CQ

February 1958 50c

The Radio Amateur's Journal

Make your reservation now for the ANNUAL SINGLE SIDEBAND DINNER. March 25, 1958. Contact The SSB Amateur Radio Association, 261 Madison Avenue, New York 16, New York.

COLLINS

Here is an operating model of

Collins new 32S-1 SSB transmitter

*Another potent and clean SSB signal from Collins to be available this summer at a tentative price of only $555**

Previewing the 32S-1: 175 watts PEP input . . . 80-40-20-15-11-10 meter bands . . . upper-lower sidebands . . . break-in CW . . . ALC . . . RF feedback . . . Mechanical Filter . . . VOX . . . Permeability Tuned Precision VFO.

Here is a clean 100 watts output for you. Simple tuning and band change, typical Collins stability. The six HF bands covered by 13 200 kc segments with crystal controlled injection oscillator. Dual 6146 output. It's just slightly larger than the KWM-1. Accessories include phone patch, directional wattmeter. Antenna relay built-in.

Abbreviated specs

EMISSION — upper or lower sideband and CW.
SIZE — $6\frac{3}{16}$" H x $14\frac{1}{2}$" W x 11" D.
WEIGHT — 16 pounds.
POWER OUTPUT — 100 watts.
FREQUENCY STABILITY — ±100 cps-reset 1 kc.
SUPPRESSION OF HARMONICS AND OTHER SPURIOUS RADIATION — Carrier −50 db, unwanted sideband −50 db, 3rd order distortion −30 db.

*$690 with power supply.

Uses same power supply as KWM-1.

See your Collins distributor. Get your order in now.

Collins CREATIVE LEADER IN COMMUNICATION COLLINS

For further information, check number 1 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

PR PRINTED OSCILLATOR KIT

Has many uses—

- As 100 Kc. Marker
- As 1000 Kc. Marker for Check Points up to 54 Mc.
- As Foundation Circuit for Low Frequency SSB Crystals

Assembled in minutes. Kit contains everything but 6BA6 oscillator tube and crystal.

Each . . . . . $4.50 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

3100 Kc. . $2.95 Net

4100 Kc. . $2.95 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

ALL PR CRYSTALS ARE UNCONDITIONALLY GUARANTEED. ORDER FROM YOUR JOBBER.

PETERSEN RADIO COMPANY, INC.

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For further information, check number 4 on page 126.

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CQ, the Radio Amateurs' Journal is published for active hams by active hams. Not affiliated with any clubs or other political groups, CQ endeavors to be a true and honest reporter for those interested in the hobby. Suggestions for improvement are welcomed.

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:

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 and 1957 CQ yearly indexes will bring you up to date. Most back issues are available at 50c from us. Check our "Back Issue" ad for details on those not available. Reprints of the Cumulative Index are available free.

For further information see the Ham Clinic column.

Disclaimer:

The authors and editors do the best they can to make everything as correct as possible in the articles. If for any reason any of them should happen to goof we hasten to point out that everything is experimental and we guarantee nothing.

CQ, The Radio Amateur's Journal

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February, 1958

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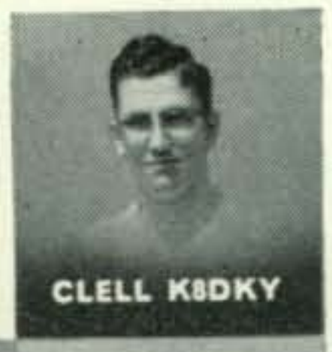


All of these licensed radio amateurs make important contributions to the Heath line of fine ham kits. In a sense, they are your personal representatives within the company, because their design ideas and performance preferences reflect not only their own "on-the-air" experiences, but those of the amateur fraternity with which they are in constant contact. With this kind of representation in Benton Harbor, you can continue to rely on high-performance Heathkit amateur radio equipment designed by hams, for hams!

HEATH *hams work to bring you*

ROGER MACE (W8MWZ)
SENIOR HAM ENGINEER
HEATH COMPANY

HEATHKIT 50-WATT CW TRANSMITTER KIT

MODEL DX-20

$35.95

If high efficiency at low cost in a CW transmitter interests you, you should be using a DX-20! It employs a single 6DQ6A tube in the final Amplifier stage for plate power input of 50 watts. The oscillator stage is a 6CL6, and the rectifier is a 5U4GB. Single-knob band-switching is featured to cover 80, 40, 20, 15, 11 and 10 meters, and a pi network output circuit matches antenna impedances between 500 and 1000 ohms to reduce harmonic output. Designed for the novice as well as the advanced class CW operator. The transmitter is actually fun to build, even for a beginner, with complete step-by-step instructions and pictorial diagrams. All the parts are top-quality and well rated for their application. "Potted" transformers, copper-plated chassis, and ceramic switch insulation are typical. Mechanical and electrical construction is such that TVI problems are minimized. If you desire a good clean CW signal, this is the transmitter for you! Shpg. Wt. 18 lbs.

HEATHKIT DX-100 PHONE & CW TRANSMITTER KIT

MODEL
DX-100

$189.50

Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.

You get more for your transmitter dollar when you decide on a DX-100 for your ham shack! Recognized as a leader in its power class, the DX-100 offers such features as a built in VFO, built in modulator, TVI suppression, Pi network output coupling to match a variety of antenna impedances from 50 to 600 ohms, Pi network interstage coupling, and high quality materials throughout. Copperplated No. 16 gauge steel chassis, ceramic switch and coil insulation, silver-plated or solid silver switch contacts, etc., are typical of the kind of parts you get, to use in assembling this fine rig. The DX-100 covers 160, 80, 40, 20, 15, 11, and 10 meters with a single band switch, and with VFO or crystal operation on all bands. RF output is in excess of 100 watts on phone and 120 watts on CW, with a pair of 6146 tubes in parallel for the final Amplifier, modulated by a pair of 1625 tubes in parallel. Other tubes featured are: 6AL5 bias rectifier, 5V4 low voltage rectifier, 2-5R4GY high voltage rectifiers, OA2 voltage regulator, 12AX7 speech amplifier, 12BY7 Audio driver, 6AV6 VFO, 12BY7 crystal oscillator-buffer, 5763 r.f. driver, and a 6AQ5 clamp tube. VFO tuning dial and panel meter are both illuminated for easy reading, even under subdued lighting conditions. Attractive front panel and case styling is completely functional, for operating convenience. The DX-100 was designed exclusively for easy step-by-step assembly, and no other transmitter in this power class combines high quality and real economy so effectively. Listen to any ham band between 160 meters and 10 meters and make a mental note of how many DX transmitters you hear! This kind of acceptance by the amateur fraternity testifies to the performance and quality of the rig. Its the kind of a transmitter you will be proud to own, and one that will give you a very respectable signal on the air. Time payments available! Shpg. Wt. 107 lbs.

...top quality at lowest prices!

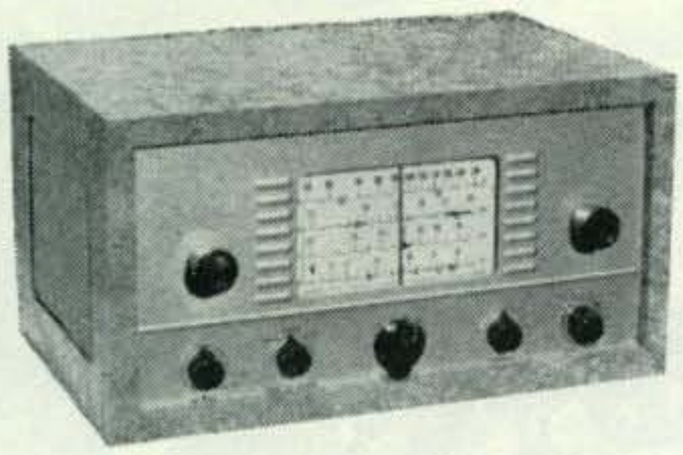
NEW HEATHKIT PHONE & CW TRANSMITTER KIT

MODEL
DX-40

$64.95

The new DX-40 incorporates the same high quality and stability as the DX-100, but is a lower powered rig, for crystal operation, or for use with an external VFO. Plate power input is 75 watts on CW, permitting the novice to utilize maximum power. An efficient, controlled-carrier modulator for phone operation peaks up to 60-watts, so that the rig has tremendous appeal to the general class operator also. Single-knob switching covers 80, 40, 20, 15, 11 and 10 meters. Pi network output coupling makes for easy antenna loading, and Pi network interstage coupling between the buffer and final amplifier improves stability and attenuates harmonics. A line filter is incorporated for power line isolation. The efficient oscillator and buffer circuits provide adequate drive to the 6146 final amplifier from 80 to 10 meters, even with an 80 meter crystal. A drive control adjustment is provided, and the function switch incorporates an extra "tune" position so the buffer stage can be pretuned before the final is on, and so the operator can locate his own signal on the band. Tubes used are a 6CL6 Colpitts oscillator, a 6CL6 buffer, a 6146 final amplifier, a 12AX7 speech amplifier, a 6DE7 modulator, and 5U4GB rectifier. The modulator, incidentally, has plenty of "punch" for clear, strong phone operation. A switch selects any of three crystals, or a jack for external VFO. A high-quality meter with D'Arsonval movement mounts on the front panel for tuning. Whether you are a newcomer or an old-timer, you will find the DX-40 an ideal rig in its power class! Shpg. Wt. 26 lbs.

HEATH COMPANY A Subsidiary of Daystrom, Inc. BENTON HARBOR 12, MICH.



ALL-BAND RECEIVER

HEATHKIT ALL-BAND COMMUNICATIONS-TYPE RECEIVER KIT

Ideal for the short wave listener or beginning amateur, this Receiver covers 550 KC through 30 MC in four bands. 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—internal 5½" speaker—head phone jack and AGC. Has built-in BFO for CW reception. An accessory power socket is also provided for connecting the Heathkit model QF-1 Q Multiplier. Will supply 250 VDC at 15 ma and 12.6 VAC at 300 ma. Shpg. Wt. 12 lbs.
Cabinet: Fabric covered cabinet with aluminum panel as shown part 91-15A. Shpg. Wt. 5 lbs. **$4.95**

MODEL AR-3

$29.95

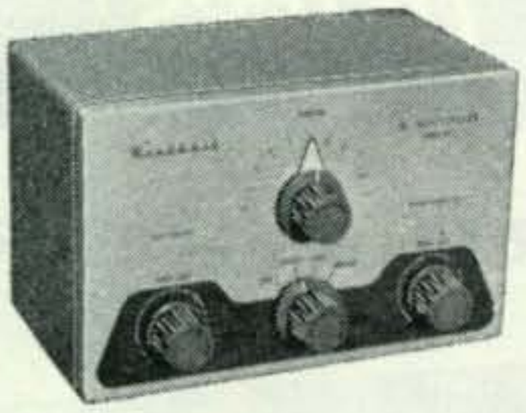
ELECTRONIC VOICE CONTROL

HEATHKIT ELECTRONIC VOICE CONTROL KIT

Here is a new and exciting kit that will add greatly to your enjoyment in the ham shack. Allows you to switch from Receiver to Transmitter merely by talking into your microphone. Lets you operate "break-in" with an ordinary AM transmitter. A terminal strip is provided for Receiver and speaker connections and also for a 117 volt antenna relay. Unit is adjustable to all conditions by sensitivity and gain controls provided. Easy to build with complete instructions provided. Requires no transmitter or Receiver alterations to operate. Shpg. Wt. 5 lbs.

MODEL VX-1

$23.95



"Q" MULTIPLIER

HEATHKIT "Q" MULTIPLIER KIT

This fine Q Multiplier is a worthwhile addition to any communications, or Broadcast Receiver. It provides additional selectivity for separating signals, or will reject one signal and eliminate a hetrodyne. Functions with any AM Receiver having an IF frequency between 450 and 460 KC that is not AC-DC type. Operates from your Receiver power supply, and requires only 6.3 VAC 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. Effective Q of approximately 4000 for sharp "peak" or "null". A tremendous help on crowded phone or CW bands. Shpg. Wt. 3 lbs.

MODEL QF-1

$9.95

more fine ham gear from the pioneer

GRID DIP METER

HEATHKIT GRID DIP METER KIT

A Grid Dip Meter is basically an RF Oscillator used to determine the frequency of other Oscillators, or tuned circuits. Numerous other applications such as pretuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, designed procedures, etc. Features continuous frequency coverage from 2 MC to 250 MC, with a complete set of prewound coils, and a 500 ua panel meter. Has sensitivity control and a phone jack for listening to the "Zero-Beat". It will also double as an absorption-type wave meter. Shpg. Wt. 4 lbs.
Low frequency coil kit: two extra plug-in coils extend frequency coverage down to 350 KC. Shpg. Wt. 1 lb. No. 341-A **$3.00**

MODEL GD-1B

$21.95

HEATHKIT VARIABLE FREQUENCY OSCILLATOR KIT

Enjoy the convenience and flexibility of VFO operation by obtaining this fine variable frequency oscillator. It 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 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a, available on most transmitters. It features voltage regulation for frequency stability, and has illuminated frequency dial. VFO operation allows you to move out from under interference and select the portion of the band you want to use without having to be tied down to only 2 or 3 frequencies through the use of crystals. "Zero in" on the other fellows signal and return his CQ on his own frequency! Shpg. Wt. 7 lbs.

MODEL VF-1

$19.50

HEATHKIT REFLECTED POWER METER KIT

A necessity in every well equipped ham shack, the model AM-2 lets you check the match of the antenna transmission system, by measuring the forward and reflected power or standing wave ratio. Handles up to one kilowatt of energy on all bands from 160 to 2 meters, and may be left in the antenna system feed line at all times. Input and output impedances for 50 or 75 ohm lines. No external power required for operation. Meter indicates percentage forward and reflected power, and standing wave ratio from 1:1 to 6:1. Shpg. Wt. 3 lbs.

MODEL AM-2

$15.95

HEATHKIT BALUN COIL KIT

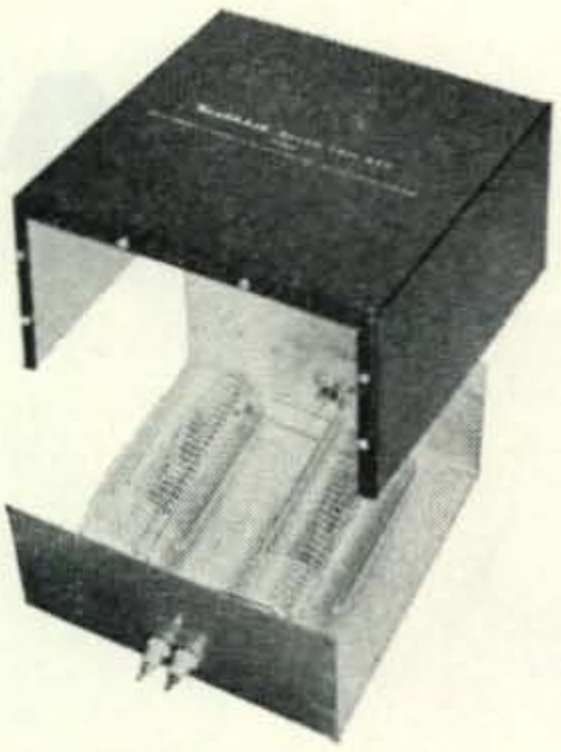
This convenient transmitter accessory has the capability of matching unbalanced coax lines, used on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance. Design of the bifilar wound Balun Coils will enable transmitters with unbalanced output to operate into balanced transmission line, such as used with dipoles, folded dipoles or any balanced antenna system. Can be used with transmitters and Receivers without adjustment over the frequency range of 80 through 10 meters. Will handle power inputs up to 200 watts. Shpg. Wt. 4 lbs.

MODEL B-1

$8.95

VARIABLE FREQUENCY OSCILLATOR

REFLECTED POWER METER



BALUN COIL

...in do-it-yourself electronics!

FREE 1958 Catalog

Send for this Free informative catalog listing our entire line of kits, with complete schematics and specifications.

☐ Rush Free 1958 catalog.

HEATH COMPANY

BENTON HARBOR 12, MICH. a subsidiary of Daystrom, Inc.

name _____

address _____

city & state _____

QUAN.	ITEM	MODEL NO.	PRICE

$_____ enclosed. Parcel post, include postage—express is shipped collect.

For further information, check number 5 on page 126.

*Utility Type Transistorized

POWER SUPPLY

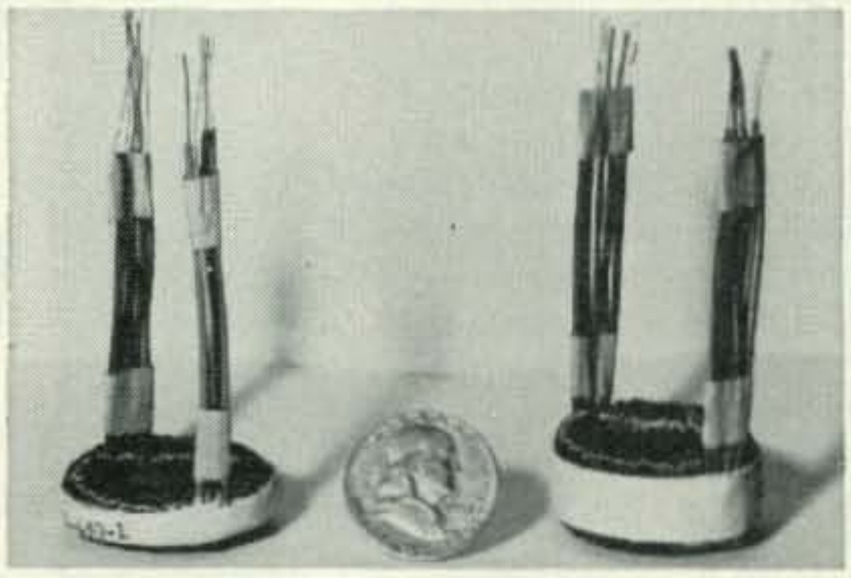
Size: 4½" x 3¼" x 1"
Weight: 10 ounces
Input Voltage: 12-14
Output Voltage: selectable 200, 250, 300

$39.95

**Not a kit, but completely assembled with all necessary filtering.*

TOROID TRANSFORMERS

available to meet any voltage up to 600 volts with current demands to 300 MA



Standard Toroid

- **Input Voltage: 12-14 or 24-28**
- **Output Voltage: from full wave bridge rectifier 225 and 450 simul.**
- **Constant load to 40 watts**
- **20% duty cycle to 80 watts**

$16.00

H.D. Toroid

- **Input Voltage: 12-14 or 24-28**
- **Output Voltage: 450 or 600**
- **Output Current: 150 MA**

$18.50

Matched Pair Power Transistors $11.00

All fully performance tested, 100% guaranteed. Manufactured by makers of world-famous SUNAIR L.F. Aviation Transceivers. Quantity prices available on request.

SUNAir ELECTRONICS, INC.

SUNAIR ELECTRONICS, INC. Dept. 10
Broward County International Airport, Fort Lauderdale, Florida

Please send ( ) Transistorized Power Supply(s) $39.95 ea.; ( ) Standard Toroid Transformer(s) $16.00 ea.; ( ) H.D. Toroid(s) $18.50 ea.; ( ) Matched Pair(s) Power Transistors $11.00 ea. Enclosed is ( ) money order; ( ) check for $..... Equipment desired for operation ( ) 12-volts; ( ) 24-volts.

Name.....

Address.....

City.....**Zone**.....**State**.....

For further information, check number 9 on page 126.

. . . de W2NSD

never say die

WPX Number Two

Aug Nickel, W2HMJ turned up in November with his 300 cards to be the second winner of our difficult Worked All Prefixes award. Aug had been working hard on this award from the time we announced it in January, but had been held up by a break-down in the W2 QSL Bureau. Apparently this Bureau has now been reactivated by a group in Northern New Jersey and the cards are again rolling through. This was quite a frustration to Aug since he was trying hard to be the first winner and was thwarted by factors beyond his control.

Full instructions for the award were given in the January CQ, but essentially the award is given to operators who verify contacts with a minimum of 300 different prefixes. Separate awards are available for phone, cw, and sideband. A WPX application form is available at no cost from CQ. Record booklets are 15¢ each and are twelve page booklets which list all of the prefixes known to be available, together with a place to write in the call of the station worked in each prefix. On the back cover are the full instructions for the award, a list of the certificates available and the special stickers that can be won.

Novice Handbook

Donald Stoner, W6TNS, our Novice Editor has written a Novice and Technician Handbook which was recently published by Radio Publications, Inc. This 152 page book ($2.85) leans heavily in the how-to-build-it direction and is the best thing out yet to help the Novice and Technician with the special problems that he has to meet. This is not a license manual, it is a handbook. All of the material in the book is original . . . there are **no** reprints of magazine articles. Theory is kept to a minimum and most of the book is devoted to construction articles on receivers and transmitters designed to exactly meet the needs of Novices and Technicians. Certainly every ham will want a copy of this outstanding book, and a Novice or Technician cannot really afford to be without it.

Ham Job Opening Soon

This is the last call for applications for a rather fascinating low paying job. We need an avid ham with a good technical background to work full time at building special projects for CQ, testing new commercial equipment, operating the CQ Headquarters Station, and stuff. Writing ability, technical background and variety of ham experience count. So, who wants to be a professional ham. Quite a deal, eh? Starting salary up to $100 a week. And you couldn't find a nicer outfit to work for.

Make the letter and arguments good, everything counts. Address it to Slave Labor, CQ Magazine, 300 West 43rd St., N. Y. 36. Don't forget minor details like what awards you have won, what bands you have operated, what DX you have worked, clubs you have belonged to, rigs you have built, schooling, age, present or last job, the job before that, the job before that, etc., and how come you couldn't hold all those jobs. Or if you're married, childrened, other hobbied, sick, have a car, read, member of AA, member of AAA, or possibly a member of $\overline{A}$.

Flying

My editorial mention of flying in December brought forth several letters from fellows who were interested in getting organized. George Zarin, W2DIO, a CAP Captain and head of the Ham department of Harvey Radio has agreed to act as a communications center for the flying ham division. Drop a card or note to George (c/o CQ, 300 West 43rd Street, N.Y. 36) and you will be listed in CQ when we get this going. If you've done any airborne hamming, that would be of interest. You know, what bands, power, how'd you work out, etc.

Corrections

A letter from Robert Gluck, K6BNB, suggests that we run a specific column every

More on page 10 . . .

More editorial . . .

month in a specific place to bring out corrections of articles of the previous month. While there generally are only a few corrections to be made each year, it certainly is a good idea and might be expanded to include amplification as well as corrections. So, we'll give it a try. One of these months we may make so many mistakes that we'll cancel the whole idea in embarrassment.

So, fellows, if you run across anything that is an obvious goof drop a line to the Correction Department, c/o Harassed Editor, CQ, 300 West 43rd Street, New York 36, N. Y. You know, like important parts left unvalued, electric chair electrodes left unconnected, etc. Most corrections will have to skip an issue since we have only about a week between the arrival of your magazine and the closing of our next issue. We'll find an appropriately obscure spot in the magazine to hide our dirty linen.

Ham Shop

Maybe you think we make all our money on the Ham Shop section of CQ, but really that is more of a convenience than anything else and the small fees charged go towards paying a gal to take care of all the tedium of getting it right every month. We have been taking a licking on this deal though and finally have had to raise our word rate just a wee bit to even things out. Rich it won't make us . . . poor it won't make you, but it's up.

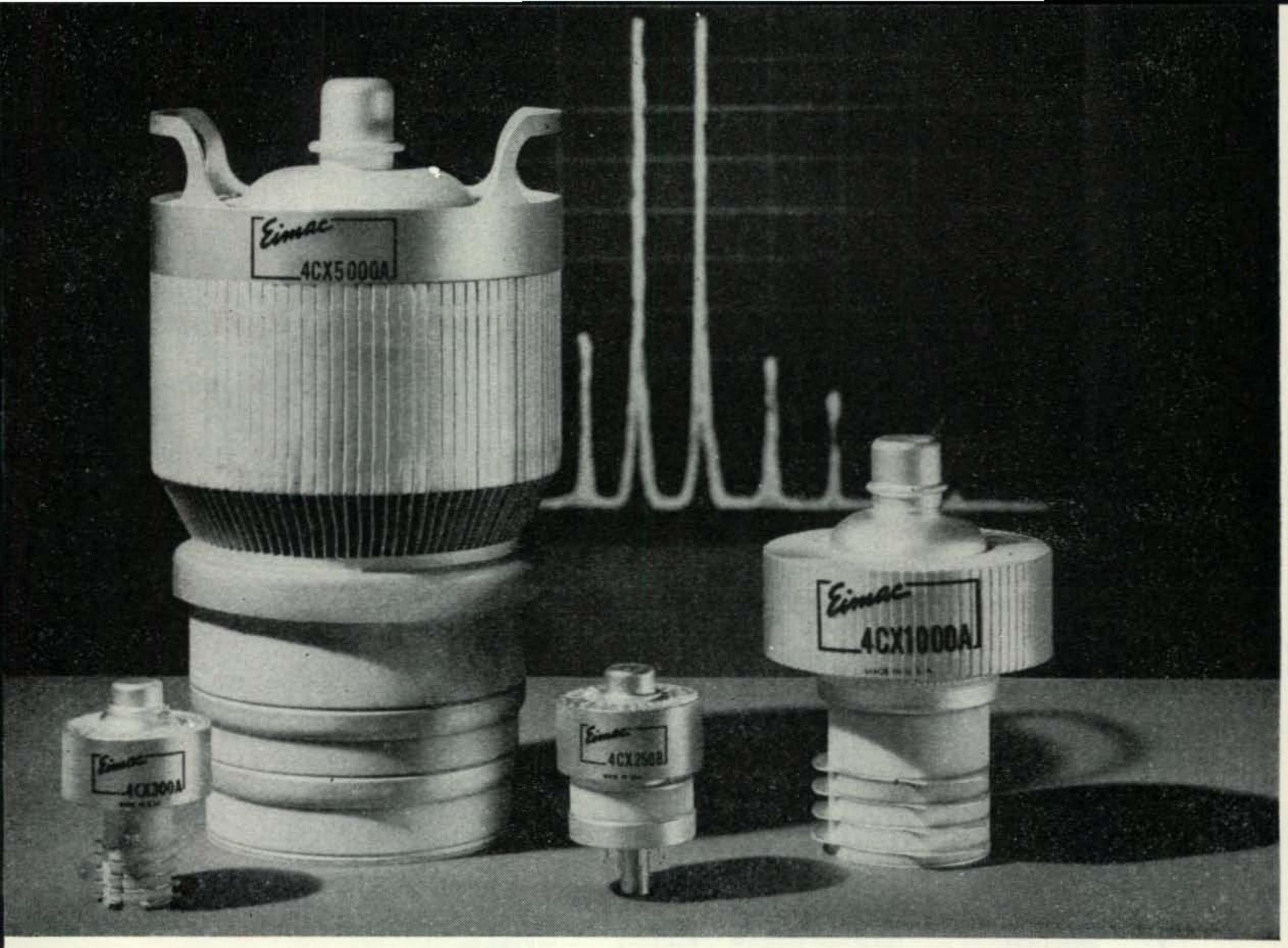
Better Photos

Since about 1/3 of the CQ readers are also interested in photography it baffles me that so few authors are able to come up with much more than an out of focus dimly lit Brownie shot of the equipment taken from ten feet. Let's get with it gentlemen. Taking pictures of radio gear isn't that difficult. Certainly if you don't have a good camera then you must know a brother ham who does have one. Get him over for a couple shots, or even better for dinner. Once he has been fed he can hardly say no to your request for a couple of pix of the super bandbanger receiver you just completed.

Hints. Once you have located the chap with the good camera and have fed or oiled him into submission then get things set up. The best way is to set the camera up on a tripod so it is nice and steady. Light up the subject and get a light meter reading. Set the camera for the smallest aperture available and open the shutter. This will give you a long exposure, possibly thirty seconds if you aren't using too fast a film and you don't have too much light. While the shutter is open move one light around to paint in any shadows. This will give you an excellent shot. Please?

[*Continued on page 24*]

← For further information, check number 10 on page 126.



The Ideal Approach to SSB . . .

Eimac Ceramic Tetrodes for Class AB_1

Generating a clean SSB signal is one thing . . . amplifying it to the desired power level without distorting or broadening it is another. A modern class AB_1 final amplifier designed around an Eimac ceramic-metal tetrode is the ideal answer to the problem. Three of the four Eimac ceramic tubes shown above — the 4CX250B, the 4CX300A and the new 4CX1000A — are ideal for amateur radio application. All four offer the high power gain, low distortion and superior linear performance that is needed for class AB_1 operation. Each has performance-proved reserve ability to handle the high peak powers encountered in SSB operation. Efficient integral-finned anode cooler and Eimac Air System Sockets keep blower requirements at a minimum and allow compact equipment design. And all four incorporate the many advantages of Eimac ceramic-metal design, which assures compact, rugged, high performance tubes.

The reliability and performance that make Eimac ceramic tubes the choice for government and commercial transmitters can be yours in a compact, SSB tabletop kilowatt or a deluxe mobile rig. Eimac ceramic tetrodes simplify design and give more watt-hours per dollar.

For a copy of Application Bulletin #9 "Single Sideband" write our Amateur Services Department

EITEL-McCULLOUGH, INC.
SAN BRUNO · CALIFORNIA

Eimac First with ceramic tubes that can take it

Eimac®

CLASS AB_1 SSB OPERATION

	4CX250B	4CX300A	4CX1000A	4CX5000A
Plate Voltage	2000 v	2500 v	3000 v	7500 v
Driving Power	0 w	0 w	0 w	0 w
Peak Envelope Power . .	325 w	400 w	1680 w	11,000 w

Feenix, Ariz.

Deer Hon Ed:

Are hoping you are feeling reel well, Hon. Ed., on acct. Scratchi not the same. No indeedy, I are being on sickly list, and gulping down pills by carloads. Pills shaped like footballs, pills shaped eggs-shaped and almost same size, green ones, red ones, and capsools made of selyouloyd. In fackly, it are these capsools what getting me so mad.

Frend of mine, who working at neerby place what making compooters, are dropping by to seeing me on acct. he heering I not ship-shape. He bringing me a present. Are in a box about half the size of matchbox. I opening it and looking in, but all I are seeing are two ded moskeetoes.

He asking how I liking them, and I telling him that two ded moskeetoes are just what I needing, I think. At this he laffing like furies, and telling me he not giving me moskeetoes, he giving me cupple transisters. He explaneing that they are brand new type which not having big old metal case on them, and he thinking maybe I like to making brodcast reseever out of them, or sumthing. He also leeving me some reel teeny capacitors and some eleventeenth-watt resistors.

So, next day, I thinking and thinking about the kind of reseever I wanting to make. Are desiding first crack out of the box that I not wanting any reseever bilt into cigaret package or anything like that, on acct. everybuddy bilding reseevers in things like that. No indeedy, Scratchi are wanting to bild reseever in something diffrunt.

I happening to be taking Hon. Pills at that time, and just when are swallowing capsool that I getting idea. Why not bilding it in capsool? I taking one, and pulling two ends apart, dumping out medisin, and there you are, reel neet empty capsool!!

So, getting together magnifying glass, nail polish, nice big needle, modelling clay, airplane cement, and other stuff I needing, and setting to work. Well, almost setting to work. Are accidently breathing hard on work bench and transister are blowing off bench, but with help of magnifying glass are finding it in abouts ten minutes.

Incomparable Value!

Model SX-100
Amateur Net $295.00

SX-100 selectable sideband receiver *proved best in its field by far!*

- In all our quarter-century of manufacturing, no Hallicrafters design has received more enthusiastic approval than the SX-100 receiver.

How have we measured this approval? *First*, by the letters we receive—more favorable comment than ever before. *Second*, by the conversation we hear on the air from owners and observers alike. *Third*, by sales—the SX-100 is one of the *fastest selling communications receivers we've ever designed.*

Never before has there been available a receiver with all these quality features at such a reasonable price. Better look into it yourself, today. Your jobber has the details.

1. Selectable side band operation.

2. "Tee-Notch" Filter—This new development provides a stable non-regenerative system for the rejection of unwanted hetrodyne. The "Tee-Notch" also produces an effective steepening of the excellent 50 KC i.f. pass band (made famous in the SX-96) and further increases the effectiveness of the advanced exalted carrier type reception.

3. Notch depth control for maximum null adjustment.

4. Antenna trimmer.

5. Plug in laboratory type evacuated 100 KC Quartz crystal calibrator—included in price.

6. Logging dials for both tuning controls.

7. Full precision gear drive dial system.

8. Second conversion oscillator crystal controlled—greater stability through crystal control and additional temperature compensation of high frequency oscillator circuits.

9. Frequency range: 538-1580 kc. 1720 kc-34 mc.

CONTROLS

Pitch Control • Reception • Standby
Response control (upper/lower side band selector)
Antenna Trimmer • Notch depth
Notch Frequency • Calibrator on/off • Sensitivity • Volume
Band Selector • Tuning • AVC on/off
Noise limiter on/off
Bandspread • Selectivity.

hallicrafters ...*where the best ideas in communications are born*
Chicago 24, Ill.

Available with convenient terms from your Radio Parts Distributor.

EXPORT SALES:
International Operations
Raytheon Manufacturing Co.
Waltham, Massachusetts

For further information, check number 13 on page 126.

First are putting transisters on tiny dabs of modelling clay so they staying put, then heeting up needle so can using as soddering iron. As making conneckshuns are dabbing on nail polish to insolate wires, then pushing them in more dabs of clay. Same thing likewise with capacitors and resistors.

Coils I needing I winding around number thirty wire as coil form, then dabbing with airplane cement until dry. Pretty soon having little two-transister reseever all finished inside, so shoving ball of clay in capsool, and putting capsool together. Having six leeds coming out —two for batrees, two for earfones and two for antenna.

Winding antenna around outside of capsool and getting all soddered. Then, making temporary lashup of earfone and batree, and trying out. Hon. Ed., it working reel peachy!! Of coursely, I only making it working on one brodcast stashun, but that stayshun coming in like millyun bux!!

Now all are needing to do is buying earpiece, and little mercury batree, and can cementing capsool to earpiece and batree to earpiece, and having hole reseever right in Hon. Ear!! Pretty slicky, you not thinking??

So, taking another set of Hon. Pills, getting in car, and driving into city to getting batree and earpiece. It not taking me long, and having no trubble. No indeedy, it are when getting home that trubble starting.

I going to workbench and starting to work again, but not finding capsool reseever. Calling Hon. Brother Itchi and asking if he seeing capsool reseever. He not seeing it. He asking me when last time I seeing it. I telling him when I leeving for downtowns it are sitting in capsool right next to my medesin here on work bench.

Yes indeedy, last time I seeing it I are taking pills just before I—Hon. Ed!! you not thinking what I thinking?? Well, I not knowing what you thinking, but I thinking maybe I swallowing Hon. Capsool Reseever!! Oh, my Hon. Akeing Tummy.

We'll keep looking, and letting you know if anything turns up.

Respectively yours,
Hashafisti Scratchi

hamfest

The Indian Hills Radio Club 3rd Annual Break-Break Pow-Wow family style dinner will be held at Nelson's, 1422 Addison Rd., Cleveland on Saturday night, February 15 at 7:30 PM. Reservations are limited—get yours early. YL's and XYL's invited. Tickets $2.50. Refreshments, entertainment and prizes. For tickets contact W8ICS IV 1-1834 or W8SZF EV 2-1133.

RECORD BREAKERS!

THEY MUST BE BEST!

The best always sets the record—and the Hammarlund HQ-110 and HQ-100 have broken all old records and set brand-new ones for popularity. And there's one very good reason for this record-breaking popularity—REAL VALUE. You get more of everything that really counts per dollar cost in either the HQ-100 or HQ-110. Check and compare today!

HQ-100

General coverage, 540 KCS to 30 MCS. Electrical bandspread, Q-multiplier, Auto-response, voltage regulated and temperature-compensated stability, automatic noise limiter, 10-tube superheterodyne with noise limiter, and inherent Hammarlund quality—all for only $169.00*

HQ-110

Amateur band coverage of 6, 10, 15, 20, 40, 80 and 160 meter bands. Separate linear detector for SSB and CW signals, Q-multiplier, BFO oscillator, voltage-regulated and temperature-compensated stability, crystal controlled 2nd conversion oscillator, dual conversion, Auto-response, 12-tube superheterodyne with automatic noise limiter, and inherent Hammarlund quality—your best buy for only $229.00*

*Telechron Clock-Timer $10 extra.

WRITE FOR COMPLETE DETAILS.

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.

Established 1910

For further information, check number 15 on page 126.

Letters . . . to the editor

Somebody read our sub ad!

Dear Wayne:

Re December 1957 issue, page 96. . . .

There was a young orphan named 'Annie'
Whose dog was big rough and 'Sandy'.
"Leapin' Lizards" she cry. . . .
Not "Gloryowsky"
The other was 'Little Annie Roonie'.

William H. Starr, KØEOX
Minneapolis, Minnesota

Aw, you saw thru our little flim-flam.

No active clubs in Massachusetts?

Dear Wayne,

Are there any active ham clubs in this area? I've been unable to find any in North Central Massachusetts. Also wonder if you know of any nets in northwestern Mass?

Bruce Eldridge, K1CIW
119 Main Street
Shelburne Falls, Mass.

I dunno Bruce, maybe someone will write and let you know.

Radio's inventor

Dear Wayne:

Nicola Tesla is the man you describe in your Dec. editorial. I hope you will publish the results of your question as to his identity. He sure deserves a lot more recognition and credit than he has received.

Yates Holleman, W4ZLH
Charlottesville, Virginia

Tesla has a strong fan club in the editorial staff of CQ so don't be surprised if some credit is forthcoming. Matter of fact we have an article in the works by K2AE who worked with Tesla to put on his demonstration in St. Louis in 1893 of two way radio communication. Wouldn't be surprised if this was the first ham radio contact ever made.

Dear Wayne,

Re your question in December CQ: Radio's Inventor—page 102; Yeah! I've heard about this guy, but can't spell his name. Heard about him on Radio Moscow one night!

George Mobus, WØRXK
St. Louis, Missouri

Sorry George, wrong inventor . . . the real one is easy to spell.

Dear Mr. Green:

In the December issue, which arrived today and which is the second copy of CQ to be received under subscription, you are referring in your editorial column to an almost unknown electrical genius — Elihu Thomson. Sorry, but I just couldn't resist showing that I have heard of the man. In fact, he once taught at Central High School in Philadelphia, back in the 1870's, an institution which I myself attended. I recall seeing a portrait of Thomson in the halls. Further, in the old Central High building, now turned over to Benjamin Franklin High, there stands a brass plate commemorating Thomson's discovery of wireless in 1875 on that site. The entire story of this amazing inventor can be found in *Beloved Scientist* by David Woodbury (McGraw-Hill, 1944).

Jay Kay Klein
Syracuse, N. Y.

Wrong man, Jay.

More hams in sports cars

Dear Wayne,

Your editorial had the usual number of integrated commercials this month. I was surprised that you are a 1600 Porsche owner. I navigated one in the Continental Divide Rally this year . . . it surely was an impressive machine. We finished third and a ham from Kansas was on the team which won the team prize. That rally is a Jim Dandy (to coin an adjective), almost 900 miles of roads that I'd hate to cover in a sedan. I drive a red MGA myself, belong to two clubs, run quite a batch of rallies, and occasionally race.

Bob Schoening, WØTKX
Bloomington, Minnesota

. . . I have a Subraco and a Gonset 10-11 behind the gearshift in my MGA coupe . . . how about a rally that is also a transmitter hunt?

Dave Smith, K2CHS/2
Colgate University

Coming, Dave.

Boy Scout ham station

Dear Editor:

We are interested in Troop 14 hereabouts and promote ham radio as a troop project. The scout troop own and operate their own ham station and we would like to know if we are the only troop that is so equipped.

W. E. FitzSimons
Phoenix, Ariz.

What's your QTH?

Oops!

Dear Wayne,

Many thanks for the plug in your December editorial, however I have received over 50 calls saying that my name was spelled wrong and suspicious looks from the FCC for using the wrong call.

Marty Bettan, K2JKX
Flushing, N.Y.

Sorry Morty.

Missing persons dept. . . .

Dear Wayne:

What ever happened to Pop, KA1CM? You mentioned him in your Twin Three editorial. I lost him in Redwood City with a 6 call a couple of years ago. I was KA1BN pre-war.

W4RHC
Vienna, Virginia

Last I heard of Pop was when he went to California. Anyone seen Pop lately?

CQ globe as direction indicator

Dear Wayne:

Enclosed are latest pictures of rotating globe. A rotating globe is the most accurate and versatile of the direction indicators. By taping a tack with scotch tape over your own particular QTH, the globe becomes adapted to your location regardless where you live.

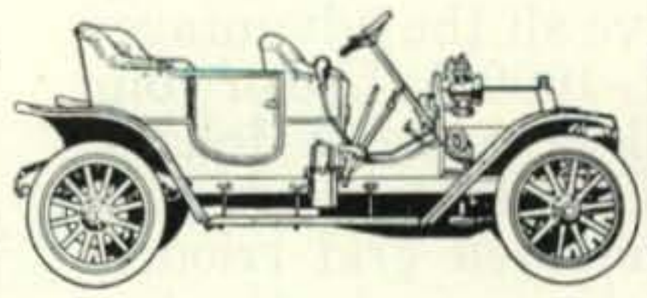
If you don't have a pair of 110 volt selsyns to drive it, but have a radio-compass direction indicator all is not lost. You can take the globe the way it comes and tape thump tacks on your QTH and a point directly opposite, and use the globe alone. By putting the numbers representing thousands of miles on the wrap-around bar it will show you how far the various countries are from your QTH regardless of where you live. Degree numbers can be put on with decals or a Wrico inking pen.

To align globe and beam, simply point the beam north and turn globe on base (4 fingers) until the north pole is under the bar. Once the globe is set, four strips of scotch tape can be applied to the fingers and globe.

Ken Judge Glanzer, WØLMB/7
Seattle, Wash.

[Continued on next page]

OLD TIMERS CAN TELL YOU...



Old timers can tell you that . . . fixed or mobile . . . they never had it so good!

Today, Gonset's skillfully engineered modern designs give you 5-band mobile operation . . . a powerful, complete station with full control at your fingertips.

G66B receivers and G77 transmitters are excellent examples of Gonset leadership in "compactness without compromise" designs. With them your mobile installation offers you the same operating features and conveniences as those of the finest fixed stations. Note too that G66B also covers the standard broadcast band, eliminates need for second receiver.

This same sparkling duo can also give you outstanding home station performance on 80-40-20-15 and 10 meter bands.*

G-66B, less power supply.....#3046.....209.50

Universal "three way" power supply/speaker unit. (6V-12V DC, 115V AC) Factory wired 6V DC, 115V AC. With patch cable.....#3069-6.....49.50

"Thin pack" power supply. (12V DC only) less patch cable ....#3098.....29.50

G-77 Transmitter with power supply and installation kit. ..... Model #3116 .....289.50
6 and 12 volt operation. Factory wired for 12 volts.

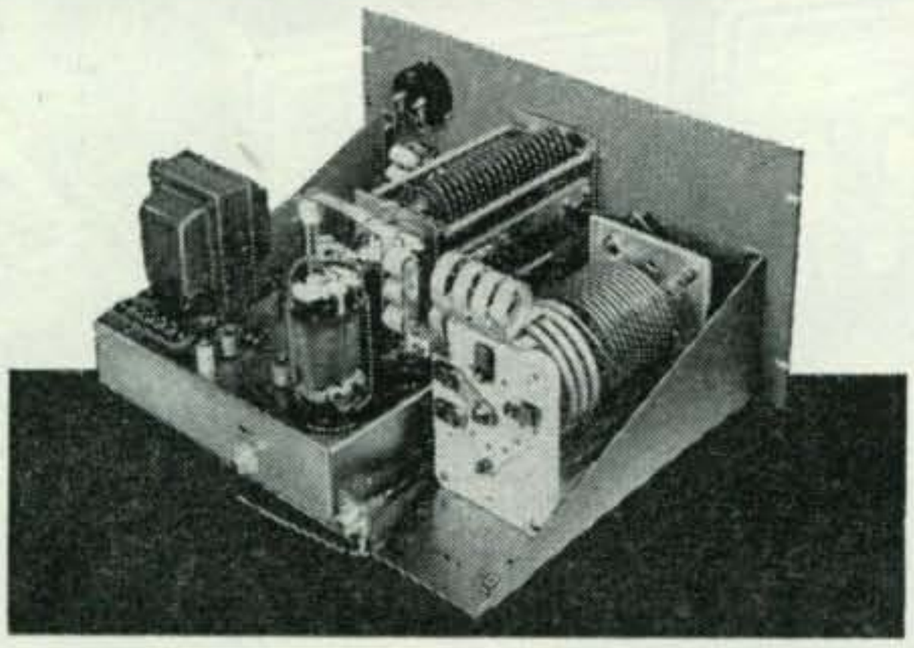
*Special G77 models for AC operation available soon.

GONSET

DIVISION OF
L. A. YOUNG
SPRING & WIRE
CORPORATION

BURBANK,
CALIF.

For further information, check number 16 on page 126.



You fellows have been asking for it

...NOW IT'S HERE—the L-1001-A

Ever since B&W first came out with their grounded grid linear amplifier, amateurs from all over the country have been clamouring for just the RF section of the unit.

Now it's here! At last, you can buy only this RF section and have all the advantages of the complete B&W L-1000-A. Use of your own power supply will save many dollars.

Two tetrodes in the RF section are connected as high-Mu grounded grid triodes. Intermodulation distortion products of a grounded grid amplifier are far less than those generated in a conventional grounded cathode circuit because of the inherent negative feed-back. Increased driving power requirements are offset by recovery of most of the driving power in the output circuit.

This RF section will boost your signal to the maximum allowable. Quality of materials and workmanship is unsurpassed. Tuning and loading are precise over the 80, 40, 20, 15, 11 and 10 meter bands. Why not drop in at your favorite dealer and take a look at either the Model L-1000-A or just the RF section, Model L-1001-A. If he doesn't have them in stock write the factory for details.

$240.00

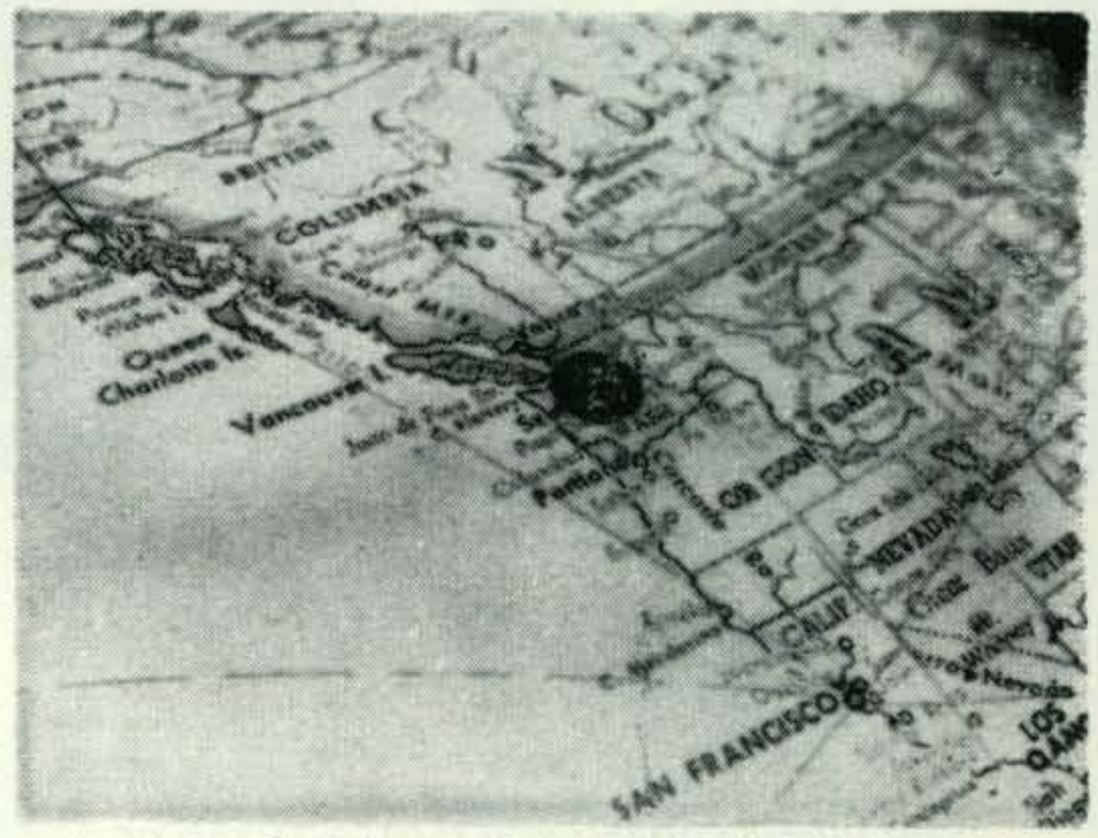
Barker & Williamson, Inc.

Bristol, Penna.

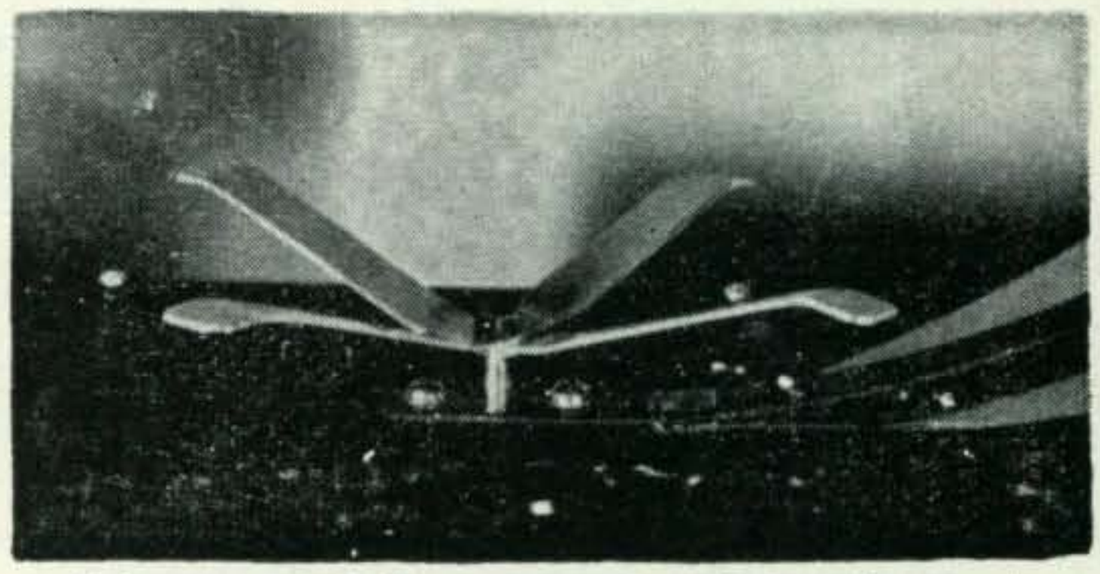
B&W AMATEUR EQUIPMENT: Transmitters • AM—CW—SSB • Single Sideband Generators • Grounded Grid Linear Amplifiers • Single Sideband Receiving Adapters • Dip Meters • Match Masters • Frequency Multipliers • Low-Pass Filters • T-R Switches • R-F Filament Chokes • Transmitting R-F Plate Chokes • Audio Phase Shift Networks • Band Switching Pi-Networks • Cyclometer-type Counters • Antenna Co-axial Connectors • Baluns • Variable Capacitors • Fixed and Rotary Type Coils • Band Switching Turrets • Standard Inductor Materials •

Letters *cont.*

Judge, WØLMB/7 rotating his beam.



Tack is scotch taped to globe.



Selsyn rotated fingers are taped to other end of globe.

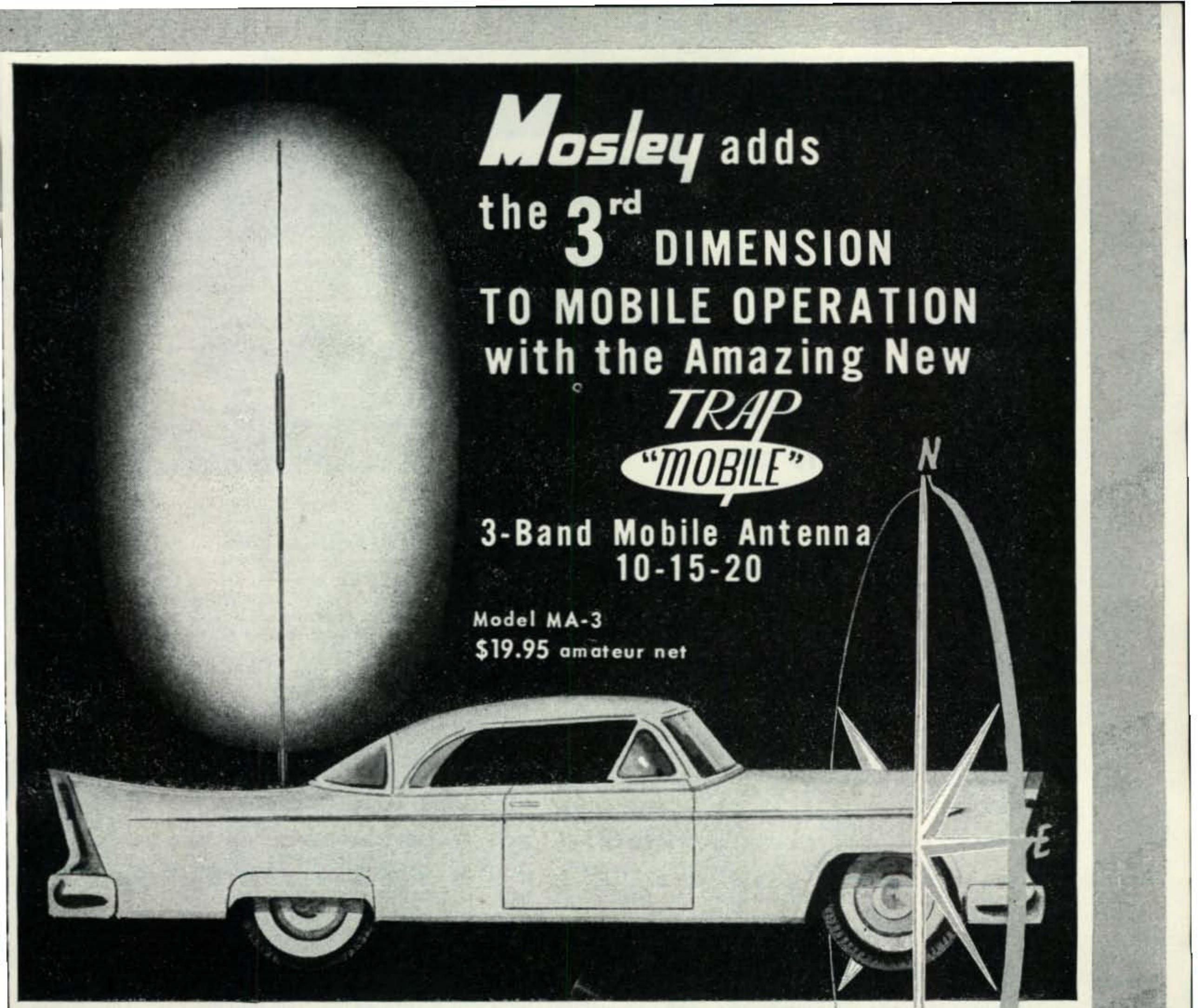
please
please
please
please tell them
you saw it in CQ

← For further information, check number 17 on page 126.

Mosley adds the 3rd DIMENSION TO MOBILE OPERATION with the Amazing New TRAP "MOBILE"

3-Band Mobile Antenna 10-15-20

Model MA-3
$19.95 amateur net



Now! Roam at will-across country and Across Bands!

Here's unequalled operating convenience for "mobileers"! With "Trap-Mobile", no antenna bandswitching is needed. Just change bands at transmitter and receiver and "Trap-Mobile" is ready to go . . . on 10, 15 or 20!

"Trap-Mobile" operates on the same principle as the famous MOSLEY "Trap-Master" Rotary Beams and Verticals—provides exceptional operating bandwidth and almost unbelievable radiating efficiency!

For further information, check number 18 on page 126.

- Multi-band operation with low SWR over full width of each band!
- Polished aluminum trap cover—stays beautiful, compliments the finest car!
- No tricky mechanical gadgets, relays, sliding contacts or other troublesome devices!
- New lightweight "traps" with slim profile for low wind resistance!
- Stainless steel whip sections—install on standard mounts!
- Weatherproof traps cannot retain moisture! Perfect performance in all weather!

Enjoy the thrill of "3-D" Mobile Operation. Get a "Trap-Mobile" today!

Mosley Electronics, Inc.

EXPORT DEPARTMENT
15 Moore Street
New York 4, New York

WEST COAST BRANCH
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Los Angeles 15, California

MAIN OFFICE AND PLANT
8622 St. Charles Rock Road
St. Louis 14, Missouri

New MORADCO Mobile-High Power TRANSMITTERS RECEIVERS

Check these Outstanding Features:

- **Turret-type,** hooded, illuminated dial.
- **Each band** is full scale.
- **Anti-backlash,** gear-driven tuning assemblies.
- **Gold-plated** variable capacitors for reliability and low RF losses.
- **Screw, nut, and lock washer** construction—no rivets.
- **Jiffy mounts** available to facilitate effortless removal from vehicle to shack.
- **Preformed cables** available.
- **Constructed** of heavy gauge, formed aluminum for mechanical rigidity.
- **Neutral Hammertone** finish to blend with the decor of your car.
- **Functional in design**—symmetrical in looks.
- **Designed** with the newer automobile in mind (a little wider, but not so deep or high).
- **Dimensions**—11⅜" wide, 4⅛" high, 7¼" deep.

MB-565 TRANSMITTER

10 tubes—covers 80-40-20-15 and 10 meter bands.

VFO or crystal controlled.

VFO always operates at ½ the carrier frequency into a cathode follower, then through a Class A buffer stage to the driver operating as a doubler. The neutralized PI network final operates straight through on all five amateur bands at 60 watts input. It uses carbon, crystal, or dynamic microphone.

High level plate modulation is an integral part of the transmitter. This allows you to use the power supply or dynamotor of your choice.

Designed to operate into 50 to 75 ohm antenna or antenna tuner.

Antenna change-over relay is built in.

Illuminated meter measures all necessary currents and voltages.

AMATEUR NET PRICE $249.50

MB-6 RECEIVER

13 tubes—covers 80-40-20-15 and 10 meter bands.

Sensitivity is 1 microvolt or better on all bands.

Signal to noise plus signal is better than 20 db.

Crystal controlled second mixer.

Bandpass—4 kc at 6 db down.

Integral—100 kc crystal calibrator.

Illuminated "S" meter, converts to field strength meter for transmitter tune-up.

RF and audio gain controls.

Noise limiter.

Noise balanced squelch circuit eliminates interstation noise but opens on extremely weak signals.

Temperature stabilized for single side band reception.

AMATEUR NET PRICE $239.50

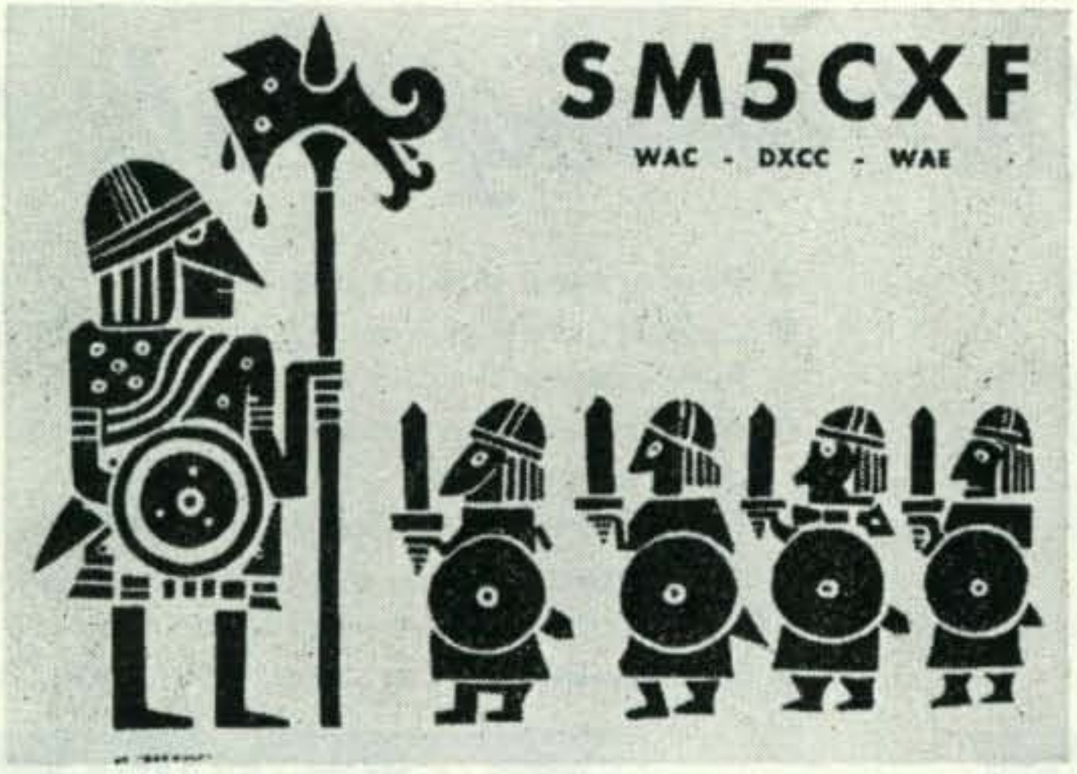
SEND FOR COMPLETE DETAILED INFORMATION

MORROW
RADIO MANUFACTURING CO.
2794 Market Street • Salem, Oregon

For further information, check number 20 on page 126.

QSL contest

This month's winner is Bo Hellström, SM5CXF. Losers are Knud Smith, OZ1SW; Spencer Mark Lazar, K2MWK; L. V. Davis, WØNTA; Bjørn (Len) Odell, LA8ZF.



We can't hold back any longer!

WE HAVE BEEN DELUGED WITH REQUESTS FOR INFORMATION ON THE NEW 100V, SO WE ARE RELEASING THE FOLLOWING DATA IN SELF DEFENSE—AHEAD OF SCHEDULE.

Central Electronics....

....Proudly Presents

The NEW MULTIPHASE MODEL 100V Exciter-Transmitter

RF OUTPUT: 100 watts average before grid current on all bands using a pair of ultra-linear 6550 tubes in final. Separate POWER OUTPUT CONTROL continuously adjustable down to 10 watts. Drive any linear or use it "barefoot".

FREQ. RANGE: 80, 40, 20, 15 and 10 meters with spare position on bandswitch for 160 meters or other frequencies such as Mars, CAP, commercial, etc.

PRECISION LINEAR VFO BUILT IN: Direct reading 1 KC calibration all bands. Separate .1 MC slide rule dial and KC window. Two speed tuning knob turns precision leadscrew in new Patent Pending permeability tuned two tube oscillator circuit. Fast tuning 100KC per turn; Slo tuning 750 CYCLES per turn!

NO TUNING CONTROLS (other than VFO): Broadband circuits throughout, as introduced in our 600L Broadband Linear. Separate crystal controlled mixers.

NINE POSITION EMISSION SELECTOR: Lower sideband, upper sideband, double sideband, all with suppressed carrier; lower, upper or double sideband (AM) with preset carrier; Phase Modulation (PM), CW and FSK with preset carrier. FSK frequency deviation adjustable.

ONLY FOUR OPERATING CONTROLS PLUS VFO ON FRONT PANEL: Seldom used "set and forget" controls on front panel behind magnetic doors.

METER READS: Watts input 0 - 200, RF amps output and suppressed carrier level. Has input marked at 100 watts for AM and 170 watts for CW, PM and FSK.

2" RF ANALYZER SCOPE BUILT IN: Monitors RF output wave to show flat topping and prevent TVI.

CALIBRATE LEVEL CONTROL: Choice of either voice or carrier for calibrating signal.

ADVANCED PHASING GENERATOR: With inverse feedback and new PS-2 network. Sideband suppression with new network in excess of 50 db. Built-in audio filter. Narrow signal, plus naturalness, coupled with long term stability are features of new generator.

SIZE AND STYLING: Equal to 600L **PRICE:** $595.00

PLACE YOUR ORDER NOW—THE BACKLOG IS INCREASING DAILY.
WE ARE ALMOST READY FOR PRODUCTION.

MULTIPHASE EQUIPMENT

Central Electronics, Inc.

1247 W. Belmont Ave. Chicago 13, Illinois

MULTIPHASE
THE OVERWHELMING
CHOICE OF HAMS
EVERYWHERE

For further information, check number 21 on page 126.

DE W2NSD [*from page 10*]

You Seen It in CQ

When you write to our advertisers please, please tell them that you saw it in CQ. Same thing goes for the distributors . . . when you drop in at their store tell them you read their ad in CQ. This is darned important, as you probably realize.

Advertising pays most of the freight for us. The subscriptions pay mostly for postage and handling involved in sending them out. Every time a company runs an ad in CQ they want to see some results, naturally. The results have been excellent, hence the ever increasing number of ads, which brings you an even greater increase in space for articles.

We want to keep this spiral going up so we can bring you even more articles and columns. You can help in this by mentioning CQ to our advertisers and by using the readers service coupon on page 126.

Call Letters for Cars

One of the most inexpensive call letter deals I've seen yet for cars (providing you don't have call letter plates) turned up at the local Strauss Store. Costs 49¢ and includes a miniature license plate with a complete set of letters and numbers. Called Mini-Plate, it is designed for bicycles and cars. Looks nice and the letters are ¾" high.

Single Sideband Communications Book

The TechRep Division of Philco Corporation has come up with a fine technical manual on SSB. This 148 page book is written for the Philco TechReps and thus stresses more the theory angle than the how-to-do-it. It is filled with lots of block diagrams and simplified diagrams which help to get across some of the rather complex concepts involved. This book is certainly to be recommended for anyone who is interested in learning how SSB works.

SSB Annual Dinner, Hotel New Yorker, New York City, March 25, 1958. Tickets—$7.50 each. Sponsored by Single Sideband Amateur Radio Association, Inc. (SSBARA) 261 Madison Avenue, New York 16, New York.

Sebring

Several fellows have written in suggesting that we all get together down at Sebring this March. Fine with me. Let me know where and when and we'll put it in the March CQ and see how many we can gather. Let me know right away as the March issue closes a couple days after you get this issue.

May

We're planning another special May Mobile Issue this year, so if you have any material that should be in it you'd better get it in soon. Make 'em short for we are very short of space

[*Continued on page 114*]

Printed Circuit OSCILLATORS

The operating tolerance of a crystal is greatly affected by the associated operating circuit. Because of our precision printed circuits and quality components, the use of the FO-1 oscillator in conjunction with the FX-1 crystal will guarantee close tolerance operation—up to .001% if desired.

FO-1 and FO-1B OSCILLATOR

Kit (less Tube and Crystal) $3.95

Wired and Tested with tube (less Crystal) $6.95

FO-1

Fundamental Operation, 200 KC to 15,000 KC.
Available in kit form, or wired and tested. Tolerances of .01% and .005% with appropriate FX-1 crystal.
Tolerances of .0025% and .001% available only in wired and tested form, together with appropriate FX-1 crystal.

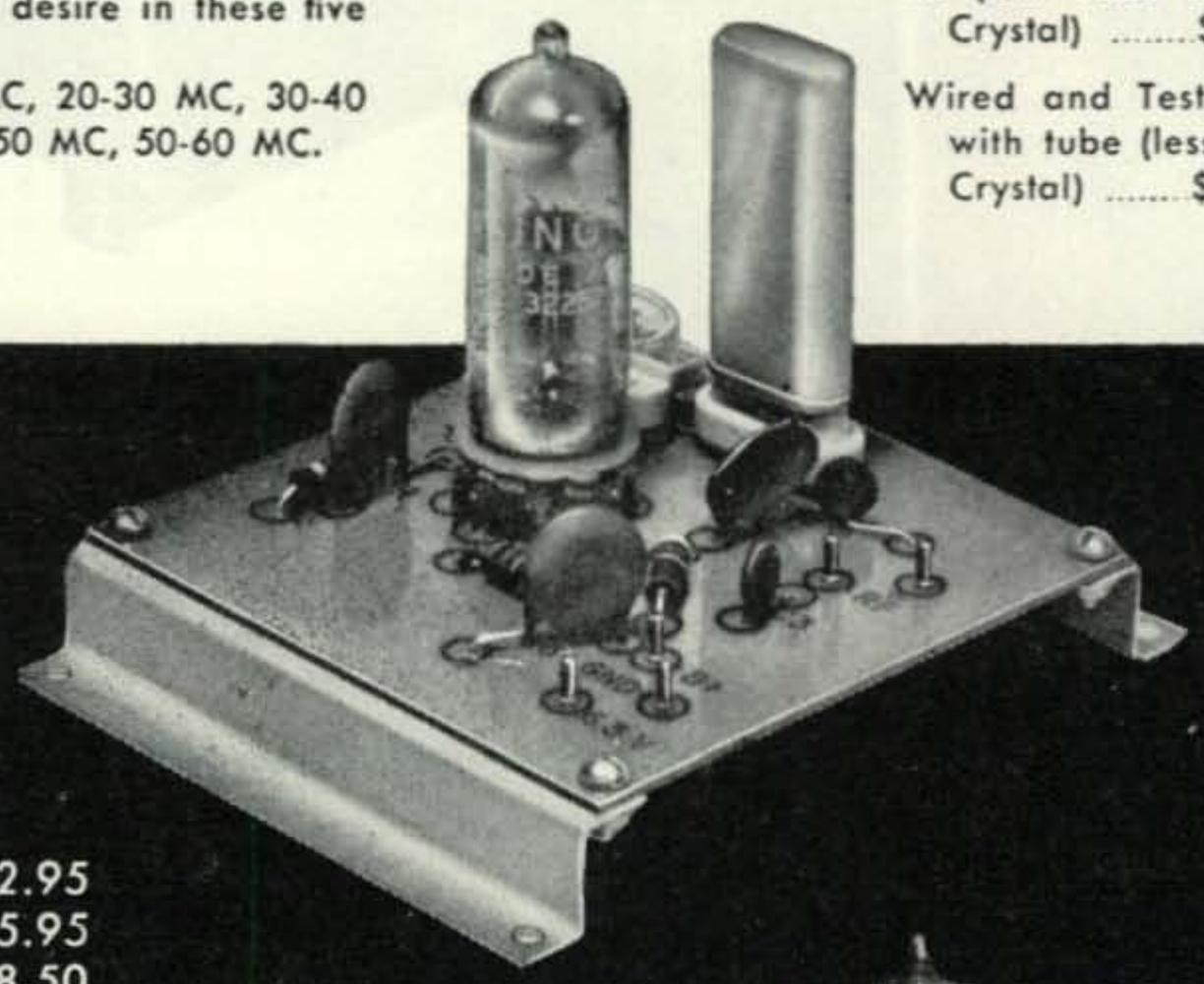
FO-1B

Overtone operation (five bands) 15 MC to 60 MC.
Same as FO-1, EXCEPT: please specify which band coil you desire in these five ranges:
15-20 MC, 20-30 MC, 30-40 MC, 40-50 MC, 50-60 MC.

FO-1L OSCILLATOR

Printed circuit oscillator for band-edge calibrator and frequency standard use.
(Additional requirements:
Power 6.3 volts AC @ 150 ma
150 volts DC @ 8 ma)

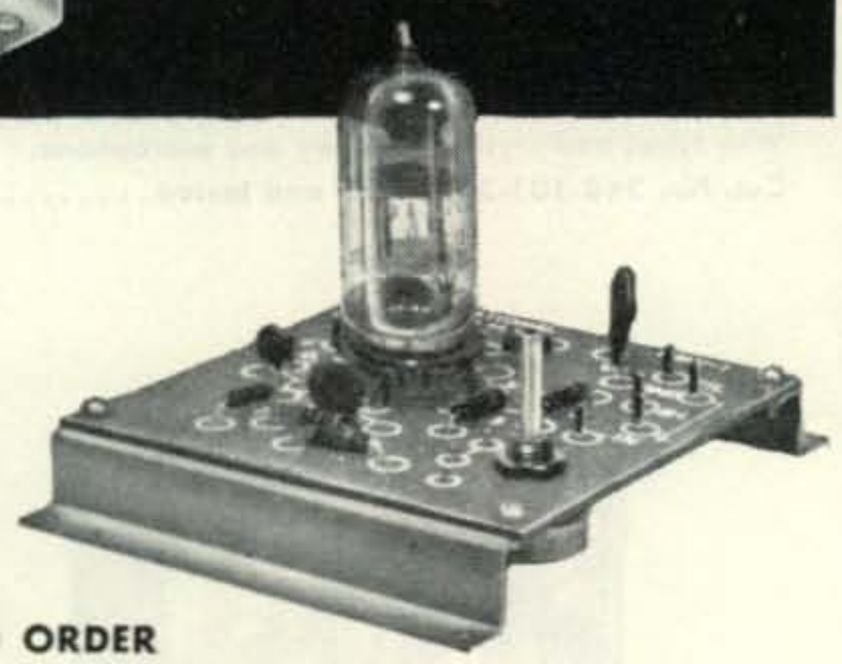
Kit Complete with
Tube and Crystal.....$12.95
Wired and Tested.....$15.95
100 KC Crystal Only.....$ 8.50



FMV-1 10 KC MULTIVIBRATOR

Used in conjunction with the FO-1L 100 KC Oscillator to form a complete secondary frequency standard. When the FO-1L 100 KC Oscillator is accurately tuned to zero beat with WWV transmissions, precise frequency measurements to 30 MC can be made. (Additional requirements: Tube—12AT7; Power—6.3 volts AC @ 300 ma; 150 volts DC @ 15 ma).

Kit, less tube.....$5.95
Wired and Tested, with tube.....$8.95



HOW TO ORDER

For fastest possible service, International Crystals and/or Units are sold direct, open account F. O. B. Oklahoma City when credit approved. On C. O. D. orders of $25.00 or over, ⅓ down payment with order is required.

Add sufficient postage and insurance (for applicable Parcel Post Zone) to check or money order for each printed circuit unit ordered.

Shipping Weight Each Unit 1-Lb.

Zone	Postage
1x2 (to 150 miles)	.27
3 (150-300 miles)	.29
4 (300-600 miles)	.31
5 (600-1000 miles)	.36
6 (1000-1400 miles)	.40
7 (1400-1800) miles)	.46
8 (Over 1800 miles)	.51

Insurance—Add 10c for $10.00; 15c for $25.00 Value.

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CRYSTAL MFG. CO., INC.

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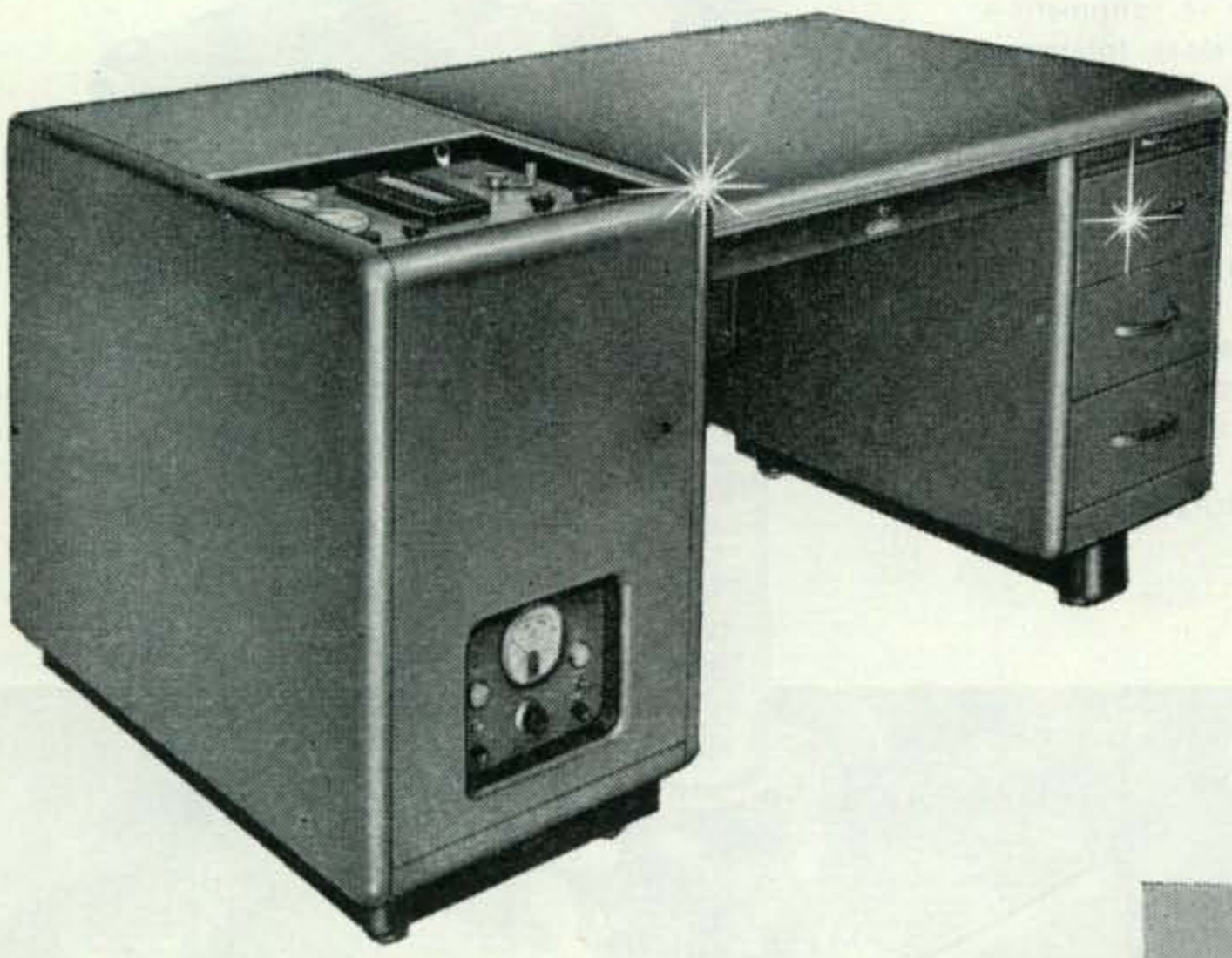
For further information, check number 23 on page 126.

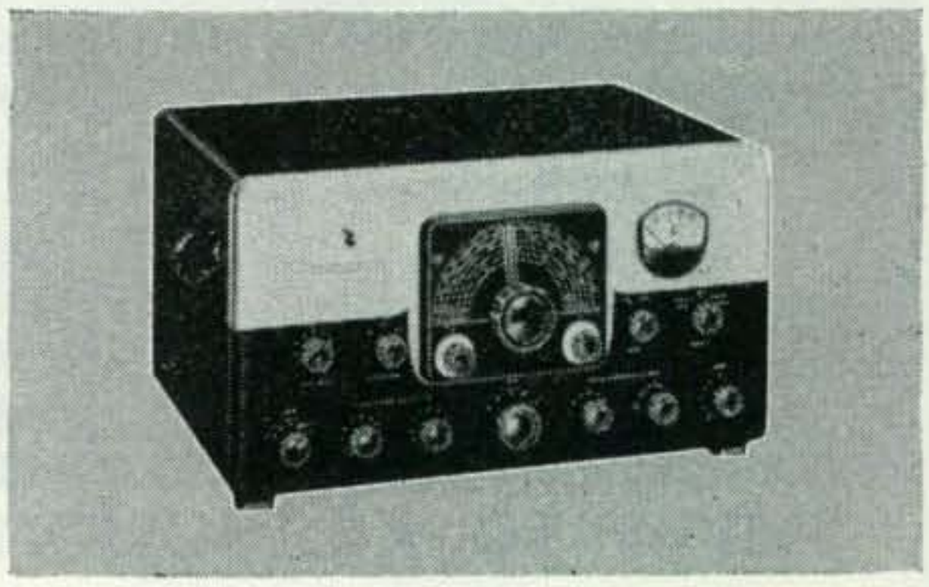
*Choose your next transmitter 1st choice**



VIKING "KILOWATT" AMPLIFIER—Boldly styled, effectively TVI suppressed—contains every conceivable feature for safety, operating convenience, and peak performance. 2000 watts P.E.P.† on SSB—1000 watts CW and AM. Continuous tuning 3.5 to 30 mc.—no coil change necessary. Compact pedestal contains complete kilowatt—rolls out for adjustment or maintenance. Excitation requirements: 30 watts RF and 10 watts audio for AM; 2-3 watts peak for SSB. Completely wired and tested with tubes.

Cat. No. 240-1000..Wired and tested.....Amateur Net $1595.00

Cat. No. 251-101-1..Matching accessory desk, top, back and three drawer pedestal.....FOB Corry, Pa. $132.00



DRIVE IT WITH THE "PACEMAKER"—This exciting transmitter offers you the ultimate in single sideband . . . 90 watts SSB P.E.P. and CW input . . . 35 watts AM. Self-contained—effectively TVI suppressed. Instant bandswitching on 80, 40, 20, 15, and 10 meters. Excellent stability and suppression. Temperature compensated built-in VFO . . . separate crystal control provided for each band. VOX and anti-trip circuits provide excellent voice controlled operation. Pi-network output matches antenna loads from 50 to 600 ohms. More than enough power to drive the Viking Kilowatt or grounded-grid kilowatt amplifiers. (Requires use of Cat. No. 250-34 Power Divider when used with Viking Kilowatt.) With tubes and crystals, less key and microphone.

Cat. No. 240-301-2..Wired and tested.....Amateur Net $495.00

New Power-packed Desk Top Linear Amplifiers!

VIKING "COURIER" AMPLIFIER—Rated a solid one-half kilowatt P.E.P. input with auxiliary SSB exciter as a Class B linear amplifier; one-half kilowatt input CW or 200 watts in AM linear mode. Completely self-contained desk-top package—may be driven by the Viking "Navigator," "Ranger," "Pacemaker," or other unit of comparable output. Continuous coverage 3.5 to 30 mcs. Drive requirements: 5 to 35 watts depending upon mode and frequency desired. Pi-network output designed to match 40 to 600 ohm antenna loads. Fully TVI suppressed. Complete with tubes and built-in power supply.

Cat. No. 240-352-1..Kit.....Amateur Net $244.50

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VIKING "THUNDERBOLT" AMPLIFIER—The hottest linear amplifier on the market—delivers over 2000 watts P.E.P.† input SSB; 1000 watts CW; 750 watts AM linear; in a completely self-contained desk-top package. Continuous coverage 3.5 to 30 mcs.—instant bandswitching. May be driven by the Viking "Navigator", "Ranger", "Pacemaker", or other unit of comparable output. Drive requirements: approximately 10 watts in Class AB_2 linear, 20 watts Class C continuous wave. With tubes and power supply.

Cat. No. 240-353-1..Kit.....Amateur Net $524.50

Cat. No. 240-353-2..Wired and tested.....Amateur Net $589.50

†The F.C.C. permits a maximum one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.

**Results of a recent nationwide survey conducted by CQ Magazine prove that Johnson Viking transmitters in use outnumber those of any other manufacturer. Published copies of this survey available on request.*

from the line that's among the nation's amateurs!

VIKING "RANGER" TRANSMITTER— This outstanding amateur transmitter will also serve as an RF and audio exciter for high power equipment. As an exciter, it will drive any of the popular kilowatt level tubes. No internal changes necessary to switch from transmitter to exciter operation. Self-contained, 75 watts CW or 65 watts phone input . . . instant bandswitching 160, 80, 40, 20, 15, 11, and 10 meters. Extremely stable, built-in VFO or crystal control—effectively TVI suppressed—high gain audio—timed sequence (break-in) keying—adjustable wave shaping. Pi-network antenna load matching from 50 to 500 ohms. Easily assembled—with tubes, less crystals, key and microphone.

Cat. No. 240-161-1.. Kit.....Amateur Net $229.50

Cat. No. 240-161-2..Wired and tested.....Amateur Net $329.50

VIKING "VALIANT" TRANSMITTER— Designed for outstanding flexibility and performance. 275 watts input on CW and SSB (P.E.P. with auxiliary SSB exciter), 200 watts AM. Instant bandswitching 160 through 10 meters—operates by built-in VFO or crystal control. Pi-network tank circuit will match antenna loads from 50 to 600 ohms—final tank coil is silver-plated. Other features: TVI suppressed—timed sequence (break-in) keying—high gain push-to-talk audio system—low level audio clipping—built-in low pass audio filter—self-contained power supplies. With tubes, less crystals, key, and microphone.

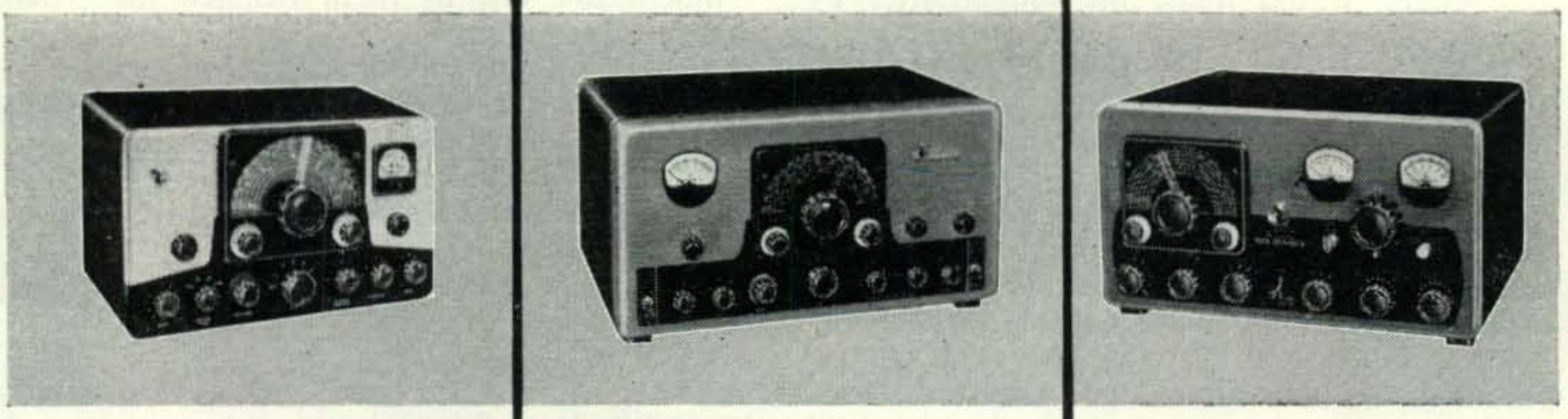
Cat. No. 240-104-1.. Kit.....Amateur Net $349.50

Cat. No. 240-104-2..Wired and tested.....Amateur Net $439.50

VIKING "FIVE HUNDRED" TRANSMITTER — Rated a full 600 watts CW . . . 500 watts phone and SSB. (P.E.P. with auxiliary SSB exciter.) All exciter stages ganged to VFO tuning. Two compact units: RF unit small enough to place on your operating desk beside receiver—power supply/modulator unit may be placed in any convenient location. Crystal or built-in VFO control—instant bandswitching 80 through 10 meters—TVI suppressed—high gain push-to-talk audio system—low level audio clipping. Pi-network output circuit with silver-plated final tank coil will load virtually any antenna system. With tubes, less crystals, key, and microphone.

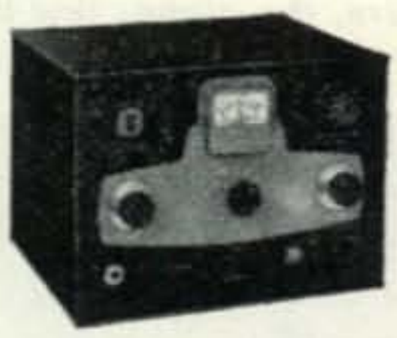
Cat. No. 240-500-1.. Kit.....Amateur Net $749.50

Cat. No. 240-500-2..Wired and tested.....Amateur Net $949.50



VIKING "ADVENTURER" 50 WATT TRANSMITTER—Used to earn first Novice WAC! (Worked All Continents.) Self-contained, effectively TVI suppressed, instant bandswitching 80, 40, 20, 15, 11, and 10 meters. Operates by crystal or external VFO. An octal power receptacle located on the rear apron provides full 450 VDC at 150 ma. and 6.3 VAC at 2 amp. output of supply to power auxiliary equipment such as a VFO, signal monitor, or modulator for phone operation. This receptacle also permits using the full output of the supply to power other equipment when the transmitter is not operating. Wide range pi-network output handles virtually any antenna without separate antenna tuner. Break-in keying is clean and crisp. With tubes, less crystals and key.

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



SPEECH AMPLIFIER/SCREEN MODULATOR—Designed to provide phone operation for the "Adventurer". High gain—use with either crystal or dynamic microphones. Simple installation—only minor wiring changes necessary in "Adventurer". With tubes.

Cat. No. 250-40..Kit.....Amateur Net $12.25

VIKING "NAVIGATOR" TRANSMITTER/EXCITER—This compact, flexible CW transmitter has enough RF power to excite most high powered final amplifiers on CW and AM. 40 watts—bandswitching 160 through 10 meters. Highly stable, built-in VFO is temperature compensated and voltage regulated—may also be operated crystal control. Timed sequence keying—effectively TVI suppressed. Pi-network antenna load matching from 40 to 600 ohms. With tubes, less crystals and key.

Cat. No. 240-126-1..Kit.....Amateur Net $149.50

Cat. No. 240-126-2..Wired and tested.....Amateur Net $199.50

If you're in New York during the IRE Convention—don't forget the Annual Single Sideband Dinner on March 25th at the Hotel New Yorker.

E. F. Johnson Company

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For further information, check number 24 on page 126.

DX-pedition FP8

by CHARLES M. O'BRIEN, FP8AS/W2EQS
48 Prospect Ave., Westwood, N. J.

Sooner or later the average ham, bedeviled by QRM and cursed with the most mediocre of all call letters, dreams of *being DX!* Me, plain old W2EQS, this vision has plagued for years. To think that the same low-power rig that puts me in a class with thousands of obscure hams, simply transplanted to a rare island somewhere with the addition of exotic call letters, would make me sought after by the world! Ah, what bliss!

Larry and Joe returned from a DX-Vacation jaunt to inject the specific virus which was to feed on this chronic malaise and bring it to the acute stage. It was called *FP8*. A place not too far away—close enough that I might not have to desert my family to join the merchant marines or the Foreign Legion, all for the glory of amateur radio! I might be able to keep my job, my house and even my car, with careful planning. My wife should be overjoyed. Now, to find another ham with a similar spirit of adventure.

Thru the grapevine Ed, W2HTI contacted me. He suffered from a similar ambition and soon a pact was made.

No place is rare if it can be reached easily. FP8, St. Pierre is only 160 miles northeast of Nova Scotia. Why hasn't there been more FP8 activity? We learned that quite a few hams had been licensed by the St. Pierre government but few of them reached the place and got on the air.

The islands of St. Pierre and Miquelon are 17 miles off the southernmost point of Newfoundland. The entire area embraces 93 square miles, with a total population of 4600. 3400 live in the Capital town of St. Pierre. Apparently very little is known of these islands by most hams as many questions were asked of us ("What part of Africa or the Indian Ocean are you in?")

The port of St. Pierre is extremely busy. Its multitude of fishing boats and multi-masted freighters utilize both engines and sails. Many

Radio St. Pierre, the islands lkw broadcast station.

Harbour scene — St. Pierre. Cruiser is FP8AP's "Atta Boy".

Spanish Basque fishermen here speak only the Basque language. A knowledge of French is of tremendous aid but if you don't speak or understand it you can get by as a goodly number of the St. Pierre's understand English. The people are extremely friendly and hospitable.

Two boats sail between North Sydney, Nova Scotia, and the island of St. Pierre. Neither has a regular schedule. Main payload is cargo, not tourists; nearly everything on St. Pierre must be imported. Authentic sources for accurate, detailed information revealed this: one of these boats sails about every seven or ten days. With such a schedule, where does that leave a couple of fellows with a two-week vacation? If we should be lucky enough to catch the outgoing boat in time, we still might get stuck on St. Pierre. Our dream picture started looking a little fuzzy around the edges.

We could hope. Ed contacted friends in the maritime and Cape Breton Nets who would keep an eye on boat movements. Marshall Killen, VE1MK had a view of the North Sydney harbor, so he could keep watch on the two boats, the *Miquelon* and the *Langlade*.

Word finally came thru that the *Miquelon* would definitely be sailing on Monday or Tuesday, September 9 or 10, so if we arrived Sunday there would be plenty of time to spare.

We left Friday the 6th, motoring straight thru with no sleep, stopping only briefly for food and gas.

Two very groggy hams arrived at the dock Saturday night only to see the *Miquelon* on its way to St. Pierre without us. Frantic arm-waving and hollering failed to bring them back. Oh,——ugh! Utter dejection! Bitter woe!

With what was left of our determination we contacted VE1MK, who got us in touch with Canadian National Railways. We *could* still get to St. Pierre, but instead of the originally-planned 160-mile boat trip, we'd have to travel over 700 miles via boat, train, taxi and again by boat. Never say die! After coming this far we were determined not to turn back.

Via Newfoundland

Our new route would take us via steamer to Port-Aux-Basques, Newfoundland. Then by train on a giant semi-circle from southwest to north central to southeast, a rugged and beautiful trip on the country's only cross-country railway.

Sunday night we caught the steamer to cross the Cabot Straight. Who should be the Purser and Sparks but old VO1AW (ex-VO1W) who I contacted many times 22 years ago but now had the pleasure of meeting in person. This pleasant surprise gave us a lift.

Rain had begun falling Saturday night and increased steadily, turning into a full-fledged nor'easter which didn't let up 'til late Tuesday afternoon.

Rock-bound, craggy and barren, the tiny harbor of Port-Aux-Basques greeted us Monday morning. Then the long rail journey began.

The first 400 miles took 22 hours. Up to Corner Brook, then circling northeast across the continent — Springdale, Grand Falls, Bishops Falls. Rain, wind, fog and miles of desolate country. Heavy pine growth in places, stunted pine or nothing but rocks and barren hills in others. Plentiful lakes fed by roaring rivers and streams, filled to capacity by the constant rain. Our vision of hamming on St. Pierre was becoming a little brighter when we ran into a landslide which covered the tracks ahead. Another wait while the work crew cleared them.

At Gander a huge trans-Atlantic plane took off so close overhead we thought the train would disintegrate from the vibration. But it held together, soon winding its way along again, now south toward the Avalon Peninsula.

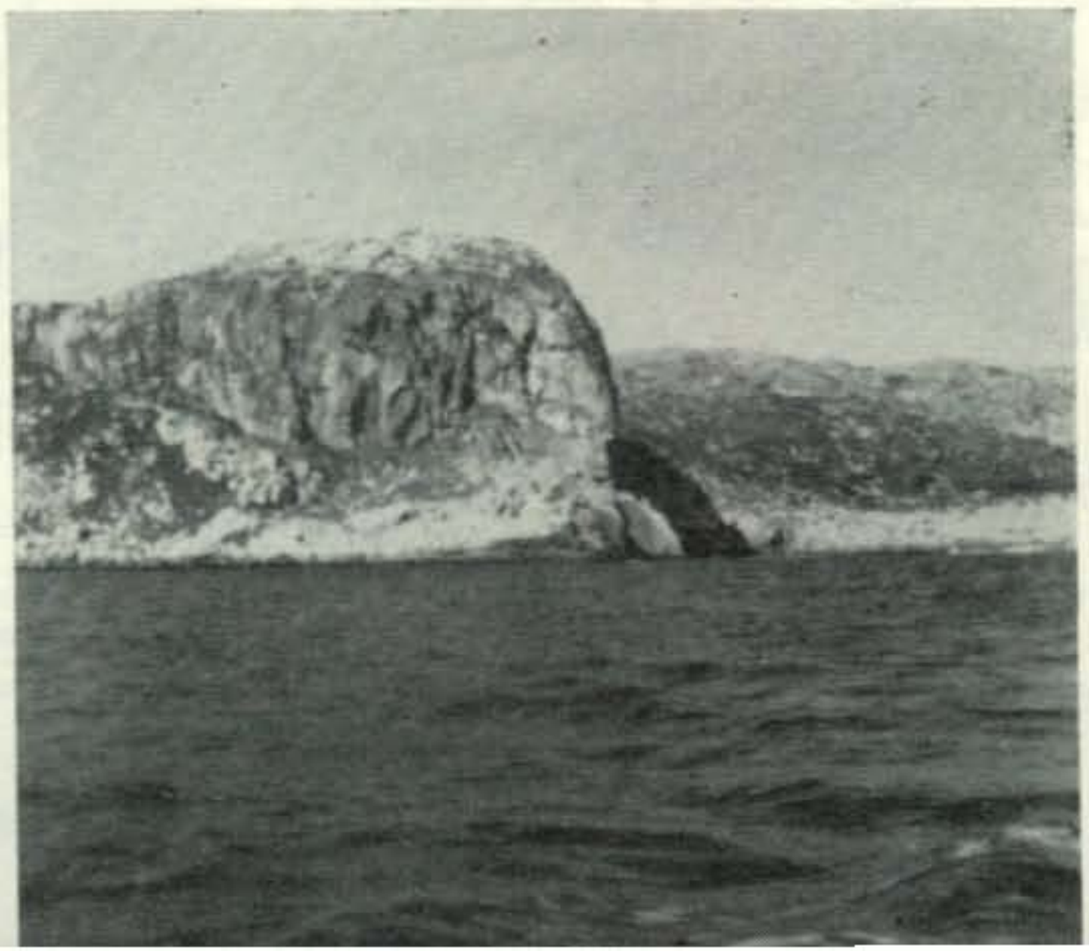
At 7 a.m. the conductor gave us the call for Goobies—a tiny station where even this train stops only on signal. Groggily we debarked. The rain, still with us, beat a steady tattoo on numb backs as we unloaded 8 heavy pieces from the baggage car. Few of the 25 population of Goobies were out to meet us this soggy morning.

Luckily there was a taxi at the station. But when we told him we wanted to go 150 miles down the Burin Peninsula, he balked. Only one road wound down this protuberance and it was in bad condition from the rains. For $6 we talked him into taking us to Swift Current,

[*Continued on page 104*]

Gus Roblot, FP8AP is the only active ham on the island.

The rugged coastline of St. Pierre.



"ARRL Exposed" (December '56 CQ) brought numerous requests for a similar article on the CQ Headquarters. It took us a while to get things straightened up for the picture, but at long last . . . etc.

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12	14	16	18	20	2
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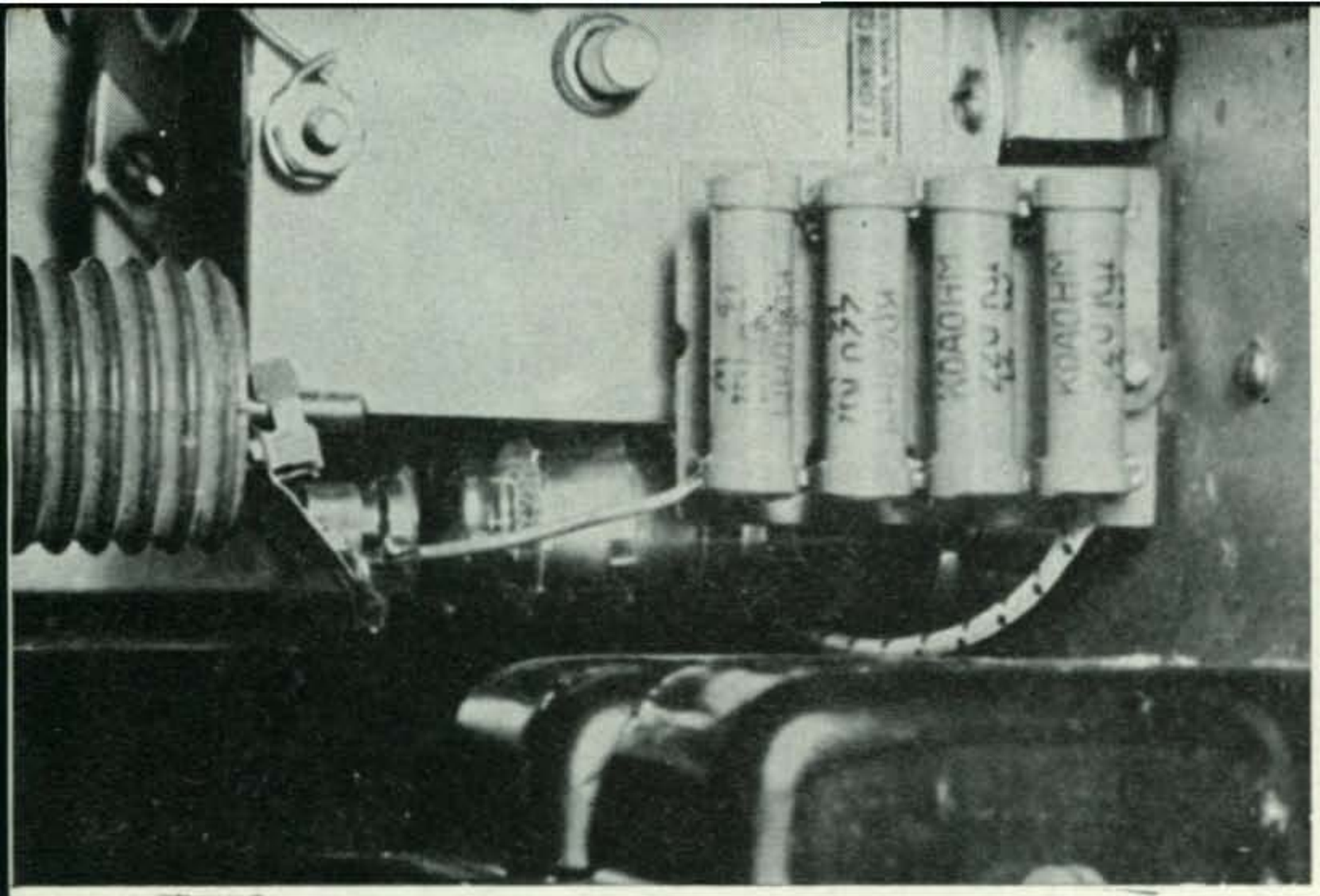


Fig 2

A Transmitter Tuning Meter

W. B. Bernard, CDR, ED, USN, K6EUS
Navy dept., Wash. 25, D.C.

Power pentodes and tetrodes are widely used as output amplifiers in amateur transmitters. The high power sensitivity of these tubes makes it possible to drive them with a low power driver system. This low power driver may be simple and therefore economical. Also because it is low powered it is less likely to cause TVI and other interferences than is a high power driver system. With all these advantages there are some disadvantages which must be accepted. The one of most importance is the ease with which such tubes may be damaged if they are not operated properly. Contributing to this difficulty is the small change in plate current which occurs between an overloaded condition which is likely to cause overheating of the screen and an overloaded condition which will cause overheating of the plate.

A glance at the characteristic curves in the tube handbook will show that the screen current of the output tube rises steeply if the plate voltage of the tube goes much below the screen voltage. This situation will occur once each cycle of the transmitted frequency if the voltage swing of the plate tank is too great. This high voltage swing results from too light a loading of the tank. If the screen grid is furnished its current from the plate supply through a high resistance the screen dissipation, which is limited to a maximum of $\frac{E^2}{4R}$ where E is the supply voltage and R is the value of the dropping resistor, may be less than the maximum permissible screen dissipation of the tube in which case we need not worry about burning up the screen. If instead of a high voltage supply with a high value dropping resistor we have a low voltage supply with little or no series resistance $E^2/4R$ can easily become great enough to melt down the screen leaving us with a poor grade triode which we really don't want.

Tuning up is a process that is very dangerous since during most of the process there is insufficient load on the plate tank. This danger can be minimized by tuning up and loading with reduced grid drive and/or screen voltage but we are left with the basic difficulty of recognizing correct loading as mentioned in the first paragraph. The number of amateurs complaining of the short life of certain type tubes attests to the difficulties of correct operation.

The answer to the problem is some type of an indicator which tells, with more accuracy than the plate current meter, the actual operating conditions in the plate circuit. A meter which measures the peak radio frequency voltage in the plate circuit will give us the information which we need. Such an instrument has been used in commercial transmitters for years but has rarely been adopted by the amateur fraternity.

Perhaps in the past the cost and the bulk of the necessary components acted as a deterrent to its wider adoption but the wide availability of high voltage components designed for television receiver service has removed these objections.

Fig. 1 shows the circuit of a plate voltmeter for use in amateur transmitters. The components which must be added to make this circuit are small enough that they may be installed in all but the smallest transmitters. *Fig. 2* shows the coupling capacitor, rectifier tube and multiplier resistor for the plate voltmeter installed in the author's transmitter.

Returning to *fig. 1* the 1x2A tube and the 20KV 500$\mu\mu$fd capacitor are easily secured inexpensive television receiver parts. The meter must give full scale deflection with 1 ma or less since the 1X2A is limited to 1 ma average current. If the transmitter already has a DC

meter other than the plate current meter a 1 ma meter may be substituted for this meter and a switch with suitable shunts can be connected to use the meter for the original function(s) and the plate voltmeter circuit.

The multiplier resistor string should consist of a number of resistors in order to limit the

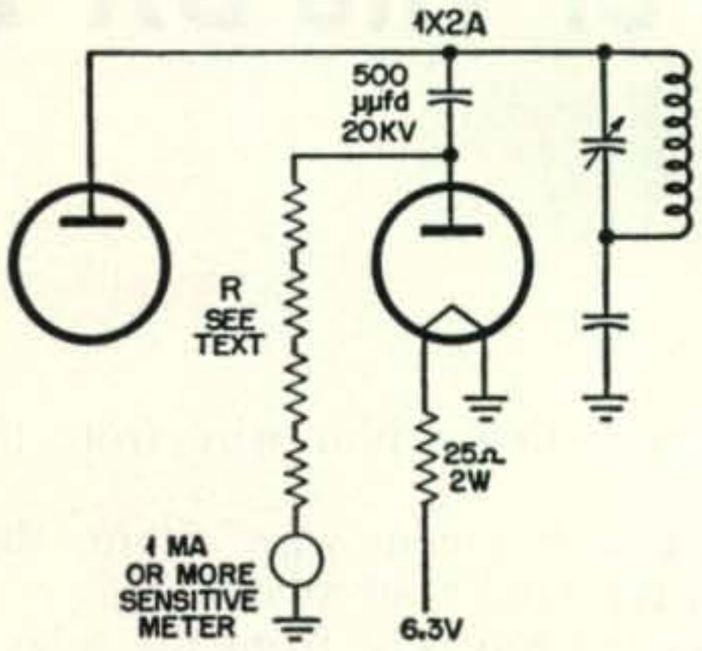


Fig 1

voltage which is impressed across each individual resistor. At least the top two resistors should be of the deposited carbon type since some composition resistors have a very small resistance element inside a large phenolic case. When such resistors are subjected to high radio frequency voltages they tend to overheat and burst. The value of the total resistance string is equal to the full scale voltage reading desired divided by the current required for full scale deflection of the meter movement. For instance if the meter is to read 1000 volts and has a sensitivity of 1 ma (.001 A) the resistance needed is 1000/.001 or 1,000,000 ohms (1 megohm). It is convenient to have the meter read from 1.25 to 1.33 the DC plate supply voltage except in the case of a plate modulated amplifier in which case it should read about 2 times the plate supply voltage.

The author's transmitter has four 807's in the final amplifier designed to run at 750 volts and 400 ma for c.w. The curves shown were taken at reduced screen voltage to prevent damage to the tubes during the data taking, however if the voltages and currents shown are multiplied by two they will be very close to those obtained under full power conditions. *Fig. 3a* shows the plate current and plate voltage as the final tank is turned through resonance with no load coupled into the circuit. It can be seen that at resonance the r-f plate voltage rises to a very high value. Had the screen voltage not been reduced the plate swing would have exceeded the plate supply voltage and the screen current and the screen dissipation would have been far in excess of the disallowable ratings. *Fig. 3b* shows the plate current and the plate voltage as the plate tank is tuned through resonance with the tank heavily loaded. The much greater sharpness of the plate voltage rise compared to the plate current dip is still evident although the transmiter is loaded more heavily than is desirable. Although there is not much plate current change between a plate tuning dial reading of 8 and 8.5 the plate voltage curve shows that the r-f plate voltage changes 25%, therefore the output power may be down by more than 40% with little indication by the plate current meter. Since the DC input has not changed much and the r-f output has dropped 40% there must be much more power being dissipated in the final amplifier plate(s).

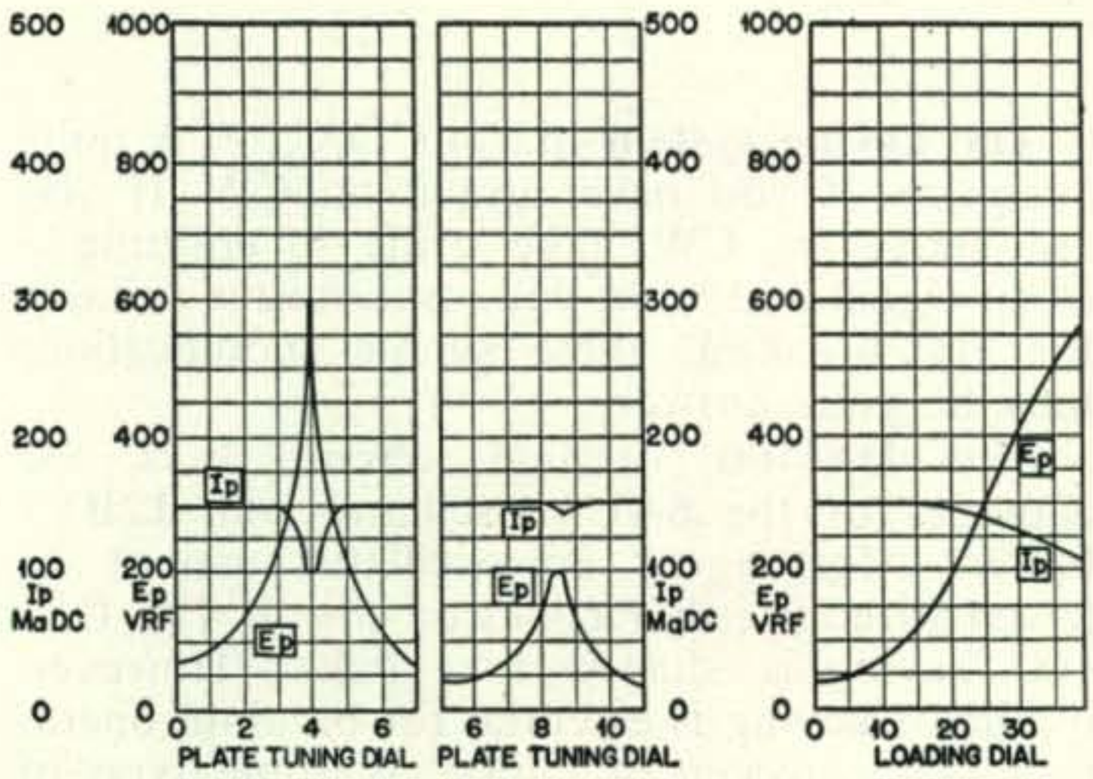


Fig 3(a) (b)

Fig 4

Fig. 4 is a plot of the plate current and the plate voltage as the loading on the plate tank is varied with the tank being maintained at resonance. As the loading dial numbers increase the loading on the tank is decreased. We may consider that under the reduced screen voltage condition a 250 volt peak plate swing indicates proper loading on this amplifier. A loading which gives 200 volts plate swing under these conditions will give excessive plate dissipation under full power operation while a loading which gives 300 volts plate swing under these conditions will result in excessive screen dissipation under full power operation. This 100 volts difference on the voltmeter results in the same needle movement as 50 ma difference in plate current, however the same change in loading which caused the 100 volts change in plate voltage caused only 5 ma change in plate current thus the plate voltage meter is 10 times as sensitive an indicator of operating conditions as is the plate current meter.

In addition to being almost essential for the determination of proper loading of final amplifiers the r-f plate voltage meter is also useful for the determination of linearity of linear amplifiers and the modulation capabilities of modulated amplifiers. To sum up, the radio frequency plate voltmeter is more than a convenience. Once you have become accustomed to using it you will wonder how you got along without it in the past. ■

Traffic Man's Keying For The DX-100

Robert A. Thomason, W4SUD
626 Eastwood Drive
Owensboro, Kentucky

The keying system in your DX-100 is quite adequate, if you never use it on CW. If you are active on CW, take pride in emitting a clean signal and want your transmitter suitable for full break-in, these simple modifications may be your answer.

The DX-100 original circuit keys the cathodes of the 6AU6 oscillator and 12BY7 buffer. Most agree an oscillator cannot be keyed without either clicks or chirps. The DX-100 keying is shaped for clicks. However, oscillator keying is essential for break-in operation. The answer of course is some type of differential keying, that is, keying the oscillator a few milliseconds before the amplifier and break the amplifier a few milliseconds before the oscillator. Thus the clicks generated by the oscillator are not transmitted. The step by step instructions to follow will convert your DX-100 keying to a very effective differential keying system using two popular surplus keying relays (found in the BC-645). Other relays can be used as described later.

The advantages of grid block keying over cathode keying are numerous. One of the more important being ease of shaping the keying characteristics. These instructions also include grid block keying of the 12BY7 stage.

It may be of interest to some that these modifications only require drilling two 5/32" holes in the chassis.

Details

The relays used were removed from a junk BC-645 and may be recognized from the photograph. They have a standard five prong base and a metal cover. Mount the relays on a small sub-chassis and wire as shown in *fig. 1*. The chassis is made by bending a piece of .051" aluminum 1⅝" by 8". (See *fig. 3*.) Mount in the high voltage power supply section as shown in the photograph, using two 6-32 by ⅜" machine screws.

Refer to pictorial 6 in your Heathkit assembly instructions.

Disconnect the blue wire going to terminal 8 on switch N. (Phone-CW switch.) Splice this blue wire to the blue wire from the relay chassis.

Connect the green wire from the relay chassis to terminal 8 of switch N.

Connect the red wire from the relay chassis to the front terminal of the strip mounted near the 12BY7 socket (L.V. B+).

Refer to pictorial 7 and *fig. 2*. Mount a three lug terminal strip (center lug grounded) behind the 12BY7 socket using the screw holding the loading capacitor. Connect a 100K ½-watt resistor from the lower lug to terminal 2 of the 12BY7. Connect a 10K ½-watt resistor between the top and lower lugs. By-pass the lower lug to ground (center lug) with a .005 mfd ceramic capacitor. Connect the lower lug (junction of 10K and 100K resistors) to terminal 7 (tie point) of the 5V4 socket. Connect the yellow wire from the relay chassis to the top lug. Dress all wires close to the chassis.

Refer to pictorial 5. Connect a 22K ½-watt resistor between pins 1 and 7 (tie points) of the 5V4 socket. Connect pin 1 of the 5V4 socket to lug 1 of terminal DD (grid block voltage). Connect a .15 mfd capacitor from pin 7 of the 5V4 socket and a convenient ground point. This capacitor shapes the amplifier grid blocking voltage and therefore determines the keying characteristics. For example, a .25 mfd would give softer keying. The one suggested appears to be a good choice.

Testing

Measure the relay current by plugging a multi-meter into the key jack. A reading between 9 and 11 ma. is satisfactory. If this current is too high both relays close at the same time. If it is too low K_2 is not closed long enough or fails to close at all. Therefore, it is important the relay current be within the above limits. The current can be varied by changing R_1 in *fig. 1*.

Now you are ready for an "on the air" check. Select a local station or one that receives you strongly. It is difficult to check for clicks in your own receiver, due to the clicks caused by key contact arcing. (Only heard a

few hundred feet.) While sending a test signal, ask the receiving operator to adjust his BFO to zero beat and listen for clicks. This is the acid test which only the best will pass. When checking for chirps the BFO should be adjusted near zero beat. A small frequency change will thus be a larger percentage of audio frequency change.

Other Relays

If other relays are used, some cut and try will be necessary. The relays used have a coil resistance of 2200 ohms. C_1 and C_2 are approximately inversely proportional, and R_3 and R_4 are directly proportional to the coil resistance. For example, if the coil resistance were 4500 ohms the values are as follows:

C_1—1 mfd
C_2—.1 mfd
R_3—300 ohms
R_4—4500 ohms (equal coil resistances)

R_1 and R_2 form a voltage divider for the relay voltage. Values should be selected which will give a key down voltage at point A of about three times that required to operate the relay used. I would suggest R_1 be variable. Then while making the "on the air" test outlined above adjust R_1 until the clicks have disappeared and at the same time there is positive closure of K_2.

Trouble Shooting

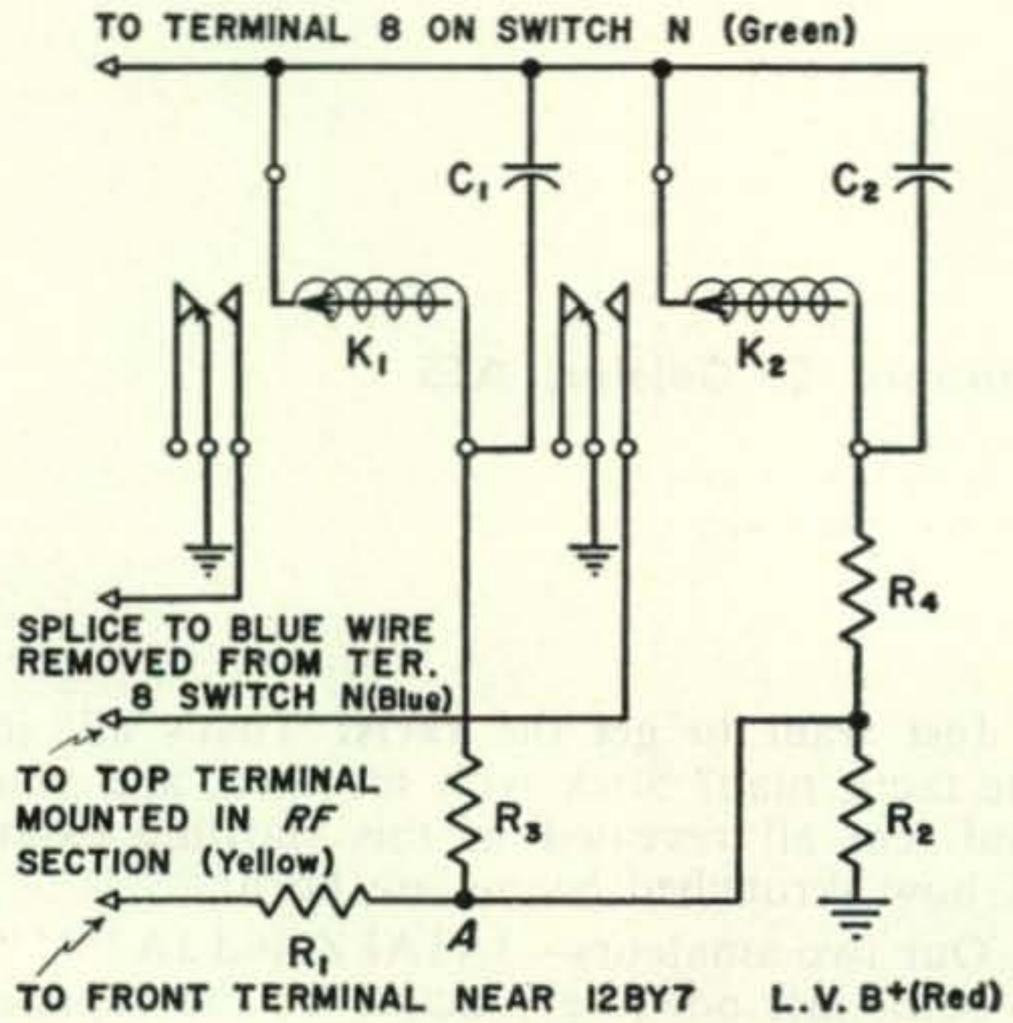
If trouble is experienced with clicks, short the oscillator relay contacts. This will key the amplifier grid block voltage only and the keying should be very clean. If not, recheck the grid block modifications.

After amplifier keying only is operating without clicks, remove the short from the oscillator contacts. The oscillator relay K_1 keys first because it operates at a higher voltage (lower series resistances). It also drops out last since C_1 is much larger than C_2. K_1 will not drop out until C_1 has discharged through the coil. Determine if the clicks occur on make or break. A click on make indicates both relays are keying almost at the same time, and is corrected by increasing the value of R_4. A click on break indicates both relays are dropping out at nearly the same time. This is corrected by increasing the value of C_1. R_1 should be adjusted for optimum as these changes are made.

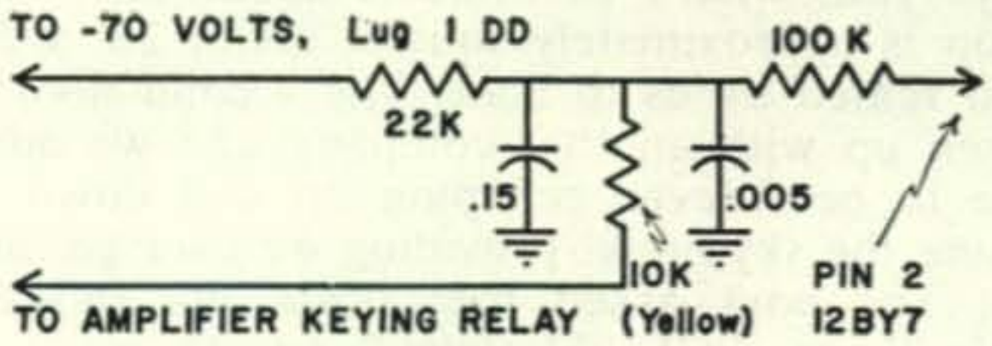
Full Break-in

The back contacts of the oscillator relay could be brought out pin 5 of the remote control socket and used to desensitize your receiver. This is done by adding resistance in series with the rf gain. During key up K_1 shorts this resistance. The NC-300 used here already has this connection, so it can be easily added to others. A T-R switch or separate receiving antenna completes the system.

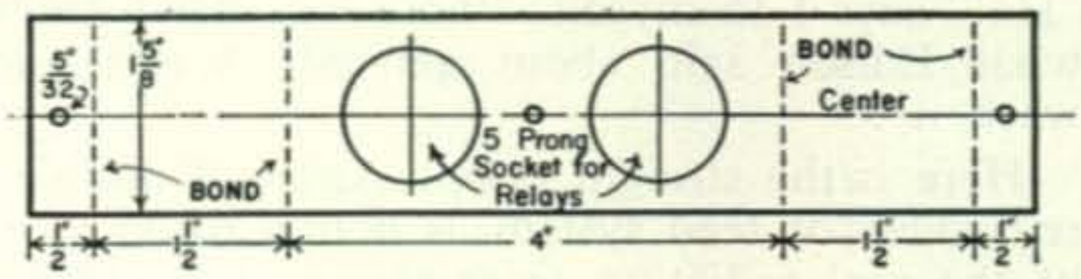
It is a pleasure to operate and you will be proud of the reports from the most critical listener. ■



[Fig. 1]



[Fig. 2]



[Fig. 3]

Little but . . . OH My!

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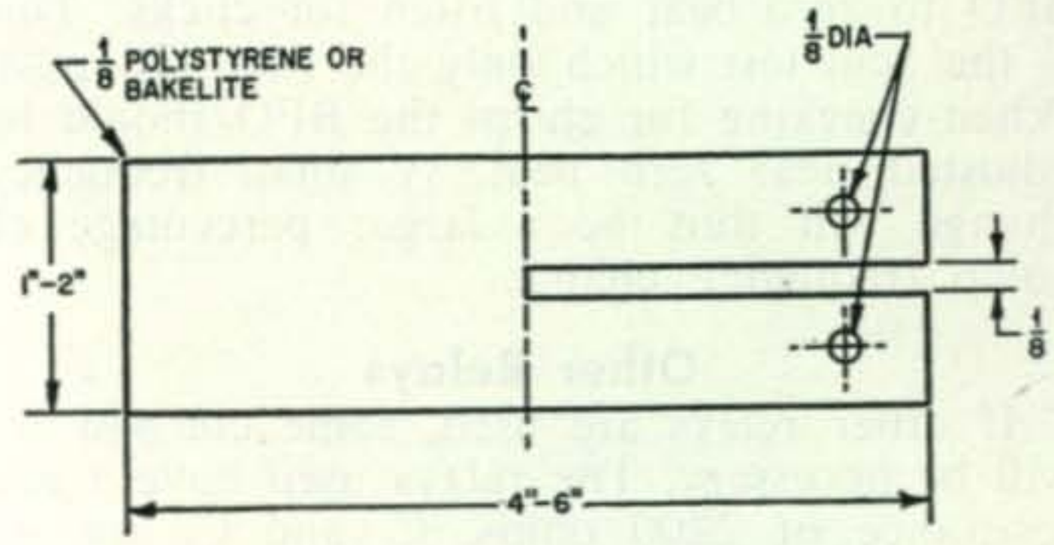
CPO Box 1556, Tokyo, Japan

Just want to get the facts? That's all, just the facts, man? Stick with me then, and you'll find 'em all revealed in this startling exposé of how skrunched beams are born!

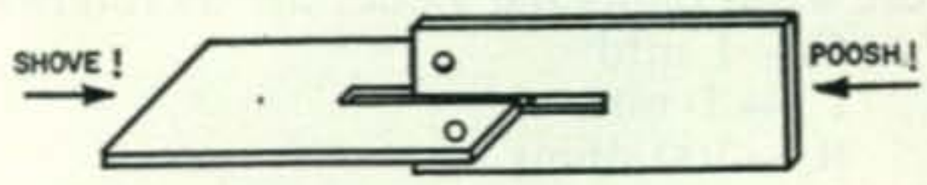
Our two amateurs—JA1ALZ and JA2MN/1—both, just now, very active on the Japanese 40 meter band were faced with a problem. JA2MN has a room on the premises—he doubles as night watchman—and the poor guy's *got* to have a ham outlet. How to get a λ/2 doublet hung on the roof of our store? Says you, what's so difficult about this? Our shop is approximately square, about 26′ x 26′ and rented by us to boot. The second floor is taken up with another company and we don't like to be forever galloping up and down to prune the sky-hook, providing we ever get one up. The boys asked me "doshi ma shoka?" (Wot'll we do?) "Mattetei," (wait) sez I.

Much head scratching, slip-stick sliding, coffee slurping and hard skull-drudgery later I come up with the proposal that hanging up the driven element of a foreshortened beam might do. "This," the boys say, "is pure genius." "Ha!" says I to myself, "these lads don't know what Edison said about genius!" We set to work. . .

Here is the straight poop: Any λ/2 doublet, regardless of feed system, is bound to do most of the real radiation from the center portion, roughly a chunk of radiator λ/4 long. Looking



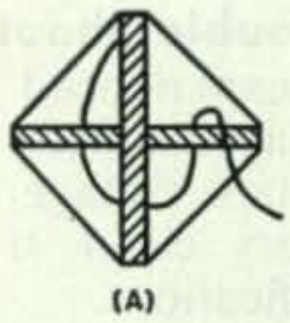
(A)

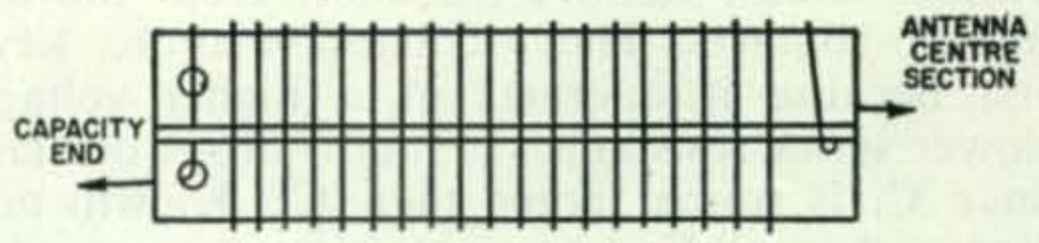


(B)

(a) Make coil forms as shown, cut for tight fit, use 1/8" Polystyrene or bakelite.

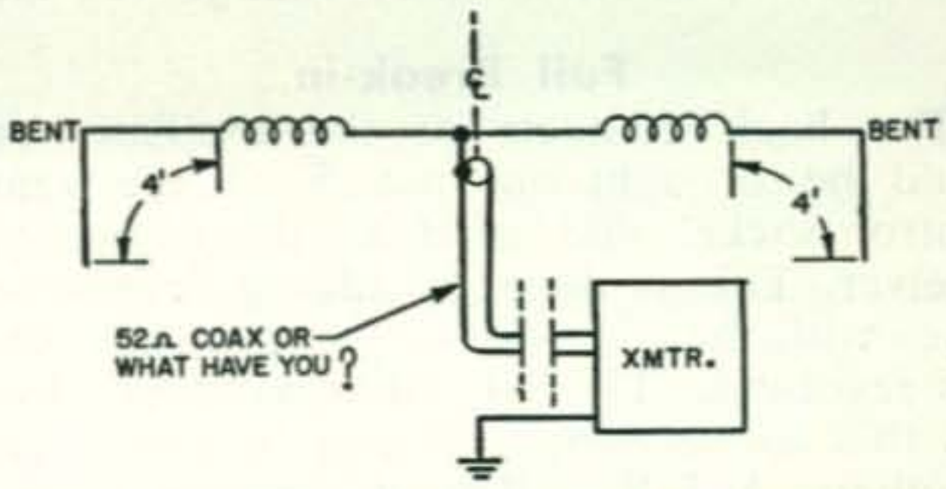
(b) Assembling the coil forms.


(A)

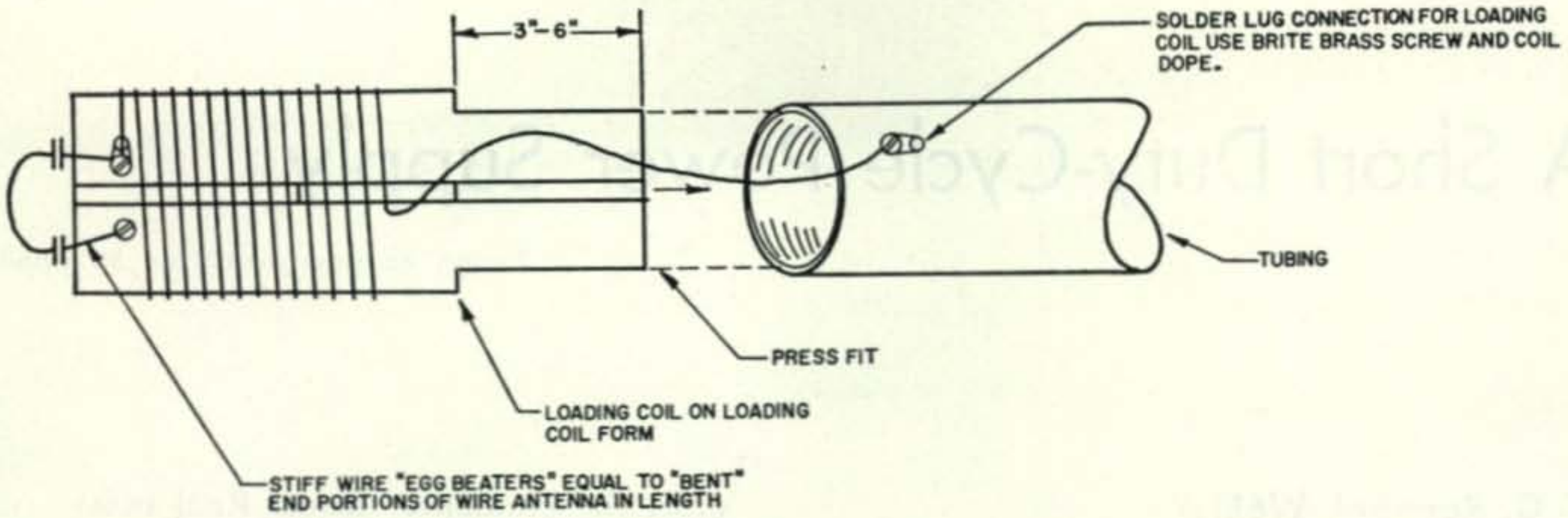


(B)

Winding. Note the form locks with the pull, making a secure assembly without nails, hooks or Scotch tape.



Electrical appearance of the "SS".



Suggested assembly for beams.

at it another way, you radiate most of your antenna *current* from the said center portion of the wire, the *voltage* meanwhile, isn't doing much out near the ends of the wire, except maintain proper phase relationships toward the center, working, portion. The voltage doesn't *radiate*, if you follow me. (If you don't see the Antenna Handbook!) How to shorten the antenna and still keep voltage & current 90° out of phase? Simple. Either chop off some of the ends and fold 'em over to provide capacitive reactance or insert loading coils at the λ/8 wave points and leave a little wire for a capacity at the ends. Simple?

Now, any capacitor and inductance, within reasonable limits, will resonate when wired in series and hooked to a generator. They will present a near short-circuit to the generator at some certain resonant frequency. The X_C and X_L show up as so many ohms, through which power is being dissipated. In the case of the doublet antenna this reactive remainder is called "radiation resistance" and the object of all your hectic activity, when tuning up the line & transmitter is to match this radiation resistance as near perfectly as possible, not so? OK, put the series-resonant antenna loading to work. See what happens? The antenna still looks like a very low resistance to the line and transmitter and you still radiate!

Yes. The coil data. Well, there really isn't any. That's right! Take your λ/2 doublet and . . . measure off exactly an electrical λ/8 each side of the physical center. Don't cut the wire! Knot it, or something. Measure this λ/8 at the center of the band you plan working most on. Then take any reasonable size of coil form, say something like those shown in the figure—you can whomp these up in a half-hour or so—and wind the remaining, or running, ends of the antenna halves on these forms. Stop winding when you've about 4′ left over. Make sure you have the same number of turns on each form, wound in the same direction—series adding—to preserve phase relations, remember? Take the remaining 4′ of wire on each end and bend as shown, or any way to suit your installation, attaching the proper quantity of insulators. I do not recommend your running the end sections straight out as the antenna then becomes sharply resonant. Now, all that's left to do, assuming you're working on your present antenna, is to check the loading and SWR. Yoiks! You're on the air!

You'll find very little difference at the transmitter end of this arrangement, however, due the slightly broader radiation angles, you'll find stations coming in almost on "beam end" (and you may not need the rotary beam you were dreaming of impressing the neighbors with). As far as getting out is concerned, our boys formerly used a λ/4 vertical aluminum mast for a radiator on 40. DX was conspicuous by its absence, even locals gave our boys 3-3-5 reports. We put up the "Skrunched Squirter" and they now consistently get 5-5-9's on long hauls, 40 over 9's on locals. This, I believe, is the pudding's proof!

If you've a space problem, why not give this system a try? Work with a test length of wire on the ground, using your GDO for a signal source and your receiver's S meter for measurements. You can also tune up a Gamma match on the finished antenna on the ground—incidentally, this system is a natural for Gamma matching! You may find this type of sky-hook has a slightly higher SWR than a full λ/2 doublet due to the somewhat reactive characteristic of the series LC loading circuit. We find, however, that it does darned well for our boy's 100 kc wide 40 meter band.

You might note the lack of inductance formulae. You won't need any, believe me. This system works without all that fancy stuff!

If you would like to alleviate the sharpness of your radiator, I suggest you use large diameter tubing, say 3″ or so, and cut the central portion to 0.1λ each side of center instead of the λ/8. Chop off loading coils you've made according to this system, stick 'em into the ends of the tubing—see sketch—attach some stiff wire egg-beaters on the ends—Lo! You have the makings of the rotary!

Getting ideas? ■

A Short Duty-Cycle Power Supply

Design considerations for 5B application

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During the war, many hams were engaged in work that put to use their special talents. Hams were found in communications, equipment installation, engineering and all phases of radar. As we all know, if you let a Ham play with some item of equipment for any length of time, he will do one of two things; improve the item or make a note of the good features for future use in his own station.

The writer, having been exposed to all types of equipment, is no different from any other Brass-pounder, and many notes were made for future use and consideration. One idea possessed him for a long time, and sooner or later something had to be done!

About eight months ago, time from the busy chore of living and eating was alloted, and construction started on a unit to prove the idea. Very few articles have been written on the possibilities of using the small and compact power supplies that are used in radar transmitters. I can hear the radar engineers and oldtimers start at this point to cry, "Time constant," "Duty cycle," and "Pulse duration," etc.; however, let's calm down and take a slower look at the complete picture. A few of the boys have no doubt thought this thing over and passed on. In most cases the rig was to be used for CW or Phone, and the "Duty cycle" would throw the whole thing out the window. With the ever increasing use of Single Side Band and its short duty cycle, the picture changes back to a more favorable one. (CW men QRX—there is more for you later.)

The following will be in as simple form as possible with a minimum of mathematics, for it is hoped that all types of readers will enjoy what is to come.

The basic principle used in radar power supplies is to provide a burst of very high power and then rest before the next burst is required. To supply the burst power, a condenser is charged and then discharged as short demands are necessary. To get an idea of how this works, take a filter condenser and charge it with voltage from a small power supply, Now remove the condenser from said power supply and short the condenser leads. Real noisy, isn't it! Also it burns the lead wires at the point of discharge. This shows that the condenser has a new and useful power, which we are going to put to work. Really what has happened is that the unit has stored the full voltage of your power supply and holds it waiting for your next move. Let us say you have the condenser connected to your power supply for one second and your supply will deliver 100 mills. During the time connected, the supply was pumping in voltage at the rate of 100 mills, until the condenser reaches the full voltage of the supply output, at which time the current drops to zero and the capacitor rides on the line. When we remove the condenser and short the leads, we are using this stored power, but we are using it completely in a fraction of a second, and therefore, have available the same voltage as the power supply but many times the original 100 mills, which took one second to charge the capacitor. This is the reason for the loud noise and burning of the wire ends that we noted in our first experiment. The difference between the one second charging time and the fraction of a second discharge time is the "Time constant" we hear so much about.

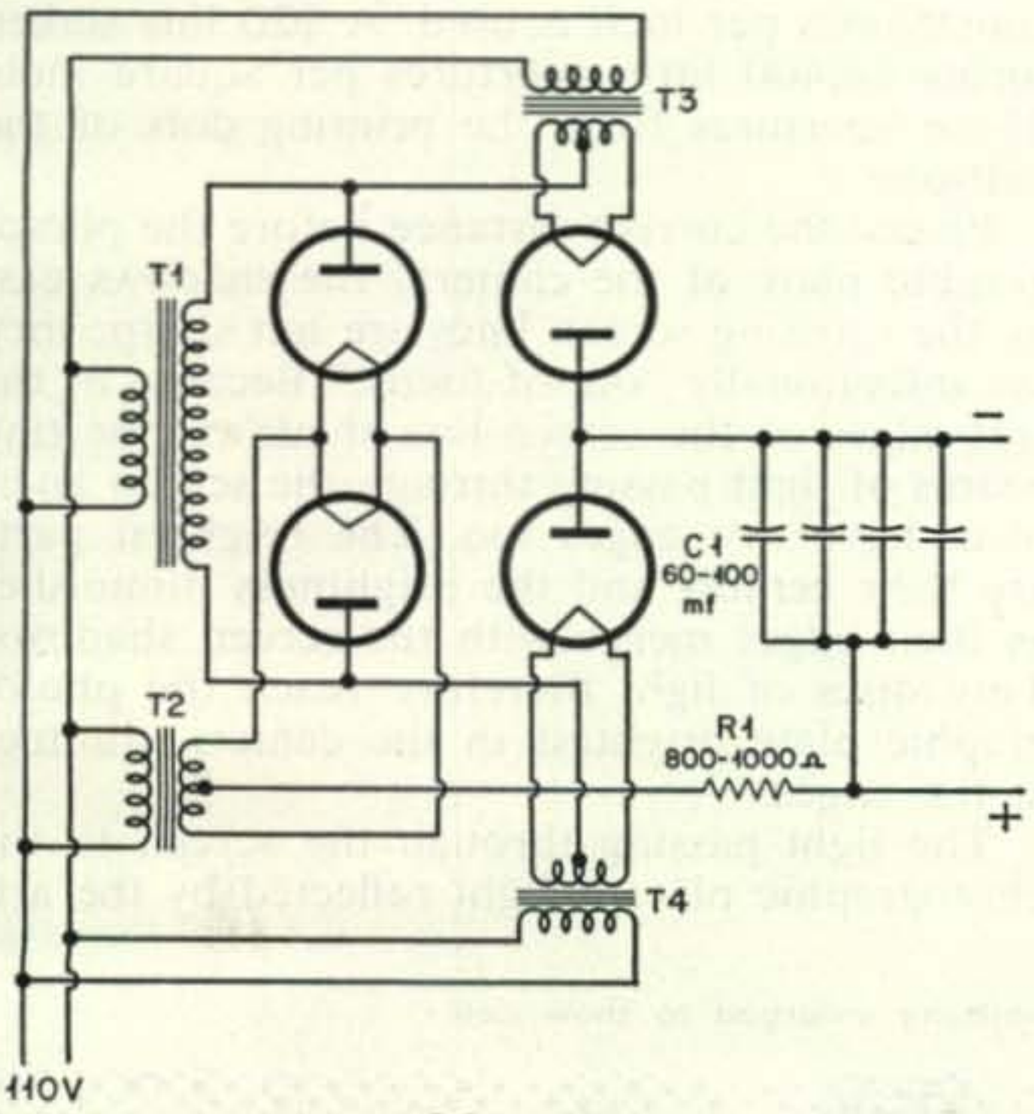
If we say that we used 100 mills at 1000 volts to charge the condenser and when discharging we had 1000 volts at 1 amp., we seem to have increased our wattage considerably; charging 100 watts, discharging 1000 watts. Now we know that we don't get anything for nothing; the joker in the picture is time. If the condenser was a tank and we were filling the tank with water from a small pipe, it would take a certain time; once the tank is full, we could get all the water at once by removing the bottom. The same thing is happening in the condenser—on discharge, you are removing the bottom!

Now that we see how it's done, let's take a look at a way to use the idea. In Single Side Band Transmitter Final Amplifiers, the heavy load is only required during speech. The human voice during a conversion is a series of short bursts of sounds over a rather narrow range of frequency. The duration of any one of these sound bursts is a very short time. We now begin to see the comparison between the human voice and a radar transmitter. The average linear amplifier used will draw some fixed plate

current, called idling current. This power is only a small percentage of the power necessary for the speech bursts as they pass through the amplifier.

It should not be hard for anyone to visualize the size and cost of a power supply to run a 1 KW AM Transmitter. Now look at the cost and size of a power supply to operate a 300 Watt AM transmitter. Boy! some difference, eh! What we propose to do is use the 300 Watt cost and size, but still get the 1 KW signal on the air. There has been reams of information written on final amplifiers of all types. We will not go into this subject, but confine ourselves to a power supply which will supply power for the linear amplifier of your choice.

From months of experimental work, a guide has been developed that will be used for the



Schematic

selection of components. We start with the Plate Transformer. First determine the idling current and plate voltage that your linear amplifier will require with no voice signal. The current should be approximately 20% of the peak current drawn with voice bursts. Now, double the idling current figure that you have selected and use this value along with your desired plate voltage for the selection of your plate transformer. You will find your unit about one-half the size of a transformer that would be required for AM or CW for the same power. The rectifier tubes used may also be selected on the basis of having to carry only the double idling current figure, however the voltage rating must be for the full voltage of the supply as is standard for all systems. Filament transformers are selected as for any standard power supply. We now have the Plate Transformer, Rectifiers and Filament Transformer.

Now we come to the most important part of the whole system. The Filter Condenser (our storage tank) that we were talking about in the first part of our discussion. Here is the heart and lungs of the whole system! The value chosen boils down to the more the merrier, within reason. Experimental data shows that a minimum of 25 mfd's is necessary for proper results and 100 mfd's will do a wonderful job on a 1 KW Final Amplifier! This is not as rough as it sounds with all the fine capacitors available on the surplus market today. Series and parallel connection using lower voltage capacitors is acceptable and works very well as long as the final rating of the stack fits the power supply voltage. Heavy filter chokes are not required, as a matter of fact, no filter chokes were used at all in the experimental rig tested. No bleeder resistors were used, as this is taken care of by the idling current drawn by the amplifier.

There is one additional part necessary. This item is a *must* and protects the rectifiers. There is a low value of resistance, which is connected between the rectifiers and the condenser bank. This resistor limits the current to the condenser when the supply is first turned on. A value of between 800 and 1000 ohms will be ample and a wattage equal to your plate voltage times twice your idling current, will run quite happily.

Assuming that you now have the unit wired and ready for business, let's see how we use this rascal. With your Exciter, Final and Power Supply all hooked up and ready for use, you should place some form of dropping resistor or variac in the primary of your plate transformer while tuning up. This dropping element should reduce your plate voltage to one half of its normal value. After you have tuned the complete rig up for best loading and drive, remove the carrier and introduce audio through the system as a check to see that the final plate meter kicks up. We are not interested at the moment as to how high the meter kicks up, just so we are getting the proper action under speech bursts. Remove your dropping device from the primary of your plate transformer and stand back! You have a real monster on your hands! The idling current should be normal as originally figured and the plate voltage will be a little above your original figures. This is normal and you are ready to bellow into the microphone. Your voice peaks and power output will be of the same magnitude as if you were using a large full size power supply.

All that remains is a few "Don'ts" which are peculiar to this type of supply. By looking at the diagram, you will see that unless the final bleed is working, the supply will reach full peak transformer voltage and stay there. Some means of discharging the condenser bay must be used before working around the final or supply. Do not under any condition try to short the condenser with wire, screw drivers, etc; this will

[*Continued on page 98*]

Designing QSL's At Home—part III

by F. D. WHITMORE, W2AAA
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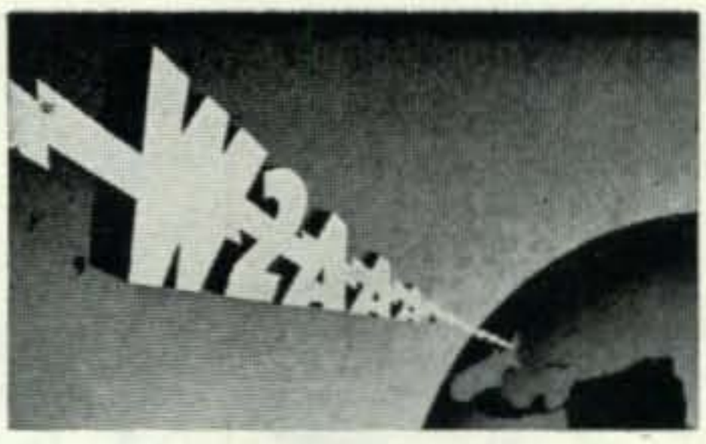
Halftones are in-between tones lying somewhere between the solid color and white. If black is the solid, any and all gray shades falling between solid black and white are halftones. In process color work (three and four color printing where one color falls over another) complimentary colors occur. The shades of these new colors vary with the amounts of basic inks reaching the paper.

Screening controls the amount of each color applied and enables halftone printing. Original artwork in black-and-white or color is photographed through a fine screen. The screen consists of two pieces of optical flat glass cemented together. Each piece contains black parallel lines. The two pieces of glass are cemented together so the lines crossed at right angles. Thus the intersecting lines form little square openings. For printing on smooth stock, a screen containing 120 or 133 vertical and horizontal lines per inch is used. A 120 line screen forms 14,400 little apertures per square inch. These apertures form the printing dots of the halftone.

Placed the correct distance before the photographic plate of the camera, the shadows cast by the crossing screen lines are not sharp; they are intentionally "out-of-focus." Because of the soft edges of the screen-line shadows, the tiny beams of light passing through the screen apertures have soft edges too. The brightest parts are their centers and the brightness diminishes as their edges merge with the screen shadows. Tiny discs of light therefore reach the photographic plate brightest in the centers, dimmer at the edges.

The light passing through the screen to the photographic plate is light reflected by the art-

Fig. 1 (a) Halftone (b) Portion of halftone enlarged to show dots.



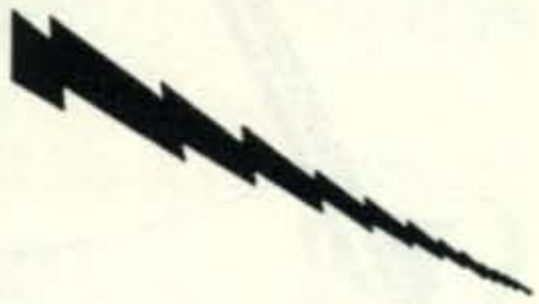


Fig. 3. (a) Blue-plate linecut (b) Black-plate halftone (c) Red-plate linecut

work, not direct light from the arc lights. If the copy has variation of tone, the light reflected from it will vary in intensity; these variations will be in accordance with the lightness or darkness of the copy tones. The less light, the smaller the dot on the negative; the greater the light, the larger the dot. The size of the dots controls the amount of ink reaching the paper, and produces the illusion of shading.

The variable halftone dots are illustrated by Figure 1. In (a) we see the gamut of tones from light to dark that form the dog picture. Seen under a powerful magnifying glass, however, these shades are not smooth tones; instead, they are dots of ink spread out to form the light areas and congested to produce the dark portions.

Examination of Figure 1a shows a small square drawn around one of the dog's eyes. This area magnified about ten times is Figure 1b. Here we see illustrated the printing technique of halftones by screening. The light-streak part of the dog's eye shows small scattered dots of ink. Dark areas of the eye show mass ink concentration; in fact, it is so concentrated as to cause the paper stock to oppear as small white dots. But note this: neither the light areas nor the dark areas of halftones are solid white or solid black; white paper stock shows in the black areas, and fine black dots are in the whites. The fineness of these dots cause the eye to see these areas as black and white.

Halftones introduce realism to artwork. Gradual fading of dark tones to light ones and vice versa creates third dimension or depth in the art and separates one plane from another. The eye automatically seeks highlights (light or bright areas) in a picture. From these highlights the eye moves via the deepening tones to the dark color. This treatment of artwork keeps foreground objects clear and distinct while distant ones dim and fade. Also, this same method makes spheres where formerly there were circles. See Figure 2.

Combination Halftone and Linecut Plates

If tone values are near enough alike, a printing plate may contain both linecut and halftone portions. However, only experience can guide this choice, so you should create separate art for your halftones and linecuts. Figure 12a shows a combined plate having both halftone and linecut portions. This is possible because the color ink for each will be the same; and also because the tone values of both are very close.

The easiest halftones to produce are photographs. A camera automatically records variations of light from the object so it appears life-like on the positive print. This is true

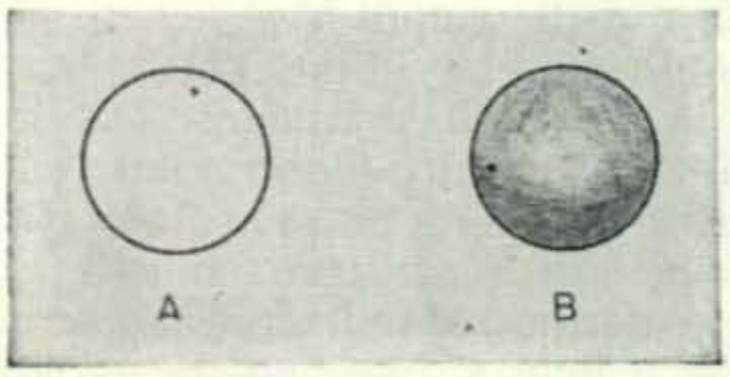


Fig. 2. (a) A circle
(b) With shading, the circle becomes a sphere.

Fig. 4. Artist's airbrush

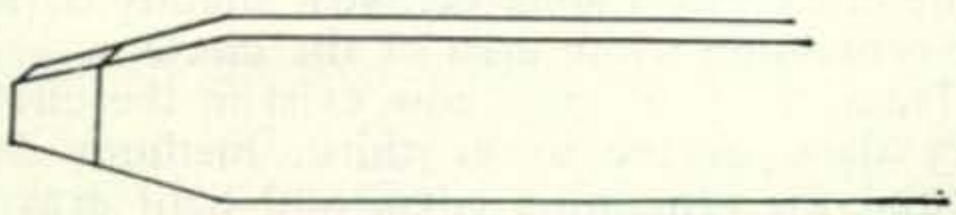


Fig. 5. Artist's pencil

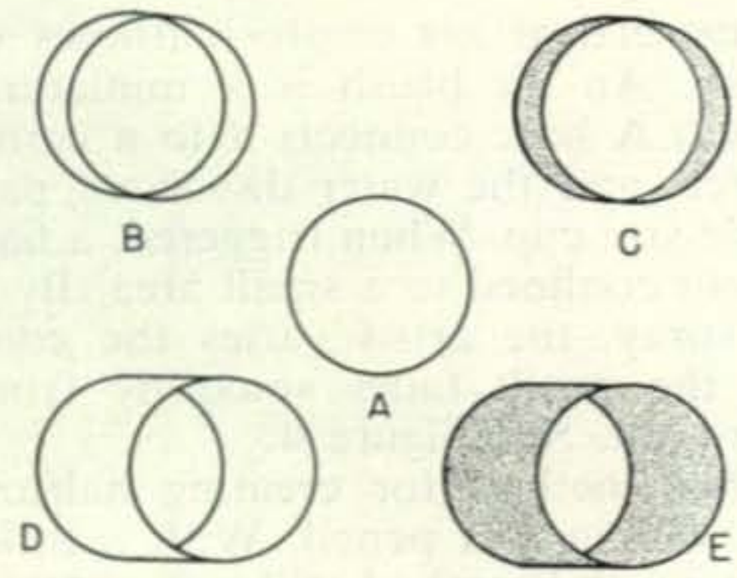


Fig. 6. (a) Circle
(b) Double circle
(c) Obtaining depth through shading.
(d) Spread circles to make cylinders.
(e) Shading emphasizes planes of cylinder.

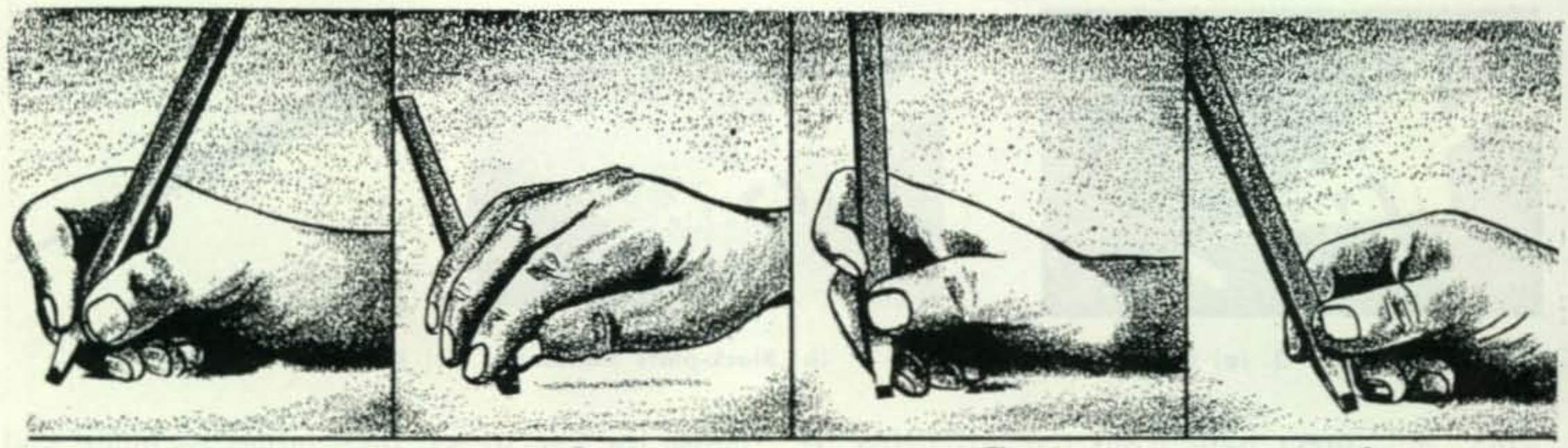


Fig. 7. (a) Normal manner of gripping pencil.

whether you "shoot" in black-and-white or color.

Producing printed QSL's from the original black-and-white print limits one to a single color: Black ink will create black-and-white cards with all the in-between tones in shades of gray; if a colored ink is used, the cards will vary from that solid color through various tints of that color to the cardstock white.

On the other hand, using a color print forces the printing into process color work. The photo-engraver has to photograph your color print three times using yellow, red and blue filters on the camera. Separate plates are made from these separate negatives. One plate prints the yellow ink; the second, the red ink; and the third, the blue ink. Sometimes a fourth plate is made for black to give extra richness to the printing.

If a photograph is your design or a part of the design, be sure it is a sharp image (in focus and not an enlargement made from a very small negative). Sharp 5" x 7" or 8" x 10" photographs are best.

Better control of printing occurs by using separate linecut plates in conjunction with the halftone plate. Brilliant deep colors reproduce from the linecut plates forming sparkling comparisons with the halftone areas which are softer.

Creating Halftone Artwork

Commercial artists create halftones with an air brush. An air brush is a miniature paint spray-gun. A hose connects it to a compressed air source, and the water dissolvent paint fills a thimble-size cup. When triggered, a fine spray shoots out confined to a small area. By control of the spray, the artist varies the concentration so the result fades smoothly from dark areas to light. See Figure 4.

Another method for creating halftone artwork is with a soft pencil. With a little practice, this second method will suffice to produce satisfactory halftone art for QSL designs. It requires only a very soft pencil and careful maneuvering. If you have access to an art supply store, obtain a soft lead pencil with flat lead. See Figure 5. In lieu of this, use either a Venus 6B or a No. 1 round lead pencil obtainable in stationery stores.

Figure 6 is a circle. It is a two-plane object: it has only height and width. Now let's move the compass focal point slightly to the left on the same lateral plane, and draw another circle. Our circle now appears to be a circle slightly overlapping another circle. See Figure 6b. If we heavily shade the space between the two circles at the left, and lightly shade the space between the two circles at the right we have added a third-dimension—depth. See Figure 6c. The two circles now appear as one broad-band circle. Moving the focal point further to the left before drawing the second circle results in a cylinder. See Figure 6d. Shading the outside and inside with different tones emphasizes the cylinder. See Figure 6e.

This procedure is fine if all we want is a circle or variations of a circle. But what has to be done to make a ball out of the circle; we might need the sphere effect to represent the world or a portion of it?

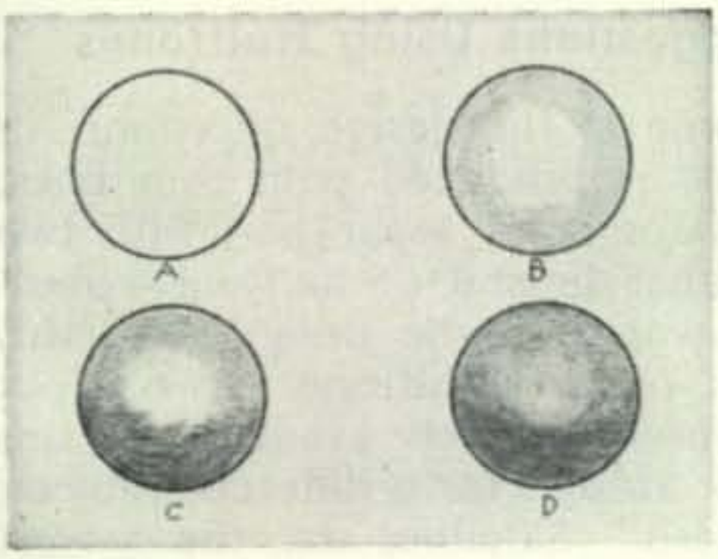
This time let's draw two separate circles proceeding from left to right. Let the first one stand as an example of a circle. With either the broad point artist's pencil or the No. 1 round-lead pencil start shading. Figure 7a, b, c and d show how to hold the pencil to obtain special effects.

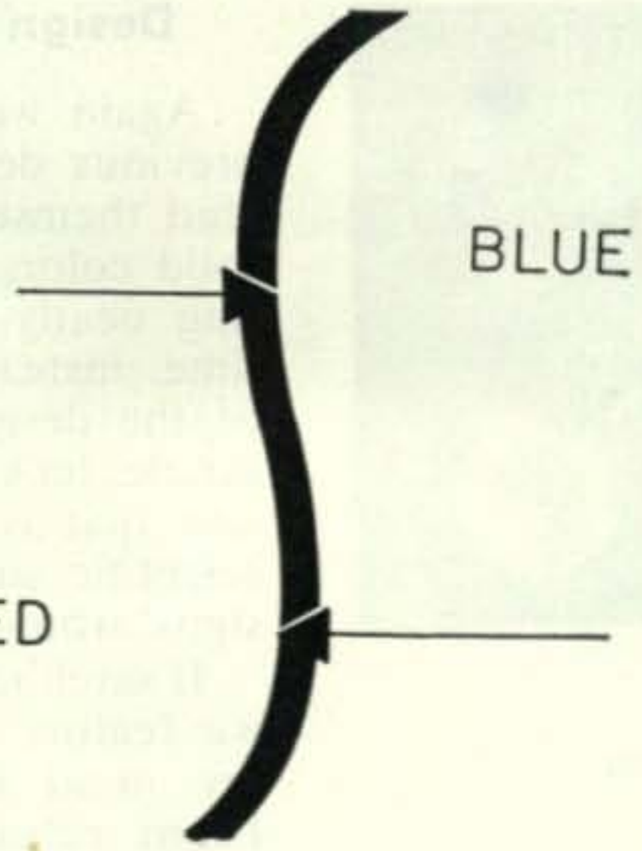
If you use the round-lead pencil, sharpen it to a smooth tapering point. This is best accomplished in a pencil sharpener; but it can be done with a pen-knife if the point is smoothed afterward by rubbing on the sole of your shoe.

With the soft pencil, start shading the outer third area of the second circle adjacent to the edge. Use a light stroke and the broad side of the pencil lead. See Figure 7b. Apply a medium shade to this area being shaded making the consistency as even as possible all around. See Figure 8b.

Next, in the lower third of the shaded area you've just finished, go over it once more bearing down somewhate on the pencil to make it quite black. See Figure 8c. Now slightly darken the remaining white area of the circle.

Three tones of gray now exist in the circle: very dark in the lower third, medium dark around the remaining edge, and light gray in the center. Now work over the areas where the various tones meet, darkening the abuting





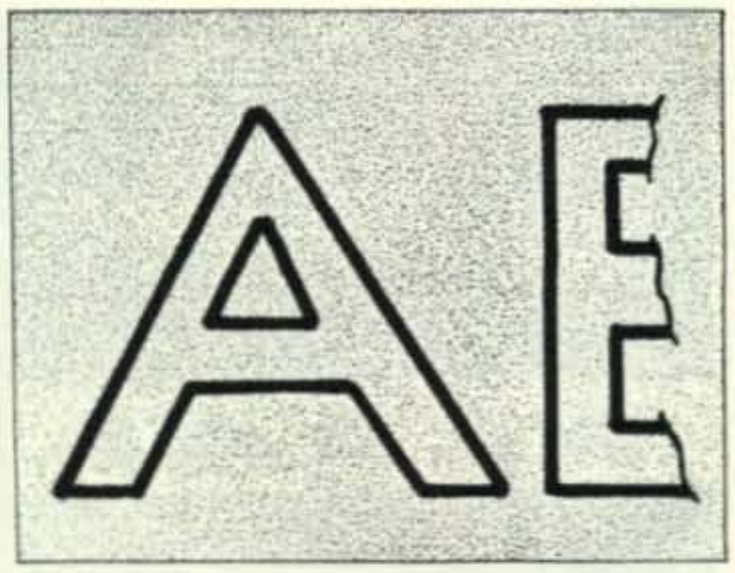


Fig. 8. (a) Circle
(b) Beginning to shade for sphere.
(c) Advanced shading for sphere.
(d) Sphere complete.

Fig. 9. When color separating, work to far side of the line.

Fig. 10. Wide color overlap is suitable for poster work.

edges until one merges into the other. This completes the sphere. See Figure 8d.

The same technique of shading from outside to inside works for all other shapes that you wish to reproduce in halftone. Figure 3 illustrates both the shaded circle to form a sphere, and the general shading around the rectangle of the card. The latter is evident aroud the top edge where it fades toward the center.

This QSL was printed from three plates on white Kromekote stock. The lightning flash is red produced from a linecut plate. From a second linecut plate, a medium blue was applied all over except for the call-letter area. A halftone plate then applied black over blue to produce the general variations in the blue area, and to obtain the deep midnight blue portions.

Color Separation Hints

Introducing halftones into artwork is a high-class refinement. Your artwork, therefore should warrant this advancement by its neatness and careful planning. Part II of this article created artwork in which two solid colors did *not* abut. The second color was either outlined, screened or separated from the second by the white card-stock. Now, however, we are interested in the finest printing work; so our solid colors should meet.

When artwork is color separated, each color goes to the far side of the separating line. Figure 9 illustrates this point. As is clearly shown, the wider the separating line, the further each color must extend to reach the far side. Reaching across to the far side of the line means the color will lap. The wider the lines the greater the lap.

In poster work, a wide lap doesn't matter. It doesn't matter because you view the poster from a distance and do not see the overlap. Therefore, if you examine closely the next two-color poster you see, you will notice the *third* color caused by the wide overlap. You will also find that, when viewed at the proper distance, this overlap is not noticeable. See Figure 10.

Printed work for viewing at normal reading distance must have so small a lap that it isn't evident unless you are looking for it. This situation applies to QSL cards. We achieve it by using thin lines in the artwork. Even though thin lines are adhered to in artwork, sometimes printers have severe trouble because of the colors selected. A yellow color abutting a medium blue forms a noticeable third color where they overlap. In this case green is formed; and, with such light colors, it stands out harshly. Such colors require skillful separation to obtain the tiniest of overlaps.

When color separating artwork drawn with thin lines, use extreme care. Go to the far side of the thin lines but no further. Your drawing hand can frequently be steadied by applying a slight pressure against the thumb of the hand holding the pen, with the other hand. See Figure 11.

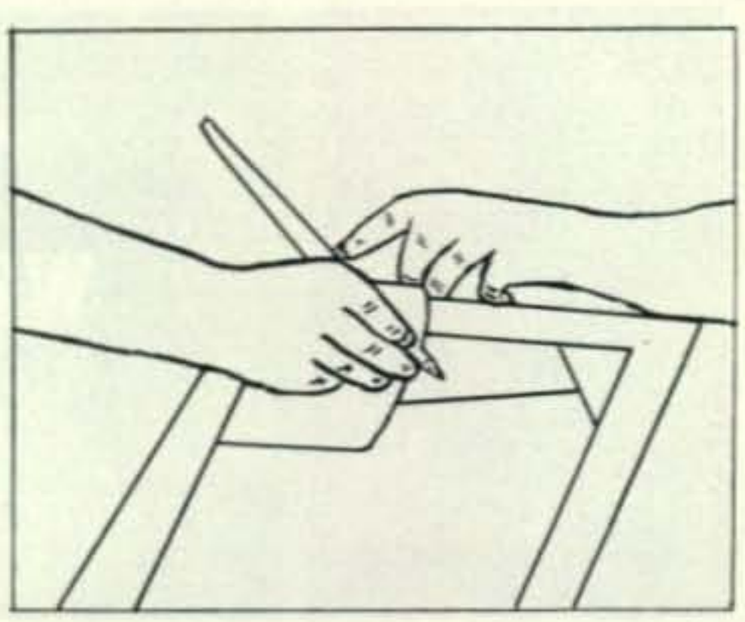
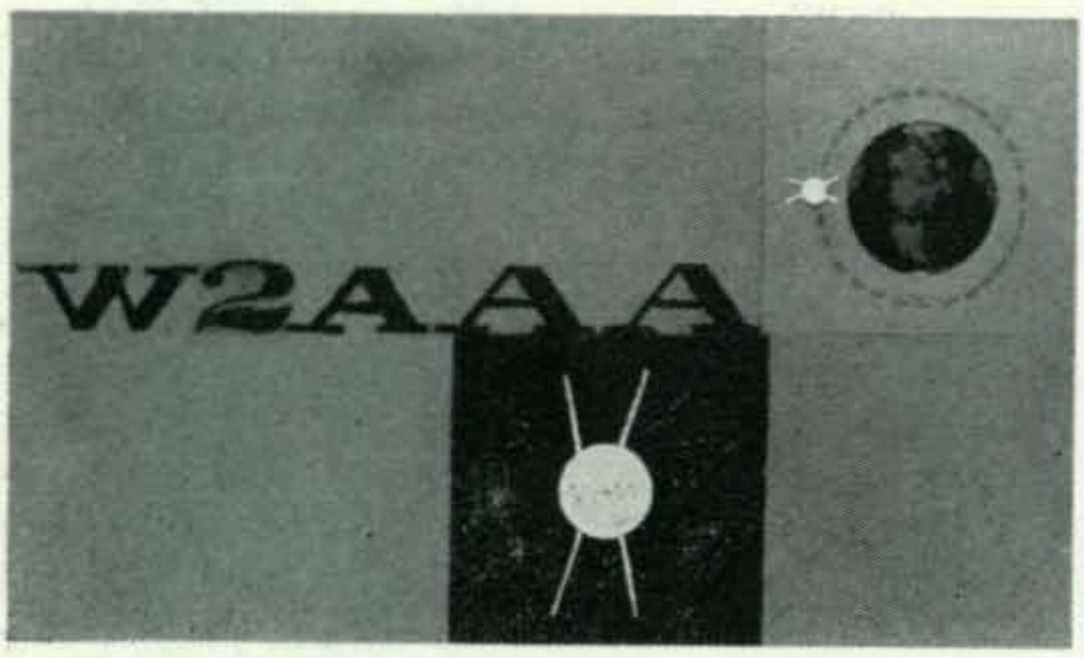


Fig. 11. Steadying the hand when making color separations.

Fig. 12 (a) Satellite launching.



(b)
(c) Satellite as symbols.

(d) Satellite "you-are-there" theme.

Design Suggestions Using Halftones

Again we come to the design question. All previous designs, if produced with thin lines, lend themselves for color separation with two solid colors—either linecut or halftone—abutting neatly anywhere in the design. But this time, instead of making halftone artwork out of the designs used in Parts I and II of this article, let's look around for a different subject; one that is "fresh." Satellites are the newest scientific subject; suppose we create some designs around these.

If satellites, then, are our subject; how should we feature this theme? Several ideas come to my mind immediately. First—the launching. From releases appearing in newspapers and magazines, the launching of the satellite occurs in several stages. Amid flame and smoke from burning gasses, the satellite starts its piercing trek of the earth's atmosphere. Next a booster charge spurts the satellite through the second stage. Still a third "shot" must erupt to sever earth's gravity attachment and put this man-made laboratory in unattached space.

A design predominating the spectacular launching has potential for a powerful design theme. My own feeling, however, is that launching designs would hold interest only until the satellite was launched; after that, the design would be dead. Figure 12a is an artist's comprehensive drawing for a launching design.

Second—Satellite in Space and Viewed from Earth. This is not a hard design to visualize. It can appear at top portion of QSL surrounded in the heavens by stars and planets. A portion of earth could show at bottom of card to complete the perspective. A black or blue-black sky should set off these heavenly bodies.

This design has good possibilities. My big objection to it however is the tiny size the satellite must be to blend properly with planets and stars. It seems to me our highlight—the satellite—gets lost among its bigger brothers. However, such a design would stay alive.

Third—Satellite Symbols. Using this theme, the card design is sectionalized with the satellite trend indicated in one portion. The other portions can be anything you like from patterns to solid portions.

Be careful with this theme so the card doesn't become cluttered. This is a solid conservative design that would show to advantage in black and chartreuse. Figure 12b and 12c are comprehensive drawings based on this theme.

Fourth—You-Are-There Theme. I believe a satellite theme should *feature* the satellite. The satellite should predominate the card and be recognizable. It should convey action. Can all this be done and not clutter the card? Absolutely!

Make the satellite big so it occupies a large area of the card. Keep stars and planets small and in the distance. Now you get the feeling

Fig. 13. Artwork for design in Figure 11d: (a) The black plate (b) The Red plate (c) The blue plate

of being in space too, and observing the surrounding galaxy from the vicinity of the satellite. Put enough detail in the satellite for easy recognition. Some lightning flashes from the antenna gives meaning and action to the satellite. Figure 12d shows this design. It was done in black and red with some blue for the earth.

Except for the satellite, example four illustrated by Figure 12d is printed from linecut plates. Detail in the satellite occurs from halftone treatment of the black color to obtain various gray tones.

Separation artwork for this design appears in Figure 13a, b and c. Artwork for the black plate including the halftone portion appears in (a). The second color artwork is in (b) and covers the red plate requirement. Artwork in (c) is for the blue plate.

Preparation of Artwork

To prepare this artwork, first make a drawing outlining all the objects in fine pencil lines. Draw call letters by outlining with thin lines leaving white area within the lines. Now, with the soft-lead pencil, shade the satellite sphere.

Next attach two pieces of clear acetate to the drawing. Attach the acetate so one piece is hinged at the top of the drawing and the other piece at the bottom. This way of mounting allows either piece of acetate to cover the drawing for separation work; and also, permits both pieces to lay over the drawing at the same time to check the overall separation or the relation of one overlay with the other.

Don't forget to put crop marks on the original drawing and on each piece of acetate. Without these, it is impossible to get absolute registry.

Now with India ink or black artist paint, fill in the background. When finished, this art piece for the black printing plate will have white call letters, a white area for lightning flash and a solid white circle for the world. This completes the black plate.

For the red plate, flip one piece of acetate over the drawing. On this, with India ink and a pen, outline the lightning flash. Make it slightly larger than the area allowed for it on the black plate artwork. This treatment allows a small overlap around the flash to insure the red meeting the black when printed.

Now we are ready for the blue plate. Raise the red plate acetate from the drawing letting it lie back out of the way. Swing the second piece of acetate in place. On this piece we need to draw a sphere containing detail of the world.

Draw in some continents and some longitude and latitude lines. With the soft pencil, shade the land masses and the water areas about them. Use heavier shading for the land than for the water. Fade the shading so the outside perimeters are the darkest. When finished, shades of light gray will cover water parts, dark gray will fill land areas and black lines will portray longitude and latitude. When printed, all of this will be blue.

Like the red-plate artwork, some lapping is needed of the blue-plate art over the black artwork. In this case it is the blue that abuts the black. Use extreme care when drawing the blue artwork on the overlay to keep the overlap small. The artwork, however, must cover all of the white circle left in the black-plate artwork.

Conclusion

This article had only one aim: to acquaint the amateur fraternity with the art and printing techniques behind those really unusual QSL cards. In so doing, enough commercial art was included to enable those so desiring to make their own designs; or, from their better understanding of the techniques, to transmit more clearly to artists features of the design they want.

Concerning designs, remember this: if you can think of it, it can be produced; if you want unusual and "snappy" designs, they'll be printed from plates created from one or more pieces of artwork; if you want realism, try halftones. ■

This model has a built-in 15 meter jammer to take care of any hams in your neighborhood.

by Rolf Schick, DL3AO
Essinger-Neckar
Plochinger str 43
Germany

The Command Twins

An all-band SSB receiver for less than 25¢ and a little ham's work

With the rapid interest of sun-spot activity during the last two years, conditions on the DX bands become more outstanding again. The QRM curve, however, follows close behind.

During the years of 1953 and 1954, I used a small converter in front of a BC-454 and the results were very satisfying. The sensitivity was good which came to me as a happy surprise. The lack of selectivity (about 10 kc with 3 db down) didn't disturb me in the least in the then quiet bands.

It first came to my mind that all the receivers I used so far, like BC-348, BC-342, BC-455, etc., were nearly useless nowadays when some locals and I worked from Luxembourg in August 1956. Using a BC-342 in Luxembourg we could make 2000 QSO's in one week of operation, but in the pile-up of some 50 stations calling us at the same time we often could only fish out the odd ones. A Q-multiplier might have helped a lot but we feared losing the compactness of the station by adding some outboard equipment.

It was through the CQ DX contest of the same year that I realized that we could have done better. I was one of the multi-operators at DY3YZ who has a 75A4. If you have ever heard of the QRM from commercial stations on 35 and 7 mcs here in Europe, you may know what it means to be able to work 25 W/K stations per hour on these bands.

While Knob, DL1CR, gave numbers out to so many W and K's, I monitored the frequency on a BC-348 that I had in my shack. The only thing I could hear on this frequency was a S 9 + 20 db teletype station. Working with my own station back home did not give me any more satisfaction than before. One might even hear this sort of comment at a club meeting: "Heh, you must have plenty of XW8's since you don't come back when someone calls you!"

Something really had to be changed!

I figured that a new receiver must have the following features:

1. Sensitivity must be good, but not too good. In most man-made equipment there is the usual amount of noise and static, however, an ultra-high sensitivity eliminates a great deal of this. Stability, selectivity and a good dial do more to give a "solid QSO".

2. Selectivity should be no worse compared to the Collins 75A4. Both SSB and DSB reception is a must.

3. Stability must be as such so that an accurate dial reading (± 2 kc up to 28 mc's) is possible and that SSB and DSB contacts can be kept without having to finger the dial knob constantly.

4. The receiver should not cost more than $25.

After having compiled all this information I then had to decide just how I was going to put all this into one compact unit, especially considering the fact that it should not cost more than $25. It was some weeks later that I found the answer. How did I do it? I shall now let you in on my secret.

The receiver I had consisted of a BC-455 and a BC-453, of which both are very easy to get at low prices. The BC-455 takes care of all-band coverage, good sensitivity and eliminates nearly all images, but using this alone does not give good results because of low selectivity and miserable band-spread. This is where the BC-

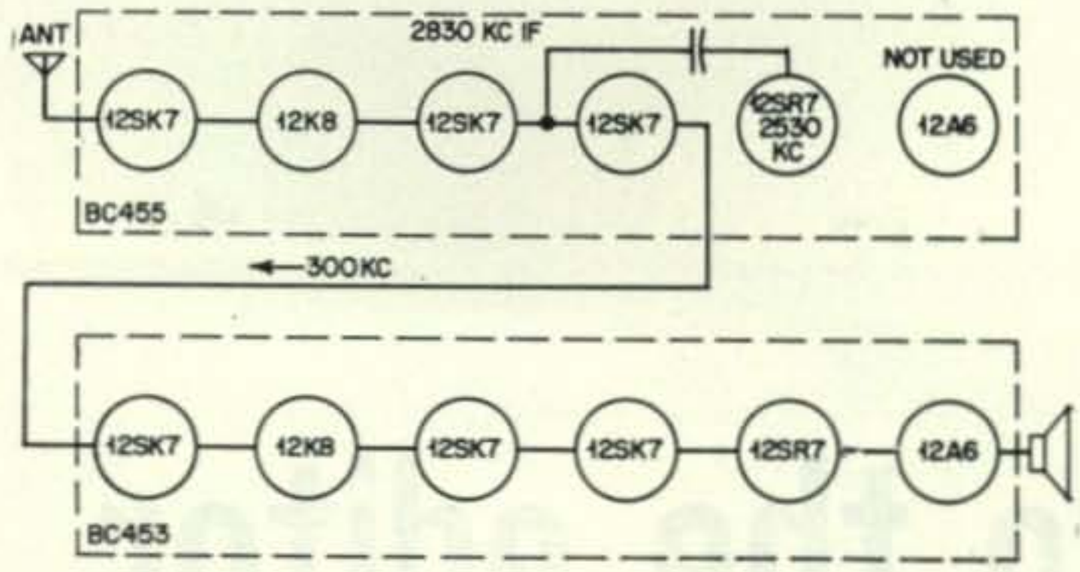


Fig. 1

	ANT COIL		MIXER COIL		OSC COIL	
	NO. OF TURNS	LENGTH	NO. OF TURNS	LENGTH	NO. OF TURNS	LENGTH
14 MC	11	.35"	11	.35"	7½	.24"
21 MC	5½	.24"	5	.22"	6	.24"
28 MC	3	.16"	5	.5"	2½	.16"
NOTE-REMOVE IRON CORE IN OSC. AND MIXER COILS !						

Fig. 2

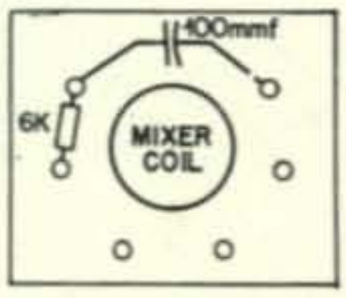


Fig. 3

453 comes in. The three 85 kc filter gives you that 60 db's at 4 kc's which you have often dreamed of using on an old receiver. Don't worry about the three mixers involved . . . it works ok. Since much has been written on the excellent qualities of the BC-453 I need not say how well this DX works as it can be used without any modification.

You probably know that the frequency coverage of the 453 is 190-550 kc, therefore it does not work directly in the IF of the 455 (which is 2830 kc). These 2830 kc's can be mixed down very easily: The CW oscillator of the BC-455 is (in our combination) not necessary. That work takes the BFO of the 453.

Now you simply insert a small (100 mfd) variable condenser between the plate of the 12SRF. Ground and tune it so that the (former) BFO oscillates not the usual 1 kc up or down the IF but 300 kc down the IF of the 455. With the help of a grid-dipper this might be done in a few minutes. If you haven't one of these, just listen in on your old station receiver (or in a BC receiver) on 2830 kc with the inserted trimmer all out. Slightly turn in the condenser until you hear the tone about 300 kc down to the IF, namely on 2530 kc. This new result in IF of 300 kc can be given directly to the antenna input of the 453.

Now you remove the third IF filter of the 455 (loosen 2 screws and pull out like a tube) and solder a 30K resistor between the pins of the plate circuit coil. Connect the plate end of this 30K and the antenna input of the 453 with a screened wire. Fig. 1 shows the block diagram.

Now we come to the bands. The BC-455 is designed for 6-9.1 mc coverage that gives you only 40 meters reception. However, the coil boxes of the receiver can be plugged in and out in seconds and it is possible to wind a coil box for every band you desire. (It's quite similar to the well-known HRO boxes.) A rainy afternoon could be put to good use to wind and adjust new coil boxes for 20/15/10. If you use the coil windings given in Fig. 2, you'll get good results immediately and then just a little bit of adjusting is necessary for top performance.

In the RF mixer coil you'll find a honey comb winding. Unwind it completely and solder in a RC chain as in Fig. 3.

Your tuning is done on the 453. The IF amplifier of the 455 is so broad that one can dial over 100 kc's on the 453 to find any reworkable decrease in signal strength. I found a 100 kc xtal oscillator very useful which gives me "marks" on the 455 dial. For instance, if I want to be on 21243 I get the dial of the 455 to 21200 (zero beat to the 100 kc xtal) and then dial 43 kc's up with the dial of the 453. This gives a frequency accuracy which is better than ± 2 kc's.

All in all these two receivers do a very remarkable job. I have been using this combination now for almost a year and could QSO over 100 countries in phone. Some locals have rebuilt it with great success, and, too, it's not a one-man affair. Hi.

There are no doubt better receivers in the world, but if you know of a better way to get better reception from a receiver for less money, well, I for one would like to be the first to hear about it. ■

letter to the editor...

by TIMA POPOVIC, YU1RS

Dear Wayne:

When I started writing for CQ magazine, my sole objective was to give pleasure and information to the guys who recently joined our ham fraternity, the Novices. I used to be a lonely guy back in my early days of hamming, who didn't know of anyone who could assist or help me and it was a long period of time before I found that I was getting anywhere with my ham operations, depending solely upon my own ability. When I think about it today, I can remember the strange feeling that came over me when I realized how little and yet how much I was accomplishing from day to day, at such a slow pace.

I thought of the number of Novices that might become discouraged due to the lack of information and understanding needed for their hobby, so I tried to help them as much as I could through my communications with them. Much to my surprise it turned out to be something bigger than I had ever expected. I was flooded with mail for reports from the Novices as well as from the "old timers" who wanted to know if they, too, could receive reports on their signals. The letters came from all over the world, the U.S.A., Canada, Philippines, New Zealand, etc.

The more I thought about SWLing the more letters poured in, completely swamping me and quite suddenly I realized there were more SWLs than commonly known. I also learned that the SWLs were unorganized, that is to say, they were uncertain about giving the right information to hams wanting SWL reports and many times were unrewarded for their efforts. There were only a small number exchanging SWL cards, however there were a larger number, particularly in U.S.A. and Canada who were highly interested in getting SWL reports.

Being a long time SWL'r myself and having had a great deal of experience on the matter, I am convinced there is some way to help the situation . . . an SWL Column. The column would be open to everyone interested in the hobby for exchanging ideas, suggestions, information and devoted entirely to SWL situations and problems. Calls, names and addresses of hams wanting SWL reports on their signals would be printed. Similarly every SWL who would like to exchange SWL cards with other SWLs or knows of somebody else who would be interested would have only to drop a line to me to be listed. SWLs would also be invited to let us know the calls, names and addresses of hams operating from rare DX areas who answer their SWL reports. Good sharp photos would be appreciated as well. Both hams and SWLs might even state their philatelistic preference if any.

It even might be possible that later on, if and when we gather the correct calls, names and addresses, a special SWL Call Book might be printed. This, of course, will depend upon the reaction of the column.

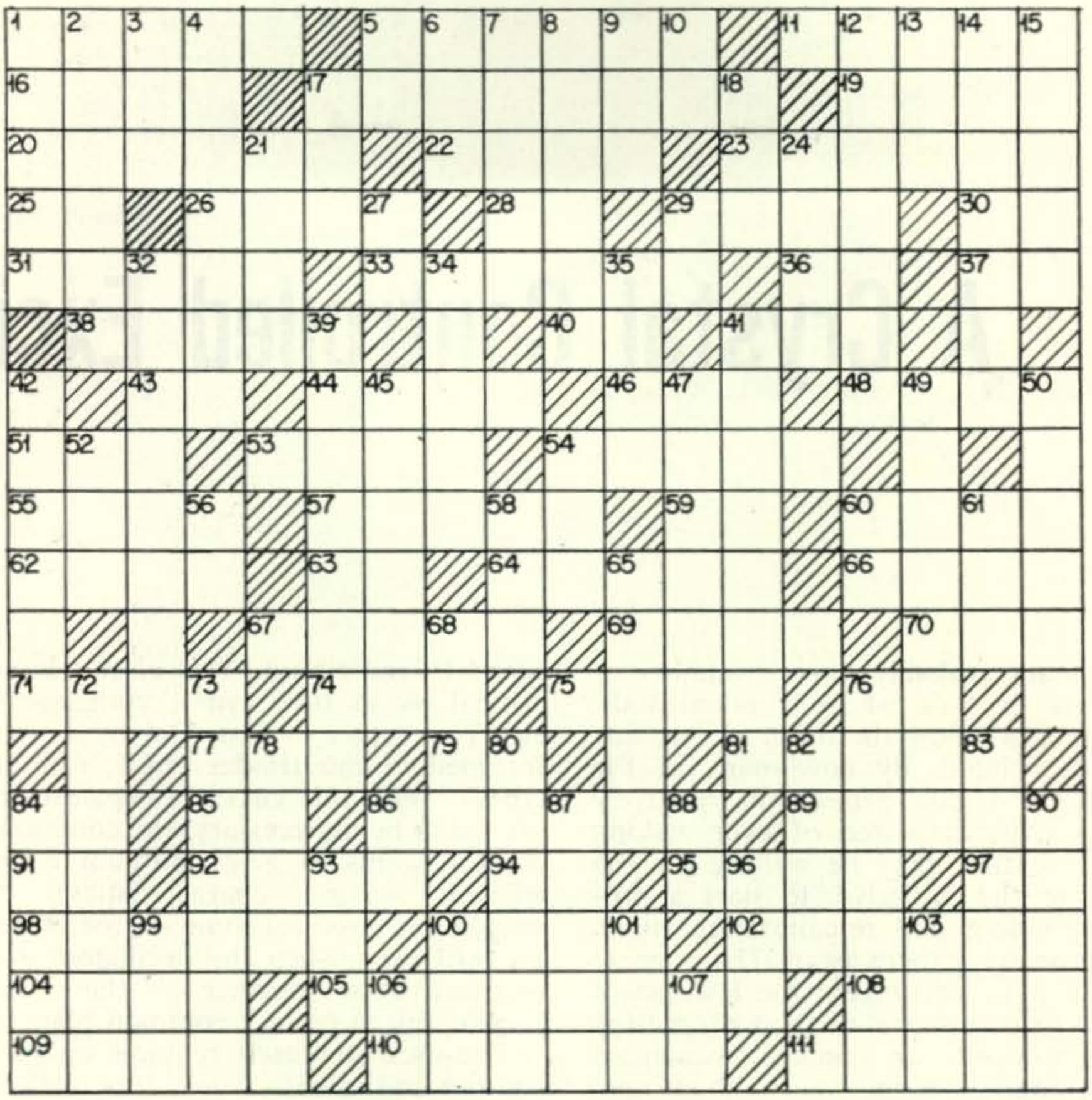
The results, I'm sure, would be most favorable for this new column. The "old timers" will not be bothered by SWLs, the hams who would appreciate SWL reports on their signals will get them, the SWLs will be able to get 100% reports.

Considering all that I have mentioned above I feel confident that all the necessary elements are at hand to open a column for the SWLs, which I believe is almost as important, if not as important as the standard columns (DX, Novice, VHF, RTTY, etc.) already established in CQ. I might add that if this proves to be successful (and I have the greatest hopes that it will be successful) that we might even organize a world wide SWL section affiiliated to IARU.

Tima

Editor's Note: It is rather regularly being proposed that CQ run an SWL Column. So far I have been turning thumbs down on this idea since I have felt that this is a magazine for radio amateurs and should stay that way, without going off too far into philately, photography, and other hobbies. SWL'sing used to be a healthy outlet (in this country) for the fellows who were working towards their ham ticket . . . I used to go in for it myself some

[Continued on page 100]



HORIZONTAL

1. Directional antenna
5. Transfer RF
11. Recorded tape
16. Constructor's necessity
17. Hams
19. Standing Wave minimum
20. Field day
22. That sweepstake in CW
23. Transmitter's product
25. UHF antenna site (abbr)
26. Leaves
28. Ethiopia
29. Poker stake
30. Chile
31. A net
33. Type of modulation
36. Printer's type
37. End of message
38. Successful people
40. Right (abbr)
41. One of the military services
43. Tenth district state
44. Filter type
46. Single earphone
48. Imitates
51. Food for a KH6
53. Donate
54. A possible SU
55. Tear down
57. Abater
59. Antenna's output.
60. Call district
62. Crystal maker's QTH
63. Chinese coin
64. Standing Wave figure
66. Let stand
67. Loafs along
69. The DX under the pileup
70. Oriental prince
71. Prepares for antenna masts
74. Time zone
75. Serene
76. Austria
77. Know-it-all ham
79. Continent from VE to XE
81. Over charge for ticket
84. By
85. Popular handle
86. Connected tuning capacitors
89. Moldings
91. Junior's OM
92. Dash
94. Preposition
95. Transmission line wire
97. Pronoun
98. Charted resonance
100. Negative grid voltage
102. Dream of new layout
104. Lebanon spelled out
105. Cathode to plate traveler
108. DXpedition
109. Tight
110. Novice's homework
111. Operators

VERTICAL

1. Electrons
2. Passed traffic
3. Wooden mast hazard
4. Peaked a receiver
5. Cuba
6. Fit for a horse
7. Say
8. Annoy
9. Argentines
10. Suffix
12. Sky hook
13. XYL's dad
14. Teach
15. Put off
17. Era
18. Jr. Op.
21. Constant disagreer
24. Not the Tennessee Valley kind
27. Ham contest
29. Article
32. Reason skip changes
34. Enclosures
35. Print a circuit
39. TVI'd
41. GI Radio Ops clothes
42. Done to feeders
45. Users
47. Antenna
49. Operate away from home QTH
50. QRN
52. Row
54. Society of Radio Amateurs (abbr)
56. Electrical Engineer
58. Vetch
60. Like
61. Electrical fish
65. Turn in gear for new
68. Oven
72. Go where not wanted
73. Impedence matchers
76. Metals that attract
78. Not working
80. Capers
82. College YL
83. Tin and copper
84. Race course in G-land
86. Good night ala CW
87. Animals
88. Accomplish
90. Looks for
93. Soft drink
96. Part of tube base
99. Renfrew's nickname
100. Honey of a wax maker
101. "My Fair Lady" sign
103. Am
106. 50-50 in Nero's time
107. Rig when pilot is lit

[Answer on page 108]

A Crystal Controlled Exciter

Most amateurs probably have a number of surplus quartz crystals whose fundamentals, and all harmonics below the ninth are outside of any amateur band. By now many of the owners of these highly prized but relatively useless rocks have despaired of ever making use of them, or they may be waiting for the opportunity, or the initiative, to start a program of re-grinding and re-calibrating them, or just plain throwing them away. The purpose of this article is to circumvent the last-named alternative:—to describe a method of putting these crystals to work—on amateur frequencies —without re-grinding them—and without necessarily using harmonics. It is written for the man whose budget does not provide for a separate, ground-to-order crystal for every frequency on which he intends to work, who does not wish to be rock-bound to a single frequency, but who still wants crystal control.

The circuit operation depends upon the well-known heterodyne principle. In most heterodyne applications with which the reader is familiar, one or both of the input frequencies are variable, producing a variable output. In this circuit both input frequencies are fixed, hence the output frequency is fixed.

In most random assortments of surplus crystals, if all possible pairs of crystals are compared, a number of pairs will be found whose sum or difference of frequencies will fall in one of the amateur bands. Such a pair, or a number of such pairs, will be needed for this circuit. To apply the method it is necessary to set up two crystal oscillators and to provide means of mixing the two frequencies so as to obtain either their sum or their difference, whichever gives the desired frequency. The resultant heterodyne may then be amplified to the level required to excite the transmitter amplifier.

There are numerous possible circuit arrangements which will accomplish this result. The circuit of fig 1 is the one in use at W6QJJ. As shown on the diagram, V1 and V2 are triodes connected as oscillators using the familiar untuned Pierce circuit. This circuit is very non-critical as to tube types, component values, etc. The values indicated in fig 1 are suitable for medium-mu triodes (6C5, 6J5 or similar types). With this circuit a separate mixer has proved to be unnecessary; the common cathode resistor seems to give optimum coupling for efficient mixing characteristics. (Sufficient coupling to produce some degree of heterodyning will exist when the oscillators are merely mounted close together on the same chassis and energized from a common plate supply.)

The oscillator itself requires only two tubes (or the equivalent, a twin tube), two crystals (whose sum of difference of frequency gives the desired frequency), five resistors, two capacitors, plus chassis, sockets and hardware. Sw1 kills the oscillator during reception, in case amplifier keying is used. Since other tube types may give best performance with resistance and voltage values other than those given, it is suggested that a sensitive voltmeter (10k or 20k per volt) and a crystal probe be used to check the output while resistance and voltage values are varied to secure optimum operation.

Fig 2 is a suggested first amplifier stage which, incidentally, should be included on the oscillator chassis. The output signal, obtained across the common cathode resistor, Rk, contains not only the desired heterodyne, but also the undesired one, the fundamentals of both crystals, and considerable harmonic content. The combined amplitude may be sufficient to overload the amplifier input, if a sharp cut-off type tube is employed. Hence, the amplifier input should be tuned. If the tuning capacitor C3 can be insulated from the chassis, the DPDT switch Sw2 connected as shown, will permit the use of a high-pass filter when using a sum heterodyne (to block the crystal fundamentals), or a low-pass filter for use when the different heterodynes are employed.

Although tuning the plate circuits of the oscillators would result in considerably higher output, the untuned circuit was used for the

# of Novel Design

by THOMAS D. HERRIMAN, W6QJJ
123 West Acacia St., Stockton, Calif.

Fig. 1

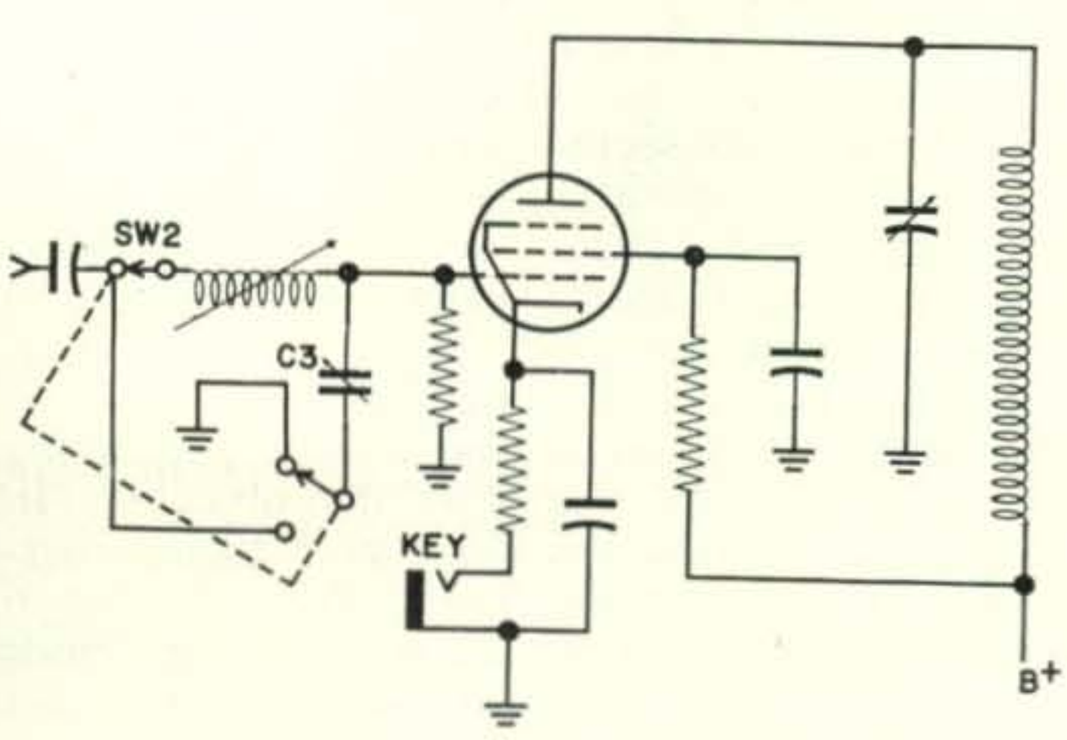
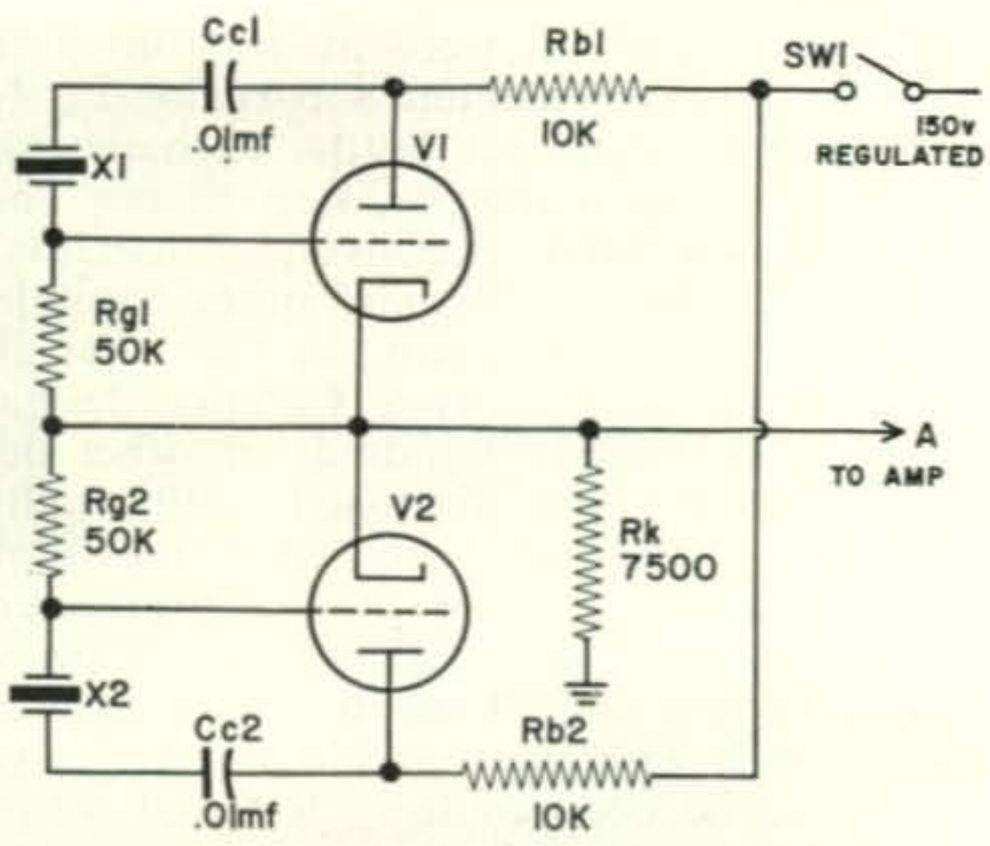


Fig. 2



following reason. Crystal pairs having widely difference combinations of frequencies will often be used to produce heterodynes within the same band. For example 8275 kc minus 4735 kc gives 3540 kc; 11,835 kc minus 8275 kc gives 3560 kc. Tuning the plate circuits would necessitate changing or switching coils, not only whenever changing bands, but also, often when merely changing frequency within the same band. A further advantage of the untuned circuit is its extremely high degree of stability, the absence of abrupt, erratic amplitude changes which occur when a conventional oscillator is tuned in the vicinity of exact resonance. The low amplitude of oscillation minimizes crystal heating; with regulated plate supply and amplifier keying, changes in either frequency or amplitude are reduced almost to the vanishing point.

Prior to an initial trial it was expected there might be trouble from spurious radiation. After all, four frequencies are being generated (exclusive of harmonics) of which only one is the desired signal, and all the undesired signals could be detected with the station receiver. Tests revealed, however, that if the crystal frequencies are chosen as far as possible from the desired heterodyne, the suppression afforded by the amplifier tuning is sufficient. One test, using 3105 kc plus 4035 kc to transmit 7140 kc., showed no fundamental radiation detectible at a distance of one-and-one-half miles, using *only one* tuned amplifier. A second test, using 3105 kc plus 4080 kc to transmit at 7185 kc (using three tuned stages) showed no spurious radiation between 3 mc and 14.4 mc, except a weak second harmonic of 7185 kc, at a distance of only 200 yards.

In regard to the accuracy of the heterodyne as compared with that of a single crystal of the same nominal frequency and tolerance rating, extra precaution is necessary only when the heterodyne falls within a few kilocycles of the

[*Continued on page 118*]

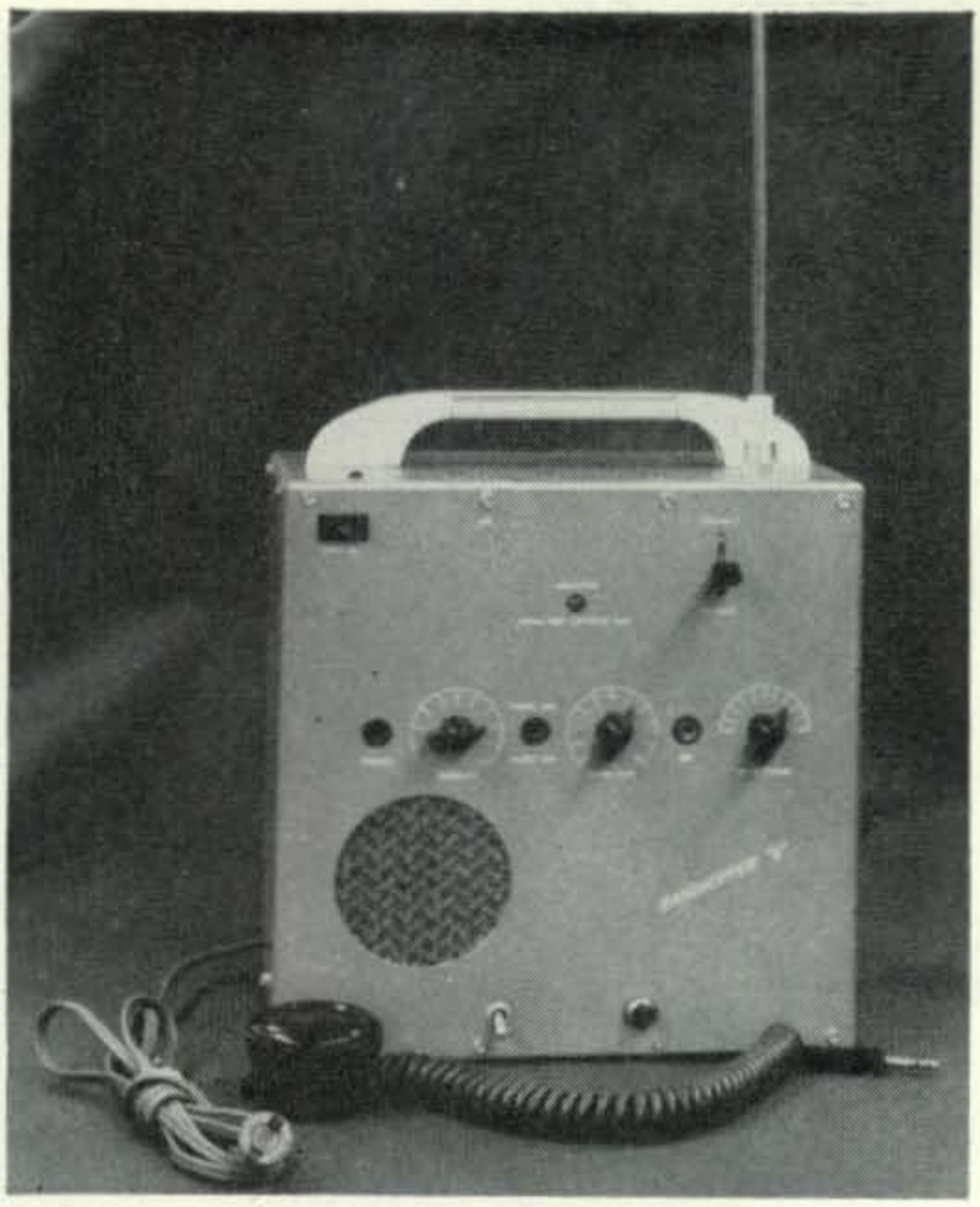
Bandhopper "6"

by HAROLD L. MARTIN, WØEXN
537 Hentchel Place, Ferguson 21, Mo.

The Band Hoppers Radio Club of St. Louis County, Missouri is a "small-town" club near a big city. Organized in February 1951 by five amateurs (licensed hams), it has a limited membership of ten. The "first five" drew up the charter, which in itself is unique and extremely democratic. All members are required to hold office on a six months' rotating schedule. Meeting places are designated in a similar manner, and instead of gathering at the corner pub (XYL's please note) each member takes his turn at holding a combined business meeting and social gathering in his home, hence the ten member limit. To maintain an active and interested membership no member, without just cause, is allowed to miss more than two consecutive meetings and remain in good standing. If this occurs he is put on the inactive list and can only be returned to active membership by vote when there is a vacancy. Perhaps this seems a little exclusive, but it's not intended that way. In a small club you just can't put up with any deadwood and hold it together. At the present writing our membership is a full strength, and we have had little difficulty with lack of interest. However, it is a must in any organization to devise ways of maintaining interest and activity to supplement the rules. Perhaps your club needs a "shot in the arm" as ours did.

The idea of building fixed frequency tranceivers as a club project was first presented at a meeting on September 8, 1952. It had been difficult to get together on the air for club ragchews in the past due to most of us being scattered around on different bands and reluctant to tune up on a common frequency at a given time. A small rig, including receiver, that could be left turned on whenever we were around the shack seemed to be the answer. This would require operation on a band which was fairly quiet and without too much skip. Therefore the 2 or 6 meter spectrum appeared to be best suited for our purpose. Due to the lack of activity in the greater St. Louis area on 6 meters we agreed that a little promoting on this band would be a worthy objective. In addition to all this was the ever present emergency communications angle. We felt that 6 meters should have the edge on other bands in this category, too, for local emergencies within 20 or 30 miles. None of us had ever tried anything like this, so we agreed the thing to do was to heat up the old iron and go to it.

During the Fall of 1952 and Winter of 1953 several breadboard rigs were made from junk boxes. One member located a bargain supply of 2E26's at 50 cents per bottle. Perhaps this may have influenced our decision to use one as the final amplifier. Receiver, transmitter, power supply, sheet metal, and other committees were appointed, so many, in fact, that all of us were on at least two. Cabinet design, layout, tube types, and hundreds of other details were cussed and discussed until finally in February 1953 we voted that the club would build one six meter prototype tranceiver, cost of same to be squeezed out of the treasury. We had only $38.59 and the treasurer was guarding that with his double-barreled kw. There would be none of this "test and throw away" stuff in our watt factory.



The Bandhopper "6" . . . a compact, fixed-frequency, crystal controlled 6 meter transceiver.

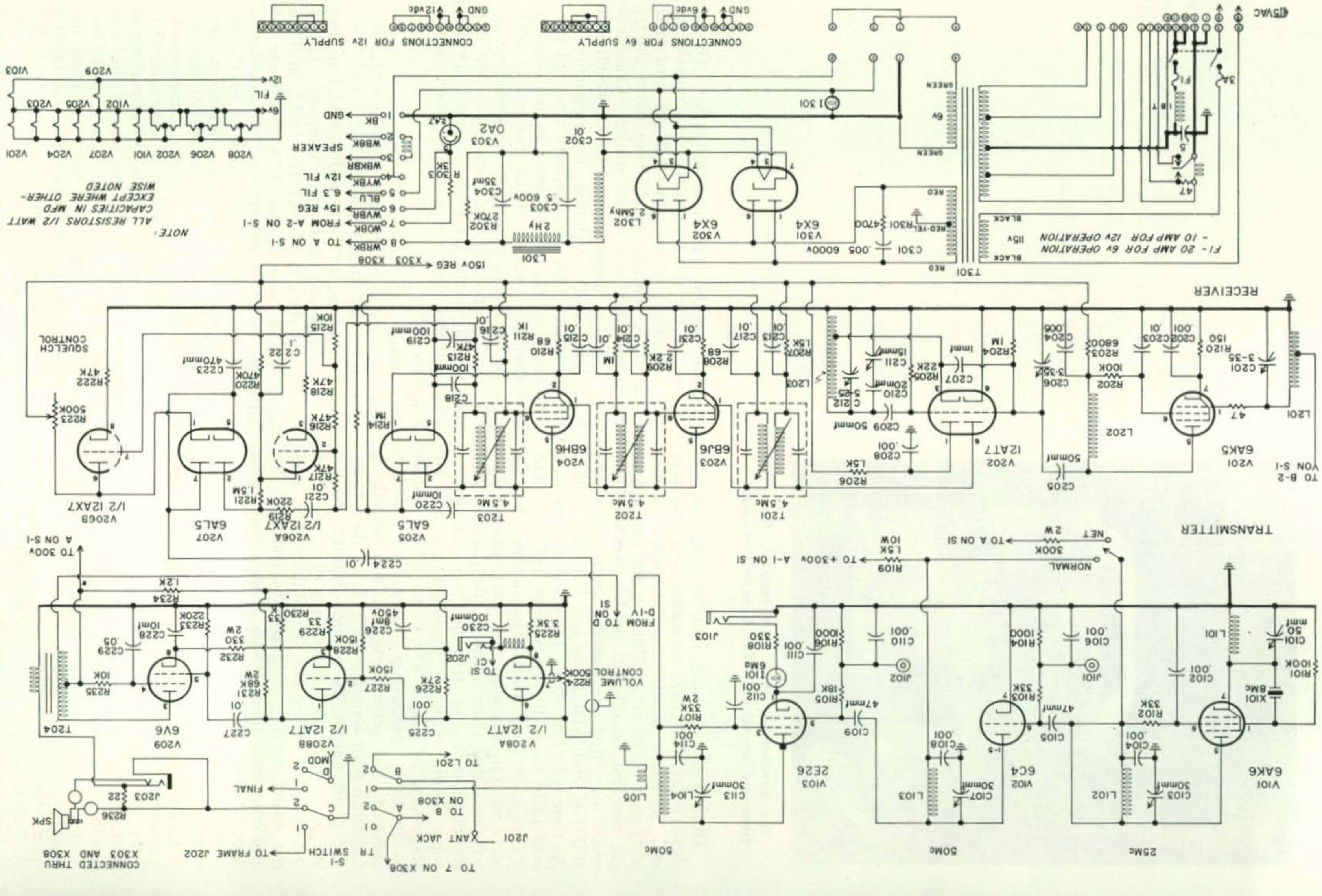
During the ensuing months progress was slow, what with FD, vacations, hot weather, and the many family activities that take priority over ham radio. But we did manage to get the first breadboard models working and made our first six meter contact between WØJNK and WØLTT in late February, 1953. As time rolled on many big problems resolved into little ones. By November 1953 we had a couple of experimental rigs running, but we were not satisfied with their performance. Determined that these units would perform like thoroughbreds, we struggled on. Oscillators were rebuilt, pi-finals exploited, cascode r-f stages and i-f's from 455 kc to 10 mc tested, modulation percentages and r-f output checked. The project evolved into something far more than building a rig from do-it-yourself plans out of "Scratchie's Scratch Book." We didn't take the word of any of them. Even the theories of Edison, Franklin, Ohm, and the ARRL were questioned. We learned a lot and consumed many hours of our spare time, happy hours, at a hobby which has so many possibilities the surface hasn't even been marred.

January 1954 had arrived by the time three transceivers were in operation. These were built from junk box parts supplied by soft-hearted members. A special meeting was held for the great decision. The acid test had been a success. Satisfactory communications were established and maintained over the 21 mile span between QTH's of WØEXN and WØNOA, using a ground plane at EXN's and a 3 element beam (vertical) at NOA's. Now the club had the opportunity to make a choice of one of the three prototypes, a redesigned unit comprised of desirable features contained in all three, (which would take more time), or to terminate the whole project. Considerable time had already passed and it would still be a long road, rough too, to completion of ten transceivers. A questionnaire revealed that the members' choice, gluttens for punishment that they are, was to build, entirely at club expense, a fourth prototype consolidating all the good features of the other three into one unit which would serve as a model for ten identical rigs, one for each member. Specifications are:

Receiver:

The 9-tube receiver consists of a 6AK5 r-f stage, 12AT7 triode mixer-oscillator, two stages of 4.5 mc i-f using 6BJ6s, 6AL5 second detector and avc diode (approximately 1 volt of delayed AVC), 12AX7 and 6AL5 in TNS squelch and noise limiter, 12AT7 2 stage a-f amplifier and 6V6 power amplifier-modulator.

The triode mixer was employed in the interest of obtaining lower converter noise, tuning is accomplished by variation of the oscillator frequency. r-f and mixer tuned circuits are fairly broadband and it is estimated that the maximum signal loss due to mistracking is about 6 db. The original purpose of the unit was for fixed frequency operation and the oscillator tuning adjustment was to correct for drift or slightly off-frequency transmitting crystals—experience with the unit and the user's desires indicated the need for a wider tuning range. The range in the final model


RECEIVER
TRANSMITTER
CONNECTIONS FOR 6v SUPPLY
CONNECTIONS FOR 12v SUPPLY
FI - 20 AMP FOR 6v OPERATION
- 10 AMP FOR 12v OPERATION
ALL RESISTORS 1/2 WATT
CAPACITIES IN MFD
EXCEPT WHERE OTHERWISE NOTED
NOTE:
SQUELCH CONTROL
VOLUME CONTROL
NORMAL
TO A ON S1
TO +300v A-1 ON S1
FROM TO D ON S1
D-1V
TO 300v A ON S-1
TO B-2 VON S-1
TO 7 ON X308
TO L201
TO FRAME J202
TR SWITCH S-1
ANT JACK J201
CONNECTED THRU X303 AND X308
6AK6 V101
6C4 V102
2E26 V103
6AK5 V201
12AT7 V202
6BJ6 V203
6BH6 V204
6AL5 V205
I/2 12AX7 V206A
I/2 12AT7 V208A
6V6 V209
I/2 12AT7 V208B
6AL5 V207
I/2 12AX7 V206B
6X4 V301
6X4 V302
OA2 V303
SPEAKER
150v REG X303 X308
12v FIL
6.3 FIL
15v REG
FROM A-2 ON S-1
TO A ON S-1
GND
6vdc
12vdc
115VAC
3A
47
T301
L301
L302
I 301
C301 .005 6000v
R301 470Ω
R302 27ΩK
R303 3K
C302 .01
C303 .5 600v
C304 35mf
2 Hy
2.5Mhy
T101
T202
T203
T204
4.5Mc
25Mc
50Mc
J101
J102
J103
J201
J202
J203
SPK
FINAL
MOD
ANT
S-1

was increased from 0.5 mcs to 3.5 mcs with the values shown on the schematic. The narrow range can be obtained by decreasing the value of C-210 to 3.5 uuf. Some trouble was encountered with oscillator drift; this was corrected by reducing the amount of capacity in the oscillator with -750 ppm characteristic and replacing it with an equivalent amount of zero ppm characteristic capacity. The use of a triode mixer results in a slight amount of oscillator "pulling," but this have given no trouble when the 4.5 mc i-f is used—a 455 kc i-f would present a stability problem for this reason.

The r-f stage is straight-forward. The antenna tap position was adjusted with an antennascope to match 50 ohms. It was found necessary to place a copper shield on the center pin of the tube socket to prevent feedback from the plate to the grid circuit. The injection capacitor C-207 is a piece of "gimmick" wire consisting of 2½ turns of #28 PE wire around the spaghettied lead that connects the oscillator cathode to the mixer grid.

The i-f stages employ 4.5 mc TV i-f transformers. These have a bandwidth of about 150 kc at 6 db down. Admittedly this is wider than is desirable under crowded band conditions or during band openings, however for the primary purpose of net operation it eliminates the need for constant tuning and the possibility of missed calls from stations with crystals which are not closely netted. The desirability of this has been demonstrated in several CD drills where high receiver selectivity was a distinct disadvantage. Remote cutoff 6BJ6s, low filament drain, tubes are used in the i-f with delayed avc (about 1 volt delay) applied to both stages. One section of 6AL5 is used as the second detector with the second section coupled through C-220 to the primary of the last i-f transformer to act as an AVC detector with the avc delay voltage being obtained from the cathode of the last i-f stage. A standard TNS squelch circuit follows the i-f system.

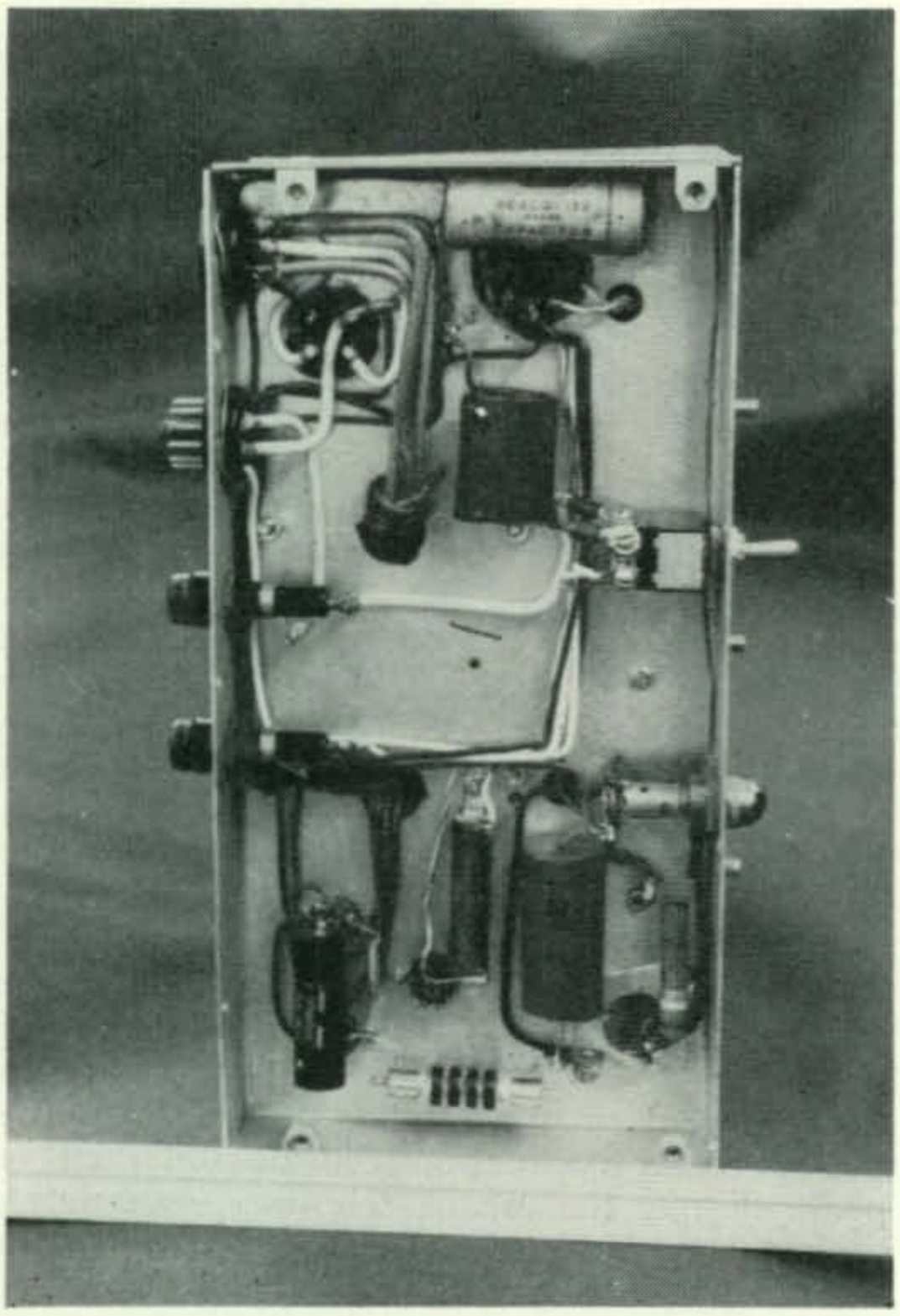
The first a-f stage (12AT7) supplies microphone voltage for a carbon microphone from its cathode circuit. The second stage is designed to introduce grid circuit limiting and plate circuit limiting so that the input to the modulator is clipped and a higher effective modulation level can be obtained. The power output stage is a 6V6 with provisions for plugging in headphones in the output circuit. The output transformer is a universal pushpull output transformer, on "receive" one half the primary and the secondary function as an ordinary output coupling transformer, on transmit" the two halves of the primary are used as a 1:1 auto transformer to provide "Heising" modulation of the final. This method of connection allows the use of a more inexpensive transformer since the modulator and final amplifier dc plate currents are divided between the two halves of the winding so the dc capacity of the primary wire need be only half what it would be if an untapped winding were used.

Transmitter:

Consists of 6AK6 regenerative crystal oscillator, with the crystal operating on 83 mcs, plate circuit tuned to 25 mcs, a second 6AK6 with its plate circuit tuned to 50 mcs and a 2E26 operated straight through to 50 mcs. Crystal access is provided from the front panel, transmitter tuning adjustments are made through holes in the top of the cabinet, grid current metering jacks are also reached through the top of the cabinet, final amplifier cathode current is continuously monitored by the 60 ma pilot bulb 1-101 which is visable in the center of the front panel. The grid current jacks are shunted with 1 k resistors so that a dc vtvm may be used to read current —1 ma grid current producing 1 volt dc. J-103 provides for insertion of a milliammeter to determine power input to the final amplifier. Checks of the modulation using trapezoid patterns on the oscilloscope indicate that 100 percent modulation can be obtained on peaks despite the use of "Heising" modulation —this is probably due to the clipping action in the speech amplifier stages. The "transmit-receive" switch performs the following functions: Transfers antenna from receiver to transmitter, mutes speaker or mike, applies voltage to final amplifier stage, disables front end of receiver on "transmit." A "netting circuit" has been added to the original design which allows a low voltage to be applied to the oscillator stage through a momentary switch so that the transmitter crystal can be used to spot the net frequency to which the receiver should be tuned.

Power Supply:

The use of a special transformer and appropriate plugs and cables permits operation of the unit on 6, or 12 volts dc and 110 volts ac. 6 volt vibrators are modified by the addition of a 39 ohm resistor in series with the vibrator coil to the ordinarily unused fourth pin on the vibrator. Since the secondary of the power transformer delivers about 350 volts and the buffer condenser and resistor are across the winding on ac or dc operation the rating of the buffer should be at least 6000 volts instead of the usual 1600. Two 6X4s in parallel are used to handle the current drain of the set, some saving in filament current drain might be achieved if an indirectly heated cathode type rectifier with adequate plate current ratings were available. An OA2 voltage regulator is used to provide regulated 150 v to the front end and i-f of the receiver. Both the dc and ac power input leads are fused. Separate power cords for ac and dc operation are used, with a jumper plug inserted at the rear of the chassis for 6VDC or 12VDC, as appropriate.



Bottoms-up view.

Cost: $50.00 or less.

Model IV was completed and tested in a fairly short time, most of us having a hand in it. It was decided to use production line methods for construction of the ten units rather than depend upon individual building. Everyone worked on all of the equipment at one or more stages, thus minimizing any tendency to do substandard work. Not that we didn't trust each other, but, well it's better this way. The units were numbered one thru ten for identification of chassis, cover, and parts. At the end of the construction period a drawing was held and only then did anyone know which unit he would receive.

Production of even the small number of units such as ours presents a lot of problems in purchasing, inventory, distribution of parts, layout, work skeds, etc. To add to the confusion some of us supplied some of the parts from our own private stock. In order to keep the rigs uniform and of equal quality we restricted the personal supply of parts to components of standard make and ratings. These parts were then placed in the inventory. The committee on purchasing, supply and inventory, had a few bad moments over this, but they did admirably when you consider that, when the entire project was completed only minor shortages and overages in parts per member remained. At the end we had a grab-bag party and each ham went home happy with a few new junk box items for the nucleus of a future ohm and watt grinder.

The actual construction of the Bandhopper "6" was split up between four crews, one each for receiver, transmitter, power supply, sheet metal. Since we had no shop facilities suitable for handling all of these operations at one location, each of the four phases were completed in as many workshops. Then all units were sent to one location for final assembly. We owe a vote of thanks to Brother Jim Liley and XYL for donating almost their entire basement to such a worthy cause. Since Jim's basement was frequently a gathering place for the younger set (under ten) he and Helen must have had many trying times, especially on those bad weather days when it becomes necessary to attempt confinement within four walls the future of America.

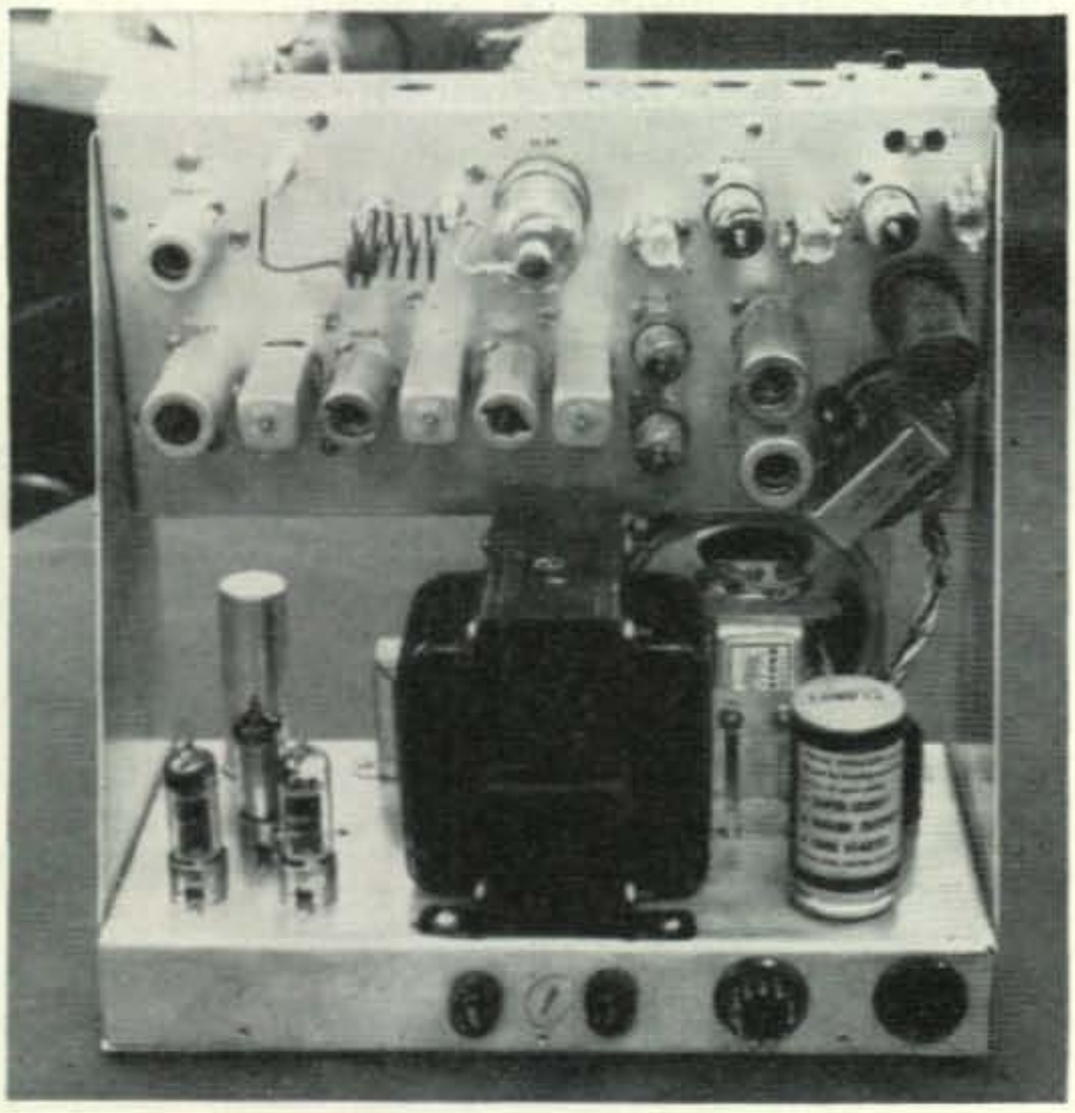
No particular problems were encountered by the construction crews. Each had a model to use for reference and a schematic as a check sheet. Our sheet metal work went fairly well. All of the chassis', brackets, cover, etc. were hand made without benefit of modern machinery. We used .050 half-hard aluminum donated by a very generous neighbor of the writer and cut to size on his power shear. Form blocks were made for the two chassis and the other bending was done with the use of angle-irons held in a bench vise. Dimensions can be held fairly close in bending this material if you are careful in your layout and allow one metal thickness for gain in each direction; if you make a 90 degree bend each side will measure approximately one metal thickness longer than before. Thus, if you are bending up a chassis to fit inside a given enclosure and using 1/16" thick material you must allow for an overall outside dimension

Front view of Bandhopper's works.

gain of approximately ⅛ inch in length and width. This varies some with the hardness of the metal used. It would be time well spent if you are the do-it-yourself type to experiment with some scrap material, checking measurements carefully for increase in size. Another tip, the angle irons, if used, should be smooth, clean, and close to the same length as the band.

All units were completely assembled and turned over to a "smoke-test" group. A few minor errors were made in the "manufacturin" process, but most of them required tuning up and alignment only. A chart listing voltages, current, etc. for each unit was compiled and operating standards set up. After debugging, alignment, and adjustment the rigs were released to each owner. The next regular club meeting was devoted to cleaning up the financial details of the project. Most of us had paid in the bulk of the cost, so it was simple math to pitch in a few pennies to cover the balance. The original goal was to build ten transceivers for 50 bucks or less. The components furnished by individuals were included in the cost figures at market value but the final figures did not include the cost of tubes. These were supplied by each member from a source of his own choice. Using bargain tubes and purchasing your aluminum on the open market would probably run the total to sixty or sixty-five U. S. dollars.

Then there is the mike and an antenna. If you've been a ham for awhile (not the type who buys everything tailor made, but the real old-fashioned kind who has a few battle scars from the old soldering iron and a junk box) you will probably have a T17B or something similar. Now the antenna is another story, so choose your druthers. However, we recommend a 50 ohm coax feedline and vertical polarization. In fact most of us are now using a coaxial job called "the JNK vertical" built by one of the Bandhoppers. (Note below) But, as I said, that is another story.



And she looks like this from the back.

"Now that the project is complete," you say, "what do you do with these rigs?" Well, as I stated earlier, to keep the club members interested and active you have to keep something going, or, like a fire with no fuel added now and then, they will cool off and disappear.

This project has lasted almost five years, and is still going. Many little modifications and improvements have been suggested and tried. Hardly a meeting goes by, except around Field Day, without a new idea on the Bandhopper Six from someone. Many have been tossed out (ideas), some have been tried, and a few have been used. For example, a different padder condenser in the receiver oscillator circuit to broaden the tuning range was adopted. Then to assure correct club frequency spotting (52.450) a spring loaded slide switch and a resistor was incorporated into the transmitter oscillator circuit. This allowed the operator to activate the oscillator while receiving, thus causing the squelch to open when the receiver tuning control is tuned to the crystal frequency. This provides accurate netting on the club frequency. Another modification that is in the mill at the present writing is "push to talk." This change is not quite as simple as it might seem when you consider the necessity of using a relay under 6, 12, and 110 volt operation, with severe space limitations as well as economic limitations.

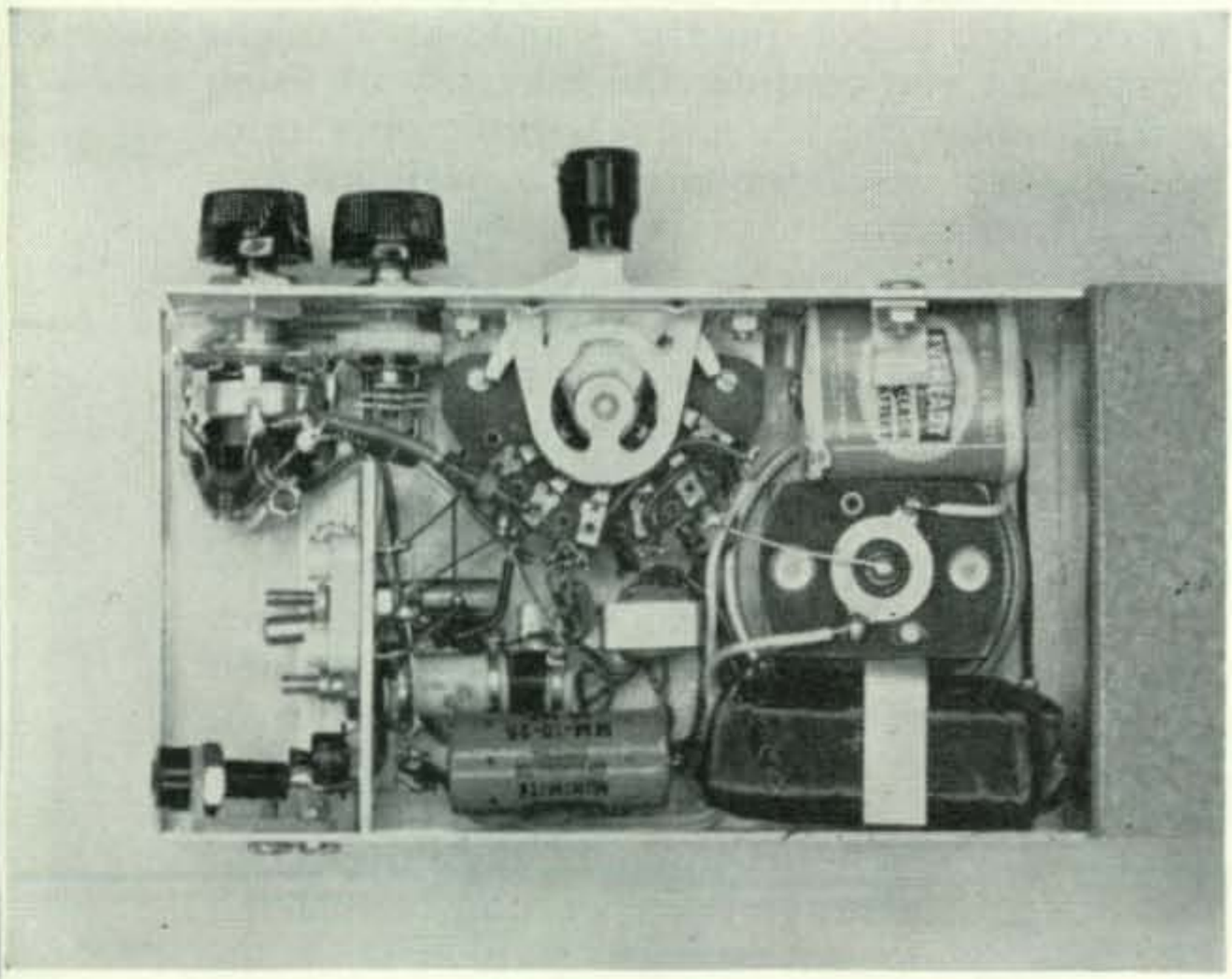
The Bandhopper "6" 's have been through several test operations on CD drills and one SET. They have performed satisfactorily under extended periods of operation with only a few minor break-downs. These were the result of using too small a buffer condensor in the vibrator supply, which has been corrected. The equipment is used on Field Days for intercoms between transmitter locations for the cw men to keep tabs on the phone men and vice versa. It is used for mobile communications while on "Safari" to and from Field Day and other locations. The Club is equipped with two gasoline driven generators for operation from fixed locations while on emergency or FD drills. All members are RACES members and use their Bandhopper "6" 's to fill in wherever needed, regardless of the type of emergency or drill. Once we were called upon to assist in handling traffic (automobiles) around the municipal airport for two weekends when a new terminal building was formally opened for the public to view their tax dollars in concrete, glass, and steel. Over 100,000 cars (or was it people) attended each weekend. Our newest project is the equipping of the club with a trailer and tent. This will complete the layout, and if a real emergency arises in our local area, we are ready. ARE YOU? ■

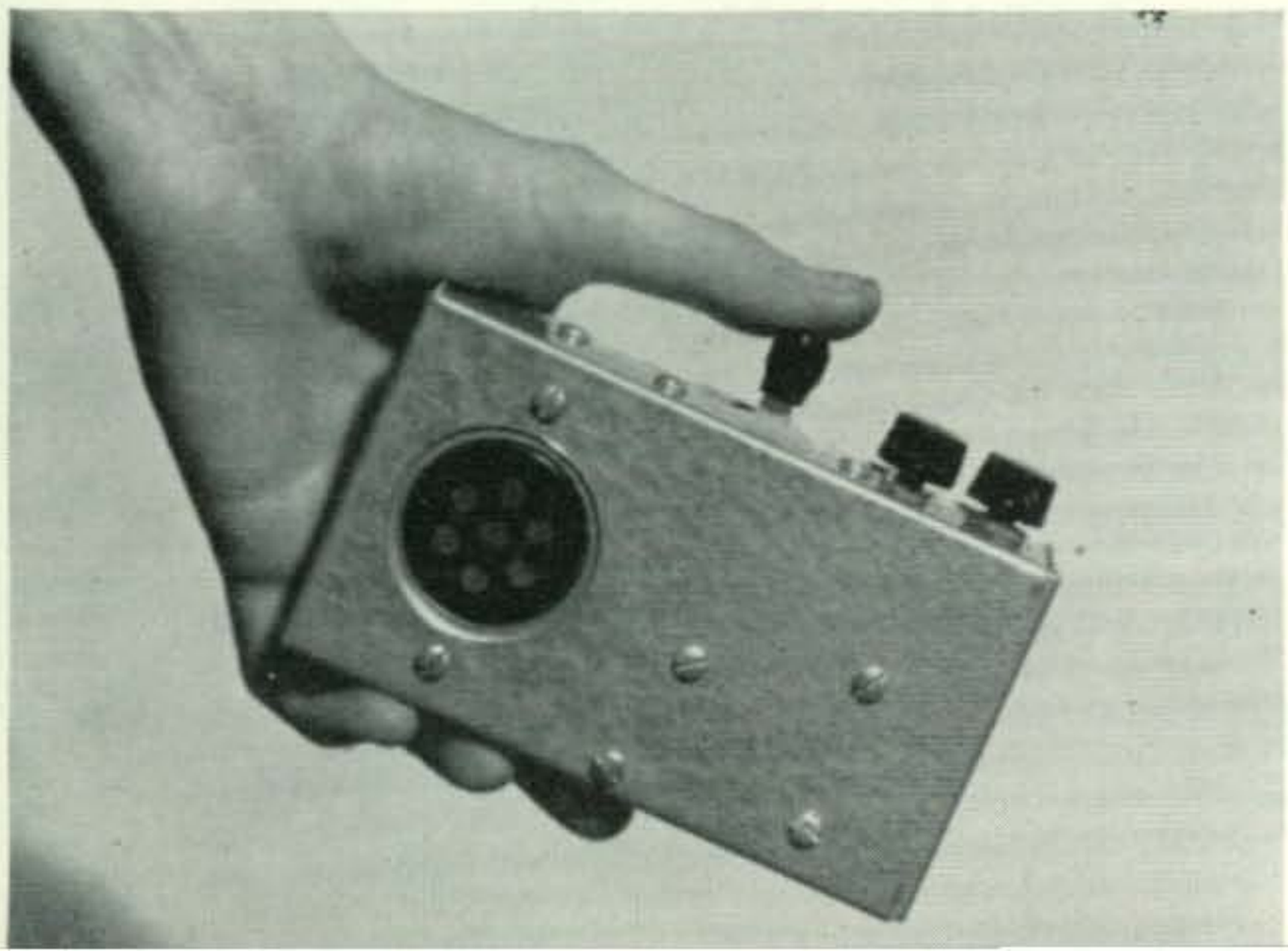
transistors

by **DONALD L. STONER, W6TNS**
P.O. Box 137, Ontario, Calif.

Interior view of the handie talkie with the crystal removed to expose the SB-100 transistor. The interstage transformer is mounted directly above the microphone/earphone with an aluminum clip.

The Ten Meter Handie Talkie fits the hand nicely. Controls are regeneration, receiver tuning, and transmit/receive from top to bottom.





Every so often I get struck right betwixt the eyes with a "real ball of fire idea". Everybody likes a contest and with the current interest in the mighty milliwatt transistor transmitters, why not have "battle of watts" to see who can do the best with the least. After batting around several pads of scrach paper I believe that I have devised a formula that will be fair and equitable to everyone from 160 meters on up. Although several details are yet to be resolved (such as prizes) it should be fun for everyone, and profitable for the winner and runner ups.

I looked through all the publications that I had available* and found several accomplishments with transistor transmitters. The figures were substituted in the formula and the results were rather close. It works like this. The power in milliwatts is divided into the frequency in megacycles and the resultant is multiplied by the distance. CW, phone, sideband, all's fair, even 60 element beams. The idea is to radiate as much as possible with the lowest power input. As example of how the formula works, let's assume that Joe Ham builds up a two meter rig using transistors and works 200 miles with a power input of 100 milliwatts (.1 watts) on 144.01. Substituting these figures in the formula produces an answer of 288 points. Incidentally these powers and distances are quite possible on two meters with the newer transistors. Circuits coming up!

To illustrate the fairness of the formula let us examine an actual case history. E. M. Washburn, W2RG built a transistor rig using a pair of 2N140's. According to his article in

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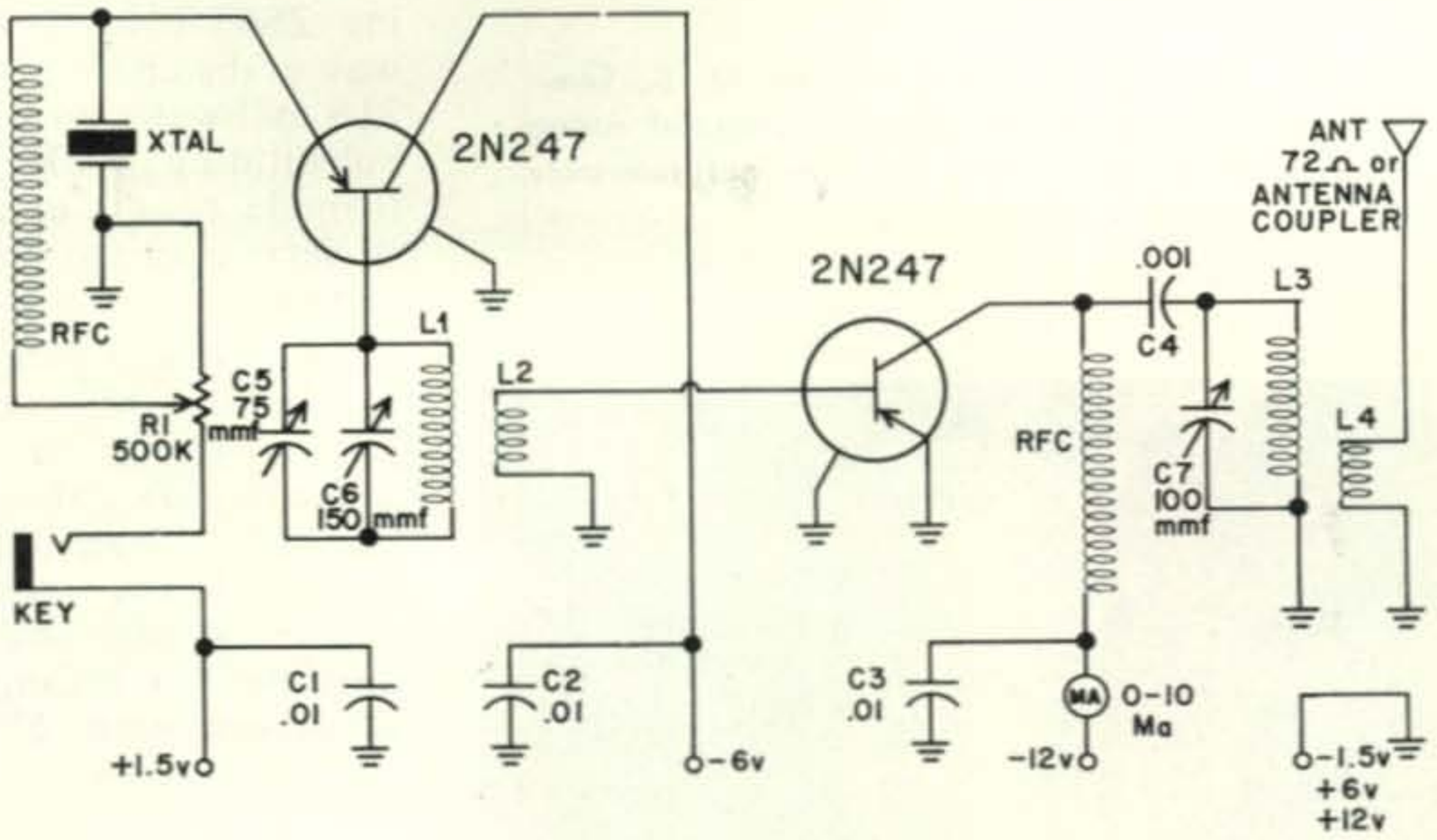
* Transistorized Rig Works 10 Meter DX (Griffith, W7MPQ) Radio Electronics May, 57
RF Transistors, Part One (Aerovox Staff) The Aerovox Research Worker Nov./Dec., 56
A Transistorized QSO Getter (Washburn, W2RG) RCA Ham Tips, July, 57
Transistors in Speech Equipment (Albrecht, VK3AHH) QST, Sept., 57
An Experimental All Transistor Communications Receiver (Heinem) May, 56 QST
Transistorizing the Single Sideband Exciter (Jennings and Alvernaz QST, Sept., 56
The Ten Meter Two Lunger (Stoner, W6TNS) Popular Electronics Nov., 57

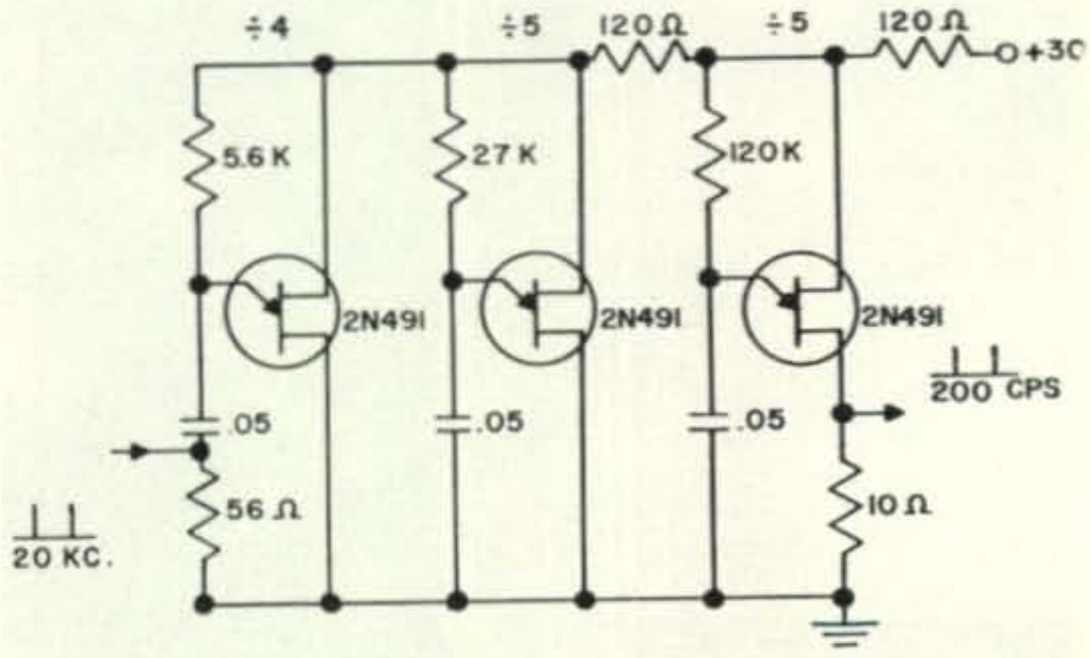
Schematic and parts list for Monty (VE3TA) Hart's flea powered transistorized transmitter.



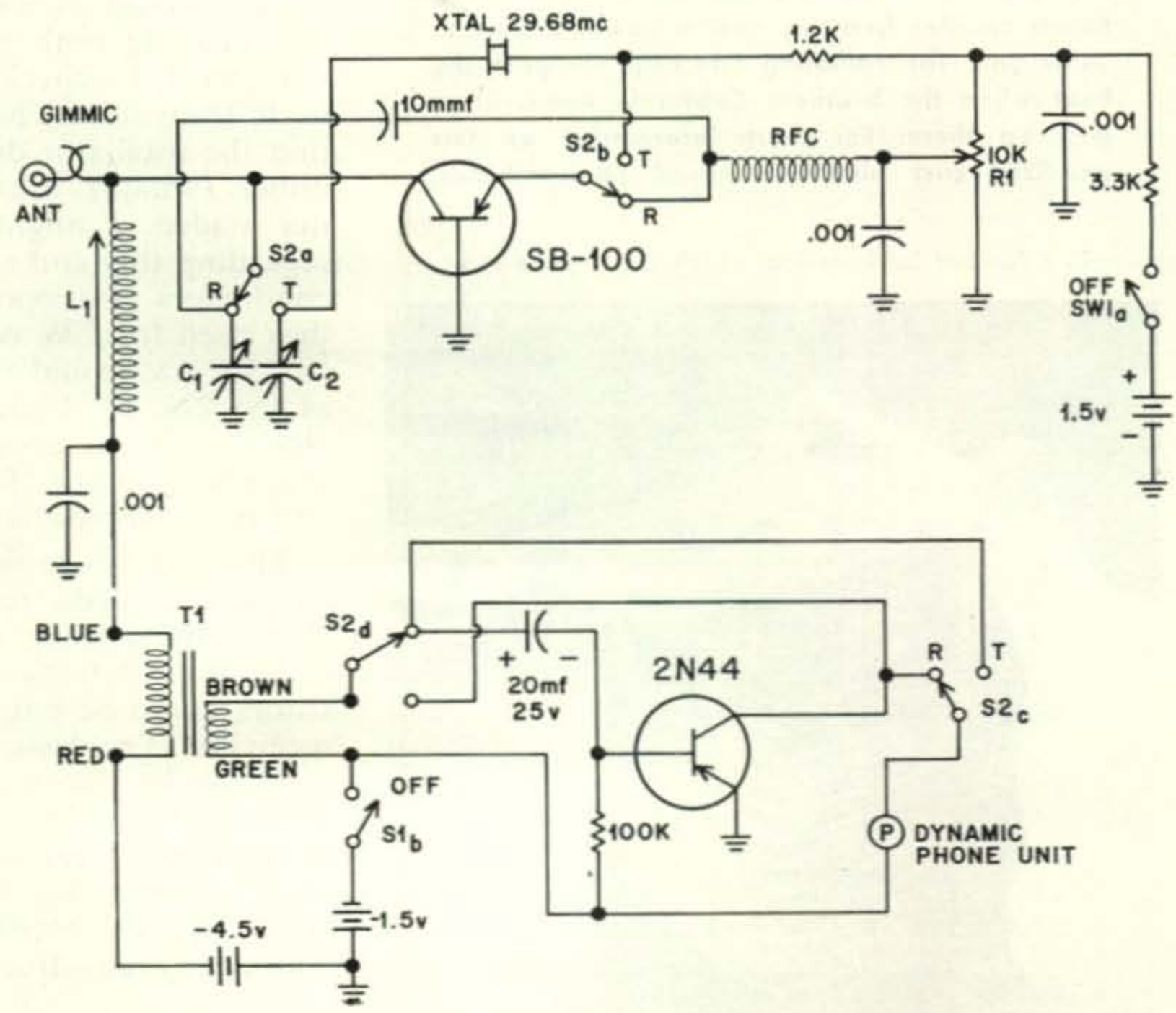
One application for the unijunction transistor. This is a 100:1 frequency divider similar to one that might be found in a frequency standard.

Parts List

C1, C2, C3—.01 mf disc ceramic capacitor
C4—.001 mf disc ceramic
C5—75 mmfd variable capacitor
C6—150 mmf trimmer capacitor
C7—100 mmf variable capacitor
RFC—1 mh., (Miller 952)
R1—500K potentiometer
L1—(Miller 4506) 9—16 uh.
L2—8 turns #28 enamel over bottom end of L1.
L3—45 turns B&W Mininductor #3012, ¾ inch diameter, 32 TPI
L4—4 turns #20 plastic wire around cold end of L3.
MA—0-10 ma midget meter
Xtal—80 or 40 meter crystal

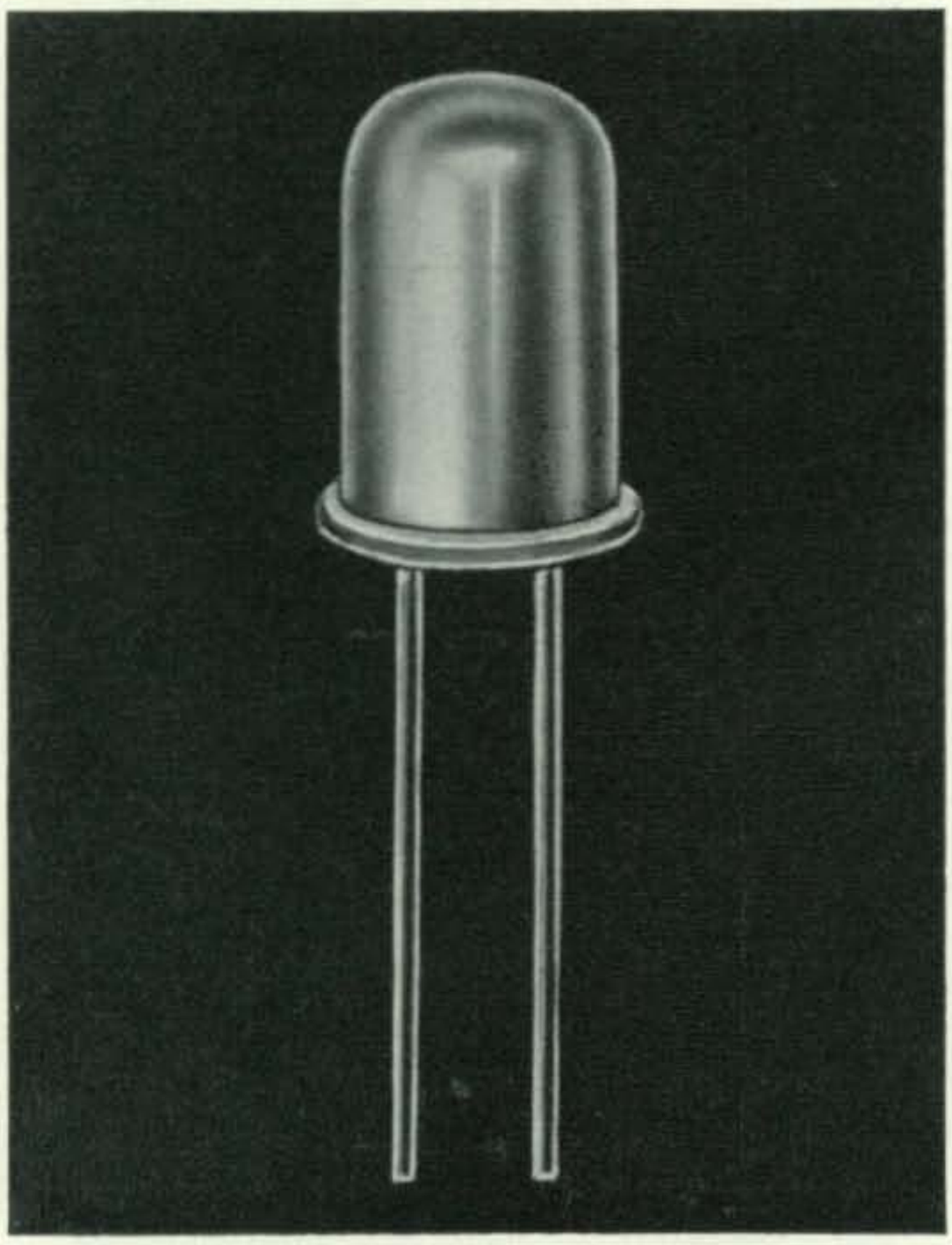


Schematic diagram of W6TNS's 10 meter "Pocket-talkie." Only two inexpensive transistors are used in a transceiver configuration. The transmitter, however, is crystal controlled and tuning the receiver does not affect the transmitter frequency.



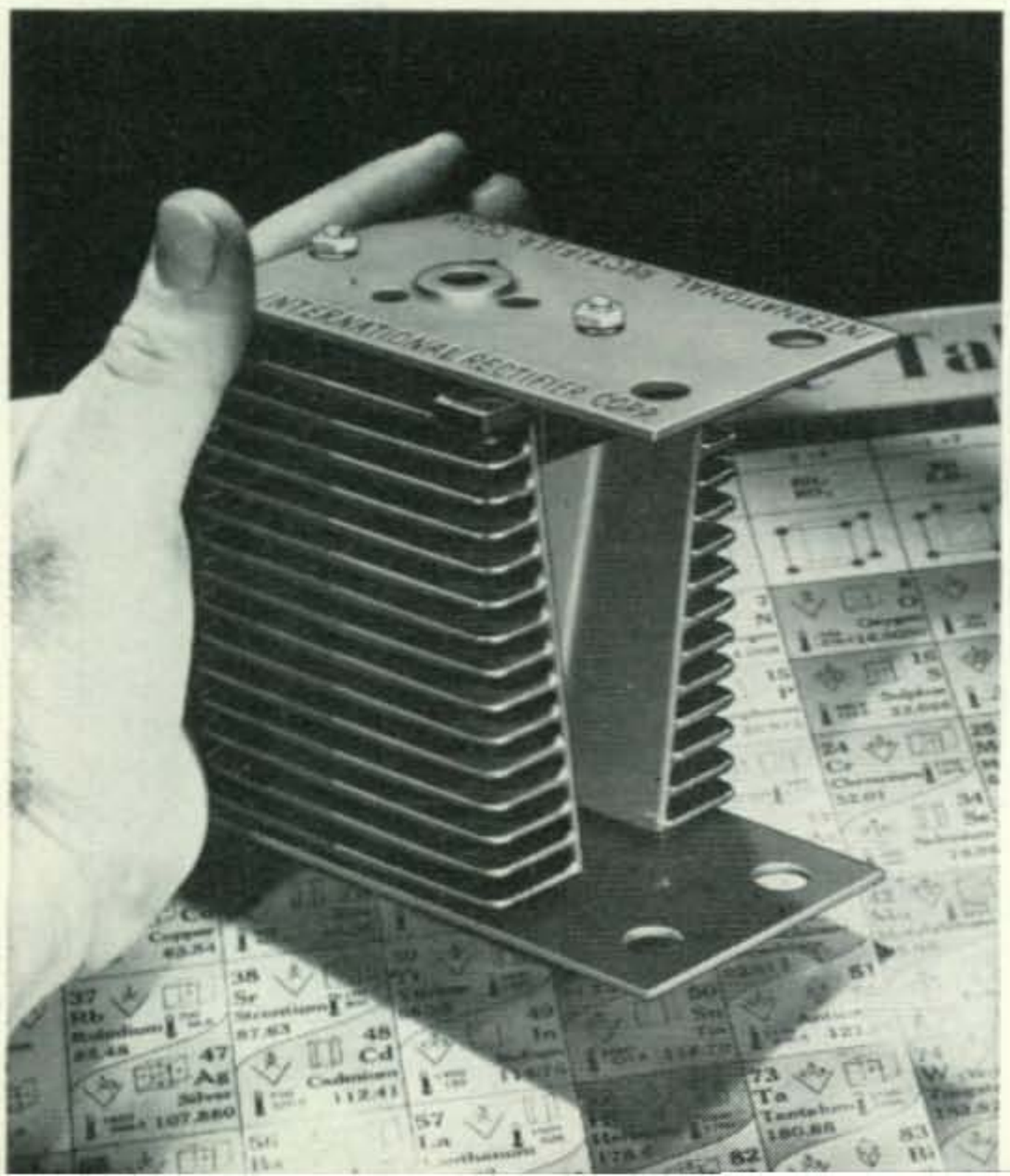
Zener diodes are available from U. S. Semiconductor Products, Inc. with a nominal rating from 3.9 to 560 volts. The nominal tolerance is 10%.

For further information, check B on page 126.



I simply had to remove this 200 ampere silicon power rectifier from my exciter power supply to show you. The radiating fins help dissipate the heat when the Southern California temperature gets up there. For more information on this anodized cast aluminum cased semiconductor,

For further information, check A on page 126.



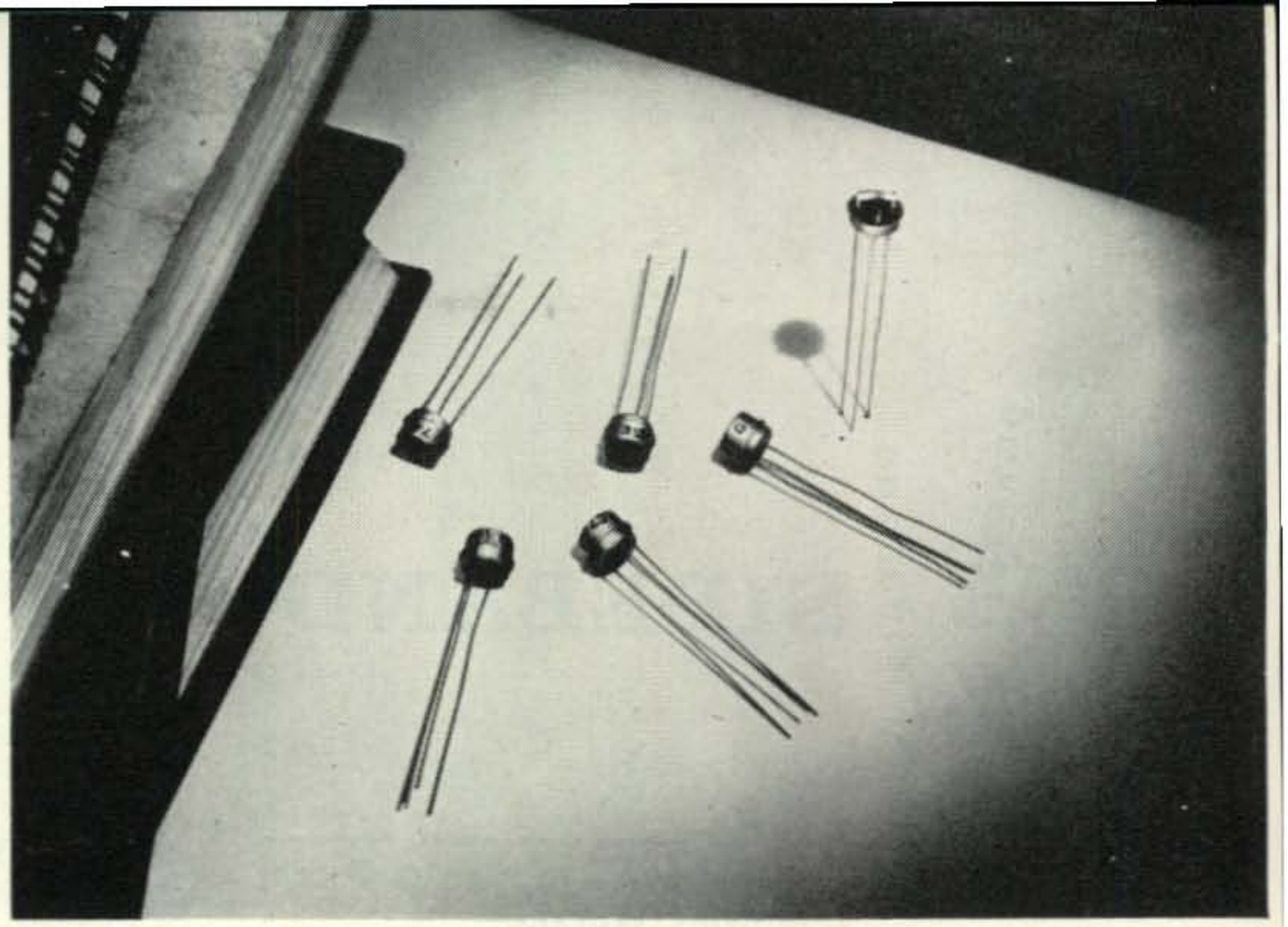
HAM TIPS (July 1957) he succeeded in working ZS6TR in Transvaal South Africa. This was a distance of 8,000 miles while running 216 milliwatts on 7.002 mc (ooooh the QRM). Substituting W2RG's accomplishment in the formula results in 256 points. Notice that this is very close to our imaginary ham on two meters.

Just to keep you in touch with the situation, I will print the latest figures every so often. Four or five of the leaders should be sufficient and the low man on the totem pole gets bumped. As an aid to basic research on the subject I am including a list of pertinent articles at the end of the column. We will start the list rolling by listing W2RG, E. M. Washburn with 256 points, Richard Griffith, W7MPQ, is the leader with 5,500 points. As you may remember from his article in *Radio Electronics* Dick managed to work Canton Island (KB6BC) on 29 mc. This was a distance of 4,500 miles while running only 24 milliwatts! Also listed this month is Monty Hart, VE3TA who has fired up on 80 and 40 meters. He managed to snag K2UYW for a distance of 400 miles while running 36 milliwatts on 3570 kc.

So remember no holds barred, and no power limit (yuk, yuk). Pssst. . . . A tip to my very special friends though . . . the probability of the formula is the greatest around ten meters and the QRM on 11 meters is nil. . . . Nuff said?

Monty Hart, VE3TA, sent the circuit for his little rock crusher along with sufficient data for duplication by interested parties. By changing the coils and using suitable crystals, the rig will perform on ten meters also. The basic circuit would remain the same. Monty uses the meter in both stages (although not drawn that way) to check the current consumed by each transistor. The bias pot (R1) is set so that the oscillator draws 4 ma. The power amplifier (what?) draws 1 ma. unloaded and 3 ma loaded. I might also inject the comment regarding this and similar rigs. Since the semiconductors are operating class C, and since they used for CW work I believe that as much as 150 mw. could be run safely to units such as the 2N247. Clamping the transistor to the chassis with a good thermal connection will also allow you to "fudge" the dissipation rating (50 mw.) somewhat.

This month's project is not intended to break any DX records, for sure. In fact, it is probably nothing more than a toy when it comes to communications. It does illustrate how transistors could be employed for transmitters and receivers. The basic circuit works as either a super regen receiver or a modulated crystal controlled) oscillator. The best DX to date is about 900 feet using a 20 inch whip. It is quite possible that if that device were loaded into a good antenna and the efficiency increased by constructing it on a decent sized



The action of the General Electric Company Unijunction transistor is similar to the grid controlled thyratron. The device shown here carries the JETEC numbers 2N489 through 2N494.

chassis, that it would really get out.

Technically, the transceiver uses a Philco SB-100 as a super regen detector and modulated oscillator. Coil L1 is tuned initially so that capacitors C1 and C2 will hit the 10 meter band. The antenna is coupled into the device with a gimmick i.e. two short pieces of wire twisted together. Capacitor C1 is the Johnson midget variable that extends out the side of the case. Capacitor C2 is an internal adjustment which puts the crystal on the right frequency. It is interesting to note that this capacitor will "rubber" the crystal as much as 50 kilocycles with good stability. Section B of S2 switches between the 10 mmfd feedback capacitor and the crystal. Potentiometer R1 varies the emitter voltage to control the amount of regeneration. The audio is more or less standard. A 2N44 PNP transistor delivers roughly 50 mw of audio to the dynamic headphone unit. Note that there is no off-on switch in SB-100 collector battery lead. When the emitter bias is removed, the transistor draws only 30 amps and a switch was deemed unnecessary.

No difficulty should be experienced in getting the unit to operate. Coil L1 should be as far away from the chassis as is practical. Excessive antenna coupling (too many turns on the gimmick) will cause the regeneration to be erratic or even cause it to cease. The SB-100 is available from jobbers or by writing directly to The Lansdale Tube Company (a division of Philco), Lansdale, Pa. The 2N247 will also work in this circuit with no value changes.

A terrific companion rectifier for my final amplifier power supply is the International Rectifier 500 ampere single crystal germanium power rectifier junction. Actually the rectifier is intended for use in electrochemical and metal refining applications, but it helps me get out so well on 15 meters! Bulletin GPR-2 describes this beauty more fully than I can.

New Transistors

It is not too often that a really new transistor comes along and we are happy to report on it, when it does. I am speaking of the new General Electric Uni-Junction silicon transistor JETEC numbers 2N489 through 2N494. The unijunction transistor might be considered a solid state equivalent of a small grid controlled thyratron. The unijunction transistor, originally called the double-base diode, was invented by Dr. I. A. Lesk of the General Electric Advanced Semiconductor Laboratory, and has been under development for over five years. The device is particularly recommended for relaxation oscillators, sawtooth and pulse generators, pulse rate modulators, pulse amplifiers, multi-vibrators, flip-flops, and time delay circuits. The accompanying photograph illustrates the fact that this unusual semiconductor device has two bases, with a single junction. The schematic shows one of the many possible applications for the Unijunction transistor.

U. S. Semiconductor Products, 3536 Osborn Road, Phoenix, Arizona have announced a line of Zener diodes. The name stems from the well known Zener Effect common to all diodes. If one applies sufficient voltage in the

[*Continued on page 114*]

by **BOB ADAMS, W3SW**
919 McCeney Road, Silver Springs, Md.

sideband sideband sideband

SIDEBAND

Countries Worked

Two-Way SB

W2JXH	101	G3MY	90
DL4SV	98	W3HN	90
ZS6KD	96	W3SW	90
VK3AEE	96	WØQVZ	89
W4IYC	95	F7AF	88
W2KR	95	W2CFT	88
ZL3PJ	94	W6UOU	88
ZL3IA	92	W3BZ	87
W3ZP	91	G6LX	87
K6GMA	90	K2GMO	85
CN8MM	90	TI2HP	85

As we write this, the last column for 1957, it is with a sense of pride and humility to be reporting on a state of the art, which has grown in popularity perhaps faster than any other mode of communication. I well remember "graduating" from Spark to CW, which was also a revolutionary transgression, but in sheer numerical changeovers this has been the more remarkable. At the present pace, your Editor predicts an end to the power wasteful carriers which cause the annoying heterodynes, within two years. With the concern felt by those who know the circumstances, our possible loss of many of our present frequencies, will eventually require utilizing the spectrum in the most economical matter and that can only mean by carrier supression and the use of only one sideband. Our FCC has already served notice on many of the commercial licensees that they must convert to SSB in the next five years.

The long goal of working on hundred countries, SB to SB has been achieved. Harry Whiting, W2JXH accomplished it by working ET2US and VS2DB for a total of 101. Our sincerest congrats to you Harry. A picture of W2JXH is shown as well as one of Harry. From where we sit it is apparent that Harry has put in plenty of hours on his chair while seeking new countries.

An indication of the popularity of SB in other parts of the world is clearly shown by Humberto's letter which lists eight SB stations in Costa Rica. These are in order of their appearance on the air: TL5JG, Jose; TI2HP, Humberto; T12RC, Bob; TL2EV, Ernesto; TI2CHV, Charles; TI2ACQ, Adrian; TI2IO, Hans; and TI2LA, Luis. In a country of only one million population this is a remarkable showing.

As previously reported, Ted Henry, W6UOU has been shipping his small 11 pound SSB rig to the remote spots in the world which do not have SB activity. It was operated for several weeks in Brunei by Tony, VS5AT, by Jim, on Baker Island as KH6KS/KB6, by Ted himself as W6UOU/KX6 and now it is giving many stations a new country in Malaya where it is operating as VS2DB by Stewart. It will soon be in ZC5-land.

We can soon expect a new one as Bill, ZK1BS, now on AM told me during a QSO

W2JXH, Harry

KØIKL, Joyce

W9AC, Bill

that he was going to change over to SB. Hurry Bill as we all want to work Cook Island.

OQ5GU, Paul in the Belgian Congo has been going strong with his 50 watts to a three element beam. Shortly after a nice contact with OQ5GU, I was surprised to work Earle, W4DGW/OQ5 who at the time was seventy miles up the Congo River. Even in the Congo there is plenty of SB activity.

VS1HS is now on 14,324 xtal controlled, and while he is only using a low power exciter, he is making many nice contacts.

As proof that the real "ham spirit" still exists, my note in last months column of VP4TE's problem in finding parts in Trinidad, brought forth an offer from Edgar, W1BDF, to provide Louis with a complete bandswitching exciter. This exciter is being delivered to VP4TE by Ted, W5YMX/MM, so we should soon be working Trinidad, thanks to W1BDF. E/I should be allowed the first contact, hi.

Gordie, W7WHB advises of a new club station DL4USN, formed by a group of fellows desiring to become amateurs. There are at present only two ops, but SB is the chief interest and the equipment consists of an SX101, an HT-30 and an HT-31.

Hal, KR6HN whose picture is shown, has completed raising his 85 foot tower, and three band Hy-Gain beam and is putting in a husky signal with the HT-32 barefooted. A new 833A linear is under construction.

KR6HN, Hal

We are happy to welcome another YL-sideband er, Joyce of KØIKL whose photo is shown. Joyce, who received her general class license in June has already worked fifteen countries on SB including HS1A, CN8MM and ZS6KD. Her rig is a Pacemaster, a 75A4 receiver and a ground plane antenna.

George, W1EQ by contacting DU7SV, VP2VG, OQ5GU, VS4JT, ZC4DA, KAØSC and ET2US brought his total up to 76. Bob, K2GMO hooked VS4JT and GD3GMH for number 84.

John, PY2JU, who contacted 3A2BX in Monaco for country number 72 advises that a new SB station, PY2KD is now active in Brazil. His handle is Alvaro. PY2BEW in Lima will be on SB very soon. Welcome fellows.

F7AN and G3IRP took a KWM-1 and a 20A with GG 6AG7s to Monaco this month and operated several days as 3A2BX on 10, 15, 20 and 75 meters. A full story of their trip will be told in next month's column.

Charlie of F7AF made it 86 with EL4A and HC2AGI. Jerry at HC2AGI told F7AF that he will soon have a beam up aimed at Europe.

KG4AQ is now on SB and will be at this QTH for two years. He is heard on 15 and 20 meters and is EX KL7AIZ. His mailing address is D. S. Metzger, CTC, Box 41, Navy 115, F.P.O. N.Y.C., NY.

GM3CIX is looking for XE on SB to complete a WAZ. Congrats. VS6AZ, Luk is putting a wonderful signal all over the world with his new KWS-1. VS6DE is also very active from Hong Kong.

Mirko, YU1AD is very pleased with his new mechanical filter rig and the EL34 GG linear. He sounds great with it, on 15 and 20 meters. Harry, JA1ANG now has a VFO and is able to move around in the band. He is finding 15 to be good with his dipole antenna in spite of the high mountains between him and the States. His recent contacts were with VS4JT, CX5AF, OA5G, DU7SV, HS1A, G3BXI and DL40D. He is on daily from 2200 to 0500

[*Continued on page 94*]

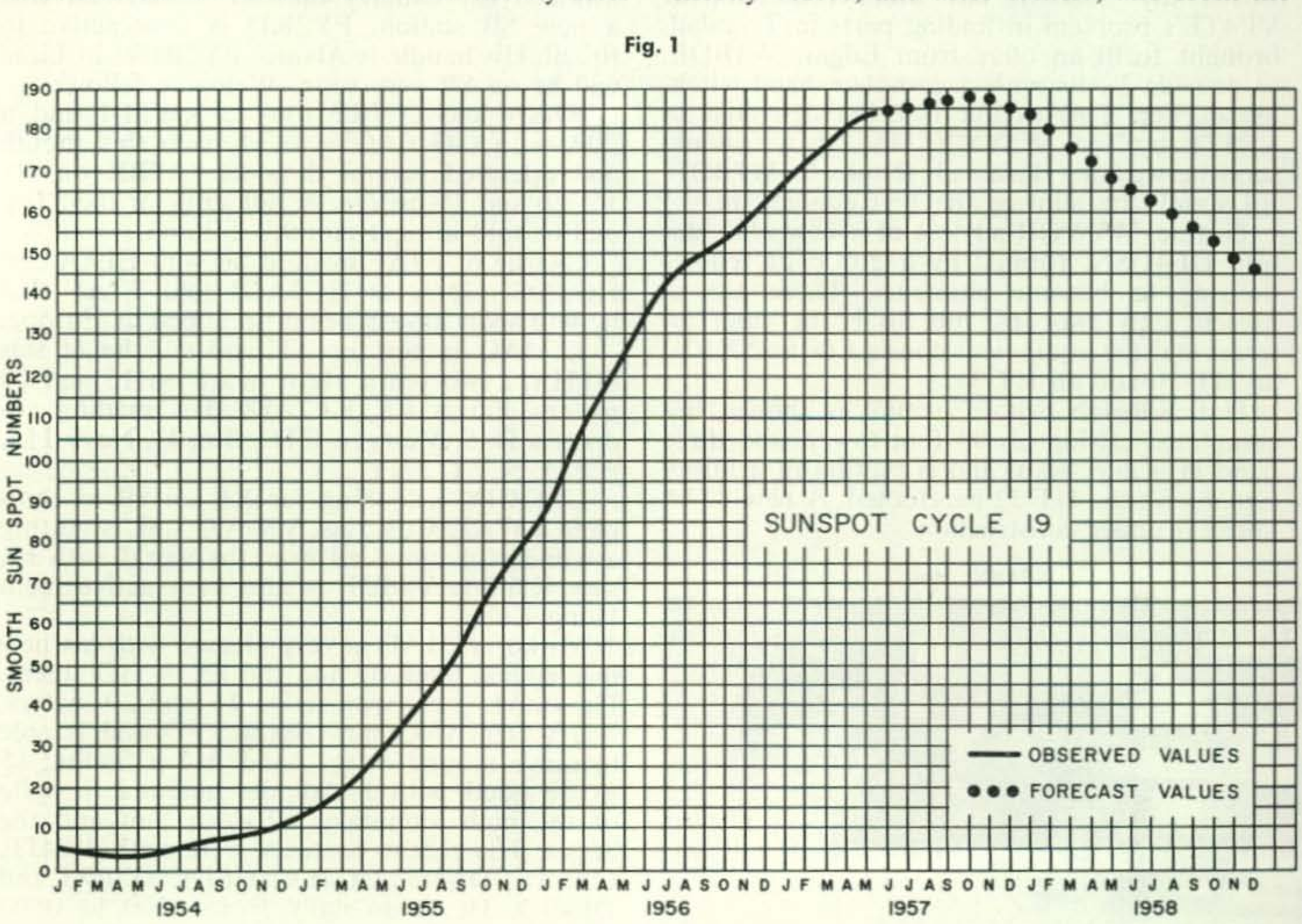
by **GEORGE JACOBS, W3ASK**
607 Beacon Road, Silver Spring, Md.

PROPAGATION

February Propagation

During February the sun continues its travels toward northern skies, and as it does so its distance from the earth is also increasing. As a result, less ultraviolet radiation sweeps across the ionosphere during the full daylight hours, causing somewhat lower values of MUF's than occurred during the winter months. This means fewer *6-meter* openings towards Europe and the Far East, although some openings to these areas *are* expected. *6-meter* openings to South America are expected to occur rather frequently during February and March. Conditions on *10-meters* should continue to remain excellent for world-wide DX from shortly after dawn through the early evening hours. With increased hours of daylight, the *15-meter* band is forecast to open to all areas of the world as often as it did during the winter months, and is expected to remain open for a longer period of time. On some days, DX reception on *15-meters* may be possible around-the-clock. The increased hours of daylight during February and the spring months also results in *20-meters* remaining open longer than during the winter months, with the band frequently expected to remain open for world-wide DX around-the-clock. During February, peak conditions are expected to occur *on 20-meters* shortly before, and after sunrise, and from the

Fig. 1



ALL TIMES IN EST

Eastern USA To:	*6/10 Meters	15 Meters	20 Meters	40/80** Meters
Western Europe	9A-1P (2)*	5A-7A (3)	5A-9A (3)	5P-7P (2)
	6A-8A (2)	7A-9A (4)	9A-3P (2)	7P-1A (3)
	8A-4P (4)	9A-12N (3)	3P-7P (4)	1A-3A (2)
	4P-6P (2)	12N-6P (4)	7P-1A (3)	8P-2A (2)**
		6P-11P (2)	1A-5A (2)	
Central Europe and European USSR	9A-1P (1)*	3A-5A (1)	6A-1P (1)	5P-7P (1)
	6A-8A (2)	5A-11A (2)	1P-5P (2)	7P-3A (2)
	8A-11A (3)	11A-3P (3)	5P-12M (3)	11P-2A (1)**
	11A-1P (4)	3P-6P (2)	12M-6A (2)	
	1P-4P (2)			
Eastern Mediterranean	9A-11A (1)*	1A-5A (1)	7A-1P (1)	6P-11P (2)
	6A-11A (2)	5A-7A (2)	1P-3P (2)	8P-10P (1)**
	11A-1P (3)	7A-11A (1)	3P-9P (3)	
	1P-3P (2)	11A-2P (3)	9P-12M (2)	
		2P-4P (2)	12M-7A (3)	
North and Central Africa	9A-12N (2)*	6A-12N (2)	6A-2P (1)	6P-8P (2)
	6A-11A (3)	12N-6P (4)	2P-4P (2)	8P-10P (3)
	11A-4P (4)	6P-9P (3)	4P-8P (4)	10P-1A (2)
	4P-7P (2)	9P-12M (2)	8P-3A (3)	10P-12M (1)**
		12M-6A (1)	3A-6A (2)	
South America	9A-12N (2)*	5A-9A (3)	1A-9A (3)	7P-9P (2)
	3P-6P (1)*	9A-2P (2)	9A-3P (2)	9P-4A (3)
	6A-1P (3)	2P-4P (3)	3P-5P (3)	4A-8A (2)
	1P-5P (4)	4P-8P (4)	5P-1A (4)	9P-5A (2)**
	5P-8P (3)	8P-2A (3)		
	8P-10P (2)	2A-5A (2)		
Central and South Asia	7A-9A (1)	7A-10A (2)	3P-5P (1)	8P-10P (1)
	6P-8P (2)	10A-6P (1)	5P-11P (2)	5A-8A (1)
		6P-10P (2)	11P-3A (1)	
			3A-9A (2)	
			9A-11A (1)	
Australasia	9A-11A (3)	8A-11A (2)	4A-8A (4)	4A-9A (3)
	11A-1P (2)	11A-5P (1)	8A-10A (2)	5A-8A (1)**
	1P-4P (1)	5P-7P (2)	10A-9P (1)	
	4P-6P (2)	7P-10P (3)	9P-12M (2)	
	6P-9P (3)	10P-2A (2)	12M-4A (3)	
	9P-11P (2)			
Guam & Pacific	4P-6P (1)*	8A-12N (2)	7P-9P (1)	10P-6A (1)1
	3P-5P (2)	3P-5P (2)	9P-12M (3)	
	5P-7P (3)	5P-9P (3)	12M-5A (2)	
	7P-9P (2)	9P-11P (2)	5A-7A (3)	
	9P-11P (1)		7A-9A (1)	
Japan & Far East	4P-6P (2)	3P-5P (2)	3P-5P (1)	3A-8A (1)
	6P-8P (3)	5P-8P (3)	5P-3A (2)	
	8P-10P (2)	8P-10P (2)	3A-8A (3)	
			8A-10A (2)	
Antarctica	7P-11P (1)	6A-8A (3)	3P-6P (1)	12M-7A (2)
		8A-12N (1)	6P-11P (2)	1A-5A (1)**
		12N-7P (2)	11P-4A (3)	
		7P-12M (3)	4A-9A (2)	
		12M-6A (2)		

ALL TIMES IN CST

Central USA To:	*6/10 Meters	15 Meters	20 Meters	40/80** Meters
Western and Central Europe	9A-11A (1)*	5A-8A (2)	4A-8A (3)	6P-1A (2)
	6A-8A (2)	8A-10A (3)	8A-12N (1)	8P-12M (1)**
	8A-10A (3)	10A-2P (4)	12N-3P (2)	
	10A-1P (4)	2P-4P (3)	3P-8P (3)	
	1P-5P (2)	4P-9P (2)	8P-4A (2)	
Southern Europe and North Africa	8A-11A (1)*	5A-11A (3)	7A-12N (1)	6P-1A (2)
	6A-10A (3)	11A-2P (4)	12N-2P (2)	8P-12M (1)**
	10A-2P (4)	2P-7P (3)	2P-8P (4)	
	2P-6P (2)	7P-12M (2)	8P-12M (3)	
			12M-7A (2)	
Central and South Africa	8A-11A (1)*	12M-2A (1)	6A-12N (1)	6P-10P (2)
	6A-9A (2)	6A-11A (1)	12N-3P (2)	9P-12M (1)**
	9A-12N (3)	11A-2P (2)	3P-9P (4)	
	12N-3P (4)	2P-6P (4)	9P-12M (3)	
	3P-7P (2)	6P-9P (2)	12M-6A (2)	
South America	8A-11A (2)*	5A-9A (3)	12M-8A (3)	6P-4A (3)
	5P-7P (1)*	9A-2P (2)	8A-2P (2)	4A-8A (2)
	6A-2P (3)	2P-7P (4)	2P-4P (3)	8P-4A (2)**
	2P-5P (4)	7P-12M (3)	4P-12M (4)	
	5P-7P (3)	12M-5A (2)		
	7P-9P (2)			
Japan & Far East	3P-6P (1)*	2P-4P (2)	7A-9A (3)	12M-8A (1)
	2P-4P (2)	4P-10P (3)	9A-1P (1)	1A-7A (1)
	4P-7P (3)	10P-12M(2)	1P-5P (2)	
	7P-9P (2)		5P-2A (3)	
			2A-7A (2)	
Central and South Asia	5P-7P (1)*	7A-12N (2)	4P-9P (2)	8P-10P (1)
	8A-11A (2)	12N-3P (1)	9P-3A (1)	4A-8A (1)
	11A-3P (1)	3P-9P (3)	3A-5A (2)	
	3P-5P (2)	9P-12M (1)	5A-8A (3)	
	5P-8P (3)		8A-10A (1)	
Hawaii	11A-4P (2)*	8A-3P (3)	7A-3P (2)	9P-7A (4)
	10A-2P (3)	3P-11P (4)	3P-6P (3)	7A-9A (2)
	2P-7P (4)	11P-3A (3)	6P-2A (4)	11P-7A (3)
	7P-9P (3)		2A-7A (3)	
	9P-11P (2)			
Australasia	5P-7P (1)*	7A-9A (3)	6P-12M (2)	3A-9A (3)
	8A-11A (3)	9A-3P (2)	12M-3A (3)	4A-7A (1)**
	11A-4P (2)	3P-8P (3)	3A-8A (4)	
	4P-8P (4)	8P-11P (4)	8A-10A (2)	
	8P-11P (2)	11P-3A (2)	10A-6P (1)	
Antarctica	7P-11P (1)	6A-8A (3)	3P-6P (1)	12M-6A (2)
		8A-12N (1)	6P-11P (2)	1A-4A (1)**
		12N-6P (2)	11P-3A (3)	
		6P-12M (3)	3A-9A (2)	
		12M-6A (2)		

late afternoon through the evening hours. Fairly good DX propagation conditions are expected on *40-meters* from shortly before sundown, through the hours of darkness, until shortly after dawn. Early morning openings to Australasia are expected to improve considerably on *40-meters* during February and the spring months. Both ionospheric absorption and static levels increase during February, and their affects should be quite noticeable on both *80 and 160-meters*. Only an occasional nighttime DX opening is forecast for *80-meters*, with even fewer openings on *160-meters*.

Outlook, 1958

As predicted in this column as early as March, 1956, the present sunspot cycle, cycle 19, has reached a level of activity higher than ever recorded previously. The latest *smoothed sunspot number*, centered on May, 1957, is 184. The latest monthly number reported by the Zurich Solar Observatory is 207 for November, 1957. Although it is not yet certain, evidence indicates that the peak of the present cycle was recorded during the fall of 1957

[*Continued on page 112*]

ALL TIMES IN PST

Western USA To:	*6/10 Meters	15 Meters	20 Meters	40/80** Meters
Europe and North Africa	8A-11A (1)*	6A-9A (2)	11P-2A (3)	7P-12M (2)
	6A-8A (2)	9A-1P (3)	2A-8A (1)	8P-12M (1)**
	8A-11A (3)	1P-3P (2)	8A-1P (2)	
	11A-2P (2)		1P-6P (3)	
			6P-11P (2)	
Central and South Africa	8A-3P (1)*	6A-9A (1)	12N-2P (1)	6P-10P (1)
	6A-9A (2)	9A-12N (2)	2P-4P (2)	
	9A-12N (3)	12N-2P (3)	4P-6P (3)	
	12N-4P (4)	2P-7P (4)	6P-9P (4)	
	4P-7P (2)	7P-11P (2)	9P-12M (2)	
South America	8A-12N (2)*	5A-8A (3)	8A-2P (1)	7P-9P (2)
	3P-7P (1)*	8A-12N (2)	2P-4P (2)	9P-4A (3)
	6A-12N (3)	12N-8P (4)	4P-10P (4)	4A-6A (2)
	12N-4P (4)	8P-2A (3)	10P-2A (3)	9P-2A (2)**
	4P-8P (3)	2A-5A (1)	2A-8A (2)	
	8P-10P (1)			
Guam & Pacific	12N-4P (1)*	10A-12N(2)	8P-10P (2)	2A-6A (2)
	11A-4P (3)	12N-4P (1)	10P-2A (4)	3A-5A (1)**
	4P-6P (4)	4P-6P (2)	2A-7A (2)	
	6P-10P (2)	6P-10P (3)	7A-9A (3)	
		10P-12M(2)	9A-11A (1)	
Australasia	2P-5P (2)*	7A-12N (3)	6A-10A (3)	2A-7A (3)
	8A-1P (3)	12N-6P (1)	10A-12N (2)	3A-6A (2)**
	1P-5P (2)	6P-11P (4)	12N-8P (1)	
	5P-8P (4)	11P-1A (3)	8P-11P (2)	
	8P-11P (3)	1A-7A (1)	11P-2A (4)	
			2A-6A (2)	
Japan, Okinawa and Far East	3P-5P (1)*	12N-4P (3)	6P-8P (2)	1A-6A (3)
	12N-3P (3)	4P-8P (4)	8P-4A (4)	2A-5A (1)*
	3P-7P (4)	8P-11P (3)	4A-10A (3)	
	7P-9P (3)		10A-12N (2)	
			12N-6P (1)	
Philippine Is. and East Indies	4P-6P (1)*	8A-11A (3)	12M-2A (1)	4A-6A (1)
	8A-10A (2)	11A-8P (1)	2A-6A (3)	
	10A-1P (1)	8P-12M(2)	6A-8A (2)	
	1P-6P (3)		8A-10A (1)	
	6P-8P (2)			
Malaya and Southeast Asia	4P-6P (1)**	8A-12N (3)	12M-3A (1)	4A-8A (1)
	9A-11A (2)	12N-3P (1)	3A-9A (3)	
	11A-2P (1)	3P-6P (3)	9A-11A (2)	
	2P-6P (3)	6P-10P (2)		
	6P-10P (2)			
Hong Kong, Macao and Formosa, etc.	4P-6P (1)*	1P-5P (2)	4A-9A (3)	3A-7A (2)
	1P-9P (3)	5P-9P (3)	9A-11A (2)	4A-6A (1)**
		9P-11P (2)	11A-7P (1)	
			7P-10P (3)	
			10P-4A (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.

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 March 15, 1958. All forecasts are based upon ionospheric data published by the CRPL of the National Bureau of Standards, Boulder, Colo.

Novice

by **DONALD L. STONER, W6TNS**
P.O. Box 137, Ontario, Calif.

Hey you! Yes, you thumbing through CQ Magazine on the news stand. Want to become a Radio Amateur? Sure you do, or you wouldn't have gotten this far back in the book. Honest, it's not hard. Remember boning up for the mid term exams last semester? It's about that stiff, and a darn sight more fun! Ham radio operation could be a turning point in your life. If you have a genuine interest, drop me a card or letter and I will put your name in the help wanted section. Before you can say "Jack Robinson" a helping Ham will contact you and put you on the pleasure path towards your own hamshack.

All the hustle and bustle has subsided getting that super duper silver plated converter for satellite reception working. Looks like I'll have to set it aside for a while, unfortunately. I was very sorry to hear of the failure of the Vanguard rocket as I am sure you all were.

This month's column includes some pieces of new commercial gear that will be of particular interest to Novices.

World Radio Labs, Broadway at 34th, Council Bluffs, Iowa has introduced two antenna couplers for amateur use. The *Globe Matcher, Jr.* Model AT-3 will be found in many a Novice station from now on. The AT-3 is designed to operate with any type of transmitter with a power input of 100 watts or less. It is contained in a very attractive grey hammertone case measuring five inches high, 4 inches deep, four inches wide and weighing approximately two pounds. The cabinet is completely enclosed to insure that those nasty harmonics in your transmitter stay bottled up where they belong. The Globe Matcher, Jr. aids materially in transforming the impedance of random length antennas and long wires to your transmitter.

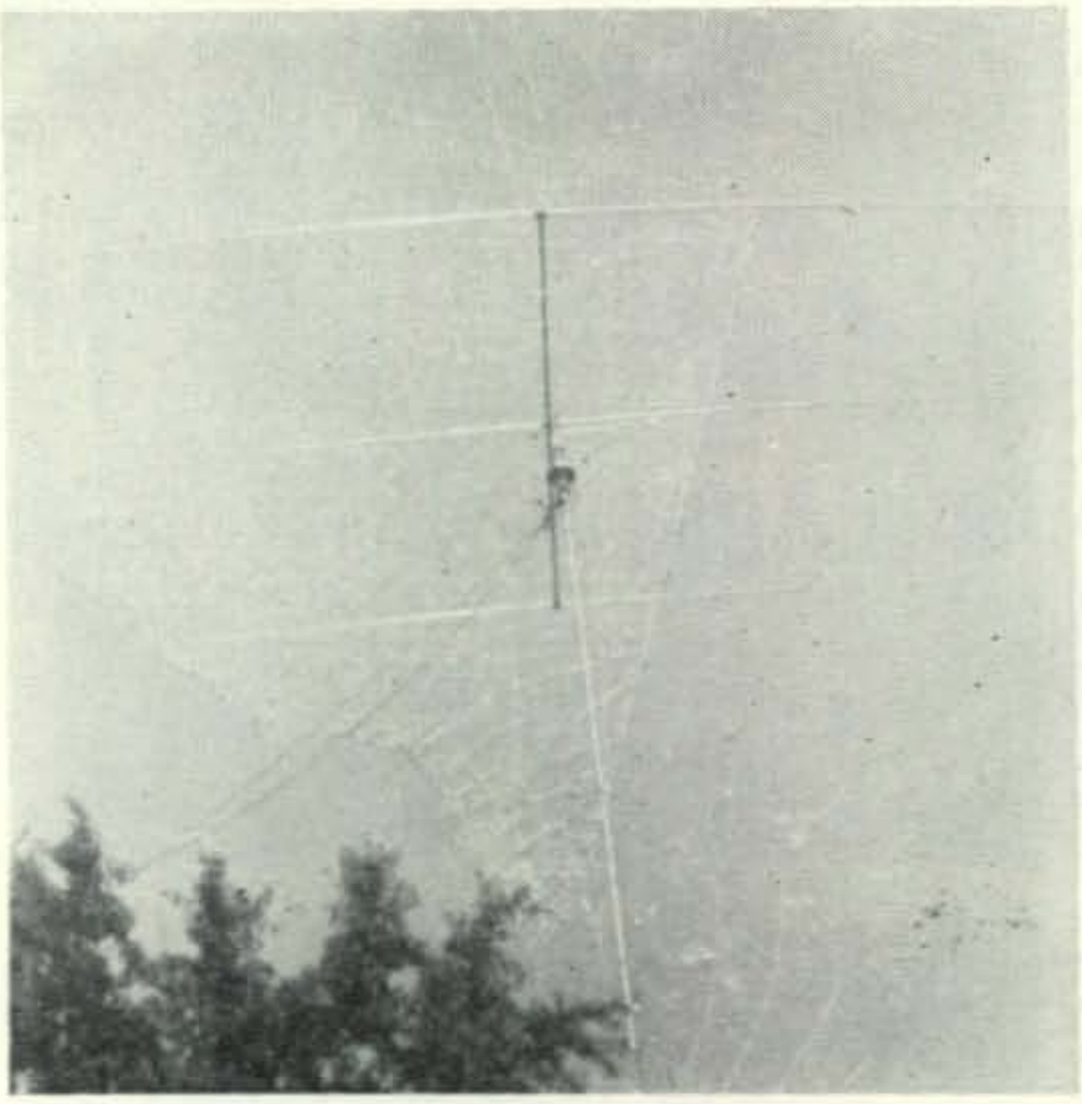
In operation, you simply adjust the TRANS. COUPLING and the ANT. TUNING until the desired amount of loading is obtained, as indicated by your transmitter plate current meter. A neon bulb is provided on the front panel of the AT-3 to indicate the presence of rf. This antenna coupler will provide a definite increase in radiated power when you replace

Ralph, WN2RZJ, 2-19 27th Street, Fair Lawn, N. J. has worked 22 states for WAS so far and will sked anyone for WAS or rag chew. He can be found splitting the ether on 40 meters.

Jim Hauser, KN2YJN, 62 Harrison Avenue, Kenmore 23, N. Y. uses a Gotham 3 ele. wide-paced beam, up 55 feet as shown. Jim has racked up 29 countries and some of the better DX includes ZC4, UA1, PS, FA8, GD4, EA, OK, HA1, ZI2, MP4, CX5, and an assortment of F's and G's. He still needs Nevada and Utah for WAS.

North Carolina is represented by Dick Paschall (14), KN4QZG, 106 Bryan Court in Jacksonville. Dick picks 'em up and puts 'em down with a DX-35 and an S-38D along with a 15 meter dipome. DX includes VE5-6 and WP4.

Picture of a contented man. . . . B. G. Mancel, KN9IUH, 6076 N. Giffond St., Indianapolis, Ind. sports a 75A1 plus a beautiful home brew rig all contained in a 19" rack. Looks like a terrific idea for small spaces.



the all too common method of "brute force loading" of random and long wire antennas. Amateur Net on the AT-3 is $15.95. The instruction is very complete and the constructor should have no difficulty in completing the unit.

No need to junk your "CW only" rig when the big day arrives and you fire up for the first time on the General Class frequencies. World Radio Labs also makes a Screen Modulator for adding voice modulation to *any* transmitter in the 50 to 75 watt class. Although this little gem is designed specifically for the Globe Chief Model 90 transmitter it may be used with any other transmitter such as the Heath AT-1, Johnson Adventurer, and the Knight 50 watter. Complete conversion instructions are provided for converting these transmitters and the same techniques would apply to others such as the DX-20.

The Model SM-90 Screen Modulator is housed in an attractive grey chassis box measuring approximately 5 X 3 X 2 inches, and the tubes and transformer project through the top. On the side of the chassis is an eight pin octal plug that connects to the accessory socket on cw transmitters and provide all interconnections between the units. A printed circuit board greatly simplifies wiring of the modulator. The theory of operation is very simple. A 12AX7 dual triode amplifies the tiny microphone voltage to a usable level. This voltage, in turn, drives the first half of a 12AU7 (another dual triode) which provides even more audio voltage for the modulator. Transformer T1 couples energy to the second half of the 12AU7. This section of the tube is connected in series with the voltage feed to the final amplifier screen of your "CW only" transmitter. As the audio modulation voltage varies, it causes the second half of the 12AU7 to pass more or less voltage to the screen of the final amplifier. The final amplifier screen voltage directly controls the power output of your transmitter and since

Thanks to Kelly Johnson, WØYNY, the Scout Master of Troop 222 from Dawson, Minn. for this shot of the station at the Boy Scout Exposition at Montevedio, Minn. From left to right: Howard Nelson, SWL, Eric Solie, KØESQ, Stan Molstad, KNØHGP, Rolly Wold, KNØJYK, and Kelly Johnson, WØYNY.

My hats off to Mr. Edward Asay, K2GTX, of Middletown Township shown here instructing some of the 25 students enrolled in the Code instruction class sponsored by the Garden State Amateur Radio Association. The code classes are held every Tuesday and Thursday at the Red Cross Headquarters Bldg., Broad St., Shrewsbury, New Jersey.

A very neat short wave listening station belonging to Shinji Hasegawa, JA31050. Shinji reports that the examinations for an amateur license are very difficult in Japan.

your "voice voltage" is powering the screen it causes the transmitter output to change amplitude. Presto—amplitude modulation.

The manual is written in clear language and "can't miss" instructions are provided for converting your present transmitter. Amateur Net on the Screen Modulator SM-90 is $11.95.

Speaking of transmitters, I have been completely captivated by the New International T-12 transmitter. The T-12 provides all the essentials of a neat Novice cw transmitter but is not "packaged". By that I mean it is not boxed up in a pretty cabinet and doesn't have those shiney knobs that cost so much. It allows you to use your inventiveness in a manner that none of the other kits can do. When you complete the wiring of the simple printed circuit board (a one or two hour job), it can be installed in your own cabinet, in present equipment, in a mobile case, or in a portable case (for vacations and such). The number of ways that the T-12 can be used is only limited by your imagination.

Technically, the T-12 is completely contained on a 3½ x 6 inch printed circuit board (a pretty powerhouse placed on a printed package!) The output is between 3.5-4.0 mc and 7.0-7.3 mc with a power input of 14 watts. A 12BH7 is used as an oscillator-buffer and it drives a 5763 power amplifier. For ease of tuning the T-12 uses a pi-network antenna coupling system and will load any antenna between 50 and 500 ohms. By the way, with only a small amount of fussing, the little jewel can be modified to work on 15 meters. Because of the close control of circuit capacities, International can supply crystals with a .005% tolerance for those of you who like to work close to the band edges. Also, provisions have been made for separate connections to the final so that it can be modulated. They thought of everything! The only thing you will need to fire up the completed kit is a power supply (capable of supplying 350 volts at 60 ma. and 6.3 volts ac at 1.35 amps and a key. The cost of the kit, including one crystal for either 80 or 40 meters is only $10.95, less tubes. Tubes cost about $3.00.

The Heath Company's latest contribution to better amateur operation is the AM-2 Reflected Power and SWR Bridge. As you know, I have been spouting about these bridges ever since QST brought out the Moni-match II. The Heath AM-2 is a commercial version of the bridge designed by the Naval Research Labs and indicates how much juice is coming back down your transmission line, with respect to how much you are sending up. It doesn't tell you how much power you are actually putting out. Who cares? What it does tell you is how to tune your rig and antenna coupler so that the most power is radiated by your antenna. That's what counts! If you desire to prove its effectiveness, tune your rig as you would normally and check the signal strength at some remote location. Then insert the AM-2 and retune (and you will have to) for minimum reflected power. Now note the increase. During such a test at this QTH I was able to increase the reading by several "S" units on a friends receiver.

The AM-2 is housed in a grey cracke cabinet measuring roughly 7 X 4 X 4½ inches and is designed to work with either 50 or 70 ohm transmission lines and it handles a full gallon with ease. The front panel is graced by a very exotic meter that is calibrated in percent of reflected power and the standing wave ratio.

I firmly believe that every ham should use an SWR indicator for maximum performance. If you are too busy to build one, the Heath AM-2 is an easy way out at $15.95.

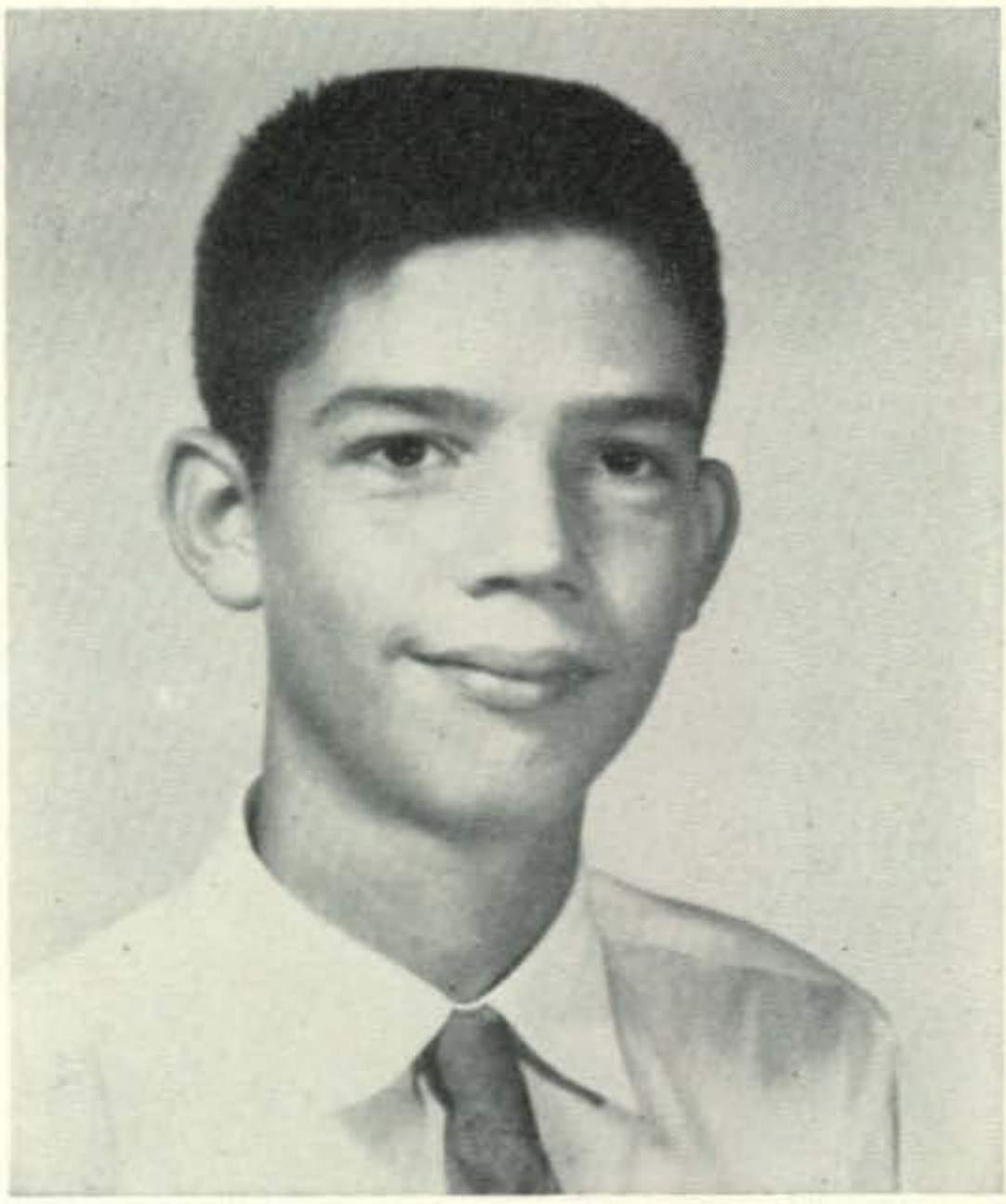
If you build the AM-2 observe the following precautions. The nuts on the meter studs on my unit were very tight and require some *careful* wrench juggling to loosen. I understand this is not common to all the meters; thought I should mention it tho. Also, just before you are ready to insert the trough in the rear of the case check the fit of the coax connectors. This can be done by slipping the connectors in the mounting holes from the back of the case. The holes may need enlarging or it might be necessary to re-position the connectors slightly. It is a very simple operation and it might save wear and tear on the vocabulary.

Who's DX?

I received a very nice letter from Shinji Hasegawa JA3-1050, #1815-15 Higashi Maiko-cho, Tarumi-ku, Kobe, Japan describing some of the amateur conditions that exist in Japan today. One unusual aspect is that beginning Japanese hams can use phone but not CW! Also, power is limited to 100 watts, and the highpower KA stations cause a lot of QRM to the JA stations. Although he did not include the dates and times, Shinji reports hearing the following Novice stations: KN6CLJ/MM, KN6YLQ, KN6VSG, WN6DHU, WN6EDE, WN7GZT, WN7HJY, WN7CNL, WH6CKK, WH6BXZ, WH6CBF, WH6CFU, and WL7BZQ. Many thanks to you for the report, Shinji. Hope to hear more from you in the future.

Here is the monthly list from our friend Tima Popivic, YU1-RS-357, Banat, Novo Selo, Yujoslavia. October 21, at 0220 GMT on 7 mc. KN4RGN. Oct. 20, 21 mc, 1800-2100 GMT, KN1AMI, BMN, BNV, CIA, DDC, DJG, KN2BLL, WN2HFU, TKZ, TTG, KN2YGV, YLE, YUX, YYA, ZJB, KN3AFP, AHB, WP4AIL, KN4OHC, ONY, PLQ, QNL, RHQ, KN5JCQ, KN8HAL, HJP, HRP, KN9HKE, HNW, IHN, KNØINR, IPY, IWQ, KOB, KUF. Oct. 21, 21 mc, 1900- 2100 GMT: KN1BNG, KN2CAT, WN2NIB, KN20SU, PSU, YMU, YQG, YQL, ZPG, KN4MUP, PIA, QIY, KN8DSL, EZQ. Oct. 22, 21 mc, 1800- 2030 GMT; KN1BRO, CSB, DAA, DAI, DIR, WN2FOB, KN2ZGG, KN3BCE, BQZ, KN4MVX, PFD, RDD/4, RIV, RNC, KN9HEL. Nov. 1, 21 mc, 1920, 2200 GMT: KN1CAK, CKK, CPD, CTN, DJX, LIU, KN2AHZ, CDO, DLU, WN21YB, ROU, KN2ZNS, KN3BZV, KN4MZO, OUZ, PQV, QBW, QHB, KN4RIX, RMK, RNU, RPD, KN6YME, KN8EBE, EUK, GAZ, GVK, HWN, ICE, KN9HQS, HYW, IBP, IQS, IQY, KAL, KNØHWK. Nov. 2, 21 mc, 1800- 2120 GMT: KN1AQL/1, AYQ, BAU, BHB, BZK, CFP, CZR, DSN, DSX, KN2CNQ, CYR, WN2HPR, JKK, JOZ, MZR, KN2VOD, YGN, YIT, YPT, ZGZ, ZRF, KN3AHK, AOX, AYT, AZC, BQS, BYV, DYV, WN3JPQ, KN3LQS.

Hubert Moore, K4OID, 406 Massalina Drive, Panama City, Florida is 15 years old and knocked the "N" out of his call a month ago. He can be found on 80, 40 and 15 running a Globe Scout 680.



WP4AKA, KN4ELW, MKN, MQB, PUZ, PWY, QHI, RCR, SFP, KN5JEH, JQO, KEW, KSV, KYH, KN6YOU/3, KN8EFI, EOT, ERX, GUP, GYU/2, GZI, HAI, HAY, HGY, IOT, JTK, KN9GNO, HQM, HSS, IDW, IGS, INW, IUI, IYW, JDC, JTI, JXZ, MSG, KAR, KNØIPG, IPZ, JWR, LIJ, LVF, LWT. Many thanks to you also Tima for this nice report. Remember fellows, if you write to our overseas reporters for confirmation or for listening schedules remember to include sufficient International Reply Coupons. You can afford it!

Bouquets

I want to thank everyone who has read *The Novice and Technicans Handbook* and written to say how much he enjoyed it. W6SAI and I appreciated your kind comments more than you know! This was my first attempt at a handbook, and I'm happy that it has been so well received.

In case you haven't run across the article titled *A $1.69 Keying Monitor* page 42 of the Sept. 57 issue of QST, look it up. This is one of the simple Novice aids that a column editor often overlooks. If you are like me, and need to hear what you are sending, this is for you.

Net News

Ronny McCloud, W1DVT, 20 Wellington St., Shelbune Falls, Mass., would like to start a teenage net on six meters. Contact him for more information.

Bob Ogren, KN1CVH, 931 Pleasant St., New Bedford, Mass. is starting a net called the School Kids Teenage Net. NCS will alternate between KN1CVH and Boyd Colglazier, KN9IHO, on a frequency of 21.105 mc. For more information write to either Bob or Boyd.

Help Wanted

Larry L. Langrehr, 1431 East Avenue, Berwyn, Ill., would like help with the code and theory. Larry's phone number is GU 4-7605.

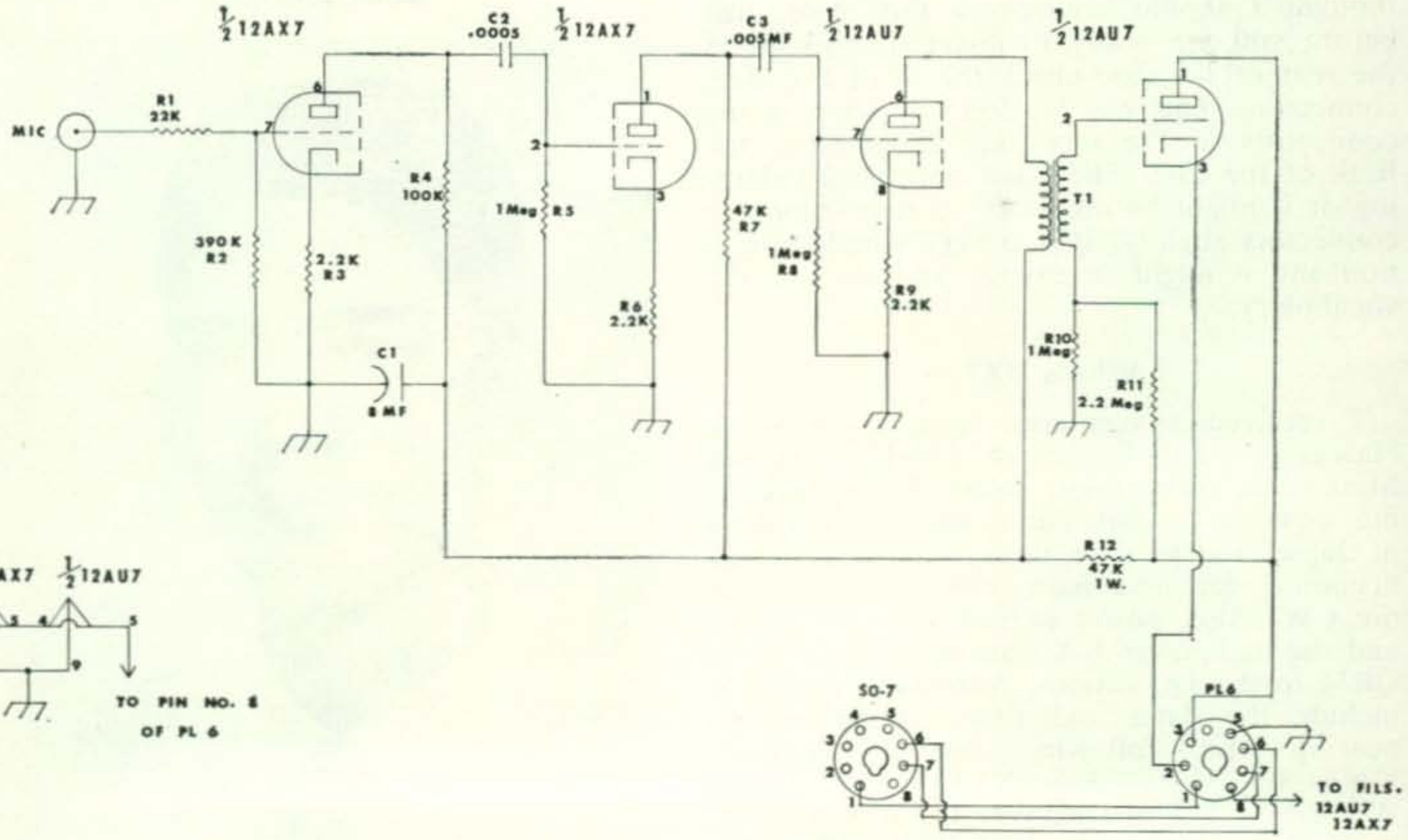
Robert D. Thornton, Forest Park, West Point, Georgia can send and receive 15 wpm but would like help with the theory.

Phil Haley, 217 Country Club Lane, Belleville, Ill. is 14 and would like to meet a local ham to help him with the code. His phone number is EX 7-6554.

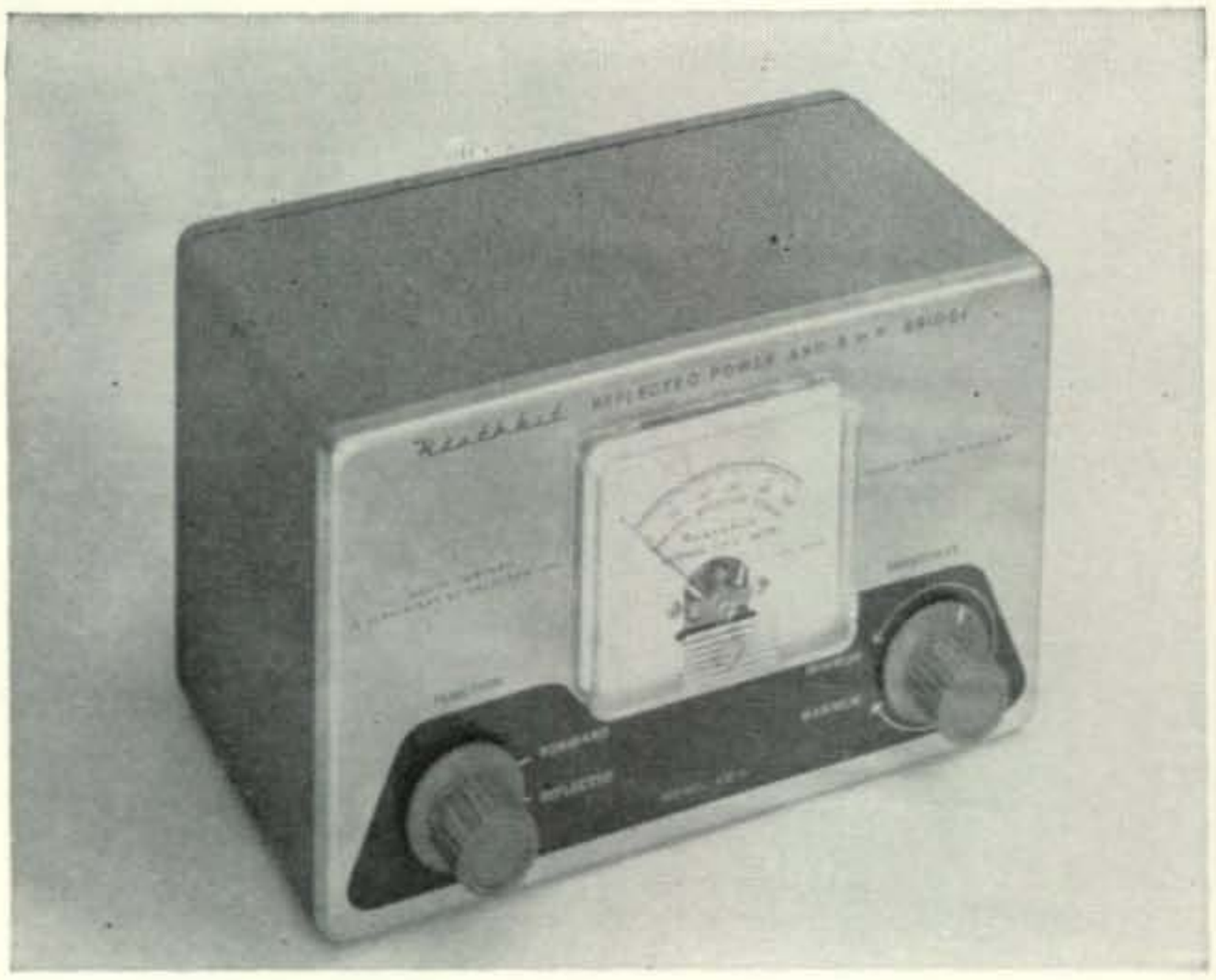
Morris G. Heins, KN4RJN, 443 Grandview Street, Memphis 11, Tenn. is hammering at the ether with a Globe Chief 90 and an SX-42 and operates on the 15 and 40 meter bands. WAS is 28 and the DX includes LU3, VE3, 4, 7, and 8, not to mention an non-existent GW1.

Cliff Anthony, KN1BYL, 30 Prospect Hill Road and Al Woodhull, 220 Lincoln St. of Lexington, Mass. both wrote to express their thanks to "Pop" Wilkins, W1DFK for helping them and other fellows to obtain their Novice tickets. Al and Cliff run 35 and 75 watts respectively, don't work much DX but sure have a lot of nice rag chews.

John Winzeler, KN9IEI, 624 Surrey Lane, Glenview, Illinois runs 25 watts to the homebrew rig that is described by the ARRL in *How To Become A Radio Amateur* and has worked five states and did FB in the first half

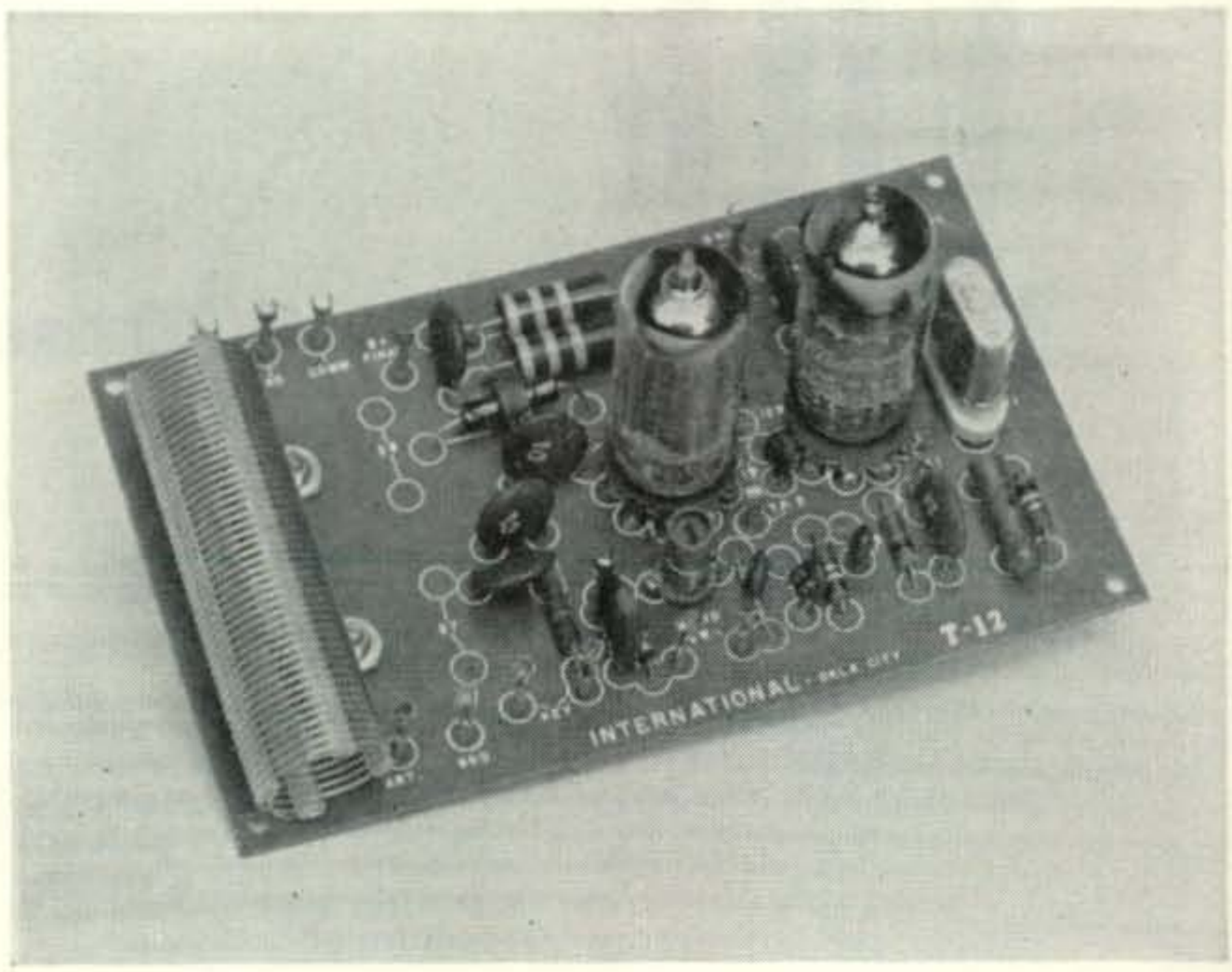


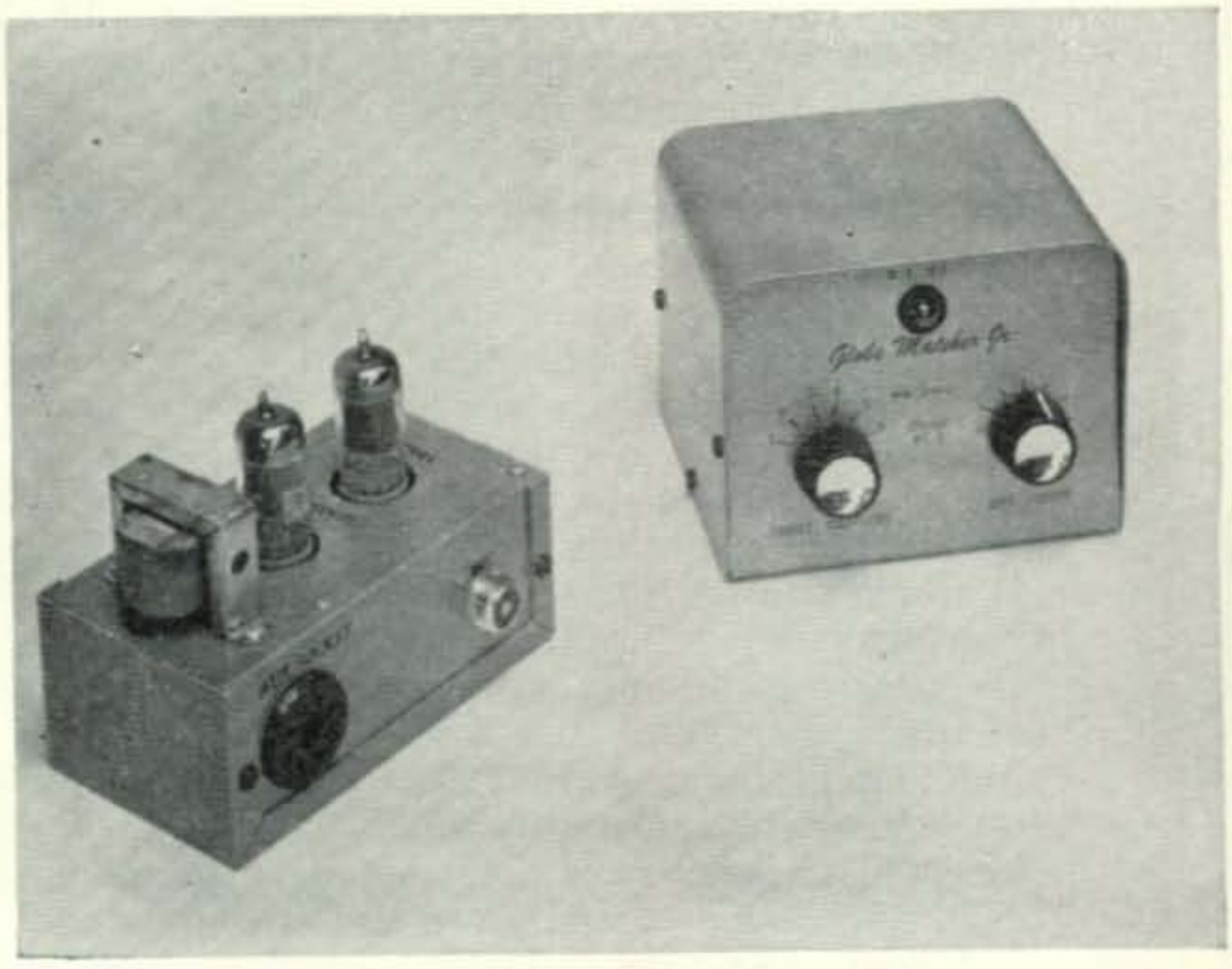
The Heath Reflected power and SWR Bridge, Model AM-2. Notice the new plastic meter now being used by Heath, jazzy huh?



International Crystals 80 and 40 meter transmitter model T-12. The two capacitor screw slots partially hidden by the coil are the loading (pi network) and the final plate tuning.

On the left a printed circuit screen modulator kit manufactured by World Radio Labs. This unit will adapt any Novice cw transmitter for phone operation. The Globe Matcher Jr. is an antenna tuner for any transmitter in the Novice power range.





of the S.S. contest. John uses a National NC-88 as the inhaler.

Roy "Question Mark," Box 52, Columbia, Miss. has passed his Novice exam and plans on a DX-20 transmitter, an S-53A receiver and a WRL multiband antenna for 80, 40, 20 and 10 meters.

Myron "Question Mark" (*not related to Roy*) 202 Howard Street Bellevue, Ohio is another almost Novice. Myron uses a Hallicrafters S-40B, and although this is a good receiver, he still has not caught on how to concentrate on one signal in the QRM. Possibly some local ham can show Myron some of the tricks or help him work out a "Q" Multiplier circuit for the S-40.

Kent Carlson, WH6CJJ, Box 713, Wailuku, Maui, T. H. is finally putting a signal into the states on 15 meters. The first contact was with KNØIYO and has now worked 18 states in all call areas except KN2. Kent can be found on 15 between 6:00 and 8:00 pm PST and will be looking for you.

Jonas R. Savage, WN6FRG, R2 Box 900 Vacoville, California is an almost General. He is planning on a 500 watt rig with a pair of 5514 in the final and Collins 70E8 VFO. Jonas is currently using a modified AT-1 and an SX-28A receiver.

William J. Rezzonico, WN6EDE, 715 Maddux Drive, Colima, California says that he never has enough money at any time to subscribe (*tsk, tsk*). He must have spent it all on the HQ-140-X, the Mosley Super "5", the Donner crank-up tower, the Heath DX-35, not to mention the home brew gear. Hummm. He has worked all call areas, 42 states, Canada, Alaska, Hawaii, and Guam. 352 contacts in 6 months, not bad at all.

Tex Birnholz, K2VAB, 634 High Street, Newark 2, New Jersey will sked anyone needing the Garden State for WAS.

Charlie, K9GSV, Hanusin, 2021 Indianapolis Blvd., Whiting, Indiana is on 40 meters

[*Continued on page 77*]

VHF

50mc. 144mc. 220mc. 420mc. and above

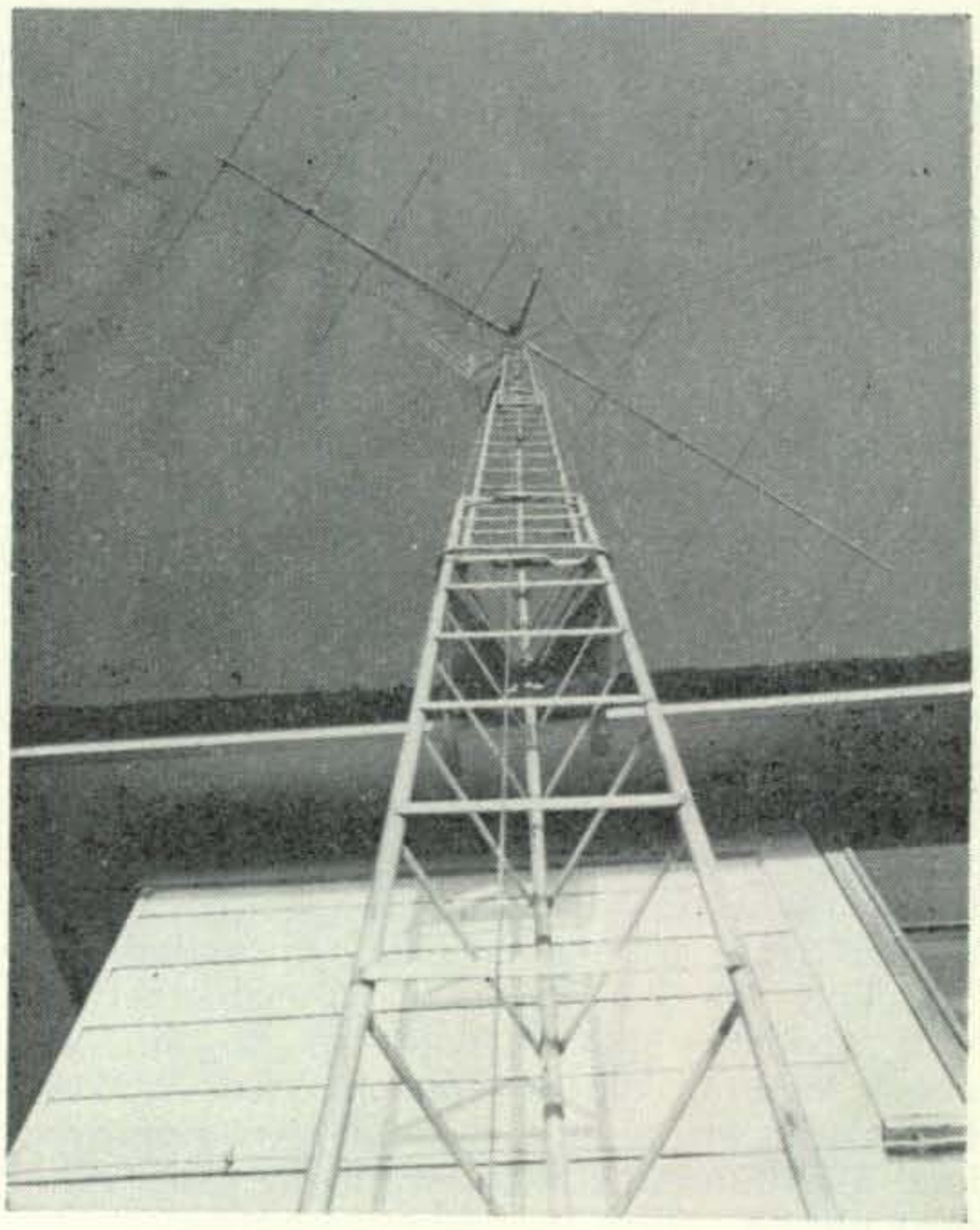
by **SAM HARRIS, W1FZJ**
P.O. Box 2505, Medfield, Mass.

In the six meter "Question and Answer" box I find a preponderance of "how do I get rid of channel 2" letters. These are closely followed by "How do I get rid of W1FOS*" (*local high power station) and are backed up by on the air comments such as: "When she points her beam my way I can't hear anything but her" or "every time he comes on I can hear his sidebanks a megacycle away", etc. The majority of these complaints are the direct result of inadequate receiving facilities.

CHANNEL 2

Interference from Channel two doesn't just happen. It is generally the result of spurious frequencies which are generated in your converter. It is always possible, by the use of simple arithmetic, to determine the mechanics behind any spurious signal you hear. For example consider a crystal controlled six meter converter. I.F. output is 10 to 14 mc. Crystal frequency is 40 mc. The interfering signal is channel two video (as evidenced by a hum modulated signal every 15750 kc). Center frequency of the interfering video mess is 49,500 kc. (This frequency is determined by tuning in each successive carrier until the strongest one is found. The sideband signals will always be weaker than the carrier.) It becomes obvious upon inspection that 49.5 mc is not the sum or difference of any of the frequencies directly involved. (Video frequency of channel two is 55250 kc. Converter oscillation frequency is 40 mc). The signal appears to be on 49.5 mc, which means that our I.F. receiver is hearing it on 9.5 mc. A little arithmetic gives us 120 mc (third harmonic of the converter crystal) and 110,500 mc (second harmonic of channel

CQ VHF-UHF CONTEST ACHIEVEMENT AWARD



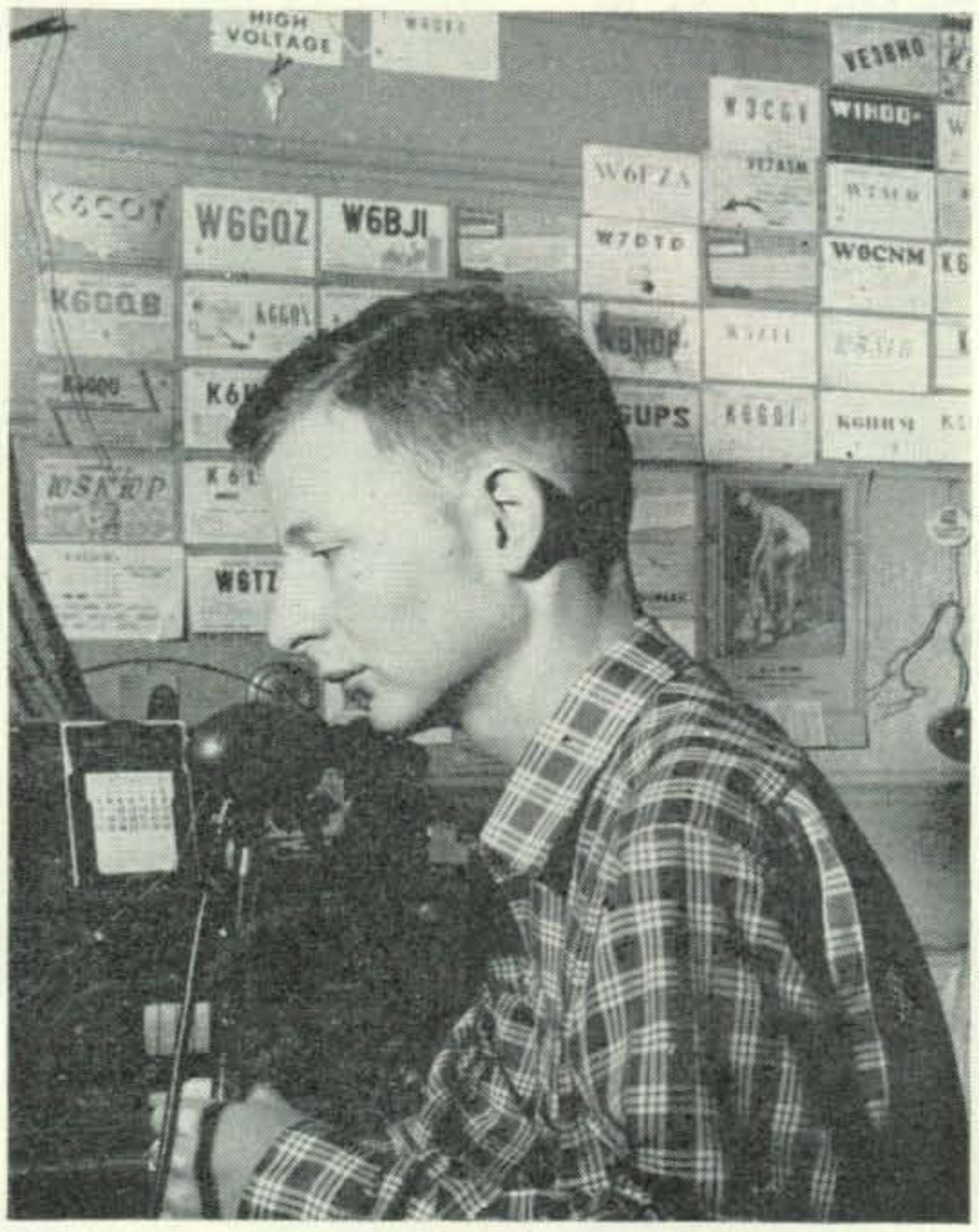
In case you have heard K6GDI this is what you were listening to. An 80 foot high, 30 foot long, seven element yagi, good for WAC.

two video). The difference frequency of these is 9.5 mc.

So there you are. One case of channel two interference tracked down. What to do about it? The first step is to put the blame where it belongs. Don't blame channel two. Don't blame the converter or it's manufacturers. They are both doing what they set out to. Each in his own way. It's just that they aren't compatible. T.V. stations make a point of having strong signals. Most good converters make a point of converting weak signals into readable ones. In the process of converting they usually use a non linear device called a mixer. Into this non linear device the local oscillator output is fed. In most cases in large enough quantities to drive the mixer well into the class "c" region. And class "c" means grid current and lots of harmonics so that even if your local oscillator signal is clean to start with, you still get lots of harmonics for spurious signals to beat with.

Now if you pump a few thousand microvolts of channel two into the front end of your converter and you have only the normal three or four tuned circuits ahead of the mixer—well, that's what you have been complaining about. Of course if you weren't so lazy and were willing to tune the R.F. stages in your converter, you probably wouldn't have any

K6GDI, Bob Perry, first W.A.C. on 50 mc.



problem. Unfortunately even if you overcome your laziness you would have to redesign your converter. And you know you can't build a good converter or your wife wouldn't have given you one for Christmas. So what can you do? Well, believe it or not, there have been several articles published in "CQ" on filters for various bands. One of these (July 1956 CQ) by Bob Kuehn (WØHKF) deals with six meters. While the article is labeled as a TVI filter it works both ways. Properly adjusted it will give sufficient selectivity to completely eliminate channel two type interference.

If you don't feel that plumbing is your forte, I guess you could find some one who would be glad to sell you one for a modest sum. (If you can find one for $25.00 or less that does the job, let me know.) (If on the other hand you are willing to pay $29.50, I'll be glad to tell you where.)

Now leave us not have any misunderstanding. This filter business will cure channel two type problems but it will not do anything about W1FOS type of interference. W2SHU had a few words to say about converter overload a few months back. We'll say some more next month.

EI2W

In case any of you VHFers don't know about Harry, EI2W, here are a few facts.

Harry took up VHF in 1951 and made the following "firsts" since that time.

144 Mc First EI–DL EI–ON EI-PAØ EI-F EI–GM EI–GI EI-GC EI-GD
435 Mc First and only EI-G (204 miles) EI-GW (147 miles)
70 Mc First EI-G
50 Mc First EI-W (W2JTE 10/27/57) EI-VE (VE3AIU 11/2/57)

Harry held the European Record on two meters in 1952 with a 655 mile QSO with DL3VJ. All his contacts have been made on phone and he has worked 298 two meter dx stations (outside Ireland) in eleven countries.

He formed the International VHF society some years ago to try to overcome some of the difficulties of operating VHF in Ireland. As all contacts made on the VHF bands in Ireland must be dx contacts, that is the first drawback. However, he managed to get a number of G and GM stations going, by providing a dx contact in EI land as a reward for their labors.

Harry is married, has a son at the University, is greatly interested in music, is a Governor of Wesley College in Dublin, has his finger in many local charities, AND expects to start writing a VHF book very shortly.

You can see from this very brief summary of Harry and his activities, that he just hasn't a thing to do except "ham".

Congratulations to our Irish friend who spends so much of his not-so-free-time promoting activity and new friendships on the VHF bands, both on his own continent and ours.

W.A.C. on Six (K6GDI)

KH6BRJ, LU4DFN, EI2W, ZE2JE and JA2QR got together and decided that old (Old?) Bob Perry ought to have WAC on six meters. So they worked him and he did. Bob worked half (about) of his continents with 100 watts to an 829B. Finished up with 200 watts to a pair of 4E27's. Antenna (see photo) is worthy of the name. In addition to six meters K6GDI also operates 220 and 420 and amateur T.V. I don't have a rundown on his T.V. transmitter but hope for more information next month.

Six meter Phone W.A.C. (W6BAZ)

Shortly after I heard EI2W working Paul (W6BAZ) I found out that Harry was all Paul

The smiling face left belongs to VK3GM, George R. McCulloch of Ballarat Victoria, Australia. The reason for the smile is the beautiful trophy at the left. The trophy is the "Ross Hull Memorial Trophy" awarded VK3GM by the Wireless Institute of Australia for being the top scorer with 969 points in the Ross Hull VHF Contest December-January 1955-56 on 50, 144, and 288 mc.

needed to make WAC on 50 mc phone. To say he was happy is putting it mildly. No photos from the King of the converter makers (no converters either). Congratulations are in order.

The VHF Institute Awards for operation above 146 mc in the 2M band

Certainly a splendid idea for increasing the activity in the hinterlands of our two meter band, thus following data will fill you in on a very simple but very ingenious contest.

1. Work 25 different stations while operating above 146 mc.
2. The station worked does not necessarily have to be above 146 mc, although it is preferred.
3. QSL's are not required as proof of contacts, but the Amateur VHF Institute reserves the right to call in the log of the station applying for the certificate.
4. Applications for the award must list each station call letters, date, time and applicant station frequencies.
5. Mail application to W2AOC, 9701 Shore Road, Brooklyn, New York.

We wish the VHF Institute success in this venture and are sure that the two meter fraternity will help by getting up in the band and making some noise so that the agitation against VHF ham bands can't say that we never use anything but a small percentage of the band.

Albuquerque, New Mexico From the scarcest (?) state (excepting Delaware) on six meters, comes word from Jim Shafer (K5LJJ).

"Hope to begin operation here on six meters by December 20th at the latest. Am only a technician and will be using 50 watts to a six element beam, but hope to supply that New Mexico QSO."

"Beginning the 22nd of December, I will be working nights and will be on the air during the day and evenings as much as possible. Will be looking forward to working anybody who needs or wants a New Mexico contact. *Anyone who doesn't need or want it?* My QSL's won't be fancy but they will be prompt." *That's all we want Jim, someone on six in New Mexico, who lets us know he surely will be on and wonder of wonders will QSL too.*

Roswell, New Mexico Another candidate to help anyone get that be-oo-tiful state on six meters, Frank Green (K5IQL) sez:

"Be glad to help anybody into New Mexico if they will do something about getting m.u.f. up to 50 mc! *I'm a-pushin'*. It peaks at 46 to 48 around 0900 m.s.t."

"Have worked VE1EF, VE1HT, VEL PQ. Hear W1QCC/VE1. Have heard British TV and broadcast in the 42 to 48 mc range."

"Incidentally, have had but one New Mexico contact on six myself, so you guys aren't doing so bad! My contact was W4SGI/5." *Congratulations to both of you.*

"This time last year, we were getting good trop. into Texas on two meters. Not a peep this year. Am beginning to think this section is for the birds!" *Not so Frank, fer Heaven's sake, don't give up now, not until we nab you anyway.*

Terre Haute, Indiana Charles (W9ZHL) sez:

"50 mc very good here in Terre Haute, Indiana. On 11/11/57 I heard KH6CN and KH6PP; 11/16/57 I worked KL7AH, KL7AUV and KL7CDG, heard KL7AZI and KL7CDS, all from 1300 to 1700 CST. At 1650 I heard JA8AO for about ten minutes, he was working into the W7 area. I heard Alabama, Pennsylvania, New York, Ohio, Connecticut and Massachusetts on reflected skip with the beam pointed northwest. *Confusing sometimes, isn't it?* Hear the east coast fellows working the west coast about every day but don't hear the west coast stations. Just 1's and 2's on reflected skip with the beam to the west." *Thanks for the dope, Charles, we have lots of that same thing here when you boys are working skip, dx, or what have you. Can hear you but not the important fellow.*

Sointula, British Columbia Ike comes through for British Columbia, and I think everyone in the states knows that Ike just has to be VE7AQQ.

"Just thought I would let you know that I worked JA3JJ on 50 mc on November 13th at 1555 P.S.T. JA5BU at 1620 plus two others, one on cw, whose calls I could not completely identify. Also worked KH6PP and KH6NS on November 10 and KH6UK and KH6CCZ on November 11th. About 1230 P.S.T., all good strong signals. Also heard LA9T on cw on November 5th." *Since this was written, and at last report Ike had worked sixty-five JA's.*

Benson, Arizona Herb Johnson (W7GRA, ex W6QKI, ex W3QKI, ex W8QKI) sends news from his area.

"Six meters finally came to life around here. Been dead for two months. Worked EI2W on mornings of November 16th and 19th. He was very good S7 on the 19th. VE1's were very strong and W1's fading between S7 and nothing. Heard W1HOY and called but N.D. Guess 6's were riding in too loud."

"Looked on ten for cross band to England but N.D. Found out later that G2BVN had been calling me, sorry I missed him. KL7's have been coming in after VE1's fade out, *here too*, along with very bad QRM on low end from scatter stations. They splash up as high as 50.1 mc. I hear them only when the KL7's are coming through, but at times I can't copy a thing below 50.1."

"Band was open today during operation 'Smoke Puff'. No noticeable effect." *Glad it started opening up for you too Herb. Started here about the 1st of November.*

Porterville, California One of the VHF gals has come through for us, Norma (K6ZEH) tells us of activity at her QTH.

"Sunday, November 10th, the O.M. and I worked Hawaii and Japan (JA3EK) and then Monday the 11th worked Hawaii again, KH6UK and KH6PP; all S9 signals."

"JA3EK was on phone, his signals were 5-6; we were 5-7-9 on cw."

"Then Tuesday W6FZA (the O.M.) worked ZS3G, Africa at last!! What a thrill!! This morning, Wednesday, we heard W1HOY 9 plus 20 db. Band opened to Nova Scotia for 3½ minutes!" *Congratulations to you and the O.M., Norma. May seem like we're saying this too frequently lately, but golly we sure do mean it.*

Uniontown, Pennsylvania This great state is heard from via W3AKZ.

"Have been working some six meter O.M.'s and YL's from the home QTH. Have a 6 n 2 about sixty-five watts, 4 element beam, up around sixty-five feet, a crystal control also a 152A plus a Collins 75A4. Mobile rig in the car is a Gonset Commander II with a converter into the car radio. Work the mobile rig in my travels and also from the famous Summit Mountain, 2480 feet elevation. So far the mobile peanut whistle has worked into South Dakota, Nebraska and down South, Texas, Florida, etc."

"Six has been HOT here since November 1st; both ten meter, cross-band into England as well as six both ways. Hearing G3BTA, OH5NW, G2COI, but no contacts. Have worked both ways on six into Sweden with SM6BTT on November 21st. He works around 50.110 and has a fine signal in here. Also SM7ZN, Ingvar at around 50.125. Also worked KL7AZI on November 21st."

"Have around thirty-one states (not all confirmed as yet) and need an Oceana contact to make WAC. Have to limit my operating time here on six as we have Channel 2 out of Pittsburgh."

"Will have a 150 watt rig on the air soon out at the Uniontown Radio Club, W3PIE, and hope to do a lot better from there. Will be glad to arrange any schedules possible, so if the boys are interested have them advise." *Thanks for all the information O.M. always happy to hear from your vicinity.*

Grande-Ligne, P.Q. A few words from friend Dave Still (K2VTX/VE2):

"A couple of months ago you published my letter about getting on six. Quite a few things have happened since then! First thing, we got our ticket and put on a powerful two watts on six, using an 832 in the final! We feed the whole deal into a quarter-wave dipole about sixty feet up in the air, and the receiver was an SX99 with a tuned fixed converter ahead of it. But they just wouldn't believe it! I was putting in too good a signal all around New York City (when I was at the Jamaica, N. Y., QTH). I even invited them over to behold this little monster, but no good. Then we got the call for school and that was the end of our six meter excitement!"

"My O.M. has received his VE2AZT call, and if I can get him on six I will."

Topsham, Maine Little - heard - from - Maine comes through again via R. Butler (W1GQL/1):

"I noticed in reading your column in "CQ" of December that Helen has worked some W6's in October, and that the band should be opening up soon."

"I would like to be put on record as having worked W6's and W7's this month (December) and also this past Sunday (December 8th) I worked EI2W in Dublin, Ireland."

"This is not probably an unusual feat in itself except that I have worked all of the above on phone using a Gonset Communicator and a Lunenburg five element beam."

"Perhaps I sound like a hornblower, *Nope,* but I don't mean to be. All this proves is that it doesn't take much power to get out on the VHF frequencies when the band conditions are right." Incidentally the Communicator was working straight into the beam without the benefit of any amplifier."

"Just before I worked E12W I heard two Norwegian stations coming in, but the band was very funny. It seemed as though the high end was much more open than the low end." *F.B., O.M., we agree one hundred per cent about conditions etc., when the band is open. When you're there at the right time, it doesn't make much difference what you're running.*

Phoenix, Arizona Don Roberts (W7RUX) emits with:

"I would like to notify you that I have worked four continents on six meters and am working very hard for the other two."

"I have worked Europe, Africa, North America, and Oceania and would like to set up skeds with South America and Asia."

"It probably sounds funny that I haven't worked A.A. yet, but have been active only from May '57 on, so have missed out on them. *Been a busy little bee since May, haven't you Don?* I would like to know if WAC has been worked by anyone in the States yet? *So far Don, two 6's have worked all continents, but at last contact they still had no confirmation from Europe. Hope they have them long before this gets in print.* I have worked so far, seven countries but only four of them are confirmed."

"The rig here consists of a Viking 6 n 2 at 75 watts, a six element Telrex beam 60 feet high, and a GPR-90 with a homebrew GG converter. Plans for the station include another six element beam stacked and a pair of 4-125A's which is coming along rather slowly."

"I normally operate on 50.040 and 50.2 on phone, and 50.005 on cw from 0900 until noon MST daily and anytime on Saturday and Sunday. Will be looking for fellows in Asia and South America, or anybody needs a QSL card from Arizona." *Thanks Don, good to hear via U. S. mails from your fair state.*

Albany, Georgia One of our regulars, Ben (K4BLA) comes through again:

"There has been quite a bit of activity around here on six this month. There wasn't a signal heard here from the 1st through the 16th of November, but on the 17th I worked SM7ZN in Sweden, also heard LA8RB and LA9T in Norway, but did not work them. I heard SM7ZN work around forty stations in Georgia, Alabama, and South Carolina, Tennessee, North Carolina and Virginia, and I could listen to both sides of the contacts (many of them). Then the band switched and I worked VE7CN."

"On the 19th there was an opening to the northwest and I worked W7WRA for my first Oregon contact, then W7VBH, W7CET and heard a number of others. On the 20th I worked VE7AQQ." *That Ike sure gets around. Nice report Ben, keep 'em coming.*

73, Sam, W1FZJ

VHF Contest Results

A certificate just like the one shown is being sent to all the "lucky" winners of the September "C" WW VHF Contest! However, it's pretty obvious that although thirty odd states and Canadian provinces were heard from, large multitudes of people neglected to turn in their logs. Certainly there was more activity than ever before, at least in this corner of the U. S. as evidenced by Helen's non-competitive score of 47,392. In fact, if you will peer intently at the scores listed it will become evident that big fat scores are not always necessary to win a contest (viz W7QLZ from Arizona).

"Old John" W8LPD, has won the second round in the battle for the Microwave Associates VHF Trophy. I don't want to wish him any bad luck, but why don't some of you fellows at least make him try a bit harder? Although if he wins next time we'll just have to figure some other way to keep his dander up so that you others won't have life made too easy for you.

Getting back to that log problem, we people who decide the contest rules try (really I do!) to make them as plain ?? as possible. But, there are a number of you wretches who insist on being individualists and operating under your own rules. Please, fellows, we don't want to disqualify a *top* score, or any score for that matter, because the rules weren't followed. Several of the boys sent in logs without all of the information necessary to call a contact legal for the contest. Some stations, notably multi-op, sent in logs which showed some remarkable inconsistencies in logging contacts. The cues for these faux pas are obvious, but a cure is no good unless it is applied to the patient. By the way, an easy way to avoid having to copy a log over is to use carbon copy methods and individual pages. Then the work of copying is unnecessary and you really have no excuse for sending the log in.

We are already planning a new contest for the usual time in April, and it looks like enough logs are coming in from some states

to warrant the inclusion of 2nd and 3rd place awards to the needy, in states from which a sufficient number of logs are received. (I won't define "Sufficient" now, you'll just have to wait.) So gird your loins for battle and remember to send those logs in!!!

Call	*Contacts*	*Counties*	*Score*	*Band*
CALIFORNIA				
K6DTR/6	126	18	6336	50
W6OKR	95	14	2260	50
W6RNQ	60	15	1800	50
K6VXI	37	10	740	50
W6BUR/6	36	9	688	50
K6ZXS	32	9	576	50
W6NZV/6	104	14	2912	144
K6DTR/6	49	13	1274	144
WN6MWT/6	46	11	1012	144
W6ASH	55	9	990	144
W6VMY	35	9	630	144
K6HYX	17	8	272	144
KN6UJG	13	10	260	144
K6OHE	20	6	240	144
W6AJF	52	23	2392	Multi.
COLORADO				
KØCLJ	10	5	100	50
CONNECTICUT				
W1LGE	96	72	7872	50
W1KLK	103	42	8652	144
K1BML	92	37	6808	144
KN1CRQ	96	29	5568	144
ILLINOIS				
W9ROS	112	29	6492	50
KN9HNL	20	5	200	144
INDIANA				
K9GFQ	52	26	2704	50
K9GXI	30	14	840	50
K9ABV	11	2	44	50
K9APQ	30	16	960	144
MAINE				
W1TAM	44	22	1936	50
MARYLAND				
W3BYM	38	17	1292	50
W3LCC	9	4	72	50
W3CJK/3	53	27	2862	144
W3UJG	10	6	120	220
W3LCC	8	5	80	220
MASSACHUSETTS				
W1HOY	246	76	47392	50
W1VDE/1	137	43	11782	50
W1EUJ	94	26	4888	50
W1JAT	86	22	3784	50
W1JTU	116	37	8584	144
W1AQE	100	40	8000	144
KN1AIC/1	93	42	7812	144
W1KPG/1	102	31	6325	144
KN1BSM	72	19	2736	144
W1BDF/1	47	27	2538	144
W1NPT	53	19	2014	144
W1PYM	48	16	1536	144
KN1BMW	35	12	840	144
W1IHL	25	11	550	144
K1CXN	48	8	384	144
W1LMZ/1	16	9	288	144
W1RFU	16	13	416	220
W1RFU	64	46	6288	Multi.
W1OOP	64	41	5248	Multi.
MICHIGAN				
W8BKT	105	50	10500	50
W8SSO/8	98	31	6076	50
K8AKQ	59	15	1770	50
W8TIN	25	11	550	50
W8UML	19	5	190	50
W8URO	71	30	4260	144
W8VRH	31	8	496	144
MISSOURI				
KØABK/Ø	85	19	3230	50
NEBRASKA				
KØWRT	13	4	104	144
NEW HAMPSHIRE				
W1AZK	33	22	1452	144
W1IQD	8	5	80	50
NEW JERSEY				
K2RRI	76	36	5472	50
W2ORA	86	29	4988	50
K2MYQ	43	27	2322	50
K2KIB	70	29	4060	144
K2KJI	75	16	2400	144
KN2YPT	63	15	1890	144
W2NTY	1	1	2	144
W2RGV	15	12	360	220
W2NTY	13	9	234	220
W2OZA	14	8	224	220
NEW YORK				
K2CBA	122	55	13420	50
K2IUV	106	32	6784	50
K2GRQ	70	30	4200	50
K2TJY	73	27	3942	50
K2JVX	74	33	4884	50
K2LZF	47	24	2256	50
K2BAW	55	19	2090	50
K2RLW	50	19	1900	50
K2DBB	44	20	1760	50
K2KIJ	44	18	1584	50
K2VAW	51	15	1530	50
W2BLN/2	36	19	1368	50
K2VPX	51	12	1324	50
K2TGH	55	10	1100	50
W2JVZ	33	15	990	50
K2QVC	38	12	912	50
K2MZE	40	9	710	50
K2SJB	25	14	700	50
K2YIH	19	7	266	50
K2CUQ	8	6	96	50
K2POA	83	43	7138	144
W2GVN/2	20	13	520	144
K2QIX	18	9	324	144
KN2YUW	19	8	304	144
K2LXC	23	6	264	144
K2MYS	14	6	168	144
K2ERQ	10	6	120	144
K2SKB	7	6	84	144
KN1CFI/2	3	2	12	144
W2AOC	20	14	560	220
W2QNA	27	13	702	Multi.
K2CEH	28	16	448	Multi.
K2GSM	45	14	1260	50
NORTH CAROLINA				
K4KSM/4	15	9	270	50
GEORGIA				
K4DLE	9	4	72	50
W4FWH	8	2	64	50
W4FWH	5	2	40	144
W4GIS	4	4	32	144
OHIO				
W8MVN	164	43	14104	50
W8AQ	40	26	2080	50
W8RQV	33	16	1056	50
K8GOX	36	11	792	50
W8NAF	41	9	738	50
K8BPK	12	7	168	50
W8WEN	35	18	1260	144
W8PLQ	10	6	120	144
W8HOF	10	3	180	220
W8SCW	11	4	88	220
W8LGI	9	2	36	220
W8WRN	9	2	36	220
W8BAX	5	2	20	220
W8HPT	5	2	20	220
W8LPD	165	70	23100	Multi.
W8BMO	34	11	748	Multi.
W8UHZ	11	6	132	Multi.
PENNSYLVANIA				
W3JMY/3	112	53	11872	50
W3UGO	73	37	5402	50
W3YMC	66	32	4424	50
W3TDF	43	22	1892	50
W3TDF	98	43	8428	144
W3ZSS	74	39	5772	144
W3GWY	16	11	352	144
W3ARW	19	13	494	220
W3FXI/3	21	14	588	50
RHODE ISLAND				
W1FVZ	4	19	1558	50
W1ZJQ	134	57	15276	144
W1VXC	16	9	288	144
W1FEO	6	5	60	144
TENNESSEE				
W4TDW	47	26	2444	50
W4ZZ	18	13	468	50
TEXAS				
K5BEL	47	5	470	50
K5HYF	17	5	170	50
W5LFM	12	4	96	50
VERMONT				
W1EXZ	6	6	72	50
W1UIZ/1	67	38	5092	144
VIRGINIA				
K4PCN	37	19	1406	50
K4RAY	44	13	1144	50
W4JCJ	10	4	80	50
K4BNI	66	36	5016	144
W4JCJ	34	27	1836	144
W4UMF	10	7	140	220
WISCONSIN				
W9JCI	106	34	7420	50
W9TQ	2	2	8	144
WEST VIRGINIA				
W3KDZ/8	51	22	2244	144
W3GHQ/8	45	22	1980	50
ONTARIO				
VE3AIB	41	22	1804	Multi.
NOVA SCOTIA				
W1QCC/VE1	32	20	1280	144
ARIZONA				
W7QLZ	0	0	0	144

Novice [*From page 71*]

and will sked anyone needing Indiana but it will have to be in the wee small hours of the morning. TVI eh?

Elliott Pearl, KN9KBB, 3355 W. Lee Street, Skokie, Illinois whacks away with a Harvey Wells TBS and an NC-125 on the 40 and 15 meter bands. Elliott would like to locate a nearby ham with a Viking Valiant for sale. Is anybody?

Floyd Hammack (13) 2604 N. E. 36th Ave., Portland, Oregon is an almost Novice and wants to know about the T2FD antenna. See the June 57 Novice Column. Floyd currently is using an S-38D and plans to supplement it with a DX-35 transmitter. I will probably be a DX-40 by this time.

73, Don, W6TNS

by **BYRON H. KRETZMAN, W2JTP**
16 Ridge Drive, High Hills, Huntington Station, N. Y.

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
Minneapolis, Minn.	144.90	Mc.	AFSK on AM

An afsk oscillator has many uses around an RTTY ham shack, besides the obvious application of feeding it into the modulator of a VHF transmitter. Many RTTYers build an afsk oscillator right on the same chassis with their converter. A convenient arrangement is to key the afsk oscillator directly with the keyboard contacts. For transmission, the afsk oscillator output is fed into the converter. A polar relay connected to the converter then is used to fsk the VFO. Besides being convenient, there is a technical advantage to this arrangement. The converter, used this way, becomes a regenerative repeater. In other words, the pulses coming from the keyboard contacts are reshaped by the converter. Eliminated are any spurious transient pulses that might result from contact bounce or other irregularities in keying from the transmitting distributor used with the keyboard. Such irregularities get out on the air when the VFO is shifted directly. For reception, the receiver is fed to the converter which then operates the receiving selector magnet(s) in the machine, either directly or via a polar relay.

For work-bench experimenting, Phil Catona, W2JAV, has developed a very portable, completely self-contained "RTTY" Tone Generator. A secondary purpose of this afsk oscillator is to use it as a source of RTTY signals for demonstration purposes. Fellows all across the nation are still talking about Phil's RTTY demonstration at the RTTY Meeting at the ARRL Convention in Chicago back in September.

The photo of the "RTTY" Tone Generator will give you some idea of just how small this gadget is. Oscillator, buffer-amplifier, and battery supply are all contained in a 4" X 2¼" X 2¼" aluminum "Minibox" (*Bud* CU-2103).

Fig. 1 shows the schematic diagram of Phil's "RTTY" Tone Generator. Two *RCA* type 2N109 *pnp* transistors are used. A two-pole-five-position rotary switch *S* controls all functions of the unit. Turning this switch from the OFF position to any other position turns on the internal battery. The other positions provide SPACE (2125-cycles), CENTER (2550-cycles), MARK (2975-cycles), and AFSK. The first three provide constant tones for testing, while the AFSK position connects the KEYBOARD jack *J-1* and the associated

W1PIL, Worcester, Mass.
Transmitter: 500 watts
Receiver: HRO-50
Converter: FRA i-f, and Boehme afsk
Machines: Model 26 and Model 15 with perforator from Model 19.
Operator: Will Pilon

pair of 1N69 germanium diodes and capacitors to the oscillator.

The *L* of the oscillator is the usual 88-mhy telephone line loading coil, a toroid with both coils connected in series-aiding. It can be the *WE* #622 or the surplus C-114A field wire loading coil. It might be obtained from the RTTY Society of Southern California, 372 West Warren Way, Arcadia, California; or for $1 each from the *Tallen Company,* 159 Carlton Avenue, Brooklyn 5, New York. The shipping weight is about 3-pounds. The un-potting procedure is described in detail on page 72 of the *RTTY Handbook*.

The capacitor values indicated on the schematic diagram are approximate. You will have to substitute various paralleled combinations until you get the correct frequencies. At this point it is necessary to have some standard of comparison. Perhaps you might be able to borrow a tuning fork standard from a nearby active RTTYer, or if you have a tape recorder you might be able to get another RTTYer to record the tones.

The other knob on the "RTTY" Tone Generator is the GAIN control in the base circuit of the 2N109 buffer-amplifier. The output transformer *T* is an *Argonne* ($2.95, *Lafayette Radio,* New York City) type AR-109. Listed as 10,000-ohms to 2,000-ohms, its 5-to-1 ratio gives close to the desired 500-ohm output in this particular circuit.

The battery *B* is a 6.5-volt mercury battery, *Mallory* TR-165R, which was opened up to get the -2.5-volt tap. The second section of the rotary function switch *S* disconnects the plus end of the battery when the knob is in the OFF position.

By the way, if you have any questions about this "RTTY" Tone Generator, Phil asks that you do not write him directly, but that you send your letters to me.

Societies

Last month, while mentioning legitimate incorporated amateur radioteletype societies, we inadvertently omitted NCARTS, Inc. This is the northern California group, legally incorporated in the State of California August 13, 1956. Patterned in many ways after RTTY Inc., the pioneer southern California group, NCARTS holds informal group meetings in the Bay area every two or three months. A Board of Directors meeting is held once a year

W1ZXA, Central Falls, Rhode Island.
Transmitter: 400 watts to an 813.
Receiver: HQ-150
Converter: W9KLB with WØHZR tuning unit, from RTTY Handbook.
VFO for fsk: K2SKK
Machine: Model 26
Operator: Paul B. Boivin, Jr.

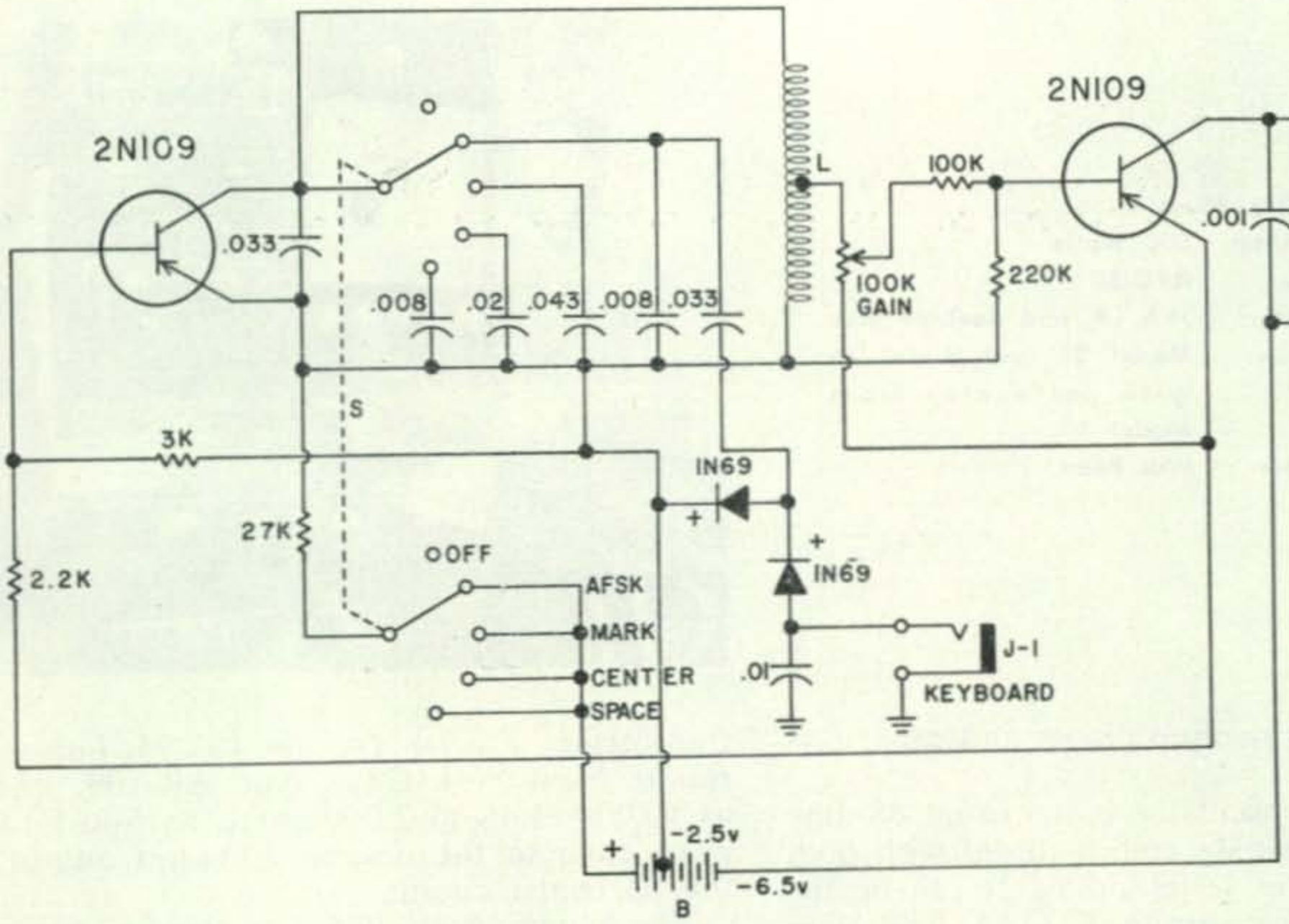


Fig. 1—Schematic Diagram, "RTTY" Tone Generator of W2JAV

to establish policies. Membership in NCARTS requires the filing of a properly filled-out application with the payment of $5.00, which includes $4.00 initiation fee and $1.00 for the current year's dues. Elliott Buchanan, W6VPC, is Secretary, and his QTH is 1067 Mandana Blvd., Oakland 10, California.

To add to the information last month on MARTS, Inc., the Midwest Amateur Radio Teletypers Society, will accept an application for membership, properly executed, with the payment of $5.00 dues for the year, plus $2.50 initiation fee. Anyone interested in joining MARTS, Inc., write for an application blank to Robert Atkeisson, WØIQC, Secretary. His QTH is 12301 E. 47 Terrace, Independence, Missouri.

RTTY Sweepstakes

Here are the "early results" of the RTTY Sweepstakes Contest which began on November 1, 1957, and which ran for 30 hours:

STATION	SECTIONS	POINTS	TOTALS
W1ASZ	25	108	2700
W1AW	14	44	616
W1BDI	17	46	782
W1BGW	25	74	1850
W1FGL	12	26	312
W1RBF	11	40	440
W1ZXA	13	39	507
K2HHH	11	32	352
W2KXT	6	18	108
W2RTW	22	86	1892
W2RUI	34	160	5440
W2TKO	30	156	4680
W3NQV	2	4	8
W3PYW	32	146	4672
W4AIY	3	6	18
W5YM	21	80	1680
W6AEE	25	74	1850
W6CG	11	28	308
K6CHR	8	20	160
K6EJM	6	17	102
W6LFF	2	6	12
W6MSG	11	43	473
W6MTJ	27	92	2484
K6OUR	11	31	341
K6OWQ	6	16	96
W6ZVO	4	8	32
W7IWH	17	22	374
W7CSC	7	24	168
W8NIY	17	45	765
K9BRL	15	44	660
W9GRW	11	34	374
W9LDH	17	24	408
W9TCJ	30	114	3420
WØBON	7	14	98
WØBP	37	150	5550
WØDW	11	24	264
WØFQW	15	40	600
WØJHS	5	12	60
WØKXB	13	26	338
VE7KX	17	62	1054
ZL1WB/Ø	11	12	132

(Receiving only, at WØBP)

Bruce, ZL1WB, guest tower-climber at WØBP, working independently from BeeP, racked up a nice score (receiving only) with BeeP's AN/FGC-1X, a Model 15, and a Super-Pro. Two YL-RTTYers, W6LFF and K60WQ, also participated. Merrill, W6AEE, deserves a large vote of thanks for the timely post-card reminders that he sent out.

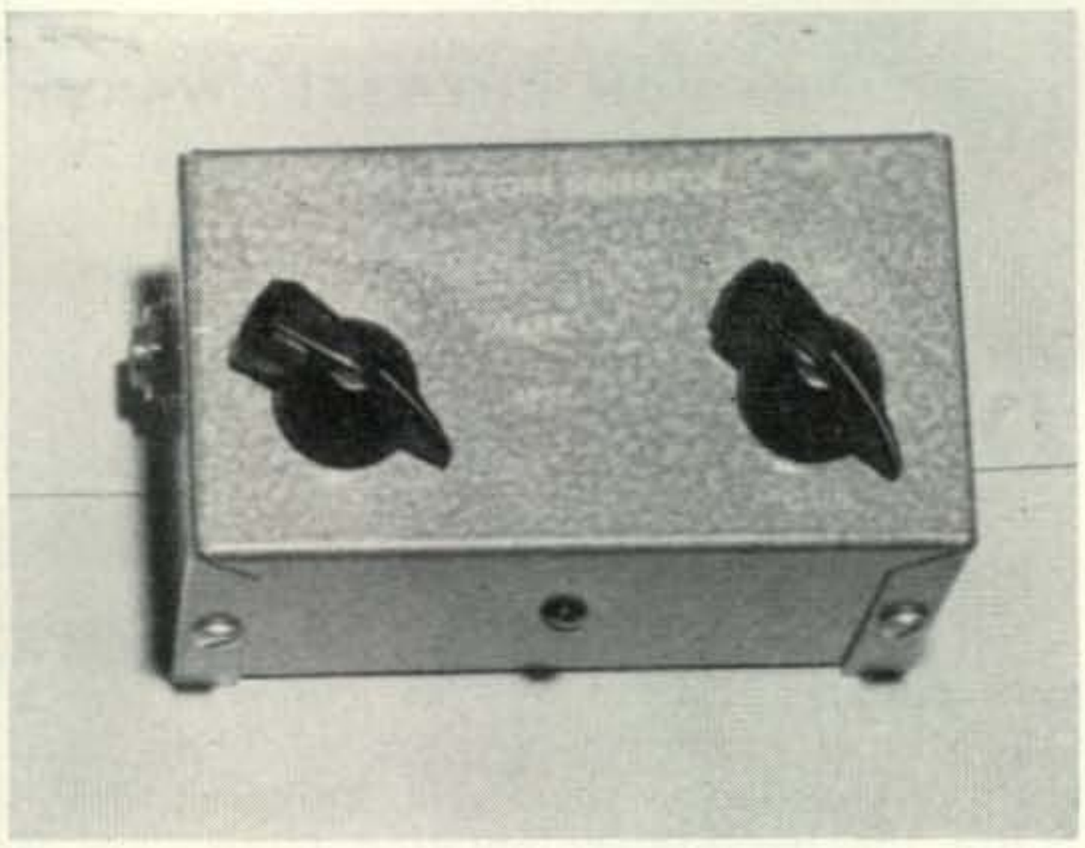
To CQ Subscribers

We sincerely regret that upwards of 3,000 CQ subscribers failed to receive their copies of the January 1958 issue as soon as they should have.

Normally subscribers' copies are sent to the Post Office by us on a pre-planned schedule which allows delivery on schedule. However, through a grievous error on our part, almost 3,300 copies of the January issue were not sent to the Post Office until January 2nd — 10 days later than usual — and consequently this unpardonable delay, and the further Holiday jam at the Post Office, resulted in slow delivery of the subscribers' copies in question.

The circulation department of "CQ" has been harassed by many subscribers who, having failed to receive their copies on time, believed something amiss at the publisher's office. Such was not the case. We take this means of expressing our regret to all who were inconvenienced by our shortcomings.

Blanchard Press
Printers of CQ



"RTTY" Tone Generator of W2JAV

OBS

Official ARRL and NCARTS bulletins are sent out on RTTY according to the following schedules:

Tuesday	2015 PST VE7KX 7144 kc
Wednesday	2000 PST W6VPC 3620 kc, 147.29 Mc
Wednesday	2000 PST K6KFF 6-meters
Friday	1700 PST W6VPC 14,330 kc, 147.29 Mc
Friday	2015 PST VE7KX 7144 kc
Saturday	1400 PST W6ASJ 7140 kc, 147.29 Mc
Sunday	1400 PST W6ASJ 7140 kc, 147.29 Mc

K6OUR is alternate OBS to W6VPC and to W6ASJ, and all would appreciate QSL of these bulletins.

If you have tape equipment, and if you desire appointment as an RTTY OBS, send your request to your SCM, giving frequencies, times and days of the week that are convenient to you.

RTTY in Canada

As could be expected, there is not too much RTTY activity in Canada. There are several reasons for this, probably the biggest is the equipment procurement problem. I get many letters from VE stations asking, "Where in Canada can I get a machine?" I don't know the answer to this question. Maybe somebody in Canada can tell me. Drop me a line if you know of any source of machines in Canada and I will pass along the dope.

Another reason is that Canadian amateurs cannot operate RTTY in any band of frequencies in which A3 is permitted. This means that they cannot operate above 14,150, 21,200, and 28,200 kc. 11-meters is out for the same reason. The same holds true for 40 and 80, but propagation in the far north makes these bands a "total loss."

Let me quote a VE in the far north who prefers to be nameless: "It seems that very, very few W's tune down into the cw bands, leaving the VE's to run their tapes to tatters calling CQ. Think of the poor fellow who doesn't have a perforator and TD, who sits hunched over a keyboard far into the night, pounding out whatever he pounds out in the way of a CQ, who is finally rewarded by someone coming back on cw at about 10-wpm telling him that his fist is so lousy that all he can make out is his call letters and something that which sounds like he is saying 'RTTY' at the end."

So, who *is* active in Canada? VE3BAD in Toronto, VE3ATC in Montreal, VE7KX on Lulu Island, and a new, unverified, report of W3UAK/VE8 and W3BXN/VE8. Any additions or corrections?

Here and There

W8PYQ in Battle Creek, Michigan, is waiting for his Model 26 with a TU all finished and waiting, too.

Dave, W1PBS, has been noticing that quite a few RTTYers have been working hard for those special QSL's sent out by the FCC for over-time transmission. (You gotta sign, with Intenational Morse, once every ten minutes or less.) Dave uses a timer from an old washing machine. He put a stop in at the ten minute point and he gives it a twist just before hitting the keyboard. A bell dings when the ten minutes run out.

KØHRX in Marion, Iowa, would like to trade a 1.5 kc *or* a 2.1 kc *Collins* mechanical filter for a working Model 12, with keyboard. (*That sounds like a good deal. I'll bet he would swap both for a Model 26!*)

W6SEW, John Porep, is now with *GE* in Tokyo. W4JSS, ex-W2AOJ, Scott Magness, is now in Beirut, Lebanon, with the CAA. W7VBH of Portland, Oregon, is dusting off his Model 26 after a 3-year lay-off.

WØBP and W6VPC are on 15-meter RTTY. (Have you listened to 15 lately? It looks real good for long-haul RTTY.) WØQPP and W6RDJ were heard working 20-meters, near 14,340 kc.

RTTY Handbook

Most active RTTYers know by now that W2NSD and W2JTP got their heads together last summer and finally put together that *RTTY Handbook* that had been in the works for such a long time. This book should answer most of the questions, both technical and operational, that usually bother a fellow just getting interested in this fascinating phase of amateur radio. Described, of course, are the machines themselves, as well as receiving converters and RTTY exciters.

To get your copy, send $3, check or money order, made out to "RTTY Handbook", to RTTY Handbook c/o W2JTP, 16 Ridge Drive, High Hills, Huntington Station, New York.

73, Byron, W2JTP

by **DON CHESSER, W4KVX**
R.F.D. 1, Burlington, Ky.

DX DX DX DX DX DX DX DX

WAZ

The big WAZ rush is on! Nearly 100 packages of cards from WAZ applicants have been received in the past few weeks! We are literally inundated in a sea of QSL cards and Honor Roll lists. All packages of cards have been dated upon receipt and certificates will be issued in that order, starting as soon as this column is in the mail. We expect to be up to date with the certificates in a few weeks, and a long listing of the fortunate winners is planned for the next issue. Don't miss it!

When the WAZ lists are current, we'll then dig into the Honor Roll pile and attempt to straighten it out. If we are lucky we should have a complete round-up of the Honor Roll list in the April issue.

Please mail all WAZ cards and applications, Honor Roll lists, requests for forms and instructions, and all other correspondence relating to DX to W4KVX at the address at the head of this column. We'll give you the best service we possibly can.

DX NEWS

The big reason for the WAZ rush, of course, is Zone 23's JT1AA. His cards are flooding the world, resulting in the biggest scramble in WAZ history. It's likely to continue, too, for Ludvik remains active, although not at the pace set when he first appeared. He has moved his ham station to his home in Ulan Bator for greater convenience and to avoid some of the terrible Siberian weather, advises Ed, W6DZZ. Although the poor antenna facilities in the town have affected his strength somewhat his signals are still adequate. He was very active during the Czechoslovakian DX contest December 8th, and he can be found almost daily at 1400GMT on 14062 or 14093 kc.

The prospects of JT1AA going on phone are poor, however. Ludvik speaks no English, and has shown little desire for phone operation. OK1JX is considering shipping him a NBFM exciter in the event Ludvik changes his mind, but chances are remote at this writing. Asking him to listen for your phone signals will do you little good, for he will not QSL phone contacts as "worked" until he himself is on phone. The "heard" card you may receive for your pains would be ineligible for DXCC or WAZ.

YK1AT also continues his ladling-out of a new country for many, in company with OK1MB as master-of-ceremonies. They were both very active in the Czech contest.

But the big DX commotion these days is over HV1CN, Vatican City. Dominico's sudden appearance on 14 mc phone created a panic that still continues. Some of the top W phones have now worked HV1CN, including W8JIN, W8QJR, W8BKP, W8JBI, and W8BRA, but they represent a negligible percentage of those hopefuls who have expended breath and many KwH's in futile calls.

Two of the major obstacles to working this excellent DX are language problems and Dominico's brief operating periods. Because of the proximity of the Vatican Radio BC station, we understand he is able to operate only when the broadcast transmitter is off the air. W8JIN informs us he shows up on 14120 kc phone between 0610 and 0645GMT three or four times a week (not Sundays!), and occasionally from 1700 to 2000GMT. He is using 300 watts to a BC610, with a dipole 380 feet above the ground! He is planning to operate 10 meter phone as soon as he can convert the BC610 for that band.

Since Dominico knows no English, most Stateside QSO's have been made with the aid of sympathetic, bilingual Italian stations such as I1AMU and I1CL, who are handling HV1CN's mounting QSL chores. I1AMU especially has been literally swamped with requests for skeds and assistance in attaining this choice DX. Some frantic W's have even sent cablegrams to arrange skeds! But I1AMU advises us not to get excited; HV1CN will be there a long time.

When Dominico first appeared there was, of course, considerable speculation as to his legitimacy. Those doubts, however, have now mostly disappeared. During a QSO with CN8MM a skeptical Italian amateur dropped in to make sure that all was above-board—and it was. HV1CN, he found, is operating with full official permission.

The first HV1CN QSL to reach the States (to our knowledge), a home made card prized by Frank, W8QJR, has been accepted by ARRL for DXCC credit. K2OPJ informs us the first HV1CN printed cards were messed up by the printer, but 3,000 more are now coming off the press.

Ancient Carthage is the QTH of Roger Wolf, 3V8AO. At present Roge is very active on 21 mc shooting for his WAS. (Photo courtesy W∅BPA)

PJ2AX, Pop Wilson, Aruba, NWI., runs a Globe Champion to a Globe spanner Triband beam. Receiver is a HRO-50T with RME DB-23. PJ2AX is also active on 6 and 2 meters. (Photo courtesy K2DHW/MM)

Another McNeil, W7FMX, of Salem, Oregon has DX'ed to the tune of 190 countries and 39 zones. Mac has a Ranger pushing a 833A with a Gonset 2 element beam. A retired Railroad man Mac has three daughters and three grandchildren. (Photo courtesy Willimette DX Bulletin)

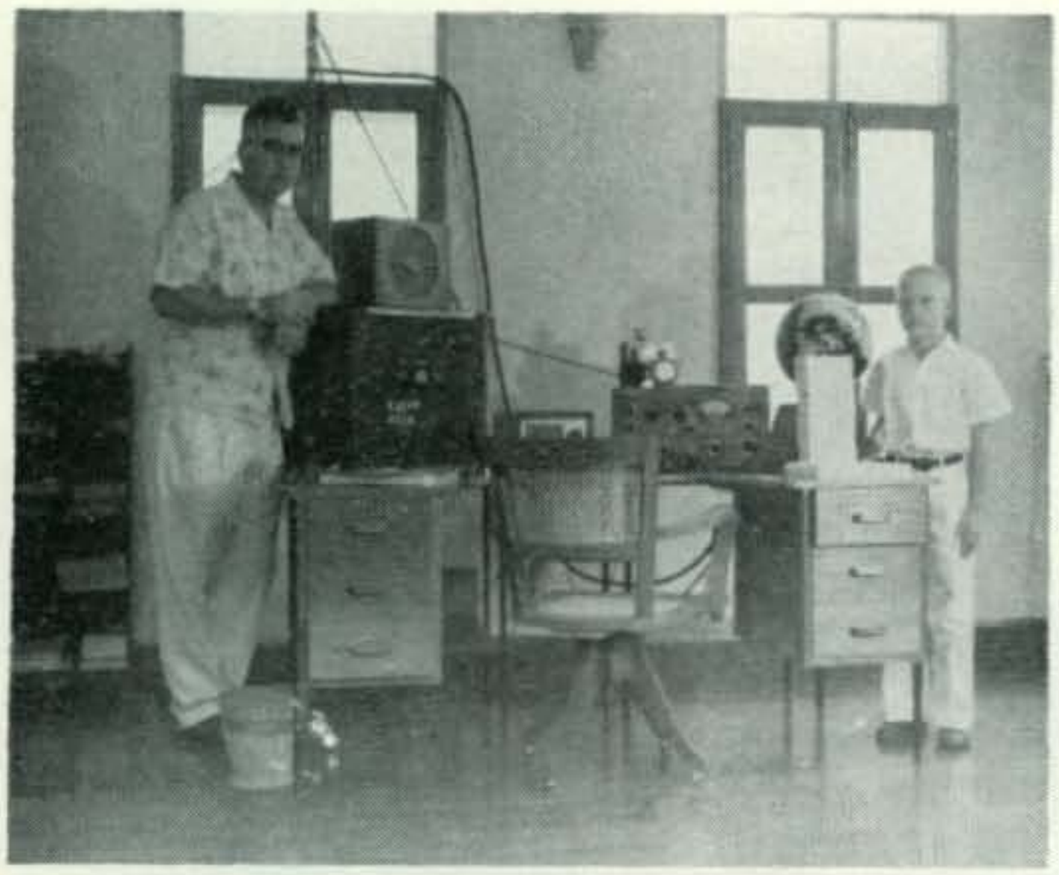
The CR8AC wheel of good fortune continues to go 'round and 'round, and where it stops nobody knows. We've received notes from those that believe Raul spins his receiver dial like a carnival gaming wheel at the end of each QSO, and works the next station that pops up on that chance frequency. We think this may be stretching the truth a bit, but there's no doubting the difficulty of attracting CR8AC's attention. We have no tips or hints to offer, except to keep trying. Sooner or later the combination of timing and frequency will click in your favor, and you'll work him with no trouble. As Tom, W4CEN, put it: "I must have spent at least 5 hours chasing him, but last week I ran across him at 1100 GMT, gave him a 2-by-2 call 5 kc off, and he bounced right back. It was just a matter of hearing him at the right time, it seems."

And so it goes, in DX history's greatest heyday—right now! Considering JT1AA, YK1AT, CR8AC, VQ8AS, and all the other exciting DX now current; considering HV1CN, amateur radio's last hold-out in the western world; considering the sunspot activity, now at its greatest peak in centuries and probably the highest of our lifetimes; all things considered, we never had it so good—and we may never again. Enjoy it while you may, fellows; these are exciting times.

Judging from the notes and letters crossing this desk lately, most of us are. Certainly receivers are getting a big work-out these days, and from the pile-ups and many of the prominent signals we hear, we suspect transmitter power is being consumed in incredible quantities, too. As Frank, W2AXR, summarizes: "I suggest we request a special postage stamp issue commemorating 1957-58 as the period of the greatest pile-ups in radio history. No records may have been set for QSL's received, but the %#&%$" ♭ KwH's should change our weather to semi-tropical!"

DX NOTES

Ron, VQ8AS, Rodriguez Island, now accredited a separate country for DXCC and the CQ Honor Roll, has been giving some attention



HS1A, Bangkok, Thailand, has been a very popular catch on 14 and 21 phone. Op Ken Barzee also holds the calls of W6JOT and K41VP. HS1A has worked over 100 countries since last February.

Antenna photo shows a two element 20 meter beam over a three element 15. QSL go via W6FKH. (Photo courtesy K6GLC)

to 7 mc DX. At this writing he is maintaining nightly skeds on 7006 kc at 0100GMT, looking for WQSO's. Among those who have accommodated him are W8JIN, W8FGX, W8BKP, and W4KVX. His signals have been exceptionally good for that hour and frequency, peaking S6 to 7 at times.

KC6JC, Cav, on Truk, is active Thursday mornings on 14025 kc with skeds with W3DVE, reports Fred, W2TVR.

Beda, OK1MB, says scratch one ZA1KM—he's a pirate. Sorry! Also, OK3AL says the same of JT1KAA, who insists he's the second operator at JT1AA and uses 3 kw, although his signals are no stronger, but much rougher, than Ludvik's 100 watts. W1BPW reports working the queerest odd-ball of them all, however—one ZZ3ZZ, who insists, with deadpan earnestness, that he's located on Tombstone Island! (Oh, brother!)

Bill, WØCPM, operated as VP2KM from the Leeward Island's November 25th, 26th, and 27th, while on vacation in the West Indies. He promised to QSL 100% when he returns home, so send your cards to his Omaha address. Bill plans to return to the West Indies the latter part of February, where he plans to attend the carnival in Trinidad February 21st and 22nd before going on to St. Kitts, with stops at Grenada and Barbados. Look for him at any or all these places.

If you've been wondering about XQ8AG, it's at one of the U. S. missile observation bases in Chile, advises George, W8BKP. QTH: U. S. Military Reservation, Antofagasta, Chile. This station operated with the call W2RYX/CE until November 20th. We can't account for the XQ prefix.

VQ9HAY, Seychelles, will work no one but VQ4ERR, VQ4AG advises us via W8BKP. A new phone rig now enroute VQ9HAY may change the situation, however. FB8CD has moved to a new home on Comoro, continues W8BKP, and he intends to work 21 mc mostly in the near future. He was heard on 21135 kc phone this month (December) by Frank, W8QJR, who reported him S7 between 1830 and 1900GMT. He worked CO2BL for his only contact in the western hemisphere. FL8AB has been heard on 14140 kc CW frequently, although he may leave FL8 for Madagascar in March or April. He plans to return home to F8UD later this year.

CN8IF should be operating from Monaco by the time you read this, reports Len, W4KZF. He expects to be there three or four weeks, using 100 watts on all bands. And VS9AG/ZD3 has arrived in Gambia, says Tom, W4ML. He hopes to be active from there a few months, after which comes possibility of assignment to VQ6 or Y12.

FW8AA must have the bugs out of his ac generator, for he's been quite active on 14340 kc CW at 0630GMT. From FA9RW via W1BPW comes word of FY7YH, a new one in French Guiana. He works 14 and 21 mc CW mostly, and is active usually at 0400GMT. SP5LM/Spitzbergen is on the air, but has crystals for commercial frequencies only, reports Phil, W3SOH. He's building a VFO and may be on the ham bands by the time you read this.

PAØRJC is reported enroute JZØ and plans to operate from Biak for one and a half years or three years if his family follows him. He will work 14 mc only.

VR1A, Gilbert Islands, has been active mostly on 21040 kc Saturdays and Sundays at 2300GMT, advises Jim, W8JIN. He has a 5,000 foot (each leg) Vee beam, but uses a 2-element rotary beam most of the time, although the Vee beam has indicated 20 db more gain in its favored directions.

In the December issue of the NCDXC "DXer" Don Wallace, W6AM, lists a bunch of prefixes he's still missing and asks the west coast boys to call him at his ranch if they hear any of them. He states his ranch phone number

(FRontier 7-4120) and requests they allow the phone to ring a long time, as he may be outside harvesting rhombics!

That's all, brother!

QSL NOTES

K6EXO advises us he is now handling QSL's for ZK1BS for QSO's after October 22, 1957. A stamped and addressed envelope with your card to Harvey Shore, 1815 Preuss Rd., Los Angeles 35, Calif., will produce rapid results —otherwise cards will go via the bureaus.

W2ZGB has received the VS9AG logs up to October 20, 1957, and will QSL 100% via the bureaus. But Gabe emphasizes he cannot furnish ST2NG cards, VS9AG's previous call, for he has none of those logs.

W1FH is helping VQ4AQ with the VQ8AS QSL chores by distributing the Rodriguez cards destined for W/VE's. If you are expecting a card from VQ8AS a stamped and addressed envelope to Chas Mellen, W1FH, 28 Woodley Ave., Boston 32, Mass., may help its prompt arrival.

From the Salem (Oregon) Capitol-Journal, via the WVDXC Bulletin, comes this news item: "LONDON (AP)—The Soviet Union today said it would send "special cards" to radio amateurs around the world who reported reception of signals from its earth satellites. Moscow Radio, in a broadcast beamed to North America, told the hams to report their receptions to Radio Magazine, Moscow."

The flush of JT1AA, zone 23, cards in this country has resulted in at least one practical joke, played by Bob, WØQVZ, on Ted, WØNLY. Ted has been feverishly awaiting the arrival of the JT1AA QSL to complete his WAZ, and his impatience has been something more than unusual. Finally he received a special delivery with "IMPORTANT!" QSL FROM MONGOLIA!" annoted on the envelope. He bit, with all the innocence of the young-at-heart. He tore it open only to find a card from Mike, UAØOM, Buryat-Mongolia, zone 18. It was forwarded, he discovered, by WØQVZ.

The long-distance telephone lines from Minnesota to Iowa trembled with some high-power, Minnesota-type cussing that all but lost them their connections, but Ted received only Bronx cheers in his face for his trouble.

But now things have changed somewhat! Ted did get his JT1AA card, but WØQVZ hasn't—as yet. Clutching his 40 cards as though they were messages for Garcia, Ted dashed breathlessly for an airplane and flew to Burlington, Ky., to apply for his WAZ in person. Tucked away in a pocket were also 39 cards from WØQVZ, to be accredited toward WAZ pending arrival of that JT1AA gem. On his return to St. Paul, Ted again activated the Minnesota-Iowa phone lines to report the success of his mission, and again they trembled, this time with Iowa-type cussing and Minnesota huzzas, for Ted had mentioned, in passing, that Bob's 39 cards would be returned—one at a time, every other week!

"And even worse," confesses Ted, "I got Al Smith, the QSL-Impressario for us W-Nothings, to make a notation on the outside of Bob's last card consignment; "Don't know if you still need Mongolia, but. . . ." Al went along with the gag, thinking, as he put it, that Bob would open the envelope so fast that no permanent hurt would be done to his nervous system."

See you next month!

73, Don, W4KVX

THE OHIO VALLEY DX BULLETINS

If you would like much faster and more comprehensive DX news and articles than time or space in this column can permit, we suggest you try the Ohio Valley DX Bulletins, edited and published by W4KVX. Its 40 or more issues a year are distributed only via first class or air mail, for greatest possible speed, and costs but $5 annually for first class service, or $6.50 air mail. Two month trial subscriptions are available for $1 first class, $1.25 air mail. Sample copies may be had for the asking. Write W4KVX (address at the head of the DX column) for further details or for your membership to this excellent service.

Addresses

CN8IF—W2SGC, via W2 Bureau.
CN8JX—Glenn H. Luse, 3906th OPRON, APO 177, PM, N. Y.
CR8AC—Raul Fernandes, Caixa Postal 32, Vasco de Gama, Goa, Portuguese India.
DL4BL—(K4ADU) A2C Cliff Watson, AF 14621315 2d ACCS Mob. SQN. APO 109, PM, N. Y.
FB8XX—Via FB8BC.
FE8AK—Box 202, Yaounde, French Cameroons, FWA (Will be there until May).
FF8AC—Box 129, Kankan, French Guinea, FWA.
FP8AR—Via W2HTI.
FP8AS—Via W2EQS.
FP8AX—Via VO1BF. A. A. Drysdale, 95, Forest Rd., St. Johns, N'fl'd, Canada.
FP8AY—Via VO1BD. R. C. Peddle Jr., 11 Vaughan Pl. St. Johns N'fl'd, Canada.
HC8GI—E. Bud Devine Jr. Isla Santa Cruz, Galapagos. (No cw used)
HA8WS—Tibor Hidvegi, St. Istvan UT 2 NR, Mezobereny, Hungary.
HB1RS/FL—HB9RS, Max de Henseler, 49, Servette, Geneva, Switzerland.
HL2AM—Major F. B. Barnes, Box 35 HDQTRS 314th AD, APO 970, PM, San Francisco, Calif.
HL2AM—Prior to Oct. 1st. Major D. A. Bartol, HDQTR 2nd AF/SAC Barksdale AFB, La.
HL9KT—(Seoul, Korea) QSL via Van, W2SUS.

[*Continued on page 110*]

by **KENNETH B. GRAYSON, W2HDM**
110-20 71st St., Forest Hills 75, N. Y.

SURPLUS

an introduction to surplus equipment

Equipment and Service	Function	Freq Range Megacycles	Conversion Band	Conversion Required	Value $	Original Voltages	Misc. Notes
TCS (Navy	R-T 2 units	1.5 to 12	160 to 40 (higher if reworked)	Power Sup.	35 per unit	12, 24 DC 110 DC 110 AC	Excel. buy MO and Xtal FB Novice 25 W CW
TDZ (Navy)	T	200-400	144 & 220	Heavy Power Supply	X	Various	Very big for power out. Pretuned Channels
RDZ (Navy)	R	200-400	144 & 220	Power Supply	X	Various	FB for VHF
TBS (Navy)	T-R 2 units	60-80	6 & 10	Power	35 per unit	Various	Xtal Control on both 50W A3
MBF (Navy)	T-R	60-80	6 & 10	Minor Coil Changes	30	110V AC & DC	5W A3 FB if in Good Condition
TBX (Navy)	T-R	T 2.0-4.5 R 2.0-8.0	80	Power Supply	X	Batt & Hand Gener.	9W CW 3W A3
TBY (Navy)	T-R	27-80	10 & 6	None	30	Battery	MOPA has built in Calibrator
TBW (Navy)	T	0.35-1.0 3-18	80-40-20	None	45	Gas Gen	FB Novice 100W CW 25 A3
RAL (Navy)	R	0.30-23	160 to 20	None	20	6V Fil 180 B+	TRF Rec
RBM (Navy)	R	0.2-2.0 2.0-20.0 (2 units)	80-20	Power Supply	X	6V Fil 200 B+	Compact Selective
RBZ (Navy)	R	2.0-5.8	80	None	40	Batteries	Miniature Superhet
ARB (Navy)	R	0.195-9.05	160-40	Power Supply	20	28 DC	FB for Conv. Variable IF
GF (Navy)	T	2.0-4.5 6.0-9.05	80 to 20	Power Supply	X	14 or 28	Has VFO
BC-191	T	1.5-18	160 to 20	Power Supply	X	12. VDC	Plug-in heads VFO or 5 Xtal 400 W CW 100 W A3
BC-221	Frequency Meter	0.02-20		Batteries	100	- - - - -	Can be used as VFO
BC-375	T	1.5-18	160 to 20	Power Supply	60	24 VDC	Plug in heads VFO or 5 Xtal 400 W CW 100 W A3
BC-610	T	2.0-18	80 to 20	Power Supply		24 VDC	VFO or Xtal 400 W CW 300 W A3
BC 624	Receiver portion of SCR-522 Equipment						
BC 625	Transmitter portion of SCR-522 Equipment						
BC-639	R	100-156	144 Mc	none	40	110 VAC	One channel Xtal Control
BC-640	R-T	420	420-220 Mc	Fair amount of Conversion Required	30	12 or 24 VDC	IFF Set MOPA superregen receiver
BC-659	R-T	1.6-4.5	80 (also Marine use)	Power Supply	90	24 VDC	4 Xtal plus VFO 45 W A3
BC-779	R	0.1-0.4 2.5-30	80 to 20	none	X	110-VAC	Similar to "Super Pro"
BC-794	R	1.25-40	80 to 10	none	X	110-VAC	Similar to "Super Pro"
BC-906	Oscillator and Field Strength Meter	140-225	144 & 220	none	8.00	Battery	General purpose

Equipment and Service	Function	Freq Range Megacycles	Conversion Band	Conversion Required	Value $	Original Voltages	Misc. Notes
BC-1033	R	75 Mc	Any band	Power Supply	4.00	24 VDC	Marker Beacon Superregenerative rec.
BC-1206	R	0.195-0.425	Q-Ser	Power Supply	4.00	24 VDC	24 V Plate and Fila. Earphone output
BC-1335	R-T	27-39.5	50-50 Mc.	None for 30 MC	30.00	6 or 12 VDC	4 W F3 See CQ Dec 57
GO-9 (Navy)	T	0.3-0.6 3.0-18.1	80 to 20	Power Supply	X	120V at 800 cps and 28VDC	VFO 100 W CW 70 W A3
ATD (Navy)	T	0.2 to 18	160 to 20	Power Supply	50.00	28 VDC	50 W CW 40 W A3 (conservative) 4 plug in units
AN/ABC-1	R-T	100-156	144 Mc	None	X	28 VDC	10 Xtal channels 6W A3
AN/ABC-3	R-T	100-156	144 Mc	None	X	28 VDC	Auto-tune 10 Channels Xtal control 6 W A3
AN/ABC-4	R-T	140-144	144 Mc	None	30	12 or 24 VDC	4 Channels Xtal Control 6 W A3
AN/ABC-5 (HF-Band)	R-T Separate Units	0.5-9.1(T) 0.19-9.1(R)	Any	Power Supply	4.00 up	24 VDC	See "Command Set" Handbook
AN/ABC-5 (VHF-Band)	R-T Separate Units	100-156	144	Power Supply	20 per unit	24 VDC	4 Channel Xtal Control
AN/ARR-11	R	0.2-0.5 1.5-18.1	160 to 20	Power Supply	X	24 VDC	6 Band Receiver
AN/ART-13	T	0.2-1.5 2.0-18.1	160 to 20	Power Supply	250	28 VDC	11 Preset VFO Channels
ATC (Navy) AN/APN-1	Navy equivalent of AN/ART-13 R-T	420	420	Power Supply	5.00	24 VDC	MOPA 1/2 Watt Needs Modulator
AN/ARR-2	R	224-258	220	Power Supply and Oscillator	4.00	24 VDC	Requires separate local oscillator. Fine for VHF parts
SCR-508 SCR-528	R-T	20-27.9	10 & 15 M.	Power Supply	35	12 VDC	30 W F3 Xtal Control 10 Channels
SCR-509 SCR-510	R-T	20-27.9	10 & 15 M	Battery or Vibrapack	X	- - - - -	1.8 W F3 2 Xtals
SCR-522 SCR-542	R-T	100-156	144 Mc	Power Supply	40.00	24 VDC 12 VDC	4 preset Xtal Channels 6 W A3
SCR-536	R-T	3.5-6.0	80 M	Batteries	120 pair	Batteries	0.02 W A3 (BC-611 is individual handy-talkie)
SCR-608 SCR-628	R-T	27.0-38.9	10 M	Power Supply	35	12 VDC	30 W F3 Xtal Control 10 Channels (BC-603 & 604)
SCR-609 SCR-610	R-T	27.0-38.5	10 M	Battery or Vibrapack	X	- - - - -	1.8 W F3 2 Xtals

This month's SURPLUS column takes on a new shape. As was mentioned last month a tabulation of usable surplus equipment requiring little or moderate conversion is included this month and will be kept up to date for CQ readers. Many of the equipment's listed are just arriving on the surplus scene. Others are old stand-bys. A few just exist in the hands of the lucky or rich.

In some cases the mere application of power is all that is necessary to get it on the air. A few require extensive coil and other component changes. Keeping in mind that not all of our readers are engineers or have adequate facilities for major overhauls. Our recommendations as to the degree of conversion will be an index of the compelxity of the problem. In most cases the equipment has been worked on by myself or by friends. In every case the equipment has been examined and the recommendations are honest.

While prices vary from area to area or even from store to store, the price column is at least an indication as to the approximate price of the equipment in good condition, and was tabulated from CQ ads and the various flyers sent out by the many surplus dealers. CQ does not intend to set price policy in any event. Price is dictated usually by the availability of the equipment and many other economic controlling factors.

Note too that the power listed in the Misc. Notes column is actually the power output of the equipment and not plate power input. The emission notation A3 is of course AM while F3 is FM. When converting FM equipment to AM remember that a modulator will be required and that appropriate changes will be necessary to the i-f stages of the receiver as well as to the receiver detector. Usually this will not be too complicated.

73, Ken, W2HDM

What's in a name?

by Al Edwards, W2BOH
86-33 253rd St., Bellerose 26, N. Y.

Names of hams with ham terms for names.

Call	WØMBW	Shields	KØCNH
Ohm	W1DIA	Pole	W2VQC
Ohms	W9DAC	Bar	DL9EJ
Watt	KN9CTE	Dial	K5ADC
Watts	W7AQO	Link	W2VKF
Tester	W9BIE	Links	W9QIM
Power	WØVPO	Band	W2SMN
Beam	W3UQO	Coil	K2QFY
Beams	W8AAL	Key	W5CDO
Towers	W9WBD	Peak	W1BWN
Loop	WØZIA	Clamp	W5NFJ
Gang	WØTIR	Null	W8VKP
Shack	W9AVY	Plate	W2RRU
Driver	W8BPD	Rod	W2KVY
Slicer	W1SCZ	Pulley	W2TQQ
Trimmer	WØNEL	Hook	W1CGV
Ripple	W9SIZ	Gear	KØBXM
Hums	W9HKP		

Spark W9UWK Sparks W3QVK

Shock WØJWF

Hardware and Tools for hams:

Brace	WØFJY	Hammer	W9AUU
Drill	K9CLS	Bolt	W1DGA
Wrench	WØMQB	Screws	W5UQC
File	W9PMN	Tack	KNØCVG
Files	WØGK	Staples	KN9CPZ

Mason and Dixon are K2KTM and W1DYY.

If you need Maine for WAS, work W2CCT.

W9EUO is Meek but W2GDN is Meeker, W9ITE is Lovely, W5SCX is Pretty, WØKYM is Kind, W3KYI is Fine, WØQZR is Gentle, K6ACC is Gay, WØQMQ is Jolly, W2DSU is Merry, W8AAH is Happy, W9UDZ is Pleasant, W9PRU and K2COB are Neat and Sporty.

W3WBQ is Famous, W1CIC is Frank, W9ZMG is Just, WØZTI is True, KØBQE is Earnest, W2GCO is Good, W3WBH is Queer, W5ITD is Strange, W8VQM is Bold, W2DOF is Wild, W8ZVO and WØSEM are Grim and Moody.

K9AFP and W2VCU are Hale and Hardy.

WØUCV is a Dear, W1AGL is a Darling, W1EHZ is certainly a Comfort but WØEHQ is a Brute.

W8WUU and W8WUT are Miracles!

W 3 K J U is an Oldham.

but

W 2 N D and K 5 E A D are Younger!

[More of this nonsense on page 109]

YL

by **LOUISA B. SANDO, W5RZJ**
212 Sombrio Drive, Santa Fe, N. M.

YL-OM Contest in March

The 9th annual YL-OM Contest is set for March 1-2 (phone) and March 15-16 (cw). Here's your chance, fellows, to make contacts toward those YL awards—YLCC (for 100 confirmed YL contacts), WAS/YL, and even WAC/YL. And you might pick up a YL club certificate or two as well as the gals will be out in force just for your benefit. Now come on, gals, let's all be in there pitching!

Results: 18th YLRL A.P.

Congratulations to the winners in YLRL's 18th Anniversary Party held last Nov. 6-7 (phone) and Nov. 13-14 (cw):

1st CW—W7COX, Fran Viers, 2970—cup
2nd CW—W4RLG, Frances Shannon, 2280—certificate
3rd CW—W6PCA, Opal Jones, 2054—certificate
1st phone—W3URU, Sarah Hengen, 9938—cup

YLs attending the Ham picnic at St. Cloud, Minn. Aug. 1957. L. to r., seated: W8ATB, WØKMP, WØQVQ. Standing: WØVYL, KØERQ, KØDIB, WØETY. Photo courtesy W8ATB.

9th Annual YL-OM Contest Rules

Phone: Start Sat. Mar. 1, 1958 at 1:00 p.m. EST. End Sun. Mar. 2, 1958 at 12 midnight EST.

CW: Start Sat. Mar. 15, 1958 at 1:00 p.m. EST. End Sun. Mar. 16, 1958 at 12 midnight EST.

Eligibility: All licensed OM, YL and XYL operators throughout the world are invited to participate.

Operation: All bands may be used. Cross-band operation is not permitted.

Procedure: OMs call "CQ YL." YLs call "CQ OM."

Exchange: QSO number; RS or RST report; name of state, U. S. possession, VE district, or country.

Scoring:

(a) Phone and cw contests will be scored as separate contests.
(b) One point is earned for each station worked, YL to OM, or OM to YL. A station may be contacted no more than once in each contest for credit.
(c) Multiply the number of QSOs by the number of different states, U. S. possessions, VE districts and countries worked. Maryland and the District of Columbia count as one state.
(d) Contestants running 150 watts input or less at all times may multiply the result of item (c) by 1.25 (low-power multiplier).

Logs: Copies of all phone and cw logs, showing claimed score, must be postmarked not later than March 31, 1958 or they will be disqualified. Please file separate logs for each mode of operation. Send logs directly to YLRL Vice President Kay Anderson, W4BLR, 5210 Raleigh Road, Richmond 23, Va.

Awards:

First place phone YL—cup
First place phone OM—cup
First place cw YL—cup
First place cw OM—cup
Winner of phone cup is also eligible for cw cup. Certificates will be awarded to high place cw and phone winners. The highest scoring contestant in each district, where three or more logs are submitted, will receive a certificate.

W9STR, Betty Sandberg, YLRL's editor for 1958.

2nd phone—W6QGX, Harryette Barker, 9275—certificate
3rd phone—W4HLF, Arlie Hager, 9100—certificate
Club gavel to San Diego YLRL, 4841

For a picture and write-up about W7COX, see "Long-time YLs, 1932," CQ, Jan. 1957. Fran had 66 contacts in 36 sections to make the high cw score. W3URU, Sarah (see photo here) had 150 contacts in 53 sections to place first on phone.

According to K5LIU, Mildred, YLRL's 1957 vice president who handled the contest, there were 132 phone logs submitted showing 528 YLs participated. 15 DX countries were represented. In the cw section 70 logs were submitted showing 146 YLs active in this portion. All who participated agreed it was wonderful fun, and many are now much closer to WAS/YL.

Club entries (average score)

San Diego YLRL	4841
Los Angeles YLRC	4071
Penn-Jersey YLRC	2834
St. Petersburg Amateur Radio Club YLs (SPARCYLS)	2618
Ladies Amateur Radio Klub (LARK)	2604
Washington Area YL Amateur Radio Klub (WAYLARK)	975

YLRL Editor

Due to tightness of space in the December issue, the write-up about YLRL's editor of *YL Harmonics* for 1958 got squeezed out.

W9STR, Betty Sandberg, of Chicago, has already served YLRL as assistant editor. Licensed in 1955, she and her OM W9STQ use a Globe King 500. Betty is active on 10 and 20, especially in RACES and on the Night Owl net. Vault manager in her neighborhood bank, Betty's other interests are rocks and minerals, photography, and a collection of 200 pairs of ear-rings. 8-year old Connie completes the family.

YLRL's third district chairman for 1958 is W3DBN, Florence Collins.

With the Clubs

Another brand new YL club to report—GAYLARK!

The Gulf Area YL Amateur Radio Klub (GAYLARK) was founded at a meeting held Nov. 19, 1957. Officers are: President, K5BJU, Harriet; vice president, W5DRA, Yetive; secretary-treasurer, KN5MIZ, Alverta; publicity chairman, K5LIU, Mildred. Other members include W5ERH, W5EGD, and K5CZZ. GAYLARK extends an invitation to any YLs in the area surrounding Houston whom they might have missed to join them. They welcome into membership any YL holding any class of license. Dues are $2.00 a year and meetings are held at the homes of members at 7:30 p.m. on the last Tuesday of each month.

W3URU, Sarah Hengen, won the cup for making top phone score in the 18th YLRL A. P.

The Penn-Jersey YLARC offers a certificate to any amateur who works 15 members of the club, on any band. Send application and QSLs to the custodian with return postage. Custodian: W3GTC, Carolyn Currens, P.O. Box

523, Norristown, Penna. Members of the P-J YL club include: W3's AAU, APT, BIW, DBN, FTP, SLF, UKE, URS, VLX, VNN, WML, ZCF, HTC, CUL, URT, URU, GTC, GTP; W4VCB/3; K2ROL.

PARKA, the Polar Amateur Radio Klub of Alaska, which was founded in July, 1955 with 26 members, is still very active. President for 1957-58 term is KL7ALZ, Geraldine; vice president, KL7BVQ; secretary, KL7AYA, Doris; treasurer, KL7CCP, Pat; activities chairman, KL7GOH, Lou. The club holds meetings on the first Tuesday of each month. Annual dues are $1.00.

PARKA is awarding a certificate upon the following conditions: Awarded to any amateur in the world who successfully completes two-way contact with seven (7) paid-up members of PARKA; operation on any authorized band, any authorized mode, cross-band operation not valid; contacts valid from Jan. 1, 1957 forward; when sending cards for certificate, please enclose a stamped, self-addressed envelope. Send application and cards to: Geraldine Nichols, KL7ALZ, c/o Alaska Railroad, Anchorage, Alaska. When working a KL7 YL ask your contact if she is an active and paid-up member of PARKA if you are interested in the certificate. Current members include: KL7's YG, AZI, ANG, BLL BJD, AZL, AYA, BOD, RN, RZ, BOH, BVC, BVQ, BBL, CCP, BWG, CDC, BZI, BOF, BHE.

Current officers of the Chicago YLRL are: president, K9CQF, June; vice president, Elsie Harper; secretary-treasurer, W9GME, Grace; P/C, Lillian Rochelle.

The L.A. YLRC welcomes these new members: W6's EPQ, QVK; K6's LMV, TFN, ZCR; WN6's VWH, YIG, KN6ZWQ.

The YLs and XYLs of the Waco area have formed an organization known as the XYLs of Central Texas Amateur Radio Club. Numbering 16 members, including W5CGE, K4AHZ, K5MRR and W5TSD, their aim is to promote fellowship among the Central Texas Amateur Radio Club members and their XYLs.

Here and There

The Wednesday morning Welcome Net meets at 9:00 a.m. EST on 3900 kc. with W8ATB, Esther, as NCS. . . . Congrats to K6OQD, Jean, on making her 3rd BPL in a row. . . . K6JRL, Peg, is reportedly the first YL in the L.A. area on 220 Mc.

33, Louisa, W5RZJ

Here are the individual scores by district. An asterisk (*) denotes the low-power multiplier was used.

CW

WIHAG	775*
WIVXC	260*
WITIW	(Conf.)
K2JYZ	1875*
K6VUE/2	531*
K2DXD	413*
W2QZZ	158*
W2BNC	(Conf.)
W3UTR	1813*
W3GEU	1290*
W3URU	1268*
W3TSC	468
W3CDQ	61*
W4RLG	2280*
W4BLR	1860
W4HLF	1849*
KP4ZV/4	1020*
K4BKT	912
W4BIL	840*
W4PPQ	132
K4EQB	64
W4SGD	(Conf.)
K5ADQ	1740*
K5LIU	1725*
K5BJU	20*
W6PCA	2054*
K6OWQ	1643
K6QPG	1540*
K6BUS	1450
K6ENK	1421
W6NAZ	744
W6WRT	150*
W6DXI	59*
K6SYR	38*
K6HOI	11*
W6LFF	1
W6JZA	(Conf.)
W6GGY	(Conf.)
W6MU	(Conf.)
K6PWH	(Conf.)
W7COX	2970*
W7PUV	1575*
W7PTX	1250*
W7ZIW	825*
W7DIF	661*
W7GUQ	375
W7DXM	336
W7FDE	124*
W8UAP	1200*
W8RIR	963*
W8OTK	630*
K8EKX	20*
W8WQE	(Conf.)
K9AVK	1950*
W9MLE	1508
K9BWJ	853*
W9USR	585*
W9MYC	158*
KØIKL	2040*
KØLYV	1631*
KØGIC	1064*
WØJAU	495*
WØZWL	60*
KH6CKO	113*
KH6BGE	44*
KL7ALZ	280*
KL7AZI	88*
VE3DMX	384
VE3AJR	(Conf.)
VE5DZ	950

Phone

WICEW	6325*
WIFTT	4264
WIZEN	3515*
WIYPT/1	3159
KIADY	1921*
WIRTB	1313*
WIVXC	653*
WIQON	440*
WIRYS	(Conf.)
K2JYZ	6750*
W2OWL	998*
K2TXM	697
W2QZZ	680*
K6VUE/2	455*
W2BNC	(Conf.)
W3URU	9938*
W3GEN	3465*
W3UTR	3106*
W4VCB/3	2625*
W3APT	1560*
W3RXJ	1265*
W3WUE	1128*
W3GTC	322
W3RXV	110*
W3MDJ	(Conf.)
W4HLF	9100*
W4KYI	7800*
W4CWV/LKM	4513*
W4WJX	4400*
W4BIL	3555*
K4IRZ	3384
W4TVT	3040
W4SGD	2765
W4UF	2516
W4RLG	2126*
K4BKT	2015
W4PPQ	1080
W4BLR	630
W4WPD	75*
K4EUG	(Conf.)
K5BNQ	7369*
W5HWK	6240*
W5JCY	4186
K5LIU	3226*
K5BJU	2652
K5IMD	2243*
W5RZJ	1770*
K5MSE	469*
W5ECF	(Conf.)
W6QGX	9275
W6JZA	8760*
W6WRT	8225*
K6EXV	8188*
W6GGX	6738*
K6OQD	6150*
K6OAI	4050
K6KCI	4046*
K6PWH	3413*
K6EXØ	3178
W6MWU	2931*
W6JMS	2920*
W6DXI	2100*
K6ANG	1856*
W6NAZ	1260
W6EHA	900*
K6ENK	350*
W6LFF	220
W6HOI	219*
K6BUS	(Conf.)
K6JCL	(Conf.)
W7WLX	7920*
W7TGG	7905
W7RVM	7405*
W7OUE	5590*
W7DXM	5314*
W7DRU	4035*
W7HHH	3290
W7RAX	2240*
K7BGP	2112
W7YHO	1620*
W7DIF	700*
W7DIC	650*
W7NJS	507
W7FDE	309*
W7GUQ	48
W8FPT	7226*
W8HUX	4600*
W8VRH	1740*
W8EIR	1516
W8RIR	1470*
W8OTK	925*
W8DNF	594
W8WUT	344*
W9UON	5250*
W9RUJ	3034
K9CCO	2723*
W9MPX	2170*
W9GME	1830*
W9LOY	1625
K9CQF	1425*
W9UXL	1129*
W9VNG	1025*
W9ZXZ	680*
W9RTH	573*
W9MYC	536*
W9STR	252
W9LDK	191*
K9BWJ	5*
W9MLE	(Conf.)
KØLYV	5518*
KØIKL	3093*
WØZWL	2138*
KØGIC	1528*
KØBTV	640*
WØJAU	520*
KH6BGE	6235*
KH6CKO	5093*
KH6AUJ	2320*
KL7AZI	6181*
KL7BHE	5850*
KL7BJD	3204
KL7ZR	2025*
KL7ALZ	1755*
KZ5VR	4158
OAIK	3774
OA4GR	924
VE3AJR	(Conf.)
G2YL	203*
G8LY	35
VP1OLY	1991*
ZL2JO	49

by **FRANK ANZALONE, W1WY**
14 Sherwood Road, Stamford, Conn.

CONTEST CALENDAR

January	**3- 5**	**DARC WAEDC CW**
January	**18-19**	**CQ 11 Meter**
January	**25-26**	**BERU**
February	**7- 9**	**ARRL DX Phone**
February	**21-23**	**ARRL DX CW**
March	**1- 2**	**REF Phone**
March	**7- 9**	**ARRL DX Phone**
March	**15-16**	**CQ SSB**
March	**21-23**	**ARRL DX CW**
April	**4- 6**	**DARC WAEDC Phone**
April	**12-13**	**REF CW**

DARC WAEDC

Don't pass this one fellows. Activity and returns in last year's contest proved this to be one of the more popular contests. In its streamlined form, this year's version should prove even more attractive. Our only criticism is the fact that the single band competition has been eliminated. Our December issue had all the details.

CQ 11 Meter

The way 10 has been opening up of late, this one might turn up with quite a following. Scoring is very simple. One point per QSO. Multiply the total number of QSOs by the total number of states and countries. Our December issue had the necessary details. Send your logs **not** to CQ but to

Eleven Meter Contest
P. O. Box 584
HoHoKus, N. J.

BERU

Just a reminder to our Canadian friends and the VP boys down Caribbean way. You fellows work 'em. We will do the listening.

ARRL

This is the Big One of the Spring DX season. January issue of QST should have all the info, if you need it.

REF

Dates – Phone, 1200 GMT March 1st to 2400 GMT March 2nd.
CW, 1200 GMT April 12th to 2400 GMT April 13th.

Serial Nrs – Serial numbers will consist of the usual RS and RST report plus a progressive 3 digit number starting with 001.

Points – Points will vary according to the continental location of the French Union station. For the USA and other North and South American countries, each completed QSO on each band counts as follows:

N. & S. America	– 4	Points
Europe	– 4	"
Africa	– 4	"
Asia	– 5	"
Oceania	– 10	"

Multiplier – The total points on all bands is multiplied by the total REF sections and countries of the French Union worked. This is your final score.

Calls – Example, from French stations: de F9ZZ/9/BG. In which 9 is the number of the REF section and BG (Bourgogne) is the province. FA9XX/OR. In which OR (Oran) is the REF section.

Logs – Send your logs to the Reseau des Emetteurs Francais, B.P. 42-01, Paris–RP, France, not later than 3 weeks after each part of contest.

CQ SSB

Bob Adams' SSB Column has all the dope for you Side Banders. Last year's impromptu party was a popuar affair. With all the advanced notice, this year's contest shoud be a huge success.

Regards our recent World Wide DX Contest. Conditions for both sections were excellent. George Jacobs, W3ASK, really hit it on the nose with his forecast. Bill Leonard, one of the ops. at K2GL, with a record breaking score of around 850,000, said that he had never witnessed such fine condx during a Phone contest. And Bill has been in some real shindigs.

If anything, the condx during the CW section, were even better. WWV was batting out N7 during the whole week-end. Here at W1WY, still QRP on 28 mc with only 25 watts, I worked 37 countries on 10 and made WAC several times over. Confidentially I had a new secret weapon, a Mosley 3 Element–Tri Bander, but still you don't get involved in one of these "brawls" with only an 807 to back you up.

For you fellows who are short a ZB1 confirmation or need points for your WAE, be sure to be on the air the week-end of Feb. 1st and 2nd. The ZB1 gang promises to be active on all bands, 3.5 thru 28 mcs, both CW and phone.

Good fishing and 73,

Frank, W1WY

ham clinic

by CHARLES J. SCHAUERS, W6QLV

Response to Ham Clinic's technical service nearly caught us "flat-footed" to say the least! Gosh, I never saw so much mail in my life! Of the hundreds of letters and cards received, only a few remain unanswered—but they will be. In some cases, interim replies have been sent. We tried our best and want you to know we do *appreciate* your interest and confidence in our trying to help you.

Perhaps some of the answers given were a little vague, but so were many questions which were not accompanied by sufficient background information. We are *not* cryptographers!

We've offered suggestions which we hope will solve the problem submitted to us. However, we do not guarantee that our answers are 100% fool-proof! Far from it. We can make mistakes and incorrect prognostications—if we didn't we would certainly ask for an audience with the people who run the $64,000 Question program!

But anyway, we are sincere in our desire to assist you and aim to please.

"Reminder" cards sent to a number of you should be used as stipulated. These enable us to maintain our files and furnish hard-to-get information within a reasonable length of time.

Again: remember to word your questions carefully and supply sufficient background information on your problem. Although we have files on most technical publications we do not have them all (nor does anyone else); so do not expect us to dig up an article written in 1929!

One request submitted to us on official stationary of a particular amateur radio organization, asked us to design a complete transmitter! Specific tubes were specified etc., as well as band coverage, power supply, dimensions and so on. Some research revealed that the transmitter AS REQUESTED is in a certain radio handbook. Who is pulling who's leg!?

Requests as to our personal opinions on certain commercial amateur gear were answered honestly. No punches were pulled!

Three letters were received which lead us to believe that the average amateur is a great big-hearted guy interested not only in his hobby but the welfare of others. For example: "I hope you can use the following information. Will you pass it on please?

"I have a Globe Chief 90. Firing it up on 15 meters it fell flat on its face! So I grid-dipped the 15 meter position and found that it would only get to 19 mcs. After taking off two turns, it worked like a charm! The 90 is a swell transmitter, but I guess sometimes the factory can make a small mistake!" (KN4QKI)

Now it just so happens that there were 6 queries relative to the 90 not working properly on 15. (WRL—please note)

Questions that are published will not carry the writer's name or address unless requested. We feel that we would be violating a confidence to publish a question without the writer's permission. So if you do not mind publication of your questions, please so state in your letters or cards.

Observation

The QRM on the 75 meter mobile frequencies (3975, 3980 and 3995) is fantastic! No one seems to want to listen in before transmitting!

On a recent long trip throughout the West, attempts to break into various nets were as hard as pulling the teeth from a Mississippi chicken!

This problem has been solved quite well by the "Needle Net" which operates on 3975 kcs in the San Francisco Bay Region every morning and every afternoon. Pauses are made after each transmission to accept net participants. Transmissions are limited to 30 seconds. Each station is assigned a "follow-spot" and patiently waits his turn—then he can blast loose.

When you are on mobile—any frequency, don't hog the air! Give the other fellow a chance to check in. There might be a road emergency you know!

Twists and Techniques

Although most mobileers have a red light on or near the dash to indicate when the filaments are on, or some other visible means to indicate the flow of current to the transmitter, they often forget to switch off before leaving the car. To obviate the unnecessary battery drain due to forgetfulness, hook up a small buzzer to the door switch which turns the dome light off and on. You will be aurally reminded to turn off your rig before you slam the car door!

Questions

Viking Ranger on 3.245 Mcs. J. M. from Fairfield, Ala. writes: "will a Viking Ranger operate okeh on 3.245 mcs with a xtal? (This is a MARS Frequency)

Yes Joe, it will. W6DCH has one that operates very well on the lower 3meg frequencies. If you run into low-load conditions however, a little extra output capacity will help. The oscillator seems to "take-off" easily with most crystals.

Stray RF. B.M. of Salt Lake City wants to know what he can do to eliminate the hot rf he finds on his transmitter and receiver as well as his mike.

Well Bill, stray rf can be a real problem! The first thing you should check is your ground system. All too often, the average ham feels that a good ground is the nearest water pipe or a rod pounded four feet into the ground outside the shack window. A good ground is a low resistance ground connected to equipment with good solid copper wire or braid of the proper size. Using bell wire for a ground connection is asking for trouble. Commercial stations pay about as much attention to adequate grounding as they do their antennae systems.

If space is available, about 12 pieces of number 12 copper wire 25 to 60 feet long buried about a foot and a half in moist earth, arranged in the form of a wagon wheel with central connection to the "hub" make an ideal ground. Certainly its a lot of work but worth it.

Now how about proper antenna impedance matching? Is the rf getting into the antenna or is it being dissipated in your final tank (and inadequate ground system)? Standing waves "throw" rf all over!

Have you checked the possibility of having a "floating" power system? This is an important point often overlooked by the average operator. With a three wire 220 volt system coming into the house which is split for distributed load, there is the possibility that the entrance ground system is very poor. A voltage between the ground you installed and the entrance ground can exist when you flip on your transmitter.

How long is your mike cord? Your ground connecting wire? Rf has the peculiar property of wiggling its way into the derndest places! Rf chokes in series with your mike input connections and those leading to your ground often help.

Imperfect coaxial grounding can also contribute its share to stray rf.

Receiver Conversions. Many requests have been received to supply conversion information on various types of receivers such as the old SX 25, SX 42, HQ 120, SX28, NC240D, 183 and many others. Those having these receivers seem to be of the general opinion that it is a simple matter to pick out a few low noise miniature tubes, change a few resistors and condensers and presto! a new receiver. To be brief, there are some changes which will improve sensitivity by changing tubes, but selectivity is another matter. For one thing, in addition to condenser and resistor aging there is the matter of old type single and double tuned IF transformers to worry about. Frequency stability is another problem (with parts that change value due to changing temperature).

No doubt, a good receiver engineer could re-vamp an old receiver and make it perform about as well as an ultra-modern set, but he would need a lot of time, patience and money.

The few changes (such as those described in December 1957 CQ) which have been found effective and are easy to make are not frowned on. However, not every amateur has the proper equipment for realignment of his receiver, after he has made the necessary changes.

Vertical Antenna. S.R., New York City wants to know what the best way is to feed a vertical antenna a quarter wavelength long with any transmission line.

The easiest way Steve is to series tune the vertical with a coil and condenser; the coil being link coupled to the transmission line. That is, the coil-condenser combination resonates at the transmission frequency and is connected between the lower end of the vertical and ground. Then a link is wound around the main antenna coil; it is connected to any transmission line. The vertical is cut to frequency.

Regulator Tubes. "What is the minimum current requirements for stable operation of gaseous regulator tubes such as the VR150 etc.?" E.L. writes from San Diego.

Between 5 and 10 milliamperes. Starting voltage is generally about 25-30 percent higher than the operating voltage. The usual load current runs between 30 to 35 milliamperes for available tubes used in ham gear.

Sweep Generator. F.K. writes from East Orange, N. J. "what tube would you suggest be considered for building a linear sweep generator for an oscilloscope I'm making?"

Try the 884. It's a gas triode and works very well. Using this tube you can control sweep frequency by switching fixed condensers in or out of its plate circuit. Fine frequency adjustment can be accomplished with a high resistance potentiometer.

50 *Mc Antenna.* "Would you please give me the dimensions and spacing for a four element 50 mc beam?" asks T.R. Jacksonville.

[*Continued on page 94*]

Ham Clinic [*from page 93*]

Make the first director about 104"; second director 106"; folded dipole about 111" and the reflector about 117". Feed the antenna with 300 ohm ribbon etc.

Space the first and second directors about 58 inches; second director to radiator about 47 inches; and radiator to reflector about 47 inches. Space the 1" tube used as radiator about 1¾ inches from the driven ¼" tubing (which is split exactly in the middle to take the 300 ohm line). Good dx!

Joining MARS. F.C. Chicago wants to know how he goes about joining the Military Affiliate Radio System in his area.

In your case Frank, write to the MARS Director, Hqrs. 5th Army, Chicago, Illinois. For those of you interested in either Air Force or Army MARS write to the MARS Director of the headquarters nearest you.

Question of the Month

Doc Lovestedt, KØEVW asks: "am trying to work 6 meters from my Volkswagon but the ignition noise at moderate and higher speeds makes it almost impractical. Any suggestions?"

An article has been prepared for the Editor's consideration Doc, and has been written with a number of foreign cars in mind. In the meantime I am forwarding you and 11 others personal letters giving you the run-down in brief on what I did (successfully) to eliminate ignition and generator noise. It can be and is being done, but it's work!

Book Review

After buying a copy of COMMAND SETS for $1.50 I found that I had gotten more than I had bargained for. Replete with good solid information on the popular command transmitter and receivers manufactured in wholesale lots for the Air Force and Navy during the war, this 136 page treatise enables those who do not have much money to go on the air and give a good account of themselves.

Written in easy-to-understand language, it covers conversions thoroughly and enables the Novice as well as the Extra-Class licensee to put together an effective station.

Command sets are still widely available and at prices most can afford to pay. So whether or not you contemplate going mobile or fixed with command equipment, you can't go wrong if you buy the book. It is really worth the buck fifty.

Thirty

Trying to choose questions for this department which would be of general interest is a task not to be sneezed at. What is interesting to one may not be to another. A lot of midnight oil has been expended answering questions from far and near. We enjoy serving you the CQ reader, and hope that you will bear with us if we are a little tardy; because we really have to "dig" on some questions—and this takes time. 73, Chuck, W6QLV

SB [*from page 63*]

GMT around 21,431 Kc.

W5VGE/4, Luke lost his tower in a recent storm but put it back up in the height of a second storm in the area. He accused me of "losing interest in ham radio" because I did not put my new tri-bander up in the same storm. By the way the new TA-33 Mosley is sure FB on all the three bands and I have brought my country count to 90 by working HC2AGI, OQ5GU, VS6AZ, GD3GMH, OA4AS, HH2JT, HZ1AB and VP2AZ.

Radio lost one of its finest in the passing this month of Lou Springer, W4NMW in Florida. We will all miss you Lou.

W2CMM, Bing

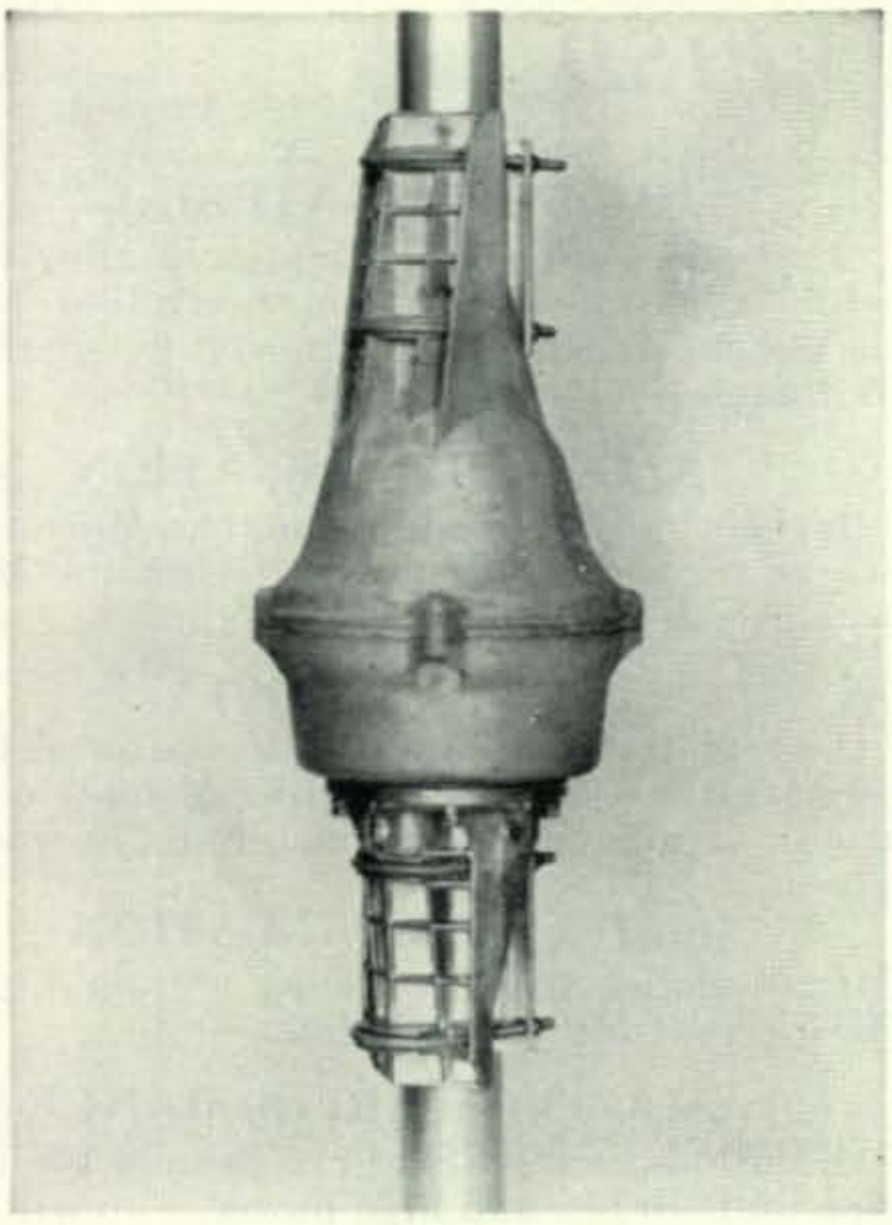
According to my latest records there are or have been 117 countries with SB activity. These are as follows: AP2, BV1, CO5, CN8, CP5, CX5, DL4, EA2, EA9, F, FS7, G, GI3, GM3, GD3, GW3, HB9, HH2, HP1, HR2, HZ1, I, KA, KB6, KC4, KG4, KH6, KL7, KM6, KG6, KAØ, KP4, KR6, KS6, KV4, KX6, KZ5, KG1, LA8, OA4, OD5, OE13, OH1, ON4, OZ3, PAØ, PJ2, PY2, SM6, SVØ, TF2, TG9, TL2, VE, VK, VP7, VP9, VQ4, VR2, VS6, W, XE, YU1, YV5, ZD4, ZE6, ZL, ZS, ZS3, 4X4, 5A2, VP2, OHØ, LU, FQ8, EL4, ZK1, YS3, ZB1, VP2, Leeward, VK5, CE2, HB9/FL, DU7, HS1, VS4, CR9, 3A2, UA1, KT1, TA2, YN4, EAØ, VU2, ET3, VQ5, ZD1, VQ3, MP4, YA1, YI2, YO3, OQ5, ZP5, VS5, KW6, VS2, VS1, VR4, SP7HX, VR2, VR6, EI4. And the list grows daily.

Don't forget the SB World Wide DX Contest from 1800 GMT March 15 until 1800 GMT on March 16, 1958. It should be very interesting. CN8MM is already preparing to win again.

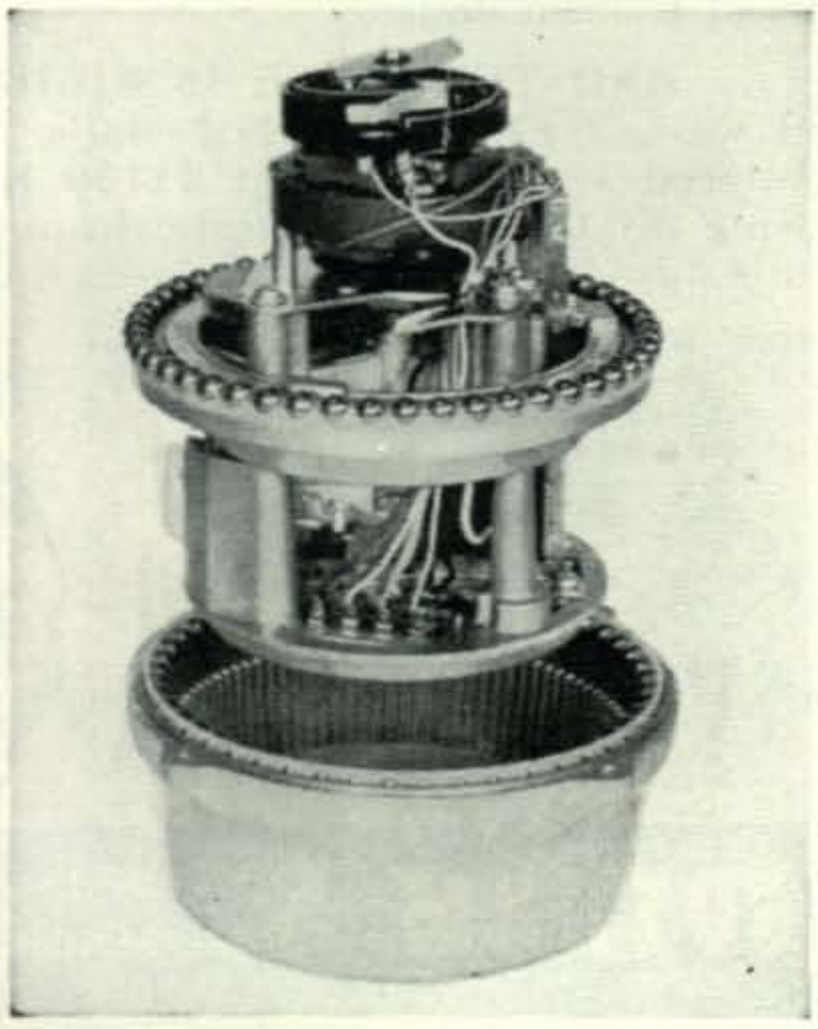
This will be the last listing of Countries Worked without verification of the totals submitted. Unless your totals have been submitted and have been duly verified by another amateur from the QSLs received, then your call will not be listed. Remember the closing date is the 18th of each month.

73, Bob, W3SW.

New Amateur Equipment



Rotating the amateur antenna has presented quite a problem since the choice of rotating mechanisms available were either very expensive, too light duty, or required considerable conversion. The fellow who wanted to rotate any real weight had to face serious pocketbook repercussions.



Antenna Rotor

Bill Ashby, K2TKN (ex-WØETJ) had quite a hand in the production of this new rotor by Cornell-Dubilier Electric. The Model HAM Rotor is designed to be easy to install, rotate just about anything you can afford to put up, last indefinitely, lock firmly when not being rotated, and give an extra accurate indication of the beam direction. They thought of almost everything. There are limit switches built in to stop it at each end of the rotation. A separate transformer is used for direction indicating to assure accuracy.

Looking inside we find stainless steel motor gears plus ball bearings all over the place. The shell is die-cast aluminum alloy. The brake is solenoid operated to eliminate drift. The unit is built for ruggedness and long life. The indicating meter is callibrated every 3°!

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For more information circle 7 on page 126.

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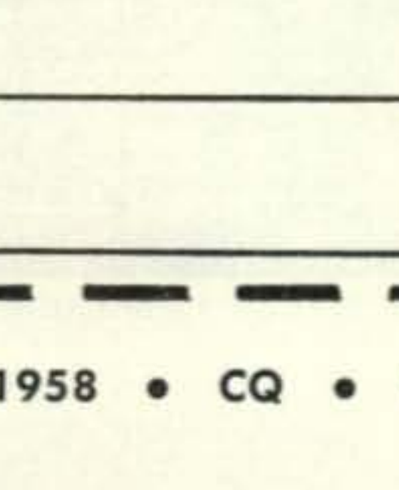

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For further information, check number 25 on page 126.

in most cases burn the leads away inside the condenser terminals, due to the very high instantaneous current which they can supply. With the plate transformer primary switch off and the exciter running, a few words into the microphone will dissipate the stored energy to a major degree. If cut off bias is used on the final, you may have a small charge remaining, but this may be disposed of in any of the normal ways; shorting, screw drivers, etc.

A Watt Meter in the primary of the plate transformer will show a steady drain when the final is in operation. The voice burst current you see on the final milliameter should not show on the primary side of the plate transformer. If your plate power kicks are appearing in the primary side of the plate transformer, you are overloading the supply. As long as the oscilliscope pattern shows your modulation is clean, you may load right up to the point where the primary just starts to show power rise with modulation. One of the nice features of this system is with a 2 KW peak power final you may have the primary connected to 110 a-c single phase line and not have lights blinking or other disturbances in your home.

For AM operation, this type of supply is utterly worthless because the filter bank cannot carry the steady high load and all the load does is to move back to the transformer, which is not large enough to carry the steady state condition of the AM requirements.

I promised the c-w men some data that should be of interest. In running tests to see just what could be expected from a supply of this type on cw, it was found when loading the final to the same conditions as were used on Single Side Band, the envelope shape of the dots and dashes was very interesting. It reminded me of the good old days when bleeders cost too much and we squeezed every ounce from the final power supply. Power output is a function of sending speed and length of the on time of the dots and dashes. This at first gives a very dim picture, however, if you drop your plate current back a bit and use a medium keying speed, the output power and keying wave form will be quite usable. One thing that will fascinate the DX boys is the peak power on the start of each dot or dash, which gives the signal a very piercing sound on the air.

A supply of this type has been used for months on a 14 mc SSB rig using 1000 T's with excellent results. Reports from stations with Oscilliscope equipment give the signal a clean bill of health, no flattening and very sharp spikes on peaks.

The possibilities of a power supply of this type is fully realized by the writer. Light weight, small size and low cost, coupled with the kick of a mule when used properly makes a very interesting package. ■

For further information, check number 54 on page 126.

Letter [*from page 48*]

twenty years ago. But then came the Novice license and the 5 wpm code requirement. This meant that instead of having to sit and drool over the ham bands you could get busy on the air with a low power rig and actually work 'em. Where did this leave the SWL? Time was when the mail brought almost as many SWL cards as QSL cards to the active phone ham. I haven't gotten more than a couple in the last year. A few months back I jabbed the SWL's to see what would happen . . . the letter printed in the October CQ was rather typical . . . mostly SW broadcast listeners, not ham SWL's. But Tima's letter is potent, maybe he has a good idea there. I don't feel that I should turn him down without taking a sounding of the readers on such an important matter. Thus I am printing here his letter for you to mull over. Please let me know if you would be interested in reading such a column every month or every other month, or let me know if you wouldn't. How many ham SWL's do we have, licensed or unlicensed? On a world-wide basis Tima has found that interest is high . . . but how about in this country . . . and you fellows are the ones who are paying the bills, so you are the ones to say what goes . . . . . W2NSD (Well, what say fellows, do we want to hear more from Tima?)

Addresses of hams who have answered SWL Reports . . .

CP3CB—Ing. G. Thofehrn, Casilla 200, Oruor, Bolivia

CR4AG—Jose Pedro Afonso, Box 55, S. Vicente, Cabo Verde

CR5AC—Anibal Barbosa Vicente, Box 38, Bissau, Guine, Africa Ocidental Portuguesa

CR7AQ — Anibal A. Martins, Caixa Postal 821, Laurenço Marques, Moçambique, Africa Ocidental Portuguesa

CT3AN—Jose L. De Brito Gomes, Rua Da Carreira, 197, Funchal, Ilha de Madera

DU1AL—Alejandro Legarda, 181 San Rafael, Manila, Philippines

EL9A—Augie H. Le Monze, PAA, Roberts Field, Liberia, West Africa

EP3SS — QSL through DARC, Munich 27, POB 99

FD8AA—R. F. de Tugny, Box 183, 3 Avenue A. Bissagné, Lomé, Togo, E. Africa

FF8DA—Dobak Albert, P.B. 1085, Dakar, Sénégal, Afrique Occidentale Franc.

HP1GD—Jorge E. Dawson, Apartado 1616, Panama, R. de Panama.

HZ1TA—H.R.H. Prince Talal al Saud, The Royal Palace, Ryiadh, Saudi Arabia

IS1EHM—Maria Marras Comida, Virle Regina Elena N. 17, Cagliari, Sardinia

MI3LV—Luciano Valeriani, P.O.B. 374, Asmara, Eritrea, East Africa.

MP4KAC—Wm. N. Burgess, Box 54, Kuwait, Persian Gulf

OA4EK—Adolfo Arens, Pasaje Velarde 176, Lima Peru

OQ5HL—Leopold Hansenne c/o Telecommunications, P.B. 3142, Leopoldville, Belgian Congo

VK5HI—John Clifton, Adelaide, South Australia

VP3YG—Desmond E. Yong, 22 Sussex Str. Georgetown, British Guiana

VP4LZ — PAA Flight Radio Officers, PAA Guest House, Piarco, Trinidad

VP900 QSL via VP9D—James A. Mann, c/o Cable & Wireless, St. George, Bermuda Is.

VQ2JN—John Nortje, P.O. Box 7, Livingstone, Northern Rhodesia.

VS9AS — George H. Schuler, C/O A.M.-D.G.W. Mess, Royal Air Force Station, Khormaksar, Aden

VS7FG—Freddy Gomes, "The Tent", Mt. Lavinia, Ceylon

FU2JU—QSL via P.O. Box 6666, Bombay 20, India

YI3ETQ (G3ETQ) — Gerald B. Whitfield, Basrah, Iraq

YN4CB—Christian Brothers, Colegio San Jose, Bluefields, Nicaragua

CD6DU—QSL via R.S.G.B.

ZE4JC—A. P. Dale, P.O. Box 88, Causeway, Salisbury, Southern Rhodesia

ZKIBC—R. Hanley, Aeradio Station, Nikao Airfield, Rarotonga, Cook Islands.

ZP4AF — Dr. Frederico Donna, Convencion 562, Asuncion, Paraguay.

ZL2GS O H.E.H. Green, Clifford Road, Johnsonville, New Zealand

ZS1H—J. J. Van Ravesteyn, "Twyford Lodge", Sandown Road, Rondebosch, C. P. South Africa

Addresses of SWLs wanting to exchange cards between eath other.

B.R.S. 20206, Roy Smith, 'Quarry Road, Tupsley, Hereford, England

G-SWL, Ron D. Young, 3, Bell Hill, Danbury, Chelmsford, Essex, England

HL-1002, Dong in Cho, C/O K.A.R.L. P. O. Box 162, Seoul, Korea

SWL—JA2, Yasutsugu Miura, Katamachi, Kataharacho, Hoigun, Aichi, Japan

SM1-SWL, Arne W. Arscans, Box 18, Stjarnarve, Gotland, Sweden

W8-6913, Joe P. Morris, 10512 Parkview Ave., Cleveland 7, Ohio, U.S.A.

W7-SWL, Miss Betty Pearl Elder, 1202 Broadway, Bremerton, Washington, U.S.A.

SWL-VE4, John W. Shinn, Box 20, Bowsman Rıver, Manitoba, Canada

VE6-SWL, Louis Thoreson, P. O. Box 115, Ponoka, Alberta, Canada

ZC4-5218, Arthur Miller, via ISWL

VK5-SWL, Brian J. Cumming, 159 Esplanade, Brighton Beach, Adelaide, S. Australia

[*Continued on page 104*]

For further information, check number 50 on page 126.

For further information, check number 36 on page 126.

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W2RID

For further information, check number 26 on page 126.

Letter [*from page 100*]

ZL-SWL, Eric McIntosh, 240 George Str., Invercargill, New Zealand
ZS-SWL, Jean Beaunoir, P. O. Box 23, Jacobs, Natal, U. of South Africa

Letters

Philippines. Pedro R. Buhay Jr., DU9-SWL, 15 Machamabus St., Cagayan de Oro City

"I am an SWL, though not a good one, I should say. I guess I am the only SWL in DU-land. I've written to several amateurs here and even to the secretary of the PARA, asking them if they have heard from other SWL and I got a negative reply. I have been tuning the SW bands for more than a year now but have not sent any reports to foreign hams yet, though I've logged a number of them. Until now I still have not a QSL card of my own and I don't know when I can have one. I can't seem to make a design suitable enough to send the hams with a report of their QSO.

"I'm using a 3-band 5-tube RCA receiver and a long wire antenna about 100 feet above the ground and about 150 feet in length. I still need more information in SWLing . . . 73's and best in DX, Pedro."

How about some of you SWL boys getting in touch with Pedro and send him some information and samples of SWL cards?

Cleveland, Ohio, U.S.A., Joe P. Morris, W86913, 10512 Parkview Ave:

"Although I send many reports to stations I hear on the amateur frequencies, I also send my cards to other listeners and in return they send me one of theirs. I now have listener cards from 17 countries . . .

"The set-up here is an 11 tube National NC-125, with an RME DB-23 preselector in front of it. The antenna is a folded dipole cut for 20 m., N/S, at a height of 30 feet. I have logged 147 countries and 34 zones on the amateur bands since I began DXing in 1953. I have received confirmations from 60.

"I have enclosed a list of other listeners who would be glad to 'swap' cards. Also would be interested to know if you can supply QRA's of listeners in such countries as U, YO, LZ, HA, SP, etc. Very best 73's es DX, Joe."

Thanks for the fine information, Joe. There are a lot of SWLs in the countries you ask for, but they do QSL only via the bureau. No QRAs are printed on their cards.

Canada. Art Ferguson, VE3HP, Ontario Hydro, 280 York St., London, Canada

"Saw reference in CQ . . . always interested in reports and always QSL."

Canada. John W. Shinn, SWL-VE4, Box 20, Bowsman River, Manitoba

"Would like to swap SWL cards. I now have 30 countries SWLed. The set-up is a trio 9 tube receiver made in Japan and a 100 ft. long, 62 ft. high antenna."

Well, that's it for the beginning. Any comments, ideas and suggestions will be appreciated. So, SWL boys and gals throughout the world, let's hear from you soon.

73s, Tima

FP8 [*from page 29*]

17 miles on our way. Here he assured us there would be taxis about 2:00 in the afternoon.

7 hours we sat. What if the taxis came in filled to capacity?

One of the three taxis had room for two more passengers.

The trip to Fortune was something to remember. Such a road. But the scenery in this part of Newfoundland was breathtaking. While our frames received a thorough bouncing, our spirits got quite a lift.

As we rounded the southern tip of the peninsula we could see the lights on the island of St. Pierre, 17 miles out. At last we felt we really might reach our goal. The rain had

[*Continued on page 106*]

HARRISON HAS IT!

THE PERFECT RECEIVER FOR SPUTNIKS . . . OR ANY PRECISE FREQUENCY

from **540 KC**
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COLLINS **51J-4**

The finest general coverage commercial receiver, with frequency-standard accuracy. Ideal for Laboratories, Communications, and the discriminating Short Wave Listener!

- **DIRECT FREQUENCY READING**
  Long slide-rule dial exposes a single linear scale for each of the 30 one-megacycle bands. Tuning dial reads direct to exact one KC.
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  Excellent for SSB, FSK, Diversity, fixed frequency, etc. reception.
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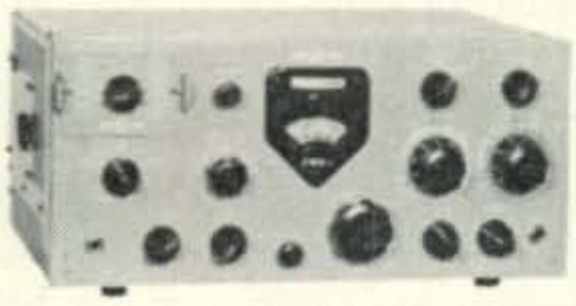

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For further information, check number 27 on page 126.

FP8 [*from page 104*]

stopped and it was wonderfully clear, but cold. Really cold. Good thing we brought heavy winter woolens and jackets.

From Fortune a little boat called the *Spencer* II sails at 1:00 p.m. every Tuesday, Thursday and Saturday to St. Pierre. Arriving Tuesday evening we resumed our former attitude of gloom, assuming we'd have to spend a day here, cooling our heels and toes.

Fortunately, our bad luck was running out. The same storm that inundated us throughout our journey, down here had whipped the Atlantic into a frenzy that persuaded the *Spencer* to lay over 'til Wednesday. Gratefully we loaded our luggage onto her and retired to a local guest home. That night I dreamed of hamming on St. Pierre with call letters FP8AS (which, it turned out next day, was the call they had reserved for me).

Next morning at 7 we putted out of the harbor on the last leg of our devious route to St. Pierre. The little, low-horsepowered *Spencer* took 3 hours, hoisting two enormous sails when we cleared the harbor, to take advantage of the wind, which true to our new turn of luck, was with us this morning.

The St. Pierre coast is rugged but beautiful. Cliffs rise 400 feet straight up from the sea. Thru the harbor entrance you can see the little town of St. Pierre spread over a gently sloping hillside, in the shadow of more rugged hills.

Gus Roblot, FP8AP, was at the dock to meet us, and helped us thru Customs. A finer gentleman we could not have hoped to meet. Gus has lived on the island all his life. Thanks to Gus we felt at home right away. Besides "big" hospitality, Gus helped us in little ways, too. Like when we were all set to go with over a thousand dollars' worth of ham gear and no place to plug it in—and no knowledge of French. How do you ask for a simple, ten-cent female socket in French? But Gus fixed us up.

M. Louis Hourtoné, *Chief d'Electric,* in charge of issuing licenses, assigned us the calls FP8AR and FP8AS. Then the job of setting ourselves up in Room 8 of the Hotel Robert. Color TV? No, you can't tell them that. Well, they don't understand English anyway. Gus will explain.

Then we hoisted a 136-foot Marconi. 30 feet above ground at the hotel end, about 8 feet at the other end. And another antenna, an all-band trap affair.

Elmac AF-67, running 90 watts CW, 65 watts AM. 50 watts legal maximum on 160, 80 & 40. For SSB, an HT-30 lent by Hallicrafters. An NC-300 receiver.

Signing FP8AS once after a ten-second tune up initiated the confusion we travelled all this distance to enjoy. An XYL, Audrey, W3GEN, was right there calling us. With no earphones on yet, the logs on the bed, pencils nowhere

[*Continued on page 108*]

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COMMAND TRANSMITTERS & RECEIVERS

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BC 455

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R-27 or BC-455, 6-9.1 Mc, used $5.95. Depot Repacks..... 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
Receiver Spinner Knobs.....ea. .69

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T-18 Marine, 2.1-3 Mc, as is, w/tubes, 3.95, used 4.95, boxed 7.95
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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 mitter both..... 25.95

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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

POWER DRIVEN ANTENNA REEL

½ HP G.E. Motor—12-24 V. Removable 6" Reel. Cam worm gears, bevel gear, Solenoid clutch. In gear only when current on. Operates clockwise or counter clockwise. Ideal for power fish line, opening or closing doors, auxiliary power take-off. Can be used as buffing machine or for dozen of other uses. Weight 6 Lbs.....New **$4.95**

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BD-83, 14V in. 375 at 150 Ma, used 9.95
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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

BC-357 Radio Beacon Receiver

62-80 Mc. radio controlled receiver. Contains 10,000 ohm plate relay. Power requirements are 24 V. AC. @ .5 Amps. and 220 V. DC. @ 20 Ma. Swell for Garage Door Opener, Receiver, and other remote control installations. Brand New **$4.95**

12 V Heavy Duty Solenoid. New.....$ 1.49
6J6 Tubes. New .....75 ea.
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BC-654 Transceiver: 3800 to 5800 KC.....Used: $34.95

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5HP4 or 5CP1.....New 1.98
7BP7 .....New 2.98

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METERS.		ALL NEW	
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		

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$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

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2 mfd 5000 vdc new.....$5.95
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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-1 IFF Trans-receiver 157-167MC. Complete with Tubes, used, xlnt. Makes nice 2 Meter Rig.....$12.95

BC-655 Ideal for Remote Control Boats, Planes, etc. Range 17.5 to 160 mc. 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
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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..... **$ .97**

Stewart Warner Ammeter, 60-0-60 Amps, brand new, 95¢, 6 for..... 5.00
Phone-CW Filters, 1020 cycles, new, FL-5, 1.89 FL-8 with switch 2.95
GP-7 transmitter with all tubes less 803 tubes with 80 meter coil unit only..... 13.95
less tubes and coil unit..... 7.95
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MN-26C Receiver w. dyna..... 14.95
MN-20E Loop 4.95
MN-52H Az Cont Box..... 2.95
All above new, special, 1 each for..... 21.95
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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
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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
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TG34 or TG10, 1 Hour Code Tapes

No. 10, No. 13..... .....New, ea. 1.25

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For further information, check number 28 on page 126.

FP8 [*from page 106*]

to be found, the avalanche began. What a thrill! My flesh crawls when I just think about it. That first day! Wow.

The second day heavy aurora blacked out the bands for several hours. It was another day and a half before conditions returned even to "fair."

Really only two of our days were "excellent," but regardless of conditions we wound up with 1500 QSO's—800 on CW and 700 on 'phone. And so-o-o nice. All we'd need to do was touch the key, or breathe into the mike (not forgetting to mention our magic call letters) and all hell broke loose—a beautiful, confused, snarling mass of signals—all calling *us!* (Sigh!) What fond memories!

Our idyllic St. Pierre DX-fest lasted September 11th thru 18th. In mid-afternoon the 18th we *had* to QRT to start repacking. We couldn't chance missing the *Miquelon* on its return to North Sydney, Nova Scotia.

Last chapter, abridged: We made it home. Puff, puff! Even reasonably on time. Inventory: Spent, each, $250. For: Fantastic adventure (see above); also social life on the island: a French movie, four dances, a football game; gifts for the folks back home. (B & B $2.50 a fifth instead of 8 bucks, and so on).

Via Gus a chance at the famed Codfish in FP8AP's 32-foot cabin cruiser "Atta Boy," and one night at Gus's home, a dinner of unequalled excellence.

Where else can you go these days for a two-weeks' vacation, in a new country, enjoying life and your favorite hobby to the hilt, and for so little?

Would you mind repeating that call again, old man? Did you say FPn8ZZQ, old man? The QRM is pretty rough down here. Give it another try? ■

(Puzzle on Page 49)

A	R	R	A	Y	▨	C	O	U	P	L	E	▨	T	A	P	E	D
T	O	O	L	▨	A	M	A	T	E	U	R	S	▨	N	O	D	E
O	U	T	I	N	G	▨	T	T	S	S	▨	O	U	T	P	U	T
M	T	▨	G	O	E	S	▨	E	T	▨	A	N	T	E	▨	C	E
S	E	I	N	E	▨	S	C	R	E	E	N	▨	E	N	▨	A	R
▨	D	O	E	R	S	▨	A	▨	R	T	▨	U	S	N	▨	T	▨
S	▨	N	D	▨	H	A	S	H	▨	C	A	N	▨	A	P	E	S
P	O	I	▨	G	I	V	E	▨	S	H	E	I	K	▨	O	▨	T
R	A	Z	E	▨	E	A	S	E	R	▨	R	F	▨	A	R	E	A
E	R	I	E	▨	L	I	▨	R	A	T	I	O	▨	S	T	E	T
A	▨	N	▨	I	D	L	E	S	▨	R	A	R	E	▨	A	L	I
D	I	G	S	▨	E	S	T	▨	C	A	L	M	▨	M	B	▨	C
▨	N	▨	L	I	D	▨	N	A	▨	D	▨	S	C	A	L	P	▨
A	T	▨	E	D	▨	G	A	N	G	E	D	▨	O	G	E	E	S
S	R	▨	E	L	A	N	▨	T	O	▨	O	P	E	N	▨	W	E
C	U	R	V	E	D	▨	B	I	A	S	▨	I	D	E	A	T	E
O	D	E	E	▨	E	L	E	C	T	R	O	N	▨	T	R	E	K
T	E	N	S	E	▨	L	E	S	S	O	N	▨	U	S	E	R	S

Names [*from page 87*]

Physical Qualifications and Personalities . . .

(if their names were indicative!)

W7AZP is Little, W3KDI is Small, W1ISW is Large, W7BCU is Short but WN8WUA is Shorter; W2JYB is Long, K4AG is Narrow, W2UZM is Strong, WØSFQ is Stout, WØBJA is Gaunt, DL2XY is Slim but W9HEA is Slimmer!

Work all these (and 99 other countries) for DXCC

Ireland	W1QG
Holland	W9DMU
France	W7AJN
England	W2SVS
Lichtenstein	W2NEA
Wales	W1AFK
Spain	K5AGL
Poland	KØAGT
Germany	W5RQD
Israel and Mars!	W2AAR WØTYK

Even Bacon W 5 F X R is a ham.

Plastic Protective Covers

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Today many radio parts are being packaged in plastic bags which have been sealed electronically. These small discarded plastic bags can find many uses. They are excellent for storing parts from dust and grime. They are excellent for safe-keeping screws, nuts, washers, etc. temporarily, while working on or repairing gear. They are excellent for providing weather-proof covering to rf connectors exposed on roofs, antenna masts, etc. A rubber-band helps to keep the bag closed and fastened in place.

Don't throw these small plastic bags away! Cut them carefully at one end with side-cutters. Open only enough to remove the part enclosed. Keep these bags handy at a nearby bin. Then watch how you will save time not looking for strayed accessories! Protected connectors, too, will be clean and untarnished, ready for the next experiment, measurement, or project. ■

DX [*from page 85*]

JT1AA—Ulan Bator, Mongolia. Via OK bureau or Jan Sima, OK1JX, Podolska 1, Praha 15, Czechoslovakia.
K6ICS—(New) Mike Gauthier, 10936 Orion Ave., Grenada Hills, Calif.
ex-KA5ZS—(Now W6UWL) Zane Sprague, 831 Joyce Drive, Port Hueneme, Calif.
KAØSC—KAØSC, APO 815, PM, San Francisco, Calif.
KC4U stations—C/O Warrant Officer W. E. Wren. Room 220, Bldg. "D", 6th and Independence, S.W. Washington, D. C.
KG1BB—Luke Rogers, 1983D AACS SQDN, APO 23, PM, N. Y.
KL7CEW—A2C L. T. Diehl Jr. AF 19557187, 795 AC&W SQDN. APO 706, Box 43, Samoa.
KS6AD—W. R. Kellen, Pago Pago, American Seattle, Wash.
KW6CE—George, Box 83, Wake Island, Pacific.
OA4AP—Cesar, Box 538, Lima, Peru.
PJ2SA—Officer in charge, Radio Station, Saba, NWI.
PJ5AA/PJ5CA—(G5RV/VP4RV etc.) Louis Varney, Box 3946, Caracas, Venezuela.
SV1SP—George N. Zarifis, 26 Zaimi St., Athens, Greece.
SVØ stations—APO changed from APO 206 to APO 223.
SVØWQ—(Crete) DL4AAP/W6GHM. PFC Stew Fason, HG&SVC CO, 2nd Battle Group, 7th Regt. APO 36, PM, N. Y.
UA9DK—Box 9, Sverdlovsk, U.S.S.R.
VE3AHU/SU—(Gaza strip) Via VE3 Bureau.
VK9AD—Stan, Norfolk Island, via Australia. (No IRC's—Send U.S. stamps.)
VK9VM—Ian, Posts and Telegraphs, Rabaul, Territory New Guinea.
VKØAS—(Mawson Base Antarctica) Via VK3KB, Cards answered in 1958.
VP4TF—Cecil Gomes, 542 Gallus St., Port of Spain, Trinidad, BWI.
VR4CW—Box 49, Honiara, Solomon Islands.
VS1HJ—Mike Plummer, 132 CA Lloyd LEAS, R.A.F. Changi, Singapore.
VS1HU—R. N. Amateur Radio Club, Wireless Station, Kranji, Singapore.
VS1HZ—4 Court Road, Serangoon Estate, Singapore 19.
VU2 Bureau—(New) Box 534, New Delhi, India.
W4FCB/KS4—(Swan Island) W. T. McClain, CAA Swan Island, Via CAA, Tampa, Fla.
W4QCW—(New) Bob Eshelman, 4924 Suburban Ave., Apt. 4, Richmond, Va.
WV4BW—Athniel Ottley, Borger Gade 6C, St. Thomas, Virgin Is. USA.
XZ2TH—U Tin Mia, 75, Bogyoke Aung San St., Rangoon, Burma. or via W6NNV.
ex-ZB2R—G. C. Wall, 91 Swiss Ave., Chelmsford, England.
ZM6AS—Via ZL2LB.

[*Continued on page 112*]

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Control Indicator with 25 Tubes, consisting of: 12/6SN7, 5/6SL7, 7/6V6, & 1/5CP1. All Controls on front panel, such as horizontal, vertical, sweep, intensity, centering, input and output circuits, etc. Voltage required: 2400 VDC 300 VDC & 6.3 V. Size: 24" L. x 20" D. x 10½" H. Complete with tubes and circuit diagram.....NEW: **$14.95**

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BC-659 TRANS.-RECEIVER FM—27.9 to 30.1 MC....Used: **$19.95**
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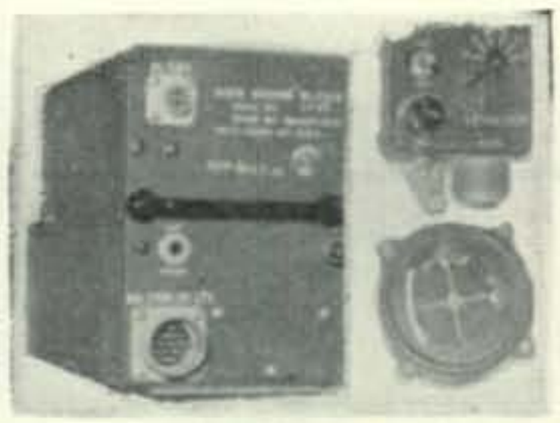

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20 M	7000 to 7150 X2	FT-243
15 M	7033 to 7083 X3	FT-243
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For further information, check number 31 on page 126.

DX [*from page 110*]

3A2 Bureau—3A2AH, Hank von Klaveren, 6 Rue Gestaldi, Monacoville, Monaco.
3V8CY—(F3CY) Box 101, Tunia, Tunisia.
4W2RP—King Ahmed, Royal Palace, Taiz, Yemen.

Thanks to So. Calif Bulletin, Willimette Bulletin, West Gulf Bulletin, WØQAZ, W8PQQ, W6YY, W4IEH, KL4DCF, W4AUL, K2GFQ, SVØWP, OVARA Bulletin.

Propagation [*from page 65*]

when the cycle is estimated to have reached a smoothed sunspot number of 188.

Based upon an empirical study of several characteristics of previous sunspot cycles, solar activity during 1958 is expected to decline from a high of 180 or so, to a smoothed sunspot number of about 145 by the end of the year. Despite the fact that solar activity is expected to decline during 1958, the average level forecast is more intense than any recorded during all of the previous cycles observed since 1749! The trend of the present sunspot cycle, including the forecast for 1958, is shown in *Figure 1*.

Since an excellent correlation is known to exist between the smoothed sunspot number and ionospheric conditions, conclusions reached from studies of sunspot data may be assumed to apply to the ionospheric phenomena as well. We can therefore expect that the record breaking propagation conditions observed on the 6, 10, 15 and 20-meter bands during late 1956 and 1957 will continue through 1958, diminishing only slightly. Although the peak seems to have passed, *1958 should be another good year* on the higher frequency bands. The change in solar activity is not yet significant enough to influence propagation on the lower frequency bands, so conditions on 40, 80 and 160-meters are expected to be much the same during 1958 as they have been for the past few years.

Contest Critique

Data is now available from several dozen amateur observers and from Ionospheric Research stations throughout the world, and for those of you who don't already know it, here's what happened propagation-wise during the 1957 CQ DX Contest periods.

As predicted in this column for October and November, propagation conditions during both the Phone and CW periods of the CQ DX Contest were very good. In fact they appear to have been *much better* than during any previous DX contest. Early reports received by CQ's Contest Editor, W1WY, indicate that the 1957 scores should break last year's record-breaking ones by a considerable amount! With solar activity now decreasing, it may be a long time before we have propagation conditions during a DX contest as good as this last one.

73, George, W3ASK

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"How come our subscription rates are so confounded low?", I asked Harold Weisner, our subscription man, the other day. "Three years for ten dollars isn't a bargain, it's a gift. When are we going to bring our sub rate up to date a bit with our increased costs?"

Harold hemmed and hawed, but there wasn't any comeback, for he knew I was right. He finally admitted that the only thing holding back an increase in the subscription rate was the big pile of sub blanks he had in stock with the old rate printed on them. Gad! Here we are nursing pennies while the dollars go.

As soon as I can make him see the ridiculousness of the whole thing we will help you increase your pride of ownership of your copies of CQ by making them more expensive. In the meantime you can still, if you insist, push us further in the hole by taking out a subscription at the old (ugh!) low rates below.

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Transistors [*from page 61*]

reverse direction (so that it is not conducting) it will break down quite suddenly. This breakdown point can be controlled in manufacture or by sorting diodes into the various Zener ranges. The diode may be used in regulated transistorized power supplies, for overload protection in sensitive circuits or even as a current regulator. For computers, Zener diodes find application in function generating networks and for information storage.

Sylvania announces a new high voltage power transistor has been added to their renewal line. The 2N296 is ideal for high voltage power amplifiers and switching applications in which a 25 to 60 volt supply voltage is required. The 2N296 features a welded hermetic seal and has a collector current of two amperes.

General Electric Company has revealed a new semiconductor device which will replace relays and certain power tubes. The device will find application in transistorized power converters and for motor and welding regulators. Silicon controlled rectifiers are still in the laboratory development stage and probably will not be ready for the commercial market until the fall of 1958. 73, Don, W6TNS

DE W2NSD [*from page 24*]

. . . only about four pages are left open. We're trying to arrange a special mobile event for amateurs in the Greater New York Area . . . suggest you mark aside May 18th for this as it will be a lot of fun. If any of the clubs around Brooklyn or Long Island are interested in helping out with this event their assistance will be welcome. We'll try to have a really worth while prize for the winner and runners up.

Flying Department

George Zarin, W2DIO has signed on as our flying consultant and coordinator. Come spring maybe we will have some doings for flying hams. For the present we are trying to work up a list of all amateurs who have planes, so if you fit this category please drop a card with your call, QTH, and type plane to George, c/o Harvey Radio, 103 West 43rd Street, N. Y. 36.

73, Wayne

hamfest

The Lawton-Fort Sill Amateur Radio Club will hold its annual Founder's Day "Ham-Fest" at the Community House of Lake Quanah Parker, in the Wichita Wildlife Refuge of Fort Sill, Oklahoma, on Sunday, 9 February 1957. Admission is $2.50 per person, which includes a catered barbecue dinner and chances on all prizes if pre-registered.

Better Audio For 10¢

George Bonadio, W2WLR

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A small expedient all ham receivers can give better audio for almost no effort and for only the price of one or two small parts.

Simple inverse feedback on the last audio stage of a receiver will dampen the transient responses of the loudspeaker or headphones. It will also help flatten out the response curve of the mountains and valleys.

A single resistor of between ½ and 1 megohm connected between the audio output plate and the driver stage plate will effect this. The value should be chosen to effect a substantial drop in gain, but not enough to cut the usable gain in CW or SB positions.

If the receiver circuit is not to be tampered with, then a socket to socket jumper, above chassis, with insulation taped around the resistor pigtails can do this fine. The ends are merely wrapped around the proper tube pins upon tube insertions.

If the gain control is on the last grid, then there is another variation which should be used. The connection should be between the last audio grid and plate, including a series blocking condenser of not less than .005 mfd. with the resistor.

One important factor is psychological in that the effects of fatigue from a few predominant audio frequencies reproduced will be lessened. One may listen longer before becoming weary of it. Naturally, readability or copy of voice is slightly enhanced. Friends sound more natural this way, too.

For 10¢ or so, better audio is worth having. Manufacturers please copy. ■

MORE NAMES [*see page 87*]

W4HZL is Keen, W8ASF is Sharp, WØWTF is Crisp, W2OWT is Quick, WØORC is Speedy, W1FDJ is Swift, W5YME is Fleet, W9OOL is Lively, W3KXH is Spry, W3AIZ is Wise, K2BFN is Witty, K4HLR and W2UQQ are Bright and Smart.

Bombay	K2JMF
London	W3LXO
Algiers	W9DTE
Paris	W1AFP
Hobart	W1AKC
Santos	W1BET
Glasgow	WØUZJ
Belgrade	KØDXI
Fairbanks	W6AIN
Juneau	W9NDI
Manchester	W8ZWL
Bristol	W8UBA
Austin	W8UCS
Lansing	K2EJN
Dayton	W8VO
Boston	W2ZFI
Cleveland	W9EJS
Washington	W3MWK
Hollywood	W2AER

French	W5FXS
Swiss	W2IUW
German	W3IMN
Irish	W1BLS
English	WØRSH
Welsh	W9ESQ
Hollander	W9VOJ

and W8APH is a Turk!

Seasons:

Spring	K2ILK
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Fall	W3PO
Winter	G6MV

(Midwinter is VE2FL)

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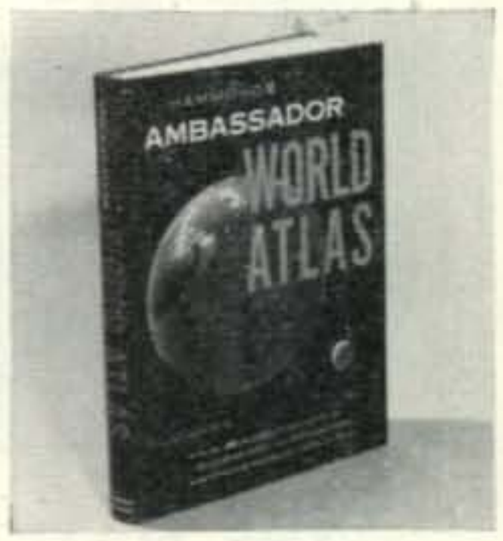

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This IS a collection of reprints, containing all of the available information on the conversion of the popular "Command" transmitters and receivers into good ham transmitters and receivers. Invaluable for Novice, Technician, General, Advanced and Extra class operators. 136 fabulous amazing terrific pages for only $1.50 PPD.

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Exciter [*from page 51*]

band edge, *and* when it is produced by taking the difference of two high-frequency crystals. For example, 19,360 kc could be used with 15,850 kc to produce 3505 kc. If the individual units had rated tolerances of 0.01% the permissible maximum errors would be 1936 cps and 1585 cps. The total error of the heterodyne (if the individual errors were in opposite directions) would be 3521 cps; the error is now greater than 0.1%, an entire order of magnitude. Operation might be much closer to the band-edge than the user realized. However, when the sum heterodynes are used, regardless of the relation between crystal frequencies and the heterodyne, the maximum possible error is the same as that of a single crystal of the same frequency and tolerance rating.

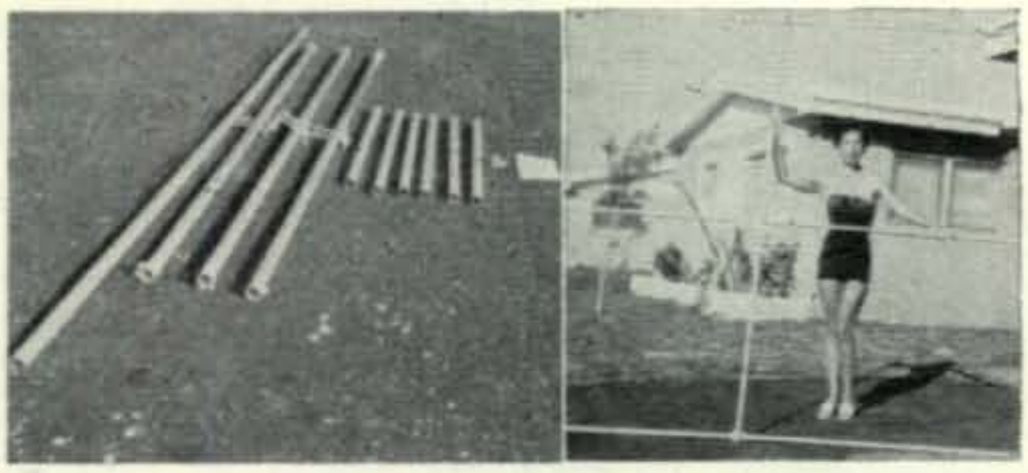
To some readers the application of heterodynes may still seem to be wasteful—using two crystals and two tubes to accomplish what could be done with one tube and one crystal ground to the desired frequency. As will be demonstrated below, however, it is not necessary to have twice as many crystals as one has usable frequencies. The crystal bank at W6QJJ contains 52 frequencies, none of which are usable at either fundamental or second harmonic. A comparison of all possible pairs revealed 56 heterodynes distributed through the 80, 40, and 20 meter bands. Not included in this total are a half dozen in the 160 meter band. The better than one-to-one ratio is due to the fact that the majority of crystals are usable with *two or more* others to produce heterodynes in the amateur bands. This ratio, incidentally, is slightly better than can be obtained with single, inband crystals!

This brief article by no means exhausts, but only surface-scratches the possibilities of the use of heterodynes. As mentioned earlier, there are many other possible circuit arrangements. The arrangement of fig 1 is probably the simplest; it worked as well as any of those tried. A few possibilities are:—plate take-off of the signal with a separate mixer, tetrodes or pentodes instead of triodes; regeneration (shunt capacitance, about 75 mmfd across the grid leaks, or series inductance) may be required for crystals which fail to oscillate in the untuned circuit.

Although no effort has been made at this station to utilize them, the oscillator output contains harmonics of the heterodynes and heterodynes between harmonics of different order including the fundamental. Utilization of these frequencies will require greater amplification and probably greater care in regard to suppression of spurious radiation.

In closing it might be mentioned that the circuit will also function with single, in-band crystals. It is hoped that this article will be, not only of interest, but also of value to those readers who wish to liquidate some of their frozen assets. ■

YOU COULD WORK WONDERS IF YOU HAD A GOTHAM BEAM!



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Diameter of Elements	7/8" & 1"
Number of Booms	2
Diameter of Booms	1"
Boom Length	12'

6-10-15 Tribander

GAIN	F/B RATIO
6.5db on 6 mtrs	23db on 6 mtrs
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10-15-20 Tribander

GAIN	F/B RATIO
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7.8db on 15 mtrs	27db on 15 mtrs
6.5db on 20 mtrs	23db on 20 mtrs

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Two-Bander Beams Available In Following Combinations: 6-10; 10-15; 10-20; and 15-20. See Coupon.

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(Continued on next page)

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WANTED: BC-610E and up, BC-939, BC-614E and up, RA-63, BC-312 and BC-342 material. We buy all types of Electronic Surplus. RADALAB INC., 87-17 124th St., Richmond Hill 18, N. Y.

WANTED: All types receivers, transmitters, test equipment, teletype. Also especially AN/URA-8A converter-comparator, APN-9, APR-9, BC-348, BC-342, BC-610, BC-221, ART-13, ARC-1, ARC-3. Cash or trade for NEW Johnson, Thunderbolt, Courier, Navigator, Valiant Ranger, National, Hallicrafters, Hammarlund, B&W, Telrex, Elmac, Gonset, Fisher Hi-Fi, Bell, etc. Write Tom, W1AFN, ALLTRONICS-HOWARD CO., Box 19, Boston 1, Mass. Phone Richmond 2-0048. Store: 60 Spring St., Newport, R.I.

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WANTED: Good buy in a current or recent model receiver. Hal Brown, W8PNM, 1330 Southern Hills Blvd., Hamilton, Ohio.

MISCELLANEOUS

MEET your Winter-Vacationing friends in Fort Lauderdale, Florida, at Broward Amateur Radio Club's second annual auction. Date: Saturday, Feb. 15. QTH: 800 N.E. 7th Ave. Doors open 10 a.m. Lunch at noon Auctioning at 1 P.M.

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456 KC IFs; single air trimmed, ceramic	8 oz.	2/95c
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OOPS...

Good Grief Department

Zounds! When we lose things in the shuffle around here, we lose them in large bunches. And we lost one last month. One column of the article on neutralizing of pi-network tetrodes ended up on the printers floor instead of in the magazine, and it was crucial too. The plot was this: Brooks, W5OSL was looking for some way to neutralize the final under load without electrocution setting in. He was just about to reveal his plot when we dropped the type basket. It goes about like this ...

I now began to wonder if there were not some component in the bridge neutralization network which could be varied under full load conditions but which would not entail the making of adjustments on NC. Obviously the interelectrode capacitances could not be "adjusted," and the only other component remaining is C_1. At this point a "light" appeared! C_1 was in reality quite as critical as NC in bringing about neutralization. In place of having 2,000-3,000 volts on it, however, the only dc potential on this capacitor is the bias voltage. A further advantage is that one plate is at ground potential. *So why not make this condenser also variable?* It could easily be adjusted during operation of the stage and should be effective in producing neutralization of the circuit.

The most effective practical way of determining *precise* neutralization is by observation of the grid meter during typical operation. If a stage is accurately neutralized the plate tuning capacitor may be rotated slightly off resonance in either direction, and the grid current will rise slightly when the plate tank circuit passes through resonance. It will decrease *equally* on both sides of plate resonance. This provides a very accurate indication of neutralization under operating conditions.

To test this "gimmick" the previously existing 4-125-A amplifier was put on the bench and in place of the 0.01 mmfd fixed capacitor a 20-470 mmfd variable capacitor was installed at C_1. This was mounted directly through the front panel of the amplifier. The spacing of this capacitor need not be large, for there is virtually no danger of the bias voltage producing an arc. The neutralizing condenser NC was arbitrarily set at about the halfway point, and the final was reinstalled in the rig. Without changing the value of NC, grid excitation was applied and C_1 was gradually rotated until there was no appreciable change in the value of current indicated on the grid meter with rotation of the plate input capacitor. At this point reduced plate and screen voltages were applied and the amplifier was partially loaded to the antenna. The re-

[*Continued on next page*]

[*From the previous page*]

sults obtained now with further neutralization were truly astonishing. A setting was quickly found for C_1 at which the amount of grid current increased very slightly on resonance of the plate input capacitor, and decreased equally on both sides of this point. At this adjustment the plate and screen voltages were raised to provide full input to the tube and the neutralization was again checked. As expected, a significant change in the loading of the tube produced a slight change in the point of adjustment of C_1 at which precise neutralization occurred. With each new adjustment of C_1 the grid tuning capacitor C_2 was retuned for maximum grid current. The amplifier now was seen to operate more stably than any one which we had ever previously built. A standard-make four year old TV set with no line or antenna filters was turned on approximately three feet from the final amplifier and at the point of precise neutralization no interference of any sort could be detected on the TV set. There

Brooks went on to say that he found that a different setting of C1 was needed for each band. You can check back in January for full details on pages 52-53 and 114. It's a shame we loused that one up for that certainly was one of the most important TVI articles that we've ever printed.

No other goofs have come to our attention for the January issue. Several questions have arisen over the Souping up the Super-Pro article in December and we hope to get some amplification of the perplexing points one of these months for you from the author (in Japan). No other questions have popped up out of December.

MARS TALKS

Here is the schedule of speakers who will address the Eastern Technical Net of Headquarters USAF-MARS during the month of February.

Feb. 2—"Satellite Tracking with the Mini-Track"
Mr. Matthew Lebenbaum, Airborne Instruments Laboratory.

Feb. 9—"Antenna Simposium"
Mr. Bruce Woodward, Airborne Instruments Laboratory.

Feb. 16—"Antenna Symposium"
Mr. Warren Offutt, Airborne Instruments Laboratory.

Feb. 23—"Telemetry"
Mr. R. Popkin-Clurman, Pres., Telecrome, Inc.

On March 2, 9 and 16, we will have an "Airways Electronics Symposium" with speakers from the major domestic and international airlines. Mr. William T. Carnes of AERinc will be moderator.

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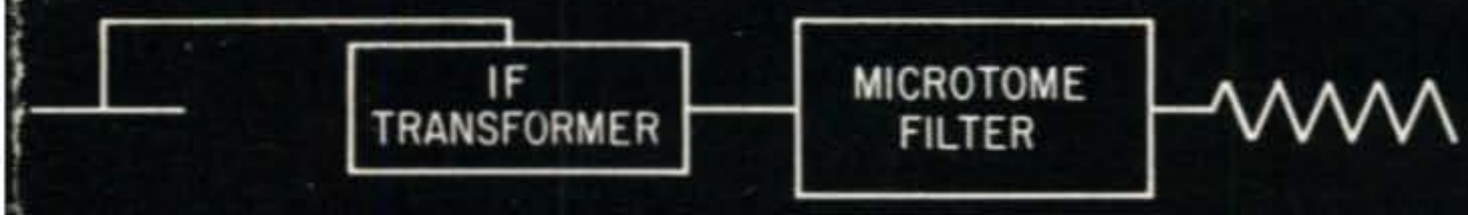

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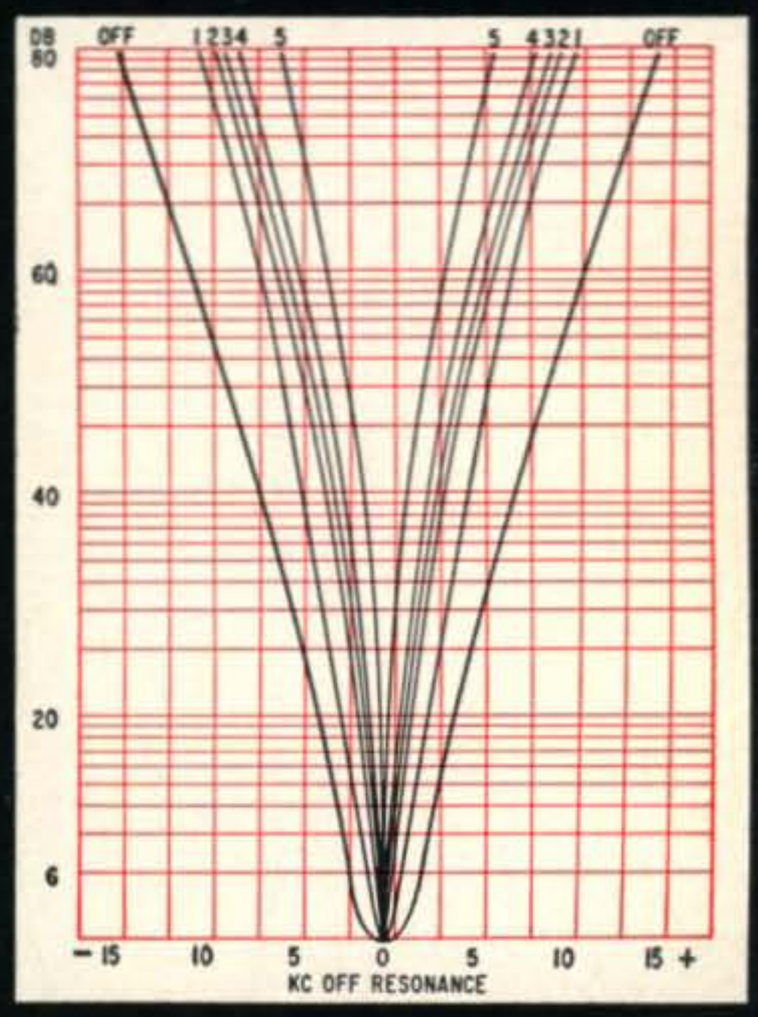

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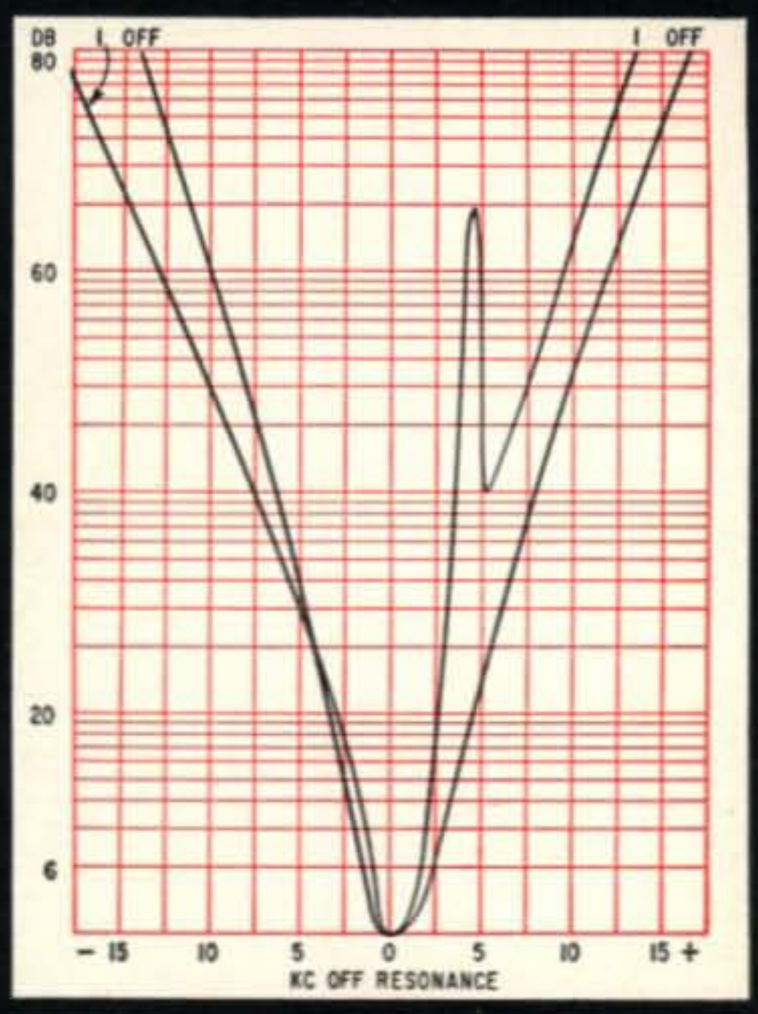

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				DC Plate Volts	DC Grid-No. 2 Volts	DC Grid-No. 1 Volts	Peak RF Grid-No. 1 Signal Volts	Zero-Signal DC Plate Current Ma.	Max. Signal DC Plate Current Ma.	Approx. Max.-Sig. Driving Power Watts	Effective Lead Resistance Ohms	Approx. Max.-Sig. Power Output Watts
6CL6	AB_1	60	6.3(H)	300●	150	—6	6	4.6	16	0	9100	3
6973	AB_1	60	6.3(H)	400	250	—24	24	8.4	33	0	5600	9
2E24	AB_1	125	6.3	500	210	—21	21	10	35	0	8300	11
1614	AB_1	80	6.3(H)	450	300	—35	35	14	50	0	5000	16
2E26	AB_1	125	6.3(H)	500	210	—30	30	9	53	0	5370	17
6893	AB_1	125	12.6(H)									
837	B	20	12.6(H)	500	0#	0#	40	2.6	61	3.5	4630	21
807	AB_1	60	6.3(H)	750	300	—35	35	15	71	0	6250	35
1625	AB_1	60	12.6(H)	750	300	—35	35	15	71	0	6250	35
6816	AB_1	60	6.3(H)	850	300	—15	15	40	100	0	3500	40
6524■	AB_1	100	6.3(H)	600	300	—33.5	67†	30▲	122	0	12100‡	50
6850■	AB_1	100	12.6(H)									
6146	AB_1	60	6.3(H)	750	180	—46	46	12	98	0	4640	52
6883	AB_1	60	12.6(H)									
809	B	60	6.3	700	—	0	72	35	118	8	3900	59
829-B■	AB_1	200	6.3(H) 12.6(H)	750	225	—25	50†	20▲	132▲	0	13640‡	68▲
805	B	30	10.0	1250	—	0	110	78	204	3.5	3560	155
828	AB_1	30	10.0	2000*	750	—115	95	25	116	0	10300	157
4X150A	AB_1	500	6.0(H)	1250	300	—50	50	57	202	0	3500	157
811-A	B	30	6.3	1500	—	0	85	13	150	13	6260	160
813	B	30	10.0	2500	#	0#	91	30	133	12	11000	219
6161	B	900	6.3(H)	1600	—	—57	82	80	239	18	3720	225
813	AB_1	30	10.0	2500●	750	—95	90	25	148	0	9660	245
7094	AB_1	60	6.3(H)	2000	400	—50	44	30	200	0	6000	280
7034	AB_1	150	6.0(H)	2000	300	—48	48	60	250	0	4270	290
833-A	B	30	10.0	3000	—	—70	165	50	328	5	5600	700

■ Twin Type
▲ Total Value per tube in Push-Pull application
† Grid No. 1 to Grid No. 1 Signal
# With Grids Nos. 1, 2 & 3 tied together at socket
* With —60 Volts on Grid No. 3
● With Grid No. 3 Tied to Filament Supply Center Tap
‡ Effective plate-to-plate value

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The *right* RCA Tube for your single-sideband amplifier is listed in this chart. For the power you want, simply read down the column on the right. For the corresponding RCA Tube type, read the column on the left. When you make your choice—let the Typical Operating Conditions be your guide.

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