will operate on polar signals of 30 to 70 ma.

For neutral operation, in order to move the armature to the *space* contact when a *space* signal is received, a current, called a bias current, is passed through the auxiliary coils in such a direction as to oppose the *mark* current in the line windings. The auxiliary coil terminals are designated Q-underlined-O, and A-underlined-A. For normal (WU) 65 to 70 am line current, the line coils are connected in series, as described above for polar operation, and the auxiliary coils are also connected in series O to underlined-A, and a bias current of one-half the line current is applied, negative to A, to move the armature to the spacing contact in the absence of marking current in the line coils.

Fig 2 shows the schematic diagram of the 1-F relay. The contacts are spread out in a straight line for clarity. *Fig 3* shows the actual circular layout of the base connections, called MTG. 2-A.

The 17-B relay is similar electrically to the 1-F; even to the same base connections. Mechanically, it is constructed in an entirely different manner, although it is somewhat similar in external appearance, in order to permit horizontal operation.

We are greatly appreciative of the above detailed data on Wheatstone relays as received from L. E. Gibbons, W5PCN, of Amarillo, Texas. Gib reports that he will soon have available, probably by the time that this appears in print, pricing and source of supply information.

Chicago RTTY Meeting

WØBP passes along the following: "August 30-September 1: The Third 'CHI-RTTY Meeting' is being planned for about this time. Some ARRL fellers are staging a national ham convention in Chicago on this Labor Day weekend and their stuff might be good, too. Hi! Watch for further details from Ray, George, or Beep." (See the story on the last Chicago meeting in the December '56 issue of *CQ*, in the RTTY column. I'm sure planning to be there.)

Filters

We would like to call your attention to an article, "Instructions for Making Mark and Space Bandpass Filters Using 88-mh Telephone-type Toroids," by Bob Weitbrecht, W9TCJ, which appeared in the January 1957 issue of *RTTY*, the bulletin of the RTTY Society of Southern California. I recently used Bob's technique, myself, to adjust a set of filters, and I sure liked his way of doing it. (Subscriptions to *RTTY* are $2.50 a year, and the QTH is 372 West Warren Way, Arcadia, California.)

Across the Nation

Paul Boivin, K2SKK/W1ZXA, sends advance notice that Rhode Island will soon be getting an RTTY station, with the help of W6CQK/2 and W6AEE. Paul is building a converter of the W9KLB type (*CQ*, Feb. '56) and a WØHZR 'scope indicator (*CQ*, May '56). He says, "I don't buy any ready-made stuff!"

Other newcomers to this last frontier of Amateur Radio are, W8APE of Columbus,

Ohio; W2KRQ of Garden City, N. Y.; W4ZJU of Mount Pleasant, So. Carolina; W2KFM of Hewlett, N. Y.; W8CRY of Lake Orion, Michigan; W8BID of Pontiac, Michigan; and W8GDQ of Wellington, Ohio.

Russ Woodward, WØFWD, reports that he will be on 40-meters by the time this gets to you. Russ works as a *UP* Teletype operator and Teletypesetter.

Walt Robinson, W2NRQ, tells us that the Livingston (N.J.) Radio Club is setting up a 2-meter RTTY net on 146.3 Mc with CD communication as the prime objective.

NYC RTTY Meeting

March 18th, a combination meeting and dinner for RTTYers was held in New York City. This was the third such dinner held in New York during the annual IRE Show.

It was easier to find the out-of-towners at the show than it was to find the local fellows. If they weren't manning exhibits they could be found in those booths that had machines running. The first pair I ran into were W1BGW and W1AFN—bending over a Model 19 banging away on a continuous tape.

About 55 RTTYers, from all across the nation, attended the dinner at a hotel in the heart of Manhattan. Clay Cool, W2EBZ, introduced the various speakers, leading off with Bill Knott, W2QGH. Bill reported on CD activities in Westchester and reminded us of the coming FCDA conference in May, where printer specs will be written.

RTTY activity in MARS was reported by John Longley, W2ANB, and Merrill Swan, W6AEE. Jack Berman, W1BGW, reported on the East Coast net, and W6AEE on the West Coast nets, plus the transcontinental RTTY net of W1BDI, WØBP, and K6GZ.

Byron Kretzman, W2JTP, displayed and briefly described his transistorized printed circuit fork-driven tone standard. W9NOE briefly mentioned that he is using a transistorized shifter on his VFO. W6AEE teased us with hints of a transistorized converter.

Door prizes were many, consisting of tape donated by W2ZKV and coax connectors donated by W6AEE.

The meeting broke up after a short but lively discussion of data transmission, or lack of it, by W2EBZ.

Kleinschmidt

Many fellows who have just come out of military service, or who are still in, have asked if I know if any of the *Kleinschmidt* teleprinter equipment is being used by amateur RTTYers. In the service they have had experience with the AN/GGC-3, TG-26, and the TT-4A. We would like to run a list of those of you who have these machines so that parts can be swapped. Would you please drop me a post card telling me what you have?

RTTY Dinner, March 18, 1957

Comments on CD

For a long time it has been our opinion that CD here in the east has been missing quite a bet by not using RTTY. County and city CD centers, already on v.h.f., very often require direct, positive, communications to subcenters. What could be more positive than RTTY? AFSK with autostart is made to order for this type of operation, and duplex, if necessary, is a lead-pipe cinch.

According to the CD Radio Officer of a large nearby suburban county, the reasons for not using RTTY are, "1—machines, as obtained by amateurs, cannot be purchased by CD; 2—inexpensive terminal units, approved for Federal matching funds, are not available; 3—machine maintenance would be too great a problem."

Are these insurmountable problems? (The city of Pasadena, California, didn't think so—their CD net has been in operation three years, now.) Reason number 1 could be solved by donations of Model 12's, many collecting dust in cellars now that the Model 26's have become available. Number 2 could be solved by the design and construction of a TU as a group project, like the 6-meter CD project of Levittown, N.Y. (*CQ*, Feb. '56). Number 3 is a minor problem due to the rugged quality of the Model 12, and surely there are telephone company men interested enough in CD to give their services in occasional maintenance on these machines. Can't we get with it?

73, Byron, W2JTP

S B

Bob Adams, K2DW
245 Revere Road,
Roslyn Heights, N. Y.

It is now official: CN8MM is the official winner of the first World Wide Single-Side Band DX Contest. With Eva working the clock around, and with only 150 watts input, CN8MM worked 491 stations with a point score of 1456. This total would have been nearly 500,000 points if we had allowed multipliers, etc as in the AM/CW Contests. Congrats, Eva! The prize is a silver cup suitably engraved, which will be awarded annually. CN8JD was a close second, with 475 contacts and 1416 points. Bill, SVØWA placed third with 437 contacts and 1247 points. Wayne HR2WC worked the most stations with 534 contacts in the two twenty-four hour periods, and placed fourth with 1118 points. Ronnie, G6LX with 417 contacts and 1027 placed fifth, closely followed by KA2YA, DL4CX, TG9AD and ZL3IA. The top twenty-five scores are as follows:

Place	*Call*	*Contacts*	*Points*
1-	CN8MM	491	1456
2-	CN8JD	475	1416
3-	SVØWA	437	1247
4-	HR2WC	534	1118
5-	G6LX	417	1027
6-	KA2YA	299	892
7-	DL4CX	283	797
8-	TG9AD	381	789
9-	ZL3IA	266	773
10-	F8RQ	218	638
11-	F7AF	224	610
12-	VE7EL	259	589
13-	OH2OJ	215	585
14-	W6ONP	358	509
15-	W4BGO	300	508
16-	W3ZP	252	472
17-	LA8WE	160	450
18-	ZL3PJ	153	443
19-	G3MY	170	435
20-	GM3CIX	147	399
21-	VE4NI	153	355
22-	W1EQ	176	338
23-	W4JUR	203	332
24-	VQ4EO	112	325
25-	VQ4EU	108	315

Countries Worked (Two-Way SSB)

W2KR	79	ZL3IA	67
K2DW	78	W2EWL	66
DL4SV	76	W2JXH	66
W3BZ	76	HR2WC	64
K2AAA	74	G3MY	64
W3ZP	73	W8JXM	63
G6LX	71	W6IAL	61
ZS6KD	71	OH2OJ	61
VE4NI	70	W1EQ	61
W4INL	69	PAØIF	60
VE2GQ	68	W5HHT	60
VE3AEE	67	CN8MM	60
W2CFT	67	F7AF	60
ZL3PJ	67	W9GPI	60

There were over five hundred logs submitted, and cross-checks reveal that more than 1500 SB stations participated in the Contest, including fifty-three countries. Nearly every log was accompanied with a note requesting that we sponsor another one very soon. We are checking with the Contest Editor and will try to schedule another Contest in the Fall. LA6J re-built his station in a hurry in order to participate in the Contest. He made over 100 contacts with 237 points. Wally, KZ5WZ with his 20 watt exciter bare-footed made 117 contacts thru all the heavy QRM. Many of the gang participated in their very first contest, and had a fine time.

I have received many registered packages containing 50 or more QSLs to qualify for the "Worked Fifty Countries Two-Way SSB" certificate. The next issue will show a photo of this award.

DL2TH, who in one year's operation on SB in Hanover made 958 contacts with 55 countries, has returned to England where he will sign G3HSR.

Jim, DL4SV will soon be returning Stateside after three years in Munich. Jim has been very active on SB and his signal will be missed in the DX portion of the band. Ronnie, G6LX who reports SB for Short-Wave Magazine, spent ten days in the U.S.A., and attended the

SB Dinner. He reports considerable activity on 80 meters in Europe, and some newcomers, including G3BWH, G3KEU and GM8CH.

Although there are two stations in Monaco, equipped for SB, 3A2AH and 3A2AM, their inactivity has encouraged a group of PAØ sidebanders to consider a dx-expedition to Monaco. Expect to hear from 3A2 very soon.

We are pleased to report another All Continent round-table was accomplished on February 27th, this time on fifteen meters. A second attempt was scheduled for March 1, and again was successful. The participating stations were: F7AF, F7BN, F7EM, DL4RY, CE2HV, YV5FL, KC4USA, 5A2TP, 5A5TH, CN8MM, HZ1AB, KH6AQ, KH6AR, W8TLL/KG1, W8DPF/4, W6ZNT/5, W6QJV, W8QIN, W7KUV, and W9RUK. Signals were Q5 all the way around. Only on SB with voice-break and stable oscillators could this have been accomplished.

HZ1AB is the USAF Club Station in Saudi Arabia, A KWS-1 is used.

Don, KT1DD reports that the KT1 calls have been changed to CN2. Reg, W6ITH had a very successful stay at his two island QTHs and many of the gang were successful in working PJ and FS7.

Bill Thomas, KV4BB received authority to operate on a small island in the new British Virgin Islands and using the call VP2VG and a Hallicrafters HT-32 with an SX-101 receiver he worked more than 1800 stations, mostly on SB from March 7th to the 9th. These contacts will count as a new country. The equipment was taken by small boat across many miles of open ocean, and as the island was uninhabited, Bill had to provide his own power from a gas driven generator. Hope you were all successful in contacting this rare one.

As previously reported, Arthur Godfrey, K4LIB, accompanied by General LeMay, KØGRL hunted big game in French Equatorial Africa during March. A one kilowatt SB field station using the call K4LIB/FQ8 on 10, 15 and 20 meters was in use. Many of the gang were worked, but the station contacted mostly U.S.A. stations with phone-patch traffic. The operator in charge was Ossie, W2HC, although Arthur did most of the operating. Cards will be sent.

The recent Single-Side Band Dinner held in New York on March 19th, was a great success and was attended by over three hundred. Many more would have been present if we could have provided larger accommodations. All U.S. districts were represented and many DX operators attended including G6LX and HR2WC etc. Major General "Butch" Griswold, KØDWC was the principal speaker. Other prominent Military Hams were present including Generals Bill Hamlin and Earle Cook of the Signal Corps and Frank Gregory of the USAF, and Captain Blair Jones of the Navy.

W2KR, Mort by working VP2VG, K4LIB/FQ8, LU7AS and VP5BH brought his total of countries worked to 79 to maintain his lead. K2DW made it 78 with VP2VG, K4LIB/FQ8 and HZ1AB.

Not much space this month. Next month 2 pages showing many of the European gang.

73, Bob, K2DW

Prospective [*from page 58*]

back, his fist was trembling, he flubbed his own call twice, forgot to give a report and asked three times for a QSL card. He was running 20 watts xtal controlled and it was obvious that he would have a hard time sleeping for a week after this contact. While he was stumbling on, I scooted back to the frequency in order to see how the big boys were taking this. Even though I was clearly in QSO, they were still booming away on my frequency calling PAØPCA, apparently in the hope of QRM'ing the W2 out of the picture. I began to see why many DX stations have little respect for W's. The technique of many of the stations calling me that night seemed to consist mainly of QRM'ing whoever I was in contact with. My finest ham hour came in ignoring this crowd and giving a few of the small fry the thrill of their lives.

After several African contacts, some more W's, and a couple of CE's, we finally closed down for a spot of breakfast before I had to take off for Amsterdam. A couple of slices of Edam cheese, bread and butter, and coffee, the usual Dutch morning meal. While we ate, Jan talked about his plans for further work on both his receiver and transmitter. He glowed. To him this equipment was something with real character and personality because he himself had molded it in such a basic way as few U.S. hams in the past fifteen years would care to attempt, or for that matter, could. I began to realize what an empty achievement it is to open the crate of a factory made rig or to hear DX on an assembly line receiver compared with the solid kick that Jan gets out of his lineup. It's true that most hobbies are going that way. Ham radio is not alone in the decline of individual creativity. Model making of any sort today mostly consists of fitting plastic parts together in fifteen minutes or less. Picture are painted by the numbers. DX contacts are bought with dollars and not operating skill and techniques. I have to admit that I felt a little envy for what PAØPCA had done, and also for what he gets out of ham radio as a result of his own efforts. Sniffing in the undergrowth of 14 mc with my lovely new NC-300 for some reason isn't the same as it was before that two hour idyll in Hilversum, Holland. ■

V H F

Sam Harris, W1FZJ
P. O. Box 2502, Medfield, Mass.

V.H.F. Contest

Don't forget the Spring VHF contest on April 27, 28. Your participation will be appreciated, even if you are not out to win, by those who are. Don't forget to exchange scores after the contest closes. Pick out a likely culprit and get him to send in the claimed scores ASAP. Photographs of participating stations are recommended. Have fun and see you on two. (I'll see you on six—Helen.)

The following is W1RUD's resappy for winning the "CQ" VHF contest: (1) 10 gal. r.f. in one dose. (2) 10 gal. a.f. in one dose. Mix thoroughly and stir for 24 hours with a 250 foot parabola. (3) Add slowly in ½ pint lots, 10 gal. black coffee. (4) When mixing is nearly complete add 1 box No-Doz. (5) Heat vigorously with 1 w. acoustical power (lung).

The following auxiliary utensils will be necessary: (1) 1 shotgun—for curing TVI complaints. (2) 1 key, for locking XYL in padded cell. (3) 4000 pencils, all sharpened. (4) And finally, a 51% interest in the local power company.

Six Meters (Receivers)

Several miles of comments on two meter converters have been foisted off on the faithful readers of this column. According to our mail however, we apparently have not done right by the six meter boys. The main reason for this oversight is the relative ease with which a six meter converter can be made. This coupled with the fact that hardly any one builds their own on six. It must be admitted that with converter prices starting around ten dollars for a simple two tuber and going from there up to sixty or more, the desire to build your own is pretty well covered up by the economics of the situation. There are a few things worth remembering when you are considering either buying or building a converter for six.

The first of these is best illustrated by the following letter from Amp (W2SHU):

"With all the locals here in town (W2DCD, K2DZM, K2QFH, K2LEO and K2RDZ) it became almost impossible to work out, due to the blocking and cross modulation that resulted when their beams were pointed my way.

"After reading an article on the pentode versus the triode, I decided to redesign the 417's into pentode stages and the most suitable, if not the best choice, would be the 404A. This tube has a gm of 14,500 with a plate resistance of 95 k with 135 volts on plate and screen with a 430 cathode resistor. With 150 volts the gm drops to 13,500 with a plate resistance of 90 k and a cathode resistor of 110 ohms. Plate and screen currents combined run about 20 ma. With such a hot tube we thought we would have trouble taming it, but had no such trouble due to the shield placed across the tube socket that separated plate and grid completely.

"We changed the second 417A first and eliminated the first one after finding that it was no longer needed.

"The signals were about the same and we coudn't detect any change in the noise figure either. The biggest change that we noted was that we could now copy a signal right along side of a real strong local with our beams facing each other. No cross modulation could be detected.

"With the triodes we find that a local with his beam at us, usually takes out almost two thirds of the .7 mc that we tune of the 50 mc band. His carrier and modulation appear on all other signals that may still manage to get through.

"It is indeed a pleasure to be able to keep up a ragchew when the locals come on. We are looking for a different receiver for the I.F. strip, as the S40A is slightly on the broad side. Trying to find an S76 but they are rather scarce.

"If anyone is interested in the layout of the converter, we'll be glad to send them a layout to build this on a mini-box!!"

The point is that the converter has to do more than detect weak signals. It has to be able to receive weak signals when your pal up the street has his kw on calling a ZS. Furthermore it must do this while Channel 2 is blasting away, two miles away. Almost any modern tube will give adequate signal to noise on six. Some of them are suitable for handling large signals when used in the right circuit. Before you build or buy, be sure to investigate the large signal and capabilities of the converter in question.

Six Meter Activity

Since February 19th and the back-scatter

opening, we ve had no openings along the east coast except for a few aurora sessions. In March 2nd during an auroral opening we copied W3's, W8's, W9's, WØ's and VE3's, but that's the best we've heard in some time.

Again our congratulations to John (W8LPD) on working ZE2JE and VQ2PL on February 18th.

A challenge to VHF Men

A new way to amplify weak signals at VHF has been discovered. The name of this sterling device has not been settled as yet. Quantum mechanical amplifier, Maser, Diversitron etc., have so far been applied to it. My guess is that it will end up being called a Maser. Call it what you will, it still is the most revolutionary thing to hit the VHF field since hams—. I mentioned it last month and this month and am going to keep on mentioning it until someone in the ham field does something about it.

I am working on it, and my ambition in life at the moment is to come up with the first ham-built maser amplifier. So far my efforts have progressed to the point where I think I know what makes it work. Rather than stumble through an explanation this time however, I am hoping that one of our more learned colleagues will volunteer an article on the subject. Meanwhile—*be not misled*—This maser business is for us. *Let's get at it.*

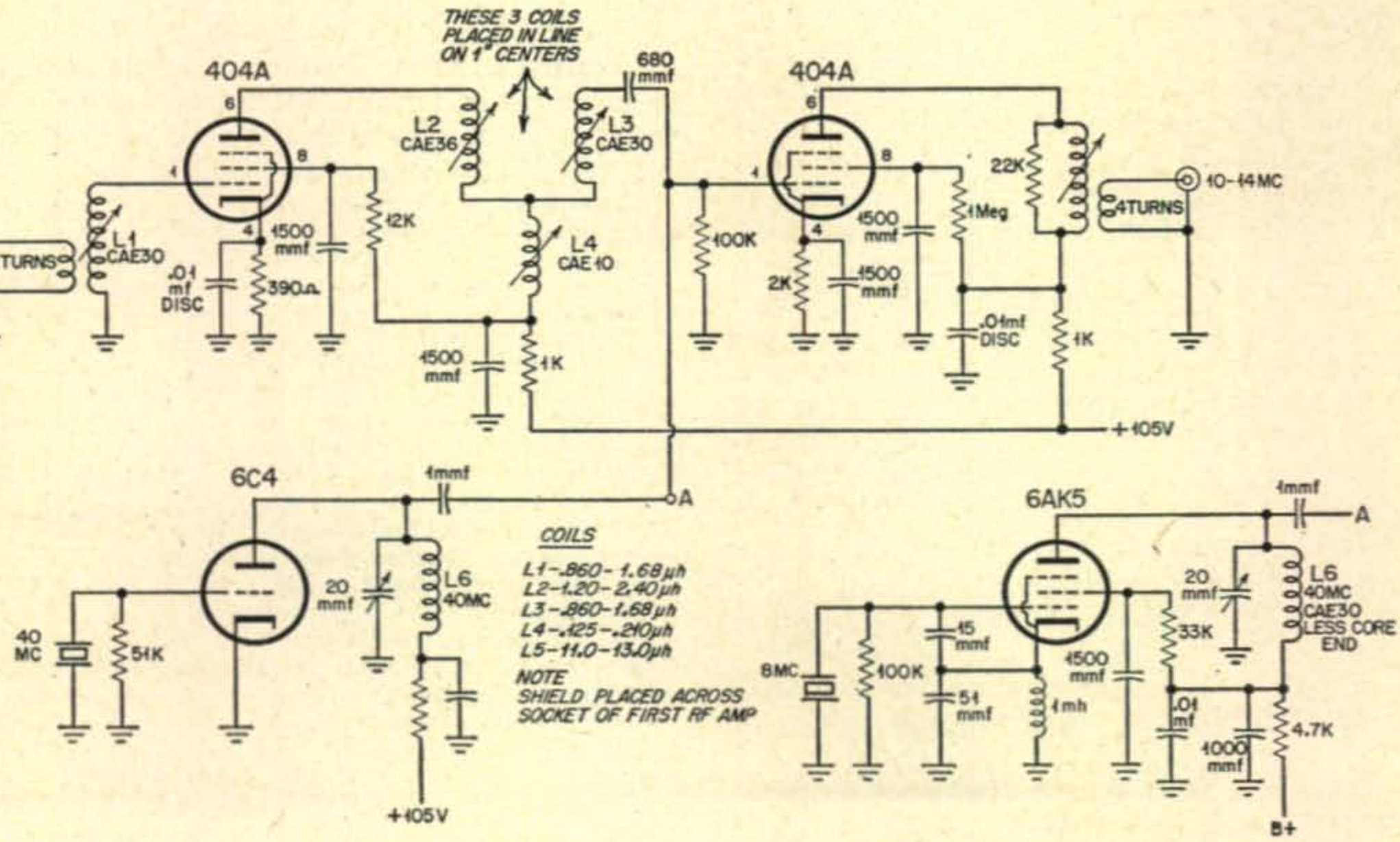
"Operation Smoke-Puff"

The following information was sent to us by O.G. Villard, Jr., (W6QYT) and R.S. Rich (W6OPX).

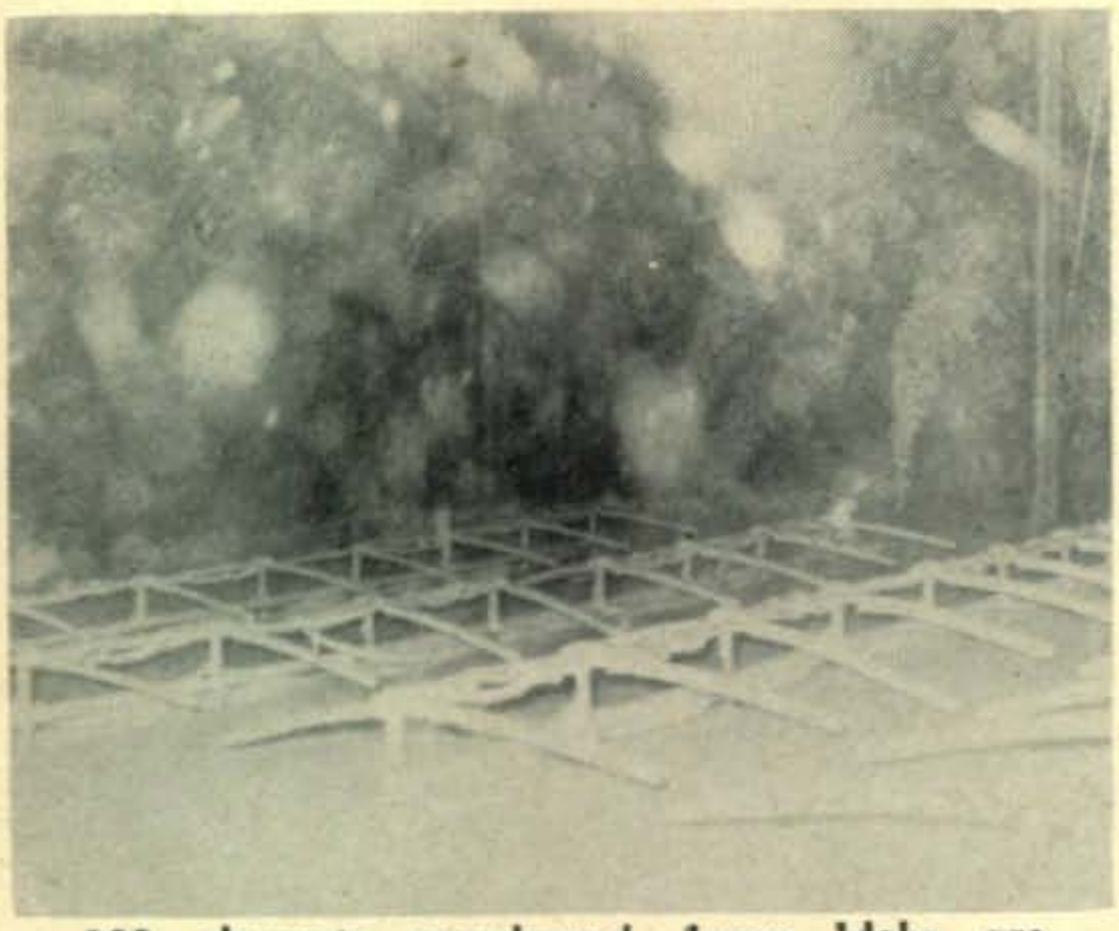
Circle showing area within which communication by reflection from artificial ion cloud should be possible.

An event of great interest to radio amateurs—in fact to all users of the ionosphere for long-distance communication—occured on March 12, 1956. On that date an Aerobee rocket, fired from Holloman Air Force Base, New Mexico, into the E layer of the ionosphere, apparently created a man-made cloud of ionization by releasing some eighteen pounds of nitric oxide gas.

That an ion cloud appeared there can be no doubt, for it was detected simultaneously on the screens of at least two different radars (one of which, incidentally, was operated by A.M. Faries, W6OOU). The fact that the cloud showed up shortly after the release of the gas is highly significant. However, no scientist



Six meter circuit recommended by Amp (W2SHU).



128 elements snowbound. Large blobs are snowflakes. (Massachusetts size.)

will allow himself the satisfaction of claiming that his experiment was a success so long as there exists the possibility—however remote—that the observed result might have been caused by chance. In the present instance, the observed cloud could have been produced at precisely the right moment by an errant meteoroid or some gremlin-like sporadic-E event.

However, the presumption that the experiment succeeded is very strong. If ions can be produced in later tests, it will be possible to say that the March rocket firing represents the first time that man has ever created ionization in the ionosphere in an experiment expressly designed for that purpose.

The U. S. Air Force proposes to continue with tests similar to those performed in March, and would like to invite radio amateurs and SWL's to participate in the task.

A post-card to the originators of this article is all that is required to participate. If you live within the indicated area, (see map) your name will be placed on a mailing list and you will receive a questionnaire, some detailed suggestions, log sheets and information as to test times. You will also be advised, after each firing, whether the experiment went off as planned. (Rockets have been known to misfire or release their gas at the wrong altitude!)

The proposed tests represent a real challenge, and a wonderful opportunity to show what skilled amateur operating can do. Here's a chance for hams and SWL's to perform an important service in furthering upper-atmosphere research, to take part in some history in the making, and to have fun at the same time. VHF men may get a made-to-order opportunity to add some elusive states (and Mexico) to their WAS list. Anyone for Smoke-puff, gang?

Complete article on "Operation Smoke-Puff" by O. G. Villard, Jr., will appear soon in "QST".

Grand Haven, Michigan A contribution from Joe, (W8ESZ) reports that:

"We have finally worked PZ1AE on February 19, 1957 at 12:54 E.S.T., via back scatter. What a haul for this small town of Grand Haven, Michigan. Also worked KØADM, W8LPD and W4HJQ. What abuot the QSL's fellows." *Congratulations Joe and don't worry about the QSL's. You'll get 'em, I know. 'Cause I did. Signed—Helen.*

Houston, Texas A six meter report from Houston by way of Bill (W5WZF):

"Haven't seen anything in your article 'VHF' about the six meter gang in Houston, Texas. I am here to report on them. We have about twenty stations, about half of them active. We have monthly meetings which brings out many of them, and then some that are interested in six meter operation. There are several mobile stations in and around town.

"On February 20th there was an opening into Argentina. LU7DDG, LU4HD were worked by this station. W5FVE and a couple other stations worked them and other stations besides. Then on February 26th the W5's had a pipe line into Florida around 1900 CST. After the pipe line was pumped dry, strange voices began coming in from the South. During this opening LU9AT, LU7AT, LU7DDG and LU3EX were worked by this station. *So that's why we haven't heard any opening up our way, you've been catching them on the way and won't let them through to us.*

"Have been looking for Jay Farnsworth, W7WLV, but haven't heard him yet. During the past two years I have worked thirty-three states, Cuba, Mexico and Argentina." *Thanks much for the report from Houston, Bill, always good to know about the openings in other parts of the country and compare them with our openings here on the East Coast.*

New York City, New York From one of the very active but little heard from (in writing, that is) cities we hear from Richard Light (K2UOY):

"I'm just dropping you a line to let you know, along with all the six meter boys, that from the period of July 2nd to August 25th, K2OTP and myself will operate portable on six meters from Contoocook, New Hampshire. The rig is a Gonset Communicator and we'll use a five element beam if we can get it up O.K. *You will.* Operation will probably be on a daily basis, and I'll be sure to bring plenty of QSL cards so that anyone requesting a card will be sure to get one. The QTH up there is good for VHF, so we're looking forward to giving someone a new state." *Very interesting Dick, lots of the boys will be looking for you.*

Clearfield, Utah From the state which we have heard a couple of times on six meters (but certainly not often) we get this information via Victor Frank (W7QDJ):

"Regarding meteor scatter QSO's. Here's how it's done out west. Most contacts are by schedule, arranged on 80 meter liaison. *I like that.* Transmissions are two and a half minutes long, with the westernmost station starting. As soon as the other station is heard, calls and a report are repeated continually throughout the transmission. The following abbreviations are given in place of the 's' or 'b' preceding the number report as per IGY. A—received your call only; C—received both calls; D—received report only; G—received my call only; R—received everything. This lets you know exactly what is needed to complete the QSO.

"Liaison, this is important to keep abreast of news, band openings, results of schedules, etc.

"A VHF group meets on 3570 kc at 2200 MST daily. Other interested stations are invited to check in. This is cheaper than a phone call and faster than a letter.

"Six meters came out of hibernation on February 24th for a nice strong opening to the South-South-East, but apparently signals were landing in the Pacific because all that was heard was back-scatter. This station got on at 1230 MST but locals reported the band open to W5's earlier. WØCMN and W6AJF were worked; K6EDX was heard on phone and several other W6's were heard on cw. Band closed 1330.

"March 1st the aurora finally got down this far. T9 flutter signals were heard from Alaska (RTTY), Washington, and Collins 49.8. Worked between 0000 and 0215 (March 2) were W7JRG, WØCNM, WØFKY, KØGKR and W7CJN. All were hash cw. Heard were W6NLZ (Phoned him collect, he couldn't hear a thing), W7UFB, W7GFM, and W7ERA.

"Although tests were made on two meters with my new twenty elements, nothing was heard, apparently ionization was too weak." *Well! That was a good one Victor. You should do this more often 'cause the boys really are interested in how VHF works out your way. And now you've had Aurora, you've had everything.*

Terre Haute, Indiana Charles Hoffman (W9ZHL) sends us the following announcement:

"The VHF picnic will be held at Turkey Run State Park, Indiana, on July 28th, 1957. Registration at 0800, games for the ladies, playground for the kiddies, Swap-table and prizes." Bring your lunch basket and enjoy the day. *Sounds good to me Charlie, sure hope I can make it.*

Opa Locka, Florida, Florida contributes through Carroll Corman (W4ZCZ):

"Just a line to let you know that South Florida is going all out on six meters. We now have thirty stations on six. *Hurrah!*

"Just formed a new club which has been named 'The Gold Coast Six Club.' We meet every fourth Saturday of the month.

"D.X. has been very good on six since January 1st. Every state east of the Mississippi river has been worked except Vermont and New Hampshire. *Activity is building up considerably in those two states Carroll, so things will be looking up for you.* We have also worked California, Washington, Oregon, Texas, Oklahoma, Mississippi, Louisiana, Missouri, and Arkansas. Also Argentina.

"On February 20th I worked OA4C, CE1AH and XE1A. That's all for now *(well, I should hope you'd be happy with all that in such a short time)*, will write again when I have more news." *Fine business, Carroll, you've really had some fun lately.*

Territory of Hawaii Lee Cox (KH6BRJ) sends news from the Blue Pacific Isle.

"Just thought I'd let you know that there are still a few of us plodding away on six out here. Whether we are going to span the gap or not I don't know. Sunday, February 24th, Ed (KH6NS) and myself, heard W5VY telling W6PUZ 'I sure would like to hook up with a KH6 or KL7 station, hi, hi.' He was in for about forty-five minutes or an hour and maybe you don't think we didn't try to give him that KH6 contact, but to no avail. *Trials and tribulations of VHF.*

"Then about ten A.M., W7's from Arizona were heard and Ed held a field-day on them. About the time they dropped out Ed called me on the land line and asked me why I wasn't calling them. After climbing back down from the ceiling, I promptly told him that I had been calling every station that he had worked. After the confusion died down I checked and found out my antenna relay wasn't doing all it was supposed to. *(Oh, no!)* plus the fact that I think that my 829B was playing tricks or me. Since that infamous day, however, we have regrouped and got the SSB linear perking with about eighty watts PEP and have worked into LU land in very fine shape.

"There are four active stations on Oahu and I understand that there is a station active on one of the outer islands, but as yet we haven't contacted him. KH6NS is operating on about 50020 A.M./C.W. KH6PP about 50025 AM/MCW and myself on 50070 SSB CW. KH6CCZ on 50300 AM

"KH6NS is running about 600 watts and right now his antenna is still in question due to some recent heavy winds. KH6PP is running about 100 watts to a six element telerex. I am running about 80 watts to a three element s/s antenna but am hoping to get a 4/4 array going in the near future. CCZ is running about twenty watts to a three element beam.

"The MUF seems to reach at least forty-three megacycles everyday but squeezing that extra seven megacycles seems to be quite a feat. Anyhow, at least one of us is watching the MUF everyday, and if it opens we'll be there.

"Only need forty-four more states for WAS!! HI." *Hope that Massachusetts will be your next new one Lee, and don't think we're not looking for you. Good luck, and keep watching that MUF.*

Jersey City, New Jersey A few remarks from good ole Jersey and Frank Scaglione, (K2RLG), also his deepest gratitude to all who helped him work toward his General:

"Six meters interests me so I bought a 150 watt rig for this band. Soon I hope to have ready my new two-meter final which will run about a hundred and fifty watts input. With this I hope to try my hand at long haul aurora DX.

"My novice has expired but I certainly enjoyed every moment of operating and worked eleven states during this period. *Just because you have a general, Frank, doesn't mean that you should leave two meters.* I'm looking for cw and phone skeds on all bands, especially two meters, my favorite band." *O.K., now I see.*

Fort Benning, Georgia A newsy note from George Cockle (K4MWR):

"Well, it's about time to pack up for F-7land for a three year tour at Poitiers, France. Of course, I'll be active withn the VHF spectrum, and who knows, maybe we'll work, even if it's cross-band. *How about a sked, George?*

"I've changed my call to K4MWR and have given several shouts on the two-meter aero rig in the Georgia and Alabama area. Have heard W3's and northern W4's at night—but not good enough for QSO (hard to fly and work ham radio too). Still on 146.71.

"Might interest you to know that as W1GYU 'aero-mobile' I made 826 QSO's (not including second QSO's and contests) with twenty-seven states accounted for in my travels, in a sixteen month period. Best dx with the ½ watter was seven hundred and twenty miles. *Whee-ee-ee!* All this gave me one major impression—A TERRIFIC GANG OF HAMS!! *Couldn't agree with you more.*

"Just one more thing, a comrade-in-arms, Cliff Tressider, KNØEMD/1, an aero-VHF enthusiast, was killed in an aircraft accident at Shirley, Massachusetts on January 27, 1957. *We surely regret to hear of this tragic accident.* Many W1, 2, and 3 hams will recall his interesting QSO's from the aircraft and regret his passing on."

Muskegon, Michigan Herb (K8CIC) sends us some six meter information from his area:

"We have twenty-four stations on six now, mobile and fixed, day and night. A stranger calling on 50.100-50.418 would never be lost. The nets are something to be proud of. Every evening at 2300 finds the 'Red Eye Net' coming to order with ten or more stations checking in. Latest dope is passed out and all the latest happenings and advice is passed on. *You better send us more of this information Herb.* New problems are then taken up. Uncle Mitch, (W8WOH), is presiding.

"DX?? It's been really F.B. this first two and a half months of '57. Heard and couldn't work on February 19th, PZ1AE, LU7PB and XE1EK on back-scatter, as well as W1, 2, 3, 4, 5, 8 and Ø. Heard Helen, W1HOY, real F.B. but was so hoarse couldn't have talked to her. Boy that was a thrill! To sit and listen to the boys work PZ1AE, and couldn't even let out a noise.

"Grand Rapids has lots of six meter boys also, according to W8HJR (43 states). You will hear them day and night, so wish the boys and girls would listen up this way. Lots of the fellas will schedule for Michigan W8's so let's hear from you. Lots of work going on now on beams and mobile antennas, power is being boosted also.

"CD is our big operation. Work on every alert and

K2KRC holds the mike. K2OKW, CVL, ONN, ORK, and W2RSC listing.

everyone seems to enjoy it. Equipment here consists of a Gonset Linear (measured 72 watts output), T-22-VFO. Hammarlund HQ 100 and converters. Four element wide spaced beam fifty-seven feet up." *Well, that was a good 'un Herb. We appreciate the information from Michigan.*

St. Louis, Missouri Ronald Skaggs, (WØODI) emits thusly:

"The midwest VHF club of St. Louis celebrated its first successful year of existence with a dinner and election of officers in January. We now have over two hundred, six meter stations in the area, and more coming on all the time. Also four nets that meet weekly, including the XYL net at 1300 Saturday.

"Although the club still needs a meeting place, we have six married couples on our roster, incorporation is under way, and a club paper is starting." *Good deal, Ron, How about some more dope on the XYL net, the club paper and the pictures you mentioned?*

Brooklyn, New York From Brooklyn and Frank Bremer (K2KRC) we are finally getting some info:

"The rig here now is running 650 watts to a pair of 4E27's, modulated by a pair of 811A's in Class 'B'. The exciter is a VHF ARC-5 that used to do such a good job at W1PEA in Weston, Connecticut. (Before I got my hands on it.) The VFO is a Johnson two meter job returned to six meters. Also have a PP 6146 rig running 120 watts input for standby and local QSO's. *Always good to have a stand by rig.* And to complete the lineup I also have a Gonset Communicator for portable or mobile work. *This boy has just too many rigs for his own good.*

"Antenna is still my good old 4 over 4 Telrex. On the receiving end I use a Super-pro SP-400 SX with a Tecraft Converter. Also I have a SP-44 Panadapter hooked up to the receiver. The transmitter is completely homebrew and took about three months to complete, but I had fun doing it. Now I have a Tapetone converter on order and hope to get my hands on it soon.

"DX-wise, I now have thirty-one states and Canada. Maine seems to be the most elusive state on six. I can't seem to get a contact there. On December 31st I worked twenty-six stations in seven states, but did not get a single new state. I'll just have to keep trying. *We're with you all the way, Frank.*

"Locally we have quite a bit of activity, as you of course know. Have four six-meter boys working in the plant with me. They are, K2RIE, K2GKY, W2PJN and W2RSC. Every Monday some of the fellows meet at my QTH. K2ONN, K2OKW, K2CVL, K2KSY, K2OPK and W2RSC, usually show up for a rag-chew session." *Sounds like quite a lot of rag-chewing goes on in your area, Frank. Are you sure these boys are doing their bit on six-meters too?*

Muskegon, Michigan And another one from Muskegon, this one from 'Stu' (W8JUV).

"Lots of aurora here recently (2-6-57), but activity seems to be down somewhat. Worked four new states in the last two weeks. There has been no apparent pattern to the appearance of auroras in the last month, so we'll have to check the band every day and evening. The boys across the Lake reported hearing W7's on aurora January 21st." *Thanks, Stu. The aurora does seem to be reaching further in all directions.*

Marissa, Illinois Bob (K9EID) adds his bit to the melee:

"I came on six meters in November '56 with a TBS 50D and I now have a sixty-five watt home brew 6146 rig. We are about sixty miles from St. Louis and work ground wave into there very nicely. In St. Louis there are several stations with a little power on the old beam. WØVWH has a KW on the band; WØZHS has 100 watts and KØDGE has 80 watts of SSB, to mention just a few. *Yep, we've heard those boys too.* In Marissa here, we have two other six meter stations, K9DTQ and K9GPF and we are about as far southeast of St. Louis that we know of, but if anybody can work us (via ground wave) drop us a line. We'd like some skeds." *O.K. boys, snow him under with skeds.*

Chattanooga, Tenn. Charles Curle, Jr. (W4TDZ4) gives out:

"Here's a note from the 'Moonshine State.' This station has just moved and I am still chasing wires and wishing for trees here at the new QTH. *Wishing for them, are you sure?* Can monitor the VHF bands, but no antennas as yet.

"The local ham club has started a project of building six meter rigs. *(Of that I thoroughly approve.—Helen)* Should be quite a few new fellows on shortly to add to the old timers. I mustn't forget that weak signal of W4IKK's new KW (he only pins the meter.) *A good gang of old timers down your way Charlie. You new boys will really have to be on the ball.*

Lexington, Virginia Noteworthy efforts of the VHF gang in Lexington, are reported by R. Marlowe Harper (K4JFK):

"Most of the members of the Rockbridge Amateur Radio Club have recently done what we thought was well nigh impossible—consistenly work a contact in Clifton Forge, Virginia, 30 odd miles away over a 1,000 foot mountain range, using low power transmitters and ground plane antennas on six meters. Two members, W4KCJ and K4CHA, made contacts with mobile rigs and whip antennas. These mobile rigs were running about eighteen to twenty watts input. We realize that this is no record, but it is the best we have been able to do with groundwaves, except with beams and much more power.

"Our club has a well organized emergency net on six meters. We have regular drills each Tuesday and Thursday evenings at 6:30 on 50.4 mc with the net control station rotated each week to give each operator experience in handling the net. *Good idea!*

"One of our members has worked thirty states on six meters, using a ground plane antenna and about 50 watts input. *Who?* This is no great feat in itself, but we think it deserves a 'P' for persistence, especially since we are surrounded by mountains.

"Our club is planning to build a six-meter relay station on a 1,000 foot mountain about ten miles away. That should give us good coverage on six meters. *Sure should, old man. This is one of the biggest projects we've heard of yet for six meters.*

"We have twenty members on six meters, so anyone coming through Lexington or Buena Vista with a mobile rig should have no difficulty making a contact, day or night." *Three cheers, for the Rockbridge Amateur Radio Club. They're really building, and in more ways than one, too.*

73, Sam W1FZJ

Top Ten
Single Operator

4X4DK	532,620	W6YY	306,803
K2AAA	397,500	OE5CK	300,384
G3AWZ	350,280	OA5H	247,050
CO2BL	328,876	4X4BO	245,856
KH6IJ	308,580	OK2AG	221,490

Top for Each Band

28 mc	- VQ4RF	-	154,453
27 mc	- W8AJW	-	1,000
21 mc	- HC1ES	-	167,940
14 mc	- CO2OZ	-	64,478
7 mc	- JA1EF	-	3,750
3.5 mc	- OK2KOD	-	820

DX Contest Results-Phone

Frank Anzalone, W1WY
14 Sherwood Road
Stamford, Conn.

Top Five
Multi Operator

K2GL	251,008
W6AM	209,412
I1BDV	207,740
K6EVR	189,550
KH6CBP	186,456

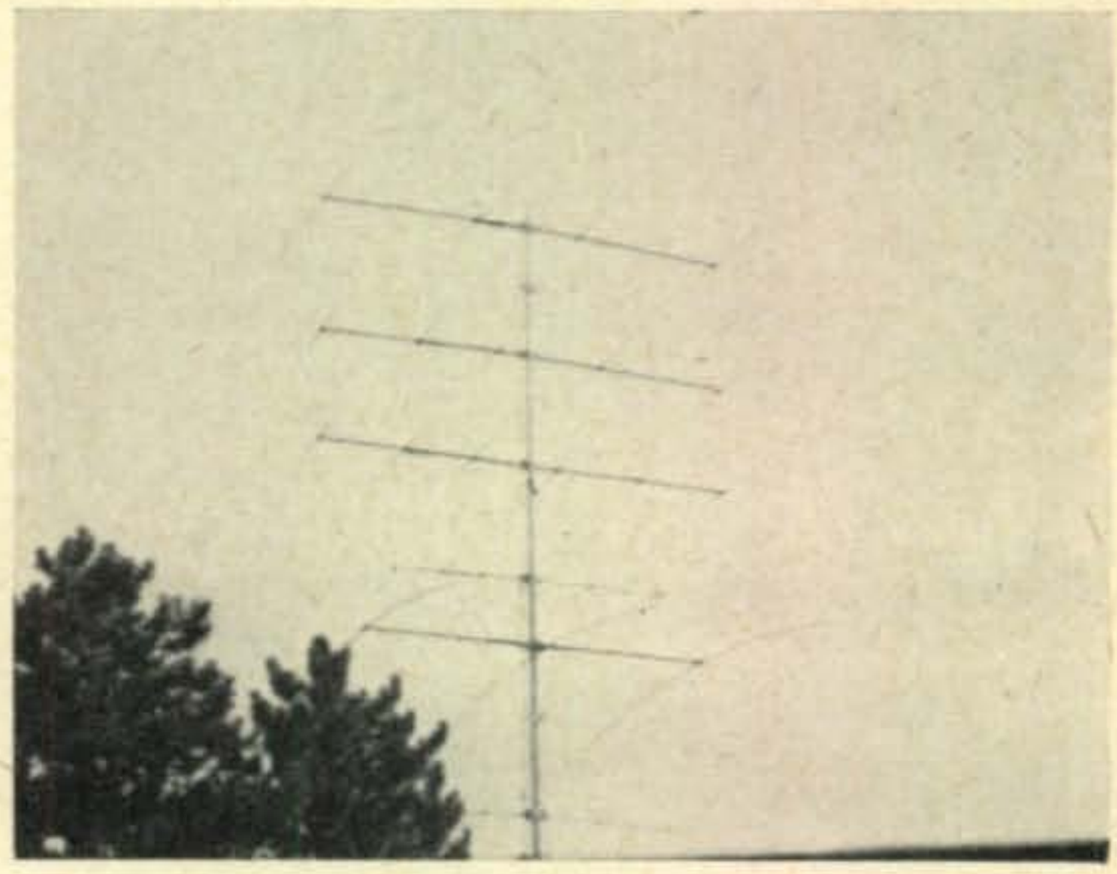
The winner and new champion—Ami Shami, 4X4DK, with a record breaking score of 532,-620 points. This means that 4X4DK will receive the W2SKE trophy which Bill Leonard is donating to the Top Man in the All Band Phone section. Ami is located in a strategic spot where almost everything he worked was a "3 pointer." Multiply this by next to the highest number of QSOs and a good zone/country multiplier and you have a combination that is pretty hard to beat. He did this with only 250 watts to a wide variety of dipoles for each band. Of course a little contest savvy and continuous operation also helped.

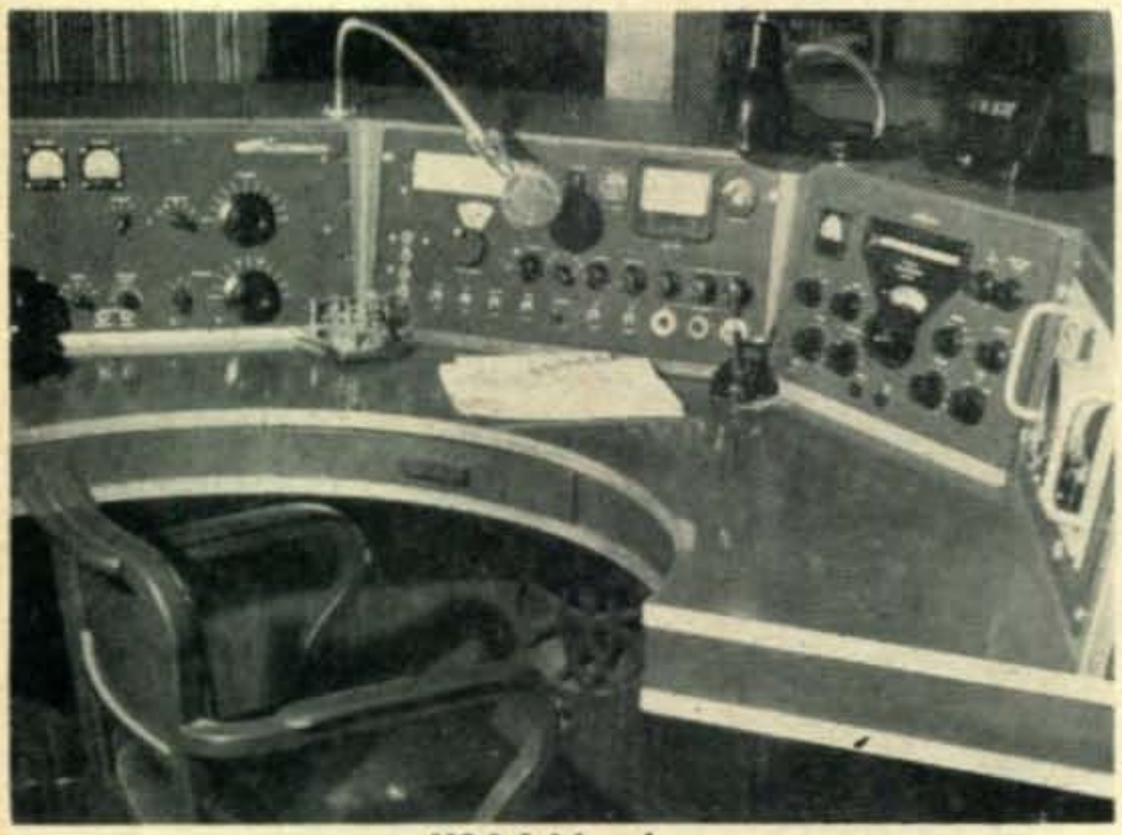
A look at the Top Ten will give you a good idea of how the boys stack up. You will note that a couple of our boys were right in there too. K2AAA on the east coast and W6YY on the west coast are the leaders for the United States. Don turned in an all around bang up job while John came up with the highest zone multiplier, 109. Other highs were G3AWZ with a 229 country multiplier and KH6IJ with 757 QSOs had the most contacts. CO2BL always a solid performer, also turned in an excellent score.

The Single Band operators put on a terrific show, with HC1ES leading the pack with 167,-940 points on 21 mc. Eric did this with 541 QSOs. That's on *one band*, brother. VQ4RF was not too far behind with 154,453 points on 28 mc. Roy was a stand-out on this band, and realized his ambition of making over 100,-000 points on one band. Right behind him was CX2CO with 153,621 points on 21 mc. "Ric" last year's champ and All Band winner, was high with 86 different countries, while CE3DY worked the most zones, 33. The 21 mc band was by far the most popular altho 28 mc was also well populated. However 14 mc, the old standby, can no longer claim the popularity it once held. The 7 mc band is hardly ever thought of as a phone man's paradise but the JA boys made good use of it and W3ECR with 21 countries certainly deserves a lot more credit than is indicated by his score. Both the 27 mc and 3.5 mc bands were little used by the Single Band operators altho the All Banders used them to good advantage to fatten up their multiplier.

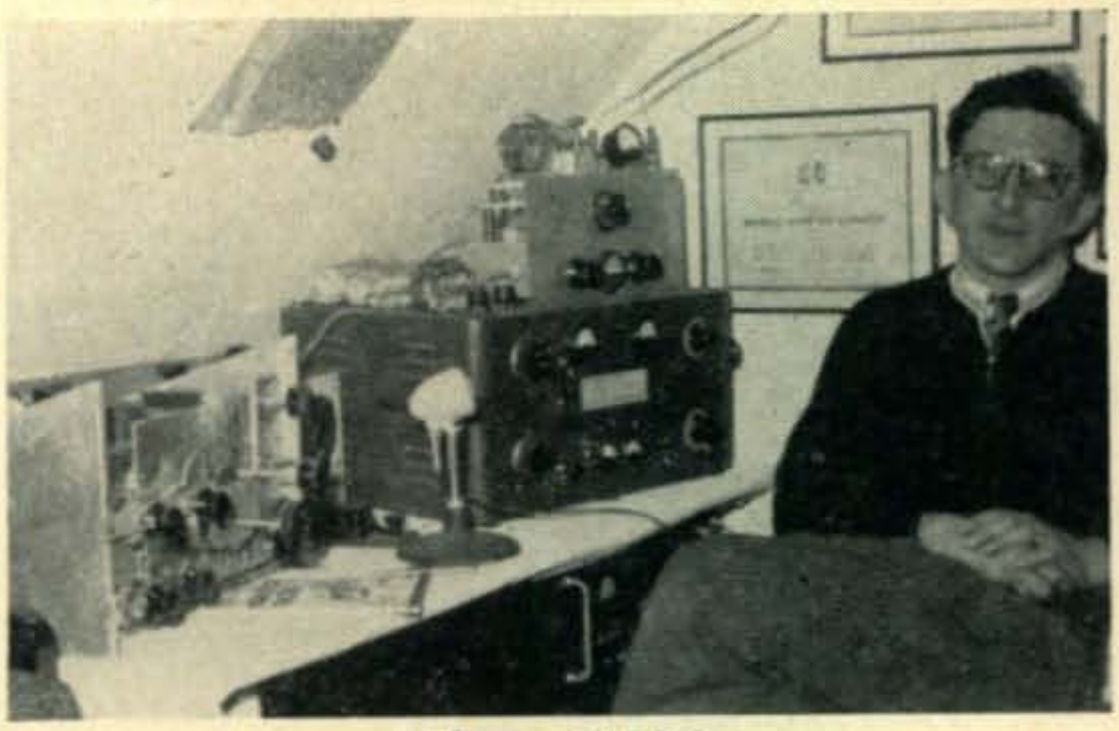
The Multi-operator scores are not too impressive when compared to the excellent job turned in by the Single Operators. K2GL (ex W2HJR) last year's leader, again leads the gang. I have a feeling that you will be hearing from this group when W2SKE gets back in harness next year. It would seem to me that a well planned and organized group should really run up a terrific score. KH6CBP was a father/son affair. Bill Jr. had his Dad KH6CBQ as an operating aid.

K2GL, Separate Telrex 40 thru 6 meters.





K2AAA's rig.



Helmut, DL1AU

Val, CO2BL

Bob, I1NU/Trieste

All the attention however should not be focused on the leaders. Because of the single band feature of our contest, the little fellow was able to participate and win a certificate to grace the wall of his shack. You do not need a "full gallon" and a 3 EL sky piece to be a winner in our contest. A look at some of the winners will show that many are in the "A" power classification.

[*text continued on page 115*]

PHONE SECTION SINGLE OPERATOR

Number groups after call letters denote following: Final score, number of QSOs, Zones and Countries. Letter designates power used, A-Up to 35 watts; B-Up to 150 watts; C-Up to 500 watts and D-500 watts and over. Winners are underlined.

NORTH AMERICA

UNITED STATES

All Band

W1PST	39,038	298	49	82	D
W1FZ	5,795	39	28	33	D
W1ZD	270	10	3	6	D

28 mc

W1ONK	34,529	156	20	53	C

21 mc

W1JYH	1,856	23	12	20	-

14 mc

W1YWU	1,984	25	11	20	B
W1APA	544	14	6	10	-
W1UCA	494	12	9	10	C

All Band

K2AAA	397,500	498	100	200	D
W2ESG	11,580	73	22	38	B
K2OPJ	208	10	8	8	-

21 mc

W2WZ	35,550	153	28	62	D
K2BHF	31,842	144	29	58	D
W2PUN	21,725	105	29	50	B
K2QQQ	18,688	111	24	49	C
W2DJT	10,370	70	20	41	-
K2EAD	4,064	46	9	23	B
W2SNI	2,964	27	15	24	C
K2PPB	1,134	25	6	12	B

14 mc

W2WE	5,828	50	18	29	C

All Band

W3VKD	132,800	249	67	133	D
W3DBX	3,145	29	13	24	B

28 mc

W3JTK	38,480	158	25	65	D
W3ZEQ	12,720	102	17	36	C
W3RPG	9,858	67	18	35	C
W3MDE	1,311	24	5	14	B

21 mc

W3ZQ	16,817	93	22	45	D
W3HIX	7,425	51	19	36	C
W3HVM	775	15	12	13	B

14 mc

W3MDO	903	19	8	13	C

7 mc

W3ECR	2,275	28	14	21	D

All Band

W4OM	29,820	104	39	66	D
W4WSF	7,215	50	25	40	B
W4HVH	4,048	35	21	25	C
W4KZV	1,430	22	16	20	C
W4KMS	416	10	7	9	B

28 mc

K4BIZ	17,019	103	20	41	C
K4CTU	6,112	69	17	32	C
W4EEO	216	6	6	6	-

21 mc

W4NQM	77,952	259	31	81	D
W4DRW	3,115	33	12	23	C
K4CFB	903	17	9	12	B

14 mc

W4NZM	24,390	117	26	64	D
W4IIKJ	14,740	102	21	46	C
W4HA	988	17	9	17	D

All Band

W7HQC	17,020	62	37	55	D
W7ACD	12,420	63	30	39	D
W7TMF	11,508	61	40	44	C
W7DAA	3,869	30	25	28	D
W7ENA	1,300	22	14	12	B

28 mc

W7VY	20,790	133	21	33	-
W7RFX	2,040	26	13	17	B
W7MII	540	12	7	8	B

21 mc

W7AOZ	5,452	48	20	27	B
W7ZOH	450	10	6	9	-

14 mc

W7MGT	19,053	103	28	45	D
W7QCF	12,848	69	27	46	D
W7NKW	957	21	13	16	-

All Band

W8NXF	94,185	195	78	129	C
W8UMR	17,094	92	28	46	B
W8ZOK	14,381	69	29	44	-
W8JIN	3,060	28	21	24	D

28 mc

W8YIN	19,454	107	23	48	B
W8WZ	12,180	69	24	46	D
W8NNH	3,956	34	18	25	B
W8KYY	2,068	32	7	15	B

27 mc

W8AJW	1,000	22	11	14	B
W8HQK	714	19	10	11	B

21 mc

W8RFT	12,993	75	25	46	D

All Band

W9EWC	106,777	229	74	113	D

All Band

W5KC	38,497	130	54	83	B

28 mc

W5ALB	23,254	115	24	53	C
W5HWK	5,610	44	22	33	C

27 mc

W5BVX	713	23	10	13	C

21 mc

W5DQK	14,274	80	29	49	B
K5BSM	7,884	74	21	33	C
W5JRE	7,100	66	20	30	B
W5QF	4,002	41	18	28	B
W5ZWR	375	9	7	8	B

14 mc

K5FFB	208	12	7	6	C

All Band

W6YY	306,803	419	109	178	D
W6IIM	26,136	110	38	50	B
W6IYJ	2,010	29	15	15	-
W6BYH	1,431	20	13	14	-

28 mc

W6PQW	14,219	97	23	36	B
K6GQH	4,914	51	17	22	B
K6LOM	1,680	25	14	14	B

21 mc

W6TCQ	7,353	56	22	35	B
W6QOZ	1,767	36	16	15	-

14 mc

W6VSS	60,000	241	30	66	D
W6CPL	47,790	199	27	54	D
W6WZD	42,840	178	31	59	D
K6EWL	26,325	134	26	49	D
W6ONP	12,988	78	26	42	D
W6PTA	5,520	49	21	25	D

21 mc

W9ZTD	27,945	132	28	53	D
W9IRH	19,368	110	23	49	C
K9BFE	1,980	35	15	21	B

All Band

WØGUV	17,400	87	46	54	D
WØTGB	1,850	36	16	21	C

28 mc

KØDRR	14,350	82	24	46	C
WØQMS	3,978	42	15	24	B

21 mc

WØLRU	26,160	125	30	50	D
WØJYW	21,360	104	27	53	D
WØMVO	9,536	76	24	40	B
WØQPR	3,840	35	21	27	D

ALASKA All Band

KL7RZ	9,638	64	26	35	B

21 mc

KL7ALZ	12,768	177	16	26	B

BAHAMAS All Band

VP7NS	199,167	662	73	124	B
VP7NF	868	21	14	17	B

BERMUDA 14 mc

VP9CY	31,920	278	22	48	B

CANADA All Band

VE2ADB	37,352	145	29	63	B
VE2AVC	928	20	15	17	B
VE3AIU	107,840	274	60	100	D
VE3DBY	8,400	61	18	38	B
VE3DNE	6,656	73	27	37	B
VE3HB	3,848	50	15	22	C
VE3BMG	1,813	27	16	21	B
VE7EH	4,830	85	23	19	B
W2ZRX/VO2	33,570	275	36	54	-
VO6U	6,783	89	26	31	B
VO6N	1,357	61	13	10	C

28 mc

VE2AEW	25	3	2	3	C
VE7MS	13,670	120	20	32	B
VE7AQQ	1,608	34	11	13	B
WØANY/VO4	12,496	114	13	31	B

27 mc

VO6I	132	22	4	2	B

21 mc

VE4RP	2,911	30	16	25	C
VE7ZM	11,696	67	26	42	B
W4FOW/VO4	17,160	160	15	37	C
K4CYX/VO2	5,742	90	12	21	B

14 mc

VE2GJ	2,988	48	15	21	B
VE2ADX	1,012	42	9	13	B
VE2PD	247	12	5	8	B
VE3ARS	20,498	112	26	48	C

CANAL ZONE 14 mc

KZ5KA	13,200	140	15	40	C

COSTA RICA All Band

TI2HP	191,592	420	79	137	D

14 mc

TI2OE	50,635	258	30	65	B

CUBA All Band

CO2BL	328,876	586	88	179	C
CO8JK	3,737	39	14	23	C

28 mc

CO8RA	7,700	106	7	10	a

14 mc

CO2OZ	64,478	321	28	75	B
CO8DL	5,852	59	17	27	B

DOMINICAN REP. 21 mc

HI8WL	5,436	119	16	20	-

GUATEMALA All Band

TG9AD	204,970	521	71	135	D

MEXICO All Band

XE1RE	12,825	107	32	43	B

21 mc

XE1DU	10,148	168	17	26	-

PANAMA All Band

HP3FL	154,000	418	80	120	D

PUERTO RICO 14 mc

KP4WLU	25,047	175	22	47	C

AFRICA

ALGERIA All Band

FA8RJ	9,263	59	21	38	A

14 mc

FA9IB	10,130	64	13	32	-

AMSTERDAM IS. 14 mc

FB8ZZ	7,668	77	18	18	C

ANGOLA 14 mc

CR6AU	11,802	98	14	28	-

BELGIAN CONGO All Band

OQ5BK	33,930	183	21	44	B

CANARY IS. All Band

EA8AX	99,968	273	39	89	B

28 mc

EA8CF	10,209	86	13	28	A

GOLD COAST All Band

ZD4BR	36,360	136	38	63	B

GUINEA, PORTUGESE 28 mc

CR5AC	1,836	36	10	8	-

KENYA All Band

VQ4DT	154,360	328	57	113	B
VQ4ERR	49,105	155	40	75	B

28 mc

VQ4RF	154,453	520	27	82	B

MADAGASCAR All Band

FB8BC	10,850	69	25	37	B

28 mc

FB8BP	1,562	27	6	16	A

MADEIRA IS. All Band

CT3AN	12,978	70	24	39	B

MOROCCO, FRENCH All Band

CN8BB	2,277	33	8	15	B

MOZAMBIQUE All Band

CR7AF	8,888	75	16	28	B
CR7CO	1,587	25	10	13	B

28 mc

CR7DS	4,681	60	10	21	-

RHODESIA, NORTHERN All Band

VQ2NA	5,250	53	15	20	-

RHODESIA, SOUTHERN 28 mc

ZE5JE	185	10	7	8	-

SAO THOME All Band

CR5SP	12,050	72	25	42	-

SOUTH AFRICA All Band

ZS5JM	173,565	353	59	112	B

14 mc

ZS1RV	126	7	3	3	-

UGANDA 21 mc

VQ5FS	38,761	163	28	55	-

ASIA

BURMA 21 mc

XZ2OM	13,924	98	19	40	B

CEYLON All Band

4S7YL	133,334	293	58	105	B

21 mc

4S7GE	52,416	208	27	64	B

CYPRUS 14 mc

ZC4PW	8,815	77	10	31	B

HONG HONG All Band

VS6AE	56,604	210	42	64	B

28 mc

VS6CY	32,635	192	18	43	B

INDIA All Band

VU2EJ	42,174	159	39	60	B

21 mc

[illegible]	10,370	65	21	40	B

ISRAEL All Band

4X4DK	532,620	694	76	193	C
4X4EO	245,856	408	64	154	B
4X4GB	192,376	379	48	125	-
4X4IA	2,592	36	7	17	-

28 mc

4X4FV	19,883	115	17	42	A

JAPAN All Band

JA1QI	33,936	145	35	49	B
JA3BB	28,704	114	41	51	C
JA1BFJ	26,200	102	44	56	A
JA6AK	23,940	122	30	40	C
JA5AF	725	14	12	13	B
JA1CR	56	5	4	4	B

28 mc

JA1ANG	6,072	69	14	19	B
JA1EC	1,288	22	11	12	B
JA1CO	396	13	6	6	C
JA9BE	324	9	6	6	B

21 mc

JA3JM	2,176	29	14	20	A

14 mc

JA6HK	30,360	164	26	40	C
JA8AA	11,298	101	19	23	C

7 mc

A1EF	3,750	55	13	12	C
JA9BY	2,300	40	11	12	C
JA1AAT	84	6	3	3	-
JA1VP	36	3	3	3	B

All Band

KA3CY	60,495	198	45	66	D

28 mc

KA8WK	6,519	60	16	25	B

21 mc

KA2FQ	30,690	176	25	37	B

14 mc

KA7CW	3,654	53	12	17	C

LEBANON

14 mc

OD5BJ	7,518	61	13	29	-

SARAWAK

21 mc

VS4BO	15,490	101	23	37	B

TAIWAN

21 mc

BV1US	75,530	296	32	59	D

EUROPE

AUSTRIA

All Band

OE5CK	300,384	445	84	204	B
OE3SL	35,875	168	38	87	B
OE1PC	4,815	52	20	25	B

14 mc

OE5BW	20,944	182	17	51	C

BELGIUM

All Band

ON4SZ	176,500	284	79	171	B
ON4DM	62,208	177	51	93	B
ON4DH	62,080	186	47	81	B
ON4LO	9,825	80	23	52	-
ON4PL	7,564	72	19	42	-
ON4DG	5,472	67	29	43	-

14 mc

ON4LJ	10,608	107	20	48	B

BULGARIA

All Band

LZ1KBD	18,655	150	26	65	B
LZ1WD	1,911	36	13	26	B

CHANNEL IS.

21 mc

GC6FQ	35,156	147	29	65	B

CZECHOSLOVAKIA

All Band

OK2AG	221,490	508	66	148	B
OK1FF	28,971	88	26	61	B
OK1JX	12,070	125	26	59	B
OK1KAI	5,537	55	20	29	B
OK1FC	1,715	46	11	24	B
OK2KYK	1,368	55	5	19	B
OK1KCB	1,127	48	5	18	B

28 mc

OK1MB	23,883	154	19	38	B

21 mc

OK1AA	31,312	174	27	49	B

3.5 mc

OK2KOD	820	45	4	16	B

DENMARK

All Band

OZ3TH	66,880	154	45	107	
OZ3Y	39,195	141	42	75	B
OZ2EN	1,224	51	6	18	B

28 mc

OZ7BG	29,568	130	27	57	B
OZ1I	5,576	52	15	26	A
OZ7AX	273	13	4	9	A

21 mc

OZ7SN	5,658	79	12	29	B
OZ4IM	432	21	5	11	B

14 mc

OZ1PO	9,912	121	13	46	B
OZ5KQ	8,910	83	20	46	C
OZ2JC	315	19	3	12	B

ENGLAND

All Band

G3AWZ	350,280	514	86	229	B
G2AJB	10,050	76	23	44	B
G2TA	9,828	80	29	55	B
G3HBR	3,822	44	19	30	-
G3HTW	2,442	45	11	22	B
G2DYV	2,288	44	11	33	B
G5MP	2,112	69	6	26	-
G3JVJ	1,800	34	12	24	-
G3AIM	768	14	12	12	-
G3GNM	276	12	11	12	-
G3KOE	171	11	9	10	-

28 mc

G3DO	49,622	210	27	59	B
G3FXB	16,492	84	25	51	-
G2BVN	11,040	88	20	40	B

21 mc

G3AFM	4,320	62	12	32	B
G3HSM	1,540	43	7	20	-

14 mc

G3BTG	33,291	243	25	56	B

FINLAND

All Band

OH2HK	3,800	67	10	28	A
OH3NY	1,924	39	13	24	-
OH2LU	896	26	11	27	-

28 mc

OH5NW	89,919	425	27	76	B
OH5PE	32,682	194	23	55	B
OH5QY	12,935	115	17	48	B
OH2XK	2,356	43	10	21	B

21 mc

OH5QN	36,603	243	26	57	B
OH3PB	11,098	113	21	41	B
OH5OP	2,667	53	9	12	B

7 mc

OH5PN	240	21	2	10	B

FRANCE

All Band

F8CH	212,675	431	62	119	B
F9RM	101,600	255	57	143	B
F8XP	54,136	189	40	94	B
F8CS	36,058	144	42	79	B
F9GL	20,400	140	22	53	-
F9ZU	6,188	57	18	34	B
F8HC	5,472	40	25	32	A
F3YO	3,108	41	15	27	B
F8PD	2,040	27	16	24	B
F9SH	1,628	26	13	24	-
F8SC	130	5	5	5	B

28 mc

F8CW	20,700	112	23	46	B

GERMANY

All Band

DL1AU	152,862	314	70	149	B
DL7BA	117,700	226	72	142	C
DL1LH	99,369	264	61	120	B
DJ1BZ	97,399	278	56	117	B
DJ2YL	73,440	270	41	95	B
DJ1ZN	39,198	164	44	95	B
DL1FK	36,456	121	46	101	B
DL7AA	28,203	113	45	74	B
DL1YA	2,745	34	18	27	-

28 mc

DL7CX	23,927	122	23	48	B
DL9SN	17,920	97	21	49	-
DL3ME	7,296	61	p7	31	-
DL6DS	3,625	43	14	15	-

21 mc

DL6DE	4,370	47	16	30	B
DL3TJ	3,354	42	15	24	-

14 mc

DJ3CN	2,484	95	7	25	B

All Band

DL4HAB	156,960	339	59	121	C
DL4SK	19,762	117	31	51	C
DL4UP	2,040	56	8	26	A

21 mc

DL4TM	4,522	62	14	24	C

14 mc

DL4CN	3,276	77	8	28	-

GREECE

All Band

SVØWT	166,980	411	64	156	B

IRELAND, NO.

All Band

GI3AXI	15,355	116	25	58	-

ITALY

All Band

IIAIM	178,650	411	67	158	-
IICHJ	160,600	357	63	137	-
IIAHW	3,915	52	15	30	-

14 mc

IISGZ	7,546	105	13	36	-

LIECHTENSTEIN

All Band

HE1RS	21,375	189	21	54	B

MALTA

All Band

ZB1HKO	6,063	113	11	36	-

NETHERLANDS

All Band

PAØVB	45,502	207	42	102	B
PAØKX	20,467	93	33	64	-
PAØHBO	12,975	169	14	61	-
PAØNV	10,980	104	16	44	-
PAØSNG	10,292	164	10	52	-
PAØEEM	6,095	109	10	43	-
PAØTV	72	7	5	7	A

28 mc

PAØOTC	5,040	41	18	30	A
PAØXX	3,354	33	17	22	B
PAØZJ	3,182	34	16	27	B

14 mc

PAØULA	31,595	192	24	65	B
PAØZL	1,711	51	6	23	B
PAØUC	999	31	6	21	A
PAØZGD	336	21	3	13	B
PAØAU	210	15	3	11	-

3.5 mc

PAØADP	774	45	2	16	A

NORWAY

All Band

LA5YE	57,577	220	47	90	B
LA7FA	1,749	31	12	21	-
LA9AD	1,708	62	6	22	-

POLAND

All Band

SP8CK	58,994	243	37	94	C

14 mc

SP5FM	13,250	192	13	40	B

PORTUGAL

All Band

CT1PK	182,367	388	61	146	C
CT1AC	1,213	21	9	12	-

ROUMANIA

14 mc

YO3FT	7,089	98	16	35	A
YO3RF	1,224	24	10	14	B

SCOTLAND

All Band

GM2DBX	21,200	183	23	72	B
GM3EOJ	5,005	62	17	38	B

28 mc

GM3BCL	7,992	70	17	37	B

SPAIN

All Band

EA5EQ	9,180	76	20	40	B
EA5DC	4,653	49	17	30	-
EA5DY	4,418	62	15	32	-
EA3KT	3,305	55	14	31	-
EA7HN	3,220	37	18	28	-
EA2CR	1,376	33	10	22	-
EA7CQ	887	25	8	16	-

28 mc

EA3GI	28,980	165	22	47	B
EA4EP	28,084	176	20	48	-

21 mc

EA3IX	18,648	172	20	52	-
EA5EI	3,854	52	12	29	-

14 mc

EA7EV	59,832	234	27	81	-
EA3CB	34,874	180	25	69	B
EA7CP	24,806	140	22	57	-

SWEDEN

All Band

SM3BIZ	63,616	310	37	105	-
SM5DW	55,545	208	50	111	C
SM3EP	27,878	157	35	71	B
SM5BJU	10,981	102	20	59	-
SM5WJ	5,995	56	17	38	C
SM2AKA	4,508	59	20	29	B
SM5BFR	3,738	52	14	28	C

28 mc

SM5CO	4,171	52	13	30	C
SM5CXF	189	17	3	6	C

21 mc

SM5WF	1,827	41	7	22	-

14 mc

SM6SA	11,605	122	17	38	C
SM7FB	6,930	130	12	33	C
SM5GBS	4,185	76	13	32	-
SM3BCZ	396	20	5	13	B

SWITZERLAND — All Band

HB9PU	52,824	250	36	106	B
21 mc					
HB9MU	2,800	35	15	20	B

TRIESTE — All Band

IIRC/T	27,144	133	24	69	C
21 mc					
IINU/T	11,592	89	22	47	C

WALES — All Band

GW3AHN	40,804	159	35	66	A

OCEANIA

AUSTRALIA — All Band

VK2ADE	30,992	110	40	64	B
VK3AO	10,191	83	16	27	B
VK6RU	28,884	115	37	50	B
28 mc					
VK4HD	14,433	95	19	32	-
27 mc					
VK4XJ	459	17	5	4	B
21 mc					
VK3HL	1,872	34	12	14	A
VK4WP	15,246	84	24	42	B
VK5AB	4,838	50	17	24	B
14 mc					
VK3AMR	6,156	57	16	22	-

COOK IS. — All Band

ZK1BS	72,369	271	43	56	B

FIJI IS. — All Band

VR2BC	28,968	143	30	41	A

HAWAII — All Band

KH6IJ	308,580	757	62	77	D
KH6MQ	94,626	268	55	71	D
KH6AYG	34,375	214	28	27	D
21 mc					
KH6PM	17,243	142	7	26	D

NEW CALEDONIA — 14 mc

FK8AO	812	24	8	6	-

NEW ZEALAND — All Band

ZL1MQ	120,350	296	66	79	B
21 mc					
ZL2AFA	46,024	212	25	63	B
ZL3RZ	3,219	37	13	16	-
14 mc					
AL1ACI	25,152	145	22	42	B

OKINAWA — 21 mc

KR6RB	50,040	207	28	62	B

SOUTH AMERICA

ARGENTINA — All Band

LU2FR	29,082	137	28	46	C
LU4DMG	19,890	97	33	45	-
LU5AQ	6,069	51	21	30	C
28 mc					
LU8DGR	27,780	162	20	40	-
LU7AS	17,000	120	19	21	C
LU7MAO	4,104	52	12	15	-
21 mc					
LU5CK	39,150	172	27	60	-
LU9DAH	336	8	8	8	-

BRAZIL — All Band

PY7VBG	29,032	102	23	53	-
PY4APE	17,625	81	24	51	-
PY1RW	6,256	50	16	30	-
PY7AN	5,382	46	19	27	-
PY7AEI	5,160	43	11	31	-
28 mc					
PY7XQ	13,676	92	15	37	-
21 mc					
PY4RJ	41,207	167	26	63	-
PY5QZ	23,542	110	26	53	-
PY4AKT	13,662	77	23	43	-
PY5GA	9,300	61	21	41	-
14 mc					
PY7ABQ	588	14	6	9	-

CHILE — All Band

CE2AN	2,369	38	11	12	-
21 mc					
CE3DY	120,360	361	33	85	B
CE2AY	624	13	7	9	-

ECAADOR — 21 mc

HC1ES	167,940	541	32	75	C

NETHERLANDS, WEST INDIES — All Band

PJ2AA	204,572	383	60	127	B

PARAGUAY — All Band

ZP5CG	39,663	127	45	72	-
ZP5JP	20,496	95	32	52	-

PERU — All Band

OA5H	247,050	531	68	94	D
14 mc					
OA4AI	16	2	2	2	D

VENEZUELA — All Band

YV5FK	72,468	209	46	76	-
YV5DE	9,310	71	25	40	B
YV5BJ	882	17	11	10	-
14 mc					
YV2AM	1,053	27	5	8	-

URUGUAY — All Band

CX1FB	2,709	27	21	22	A
28 mc					
CX3AA	23,912	136	22	39	B
CX2AY	19,272	150	16	28	-
CX1NE	729	27	5	4	-
21 mc					
CX2CO	153,621	456	31	86	D
CX1FL	984	17	10	14	-

PHONE SECTION MULTI-OPERATOR

NORTH AMERICA

UNITED STATES — All Band

K2GL (K2GL - W2BAK - W2BDS - W2LEJ - W2GLM)	251,008	435	80	132	D
W3MVQ (W3MVQ - W3LMM - W3QJJ)	31,080	111	45	66	D
W6AM (W6AM - W6BXL - W6KPC - W6KFV - W6YMD)	209,412	330	102	151	D
K6EVR (K6EVR - K6ELX - K6BYB - W6UED)	189,550	339	93	130	D
W8NWO (W8NWO - W8HMI)	105,376	224	71	107	D
W8NGO (W8NGO - W8CLR - W8ONA)	63,900	175	52	90	C
14 mc					
W8ZHT (W8ZHT - W8TPT)	8,960	55	25	39	D
21 mc					
W8BKP (W8BKP - W8WFB)	51,728	184	31	75	D

ALASKA — 14 mc

KL7BES (KL7BES - KL7BDG - KL7BWR)	2,425	44	11	14	B
21 mc					
KL 7 BHE (KL7BHE - KL7PIV)	18,512	179	20	32	B

CANADA — All Band

VE8MA (VE8OW - Don - Dick - Rod)	20,262	166	26	40	B

AFRICA

SOUTH AFRICA — All Band

ZS5OA (ZS5OA - ZS5OB)	82,764	262	46	68	-

ASIA

JAPAN — All Band

KA2KS (W3CSW - W5BOL - W5VAF - K6IGJ)	155,608	498	47	59	C
KA5ZS (KA5ZS - W5JWF - W6KTE - W9FWQ)	28,336	140	36	41	C
14 mc					
KA3KB (W5HOU - K6TJQ - W7FDS - WØHLW)	49,928	234	31	45	D

EUROPE

BULGARIA — All Band

LZ1KDP (LZ1AB - LZ1889 - LZ2991)	37,875	245	32	93	B
LZ1KPZ (Club station)	23,460	202	22	70	B
LZ2KST (Club station)	20,740	95	24	61	B

CZECHOSLOVAKIA — All Band

OK1KTI (Club station)	25,935	150	32	63	B

ENGLAND — 28 mc

GB2SM (G3JUL - G3KKI - G5CS)	16,506	107	19	44	B

ESTONIA, S.S.R. — 14 mc

UR2KAA (Club station)	19,140	251	16	44	C

GERMANY — All Band

DL4ME (DL4ME - DL4EB - DL4HI - DL4RH)	109,068	281	61	123	C
14 mc					
DL4RI (DL4RI - DL4YE)	89,552	373	33	83	C

ITALY — All Band

IIBDV (IIBDV - IITOB)	207,740	420	71	150	-
IIZCT (IIZCT - IIMAB)	61,200	253	44	109	B
IICCO (IICCO - I! -10011)	46,020	208	35	83	-

NETHERLANDS — All Band

PIIRRS (Club station)	22,422	135	36	65	-

LITHUANIAN, S.S.R. — 14 mc

UP2KBC (UP2AS - UP2 -21037)	1,456	54	5	21	-

POLAND — All Band

SP9KAD (DP9FR - SP9 -138)	69,920	232	45	139	B

ROUMANIA — All Band

YO5KAD (YO5LP - YO5 -501)	15,580	143	24	58	B
14 mc					
YO2KAC (Club station)	1,225	46	5	20	A

SWEDEN — All Band

SM5XP (SM5XP - SM5AE)	15,566	94	33	53	-
14 mc					
SM7BAH (SM7BAH - SM7CPB)	1,440	61	4	20	C

OCEANIA

HAWAII — All Band

KH6CBP (KH6CBP - KH6CBQ)	186,456	601	62	74	D

OKINAWA — All Band

KR6RT (KR6RT - KR6LJ)	81,652	211	60	69	C
14 mc					
KR6QW (KR6AH - KR6EM - KR6OZ)	600	28	4	4	C

FONE CHECK LOGS

FA3GZ	SM3SWL(1) - SM3SWL(16)
FR7ZC	VE7EB
IIPO	W2ATE
K2DEM - K6KUQ	W3RPG - W3ZQ - W3ECR
KA3WG	W4HVU
KR6SF	W6OJW
KZ5KA	W7KOI
LA6FA	XE1PJ
LU3BU	YO2KAB
OD5AB	ZE5JE
OK1GX	ZS2AA
OK2KBR	ZL1CH
OK1MB	ZL2GS
ON4SY	4X4CK - 4X4FK - 4X4FS
PAØEU	
SM1BVQ - SM3AST - SM3BWY - SM5APA - SM5AQV	

PROPAGATION

George Jacobs, W3ASK
607 Beacon Road,
Silver Spring, Md.

Last Minute Forecast

There is fairly good probability that moderate to severe ionospheric disturbances will occur May 3-4, 20-22, 30-31.

Sunspot Cycle

According to solar observations made at the Zurich Observatory and its stations in Locarno and Arosa, Switzerland, the provisional monthly sunspot number for February, 1957 was 117. This further increases the 12-month *smoothed* sunspot number (centered on August, 1956) to 148. This month's forecast is based upon a predicted smoothed sunspot number of 167 centered on May, 1957.

Propagation Conditions—May

During May and early June, as a result of the normal seasonal variation in the layers of the ionosphere, daytime maximum usable frequencies will be considerably lower than during the winter and spring months while night time MUF's will be somewhat higher. Ionospheric absorption continues to increase further during the daylight hours of May and June, and atmospheric noise levels are approaching summer-time peak values. A sharp increase in the occurrence of sporadic-E ionization should result in considerably more "short-skip" type openings during May and the coming summer months. Compared to the violent outbursts of February and March, far fewer radio storms and auroral displays are expected to occur during May and the next few months.

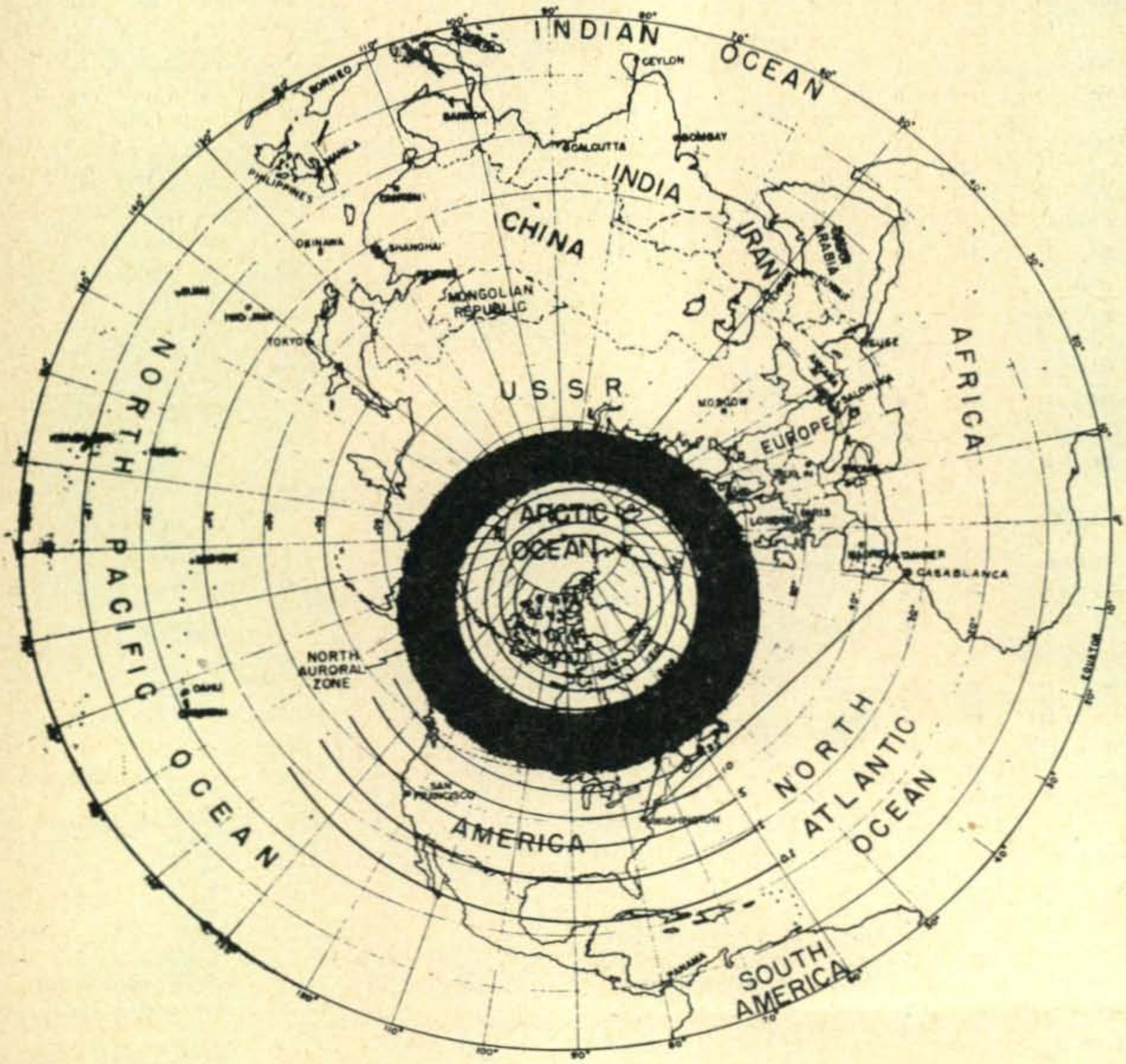


Fig 2. Estimated number of days auroral displays occur each year in the northern hemisphere. The Northern Auroral Zone is the region where displays occur upwards to 250 days a year.

The following is an overall picture of band conditions forecast for May, 1957, with a discussion of the qualitative changes in each amateur high frequency band from month to month. For specific times of band openings for a particular DX or Short-Skip circuit, refer to the *CQ Propagation Charts* on the opposite page.

6 Meters:

Occasional openings are expected between skip distances of approximately 1000 and 1400 miles as a result of an increase in sporadic-E type propagation. While widespread F-2 openings are not expected until next fall, there is a slight possibility of an occasional DX opening during May between the southern states of the USA and South America and between California and Australia. Unusual short-skip openings are expected during the aquarids meteor shower between May 1st and 6th.

10 Meters:

A sharp increase is expected in short-skip, sporadic-E propagation on 10 and 11-meters between distances of approximately 750 and 1300 miles. Regular layer F-2 short-skip propagation, beween distances of 1200 to 2200 miles, should be possible on many days, especially during the late afternoon and early evening hours. DX conditions remain fairly good from around noon to after sundown. The band will open considerably less often than during the winter months, but will remain open later in the day, peaking during the late afternoon and early evening hours.

15 Meters:

DX propagation conditions on 15-meters will be optimum during the late afternoon and early evening hours, when good reception from most areas of the world should be possible. During the periods of exceptionally good propagation conditions the band may remain open to South America and other areas of the world well past midnight. A considerable increase is expected in short-skip openings between distances of 600 and 2200 miles, especially during the afternoon and early evening hours.

20 Meters:

During the evening hours, the optimum band propagation-wise is expected to be 20-meters. From late afternoon until a few hours after sunrise good conditions are expected to most areas of the world. Dur-

Fig 3 A rare photo of CQ's Radio Propagation Editor, W3ASK, on the air. (Photo by Bruce Sturman, N.Y.)

ing daylight hours, higher solar absorption will limit most openings to short-skip distances between approximately 250 and 2200 miles.

40 Meters:

No better than fair DX propagation conditions are expected from shortly after sundown to about sunrise. Seasonally higher atmospheric noise levels will result in noticeably higher static levels. During the daylight hours, extremely high solar absorption will limit openings to short-skip distances between approximately 100 and 750 miles. As the hours of darkness approach, solar absorption decreases and the range will increase.

80 Meters:

Static levels will be considerably higher and signal levels somewhat weaker than during previous months. During the daylight hours absorption will limit maximum range on this band to less than 200 miles or so. As darkness approaches, the range will increase out to approximately 2000 miles. On nights when static levels are low, DX to some areas of the world should be possible.

160 Meters:

With higher static levels, greater absorption, and longer hours of daylight during May, it seems very unlikely that night time propagation on this band will greatly exceed 1300 miles. During periods of exceptionally low static levels propagation to greater distances may be possible, especially during the pre-dawn hours. Solar absorption will limit day time propagation

Fig 1 A brilliant auroral display similar to the one seen over most of the United States during the evening of March 1-2, 1957. (Photo by Dr. C. W. Gartlein from National Geographical Society—Cornell University Aurora Study).

to the line of sight ground wave range.

Daylight Savings Time

During April and May many communities in the United States go on *daylight savings time*. All times used in the CQ forecasts are given in *local standard time*. If your community is now on daylight savings time remember to *add one hour* to all times shown in the forecast *Charts*.

Widespread Aurora

One of the most brilliant and widespread auroral displays ever seen in the United States occurred during the evening hours of March 1-2, 1957. The weird red, purple and yellowish-green dancing ribbons, violently throbbing rays and draperies of this great aurora were visible throughout most of the United States. (See fig. 1) In the northern states, the display covered almost the entire sky and lasted for several hours, being bright enough to cast shadows on the ground. The display was also seen clearly in California, Arizona, and as far south as Del Rio, Texas. Rarely are the northern lights seen so far south and for many observers it was their first aurora ever seen.

Auroral displays are believed to be caused by corpuscular radiation from active sunspots or solar flares bombarding the atoms and molecules of the gases present in the upper atmosphere of the earth, causing them to ignite. The process is not too dissimilar from that which takes place in a neon tube.

Related to this great aurora of March 1-2, and no doubt directly influenced by the corpuscular radiation from the sun, were tremendous disturbances in the earth's magnetic field causing compasses to vary several degrees; violent upheavals in the regular layers of the ionosphere causing a two day blackout on the high frequency amateur bands; and the sporadic formation of an intensely ionized layer about sixty miles above the earth permitting unusual 10-meter and VHF propagation over distances of several hundred miles.

Auroras occur most often at the extremities of the earth. In the northern hemisphere they are seen on more than half the nights of the year along an arc swinging across northern Alaska, central Canada, the southern tip of Greenland, Iceland, over the northern tip of Norway and off the northern coast of Russia and Siberia. These displays are seen less frequently as one proceeds south of this area of maximum occurrence. Over the northern areas of the United States, traces of auroral activity can be seen between 10 and 40 nights each year, while in southern areas of the country several years may pass before an aurora is seen. *(See Figure 2).*

There is a tendency for the northern lights to spread southward during the spring and fall months, and to occur more frequently during the years of high sunspot activity as we are now witnessing.

Sporadic-E

Ran out of space this month so the discussion of sporadic-E propagation originally scheduled, will appear in the June column instead.

73, George, W3ASK

ALL TIMES IN EST

EASTERN USA TO:	6/10 Meters	15 Meters	20 Meters	40/80 Meters
Western Europe	9A-11A (1) 11A-2P (2) 2P-5P (3) 5P-7P (1)	5A-12N (2) 12N-6P (4) 6P-9P (2)	12N-5P (2) 5P-9P (4) 9P-12M (3) 12M-5A (2) 5A-8A (1)	7P-1A (3) 9P-12M (2)*
Central Europe	10A-12N (1) 12N-6P (2)	9A-1P (1) 1P-3P (2) 3P-7P (3) 7P-9P (2)	2P-4P (1) 4P-6P (2) 6P-9P (3) 9P-11P (2) 11P-3A (1)	7P-11P (2) 9P-11P (1)*
Eastern Mediterranean	1P-7P (1)	11A-3P (1) 3P-7P (3) 7P-10P (2)	1P-3P (1) 3P-5P (2) 5P-9P (3) 9P-2A (2)	7P-11P (2) 9P-11P (1)*
North & Central Africa	7A-11A (1) 11A-5P (3) 5P-7P (2)	5A-9A (2) 9A-1P (1) 1P-6P (4) 6P-9P (2)	1P-3P (1) 3P-5P (2) 5P-10P (4) 10P-5A (2)	8P-1A (2) 9P-12M (1)*
South Africa	9A-11A (1) 11A-3P (2) 3P-6P (3) 6P-8P (2)	12N-2P (1) 2P-5P (2) 5P-8P (3) 8P-1A (2)	3P-5P (1) 5P-7P (2) 7P-11P (3) 11P-2A (2)	8P-11P (1)
South America	12N-5P (1)** 6A-8A (2) 8A-1P (3) 1P-7P (4) 7P-2A (3)	2A-10A (3) 10A-2P (2) 2P-5P (3) 5P-10P (5) 10P-2A (4)	3P-6P (2) 6P-10P (4) 10P-3A (5) 3A-5A (3) 5A-7A (2)	7P-1A (2) 1A-5A (3) 5A-7A (2) 1A-5A (1)*
South East Asia	4P-7P (1)	1P-4P (1) 4P-7P (2) 7P-9P (1)	6P-10P (1) 6A-9A (1)	NIL
Australasia	6P-10P (2)	7A-11A (2) 11A-3P (1) 3P-8P (2) 8P-11P (3) 11P-2A (1)	10P-12M (1) 12M-3A (3) 3A-6A (2) 6A-9A (3)	2A-7A (2) 3A-6A (1)*
Guam & Pacific	5P-9P (1)	1P-5P (1) 5P-10P (2) 10P-11P (1)	7P-9P (1) 9P-1A (2) 1A-3A (1)	NIL
Japan & Far East	5P-9P (1)	8A-1P (1) 1P-4P (2) 4P-9P (3) 9P-11P (1)	5P-9P (1) 9P-2A (2) 2A-6A (1) 6A-8A (2)	NIL

ALL TIMES IN PST

WESTERN USA TO:	6/10 Meters	15 Meters	20 Meters	40/80 Meters
Europe & North Africa	2P-6P (1)	7A-9A (1) 9A-12N (2) 12N-6P (3) 6P-9P (2) 9P-11P (1)	12N-2P (1) 2P-5P (2) 5P-11P (3) 11P-3A (2)	6P-11P (2) 8P-10P (1)*
Central & South Africa	11A-3P (1) 3P-8P (2)	10A-12N (1) 12N-2P (2) 2P-6P (3) 6P-2A (2) 2A-6A (1)	2P-4P (1) 4P-6P (2) 6P-10P (3) 2P-3A (2)	6P-10P (2) 7P-9P (1)*
South America	12N-4P (1)** 6A-12N (3) 12N-5P (4) 5P-7P (3) 7P-2A (2)	1P-3P (3) 3P-8P (5) 8P-12M (4) 12M-4A (3) 4A-1P (2)	1P-3P (2) 3P-5P (3) 5P-11P (5) 11P-3A (3) 3A-7A (2)	9P-12M (2) 12M-4A (1) 10P-3A (1)*
Guam & Pacific Islands	8A-5P (2) 5P-8P (3) 8P-10P (2) 10P-4A (1)	10P-3A (3) 3A-8A (2) 8A-10A (3) 10A-12N (2) 12N-10P (1)	8P-10P (1) 10P-12M (2) 12M-4A (4) 4A-8A (3) 8A-10A (1)	12M-5A (1) 2A-4A (1)*
Australasia	3P-7P (1)** 10A-1P (2) 1P-6P (3) 6P-10P (4) 10P-4A (2)	10A-12N (2) 12N-7P (1) 7P-4A (4) 4A-8A (2)	10P-12M (2) 12M-4A (3) 4A-10A (2)	12M-6A (1) 1A-5A (1)*
Japan, Okinawa & Far East	12N-2P (2) 2P-8P (3) 8P-10P (2)	8A-12N (3) 12N-8P (2) 8P-1A (3) 1A-8A (2)	9P-11P (1) 11P-2A (2) 2A-4A (4) 4A-7A (3) 7A-12N (2)	1A-6A (2) 2A-4A (1)*
Philippine Islands & East Indies	8A-11A (2) 11A-4P (3) 4P-10P (2)	12M-2A (2) 2A-7A (3) 7A-9A (2)	11P-3A (1) 3A-8A (2) 8A-11A (1)	3A-5A (1)
Malaya & South East Asia	10A-2P (3) 2P-10P (2)	12M-3A (1) 3A-6A (2) 6A-8A (3) 8A-11A (2) 11A-4P (1)	2A-6A (1) 6A-8A (2) 8A-1P (1)	NIL
Hong Kong, Macao & Formosa	12N-2P (2) 2P-8P (3) 8P-10P (2)	7A-1P (3) 1P-10P (2) 10P-2A (3) 2A-7A (2)	11P-2A (1) 2A-7A (3) 7A-10A (1)	2A-6A (1)

ALL TIMES IN CST

CENTRAL USA TO:	6/10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Central Europe	8A-10A (1) 10A-12N (2) 12N-4P (3) 4P-6P (1)	5A-12N (2) 12N-6P (3) 6P-9P (1)	12N-2P (1) 2P-5P (2) 5P-8P (4) 8P-11P (3) 11P-5A (1)	6P-12M (2) 9P-11P (1)*
Southern Europe & North Africa	7A-11A (2) 11A-4P (3) 4P-6P (1)	4A-12N (2) 12N-5P (3) 5P-8P (2)	1P-3P (1) 3P-5P (2) 5P-9P (4) 9P-12M (3) 12M-4A (2)	6P-12M (2) 8P-12M (1)*
South Africa	8A-11A (1) 11A-5P (3) 5P-7P (2)	11A-1P (1) 1P-4P (2) 4P-7P (3) 7P-1A (2)	2P-4P (1) 4P-10P (3) 10P-2A (2)	8P-11P (1)
South America	12N-4P (1)** 5A-7A (2) 7A-12N (3) 12N-6P (4) 6P-2A (3)	2A-6A (2) 6A-10A (3) 10A-2P (2) 2P-4P (3) 4P-2A (5)	3P-6P (2) 6P-2A (5) 2A-8A (3)	7P-12M (2) 12M-3A (3) 3A-7A (2) 12M-4A (1)*
Hawaii	9A-12N (1) 12N-3P (2) 3P-8P (3) 8P-10P (2)	9A-4P (3) 4P-10P (4) 10P-1A (3) 1A-3A (2)	4P-6P (3) 6P-2A (4) 2A-10A (3) 10A-4P (1)	10P-7A (4) 12M-6A (3)*
Japan & Far East	4P-10P (1)	7A-2P (1) 2P-9P (3) 9P-11P (2)	5A-8A (3) 8A-5P (1) 5P-8P (2) 8P-2A (3) 2A-5A (2)	NIL
South East Asia	5P-10P (1)	10A-2P (1) 2P-8P (2) 8P-10P (1)	4A-8A (3) 6P-10P (1)	4A-7A (1)
Australasia	5A-9A (1) 3P-10P (2)	7A-9A (3) 9A-4P (1) 4P-8P (2) 8P-12M (3) 12M-3A (2)	6P-8P (1) 8P-10P (2) 10P-3A (4) 3A-6A (2) 6A-9A (3)	1A-7A (2) 2A-6A (1)*
Antarctica	12N-3P (1) 3P-5P (2) 5P-8P (1)	11A-3P (1) 3P-5P (2) 5P-8P (3) 8P-11P (2)	3P-5P (1) 5P-7P (2) 7P-11P (3) 11P-8A (2)	9P-6A (2) 12M-4A (1)*

CQ PROPAGATION CHART

(SHORT-SKIP)

BAND (METERS)	DISTANCE (MILES) 50-250	250-600	600-1200	1200-2200
10	--	--	8A-2P (3) 2P-5P (2) 5P-12M (1)	10A-3P (1) 3P-10P (3)
15	--	--	8A-5P (3) 5P-12M (2) 12M-8A (1)	7A-11A (3) 11A-9P (4) 9P-12M (3) 12M-7A (1)
20	--	7A-11A (2) 11A-3P (3) 3P-9P (2)	6A-12N (3) 12N-8P (5) 8P-12M (3) 12M-6A (1)	12M-5A (3) 5A-5P (4) 5P-9P (5) 9P-12M (4)
40	7A-10P (5) 10P-7A (3)	9A-3P (4) 3P-9P (5) 9P-5A (2) 5A-9A (3)	7P-4A (5) 4A-9A (4) 9A-3P (2) 3P-7P (3)	5A-7A (3) 5P-7P (3) 7P-5A (4)
80	6P-8A (5) 8A-6P (4)	7A-6P (1) 6P-8P (3) 8P-4A (5) 4A-7A (3)	6P-9P (2) 9P-4A (5) 4A-6A (4) 6A-8A (2)	4A-6A (2) 7P-9P (2) 9P-4A (4)
160	6P-8P (3) 8P-5A (5) 5A-8A (3)	7P-9P (3) 9P-4A (4) 4A-7A (3)	8P-10P (2) 10P-3A (3) 3A-5A (2)	3A-5A (1) 8P-3A (2)

SYMBOLS FOR NUMBER OF DAYS CIRCUIT FORECAST TO OPEN:

(1) 1-4 days (2) 5-11 days (3) 12-18 days (4) 19-26 days (5) over 26 days.

** Indicates possible six-meter openings
* Indicates possible eighty-meter openings

Time Symbols: A - A.M. N - Noon P - P.M. M - Midnight

The CQ DX Propagation Charts are based upon a CW radiated power of 150 watts at radiation angles less than thirty degrees and are centered on the Eastern, Central and Western areas of the USA. They are valid through June 15, 1957. The CQ Short-Skip Propagation Chart is based upon a radiated CW power of 75 watts, using a dipole antenna a half-wave length above ground. It is valid through June 30, 1957. All forecasts are based upon ionospheric data published by the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado.

YL

Long-time YLs,

Chapter IV—1933-1935

Louisa B. Sando, W5RZJ
U. S. Indian School
Santa Fe, N. M.

Continuing with YLs who received their licenses in *1933*, it was in this year that W5DRA, Yetive Etie, went on the air from Houston, Tex. She got started all on her own while attending radio school and joined evening classes to learn the code and get her Ham ticket. Teev put together her first rig, a bread-board job for 40 cw and used a Majestic BC set with converter for her receiver. A year later she noted on a Houston street a car with W5CFX on the tire cover. She beeped him in code and the QSO continued in person. Two years later Teev became Mrs. Matthias, the OM's call later being changed to W5BIW when they moved to State College, N.M. Teev and Dick like to handle traffic, personal QSOs for folks in their area, and published "CQ NM" for several years. Their rig is a 400-watt Globe King and they use an NC-183 receiver. They also have a mobile rig in their car. Another hobby is raising dachshunds. Now W5DRA-BIW have returned to make Houston their home QTH once again.

Bruce Groves, W5DUR, of Odessa, Tex. received her first license in *1933* and shared with her OM W5NW a kw rig using PP813's operating cw only. W5DUR's entry into Hamdom was chronicled in QST for Aug. '34 in a department known as "Reserved for YL's and YF's." Among other comments she advised other YF's to get a ticket so they will understand why OMs are late for meals, why wire is strung all over the living room, and why a YF should never dust off the OM's transmitter! At present Bruce is not active on the air but retains her interest and attends conventions and hamfests.

In California Dorothy Hagerty and her OM took their exams together in *1933* and in July of that year came up with calls W6JMH and W6JMI. They handled emergency messages during the earthquake there in the same year. In '36 they moved to San Diego, then in '40 to Chicago where their son was born and Dorothy lost interest in radio. Back in California again at Burbank they have spent much time operating portable mobile. They especially like 10 and 2 meters and have operated P/M all over So. Calif. and several nearby states. Chief among Dorothy's other hobbies is writing and she has had articles in many radio magazines and currently is working on articles dealing with traffic and safety. Another new hobby is sports cars and she and her OM hold competition driving licenses. Bob operates Hagerty Radio Supply in Glendale.

W9MSW, Nell Hagen at St. Paul, Minn. got her license in April *1933*. Her first transmitter was a bread-board setup with a 210 in the final, cw, and a homemade receiver. A year later she got her Class A and a new transmitter for her birthday from her new husband, having become Mrs. Coil in Dec. '33. Then she operated 10 phone until WW II. Now WØMSW still operates on 10, though mostly on 75, using a Viking II and her SX-17.

When Mildred McMaster, of Taylorville, Ill., married her OM, W9LIV (a Ham since 1921) he immediately started coaching her in his hobby and two years later, in July 1933, she came up with the call W9OIU. At that time they shared a 47 oscillator on 20 cw, and later went on 160 phone. After WW II with several jr. ops to care for, hamming fell by the wayside. Then a year ago her OM assembled a DX100 and W9OIU made a comeback on 40 phone. Now she is also enjoying 20 cw with a new HQ14OXA. Mildred has a son just out of service, another graduating from high school this spring, a daughter 13 and one

W6JMH, Dorothy Hagerty, at her rig in 1933—a 47 crystal oscillator, 46 buffer and a 210 final with a homemade receiver. Right: W6JMH at present.

just a year old. Other hobbies include golf, chess and square dancing.

Mamie Hamilton WØOWQ, went on the air at Sedalia, Mo. as W9OWQ in the summer of *1933*. Until WW II she was active on 10, 20 and 40 cw earning WAS, WAC and working a lot of DX. From 1945 to 1955 Mamie worked as a housemother in a college and has not resumed activity on the air, though she still retains her license.

Another *1933* licensee was Letha Allendorf who went on the air at Joplin, Mo. as W9OUD, after being bitten by the bug when her brother got his call, W9IGW. She has always loved cw, has 35 CPC, Al op, RCC and can read anyone's fist, was state net control of AARS. In 1943 Letha became Mrs. Dangerfield and postwar became WØOUD; her OM is WØDE. Letha has served as SCM for ten years and holds public service awards. Several years ago it became necessary for her to learn Braille and while she finds it hard to handle fast relay work, she still keeps up with traffic work and more or less manages the Missouri cw traffic net. WØOUD runs about 90 watts and uses an SX-24 receiver. Chief among her other hobbies is writing poetry.

W7FTX, Clarice Goodman, licensed in 1935, uses this 100-watt rig she built herself.

WØMSW, Nell Coil, was licensed in 1933 as W9MSW.

W9OIU, Mildred McMaster, became a Ham in July 1933.

WØOUD, Letha Allendorf Dangerfield, was licensed in 1933 as W9OUD.

Left, W5DRA, Yetive Etie Matthias, has been on the air since 1933.

Right, W7EXY, Gretchen Walden, has been a Ham since 1935.

1934

June Brown became interested in telegraphy while in high school and then attended the RCA school in Chicago, the only girl in her class. She received her Ham ticket W9RBP in Feb. 1934 and 2nd class radiotelegraph that June. Her first rig she built by herself on a breadboard and during the process got across 575 volts on a transformer—luckily burning only her sweater and not June! She never did use the commercial ticket, but two years later married W9RTY. The Hengels amalgamated station was active on 160 phone and cw pre-war. Since then June has been busy with girls 20, 18, and 6 and a boy 12. Their present rig is a Heathkit AT-1 with SX-28 receiver and a 136-ft. end fed Zepp with 67-ft feeders, 100 ft. high on one end and 40 on the other. Both are active in the Chicago ARC, their home QTH. One of W9RBP's treasures is a stuffed Koala bear brought to June by the parents-in-law of a Ham in Australia with whom they held many a schedule.

1935

Mary Anne Knapp received her Ham ticket a week before marrying W9OMW in June 1935, with the call W9UTO. They were active on cw until WW II and after the war their calls were changed to W4UTO-W4OMW (QTH is Covington, Ky.). Mary Anne gets on now mostly for the YL contests using their HT9 and NC125 receiver. The Knapp's oldest daughter, 20, held a Novice ticket and their son, 18, is W4UNH. Another daughter, 11, is studying for her Novice, but Mary Anne adds that her son 8 and daughter 2 are not interested in radio as yet!

July *1935* saw Clarice Goodman on the air along with her OM using his call W7FGR at Hamilton, Mont. A few months later Clarice got her own station and call W7FTX and went on 40 cw. At present W7FTX is on all bands from 10 to 75, both phone and cw. Her rig is a homemade (by herself) job using a pair of 24G's in the final, running about 100 watts, and band switching. Clarice has two grown boys and twins, boy and girl, 11 years old. She and her OM are building their own home by themselves and her other hobbies include sewing, crocheting, plastic carving, flowers.

Another W7 YL who started in *1935* was W7EXY, Gretchen Walden, at Republic, Wash. W7EXY's special interest has been working veterans and other disabled persons, keeping skeds with them and visiting them in person when possible. Gretchen has two jr. ops and finds other hobbies in painting, drawing, designing and making small novelties.

Others

In addition to all these YLs who have been so long active in amateur radio, a number of others listed in the 1934 Call Book still hold their calls. For one reason or another we could not reach them, or received no reply to our queries. Just for the record we list their calls for they have been held continuously at least over 22 years: W1HOS, Eleanor Dodd Bradshaw; W1HRB, Elizabeth Sullivan; W2FSA, Marguerite Sloane; W2FV, Florine Freitag; W2ZV (now 5ZV), Margaret Bornemann; W6IOA, Louise Milner; W6FU, Betty Shoemaker Hayes; W6GGG, Helen Wilburn; W7ECC, Margaret Start; WØ(9)CMV, Opal Sisk; WØ(9)PFO, Marie Van Aller.

To all of the YLs who furnished material for this account, our grateful thanks. If we have missed any, let's hear from you.

Correction

Due to another visitation of the "printer's devil," during makeup of the last chapter of the Long-Time YLs two of the photos and captions were switched. Get out your March CQ and mark it. The YL pictured at the bottom of p. 71 is not W2RUF, but Madie Edison, W5DQF. Page 117, lower photo is not W5DQF, but is W2RUF, Clara Reger, ex-W8KYR. Our apologies to these YLs and to all our readers.

33, Louisa, W5RZJ

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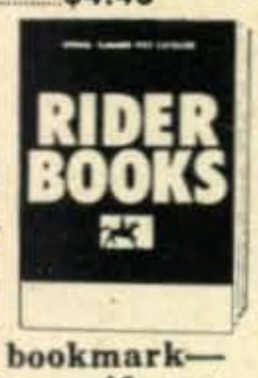

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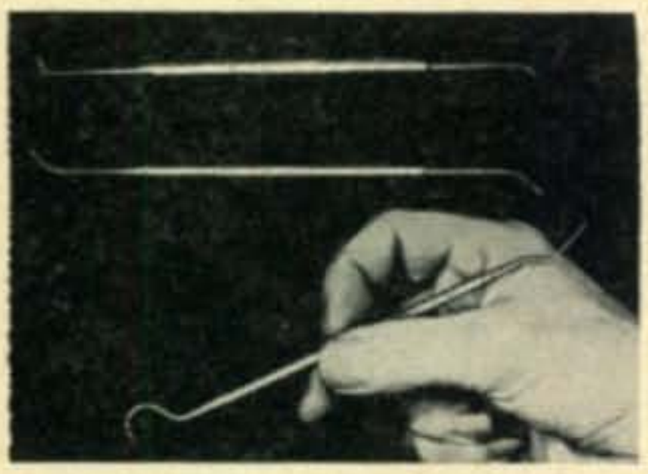
For further information, check number 88 on page 126.

RCA Tube Manual

RCA announces their new 352 page Receiving Tube Manual. This book gives data on more than 650 receiving and picture tubes and costs only 75c. In addition to detailed information on specific tube types there is information on basic tube theory, and applications. A chapter on circuits covers most of the basic radio and audio circuits now in use. Certainly every amateur should have one of these manuals. They are available from RCA distributors.

Transistor Manual

G.E. has published a 50c booklet which covers semi-conductor theory, design, and construction. It not only gives just about all the dope you could want about existing transistors but cross references various types used by different radio manufacturers. There are nineteen transistor circuits too. Your G.E. distributor should have 'em in stock.



New Tools

Every tool kit needs a pick to get into out-of-the-way corners. This shrewd importer grabbed onto some dental picks and is offering them for only $3.95 in a set of three. They are Swedish steel and almost indestructible. Used for picking, scribing, piercing, probing, and even getting oil into impossible places by rolling it down the pick. Why keep needing these? Circle B on page 126 for more info on these gems.

The SX-101

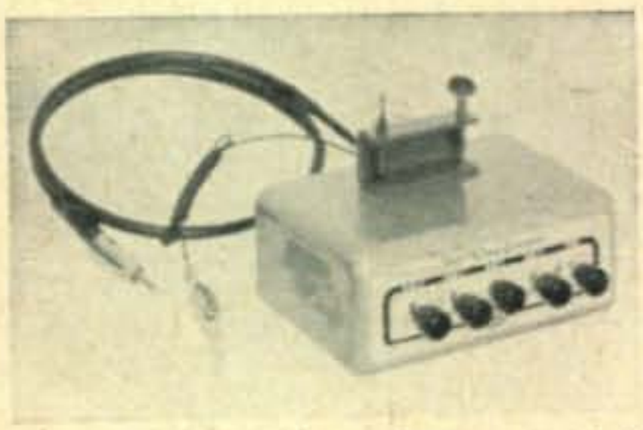
Hallicrafters has announced the SX-101, a ham band receiver (plus WWV at 10 mc for calibration checks). This receiver designed to be particularly effective on SSB, has a built-in 100 kc calibrator, T-notch filter for chopping out heterodynes, variable selectivity from 500 cycles to 5 kc, and a solidly built chassis to insure good stability. Price: $395. For complete technical details circle C on page 126.

NC-109

National hasn't been sitting on their hands either. They have just announced the new NC-109 which sells for $199.95. This is a general coverage receiver with special bandspread for the hambands. It covers 540 kc (broadcast band) to 40 mc (thru 10 meters). Features: crystal filter, illuminated "S" meter, and product detector for SSB reception; quite an array for such a reasonably priced receiver. Circle D on page 126 for full technical details.

NC-188

Yessir, two receivers! This one is very similar to the NC-109 except that they cut $40 off the price ($159.95) by omitting the crystal filter and product detector. You get full bandspread coverage on all amateur bands through ten meters, "S" meter, noise limiter, antenna matching trimmer, etc. Circle E on page 126 for details.

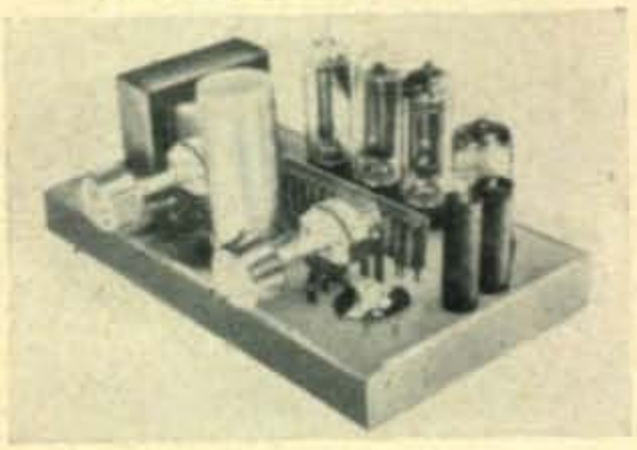


SWL Converter

Gonset has just announced a mobile SW converter. It installs in minutes and runs off the 12V from your car. Just plug the auto antenna into it and you are in business. This is particularly handy for cross-country trips where BC stations are weak and transient. Tell you what, you flip back to page 126, circle F, and wait for the hot scoop from Gonset.

Data Recorder

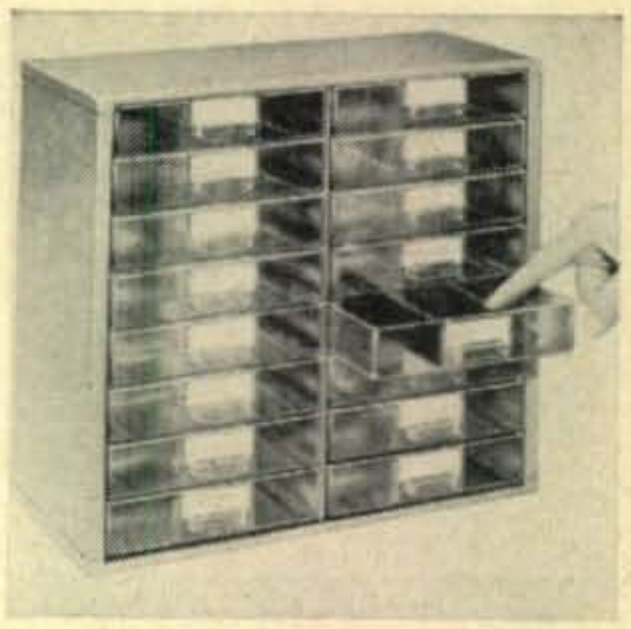
Lots of us have wanted to be able to record things on some sort of visual continuous recorder, but the drum gadgets available had such fantastic prices that it was impossible. Now, Gorrell & Gorrell has brought out a device that sells for $59.50 which will record for up to 24 hours. It is a real slick idea and you should quick circle G on page 126 if you are interested. They have all the dope just waiting to send to you.



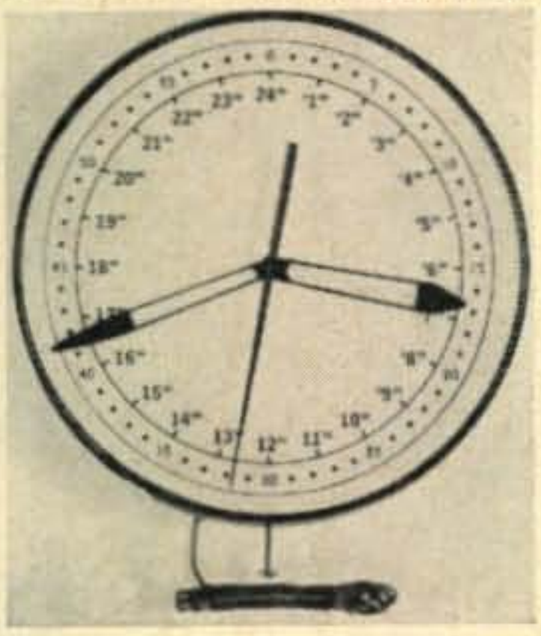
Audio Amplifier Kit

Erie Resistor Corporation has introduced an interesting four tube audio amplifier kit which comes complete with the printed wiring board, pre-assembled resistor capacitor module, tube sockets, tubes, and plug-in components. This instructive amplifier will fit in around the shack in dozens of ways and can be had from your local Erie distributor quite reasonably.

Jiffy Cabinets



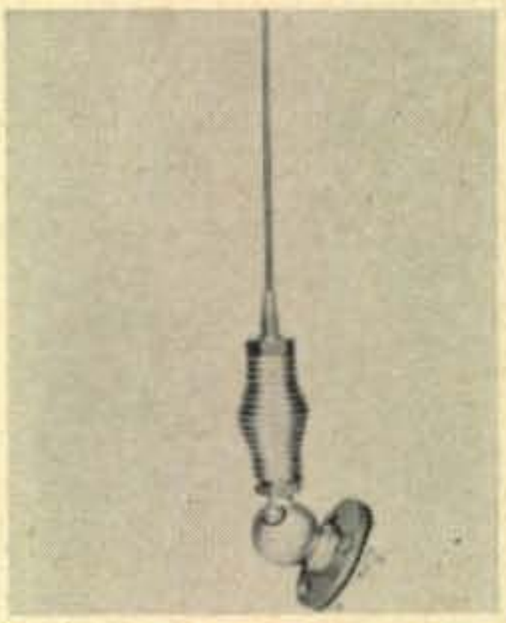
It is about time to get all those small parts sorted out and put away. These cabinets come in sets of 8, 12, 16 and 24 drawers. To get more details on these Jiffy Twin drawer sets circle H on page 126. You'll get pictures, dimensions, prices, where to order, and all sorts of reasons why you can't do without 'em.



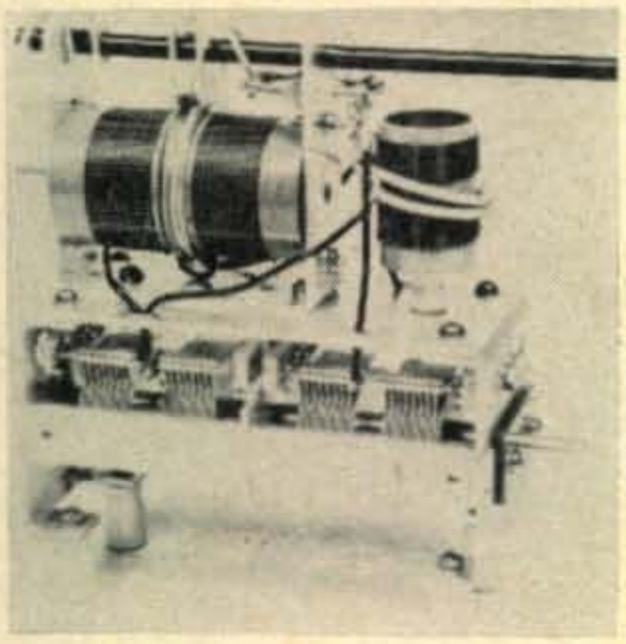
24 Hour Clock

Impress your friends. Baffle your family. Make your shack look like a regular short wave broadcast station with this professional 24 hour clock. It has a 15" dial and is lighted. Price is only $15.00. For 75c more they will put on another hand to indicate GMT for you. Real obliging people. They'll send you a picture of it, sales talk, and full spectaculars if you circle I on page 126.

New Mobile Antenna



The Antenna Specialists Company of Cleveland Ohio have just announced a complete mobile antenna set. This consists of a base 2" swivel with bakelite insulation and steel back-up plate which lists for $5.05, a spring for $3.40, and a 96" taper ground stainless steel whip for $7.25. The whip can be cut to any desired length. For further info circle J on page 126.

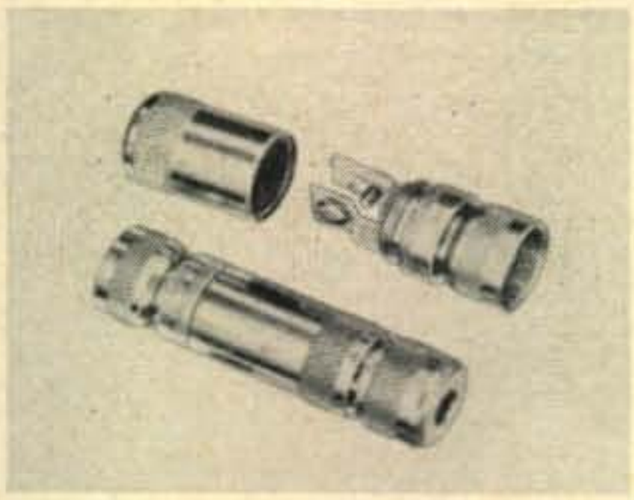


Multi-Band Tank Circuit

National has announced a new all band tank circuit MB-40DL which tunes from 3.2 mc to 9.0 mc and from 12.0 mc to 34 mc. This gives plenty of overlap to take care of varying circuit capacities. No plug-in coils or band switching is necessary, the 180° tuning of the dial covers all bands from 80 through 10. This unit is rated at 20 watts for grid circuits and 40 watts on plate circuits which are well loaded down. To get more technical data on this new unit circle K on page 126.

Panel VTVM

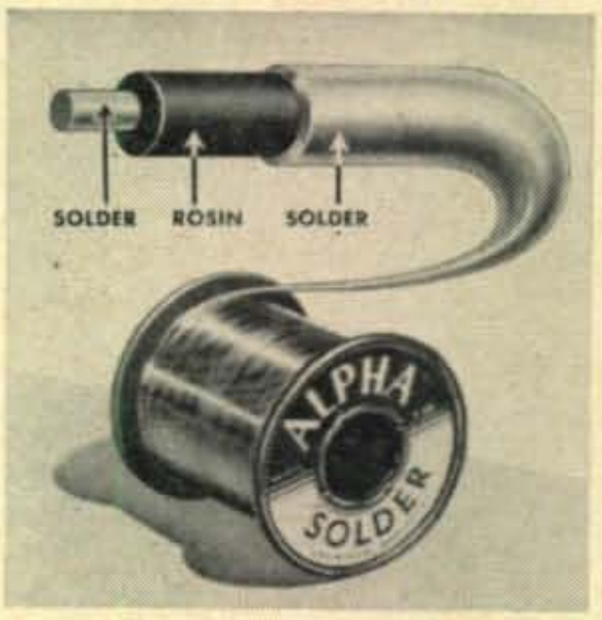
Trio Labs has a panel mounting completely contained VTVM. With ranges from 1 to 300 volts, a ten megohm input resistance, built in amplifier and power supply, this is quite a deal. The meter is a standard 4" square type. More? Circle L on page 126.



New Mike Connectors

Switchcraft has something new: mike connectors which work like phone plugs. They have screw terminals instead of the usual solder connections. Wonder why someone didn't think of this long ago? Do you wonder too? Well, if you circle M on page 126 Switchcraft will bend your ear about the thing.

New Type Solder



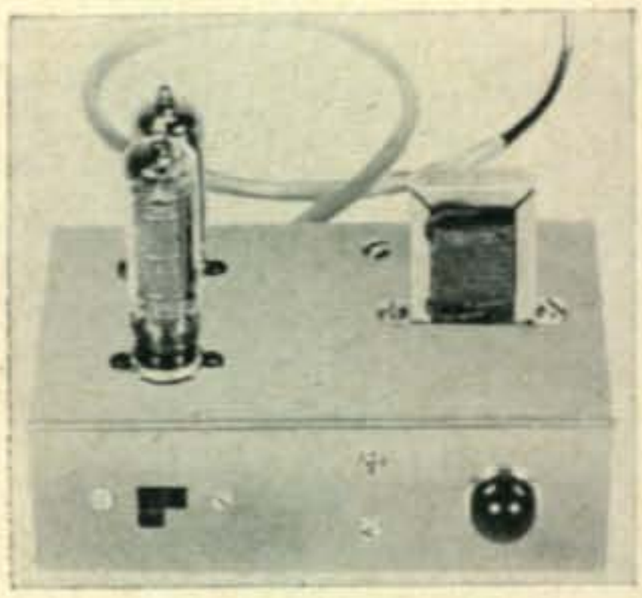
Everything gets improved from time to time. Now it's solder. Alpha Metals has come running out of the lab all excited over their new Cen-Tri-Core solder in low temperature alloys. What this all means is that you get the soldering action at lower temperatures, insulators don't have to crack under the heat, etc., and the new flux deal makes for absolutely uniform soldering. Amazing, wot? Circle P on page 126.

A-C Outlet Box

This new unit contains six replaceable sockets plus an on-off switch, neon indicator and fuses. It can be permanently mounted for workbench or lab use or can be used as a portable a-c source. It is rated at 15 amperes 110 volts. Circle O on page 126 for more info.

New Hi-Fi Book

Hi-Fi From Microphone To Ear by G. Slot (yup) runs 180 pages, has 118 illustrations, and costs $2.75 shipped postpaid from Philips Technical Library, Eindhoven, Holland. Those of you who are interested in hi-fi techniques will want to keep your library up to date, particularly since many of the advances in hi-fi have been coming from Holland.

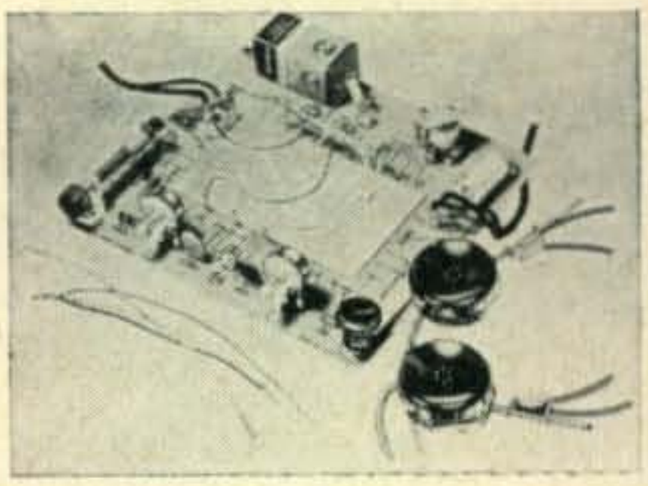


Conelrad Kit

If you are stewing over Conelrad you may be interested in this $13.95 Conelrad kit by Regdon. It uses two tubes, gives both a visual and audible alarm, and automatically cuts your transmitter off the air. Easy to build and install. Circle P on page 126 for literature.

New Transmission Line

Been wanting some jumbo transmission line? Fretco didn't tell us how much it costs or anything like that, but if you have had a frantic need for something that looks like what you see in this small picture then you'd better circle Q on page 126 and see what comes.

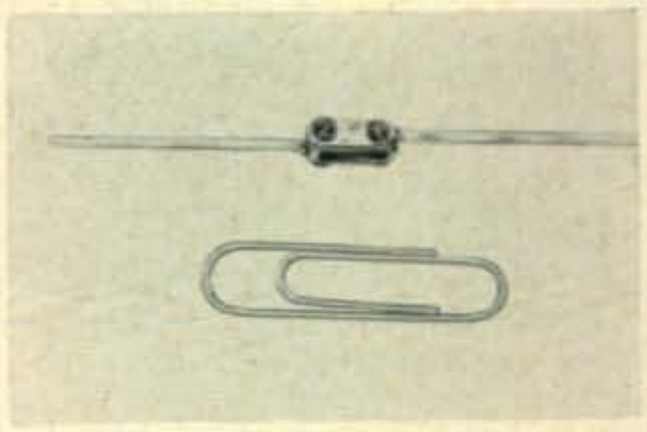


Transmitter Lab Kit

Allied Radio has a 10 circuit transistor kit available for $15.45. The plug-in leads allow changing circuits in minutes with no resoldering once the basic units have been soldered into place. With this you can build a two stage radio, a photo-electric relay, wireless broadcaster, code oscillator, two stage audio amplifier, capacity relay, timer, flasher and voice controlled relay. Headphones, transistors, relay, photocell, and everything else needed is in the kit. Circle R on page 126 for a sales brochure from Allied.

How to Use WWV

The Shasta Division of Beekman Instruments has an eight page brochure describing the function, applications and recent improvements of the National Bureau of Standards radio stations WWV and WWVH. This brochure also describes the new Shasta model 905 WWV receiver. Circle S on page 126 if you would like to get this brochure.



Dwarf Rectifiers

Radio Receptor Company has amazed everyone with this midget selenium rectifier which will handle 5 ma. at 125 volts with a resistive load. These are made in Germany by Siemens and imported by Radio Receptor to sell for from 51 to 60c list price, depending upon the type. Circle T on page 126 for a bulletin on these new units.

RME 4350

RME has just announced the release of a new receiver for us hams. It is a completely band-spread job with dual conversion, Xtal filter, die cast front panel, voltage regulation, and other features which result in the stability necessary for SSB reception. The knob is a two speed deal . . . pull it out for fast QSY to the other end of the dial, push it in for micro-tuning. It is only logical that you write for info. Price? $229! Check U on page 126 for further info.

Sorry, No Picture →

Automatic 6-12 Volt Converter

Trav-Electric has come out with a new type of converter which operates from either six or twelve volts automatically and gives 110 volts at 60 cycles output. No switches to throw either. They have a rather complete line of converters for running your small rigs, receivers, tape recorders, and Waring Blenders in your car, boat or plane. You never knew you could run your blender in your plane did you? Circle number A on page 126 and find out all about it.

THE *New Look* FROM *National* . . .

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A top-quality, low-cost receiver, directly calibrated for the 4 general coverage ranges and 5 bandspread ranges for the amateur bands (80-10M). Also covers 540 kc. to 40 mc.; voice or CW. Features include calibrated bandspread for 10, 11, 15, 20, 40 and 80M; separate tuning capacitors, knobs and scales for general coverage and bandspread; large easy-to-read 11" slide-rule dial, and front panel "S" meter for signal strength indication and more accurate tuning. Size: $16\frac{13}{16}$x10x$10\frac{7}{8}$".

Only $12.96 per mo.

Pay $16.00 Down — Cash Price: $159.95

And Another New One Coming in June!

Still the Center of Attention . . . *National's NC-300*

Features greatest sensitivity at any price! Greater stability than most receivers. 10 dial scales cover 160 to 1¼M with exclusive converter provision with scales calibrated for 6, 2 and 1¼M, using a special 30-35 mc. tunable IF selector — .5 Kc., 3.5 Kc. and 8 Kc. Provides super selectivity, gives optimum band width for CW, phone, phone net or VHF operation. Separate linear detector for SSB. High speed inertia tuning dial with 40 to 1 ratio. Exclusive optional RF gain provision for best CW results allows independent control of IF gain. Giant "S" meter. Dual conversion. Calibration reset adjustable from front panel. Crystal filter with phasing control and 3-position band width control. First IF freq. — 2215 Kc., second: — 80 Kc. 10 tubes plus regulators and rectifier. Antenna input impedance: 50-300 ohms. Output impedance: 8 ohms. Less speaker.

Only $21.75 per mo. — Pay $39.90 Down — $399.00 Cash

And Write for Detailed Info on the Four Great Globe Xmttrs!

Globe King 500B
540 Watts, CW - Fone
$39.14 per mo.
Cash Price: $699.00

Globe Champion 300
300 Watts, CW - Fone
$25.14 per mo.
Cash Price: $449.00

NEW Globe Scout 680
6-80M, Fone & CW
$8.10 per mo.
Cash Price: $99.95

Globe Chief Kit
90 Watts CW
$5.00 per mo.
or $49.95 Cash

And Only 10% Down

Please rush me: ☐ Your latest FREE catalog and information on items checked below! Quote your top trade offer for my _____ (present equipment)
on your _____ (WRL Eqpt. Desired)

C 5/7

WORLD'S MOST PERSONALIZED ELECTRONIC SUPPLY HOUSE
World Radio LABORATORIES
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ELECTRONIC HEADQUARTERS
3415 W. BROADWAY COUNCIL BLUFFS, IOWA

☐ Wall Radio Map (25c) ☐ Reconditioned Equipment List

☐ _____ ☐ _____ ☐ _____

Name: _____

Address: _____

City & State: _____

For further information, check number 94 on page 126.

Surplus [*from page 33*]

Once you have a synchronized raster turn up the video gain for overload. If you are unable to overload the monitor, it indicates that you are not getting 1.4 volts peak to peak out of the camera. Check the cable going to the monitor. It should be 75 ohm coax such as RG-59/U and *must* be terminated with a 75 ohm resistor. It might be a good idea to check the tubes also. The 1649's (low microphonic 6AC7's) are operated very close to their ratings and I have found several weak ones in the various cameras that have been converted.

Next, peek in the side cover of the camera case, and focus the scene on the mosaic of the 1846. Now, slowly advance the bias control until some semblance of a picture is obtained. Keep this control as low as possible to avoid damaging the iconoscope. Adjust the electrical focus (R111) for the sharpest picture, then readjust the optical focus by sliding the lens back and forth. Adjust the height (R152), width (L105), horizontal centering R102 and vertical centering (R103) for approximately the same picture on the monitor as is seen on the iconoscope mosaic. The parabola and saw-tooth controls should be adjusted next. The vertical saw-tooth control R118, controls the shading of the top with respect to the bottom and vice versa. The vertical parabola controls the shading of the center of the picture with respect to both the top and bottom. The horizontal controls work in exactly the same manner but the shading is in a horizontal direction. If everything seems to be working correctly, it is time to televise a test pattern. If you do not have a satisfactory test pattern you might obtain one from the Radio Electronic Television Manufacturers Assn. in Washington. They have excellent large test patterns at very low cost. The camera should be adjusted optically so that the pattern is centered on the mosaic with the circles in the corners just touching the edge of the mosaic. Repeat the preceding adjustment only more carefully for the best picture.

You will notice that the shading controls will have to be varied with changing lighting conditions. This is built into an iconoscope tube and there is not too much that can be done about it. The shading controls should have enough range to correct for all lighting conditions. If more range is needed on the shading pots, a slight readjustment of the "leveling pulse" with C151 should do the trick. If black or white streaking is noted, a slight readjustment of the "high peaker" capacitor (C124) will eliminate it.

There are many improvements that can be made in the television camera. Don't forget this camera was designed and manufactured long before our present day techniques were born. For instance a cascode video preamplifier, with a 417 or 6BZ7, using regular VHF techniques would make a tremendous improvement in the signal to noise ratio of the video system. The video response can be widened out quite a bit also. Reducing the video plate load resistors to 1800 ohms and repeaking the coils would produce 450 lines of resolution. The iconoscope and the video amplifiers determine the vertical resolution and the *system* is capable of 600 lines or more. Naturally, the horizontal resolution is limited to 262 lines because of the frequency standards. If the camera lacks resolution, always check the coaxial cable terminations and the unit for coupling signal to the monitor or television receiver. The accompanying photos show about what you can expect from a converted ATJ camera. Several "recommended circuits" are also reproduced here. A unity gain amplifier for long cable runs, a "video coupler" for standard TV sets, and a Channel 3 transmitter are illustrated.

By the way, amateur television fans will be interested in this. The British hams are making us look like pikers! I received a copy of the publication "CQ-TV" which is the official organ of The British Amateur Television Club. This club has 300 active members and some of the setups get pretty elaborate. When I say piker, I mean these gents even have a mobile unit! The "conveyance" is an ancient London taxi and carries a Staticon camera and a V antenna, both on the roof, while the petrol generator is carried on the luggage grid. This magazine really has a lot of information packed into it with helpful hints on getting an amateur system going. Because of cost considerations, the British favor the flying spot scanner and they appear to have it down to a fine art. Slide projectors and film cameras are also used. The column titled "What the Other Chap is Doing" was of particular interest for we could sure use something like that over here. CQ-TV is available at 10 Shillings a year in Britain plus postage to the States from The British Amateur Television Club, 10 Baddow Place Avenue, Gt. Baddow, Chelmsford, Essex, England. The BATC also has a book titled "An Introduction to Amateur Television Transmission" available for 50 cents from the same address. What say we give it a bloody go, chaps?

The ATJ cameras are available from several sources. The prices vary with the condition of the camera. I have seen them for $50.00 less the ike, $100 used, and $200 brand new. When you compare this with the four digit prices for the Vidicon systems it is a pretty good deal. ATJ's are available on the West Coast from Alvaradio Radio Industries, P. O. Box 151, North Hollywood, Calif. Monitors are also available for the ATJ/ATK if you do not have a suitable one.

I would like to thank Mr. Harry Gartsman W6ATC, of Alvaradio Radio Industries for

For further information, check number 72 on page 126.

the assistance that he provided in the preparation of this conversion article.

The following are some of the letters received from Amateur TV enthusiasts:

Mike Vore, W3CCV, 359 Whitfield Road, Catonville 28, Md.

V. A. Vicksell, WØMAQ, 4329 E. 49th North, Kansas City 16, Mo.

Larry A. Olson, KØAHW, Route 1, Erie, Kansas.

Fred Chapman, W4CHT, 404 Fisher Drive, Falls Church, Va.

Jesse F. Lee, W5GCJ, Route #3, Box 49D, Pine Bluff, Arkansas.

If I missed anyone, my apologies. That about winds things up for this month. We are planning conversions of some portable equipment in view of the coming Summer weather. Candidates are the BC-654 and Navy TBX-8 which are 80 and 40 meter transmitter receiver and possibly a (gasp) TBY conversion.

Letters

In answer to George Ashley's request for information on the NC-240, I received the following:

Dear Don: Regarding the receiver in March CQ. Made by National Company. First ones about 1941, for the U.S. Coast Guard. Suggest that you contact the Coast Guard and see if you can obtain a manual. 73's Fred. W7EJD *Thanks for the dope, George may write you for info if he has no luck obtaining a manual.*

Dear Mr. Stoner: The official instruction book of the RAX-1 equipment, page 8, gives the i-f frequency as 915 kd for unit #2. Is this the receiver that you designate as RAX-2. Sincerely David A. Snedeker, KN6UMY, 2639 Berkeley Terrace, Fresno, California. *Curses foiled again! I goofed Dave, the unit has a 915 kc amplifier as you say, not 455 as stated in my "Q" Multiplier article.*

Dear OM: Noticed that Jack Baldwin, K2QVG, was on the prowl for a TU-75A tuning unit. I have one with all the 815's and it hasn't been touched. I will sell for 20 bux, FOB Burlington, Wis. Would you please forward this card to him as my call book does not list him. 73's K. C. Mass., W9AZA, 484 Robert St., Burlington, Wis. *Thanks for the dope OM. I had lost Jack's letter and did not find him in the call book so I could not forward the card. Are you reading this Jack?*

Dear Don: In response to your column in the March 57 issue of CQ, I am enclosing a schematic showing one way of adding AVC to a Command Receiver. I use a BC-453 in my car and it is unexcelled for this purpose. You might tell your readers that I would be happy to supply complete data on my installation. Thomas P. Prouty, K6HJH, 112 Via Waziers, Newport Beach, California. *Well many thanks, Tom. We have reproduced the diagram hereabouts for the "surplusers" who would like to add AVC to their receivers. This should work FB on the Novice Q5'er for phone work.*

I received a stack of SOS letters (save our surplus) this month. They go like this:

Chuck Scattone, W8HKG, 20013 McCracken Rd., Warrensville Hts., Ohio would like to obtain an instruction manual on the RBM-4 receiver.

Sid Weintraub, W8API, 3698 Menlo Rd., Shaker Hts. 20, Ohio would like to obtain information on a BC-463 complete with modulator for conversion to 6 meters.

John C. Klimek, W2KHQ/8, 720 Arbor St., Ann Arbor, Michigan would like information on using the TS-16/APN. This is a test set for checking the APN-1 altimeter.

John I. Trendler, 345 Coate St., Bridgeport, Pa. would like any information on the Navy receiver FT-46194, a unit of DAQ radio equipment.

Louis Story, W6QZI, 548 W. 137th Place, Hawthorne, Calif. would like to locate the following articles: "BC348 Conversions to End Conversions" and "BC-221 Conversion and Power Supply Circuit."

John Wentz, W8HFK, would like information on the CRI-43007, 28-80 mc tranceiver. *A TBY by any other name would smell the same or something like that. Ed.*

Bill J. Clark, USAF/CAP, Communication Officer-Quincy, P.O. Box 738, Quincy, Fla. urgently needs a schematic or manual for a RU-17 receiver and the address where he can purchase coils for same. He also needs a schematic or manual for a BC-AO 429 receiver.

A. G. Pearson, W4SIP would like information on improving the crystal filter in the BC-348-Q. *So would I, they could stand it. Ed.*

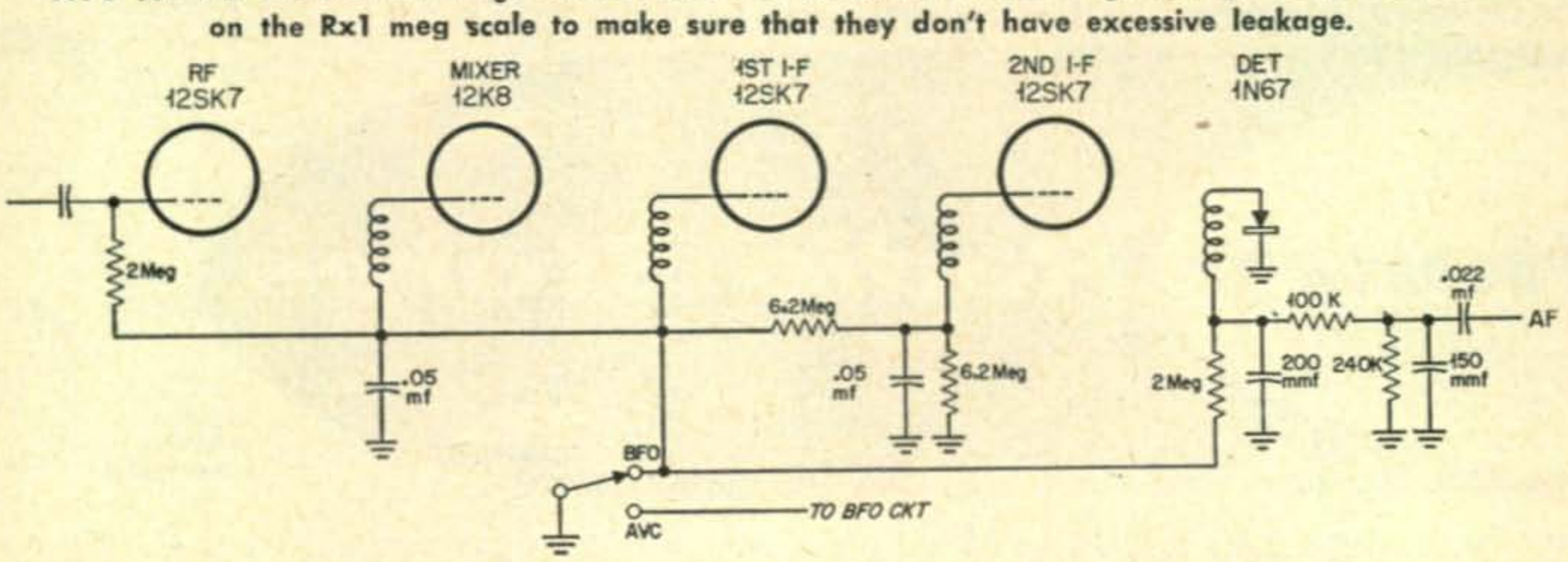
L. Kenworthy, Naby 230 Box 10, Seattle, Washington would like to obtain information regarding a surplus RTA-1 (B) transmitter manufactured by Bendix Radio.

G. K. Essex, W6PU, 1498 Sonoma Avenue, Albany 6, Calif. would like information on the GP-6 VFO-PA tuning units. *Check your log, om, didn't I work you several years ago as WN6TNS?*

J. Paul Raycob, 61 George Avenue, Middlesex, N. J. would like information on converting the TBY to 6 and 10 meters. *I wrote an article for West Coast Ham Ads some time ago, Paul. Possibly a few back issues are available, see the surplus column for the QTH. There are a few errors such as omitted coil data, so proceed with caution. Ed.*

Wick 308 Monroe St., Kalamazoo, Mich. would like to obtain a schematic for the LM-15 power supply to establish if it can be used with an LM-10.

AVC for the BC-453. Warning! Check those .05 condensers with a good high range ohmeter on the Rx1 meg scale to make sure that they don't have excessive leakage.

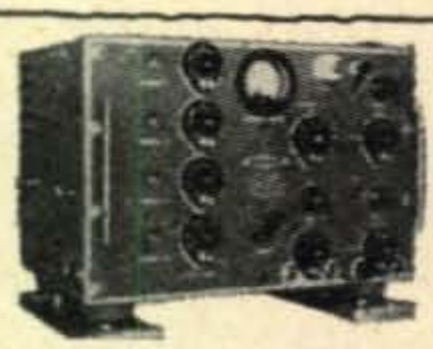


AMATEURS! THIS IS IT! ABSOLUTELY THE HOTTEST YET! READY-TO-GO. FACTORY WIRED MOBILE TRANSMITTER-RECEIVER!

Ask the southern W6's and K6's about the **BLACK WIDOW**! Now introduced nationally for the first time! Heaters wired for quick changeover 6 or 12 V. Uses your car radio speaker to reduce size and cost. Requires external power supply 300 V., 200 ma, not included. Only 9" wide 5" high, 6" deep. Hang it under the dash! Built-in tune-up meter also serves as S-meter. Crystal plugs into front panel for quick, easy, frequency change. (VFO plug-ins now in the works, will be ready soon.) 8 WATTS OUTPUT! Very sensitive and selective band-spread superhet receiver with vernier tuning and large calibrated dial.

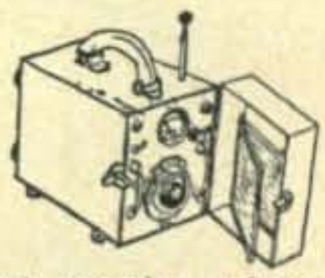
220 MC: Cat. 27-611 TXR12-CQ $165.00
2 METERS: Cat. 27-611 TXR9-CQ 165.00
6 METERS: Cat. 27-611 TXR10-CQ 165.00
10 METERS: Cat. 27-611 TXR11-CQ 165.00
115 V. POWER SUPPLY: With speaker. Cat. 13861 PS2-CQ 27.50
UNIVERSAL POWER SUPPLY: With speaker. 6 V., 12 V. or 115 VAC. Cat. 4761PS3 ..... 36.50
PLUG-IN VFO: Instead of crystal. Now in the works. May be ready soon.
NOTE: We have a limited number of 12 V. surplus dynamotors to supply The Black Widow. Sold only with Black Widow purchase. Ea. 6.95

BENDIX 100 WATT TRANSMITTER! FOUR SEPARATE ELECTRON-COUPLED OSCILLATORS!



Can be easily converted to 10-20-40-80 meters. Crystal required for 10 meters. Each electron-coupled oscillator dial has 3,000 divisions enabling quick, precision shifting. Constructed of highest quality parts with laboratory precision. Four separate output tanks, one 4-position selector channel switch has even sections which change the ECO, IPA and output tank **simultaneously**! ALL controls mounted on front panel. The housing is cast aluminum, shields and case are sheet aluminum. 11" x 12" x 15". Ship wt. 45 lbs. Complete with instructions and schematic. Uses and includes 3-807's and 4-12SK7's. Has a 2-inc 5-amp R.F. output meter. **Only one knob (center) selects 10-20-40-80 meter bands.** A complete coverage transmitter, for the new or experienced amateur. A TRUE HAM VALUE—COMPLETE WITH TUBES. Excellent condition. Cat. 3861TX15-CQ **$27.50**

FREQUENCY METER BARGAIN!



BC906 is also a wonderful Grid Dip Meter and Relative Field Strength Meter! Frequency 144-225 mc. covers VHF communications and upper TV channels. You tune a silver-plated cavity to resonance with a large National Velvet Vernier dial. A probe in the cavity feeds the diode plate of a 1S5 and the rectified negative voltage applied to the grid of the same tube dips the plate current as shown on a 0-500 dc microammeter. The dial is individually calibrated with a curve showing 100 kc per dial division. The entire unit is in a compact carrying case only 12½ x 8¾ x 6½" with a leather handle. Schematic is pasted inside. Includes plug-in antenna. Specs inside for one ea. 1.5 V. and 15 V batteries. This precision laboratory device is in excellent condition **$7.95**

COMMUNICATIONS RECEIVER

RCA's CRV-46151 6-tube superhet 195 Kc thru 9.05 MC. Very sensitive. Includes RF stage. Sharp and broad selectivity. Has AVC-MVC switching and BFO. You may replace the dynamotor with an AC power supply. Dope sheets and schematics included. Excellent cond. Shpg wt. 30 lbs. Cat. No. 3806RE5CQ Only **$19.95**

MOUNTING RACK $2.50
ACCESSORY KIT FOR ABOVE: 2 control boxes, tach shaft, and set of plugs $7.95

VHF CHECKER WITH SCOPE DISPLAY 150-240 mc

Brand new unit made for Air Forces, so you know that it is made right. Signal generator feeds pulsed RF to your receiver. Output of your receiver is displayed and measured accurately. Built in AC power supply 115 V. any frequency from 50 to 1200 cy. Also use the scope to analyze Hi-Fi amplifiers by pulsing its sweep from your square-wave generator. Each sweep will present one complete pulse from your amplifier's output. Shpg. wt. 50 lbs. A $1200 set. BRAND NEW, with all tubes and instruction book, for only **$42.50**

6 VOLT SEALED RELAY

ADVANCE has two sets of SPDT contacts and two pair of SPST Normally Open contacts, H.S. in small can with schematic on the case. In can, weighs 3½ oz. Out of the can, only 1¾ oz. New! Cat. 206RY29-CQ. Only **$1.95**

NARROW YOUR PASS BAND

With this NEW U.T.C. Radio Range filter with switch, cord and phone plug, and phone jack. Cat. 1206TF2-CQ. Only **$1.95**

TS/92 AMPLIFIER ALIGNMENT KIT

20-250 mc. 110 V. 60 cycle power supply **$17.95**

APG 5 or 15 CAVITY

10 Cm. 2C43 osc Xmitter, 2C40 Loc. Osc. Rec. 1B27 TR; tunes 2400 to 3000 MCS, less tubes. Brand New **$4.95**

RAX NAVY AIRCRAFT RECEIVER: 200 to 1500 KC. Excellent $17.95
7-27 MC. with tube, less dyn. Excel. $17.95

THE BEST PORTABLE MOBILE 10 & 6

The best for back-pack and automobile. 28-80 MC, AM. Modifications necessary for amateur use are easy and explicitly shown in simple instruction sheet furnished with your order. This is the famous Marine Corps TBY. Original power supply not included, but power supply which you can use is spelled out in these instructions. Excellent condition with tubes. You also get an AN-75 antenna and the original TBY headset and mike with the cord and plug to fit. All this for only **$24.50**

TRANSMITTER: 30 Watt TV transmitter. Uses 4-8025. 2 as 250-385 mc P-P osc. driving the other two as PA. The PA is grid modulated by a 3-tube video ampl. and plate-mod by a 3-tube sync ampl. New with all tubes, schematic and instructions for easy conversion to 420. Only **$15.75**

WIDE-PASS TEST SCOPE & 455 KC PANADAPTOR

Both in one compact unit! Brand new with schematic. Also 5.25 and 30 mc. inputs. The only modification required is to replace only one power transformer with 60 cy. units we show you how to find in your hell box and how to connect ID-60/APA-10. A gem that cost govt. $1,000! Cat. 14061SC1CQ **$39.50**

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For further information, check number 97 on page 126.

Mobile [*from page 50*]

of the grounded grid stages should be done with the aid of a field strength meter. This is standard operating procedure in mobile work since antenna coupling is so tight that it is difficult to detect a dip on a plate current meter. ■

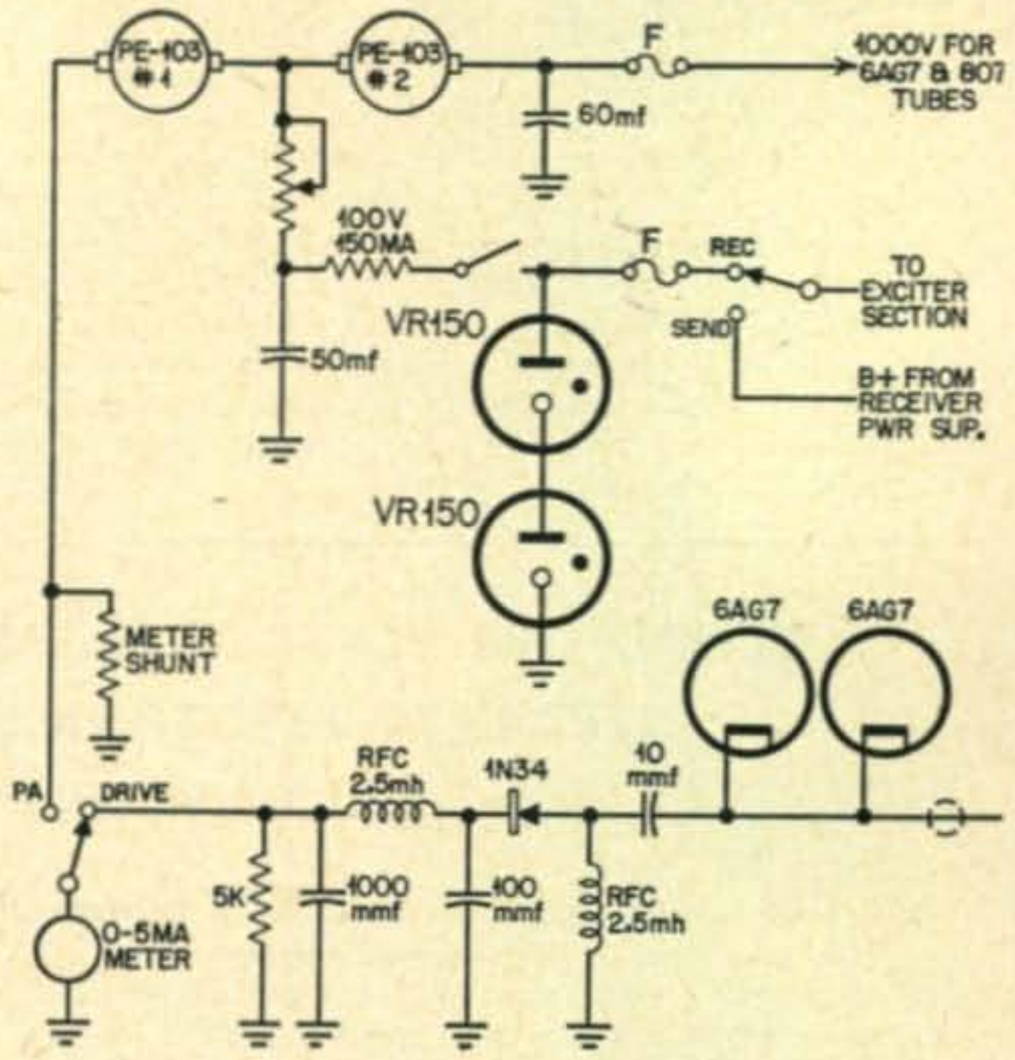


Fig 6. Power Supply and metering ckt.

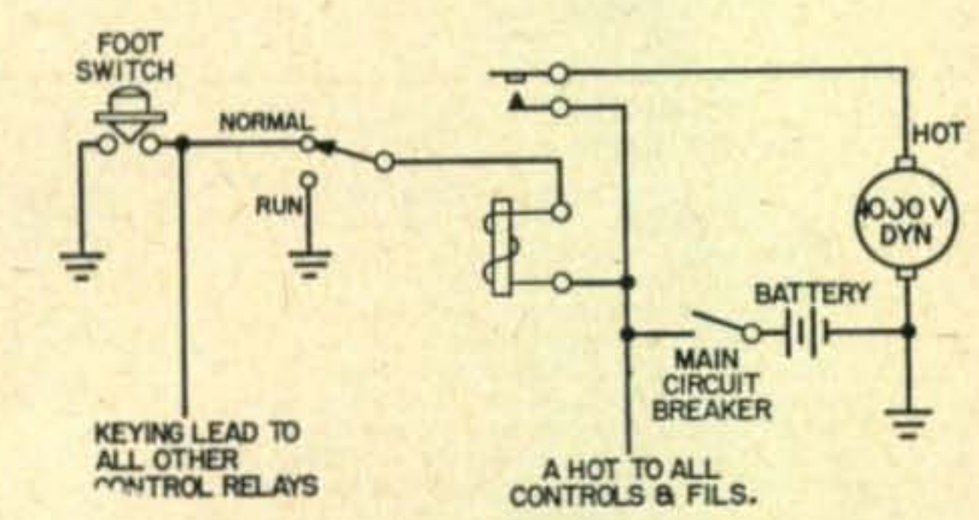


Fig 7. Control circuit for 1000 volt dynamotor.

Editorial notes . . .

The authors of the preceding pieces tell tales of melted antenna loading coils and of corona discharges 3 to 4 inches from the tips of their whips before modifications were made. The antenna system designed for low power just can't take these amounts of r.f. W4JOH solved the loading coil problem by using the 2-3.5 mc tank coil from a BC610 (*#1735*) at the base. With a few turns added, it covers the whole band. The corona discharge disappeared after a ⅜" ball bearing was brazed to the tip. W5JQA licked the corona discharge with a loop 2" in diameter on the tip. After much experimentation, he settled for a center loading coil wound on a 2½" form of #12 wire. Further effort enabled him to remote-tune the coil but that story is too involved to relate here.

The authors are united in expressing their satisfaction with their respective brain-childs. There is no doubt that "mobiling" is less of a task and more pleasureful with higher power. ■

letters [*from page 16*]

Two: Shep? Olâ Shep? Sure, we'll get more of him in the rag. The trouble there is that I have to spend day and night up at his apartment getting him to actually sit down and write something. He is in Europe now, supposedly taking pictures of ham shacks for us with my best camera. He'll be back in a week or so, though.

Three: Good grief! How would I know hams in Fairfield, Connecticut?

Four: Giant radio show? Not enough giant radios aroună these days to have a decent show. Besides, who is going to do the work. I'm heading for warmer country for some swimming.

Lastly: If you want to shatter all your gold-plated illusions, then sure, come on up and try to get through the receptionist, my secretary and the production department into the CQ editorial office. You can easily tell when you've found it by the desks piled high with unanswereâ mail and nobody around. I'm home looking for DX on 20 anâ waiting for 6 to open up properly.

Wayne Green, Editor

Dear Sir,

I refer to your enquiry on page 104 of your issue of February as to who ever turns on a foreign broadcast station and sits down and listens.

In this connection I would refer you to the author of the article on page 24 of your same issue and to his confessions contained in his article in the second sentence of his conclusion on page 118. Maybe this gentleman is not however one of your 7000 readers.

J. Cowan Adam
Vancouver, B. C.

Dear Editor:

I am very much interested in learning the geographic location of Aurora. I recently heard a local ham calling "CQ Aurora". After frantically running through the DXCC country list, I was unable to find Aurora listed. Evidently it has just been added to the official —. —. —. —. country list. I seldom have time to work the countries on the official list as it keeps me busy just keeping the list up to date. Please help me if you can, as I'm sure I'll need this to keep my —. —. —. —. list up to date.

I was wondering back deep in my mind (no, that's impossible!!) if this could possibly be one of the new earth satellites, which without our knowledge, someone had slipped Muggs (J. Fredd, that is) on board, as he has very quietly slipped away from the Dave Garroway morning show.

I am still desperately scanning the air ways for a feeble call from Aurora.

G. Paul Trinkle, W9HSG/6
Burbank, California

Dear Wayne:

I operate 10 and 15 meter phone as Maritime mobile from the SS Fullerton Hills. On my operating desk is a fluorescent lamp using two 15-watt fluorescent tubes. When listening to 15 meters I got an annoying low frequency buzz which I traced to the lamp. There was no sign of the noise on 10 meters.

I wrote General Electric for help and they sent me a filter hook-up which works fine and I no longer get any noise from the fluorescent lamp. I pass along the dope for use by others who might have this same trouble.

The only parts necessary are, one .02 mfd tubular condenser, two .002 tubular condensers, 250V rating.

The filter is mounted right in the lamp base, using the lamp base itself for the "ground" connection.

Arthur E. Hutchins W5AXI/MM
SS Fullerton Hills

Dear Wayne:

I received your card and in line with your request I am enclosing another clipping from the local newspaper. I plan to mail you one each month and later would like to send a picture of the mobile set up, of which we now have right in the club.

I used the article in CQ September 1955 by Rex Bassett to tune mine and wish to state that it worked exactly as he says. I worked 75-20-15 and 10 and after going at it according to Rex had no trouble getting tuned on 75.

I used the article in CQ, August 1956 with a few additions to eliminate the engine noise and I now have none, even at the hi end of 10. I might add, I am using an Elmac AF67 with a Gonset Super 6, Shakespeare fiber glass whip and Bassett loading coils on an Olds 98-53 four-door sedan.

Hal Mercer W3ACH
Scotland, Penna.

■

JUST RECEIVED! ASB-5 'SCOPE INDICATOR

BRAND NEW, including all tubes, together with 5BP1 'Scope Tube. Originally used in Navy Aircraft Radar Equipment. Easily converted for AC operation. Value $250.00!

OUR LOW PRICE..... **$15.95**

ASB-5 RECEIVER for 420 Mc BAND!

As featured in "CQ" for October 1956. Easily converted, makes a marvelous receiver for 420 band, with RF Amplifier! Supplied complete with all tubes,
OUR LOW PRICE..... **$14.95**
Tuning Knob for ASB-5 Receiver..... $1.29

OPERATING MANUAL for ASB-5 Indicator and Receiver listed above..... **$1.95**

BRAND NEW SPECIAL PURPOSE TUBES
in Original Individual Packing

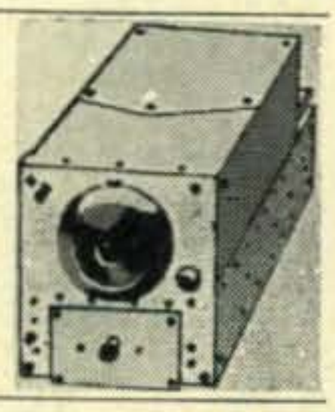
JAN CRP-730A MAGNETRON, Raytheon..... $3.45

Type	Each	Lots of 12	Lots of 100
6J6W	$.45	$5.15	$41.00
1625	.26	2.75	21.50
1626	.16	1.75	13.50
1629	.27	3.05	23.95
826	.44	4.95	39.50
2J724B	.35	3.95	29.50
VR105	.79	8.88	70.00
VR150	.79	8.88	70.00
8002R	5.95	.....	.....
RK65	7.25	.....	.....

NEW! Cathode Ray Tubes NEW!

3CP1	$1.18	5BP4	$2.22
3FP7	1.18	5CP1	2.45
5BP1	2.22	9LP7	1.88

DETROLA BEACON RECEIVER BC-1206A



A dandy little receiver for 200 to 400 Kc band. Uses 135 Kc iron core IF's. Complete with six tubes: 6SK7, 6SA7, 6K7, 6SQ7, 2-25L6s.
Used..... **$4.99**

DYNAMIC HANDMIKE with "Press-to-talk" Switch, cord and plug—**BRAND NEW**.....only **$2.95**

HI-FI DYNAMIC HEADSET WITH RUBBER CUSHIONS
Freq. Range: 40-14,000 CPS. No distortion.
BRAND NEW **$5.95**

MICROPHONES

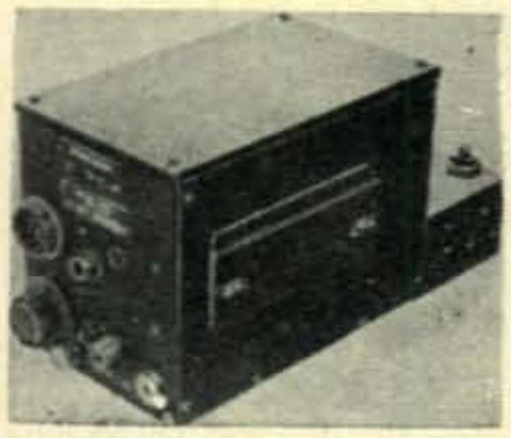
Model		Excellent Used	BRAND NEW
TS-9	Handset		$4.95
T-17	Carbon Hand Mike	5.45	$7.95

CD-307A Cords, with PL55 plug and JK26 Jack..... .99

DYNAMIC HEADPHONES, 600-ohm impedance, with large earphone cushions, cord and phone plug.
BRAND NEW, special..... **$3.95**

2" ROUND PANEL METER, 1-mil movement, 0-30 V cale. Standard Make. New!..... **$2.65**

AN/ARR-2 RECEIVER



BRAND NEW — A Terrific Value! Tuning Range 234 to 258 MC. Tubes: 7-9001, 3-6AK5, 1-12A6. Only a few at this low price!

Complete **$8.88**

With 28V 1.6A Dynamotor, complete $12.98

110 VOLT AC POWER SUPPLY KIT for above..... $9.75

BRAND NEW WOBBULATOR. Special!..... $4.95

WRITE FOR FREE CATALOG!

Please include 25% Deposit with order — Balance C.O.D. MINIMUM ORDER $3.00. All Shipments F.O.B. Our Warehouse N.Y.C.

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Telephone: CO 7-4605
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Ham Special! Famous BC-645 Transceiver

BRAND NEW

With MANUAL for Easy Conversion to CITIZENS' BAND!

Makes wonderful mobile rig for 420-500 Mc. Easy to convert for phone or CW 2-way communication. This swell rig originally cost over $1000—yours for practically a song! You get it all, in original factory carton, BRAND NEW, complete with 17 tubes, less power supply. **Conversion Instructions included.** Shpg. wt. 25 lbs. **$29.50**

PE-101C DYNAMOTOR for BC-645, has 12-24V input (easy to convert for 6 V Battery operation) only **$7.95**
UHF ANTENNA ASSEMBLY, for BC-645..... $2.45
Complete set of 10 Plugs for BC-645 **$5.50**
CONTROL BOX for above..... $2.23
SHOCK MOUNT for above..... 1.25

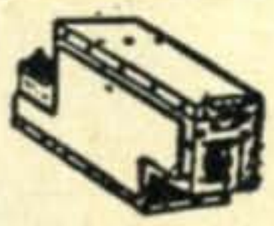
CONVERSION BOOKLET. Instructions for most useful surplus rigs..... **$2.50**

SCR-522 FINEST 2-METER RIG!

Terrific buy! VHF Transmitter-Receiver, complete with all components. 100-156 Mc. 4 channels. Xtal-controlled. Amplitude modulated voice. They're going fast! Excellent condition.
SCR-522 Transmitter-Receiver, complete with all 18 tubes. COMBINATION .....Special **$33.33**

ARC-5 MARINE RECEIVER-TRANSMITTER

Navy Type Comm. Receiver 1.5 to 3 Mc
BRAND NEW with 6 tubes..... **$16.95**
Navy Type Comm. Transmitter 2.1-3 Mc
BRAND NEW with 4 tubes and Xtal..... **$12.45**



ARC-5/R28 RECEIVER 2-meter Superhet, 100 to 156 Mc in 4 crystal channels. Complete with 10 tubes, BRAND NEW $18.95
110 V AC power supply kit..... $9.75

ARC-5/T23 TRANSMITTER companion for above; includes 2-832A and 2-1625 tubes. BRAND NEW, complete with tubes... $19.95

ARC5 MODULATOR, type MD7 BRAND NEW..... $8.95
ARC-5/T23 TRANSMITTER
Excellent used, less tubes..... $5.95
BRAND NEW, less tubes..... $7.95

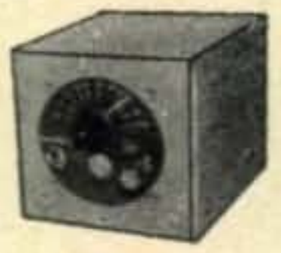
DYNAMOTOR VALUES!

Type	Input	Output	Excellent Used	BRAND NEW
DM-33A	28V 5A	575V .16A		
	28V 74	540V .25A	1.95	3.95

DM-32 type Dynamotor, input 12 V @ 2.4A; output 250V @ .060 A. BRAND NEW..... **$5.95**

R24-ARC/5 NAVY TYPE
(Similar to BC-946)

BROADCAST RECEIVER



520 to 1500 Kc. 6 tubes: 3—12SK7, 12SR7, 12A6, 12K8. For dynamotor operation. Easily converted to 110 or 32 Volt. 2—IF stages, 3-gang tuning cond. Complete with all tubes, in original sealed carton.
BRAND NEW **$19.95**

BC-457 TRANSMITTER—4-5.3 Mc, complete with all tubes and crystal. BRAND NEW..... **$7.88**
BC-458 TRANSMITTER—5.3 to 7 Mc. complete with all tubes and crystal. BRAND NEW **$7.88**
BC-459 TRANSMITTER—7-9.1 Mc, complete with all tubes and crystal. BRAND NEW..... **$11.95**
ARC-5/T-19 TRANSMITTER—3 to 4 Mc. BRAND NEW, complete with all tubes & crystal..... **$8.88**

SCR-274 COMMAND EQUIPMENT

ALL COMPLETE WITH TUBES

Type	Description	Used	Excellent Used	Brand NEW
BC-453	Receiver 190-550 KC	$9.95	$11.95	$14.95
BC-454	Receiver 3-6 Mc	7.19	8.29	11.95
BC-455	Receiver 6-9 Mc	5.25	7.95	9.95
BC-456	Modulator	2.24	2.75	4.24

110-VOLT AC POWER SUPPLY KIT
FOR ALL 274-N and ARC-5 RECEIVERS

Can be assembled quickly and easily, on pre-drilled chassis. Plugs into the rear of any model 274-N receiver and delivers 24 volts as well as "B" voltage. No wiring charges needed. Complete kit of parts with metal case, Instructions **$7.95**
Wired, Tested, Ready to Operate..... $11.50
SPLINED TUNING KNOB for 274-N RECEIVERS. Fits BC-453 BC-454 and others. Only..... **49c**

BEAM FILTER (Navy Type) BRAND NEW, complete with 3-ft. cord and PL-55 Plug **$188**

FL8-A RADIO FILTER $1.79
DYNAMOTOR for Above $4.95

TNS [*from page 39*]

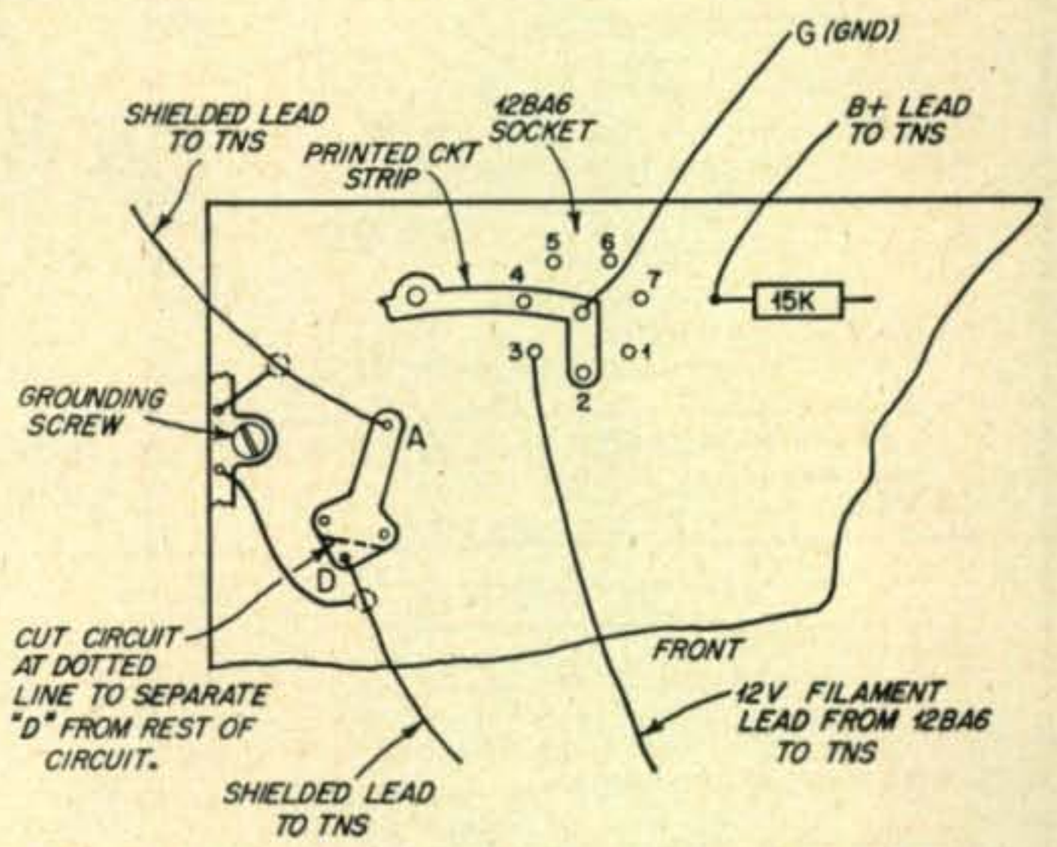
(*fig 3*). The 'hot' filament lead we can take from the socket of either the 12BA6 i-f amplifier tube, or the 12V6 audio amplifier. That only leaves three leads, namely A, G, and D of *fig 2*".

"Go ahead, boy. You're doing fine", urged WWQ.

"O.K.", I replied. "You see that the cathode of the 12AV6 is grounded, so point G of figure 2 goes to the cathode. If the tube had any cathode bias, point G would *still* go to the cathode".

"Right", said WWQ, warming to the task. "Now, the input to the TNS is point A, and the output of the TNS is point D. Therefore points A and D have to go in series with the audio circuit somewhere".

"Yes. You see resistors R1, R4, and R5 of the TNS now will form the d-c return path from diode to ground in the detector circuit. We can now mark point A on the receiver schematic. It is the bottom end of the 47K decoupling resistor. The tone control, the a-v-c return and the r-f bypass capacitor also return to point A."



Bottom view of printed circuit board of 1957 Chevrolet radio, model 987573 (6 tube) showing how printed circuit strip is cut for addition of TNS limiter. Cut circuit material with sharp knife.

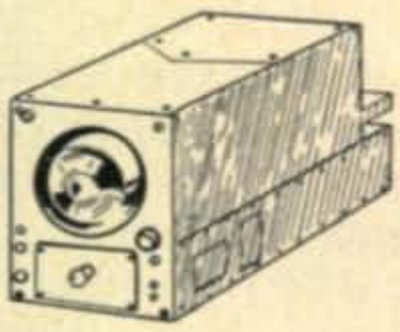
"And point D, therefore, is the 'hot' end of the audio volume control!", stated WWQ. "All we have to do is to remove the wire between A and D, and drop the shielded leads from the TNS on those two points, and we're IN!" He grabbed the circuit board and held it up to the light. He stared at it for a moment, then dropped it with a powerful oath. I grabbed the board from his lifeless fingers and observed that points A and D were firmly clasped together by a large glob of printed circuit material, and that never the twain would part. "We're licked", I said. "Sell the car. I'll give you five hundred bucks for it".

"Not on your tin-type"! replied WWQ,

SAVE!...BARGAINS GALORE!...SAVE!

NEW LOW PRICES! — EFFECTIVE MAY 1st

COMMAND TRANSMITTERS & RECEIVERS



ARC-5 and SCR274 as available

BC 455

XLNT.....$5.95

NEW.....$7.95

Receivers, w/o dynamotors

R-25 Marine, 1.5-3 MC, new.....$10.95
R-26 or BC-454, 3-6 MC, used $6.95. New..... 7.95
R-27 or BC-455, 6-9.1 Mc, used $5.95. New..... 7.95
R-28, 100-156 MC, Exit..... 13.95
R-4/ARR-2, 234-258 MC, as is w/o tubes, $2.95, w/tubes, used..... 4.95

Transmitters, w/o modulator or dynamotor

T-18 Marine, 2.1-3 Mc, as is, w/tubes, 3.95, used 4.95, boxed..... 7.95
T-19 or BC-696, 3-4 Mc, as is w/tubes, 6.95, used 7.95, new..... 8.95
T-20 or BC-457, 4-5.3 Mc, as is w/tubes 2.95, used 3.95, boxed..... 5.95
T-21 or BC-458, 5.3-7 Mc, as is w/tubes, 2.95, used 3.95, boxed by depot..... 4.95
T-22 or BC-459, 7-9.1 Mc, as is w/tubes 3.95, used 5.95, boxed..... 8.95
T-23, 100-156 Mc, xmitter used, 13.95, xlnt..... 14.95
Special—1 R-28 Rec. & 1 T-23 xmitter both..... 25.95

Misc. Command Equipment as available

Receiver dynamotors 28V, used.....$ 1.00
BC-456 SC Mod w/tubes, new 4.95, used..... 3.95
MD-7 ARC-5 Pl Mod w/tubes less dyn. Xlnt..... 8.95
28 v dynamotors for above unit..... 3.00
3-Rec. Rack, used, 1.49, new..... 2.49
New 2-Trans. Rack..... 2.95
New 24V Trans. 1A..... 3.50
Plugs for rear of receiver..... 1.00

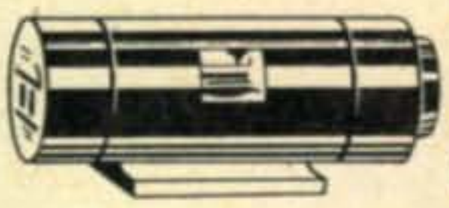
110 VAC power supply for ARC-5 & 274N Recvrs kit 8.95, Wired & tested 12.95

Receiver Conversion kit: cont. schematic, BFO Sw, 25 K Pot. phone jack and knob, with instructions..... 1.95

1625 Tubes, for trans & mod, 50¢....3/1.00

Popular Dynamotor Specials

DM-34 Recvr. Dyna, 12 V in 220 @ 80 ma Out, new 4.95
DM-36 Same as above, 28 V. new..... 4.95
either of above, used..... 3.95



PE-101C Dynamotor, 12 or 24 v input, 500 v at 200 Ma out, (300 v 6v in) new..... 10.95
DM-42, 12 V in. out 1000 and 500, ea at 215 Ma. used 12.95
DM-35, 12V in, 600 at 200 Ma out, Like New..... 12.95

Wincharger Dyna. 12 v in 440 @ 220 MA Out, new..... 12.95
BD-69 Rec. Dyna. 14 v in, 220 at 80 MA out, new..... 9.95
PE-73, 24 v in 1000 at 350 Ma out. New 8.95, used..... 6.95
PE-94, 28 v in for 522, 300 at 250 Ma, 150 bias, and 12 V 10 A, new..... 4.95

"CITIZEN'S BAND!"

420-465 MC. TRANSCEIVER. This is the famous APN-1. In excellent condition, complete but less tubes. Just remove the wobulator (which alone is worth $2.50!) and add a sweep generator. Special! This month only..... **$2.95**

SIGMA 4F 8000 OHM SENSITIVE RELAY. Pulls in at 1.6MA release at .75 MA. SPDT 2AMP contacts removed from new equip. guaranteed..... $2.95
BC-654 Transceiver: 3800 to 5800 KC..... Used: 34.95

Cathode Ray Tubes

5HP4 or 5CP1..... New 1.98
7BP7..... New 2.98

WESTON—SANGAMO—YOUR CHOICE

METERS. ALL NEW 2" SQUARE

0-2 Ma, 0-300 Ma
0-5 Ma, 0-500 Ma
0-15 Ma, 0-20 VDC
0-50 Ma, 0-40 VDC
0-100 Ma, 0-300 VDC
0-200 Ma

$3.29 ea.
SPECIAL
3 for $9.00

Heavy Duty Collins choke 4 Hy-300 Ma can take 500 Ma peaks, new..... 3.95
Bantam 1-watter, BC-746 plug-in transmitter tuning unit from WALKIE TALKIE. 140 mmfd APC type variable cond. plus assorted parts including chassis. Builds into low power transmitter (See CQ March '54)..... New, $1.29

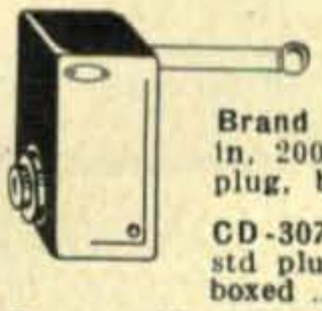
COIL CONDENSERS

2 mfd 5000 vdc new.....$5.95
2 mfd 1000 vdc new..... 1.95
10 mfd 600 vdc new..... 1.49
8 mfd 600 vdc new..... 1.49
4 mfd 600 vdc new 3 for 1.00
2 mfd 600 vdc new 3 for 59¢

Mobile Microphones, newly assembled, W.E. D173015 similar to the TC-128, push-to-talk switch, 3 cond. 5' curl, cord, new..... **$3.95**

Chest Mike T-26 w/F1 Button New.....$1.49
F-1 Carbon Mike Element.....59¢
RT-48A/TPX-4 IFF Trans-Receiver 157-167MC. Complete with Tubes, used, xlnt. Makes nice 2 Meter Rig.....$12.95
BC 655 Signal Generator Range 17.5 to 160 Mc. good for T.V. set alignment, use as transmitter fre. checker, built in 0-200 Ua. Triplett 2" round Meter New.....$19.95
Brand New Headphones, HS-23, 2000 ohms, $3.95 HS-33, 600 ohms, complete with brand new rubber cushions..... **$4.95**

New small cushions, pr..... .49
Used chamois cushions, pr..... .49
New lg rubber cushions, pr..... .29



Brand new impedance matching transformer, plug in, 2000 ohms to 600 ohms, takes std plug, boxed 69¢ each, 3 for..... **$1.95**

CD-307A cords, has JK-26 on one end for phones, std plug other end brand new, boxed..... **$ .97**

Stewart Warner Ammeter, 60-0-60 Amps, brand new, 95¢ 6 for..... 5.00
Phone-CW Filters, 1020 cycles, new, FL-5, 69¢ FL-8 with switch..... 1.89
GP-7 transmitter with all tubes less 803 tube and 80 meter coil unit only..... 13.95
less tubes and coil unit..... 7.95
TU-7, 4.5-6.2 MC; TU-8, 6.2-7.7 Mc; TU-9, 7.7-10 MC; TU-10, 10-12.5 MC; TU-26, 200-500 Kc, choice, used, for BC-375 transmitter, each..... 2.29
T-30 Throat Mikes, used, 5 for..... 1.00
3' Mast Sections, MS-49 thru 52, 50¢ each. 53 and above, 75¢ each. Special 1 each MS-49 thru 54, makes 18' vertical..... 2.95
MN-26C direction finding Equipment
MN-26C Receiver w. dyna..... 10.95
MN-20E Loop..... 4.95
MN-52H Az Cont Box..... 2.95
All above new, special, 1 each for.... 17.95

Antenna Insulators. Bendix MT-48C, plated end caps, new 15¢ ea., 10 for 1.25
Control Box w/5 Ma S meter, special 1.98
SCR-522, exc. condition. Contains Receiver, Transmitter, Modulator, tubes, tunes 100-156 MC, covers 2 m w/o modification..... 29.50
New transmitters, GF-11 for 12 volts, or GF 12 for 24 volts, with tubes and built in modulator—less tuning unit, GF-11 $8.95.....GF-12 8.95
BC-223 Xmitter New With all Tuning Units..... 29.50
Used W/One Tuning Unit..... 18.95
BC-434 Control Box W/5 Ma "S" Meter Used..... 1.95
T S-24/ARR-2—Calibration Test Set for R-3/ARR-2 Receiver New..... 8.95

TG34 or TG10, 1 Hour Code Tapes

No. 10, No. 13.....New, ea. 1.25

2.00 Minimum Order. All prices Subject to Change without Notice. Canada & Mexico minimum 10.00. Cash with Order. Sorry, no COD. California Orders include 4% tax. Prices FOB Los Angeles

SAM'S SURPLUS, 1306 Bond St., Los Angeles 15, California

For further information, check number 89 on page 126.

snatching the board away, like a hartbeeste reaching for a palm frond. "You will take your pocket knife and YOU will cut the printed circuit material between points A and D and *then* we can connect the leads in the proper manner".

Well, when ol' WWQ gets an idea in his fat little head, you just can't shake it out. There was nothing to do but to take a sharp knife and cut the printed circuit material between points A and D. After this bit of surgery, the leads to the TNS were attached as shown in *fig 3*. Sure enough, it worked right off the bat.

"Aren't we smart?", asked WWQ of no one in particular. "Why don't you write this up for CQ magazine? Surely some other ham than myself must have bought a 1957 car and is all fouled up with printed circuitry?"

"Not a chance", I replied. "Every guy who has a second detector circuit a little bit different than this one will write me a letter, and try and get me to figure out just how the heck it plays! I've got to spend my spare time bringing my bowling average up high enough so that I can beat the XYL." I paused. "Tell you what I will do. *I'll* write it up and *you* answer the letters. How's that for a deal?" ■

Ham Reps Meet at Parts Show

The Ham Reps will get together for another of their popular dinner get-togethers during the Parts Show in Chicago. The dinner will be held May 21st, starting at 7 p.m. in the Lincoln Room of the Congress Hotel. Send $6 for your ticket to John A. Benz W9DYZ, P.O. Box 217, Angola, Indiana to make sure there will be a place for you. All hams that are attending the Show are urged to come to the dinner. There will be *free* logs and world maps donated by CQ. John promises some prizes too. Send right away for your ticket.

Rudy Drobish W9QVA, one of the Hallicrafters gang, will give the main talk at the Ham Reps Dinner during the Parts Show in Chicago this May.

FCC & IRAC [*from page 27*]

that the operator of any station is qualified; if this were not done, each operator would have to be examined, or qualified by some other method). When you are operating a MARS station, you are not involved one teeny-weeny bit with amateur radio. The fact that you are a radio amateur is no more pertinent, under the Communications Act of 1934, than the fact that you may coincidentally be a Roman Catholic or a member of the Kiwanis Club. You can't slide from a non-government regulated service (amateur) into a government regulated service (military) or vice versa, without changing the entire concept of your status as a radio station. The fact that it's the same operator and the same equipment has no bearing on the situation, it's the *frequency* that counts. Each service has its own rules, regulations and procedures.

Should any question arise as to what is correct on either frequency, first determine whether it is an IRAC or FCC regulated frequency, then look to that authority for a determination.

The FCC in implementing (a good government word) the *Act* has issued several publications setting forth "instructions" as to how each radio service is to proceed in order to comply with the provisions of the *Act*. Although these "instructions" have the effect of law, they are not laws in the usual sense of the word. The FCC prefers to call them Rules. We thus have "Part 12 - Rules Governing Amateur Radio Service" as the basic publication listing the details as to how the amateur must proceed in order to comply with the *Act*.

Our amateur rules are devoid of "whereases," "to wits" etc., because they are not necessarily required. Should any question arise concerning the amateur rules, we don't necessarily try to interpret the wording of the amateur rules; we go back to the basic documents because the amateur rules are provisions and FCC interpretations of these documents expressed in plain common ordinary words rather than legal terminology.

IRAC does not issue or publish "Parts" like the FCC, instead each individual government service issues its own "instructions". But, like the FCC, such instructions must not conflict with provisions of the *Act, Atlantic City 1947*, and similar documents.

Quite obviously this short outline cannot possibly be complete; its main purpose is to show in a general way, the divisions and responsibilities of the FCC, IRAC, and the Department of State. For those who may be further interested, it is suggested that copies of the Communications Act of 1934 (as amended), Atlantic City, 1947, various FCC Rules, etc., be obtained from the U. S. Government Printing Office. ■

Editorial [*from page 12*]

This raises hob with things so there had better be a darned legitimate emergency, not just someone goofing on your end. If you make sure that anything you figure we should publish for you is in the mail by the fifteenth of the month we will get along just fine. The stuff you send May 15th will be scheduled for the July CQ . . . got it?

W2NSD At Conventions & Hamfests

Have subscription blanks, will travel. One of the things I like best about being editor of CQ is the getting around to hamfests and meeting everyone. We have a fabulous fraternity. If you can get a couple minutes on the program for me to talk about CQ I can probably convince gullible CQ to pay my carfare. I have some terrific slides of the Virgin Islands for smaller groups, plus all sorts of news and anecdotes about ham radio.

Right now I am definitely planning to attend the Birmingham Hamfest on May 4th, the Rome (N.Y.) do on May 26th, and the San Antonio Convention on July 27th (Texas in July? Whew!) The Birmingham group sent one of the most irresistible letters of invitation I have ever received. It listed two pages of fellows who will buy subscriptions if I come down and get 'em. I'm coming. The Texas trip looks fine too. I'll be flying down to Houston to drive the rest of the way with Bernie, W5YVJ and two of his horses (in a trailer, of course).

Log Sheets

Looks like I put my finger in a sore spot when I announced that I had designed some new log sheets. In order to bamboozle CQ into printing up a couple hundred log sheets for me I had to order a couple thousand. The note in my editorial in March announcing their availability wiped out the entire supply before I even managed to slip a few out for myself.

So this time we printed them up in heroic quantities. Boy do we have logs sheets now! Egad! They are even a better deal than before too for they are now put up in pads all punched for a three ring notebook. Poor Harold, our circulation manager, fell heir to the miserable job of filling the orders for them. He won't even talk to me any more. It wouldn't be so bad if we charged two dollars a hundred for them, but at $1.00 a hundred we lose money every time someone orders them. "But look at the publicity," I tell him. I'd better not tell you his answer.

If enough of you order a little something else with your log sheets I'll probably be able to hold my job for a few more issues. Any little thing, a globe or something, you know. Send $1.00 for two pads of the log sheets. Specify whether you want the regular or special SSB forms. See page 100 in the March CQ for details of the logs.

DSB

At a recent SSB gathering I was buttonholed by some of the more "enthusiastic" and soundly denounced for promoting anything as horrible as double sideband. This was quite a surprise since it is the SSB gang who have the most to gain from DSB in the long run. Once I explained the benefits of DSB to the SSB men they quieted down, so perhaps, just in case a disgruntled SSB'er may run across this paragraph, I'd better elucidate.

There are three main advantages, however the first one is of such importance that the others are really unnecessary. DSB will get those confounded *carriers* off the air. In addition to that it will teach the AM gang to tune sideband. Thirdly, the utter simplicity of the DSB transmitter compared to the SSB rig will make it possible for DX stations to change to sideband. The cost of SSB generating equipment has been almost prohibitive in most foreign countries (see the article by K2ORS elsewhere in this issue).

The appearance in an early issue of CQ of a double sideband synchronous receiving converter may give DSB some advantages over

[*Go to page 112*]

ONE DAY Processing!

FOR AMATEURS — EXPERIMENTERS 1500 KC to 90 MC

Wire mounted, plated crystals for use by amateurs and experimenters where tolerances of .01% are permissible and wide range temperatures are not encountered.

CIRCUIT: Designed to operate into a load capacitance of 32 mmf on the fundamental between 1500 KC and 15 MC. Designed to operate at anti-resonance on 3rd overtone modes into grid circuit without additional capacitance load. 5th overtone crystals designed to operate at series resonance. *(Write for recommended circuits.)*

Prices

Pin Diameter .093
Pin Spacing .486 (FA-9 Fits Same Socket as FT-243)

Frequency Range	Tolerance	Price
1500-1799 KC	.01%	$4.50
1800-1999 KC	.01%	4.00
2000-9999 KC	.01%	3.00
10000-15000 KC	.01%	4.00

Frequency Range	Tolerance	Price
Overtone Crystals — 3rd Overtone Operation		
15 MC-29.99 MC	.01%	$3.00
30 MC-54 MC	.01%	4.00
Overtone Crystals — 5th Overtone Operation		
55 MC-75	.01%	4.50
76 MC-90 MC	.01%	6.50

ONE DAY SERVICE! Crystals are sold direct, for fastest possible service. When cash accompanies order, International prepays Airmail postage; otherwise, shipment made C.O.D. Specify exact frequency and crystal will be calibrated to .01% or better of this frequency.

COMMERCIAL Precision Crystals F-6 Series 1500 KC - 50 MC

NOTE: The FA units will not necessarily have the correct correlation for Commercial use.

For Commercial applications, the F-6 type unit should be used. Write for details!

FREE CATALOG!

Ask for your copy of New 1957 Catalog showing the International complete line.. Crystals available from 100 KC to 100 MC.

International CRYSTAL MFG. CO., INC.

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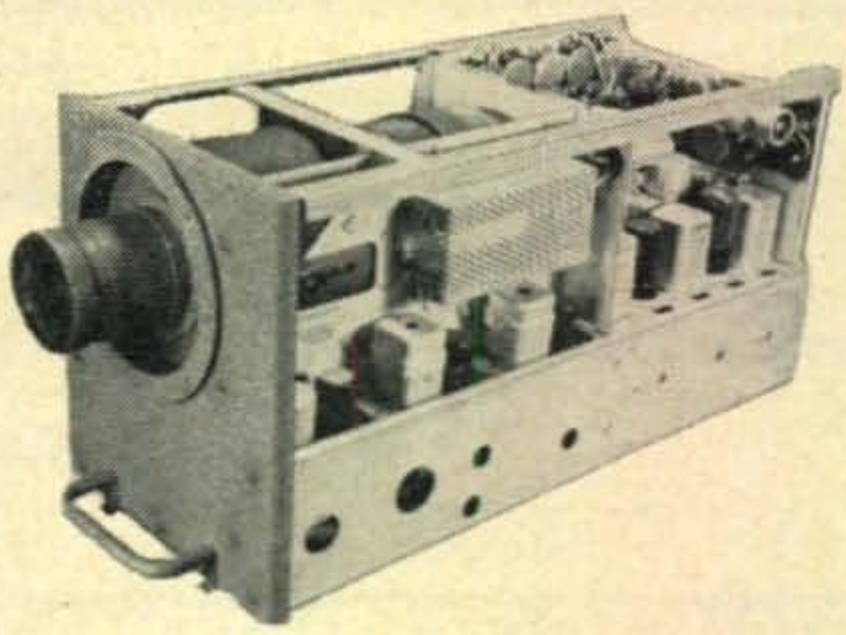
For further information, check number 74A on page 126.

Surprise! Surprise! Surprise!

YOUR OWN TV STATION

is actually possible! Start it with this

RCA TV CAMERA!



It's Brand New! Surplus Only . . .

$197.50

FILLS A MULTITUDE OF USES

Closed circuit TV! Operates in a movie pick-up chain. Ideal for labs, TV experimentation and teaching; "sees" a jillion things too hot, too high, too cold, or too far for the human eye. Will directly observe and relay to remote TV screen: plane and train departures, inter-plant activity, gauges of various types, parking lot auto placement, tool booths, conveyor belts, and a host of manufacturing processes!

SMALL ENOUGH TO GO ANYWHERE! BIG ENOUGH TO DO THE JOB!

Entire camera is self-contained: 25 x 12½ x 10½ inches. 1846 Iconoscope, 6-stage video amplifier and clipper. All external controls are readily accessible. Horizontal sync. pulses are generated from a Hartley master oscillator circuit giving excellent stability to the multivibrator system. Mfg. by RCA to Army-Navy specs. Wt. 49 lbs.

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503 North Victory Blvd.
Burbank, Cal. Phone: THornwall 5-2613

For further information, check number 74 on page 126.

[continued from page 110]

SSB as a communications system, but that remains to be seen. For the present we gain so much from the elimination of carriers that we cannot complain too loudly about there being two sidebands instead of one.

Visited by the Editor

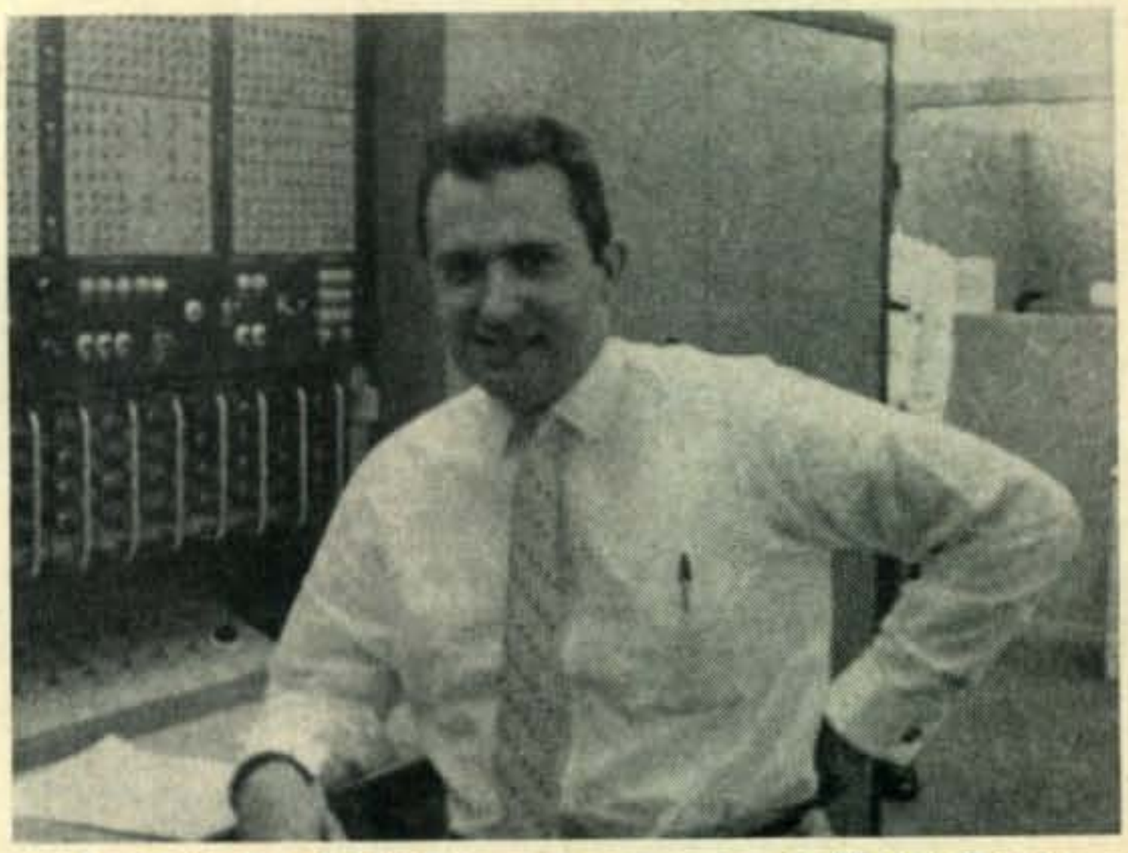
Woody Smith, W6BCX, past editor of Radio and present "wheel" with Gonset Company divides most of his time between his family and work, with the company seeing more of him than they do at home. Woody had just put the finishing touches on a small short wave converter for car use and was toying with the idea of modifying it for ham use. You'll see a product release on the converter elsewhere.

Mae Burke W3CUL, as you probably know by now, won the 1956 Edison Award. Here we see her getting the cup and $500 prize at a dinner in her honor from Mr. L. Berkley Davis of G.E. Mae spent quite a few years passing along thousands of messages every month and certainly was deserving of recognition of the fine work she has done along this line. When you think about it she has handled a lot more traffic than many Western Union offices.

[on page 114 you'll find more]

[*Here's more from page 112*]

Walt Chamberlin W6LLP, long time friend, terrific photographer, speilunker, and control circuit genius took me around the EletroData plant and amazed me with their production model electronic brains.



Bob Parks K6AEC, an engineer at ElectroData in Pasadena, is one of the writers for the West Coast Ham Ads and has promised to turn out some gems for CQ.

Bill Orr W6SAI, great writer of handbooks, is here caught racking his brains over the DX Quiz at the Fresno DX Convention. We'll run that quiz in CQ as soon as I get the answers.

[*more pix on page 116*]

DX Contest [*from page 85*]

From Bandi's letter in the March CQ and a cross check of other logs, we know that that HA5KBA was active during the contest. Unfortunately his log was not received but on the basis of the above information, an award is being made to HA5KBA. We would appreciate information as to how we can get the certificate to Bandi as a memento of the last free days he spent in his home land.

The Committee has again decided to give separate awards to stations operated by members of our Armed Forces in foreign lands.

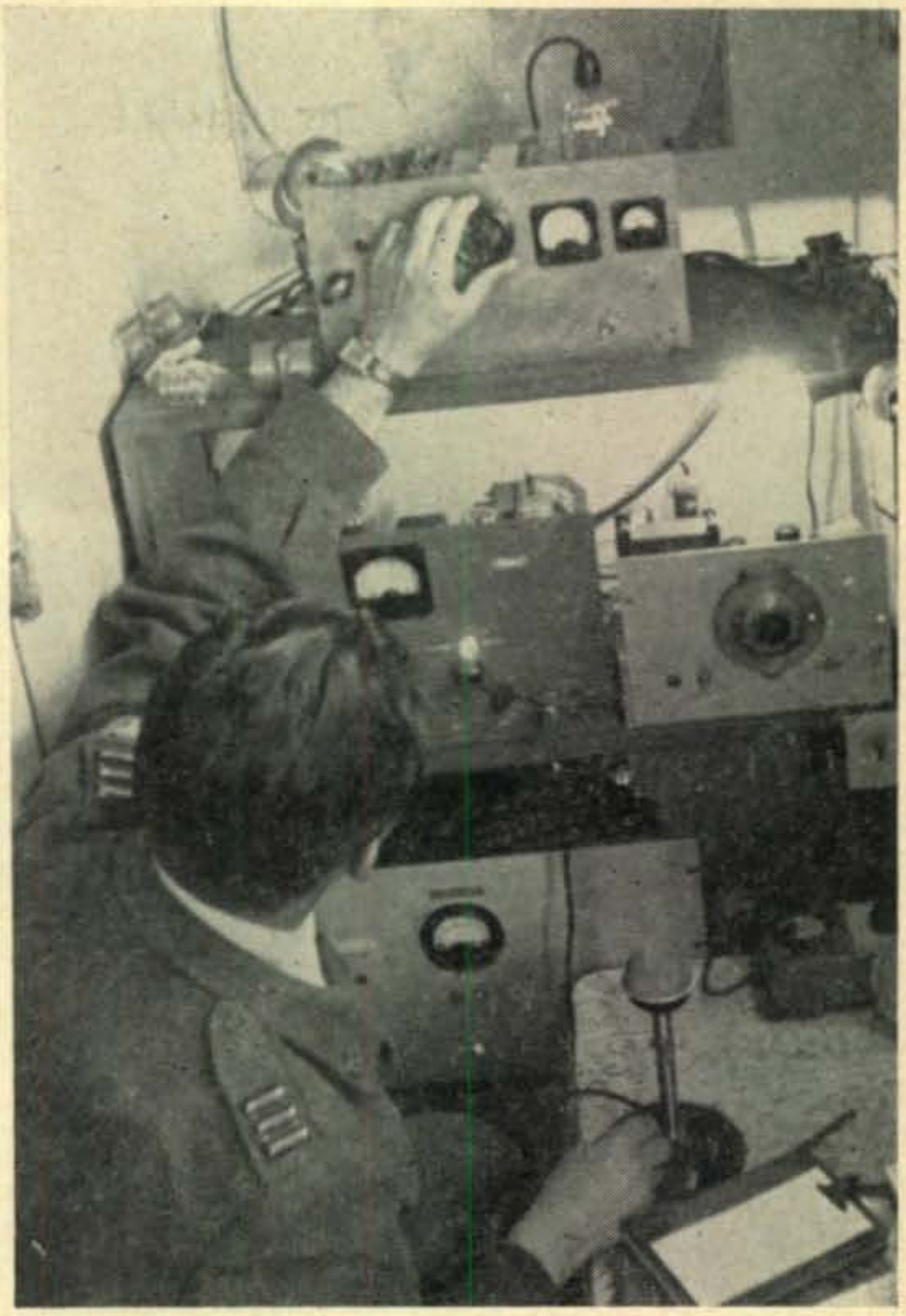
A total of 509 logs were received from 85 different countries which exceeds last year s returns by over 60 percent.

A complete report on the CW and Club awards will be made in the June issue.

Your committee this year is composed of Guy Flower W1DHO, "Mac" McIntire W2BO, Ben Lazarus W2JB, Ray Yard W2DKF and yours truly —

73, Frank, W1WY

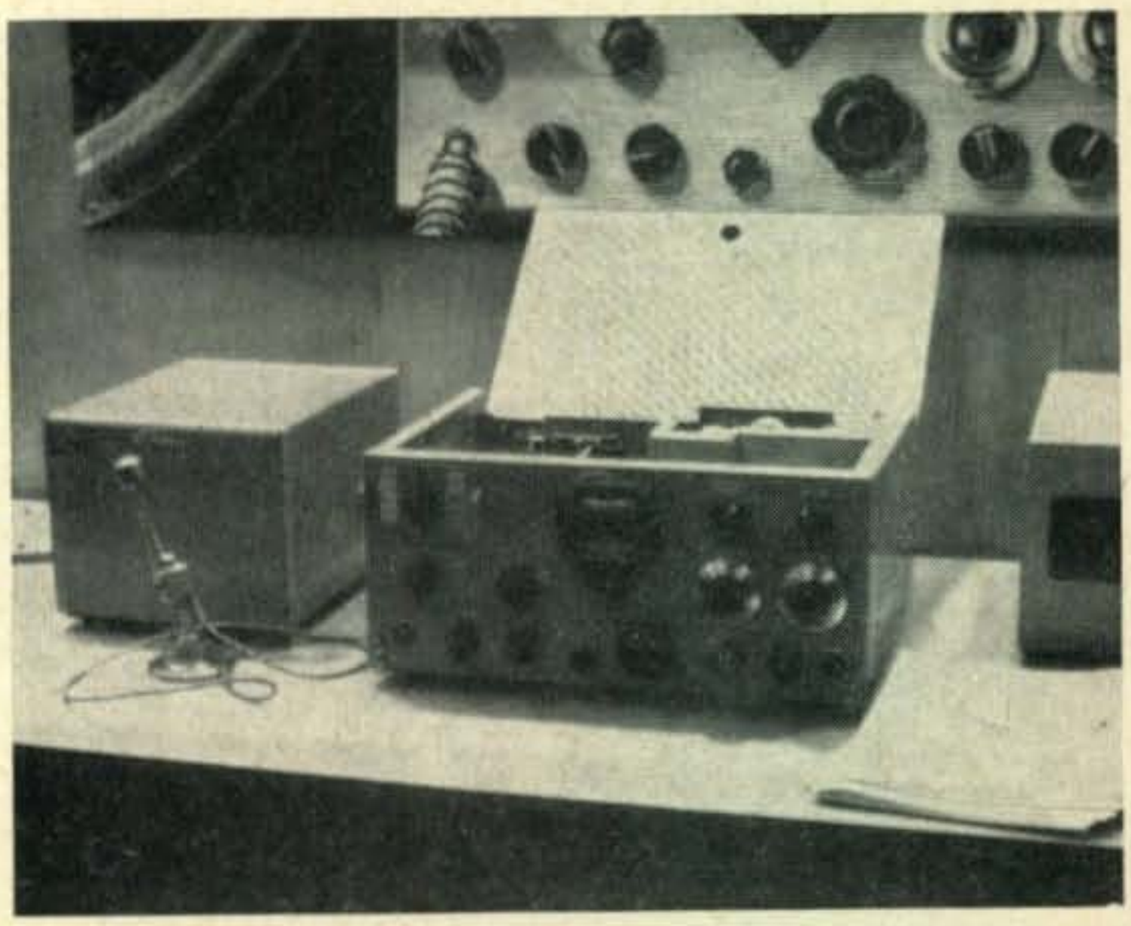
(That middle figure in the photo of the preliminary report last month is Don Wallace, W6AM himself. Sorry about the omission Don.—"FA")

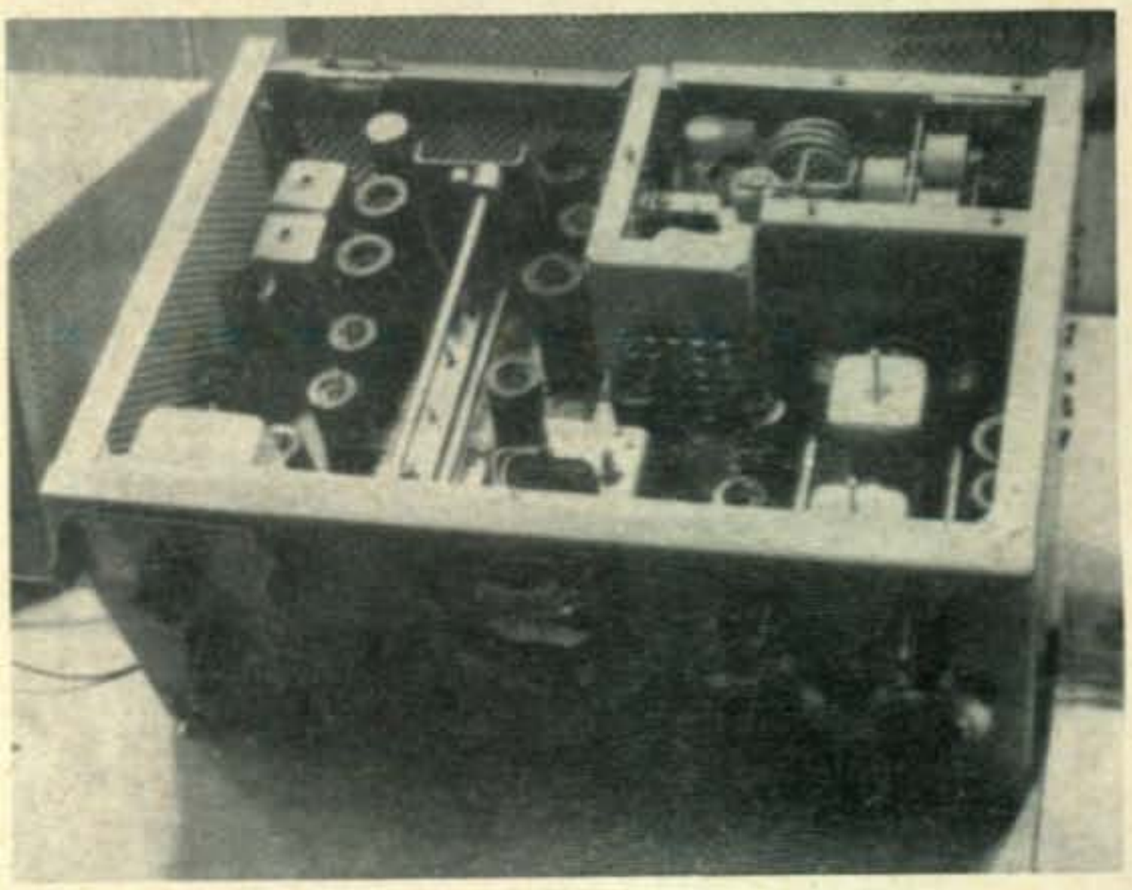


4X4-BO

[Editorial pix from page 114]

Hal Spaulding K6GMI (March CQ, page 29) tunes in W5YVJ for editor so he can con Bernie into going down to the San Antonio Convention in July. Hal is on 20M SSB almost every night.

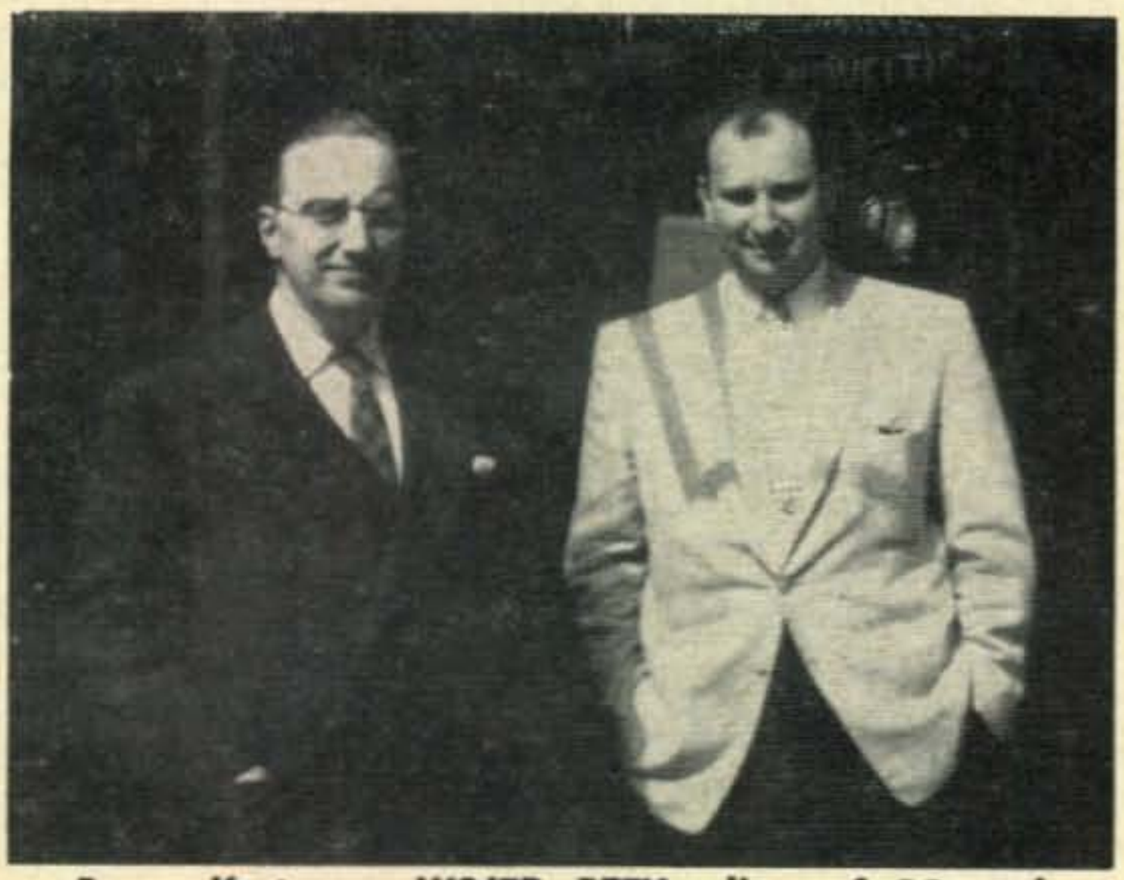




Collins let us take a peak at their new SSB transceiver which was on display at the IRE Show. Dunno if you can tell anything from these snaps. It covers 20-15-10 meters, upper sideband only and has a pair of 6146's in the output. It is small enough to fit in the car.

Joe Horvath W6GPB, one of the best known of the Northern California DX Clubbers.

Clyde Warne XE1IG reluctantly hands mike over to obscure visitor from W2-land as David George XE1RE, the host, tries to keep things in hand.



Byron Kretzman W2JTP, RTTY editor of CQ and George Jacobs W3ASK, Propagation editor of CQ turned up during the IRE Show for a free lunch from the editor. Maybe I should run their picture at the head of their columns.

CORRECTION!

In the Esse Radio Company advertisement which appeared on page 101 of our April issue, the illustrations of the BC-604 and TU-25A Tuning Unit were interchanged.

For further information, check number 54 on page 126.

The Ham Shop

RATES: 25c per word per insertion for commercial business organizations.
5c per word per insertion for individuals on a non-commercial basis.
MINIMUM CHARGE $1.00.
CLOSING DATE: 20th of the 2nd month preceding date of issue.
MAIL: Your typewritten copy with full remittance should be sent to CQ Magazine, 300 West 43rd St., New York 36, N. Y.
Attention: Classified Ad Dept.
Note: The products and services advertised in this section are not guaranteed by the publisher of CQ.
Telephone orders not accepted.
Call letters only are undesirable. Please include name and address in all advertisements submitted.

FOR SALE

SAVE! BUY surplus direct from Government at tremendous savings, radio, electronic equipment, parts, power tools, machinery, hundreds others. List, $1.00. Box 169CAF, East Hartford 8, Conn.

MULTI-BAND ANTENNA, 80-40-20-15-10. $19.95. Patented. Send stamp for information. Lattin Radio Laboratories, Owensboro, Kentucky.

CRYSTALS: FT-243's—3500 to 8700 KC ± 2 KC, $1.00 each. .01% setting, $2.00 each. Hundley Crystal Co., 2951 North 36th, Kansas City 4, Kansas.

MICHIGAN HAMS! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 327 E. Hoover, Ann Arbor, Michigan. Telephone NOrmandy 8-8696, NOrmandy 8-8262.

ATTENTION CANADIAN HAMS: New Bendix TA-12 transmitters and RA10DB receivers with control box at $29.50 each. Both units hermetically sealed in individual wooden cases. Good used AR2 Receivers at $37.50. Clean, serviceable AT1 transmitters at $17.50. Prices F.O.B., Kingston, N.S. James C. Slater, Kingston, Nova Scotia, Canada.

PERSONAL HAM SUPPLIES! Pocket printer — name, call, address (ink pad included)—$1.00. 500 miniature labels—name, call, address—$1.00. Lucite desk wedge, name or call, gold on black—$2.75. All postpaid. Santer, 544 East 6th St., New York 9, N.Y.

ATTENTION MOBILEERS!! Leece Neville 6 volt 100 amp. system alternator, regular and rectifier, $45.00. Also Leece Neville 12 volt 100 amp. system, alternator, regulator & rectifier $85.00. Perfect condition. Herbert A. Zimmerman, Jr., 115 Willow St., Brooklyn 1, N. Y., K2PAT, ULster 2-3472.

SELL CASH—No trades, complete ham station. Collins 32V2, 75A3 (converted from 75A2 by owner), and speaker, miscellaneous accessories include spare 4D32 tube, D104 microphone with push to talk stand, Vibroplex bug, antenna relay, complete set interconnecting cables, instruction manuals, etc. You pick up $750.00. I pack and ship collect $800.00. Lester Thayer, Jr. 409 Jarvis St., Greenville, N.C. ex CP5EQ/CP6.

GOOD CONDITION, Globe scout 65, $55; Supersix converter, used four hours, $35; Heathkit VFO, $13. Jim Perkins, W5DRG, Brookhaven, Miss.

SX-100 Receiver with speaker, $220. Elmac PMR-7 receiver, $120. Both in new condition. Murray McKee, W9WRC, 1911 15th St., Columbus, Ind.

HIGH POWER Filter Capacitors. Westinghouse 2 MFD. at 5500 VDC. Price $9.50 f.o.b. Bronxville, N.Y. Shipping Wgt. 10 lbs. Include postage. No CODs. Electronicraft Inc., Bronxville, N. Y.

FOR SALE: Rack Mounted Heath Q-Multiplier, plus power supply. First $12 takes it. Dick Paye, 825 Gephart Drive, Cumberland, Maryland.

SELL: S38D in excellent condition inside and out. $30 or best offer. Will ship express. Lyle Mattes, KØBMF, Hamburg, Iowa.

FOR SALE: Telrex 3EL 20 meter model 56-112 $79. Also Mosley 3EL 20 meter shortbeam $49. Both beams less than one year, like new condition and can be rotated with TV rotator. Also 1957 Plymouth "Fury" 290 H.P. 700 miles with new Morrow equipment. Bargain $3750. W2FUR, S. Gogel, 1096 Laux Place, No. Bellmore, L. I., N. Y. Sunset 5-6876.

LIKE NEW, BC-375-E Transmitter. Less meters but with dynamotor, antenna tuning unit and instruction manual, $40. Ed Joy, 825 W. 21st St., Spokane, Wash.

25-WATT TRANSMITTER, built like the Hart-25. Complete with crystal, coil, tubes. 40 or 80 meters, only $15. Also 40 meter folded Dipole, only $4. Gary Rupp, RFD No. 2, Archbold, Ohio.

FLASHING LITES Conelrad Monitors. Works any broadcast receiver, wired and tested, Gray Hammertone Cabinet. $6.95 each. C & L Service, 365 Terra Cotta, Crystal Lake, Ill.

FOR SALE: Johnson Viking II and VFO, $199. Good condition, one owner. Reason: I've gone SSB. William H. Lawson, W5DJJ, Box 496, Elizabethtown, Ky.

FOR SALE: BRAND NEW PE135AX DYNAMOTORS. 12 or 24 Volt Input, 500 Volts Output at 200 ma. Complete with filter, shock mount & spare brushes. $19.95 f.o.b. NYC. North Radio Co., Inc., 62 Cortlandt St., New York 7, N.Y.

DYNAMOTORS 6V in 600V rated 170 ma out. Will furnish 250 ma $10. Also used high and low band Motorola FM transceivers, transmitters and receivers, very reasonable. Mobile carbon mikes with coiled cords, $10. Dave Graves, W8LRT, Barnesville, Ohio.

OFF TO COLLEGE, must sell brand new Vibroplex "Blue Racer" bug $15; AT-1, 2 PR crystals $25; AC-1 $7. John Woodcock, Dumbarton Drive, Huntington, New York.

MUST SELL: Morrow MB560 xmitter, Morrow MBR-5 rcvr., Morrow RVP-250 vib sup, Morrow hook-up cables. Three months old. $400.00 gets all. Charlie, W5GPO, 1208 Kemp Blvd, Wichita Falls, Texas.

BARGAINS: WITH NEW GUARANTEE: HT-9 $99; S-52 Receiver $55; SX-28 Rack $99; Elmac PMR6A $79; Morrow 3BR $24.95; Lysco 600 $69; Eldico TR75TV $30; Meissner EX VFO $25; NC-183D rack $259; Millen 90800 $14.95; Johnson Adventurer $34.50; Johnson VFO $24.95; Viking II $199; Elmac A54 $99; RME-84 $65; Gonset Triband $24.50; Sonar SRT-120 $99; Globe Trotter $34.50; Scout 40A $59; Globe Champ 165 $149; Globe King 275 $199; Globe King 400B $275 and many others. Free Trial. Terms financed by Leo, WØGPO. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

CHICAGO AREA ONLY: 75A3 complete $400. Eldico SSB100 $400. NC300 new $250. Elmac mobile xmtr with supply $100. Will not ship, come and get it. Frankart, W9KPD, 1259 S. Boeger, Westchester, Ill., Filmore 5-2215.

FOR SALE: Heathkit AT-1 xmtr, AC-1 antenna coupler, xtals. Cheap. M. Long, 521 Russell Blvd., Davis, Calif.

FOR SALE: 550 KC to 45mc. Hallicrafters S-20R rcvr, excellent condition $39. Les Cammer, 624 San Pascual, Santa Barbara, Calif.

BARGAINS: Reconditioned with new guarantee. Shipped on approval. Hallicrafters S38, $29; S40A, $69; SX99 $119; SX71 $149; SX96 $189; SX100 $229; Viking Adventurer $39; Viking II $199; S40B; S85; SX88, SW54, NC98; NC183D; HRO5; NC300; HQ129X; HQ140X; HQ-140XA; GPR90; A54; AF67; PMR6; PMR7; HT9; HT19; Collins 75A3; 75A4; 32V3; many other items. Easy terms. Write for list. Henry Radio Co., Butler, Mo.

FOR SALE: One 42ft. windmill tower, 4-leg type. $95 f.o.b. J. Everette Hawkins, W7GIJ/Ø, 2801 N. 26th, Lincoln, Nebr.

2J41 MAGNETRON with pulse xfmr; RDR 200-400 mcs 12v recvr, 10 chan xtl; MAW 100-156 mcs port xmtr-recvr, 10 chan xtl; VP-555B Mallory vibrapack. Albert Edwards, 128A Waipao Pl., Aiea, Hawaii.

SELL: 2-meter Gonset Communicator II (6/115V) in good condx, with ground plane antenna, $150. Phil Merikle, K2GJZ, Norman Place, Tenafly, N. J.

FOR SALE (cont'd.)

TOWERS. Self-supporting, all welded tubular steel. The finest available for Ham Beams in reasonable price ranges. Heights to 200 feet. Equipped for Rotor and 2" masting. The following Towers tested to withstand 80 mph winds unguyed: Catalog No. 23AT405, 50 ft, 227 lbs., $89.95; No. 23AT205, 50 ft, 209 lbs., $82.50. Self-supporting No. 23AT244, 40 ft, 170 lbs., $59.95. Order the model of your choice and when it arrives, if you do not agree that it is the finest in design, materials and workmanship return within ten days for a full refund. Ladd Electronics, 111 North 41st, Omaha, Nebraska.

LIGHTNING Bug Code Key, $10; Portable radio $5; Timex magnetic recorder $25. All excellent. Marilyn Philips, 418 Gregory, Rockford, Ill.

WISCONSIN HAMS: Top trade-in allowances, free used-equipment lists, available from Terry, W9DIA, Harris Radio Corp., Fond du Lac, Wis.

NEW! TELREX TRI-BAND 3-band, 1 transmission line system with 2 wide-spaced elements *on each band providing genuine 3-band results without compromise!* Destined to become the "Standard of Comparison"! 40 lbs. of educated aluminum, calibrated for easy assembly to our specifications at your site, without fuss or bother. No coils or condensers to breakdown, or fuss or fume with. No formulas! Simply assemble to our calibration chart for utmost performance per element per dollar at your site! . . . And each band can be set to the portion of the band you desire without affecting the performance of the other 2 bands!

MECHANICAL AND ELECTRICAL specifications! Special Telrex TRI-BAND dipole resonated and matched for single line 52 ohm feed, with wide-spaced director on 10 meters (forward of the 15 and 20 meter sections), wide-spaced reflector on 15 meters, wide-spaced reflector on 20 meters. 2-elements, *full-size*, on the 3 bands for full-size performance on the 3 bands.

ONE BOOM, no interlacing, no compromise! Gain 5.5 db or better, on each band! F/B ratio 19 db or better on each band! V/S/W/R 1.2/1 or better each band! Rugged all-aluminum 75 mph. hurricane force construction! Boom, dural 2" O.D. x 16 ft. Elements taper swaged 1", ⅞" and ½" O.D. Stainless steel airplane clamps, Borg-Warner Cycolac insulators. Special heavy duty gusset plate mounting provided for attachment to 2" O.D. mast support. Antenna will handle 2.5 KW, or better on the 3 bands! Approx. wt. 40 lbs. Longest element length 32'10". Turning radius 18', wind area at 100 mph. 4.91 sq. ft., wind load at 100 mph. 151 lbs. Can be rotated by Telrex R-100S Rotator "Price: $158.75" in winds up to 65 mph. and will not pinwheel or breakdown at *any* wind velocities. Telrex R-200S Rotator "Price: $344.50" will handle any wind velocity!

NOTE: For the amateur who wants to use a "balun" at the antenna, a broad-band "balun" will be available shortly at $27.50 F.O.B. Asbury Park, N.J. Special Note: A heavy duty C/D TV Rotator should handle winds up to 30 mph.—probably will pinwheel and may become inoperative at higher wind velocity. Available for immediate delivery. Price $158.00 F.O.B. Asbury Park, N.J. Order from your distributor or write Telrex Labs for complete information.

PE-103 OWNERS: 8 pin male Cannon plug made for the PE-103. Brand new, $1.50 postpaid. Horowitz, W2CRJ, 37-20 Gardenview Terrace, Fair Lawn, N. J.

FOR SALE: Tubes, brand new, RCA 813s $7.50; 810s $8; 832As $3.50; 829Bs $7; 5692 $3.50; 3B28 $3.50; 203As $2; 5654/6AK5W $1; 2C39 $5; 3C33 $3.50; 5R4WGY $1; 6BA6 50c. Filament transformer Stancor P6139 $5: antenna current meter 0-5 amps $3.50; aircraft RCS AVT 110 transmitter $10; Bendix TA-12 transmitter unmodified, makes swell all band rig $35; transformer input 120, output 24 volts at 80 amps $25; step down transformer 110 volts to 12 volts at 4 amps $15; plate transformer 115 volts, secondary 7500 volts c.t. at 89 ma $25; matching transformer, 10,000 ohms to 600 ohms, ideal for amplifying phone patches $3.50; Heath AT-1 novice xmitter $25. All guaranteed, can ship COD. Bill Slep, W4FHY, Ellenton, Fla.

LEECE-NEVILLE 6 volt system alternator—Regulator-rectifier $40. J. Brittain, 78 Deepdale Pkwy, Roslyn Heights, L. I., N. Y.

COAXIAL CABLE: 53 ohms, 100 feet $3.35 postpaid. Satisfaction Guaranteed. Van Dick, Little Falls, N. J.

FAMOUS VHF "Lunenburg" antennas 6 meter 5 element, $14.95; 2 meter 6 element $6.95. 6 meter horizontally polarized mobile antenna. Wholesale Supply Co., Lunenburg 1, Mass.

DELTA-TENNA GROUND PLANES 2 mtrs, $19.95; 6 mtrs, $24.95; 10 mtrs, $29.95. Bulit-in coaxial connector, gold anodized elements. Matches 52 ohm coax. Meets FCDA standards. Send check plus postage allowance to Western Gear Corp., 132 West Colorado St., Pasadena 1, Calif. for immediate delivery.

FOR SALE: Knight VFO $21; Heath Condenser checker, $16; Ten record Ameco code course for Novice and General, $6; Five LP Retma Code Course, $4. Jac Holzman, K2VEH, 115 W. 16th St., NYC, OR 5-7137.

NATIONAL NC-300 bought Feb. with home built 100kc plug in calibrator, no speaker. 1949 WRL 175A Globe Champion transmitter with 80, 20 10 mtr coils, Meissner Ex signal shifter, microphone, $450 or make offer separate items. Will deliver 100 miles or ship f.o.b. Gene Bradley, RT No. 1, Warren, Ohio. W8BTC.

USED 10Bs, 20As, SS-75s, Viking Rangers, etc. Write for list. Electronic Engineering Co., Wabash, Ind.

PERFORATED ALUMINUM SHEET .051, 5/64" OD holes, ⅛" centers, $1.20 sq ft, cut to size. Send for listing on Beams, Aluminum Tubing, etc. Radcliff's, Fostoria, Ohio.

304TL TUBES, $8.95 each, four for $29.95. Oldenburg, 764 Vann, Evansville, Ind.

SELL: Gotham 3EL20, standard gamma beam $25, never used; CSC 5-watt amplifier w/mike-phono mixer $12; Knight VFO, new, good wiring $22. Thurber, K2IKZ, 247 Hamilton Road, West Englewood, N. J.

FOR SALE: 26 Teletypewriter with table, excellent condition $90. Consider trade for keyboard perforator. Wesslund, WØDNW, Rte 1 North Platte, Nebr.

FOR SALE: Complete industrial television installation. Ready to operate. Consists of ATJ camera and power supply as shown in this issue and Conrac CF-17 monitor with aluminumized tube. $400 fob Ontario. Also, 4X150 2 meter adapter for use with DX-100 transmitter, 165 watts input, $50, 2 meter xtal controlled cascode converter with 6AM4, complete with power supply, 26-30 mc i-f for Collins receiver $30. 2F21 Indian Head Monoscope tube, good, $25. Many other items. Write for complete list. Need new or near new Command Set receivers, SSB gear and mobile equipment. Will trade any or all of above merchandise. Write Don Stoner, W6TNS, PO Box 137, Ontario, Calif.

FOR SALE: New and cartoned mobile equipment including web spanner all band mobile whip, receivers, many other items, all bargain priced. Stamp for list. Box 57 c/o CQ Magazine.

TWO INCH THORDARSON Oscilloscope. 10.5" x 7" 5.5" $20; Philco signal generator, 110-20,000 kc, $10; Eico model 221 VTVM, $15; RCA wire recorder with dynamic mike $20; PE-157-B power supply unit minus speaker, new, $10; PE-206-A inverter unit, unit, $10. Donald G. Paddock, W4MIC, RD No. 2, Box 53, Vero Beach, Fla.

INSTRUCTION

PASS AMATEUR THEORY EXAMS. Check yourself with sample FCC-type questions & novice & general class examinations. All for only 50c. American Electronics, 1203C Bryant Ave., New York 59, N. Y.

DONT CRY if you're having code trouble. Shortcut methods are pure fantasy. We teach the association method, approved the world over, but unavailable elsewhere. Novice course, basc instruction plus practice material to 8 wpm, $5.95. Advanced course, practice material 9 to 18 WPM, $4.95. Combined, $9.95. Magnetic recording tape, 7" dual track, 3¾ IPS. TAPED-CODE, Box 31-F, Langhorne, Penna.

For further information, check number 81 on page 126.

For further information, check number 97 on page 126.

WANTED

WANTED: Collins 75A4 with filters. $1,000 in tubes, power supply units, test equipment, meters, misc. parts for trading. Frank P. Dane, W6OOB, 4254 Niagara Ave., San Diego, California.

CASH FOR BC-312, BC-342, R5A/ARN7, BC-788, BC-610E, BC-939, BC-614, BC-221 and late type test eqpt., receivers, etc. We pay freight charges. Write. Amber Industrial Corporation, 75 Varick Street, New York 13, New York.

WANTED: Used Receivers and Transmitters: Will pay cash or trade. 10% down with up to 24 months to pay. In stock new 75A4s, KWS1's (Collins equipment shipped out of our Cedar Rapids store.) Demonstrator Johnson KW Amplifier with Desk, Johnson 6N2, Valiant, Pacemaker, B & W, National, Hallicrafters, Elmac, Hammarlund, Gonset, Central Electronics; 10-15-20 Meter Hi-Gain Beams $99.75; 10 meter $18.95 also Mosley and Gotham. Write for bargains in used receivers and transmitters. Ken, WØZCN or Glen, WØZKD, Ken-Els Radio Supply Co., 428 Central Ave., Fort Dodge, Iowa.

WANTED: ARC-3, ART-13, ARC-1, BC-348, 0-17/ART13 LFO, BC-221, BC-312, BC-610E and other Military Surplus Equipment. Bonus Prices for ARC-3 and 0-17/ART13 LFO. You ship COD, we pay freight. Write-Wire-Phone. James S. Spivey, Inc., 4908 Hampden Lane, Washington, D. C. Phone: Oliver 6-8608.

WANTED: BC-221, BC-348, BC-312, BC-342, BC-610-E, ARN-7, BC-788, ARN-6, APR-4, ARC-1, ARC-3, ART-13. All types surplus or amateur transmitters, receivers, test equipment taken in trade for New Johson Viking Ranger, Pacemaker, Valiant, Hallicrafters, Hammarlund, National, B&W, Gonset, Elmac, Telrex, Fisher Hi-Fi, etc. Write Tom W1AFN, Alltronics, Box 19, Boston 1, Mass. Tel RIchmond 2-0048.

WANTED: 120 watt modulator, xtal input, no junk. Cash or trade for 20 watt Heathkit Hi Fi. Geo Leininger, W8QZF, 16412 Marquis Ave., Cleveland 11, Ohio.

WANTED: SHORT WAVE & Communications Receivers. New or used. All types Electronic Tubes. Highest cash prices paid. Write or phone: North Radio Co., 62 Cortlandt St., New York 7, N.Y.

WANTED: Test equipment. Heathkit Impedance Bridge, Heathkit "Q" meter, Heathkit regulated power supply, Heathkit voltage calibrator, Heathkit electronic switch. Larry Kleber, Belvidere, Ill.

USED vibration exciter and velocity pickup. Orv Magoon, K6DZN, 723 Josina Ave., Palo Alto, Calif.

WANTED: TTY keyboard perforator. Wesslund, WØDNW, Rte 1, North Platte, Nebr.

SELL YOUR WAY TO WEALTH! Wanted: Surplus military and commercial aircraft electronics: ARN-6, ARN-6, ARN-6, AS-313, AS-313, AS-313, ART-13, ART-13, ART-13, ARN-7, ARC-3, 5IR-3, APN-9, BC-348, BC-788, I-152, MN-53, test equipment and ALL VACUUM TUBES. Top prices paid! For fattest checks—sell to REX! Robert Sanett, W6REX, 1524 S. Edris Dr., Los Angeles 35, Calif., phone REpublic 5-0215.

WANTED: One tape code practice machine and tapes, six meter converter, six and ten meter beam. Give kind, condition and price. Herman Heard, KN5IPL, 600 Main St., Arkadelphia, Ark.

SIGNAL GENERATORS WANTED: TS-403, TS-497, TS-621, SG-3/U, TS-437, TS-510, TS-588, TS-608, etc.; TS-186 Frequency Meters, AN/APR-4 tuning units, other "APR" receivers, ARC-3, other surplus; also Hewlett-Packard and other laboratory quality equipment, Weston, etc. instruments; technical manuals; for quick cash or swap for Zenith Transistor Portables, etc. LITTELL, Farhills, Box 26, Dayton 9, Ohio.

QSL

QSL SAMPLES. Dime, refundable. Roy Gale, Waterford, Conn.

QSLS OF DISTINCTION. Three colors and up. 10c brings you samples of distinction Uncle Fred, Box 86, Lynn, Pa.

QSL's—"Brownie" W3CJI, 3110 Lehigh, Allentown, Pa. Samples, 10c, with catalogue, 25c.

QUALITY QSL's. Samples, 10c. Lee, W5CZA, Box 7171, Oklahoma City, Oklahoma.

QSL's-SWL's, samples 10c. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

DELUXE QSL's. Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10c.

QSLS. Glossy. Samples 10c. W1OLU Press, 30 Magoun Ave., Medford, Mass.

QSL MINIATURES: Unique call letter pins that are detailed minature color reproductions of your QSL cards. Send QSL and one dollar to QSL Miniatures, 4720 Timuquana Rd., Jacksonville 10, Fla. W4UHV/4.

QSL's: Ham's "Super-Speed Specials" are engineered to cover knot holes in drafty shacks. Sharp, fast, reasonable. Samples dime. Robinson, W9AYH, 12811 Sacramento, Blue Island 14, Illinois.

NOVICES! GENERALS! QSL's, VHF's SWL's, YL-OM's (Samples approximately .09¾c) Reasonably priced "tacked-up-kind," different, comic, sedate, diversified, attractive, prototypal, unparagoned, infrequent, unprecedented, extraordinary, dissimilar. (Whew!) Rogers, KØAAB, 737-B Lincoln Ave., St. Paul 5, Minnesota.

QSLs. Samples, dime. Print Shop, Corwith, Iowa.

QSLs??? LARGEST variety samples 25c (refunded). CALLBOOKS (latest) $4.50. "Rus" Sackers, W8DED, PO Box 218, Holland, Mich.

SEND $1.00 for 50 two-color QSL's-SWL's. Samples free. Bolles, 1521 Koenig Lane, Austin, Texas.

QSLs. New approach to different beautiful cards, using Silk Screen Kits. Dime sample. Modern Products, Box 8073, Seattle, Wash.

QSLs: Miniature, full size. Free samples. Howdy, W6DXZ, 1225 So. 3rd, Arcadia, Calif.

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RECEIVERS—repaired and aligned by competent engineers, using factory standard instruments. Authorized Factory Service Station for Collins, Hallicrafters, Hammarlund, National. Our 21st year. Douglas Instrument Laboratory, 176 Norfolk Avenue, Boston 19, Mass.

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RADIO MAGAZINES. Buy, sell, trade. Bob Farmer, Plainview, Texas.

SWAP LEICA M3 Camera with Summarit F. I. 5 lens for SSB equipment. Desire bandswitching exciter and VFO. Contact Lt. Claude Reynolds, DL4NR, 10th ORD. Bn., APO 189, New York, via airmail.

TRADE: 8mm movie projector, 2 good sets American Flyer trains plus $40, for good communications receiver. I need it to get on air. Contact Frank DeMartino, KN2YTH, 83 Oak St., Yonkers, N. Y. YO 5-7995, or Glenelyffe High School, Garrison, N. Y., GA 4-3609.

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BARGAIN SALE — WHILE THEY LAST

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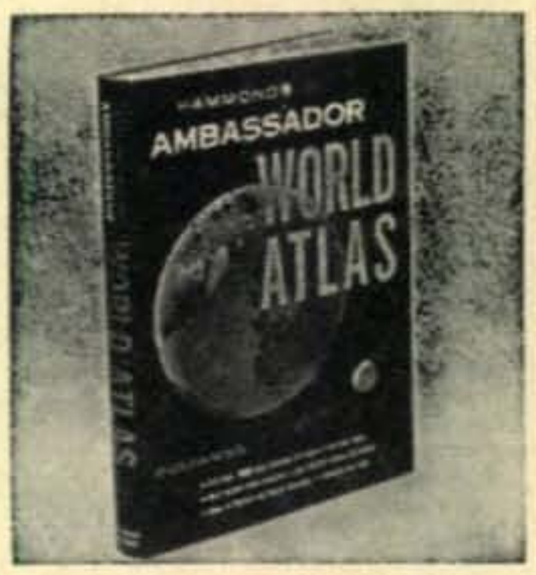

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New Command Set Handbook

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Much of the literature on converting these Command Sets is out of print and no longer available. Even those of us who had the foresight to build a complete library of radio magazines find that they have to hunt all over when they want some obscure conversion. Now, all in one book, you will find everything you need about this equipment.

And It Only Costs $1.50!

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CQ Ad Index

For further information, check number 90 on page 126.

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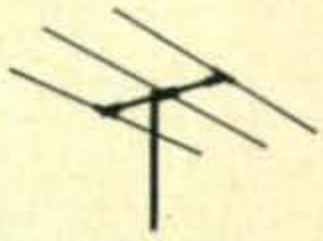

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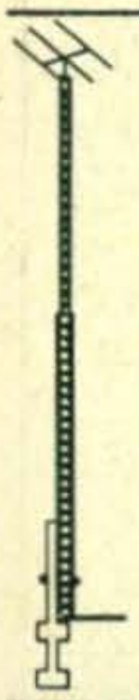

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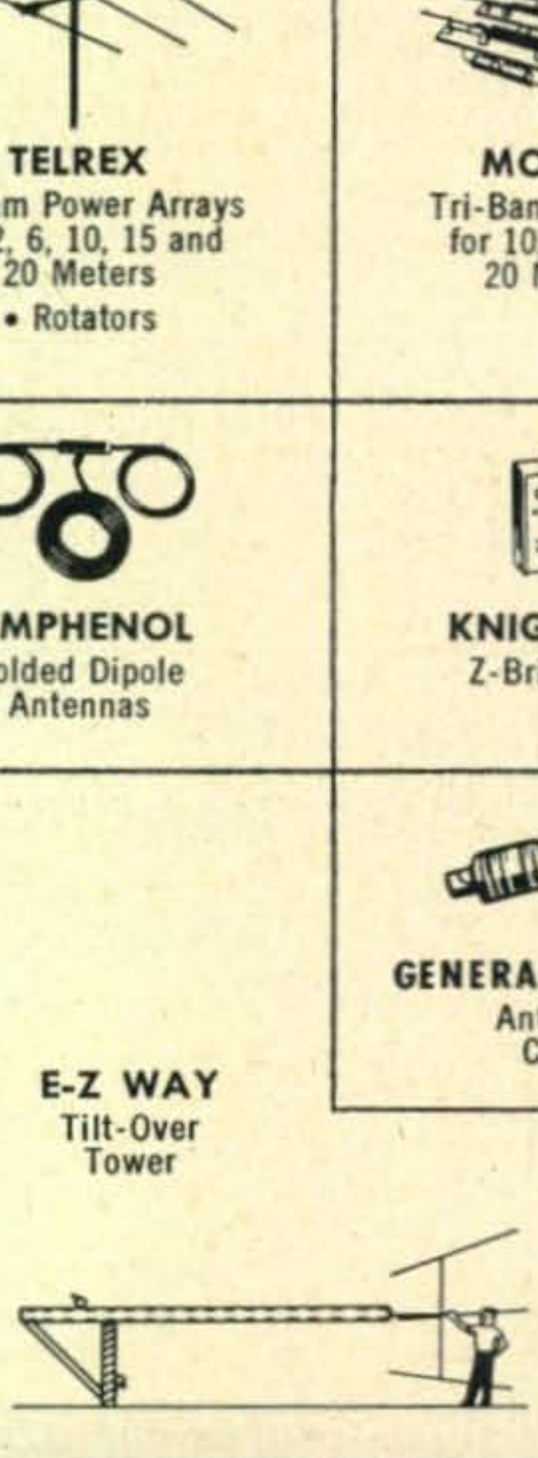
Tilt-Over Tower



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For further information, check number 80 on page 126. →

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Calibrated electrical bandspread for 10, 11, 15, 20, 40 and 80 eter amateur bands. Separate tuning capacitors and scales for eneral coverage and bandspread: large, easy-to-read, 12-inch ide-rule dial with combination edge and backlighting. Large ning knobs.

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Receives AM, CW and SSB signals. BFO provided for CW and B. Has two IF amplifier stages and two audio stages with tone ntrol; separate antenna trimmer; separate RF and AF gain con- l; automatic noise limiter; and "S" meter.

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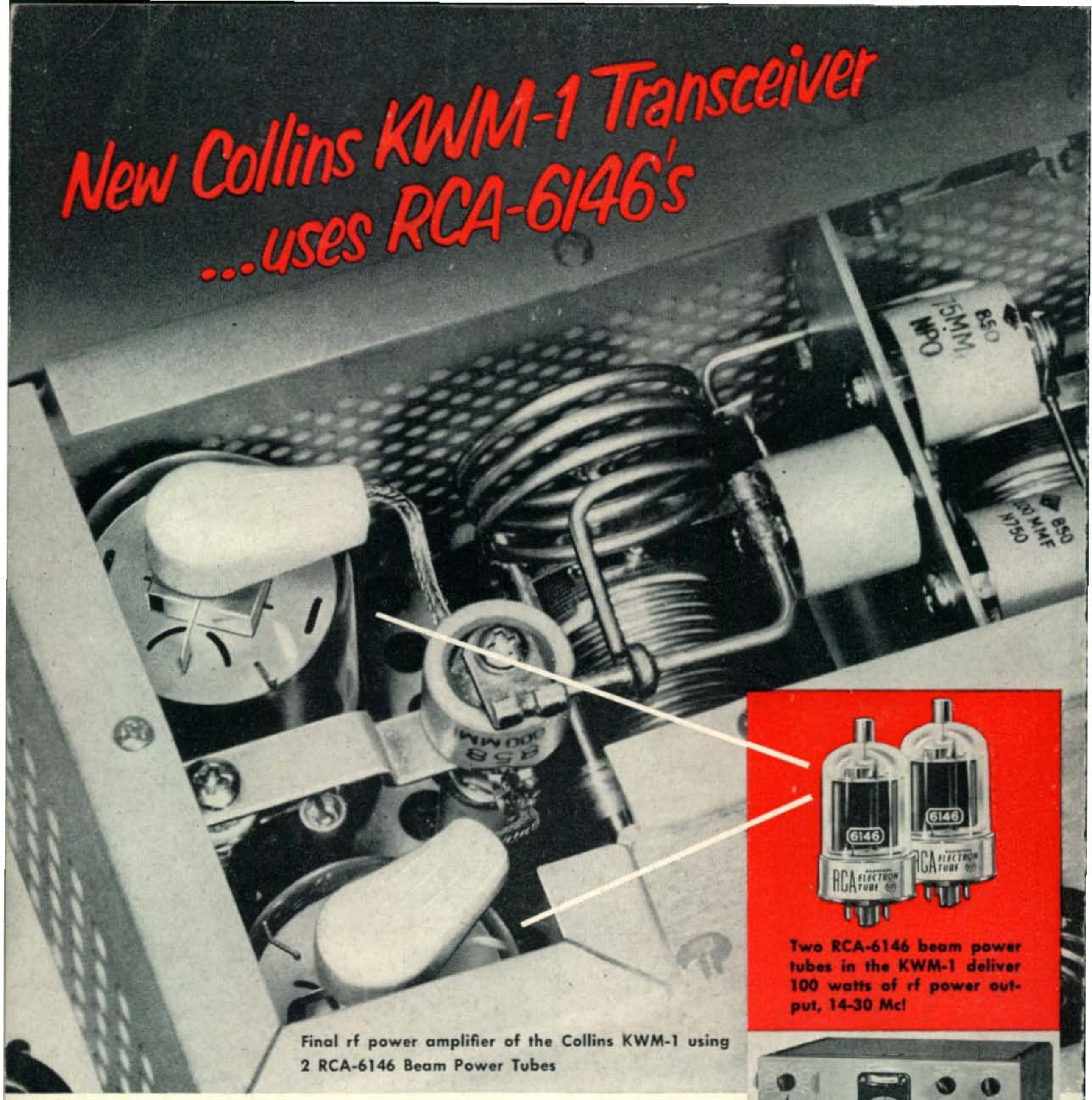

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Two RCA-6146 beam power tubes in the KWM-1 deliver 100 watts of rf power output, 14-30 Mc!

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For further information, check number 86 on page 126.