NOVEMBER
1955
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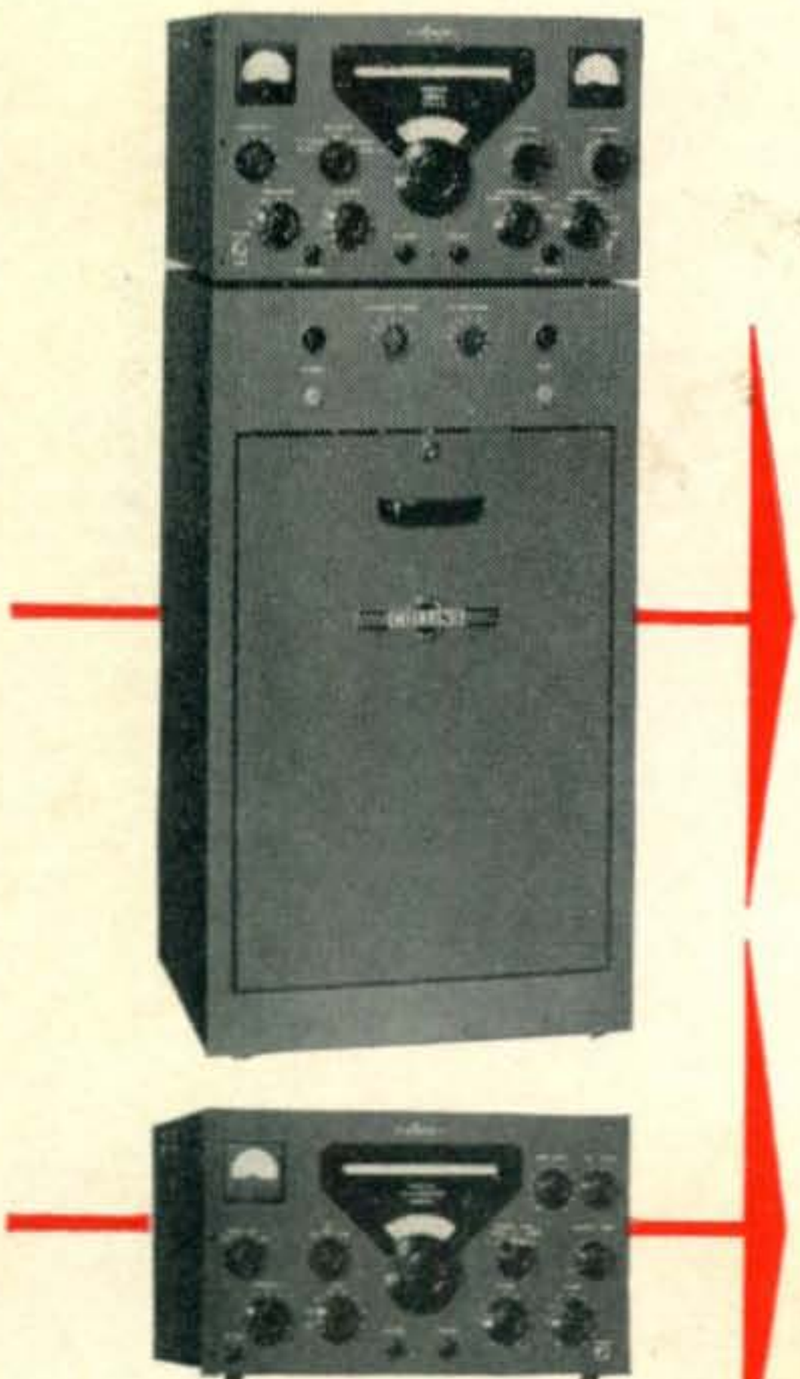
CQ

RADIO AMATEURS' JOURNAL

ANOTHER REASON for Top Amateur Performance

Collins MECHANICAL FILTERS



There are a number of reasons why the Collins KWS-1/75A-4 combination is the top-performing Amateur team on the air. But one of the more outstanding reasons is the Collins Mechanical Filter . . . the exclusive Collins development that gives you *best* sideband transmission and *best* sideband reception.

COLLINS KWS-1— In this table-top kilowatt, the F250Z-3 Filter supplies maximum intelligence with minimum bandwidth and allows such features as these:

- PERMANENT ADJUSTMENT — factory adjustment of sideband generator will hold indefinitely.
- UNWANTED SIDEBAND SUPPRESSION — unwanted sideband down at least 50 db.
- CARRIER SUPPRESSION — down 50 db minimum.
- ABSOLUTE CONTROL of transmitted bandwidth.
- SPECTRUM SAVING — voice transmission of 200 to 3,000 cycles requires minimum space in crowded ham bands along with good intelligibility.

COLLINS 75A-4— A completely new model in a famous line of Receivers. And it's the F455J series of Mechanical Filters that provides the superior selectivity, making possible the following features:

- NO INTERFERENCE — reception very close to adjacent signals without interference.
- CHOICE OF SIDEBANDS — either upper or lower.
- REINSERTION — the effects of selective fading can be minimized by reinserted carrier reception of AM signals.

For more detailed information visit or write the Collins distributor nearest you.

COLLINS RADIO COMPANY, Cedar Rapids, Iowa

COLLINS

MR. NOVICE

THE BEST AT NO EXTRA COST!

3700 - 3750 Kcs.
7175 - 7200 Kcs.

$2.95

QRM on Novice frequencies rivals the notorious weekend congestion on 75 and 20 meter fone! You'll have better luck, more completed QSOs if you pick an ODD KILOCYCLE FREQUENCY. Landing on multiples of 5 kcs. is pure murder. That's where PRs come in. You can pick any odd kilocycle frequency you want . . . at no extra cost. Order from your dealer's complete stock. If he doesn't have the particular frequency you want, he can get it pronto. So enjoy the BEST as a Novice . . . reliable, stable, highly active PR Crystals . . . the amateur and commercial frequency standard since 1934. You can't miss on a PR.

PR Crystals

Since PR CRYSTALS 1934

USE PR AND KNOW WHERE YOU ARE

PETERSEN RADIO COMPANY, INC.
2800 W. BROADWAY • COUNCIL BLUFFS, IOWA

EXPORT SALES: Royal National Company, Inc., 75 West Street, New York 6, N. Y., U. S. A.

For more than 22 years Hallicrafters has been closer to the radio amateur field than any other communications manufacturer The many leading Hallicrafters developments have been based on what the amateur wanted and needed. The result of this close association is this radio man's ideal—the finest component units (Model SX-100 AM-CW-SSB receiver, Model HT-30 transmitter exciter, Model HT-31 linear power amplifier) in a completely packaged radio station—

MODEL SR-500.

$1495.00

AVAILABLE NOW

FOR THE FIRST TIME

commercial broadcast styling in a

complete amateur radio station.

HALLICRAFTERS MODEL SR-500

a single package for

PROFESSIONAL EFFICIENCY

FEATURES

Here is a completely contained unit in a handsome console cabinet—transmitter/exciter, linear power amplifier, receiver affording the finest in V.F.O. or crystal. SSB, AM and CW transmission and reception. You need supply only the antennae, microphone and AC power. All the wiring is complete and external connections are provided for antennae and microphone.

The transmitting and receiving units are located in coordinated operation for maximum efficiency, and a special communications speaker is positioned above the operating shelf directly in front of the operator.

The mobile console is mounted on casters and is easily expandable. Three blank panels are also provided in the basic cabinet for the installation of any additional equipment that may be desired.

The console incorporates all safety and protective features. It is completely enclosed, fused with the main power relay controlled by a key lock. For "extra" safety, the entire back of the cabinet is enclosed but perforated for maximum ventilation and heat dissipation.

FRONT PANEL CONTROLS, INDICATORS AND CONNECTIONS:

1. Antenna selector switch for 80, 40, 20, 11-10 meter and dummy or special antenna.
2. Master power switch "key lock" type operates main power relay to turn on or off all equipment.
3. Main power pilot lamp.
4. "On the air" pilot lamp.
5. Microphone input.
6. Key jack.

REAR PANEL:

1. Five coaxial connectors for 80, 40, 20, 11-10 antenna and dummy load or special antenna.
2. Dual 30 ampere fuse block.
3. Three spare AC power outlets.
4. Spare octal socket for beam controls, etc.

For further information see your Radio Parts Distributor or write

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CHICAGO 24.

CQ, The Radio Amateurs' Journal

November 1955
Vol. II, No. 11

Feature Articles

Departments

Miscellaneous

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POSTMASTER: SEND FORM 3579 to CQ. 67 WEST 44th ST., NEW YORK 36, N. Y.

New Heathkit VFO KIT

MODEL VF-1

$19.50

Ship. Wt. 7 lbs.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

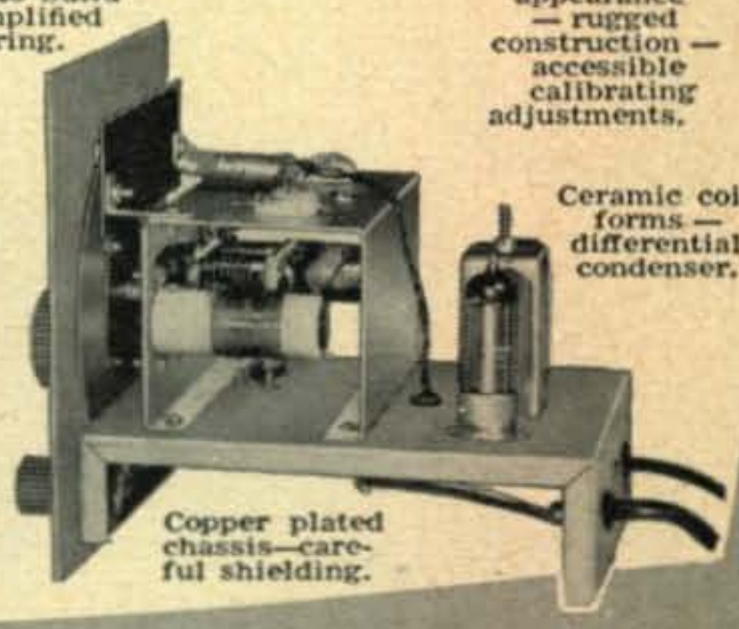
Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard ½" crystal holder. Construction is simple and wiring is easy.

Open layout,— easy to build — simplified wiring.

Smooth acting illuminated dial drive.

Clean appearance — rugged construction — accessible calibrating adjustments.



Ceramic coil forms — differential condenser.

Copper plated chassis—careful shielding.

Heathkit AMATEUR TRANSMITTER KIT

MODEL AT-1

$29.50

Ship. Wt. 16 lbs.

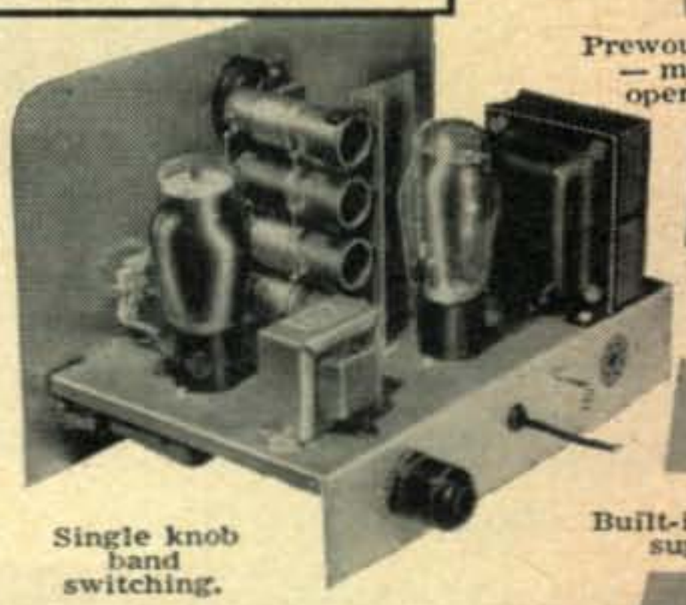
SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.
6AG7 .....Oscillator-multiplier.
6L6 .....Amplifier-doubler
5U4G ..... Rectifier.
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8⅛ inch high x 13⅛ inch wide x 7 inch deep.

Crystal or VFO excitation.

Prewound coils — metered operation.

Rugged, clean construction.



52 ohm coaxial output.

Single knob band switching.

Built-in power supply.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporaring many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

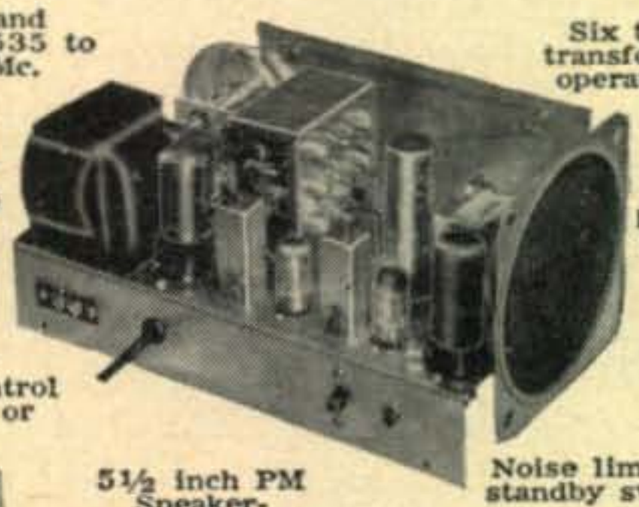
Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to to 35 Mc.

Six tube transformer operation.

Stable BFO oscillator circuit.

Electrical bandspread and scale.



RF gain control with AVC or MVC.

5½ inch PM Speaker-Headphone Jack.

Noise limiter—standby switch.

SPECIFICATIONS:

Range.....535 Kc to 35 Mc
12BE6 .....Mixer-oscillator
12BA6 .....I. F. Amplifier
12AV6 Detector—AVC—audio
12BA6 ....B. F. O. oscillator
12A6.....Beam power output
5Y3GT .....Rectifier
105-125 volts A. C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.

MODEL AR-2

$25.50

Ship. Wt. 12 lbs.

CABINET:

Proxylin impregnated fabric covered plywood cabinet. Shipg. weight 5 lbs. Number 91-10, $4.50.

HEATH COMPANY
BENTON HARBOR 12, MICHIGAN

Feenix, Ariz.

Deer Hon. Ed:

Please, for gracious to goodness sake, not telling anybuddies what are Hon. Scratchi's address. Also, in case they asking, espeshyoually not telling them what are lyesense number of Hon. Scratchi's car. Hackensake!! if those fellers ever catching me I be DAID (Dismayed Amchoor in Distress). If you had been seeing all those smashed up. . . . if those fellers with xmitters ever. . . . oh! excossing, Hon. Ed., maybe had better backing up to beginning at commencing point.

There I are, last Sattidy afternoon, driving along in car, happy as Hon. Mouse in the bran barrel, feeling fine, nothing partickyoular to doing, just riding along. When coming neer small private plane airport I knowing of, I seeing large crowd, so deciding to seeing what goings on are happening. Driving off road and alongside fence and peering at crowds.

Seeing three diffrent groups of people, each hanging round a pole with sine on it. One sine saying 27 MC, another 54 MC and third saying 450 MC. Sacremento Bullevard!! a hamfest, and Scratchi not even being notified! Aren't this fine Hon. Kettle of fish. If they thinking they can not bothering to telling me about hamfest, just on acct. not having legal amchoor lyesense, they having cupple more thinks coming.

Yes indeedy, there are more than one ways to skinning cat. Scratchi not having fancy mobile rig in car for nothing. Quick-like turning on reseever. Listening on 27, then 54. Howcomes—nobuddies talking. All are heering is funny tones like audio ossilator making. Sounding like some amchoors transmitter not in 1/c shape. Well, Scratchi's rig are in 1/c shape, you can betting your tinny-tipe.

Saying are doing, so I throwing switch and coming on air with my good old hundred watter sooper-power mobile rig. Boy oh boys, I must be nocking off there ears if they listening on six meters. Are calling medium short seek-you —abouts five minutes—then standing by. Tooning across band, but nobuddies answering. Are noticing, howsumever, that are seeming to being sum exitement over by place where 54 MC sine are. Maybe they are heering me!

[*Continued on page 8*]

ELECTRICAL ENGINEERS
or PHYSICS GRADUATES

with experience in

RADAR *or* ELECTRONICS

or those desiring to enter these areas...

The time was never more opportune than now for becoming associated with the field of advanced electronics. Because of military emphasis this is the most rapidly growing and promising sphere of endeavor for the young electrical engineer or physicist.

Since 1948 Hughes Research and Development Laboratories have been engaged in an expanding program for design, development and manufacture of highly complex radar fire control systems for fighter and interceptor aircraft. This requires Hughes technical advisors in the field to serve companies and military agencies employing the equipment.

As one of these field engineers *you will become familiar with the entire systems* involved, including the most advanced electronic computers. With this advantage you will be ideally situated to broaden your experience and learning more quickly for future application to advanced electronics activity in either the military or the commercial field.

Positions are available in the continental United States for married and single men under 35 years of age. Overseas assignments are open to single men only.

Hughes Field Engineer H. Heaton Barker (right) discusses operation of fire control system with Royal Canadian Air Force technicians. Avro Canada CF-100 shown at right.

Relocation of applicant must not cause disruption of an urgent military project.

Scientific and Engineering Staff

HUGHES

RESEARCH AND DEVELOPMENT LABORATORIES

Culver City, Los Angeles County, California

Are just abouts to blasting out another seek-you, when looking out windshield of car. Hackensake, Hon. Ed!! Airplane are hedding direckly toward car. Are ducking in seet, waiting for the worst. Cupple seconds later, heering nothing, I looking up, just in time to seeing model airplane about 3 feets long skid along hood and crashing into windshield. Hon. Ed., it cutest little things you ever seeing. Having reel gas engine, and on side of plane are lettered its name—Lorenz Speshul. Can you imagining, some character flying airplanes at hamfest!

Rite away car are surrounded by peeples from field. They all saying they hoping plane not scratching car, that windshield not cracked, that I not mad that plane are hitting car. Before I can answering, they rushing away with plane and parts what falling off when hitting car. Lowdspeeker on field are calling out "anybuddies reddy for 27 megacycles, anybuddies reddy for 27 megacycles," so I changing bands on transmitter, and deciding to trying that band. Hon. Ed., this are screwiest hamfest I ever seeing!!

Wunse more I calling seek-you and tooning over the band. What you knowing!! I getting anser. Some fellers back east calling me. Now, that more like it. He and I having reel peechy QSO. I even telling him about screwy hamfest I attending. He laffing like furies, and telling me what grate sense of humor I having. Just as he are turning it over to me, lowdspeeker saying "peeples neer fence watching out, another plane is crashing." Hon. Ed., wuddent you thinking they getting rid of this feller what flying planes?

I telling eastern amchoor I not kidding, and it are a screwy hamfest, and what he meening I having grate sense of humor. He coming back and telling me I must be crazy not to knowing I are attending model airplane meet where they flying radio-controlled airplanes!! Oh, my Hon. Akeing Back. I wunder if . . . could it be that. . . . I quicklike jumping out of car, standing on hood so can seeing over crowd. Hon. Ed., what a mess. At leest seven, maybe ate planes—or to being more ackyourately, peeces of planes—are all over the field.

Evidently when Scratchi on the air, he jamming the freakwency so planes can't be controlled. If those fellers ever catching on to why they can't controlling planes—if they spotting my mobile whip on car. . . . Hey, one or to of them pointing this way.

Scratchi quicklike jumping off hood, jumping into car, starting engine, shifting into lo, and are off in clowd of dust. Looking thru reer-view mirror, but so much dust I not sure if they pursueing me or not.

So remembering, Hon Ed., if anybuddies riting you about amchoor that recking planes at airport, I not knowing vou, and you not knowing me.

Respectively yours,
Hashafisti Scratchi

here's the ULTIMATE for ALL amateur communications

AM—PM—CW and SSB . . . the "Phasemaster-II"

phasing type exciter—AM—PM—CW and SSB with switchable sidebands at the flip of a switch—75 W PEP output—completely bandswitched 160 thru 10 meters—wide range pi-network output—fast operating built in anti trap voice control circuit—rounded corner black crackle cabinet with gray front panel, black knobs and white screening—separate phone patch and mike inputs—accessory power socket for accessory equipment—COMPLETE internal shielding including solid shielding for final tank assembly to give stable operation—no critical external carrier balancing controls—new carrier insertion control—new variable calibrating control for zero beating frequency—new eye circuit for precision operation—40 DB or better unwanted sideband suppression—no mixer stage tuning ELIMINATES OUT OF BAND OPERATION—2 additional sets of relay contacts on rear chassis—wired and tested with all tubes or in kit form—a complete wired, tested and ALIGNED audio thru balanced modulator subassembly is furnished with the kit this allows the balance of transmitter to be built as simply as a CW rig-all operating controls on front panel Audio Gain, Carrier Level, Emmission, Bandswitch, Buffer Tuning, P A Tuning, Antenna Loading, VFO—CRYSTAL, Function, VC Gain, AT Gain, Indicator Level, Calibrate Level and Eye Indicator.

$329.50 Wired and tested

$279.50 Kit form

TIME MASTER

115 V AC continuous gong timer—pleasant gong strikes automatically every 10 minutes—can be reset to start at any time — dial indicates 10 min time duration—compact molded black case ($2\frac{3}{4}$" x $4\frac{1}{8}$" x $2\frac{5}{8}$") with lithographed front face—meets FCC regs 12.82 (a) (1) (iii) & (iv) for 10 min identification requirement — complete with off-on switch and cord—DON'T GET A PINK TICKET **$7.95**

Write for special electronic, electrical or mechanical timer requirements

TONE MASTER

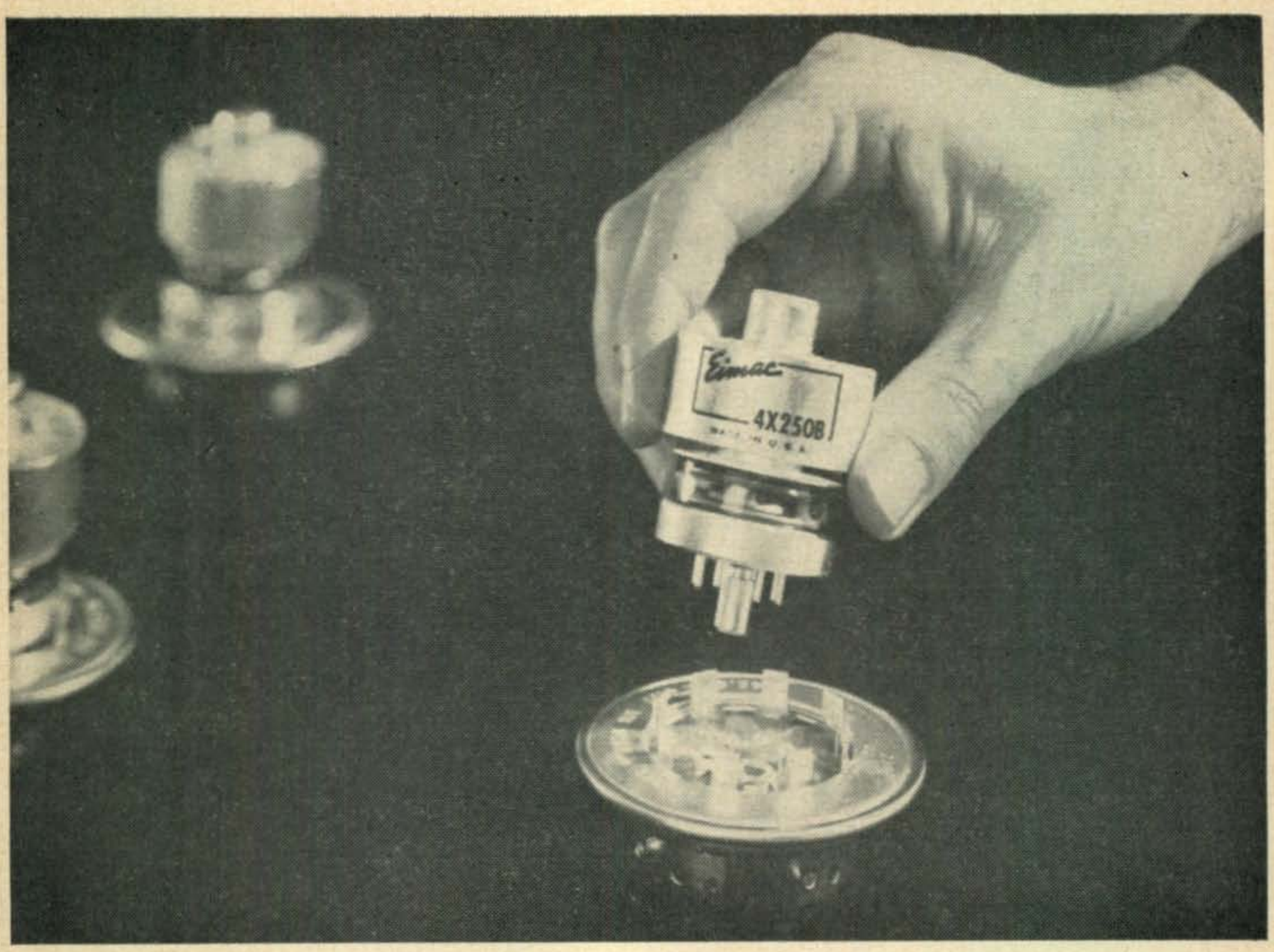
SELF powered, transistorized audio SINE WAVE generator — approx 1200 cycle tone freq—variable from 0 to over .5 volts RMS output with calibrated dial—connects directly to HiZ mike input to provide two tone test for SSB or for checking AM modulation and speech equipment—ideal for audio enthusiasts —portable, can be hand held—A MUST for every shack or service man—no need to buy expensive bulky audio generators —housed in compact black molded case ($2\frac{3}{4}$" x $4\frac{1}{8}$" x $2\frac{5}{8}$") with lithographed front face

$12.95

Lakeshore INDUSTRIES

408 COMMERCIAL STREET MANITOWOC, WISCONSIN

MANUFACTURERS OF PRECISION ELECTRONIC EQUIPMENT



Eimac 4X250B and air-system socket— the easy approach to a modern transmitter

SSB, AM or CW, the ideal combination for the modern high power, all-band amateur transmitter is the new Eimac 4X250B radial-beam power tetrode and Eimac air-system socket. With an Eimac air-system socket, full stabilization and cooling advantages of the 4X250B are realized. A high quality, minimum inductance, silver mica screen grid by-pass capacitor is a built-in feature of the socket. This custom-made socket, together with the inherent low inter-electrode capacitances of the 4X250B, make stabilization of the amplifier stage easy. Additional circuit simplicity is possible through the low driving requirements, enabling the use of standard receiver-type tubes in low level stages, permitting easy filtering of TVI producing harmonics. A pair of 4X250B's in modern, compact space-saving equipment permit a kilowatt input in SSB or CW operation. A new integral-finned anode minimizes the forced-air cooler requirements of the 4X250B. In fact, during stand-by periods no blower is necessary if convection air is properly provided. For ease of design, transmitter versatility and on-the-air reliability, investigate the incomparable combination of an Eimac 4X250B and air-system socket.

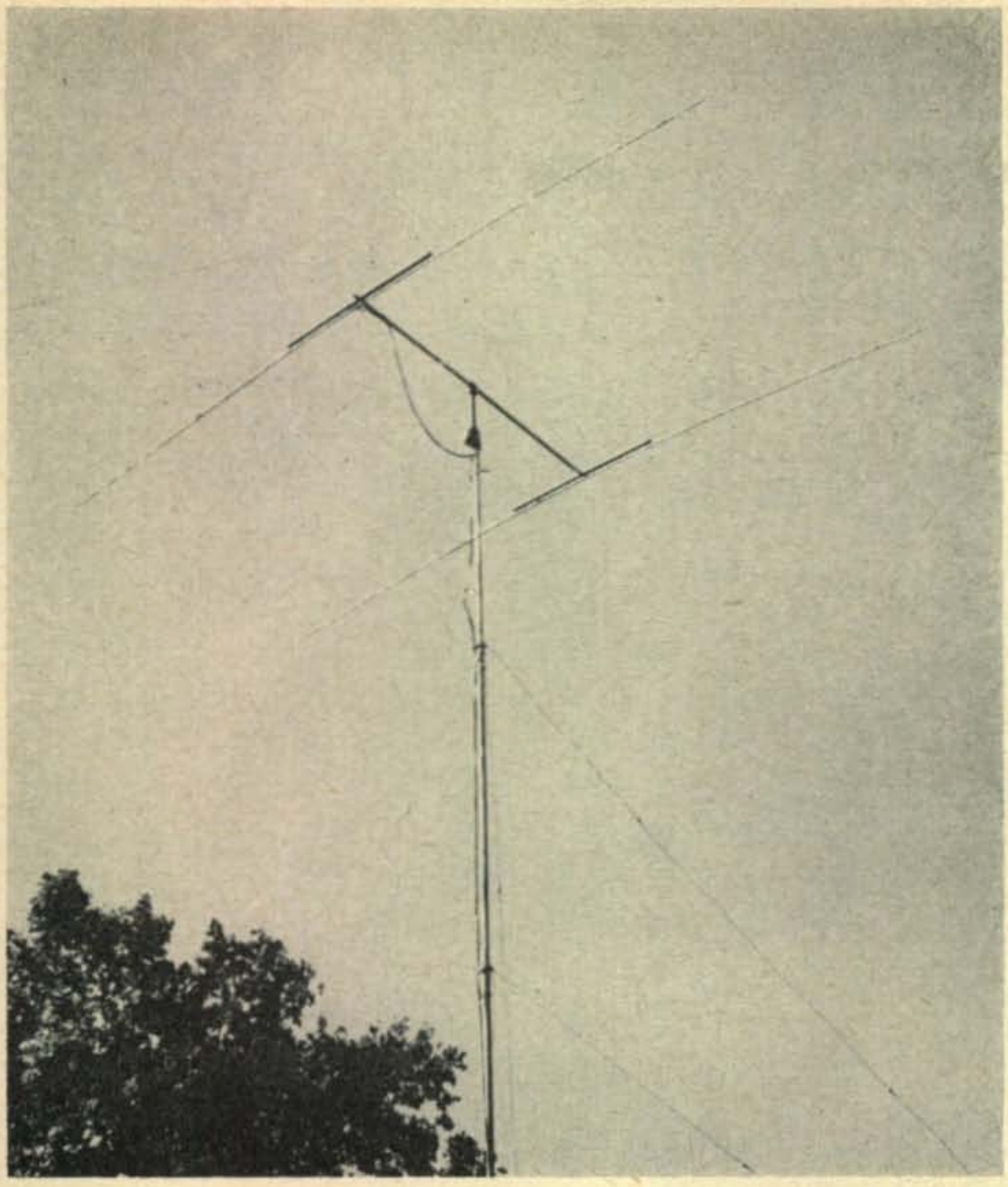
The 4X250B is unilaterally interchangeable, in nearly all cases, with the famous 4X150A. For further information and a free copy of the 20 page Application Bulletin No. 9, "Single Sideband," write our Amateurs' Service Bureau.

Eimac

EITEL-McCULLOUGH, INC.

SAN BRUNO, CALIFORNIA

The World's Largest Manufacturer of Transmitting Tubes



a "Catfish Special" for 15 meters

See any difference? This one cost less than four bucks, works DX with the best of 'em.

The $3.96 Beam

Ralph N. Roales, W9RVM
704 North 3rd St., Vincennes, Ind.

2 years ago when I first tried 15 meter fone almost any kind of antenna could be and was being used on the band. QRM was negligible and about the only requirement for a good QSO was to find someone else on the band. Using first a 20 meter ground-plane vertical and then cutting it down for 15, I had contacts with hams all over the States using antennas of all types cut for all different bands below 2 meters. I even had 2 contacts with fellows using T-V antennas.

Then Russ, W6TTB, designed his very popular 2-element split driven element and reflector beam and fellows all over the country began building 2-element beams for 15. With more hams going to 15 every day, the band gradually began to fill up until finally about the first of this year, I decided that I, too, must have a 15 meter beam.

With the dimensions already worked out by W6TTB the theory problems of building the beam worried me not at all. However, at about that time the XYL decided that all four junior ops needed new school shoes for the spring term and the problems changed from theory to finance. Had it been the fall term, they could have gone barefoot another month or two.

After giving some thought to wire beams, I happened to remember a couple of articles read long ago in radio magazines. One of these had told of an attic beam made of dowel rods wrapped in tinfoil and the other had told how the Japanese made beams during the war by spraying aluminum paint on bamboo poles. OK, why not combine the two ideas and wrap bamboo poles with the aluminum foil now so common and make the elements? Also, why not plan out the construction so everything else used in the beam could be procured by most fellows in their own home town? By some thinking and much jotting down, a list of materials that could be found in most any town was finally arrived at, as follows:

4	16 ft. Bamboo poles @ 3 for $1.00	$1.35
8	3½ in. screw in TV standoffs @ 3¢	$ .24
3	pieces 1"x2" 10 ft. wood @ 36¢	$1.08
3	TV Mast U bolts @ 10¢	$ .30
3	rolls ½"x5 yd. adhesive tape @ 10¢	$ .30
2	garden hose clamps @ 5¢	$ .10
1	roll 25 ft. x 18 in. *heavy freezer* foil	$ .59
	TOTAL	$3.96

Now, with this do-it-yourself kit all gathered up, let's build the beam. Unroll the aluminum foil and cut it in two, lengthwise and crosswise,

NOW... MODEL SX-100
SELECTABLE SIDE BAND RECEIVER
BUILT TO THE SPECIFICATIONS OF 1,000,000 FIELD EXPERTS

See it at Your Jobber—only $295.00

Hallicrafters 22 years of production know-how, the engineering experience of developing over 100 different major receiver designs, plus the advice of over 1,000,000 field experts operating Hallicrafters receivers all are combined to bring you this outstanding new receiver—the SX-100! Hallicrafters alone, long recognized as the leading designer and manufacturer of quality communications equipment, can offer you the dependability and performance of this great new SX-100 at the amazingly low price of just $295.00.

Look at these features you enjoy with the SX-100 . . . before, they were available only on receivers costing a great deal more!

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 already 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.

Controls

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

hallicrafters

CHICAGO 24, ILLINOIS

Model SX-100. *Amateur Net* $295.00
Matching R-46B Speaker $17.95
***Frequency Range* 538kc-1580 kc**
1720 kc-34 mc

to get four strips of foil 12½ ft. long by 9 inches wide.

Take one of the poles and lay it lengthwise on a strip of the aluminum foil allowing about 2 inches of foil to overlap the butt end of the pole. Get your XYL and junior ops to help and slowly roll the pole up in the foil strip crimping it down with the hands along the entire length of the foil as you roll. The foil will crimp down very nicely on and between the joints of the bamboo.

When you have all four poles rolled up in the foil get out the tape measure or yardstick. Measure from the butt end on 2 of the poles 10 ft. 10 inches and cut off and discard the small ends of the poles. Cut the other 2 poles to 11 feet 3 inches.

Cut strips of adhesive tape 4 or 5 inches long and wrap a strip tightly between each joint of the bamboo, adding a strip around the small end of each pole. Trim the butt ends of the two shorter poles and put a hose clamp on each and the split driven element is done.

Join the butt ends of the two longer poles by hollowing out the ends of the bamboo and using a small piece of dowel rod and plastic wood or glue. Wrap some foil around the joint, tape it down and the reflector is finished.

Nail 2 of the 10 ft. 1x2's together to make the boom. Cut the other one in half to use as element supports. With U bolts, mount the element supports on the boom with 9 foot 3 in. spacing between the centers of the two supports. Flip out the rubber inserts in the T.V. standoffs and spread the eye openings enough so that your elements will slip in. Screw 4 of the standoffs on the ends of the element supports 2 inches in. Place the other four 24 inches in from each end. Try to keep them in line and about the same height.

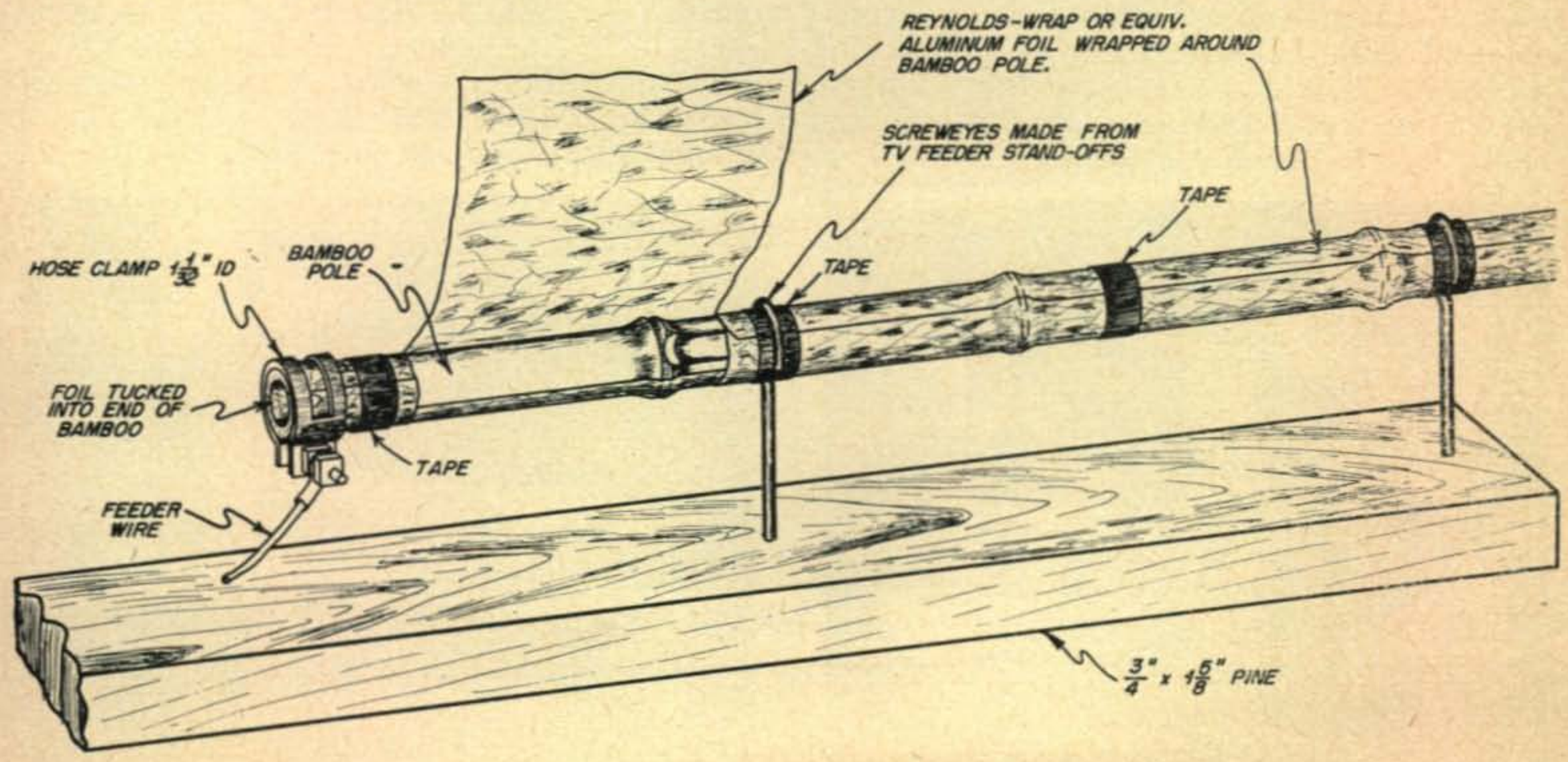
Center the reflector element and mark where the eyes of the TV standoffs will clamp down on the poles. Tape these places for insulation, set the reflector in and tighten down the eyes of the standoffs on the poles. Do the 2 pieces of the split driven element the same way leaving ½ in. spacing at the center.

Hook the transmission line onto the hose clamps, put the beam up in the air and work a few U's and ZL's.

Although most of the boys are using 300 ohm twin lead to feed this type of beam, something different is being tried here. After reading a discussion on paralleling coax, I decided to use twin 72 ohm coax. The two shields are tied together feeding one side of the split driven element and the two centers feed the other side Despite all arguments to the contrary, it has worked very well and I am not about to change it.

To finish this article I will write a little on what to expect in the way of durability and performance. Although we have had no cyclones in this part of Indiana the beam has withstood high winds, ice, snow, sleet, rain and dry hot weather. After all it takes an awful big fish to break a bamboo pole. The Catfish Special has been in use here about 6 months now and from the ground it looks about as good as it did when it went up. I think anyone will be surprised at just how much the beam will take. Then, too, repairs are very inexpensive if something does happen. A count has been kept and in the first 4½ months the beam was used it worked 36 countries including ZL and 4 European countries. This might not be so hot for a guy with a KW and a 5-element job but W9RVM and his Viking II are both pretty well pleased. In closing I might add that the beam is very light and an easy load for an inexpensive zoom-up TV mast and TV rotator.

The $3.96 beam works fine. Why spend more? If you have money burning a hole in your pocket, why, then put up a dozen.



By now, the havoc wrought in the east by Diane's floods is a dimly-remembered jumble of pictures and news reports—events heard about but not felt, now seldom recalled by most of us. For those who were there, the impression was unforgettable . . .

I Was There

John Muroff, W3SAI
Philmont Mobile Radio Club
Philadelphia, Pa.

A flood, regardless of its source or cause, is a lot of water with which to do battle; the most fortunate are those of us who see it only occasionally as something that has hit the other guy.

In the movies, or on television, the rapid-running water carrying houses and barns to destruction, ruining property and snuffing out lives, makes an impression on us which is sudden and vivid, but which mercifully dissipates as the next item pops into view. But when you are on the scene, looking at it with awe, you realize how terrible the dreaded word "flood" is.

How does one come to face such a disaster when living in comfortable Philadelphia? The answer is simply: *Phil-Mont*. The Phil-Mont Mobile Radio Club. Let me turn this into a personal story.

August 19, 1955 has just started to dissolve into August 20, and the sack feels so-o-o comfortable, when suddenly the phone rings and out you go onto the floor after it, wondering which of the patients at the Powelton Clinic needs the wife's attention. A man's voice—it turns out to be W3VSU, Lyle; you cut off his attempt at an apology and listen for the de-

tails. Lyle talks slowly but forcefully—without punctuation:

"You know that 2-meter Communicator of mine that you're using I happened to break in on QV and he says they need one at Doylestown and I said I'd hate to wake John at this hour and he said it's an emergency and I said I'd call you how can I get it?"

You are fully awake by now—"Doylestown," "emergency" have made an impression that's indelible. You ask Lyle if it's OK to go out with him and he assures you that you'll be most welcome. In about half an hour Lyle picks you up and you're on your way.

You don't navigate by the stars, you just listen for W3QV. Lyle has made simple plans for this jaunt; the couple of sandwiches and pieces of fruit he would ordinarily eat at his job will see him through; in addition to this we take along some ordinary rubbing alcohol, antiseptic, tissues, aspirin and flashlights.

"We're in good shape. Ready for anything," Lyle says with a grin. "I'll drive and you talk, so the operating procedure will be very simple."

Bip, bip, bip and Brad, W3QV picks you up immediately. The usual amenities, and down to business. Simple as anything—just get to Doylestown and listen for W3SSU operating at the Courthouse there. The best way is up Route 611, so what's holding us up?

It's a breeze—just avoid the West River Drive and parts of City Line Avenue, get onto Walnut Lane and across Germantown Avenue and thread your way over to Old York Road via Haines Street and head north. As you cross into Melrose Park and Elkins Park you gun it gently and make up a little of the lost time.

Bib, bip, bip and Brad tells you it's OK all the way into Willow Grove, bear left and continue on Route 611 and negative on Route 263. This 263 business you file in the back of your mind for later inquiry because you have two kids at camp along 263, in the Jamison area of Bucks County. You sure as heck would like some information on this but you hedge off, because by this time the channel is alive with talk, most of it from W3SSU at Doylestown. Brad has alerted them on another channel that you are on the way, and they are now on the lookout for you. You look for an opportunity, just a small hesitation in the talk, and zip, you sign in. Glad you could make it; don't stop off at the Courthouse but keep on 611 to Harrow; don't worry, you'll recognize it by the roadblock. Roger. Roger from here and call us when you get there. Roger.

As you ride it gets later and the road seems to get darker and darker and the chatter on the channel is your only contact with the outside. Suddenly it gets brighter; the sudden illumination of a diner's neon, and you stop to ask two guys who have just come out to check on their motorcycles, "Hey, matey, how far to Harrow?"

"13 miles."

You groan and Lyle suggests picking up containers of coffee for the road. You sign in with W3SSU, go in for the coffee and some dry cookies, and in about five minutes you're rolling. W3SSU is still with you, and advises that when you get to Harrow, you will start calling W3EM and he will bring you in, and then you will relieve him, as he's been on duty for one long time.

Then it hits you—W3EM—he's the number one man in a relay that got the wife through to Powelton Clinic a short week ago, to institute emergency treatment for a patient there. You warm a little and mention to Lyle that Phil-Mont is the best thing that ever happened to ham radio.

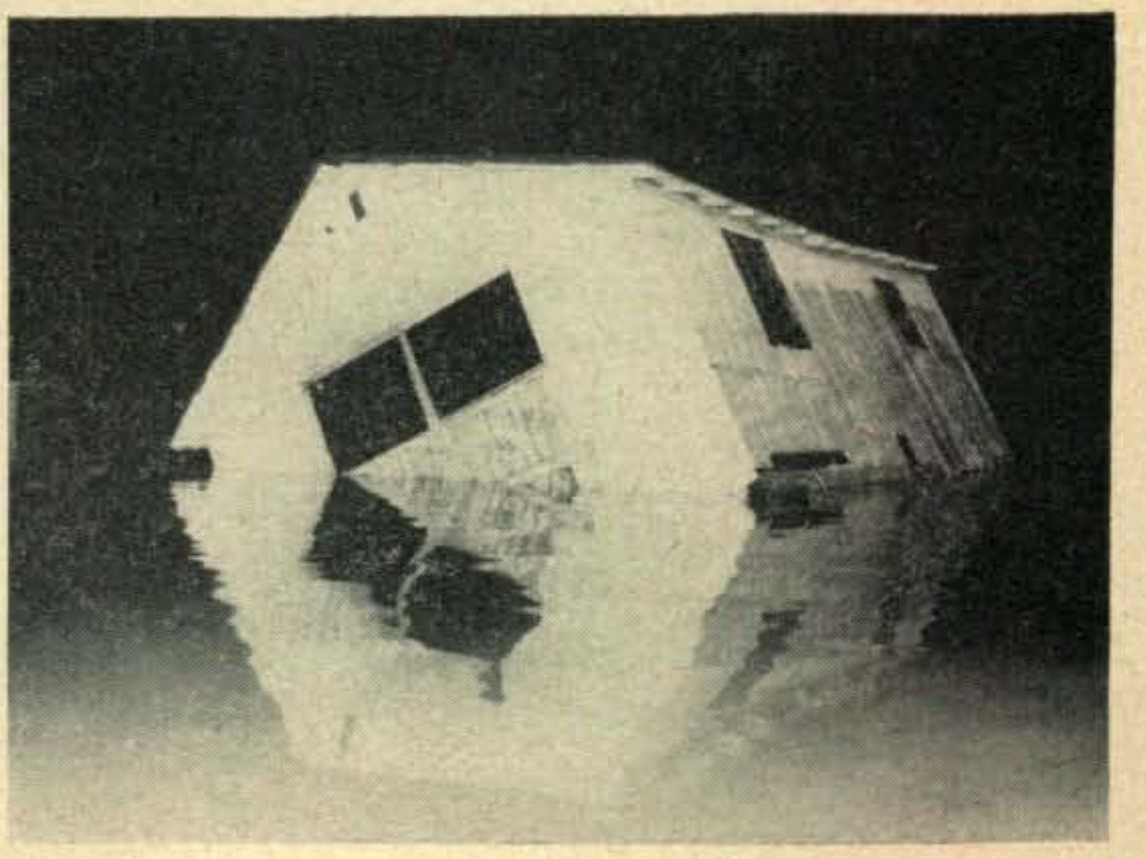
Roger.

How about some coffee before it gets too cold to enjoy? Roger again.

Enjoy? It tastes like a solution of dirt; it should—the waitress said it was fresh ground an hour ago. Fresh *ground*. Funny. Very funny.

Where is Harrow?

Right here at the roadblock, just like SSU said. The farmer with the lantern and the telltale look of a guy who has been through it starts to spin a weary tale about why you're not allowed to go in, etc. til the cackling of the receiver makes him look alive and you call in to EM and he says swell, just go through



the block and look for signs that will point to Upper Black Eddy, and stay on the same road until you get to Haney's Restaurant.

Roger. The farmer says something about thank the Lord for you guys, and you say something about being glad to do it, and he waves, and you wave and you dip into stygian blackness. Amusing thought—if Upper Black Eddy is this black, how black can Lower Black Eddy be? Is there a Lower Black Eddy? If there is, where is it?

You stop thinking of it quickly because you might get a not-so-funny answer. Around a ticklish turn, and Lyle yells something about a sign and you whip out the window and the flashlight spells out Upper Black Eddy and you start getting a little jittery, because this is it and what's it going to look like at the other end? The road suddenly brighens up ahead of you and you realize a guy has pulled in behind you from out of nowhere. To heck with him, let him get ahead of you if he's in such a hurry. No, let's stop him and find out if this is it. Roger.

The guy is friendly when he spots the whip and says to follow him in to Haney's Restaurant. He takes off like a hot KW and Lyle follows; this road is a good test for a cross-country race, and you bounce and your insides churn going around the turns, then there's the restaurant lit up like a Christmas tree, and there again is the roadblock, complete with farmer, lantern and hang-dog look.

Again the thanks, the wave and the forward motion and the agreement that all that neon sure drives a receiver crazy, as you lunge into the darkness.

Suddenly from the receiver a frantic shout: *Stop!* Hold it, you just passed us by. Stop and back up, and I'll walk out to you.

And there's 3EM, a big friendly guy that you've met casually at Philmont. The handshake, the thanks and the remark that he's going down the hill to check up on W3FUY/mobile who is at the flood's edge, keeping silent in order to conserve gas and battery power—been there since the start of it without any relief.

Roger. What's it like?

Rough.

You can almost hear the river from here. Want us to go down with you?

No. You'd better stay here in case SSU calls in from Doylestown. You can hear him OK up here, but not down at the water's edge.

Then you suddenly think how awful it must be for the inhabitants.

W3EM leaves and you watch that wheezing Crosley with the big driver dip down the hill.

The sign-in with W3SSU and the long wait.

What's keeping EM? How long is this hill anyway? Hope nothing happened to him. Oh, well, let's wait it out.

A guy sticks his head into the car and asks if there's anything new, you ask him who he is, and he says he's the sheriff around here, and sure is glad to have you radio fellas here and then you tell him about being sent here as relief for one of the other radio fellas and you ask him what's new, sort of turning the tables, and he tells you about the damage, and you hold your breath, it's that bad.

He tells you about the two Army ducks that have been trying to do rescue work in the swirling waters, and how one got swept into a barn-roof and was jammed in such a manner that the other duck couldn't give it any assistance. And it was then decided not to chance losing the other duck, so it headed for what was left of the main road and comparative safety. You wonder if the guys on the wounded duck are OK and the sheriff says they are, and to please call into Doylestown and tell them the situation, and you do; and you're not afraid any more because you can still get a call back to the home base. Oh, yes, the sheriff knows what's with the ducks—he was on the one that made it back before it got hung up like the first one.

And so through the night you hear them calling in to net control W3SSU. The clock seems to be moving slower and your eyes are getting weary. You promise yourself that all you'll do is get a little relaxed rest. So you bend your head toward the receiver speaker and fix your hand on the mike button so you can trigger it fast and just shut your eyes slowly, one at a time.

It hits like a pinball machine barrage—before you are fully awake you are already telling W3SSU that everything is OK, that nothing is new here and W3FUY is OK because in between Rogers he has gotten a Roger of his own in, and you ask permission to forward a query of your own, please.

W3SSU senses the urgency in your voice and says OK—so you mention Camp Tel-Hai on Route 263 at Jamison in Bucks County, you feel a little relief when he says the old familiar QRX-one and he'll find out.

You're relieved and happy when he reports that one of the State Troopers has been all along that stretch and gives it a clean and dry bill of health. There's even an unspoken nudge to give them a quick visit when your relief takes over. Roger.

Lyle agrees with you that it's been a long time since you've seen daylight. The guy who described it as coming up like thunder out of China 'cross the bay either didn't have all his buttons or else he never stayed awake all night long just waiting and listening.

Morning at last and with it a little comedy relief; there's one like this one in every corner of the world. Her hair is tossed back carelessly, and her ill-fitting house coat is kind of in need of laundering and she is standing barefooted; she beckons and you acknowledge her with a

good morning and a query about what you can do to help, and she says it's a shame, and you say it sure is about the flood, and then she says not that so much but it's a shame that you radio fellas have to be around so long, and you shrug like it's nothing at all and you could do it all day long as long as it would help, and she seems not to hear you because she stuns you with a classic: "Yeh, and all that talking comes into my radio and blocks all the other stuff," and just what the heck do you answer to that?

Lyle just laughs and says that crazy restaurant with the neon was open half the night and now when we could use some coffee it's shut tighter'n a drum.

More idle talk. Then a quick check with NC and he says they're sending relief over for him and relief for W3FUY and how's he doing? You Roger back and decide to take a quick run down the hill and see it first-hand, and when you get there you are almost knocked off your feet at the sight. All the stuff you saw in the movies and on television so long ago hits you right in the face, except it doesn't disappear in a couple of frames, but etches itself in your mind, and you wish you could change the channel with a flick of the finger and make everything go back to normal.

You spot the sheriff—Holy Smokes, how did he get down here so fast? You look each other over and having renewed the acquaintance you ask about the wounded duck, and he reports that they are going in after it now, and if they get it free they'll resume rescue operations. There are a number of families still missing.

You gulp real hard. Families missing. What if my family were—?

A dog waddling around. You pet him, and he shines up to you. Somebody tells you his owner's name, and it doesn't register, but later you remember nobody said anything further about the owner, so you still wonder.

The other duck goes into the water and the people begin chattering and making small jokes, the kind that indicate their relief from some of the tension. And then quiet because they all see it at once—a floating rocking chair, and they all know the owner of it. It's hard to realize the closeness of a small-town group, because your city is so much larger, but you remember the comfort a small unit can bring you.

You look at the swirling waters again because their motion is so rapid the duck seems to be in danger. Someone assures you the water is falling because you can see the top of a gas-pump about ten short feet away, and suddenly you're glad they're not hysterical, and you wonder how you would take it if this happened to you.

As you look around you meet the smiles of the people, and they have never been formally introduced but somewhere along the line they met you and are glad you were sent to help them, because they have already heard there are other areas that help can't get to yet. You figure you'd better get back to your post on top of the hill in case there's something new. On your way back to where you left the car you meet W3FUY and he looks like he hasn't slept since Wednesday last, and you're proud to meet a guy like that and Joe Levy, not a ham, who is in the car with him. You chitchat about the flood, and you remember that sometime during the weary night there was a weary W3EM and he went down the hill and he came back up the hill and you dimly remember saying something about a swell job, and the big guy took the ridiculous little car with the long antenna home, and you hoped it wouldn't get stalled on a tree limb like Von, W3UIX, once joked about when he came back from Germany.

You resume your post on the top of the hill. Some of the welcome news starts popping through. They freed the wounded duck and all hands on it are safe. Then a list of families rescued and safe. The relief is coming for the radio fellas. And roger roger roger all over the place. And when you finally take off and start winding up through the road blocks, you start hearing all the familiar calls mentioned on the frequency and you realize that other Philmont members are on more important errands and more dangerous errands than you were and you swell with pride for them where a short while ago you were blown up with your own importance. You take cognizance of all of them straight through from A to Z, and as you move home through daylight, you hear chatter from and about your friends, the real ones, the Philmont ones, and you darn near bawl. But you really sober up from something like this fast, because you're a big boy now, and you have two kids at camp yourself. Lyle has remembered your apprehension and finds the cut-through from Route 611 to 263. Up the short side road outside Jamison, and then you see both kids, safe and dry, and you know that helping the other guy is the easiest thing in the world.

The stations recognized during our short run to and from Upper Black Eddy include the following:

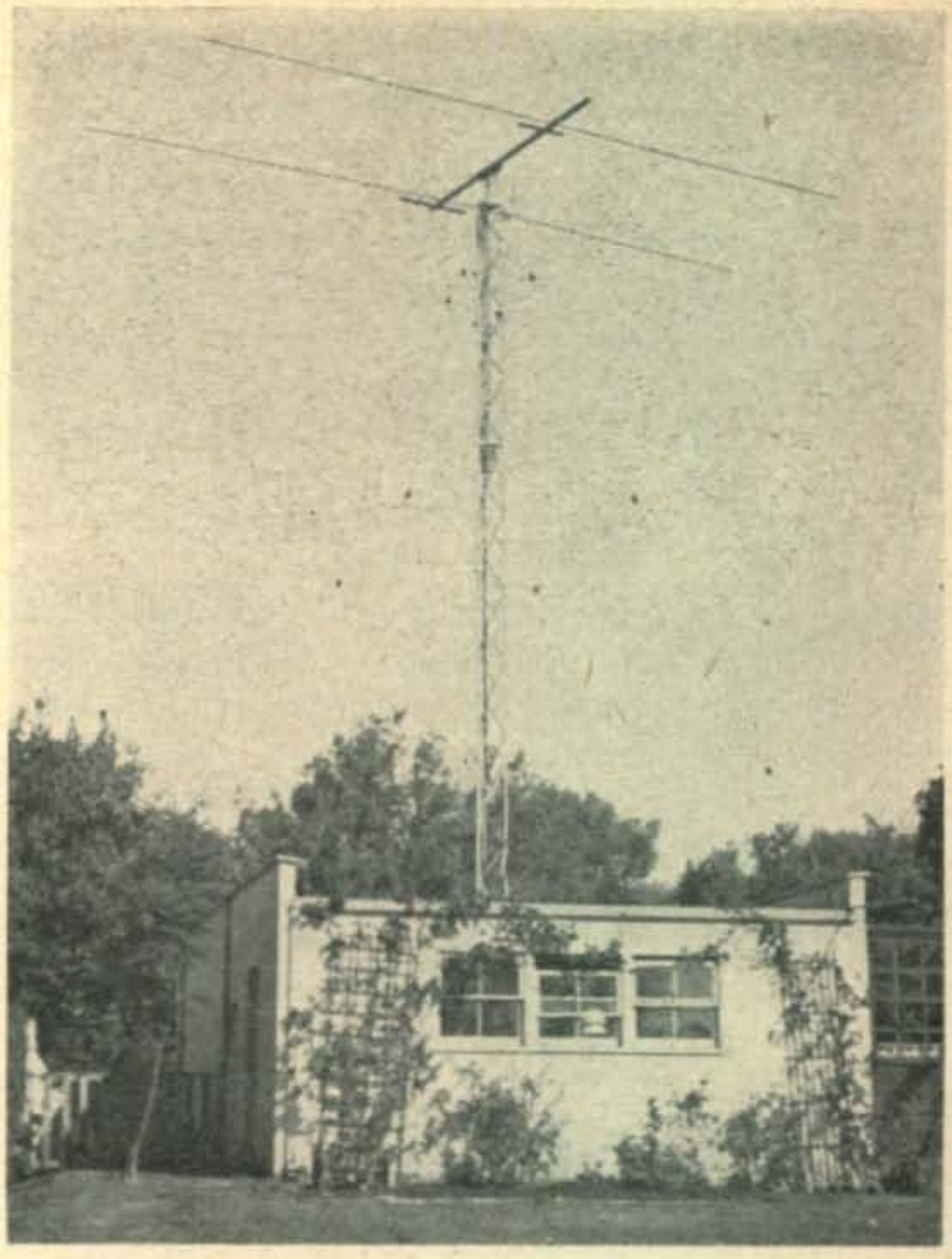
W3BGR	W3CNO	W3DOU	W3EM
HFD	IGW	IRS	IW
MVG	NIP	QQH	QV
TOZ	VVS	UIX	URU
YJM			

W3FUY	W3GRY	W3HQJ
KCG	KNC	LNQ
QZO	SAE	SSU
VXN	WML	WNC

Any omission is definitely unintentional.

W3VSU—driver
W3SAI—modulator

Bill Orr, W6SAI
555 Crestline Dr.
Los Angeles 49, Calif.



using the

20-Meter Beam on 80

Now don't get all excited! We all know that you can't use a 20 meter beam *as such* for an 80 meter antenna! It's a great idea, but impractical, to say the least. And 80 meter beams seem to be conspicuous by their absence. So you ask, "What is all the fuss about?" Well, you see, it's like this. . . .

* * * *

A long, long time ago (3 years to be exact) W6SAI decided he wanted to try some 80 meter DX. Since an 80 meter antenna was sorely needed for the weekly sked with W6LDD in Oakland, it was decided to sling up an 80 meter dipole from the tower of the twenty meter beam to a nearby utilities pole. This solution turned out to be pretty poor. The dipole was "end-on" W6LDD who had to hunt around in the QRM for the weak 10 Db over S9 signal of W6SAI. (Editor's note: Since most phone signals seem to run 50 Db to 60 Db over S9—according to received reports, it can readily be seen that W6SAI was having a tough time of it.) The fate of the antenna was sealed one day when two power company men spotted the dipole adorning their prized pole and briskly cut it down, ignoring the tearful pleas of W6SAI.

It seemed that the only safe place to go was up. The utility pole was *verboten*. The runty tree in the neighbor's yard would surely collapse under the strain of the combination of the 125 foot dipole and the radiated hot air. The only practical solution would be some kind of a vertical antenna. W6SAI took a quick, last look at the topography of the land and mentally pictured a new 80 meter ground plane securely lashed to the edge of the back porch railing.

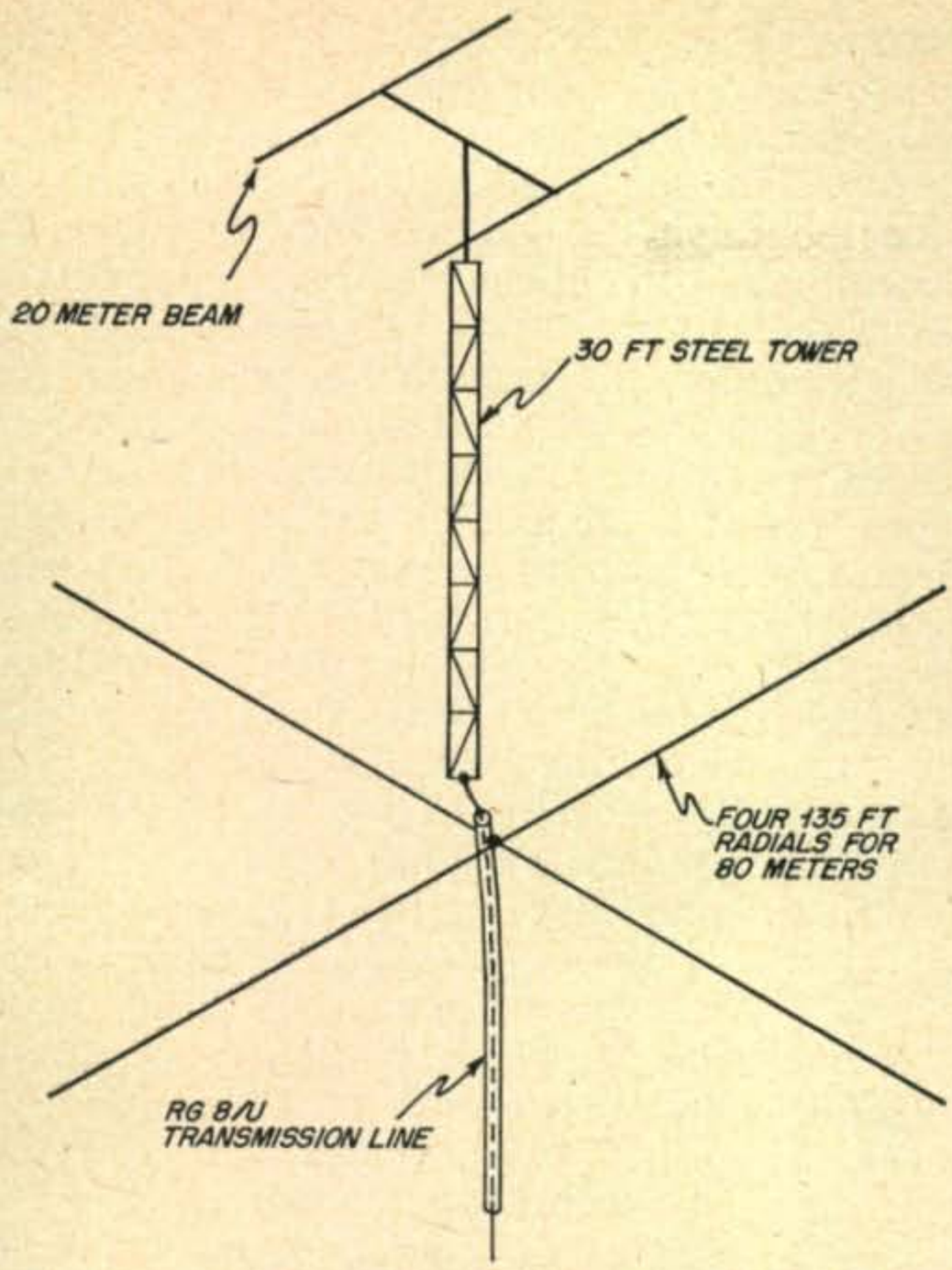
* * * *

"Another antenna on this house? What will the neighbors think? That awful 20 meter beam is enough of an eyesore. Think what sixty feet of vertical pipe will look like, with all those guy wires to trip over!!"

"Yes, dear."

* * * *

So there you are. The only thing left to do was to try and make an 80 meter antenna out of the 20 meter antenna—quite a trick. After much mental gymnastics, it was decided to use the 30 foot metal tower as a vertical antenna, top-loaded to 80 meters by the 20 meter beam. With care, four 80 meter radials could be run out horizontally from the base of the tower, twisting and dodging through hedges, around bushes and over plants, making a lumpy but efficient ground plane. The whole works could be fed with a 52 ohm transmission line. The idea sounded good, and tremendous forces



The 20 meter array employed as a top-loaded vertical antenna for 80 meter operation. Beam control wires and 20 meter feedlines were removed for 80 meter operation.

were set in motion destined to evolve a suitable 80 meter antenna. To date, the antenna is almost three years old, WAC has been made on 80 meters (a neat trick from W6-land) and such choice items as ZD4, ZS, 5A3, HB9 and VS6 have succumbed to the lure of the runty antenna. Here's the full story of it, if you're interested.

The Beginning

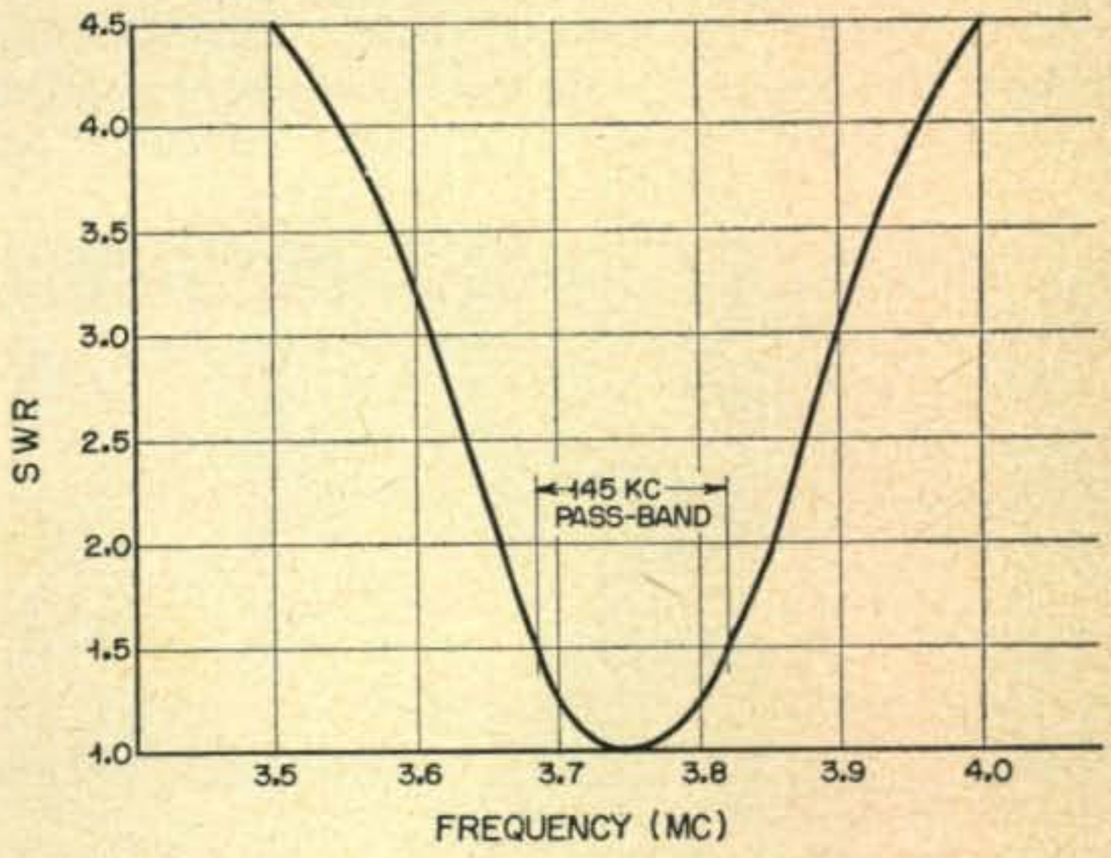
The 20 meter antenna consists of a thirty foot steel tower mounted atop the garage roof. The base of the tower is ten feet above ground level. Atop the tower is either a two element twenty meter beam, or a three element twenty meter beam, depending upon the whim of the operator. Either beam is an all-metal affair, with the metal boom directly connected to the motor drive pipe. The motor is located about 2/3 of the way up the tower, firmly bolted to the tower (figure 1). An erroneous assumption was made that if the beam was bolted to the drive pipe, and the drive pipe passed through two bearings and was bolted to the motor the beam would be at roughly the same potential as the top of the tower during 80 meter operation. (This was not so. More on this point later). The tower by itself, with no beam would resonate against ground in the neighborhood of 7 Mc. What effect upon the resonant frequency of the tower would the addition of the beam make?

Four 130′ radials were stealthily threaded about the yard. These ran from the base of the tower to the four corners of the garage roof and thence to strategically located points in the yard, chosen for their obscurity rather than for their electrical excellence. One radial ran along a brick wall, one was pulled through the center of a hedge, one wound its way through a camouflage of rose bush trellises, and the last one was brazenly attached to the top of the children's play house which reposed in the back corner of the yard. When the base of the tower was connected to the radial system via a two turn link coil and grid-dipped, the whole system resonated to *3875 kilocycles!* How lucky can you get? A length of RG-8/U was hurriedly dragged out of the garage. The shield was connected to the radials and the inner conductor to the tower base. The transmitter was connected to the opposite end of the line . . . hooray, she works!

And work it did! The signal of W6SAI was pushed up several S-units at W6LDD, and many DX contacts were made on 80 meter CW. No thought was given to the standing wave ratio on the line. Why worry? The lash-up (figure 2) worked just fine.

* * * *

After the glow had worn off a bit, W6SAI decided to go back to 20 meters for a while. The motor and selsyn control wires and 20 meter coaxial line were re-attached to the receptacles at the base of the tower and the antenna system was operated on 20 meters in the manner originally intended. It was found, however, that for proper operation on 80 meters, all the control wires for 20 meter operation had to be detached from the tower. or severe detuning of the tower on 80 meters would result from the loading effect of the control wires running from the base of the tower to the operating position. It was necessary to detach all control wires from the tower base when operation on 80 meters was desired. I knew that this situation was intolerable, since



SWR versus Frequency for top-loaded ground plane antenna tuned to 3750 kilocycles. The pass-band at 1.5 SWR points is 145 kilocycles

my enthusiasm for 80 meters would surely wane if I had to climb up on the garage roof to plug and unplug a bunch of wires for each QSY. R-f chokes in the lines were no solution either. The beam rotator drew too much current for any choke available on the market, and r-f chokes in the 20 meter coaxial line would really mess up the works. It looked like a new impasse was at hand.

The whole 80 meter project was dropped until a later and more favorable date and W6SAI turned his attention back to 20 meters. In the spring of '54 the 20 meter two element beam was taken down and a 20 meter three element beam placed atop the tower. Grid-dip measurements made at eighty meters now showed that the 80-meter system resonated at 3300 Kc. The additional top loading effect of the three element 20 meter array had obviously lowered the resonant frequency of the "eighty meter" antenna.

It looked as if the eighty meter project was going to be killed by two faults: First, the control wires of the 20 meter beam affected operation of the tower and antenna as a top-loaded eighty meter system. Second, it would be pretty hard to make the 20 meter beam the correct size to obtain just the proper amount of top capacity need to resonate to 80 meters.

The Solution

It was now determined that the base of the tower had to be at ground potential at eighty meters to prevent the 20 meter control wires from affecting eighty meter operation. Accordingly, the base of the tower was grounded to the juncture of the four eighty meter radials, and each control lead was bypassed with a .001 uufd. ceramic condenser to the base of the tower. The shield of the 20 meter coaxial feedline was also grounded to the base of the tower. These changes in no way affected the operation of the 20 meter beam. Since the tower, the control wires and the feedline were now immovably grounded to the radial system, it was decided to shunt feed the tower with a Gamma-match system[1]. Again, engineering common-sense had to yield to a combination of laziness and opportunity. There were two ready-drilled holes in the tower two feet below the top. This may not be the correct electrical place to attach the gamma match, but it was exceedingly convenient. So the gamma rod was bolted to the tower at the twenty eight foot elevation. The gamma rod was about four feet long, and protruded three feet from the side of the tower. From the tip of the rod a length of #12 enamelled wire was dropped down to the base of the tower and fastened to the roof of the garage with an eye-bolt. A 200 uufd receiving type variable condenser was attached in series with the gamma wire, and a frequency run from 3000 Kc to 4100 Kc was made. It was found that although the tower itself was resonant at 3300 kilocycles, it was possible to "pull" the frequency of resonance of the system by merely tuning the gamma condenser. A SWR curve for various points in the 80 meter band is shown in figure 3, and the complete installation is shown in figure 4.

Tuning the Tower

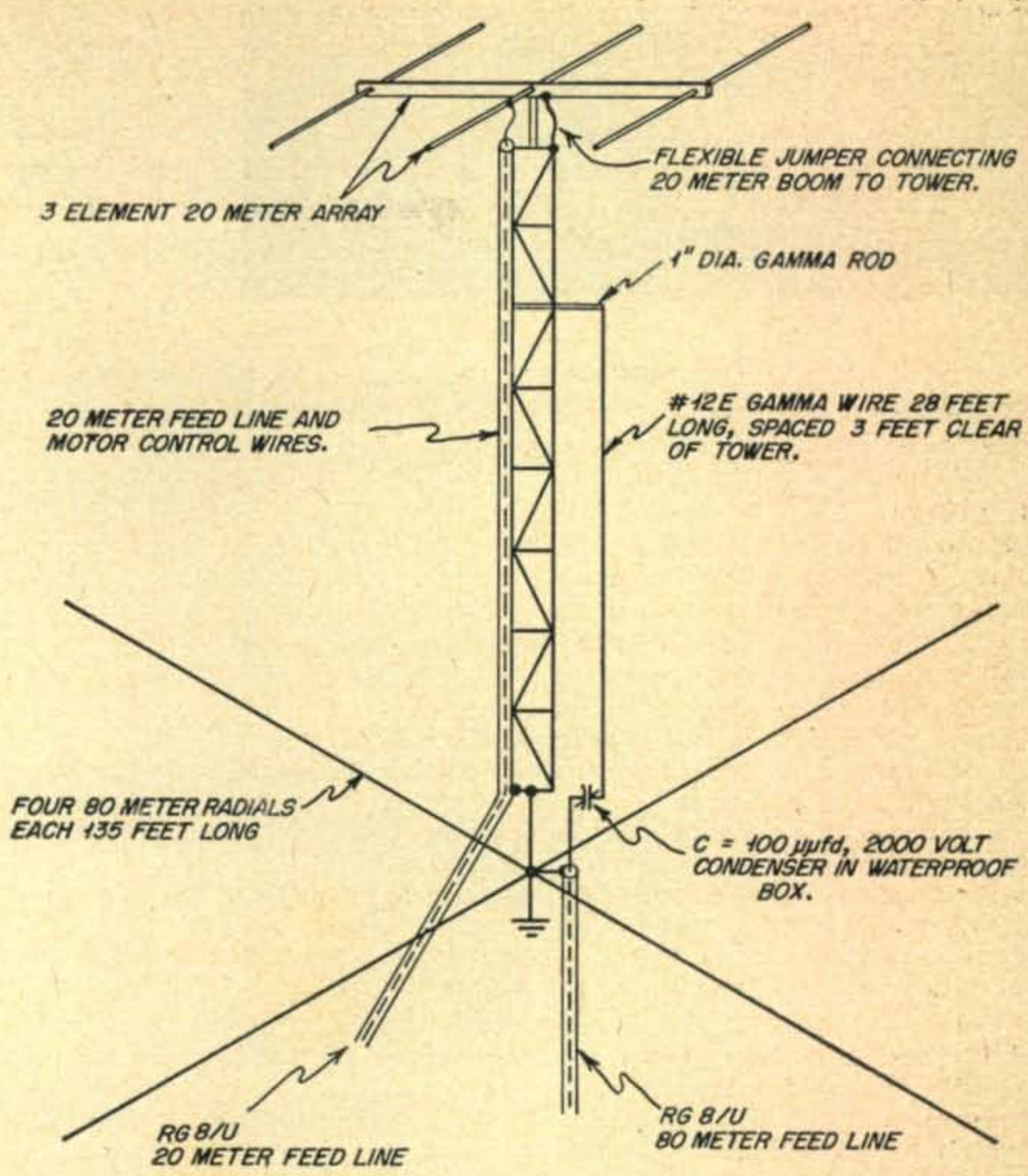
By varying the capacity of the gamma condenser, the tower could be made to provide a 50 ohm resistive load anywhere in the range of 3.3 Mc to 6.0 Mc. It was quite surprising that a good match could be had over such a wide range of frequencies. At any given frequency in the 80 meter band the effective pass-band of the system was about 150 kilocycles. (The pass-band was arbitrarily defined as that frequency spectrum enclosed by the 1.5/1 SWR points shown in figure 3). By stretching the point a bit and allowing a 2.0/1 SWR, the installation would easily cover the 200 kilocycles of the 80 meter phone band.

The process of tuning the tower was very simple. A grid-dip oscillator and an Antennascope[2] were coupled to the bottom of the gamma match. The Antennascope was set for 50 ohms, and the gamma condenser and grid-dip frequency were both varied until the null was found on the meter of the Antennascope. Changing the setting of the gamma condenser would change the frequency of the null. If the null was not complete (fortunately it was) it would have been necessary to move the gamma rod up or down the tower a few feet at a time until a complete null occurred at the 50 ohm setting of the Antennascope.

After the antenna was tuned up close to the operating frequency, the grid-dipper and Antennascope were disconnected, and the coaxial feedline was attached to the tower. A few watts of 80 meter r.f. from the station VFO were then fed to the antenna via a coaxial standing-wave meter, and the frequency of the oscillator varied across the whole band. Readings were plotted every 50 kilocycles to produce the curve of figure 3.

Since the band-pass of the antenna was only about 150 kilocycles, it was important that

A beautiful useable adornment for the hamshack, living room, game room or library—the CQ World Globe. See page 127.



Combination 80-20 meter antenna. Shield of 20 meter feedline is grounded to tower at top and base of tower. Shield of 80 meter feedline is grounded to tower at base. 80 meter radials are grounded to tower at base.

the antenna be tuned rather close to the pet operating frequency. The VFO was set on the chosen frequency, and an eager assistant (W6LGU) sat atop the garage roof and tweaked the gamma condenser with an insulated screwdriver until the antenna was exactly resonant on 3820 kilocycles, as shown by a 1/1 SWR on the coaxial SWR-meter. As an afterthought, the VFO was next set on 3.5 Mc and the antenna retuned for that frequency by the same procedure as outlined above. Two ink marks were then put on the dial of the gamma condenser. Then, by a slight expenditure of effort necessary to climb to the garage roof and reset the gamma condenser, W6SAI could scoot from 3.8 Mc to 3.5 Mc with the greatest of ease.

The Mystery of the Changing SWR

All the great expectations of the antenna were nearly scuttled when the Collins 32V was connected to the free end of the coaxial line and a few "hello test" transmissions were broadcast to a waiting world. The loading of the transmitter fluctuated violently, just as if there were an intermittent discontinuity somewhere in the system. After a great deal of fussing and fuming it was found that a jumper wire connected between the boom of the 20 meter beam and top of the tower cured the trouble. The mechanical joint formed by the drive pipe of the beam passing through the top tower bearing was not making a good connection. Any slight movement of the beam in a wind would vary the contact resistance of this joint. A length of flexible wire was jumpered across this joint, and all was well.

Final Results

No noticeable deterioration of the 20 meter beam could be found after these modifications were made to the tower. The SWR of the 20 meter beam remained exactly the same as before. The top loaded 80 meter antenna was a ball of fire on DX contacts, and proved to be equivalent or better than the old doublet on contacts over 800 miles away. Closer in, the vertical antenna lost out to the doublet by one to two "S" units. Local signals were two to five S units weaker on the vertical antenna than on the doublet. This turned out to be an advantage, as it eliminated most of the blocking and cross-modulation caused by loud locals received on the horizontal doublet. The vertical lash-up turned out to be better on the Los Angeles—Oakland schedule than did the doublet, which was "end-on" W6LDD. Obviously, the antenna could not be "all things to all men". It did the job, took up no more additional room, and was easy to get going. What more could you ask?

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1. "The Terrible T and Gamma, Too", by Wm. I. Orr, Oct, 1953 CQ.

2. "Antennascope—54", by Wm. Scherer. June—July, 1954 CQ.

Letters . . . to the editor

320 Winslow St., Watertown, N. Y.

CQ Magazine
67 West 44th St.
New York 36, N. Y.

Dear Editor:

The reactions of readers of "The 100-kc Sub-Band Theorem"* were so mixed as to be hardly classifiable. More individuals than clubs responded. None commented upon the whole structure as entirely good or bad if immediately applied; but a number of Old Timers believed it was headed in the right direction. . .

Novices were particularly intrigued by the harmonic values of crystals in the theorem; but none commented on the 10 & 15 meter uses.

Code men, not realizing that dwindling CW use of 14,350 to 14,400 cost us that precious spectrum slice, complained of phone favoritism. CW used to be abundant from 14,000 to 14,150 and also from 14,350 to 14,400 with a few less from 28,000 to 28,500. This CW abandonment is the reason for the Theorem's having phone up to the band edges of 14,350, 21,000, 21,450, 28,000 and 29,700, to avoid further loss from progressive percentage abandonment. CW is dwindling.

Phone men, ignoring FCC regulations about frequency-determining equipment, complained that it might be difficult to find a 100-kc sub-band at 29 Mc. Powerful interests will absorb more of our spectrum if we ignore necessary FCC regulations.

The only arguments which I could not answer were that this was too soon, or that such efforts would be unappreciated (until more spectrum would be lost).

The 100-kc Sub-Band Theorem article proved that many hams were unaware of band occupancies, change trends, causes of historical losses, essential FCC regulations, propagation characteristics, or how to work DX 2 out of 3 calls without a beam.

Education seems to be in order, Editor.

This plan was worked out from band occupancy comparisons since 1935. It originated as a framework in 1948 for a restudy through a quarter of the Sunspot Cycle, from 1948 to 1954.

I fear that we are due to lose 14,300 to 14,350, 21,000 to 21,150 and 28,000 to 28,200 for similar reasons for which we lost 14,350 to 14,400, and that yesterday was not too soon to have started preventing this.

*July 1955 CQ, Page 27

George Bonadio, W2WLR

Reciprocal Licensing Problem

Dear OM,

WISSZ in his letter* hit the nail right on its head. We in the Philippines are wondering when something is going to be done along the line of getting relations established with our *known* friends for reciprocal rights, at least for those of us who are of the military forces necessarily here not of our own desires.

I have appeared as guest speaker before the Institute of Electronics & Communications Engineers of the Philippines, and am an associate member of the Philippine Amateur Radio Association. Both groups have indicated a desire to have US Hams stationed in these islands active in amateur radio. So far no one has been capable of "breaking the ice."

Any help we can get will be appreciated, not only here but by DX'ers who are finding a "DU" card extremely hard to get.

LCDR W. E. MANN, JR., USN, W4CHW
Executive Officer
Fleet Aircraft Service Squadron 119
FPO San Francisco, California

**CQ*, August 1955

W. Englewood, N.J.

Gentlemen:

Re your September 1955 CQ and "Mobile Antenna Perfection". This article ought to do more to get more mobiles in operation than any other article written! Hits 99% of all questions right on the head!

W. J. Newman, K2IQX

Washington, D.C.

To Ye Editor:

Please ask Mr. Bassett how he mounted his mobile antenna without the spring and when there is no spring how does he prevent it from snapping off when driving under low hanging trees. Is the mount portrayed one commercially built or was it constructed especially for him? Down here in Washington the trees all droop so close to the ground that there is hardly a time when my 8′ whip does not hit some kind of a branch during the regular use of the car—and mine is situated on the front.

Gay E. Milius, Jr. W2NJF/4
Commander, USNR

Fort Lauderdale, Fla.

Dear Editor:

Yours is not the first question concerning "low trees" and the like. This is a difficult one to answer. The installation of an antenna is a costly thing and a valuable asset. Obviously the best answer is not to hit the trees, or anything else. With the antenna on the location indicated, it is, of course, possible to learn to drive the antenna instead of driving the car. This sounds a little foolish, but I have so learned. The antenna is in the middle of the road, so to speak, and the tree limbs are always higher here than anywhere else.

I have driven mine from Miami to Los Angeles, from Miami to New York, and from Miami to Chicago and Detroit. I can assure you that, on any of these routes, there will not be over one or two places that must be avoided or on which the antenna must be lowered. Around some cities, however, the problem is more acute. Savannah, Georgia, for example, has one stretch of city highway where the trees are "low." In fact they are so damned low that you can get scratches on the paint of your hardtop in places. The answer for this sort of thing is obvious. Either stay away from such streets, or take down the antenna.

The practice of "thumping" is somewhat like using marijuana. Most of the "thumps" don't bother you. It is the last "thump" that counts. Sooner or later enough damage can be caused by this method to destroy the antenna. Just start charging about ten cents per "thump" to amortize the antenna cost, and before long you will begin to think the game is not so hot.

A spring will not help you when "thumping." The impact is absorbed by the top rod and the coil and not by the spring, due to the time constant. A spring can only help you where you *must* enter a low garage, or the like, at very slow speed. In this case the spring enables the entire antenna to bend back, even as much as 60° or so without tearing off the fender. In other respects it louses up the antenna efficiency by 60% or so.

On the more serious side, however, the Fiberglas top rods will give plenty. You are familiar with the action of a good Shakespeare fishing rod. These rods will almost double up and then spring right back. They will not, however, take too much "thumping" or "drag" along a stone ceiling such as one finds in a low tunnel. Nothing else will either.

I realize this is not much help to you. Let me point out, though, that your bumper, or fenders will not last long if you thump them against a brick wall. The best answer is to avoid such obstacles as much as possible and save your antenna.

Rex Bassett, W4QS

1008 Willbanks Avenue
East Gadsden, Alabama

Dear Jim:

Just a line to let you know that I resent the price increase of *CQ* on the newsstand, I went for my copy this month but I replaced it back on the rack when I

[*Continued on page 97*]

Conelrad for Amateurs

Date of adoption will be announced when determined by FCC

The proposal to amend Part 12 of the FCC Rules adds the following new Sections:

Conelrad

§ 12.190 *Scope and Objective of CONELRAD.* CONtrol of ELectromagnetic RADiation applies to all radio stations in the Amateur Radio Service and is for the purpose of providing for the alerting and operation of radio stations in this service during periods of air attack or imminent threat thereof. The objective is to minimize the navigational aid that may be obtained by an enemy from the electromagnetic radiations emanating from radio stations in the Amateur Radio Service while simultaneously providing for a continued service under controlled conditions when such operation is essential to the public welfare.

§ 12.191 *The CONELRAD RADIO ALERT* is the term applied to the Military Warning that an air attack is probable or imminent and which automatically orders the immediate implementation of CONELRAD procedures for all radio stations. The CONELRAD RADIO ALERT is distinct from the military or Civil Air Defense Warnings YELLOW or RED, but may be coincidental with such warnings.

§ 12.192 *Reception of RADIO ALERT.*

(a) The licensee of a station in the Amateur Radio Service is required to provide a means for reception of the CONELRAD RADIO ALERT or a means for the determination that such ALERT is in force.

(b) All operators of stations in the Amateur Radio Service will be responsible for the reception of the CONELRAD RADIO ALERT or indication that such ALERT is in force by:

(1) Reception of a CONELRAD RADIO ALERT MESSAGE which will be broadcast by each standard, FM and TV broadcast station on its regular assigned frequency before they leave the air; or

(2) reception of standard broadcast stations operating under CONELRAD requirements during the period of the ALERT on 640 or 1240 kc; or

(3) determining that an ALERT is in force by lack of normal broadcast station operation (observations made before amateur station operation is begun and at least once every ten minutes during operation thereafter will be considered as sufficient for compliance with this Section; or

(4) other means if so authorized by the Federal Communications Commission.

§ 12.193 *Operation During an ALERT.* During a CONELRAD RADIO ALERT the operation of all amateur radio stations, except stations in the Radio Amateur Civil Emergency Service (RACES) and stations specifically authorized otherwise, will be immediately discontinued until the RADIO ALL CLEAR is issued. Stations in the RACES and such others as are specifically authorized to operate during the ALERT will conduct operation under the following restrictions.

(a) No transmission shall be made unless it is of extreme emergency affecting the national safety or the safety of life and property.

(b) Transmissions shall be as short as possible.

(c) No station identification shall be given, either by transmission of call letters or by announcement of location (if station identification is necessary to carry on the service, tactical calls or other means of identification will be utilized in accordance with 12.246).

(d) The radio station carrier shall be discontinued during periods of no message transmission.

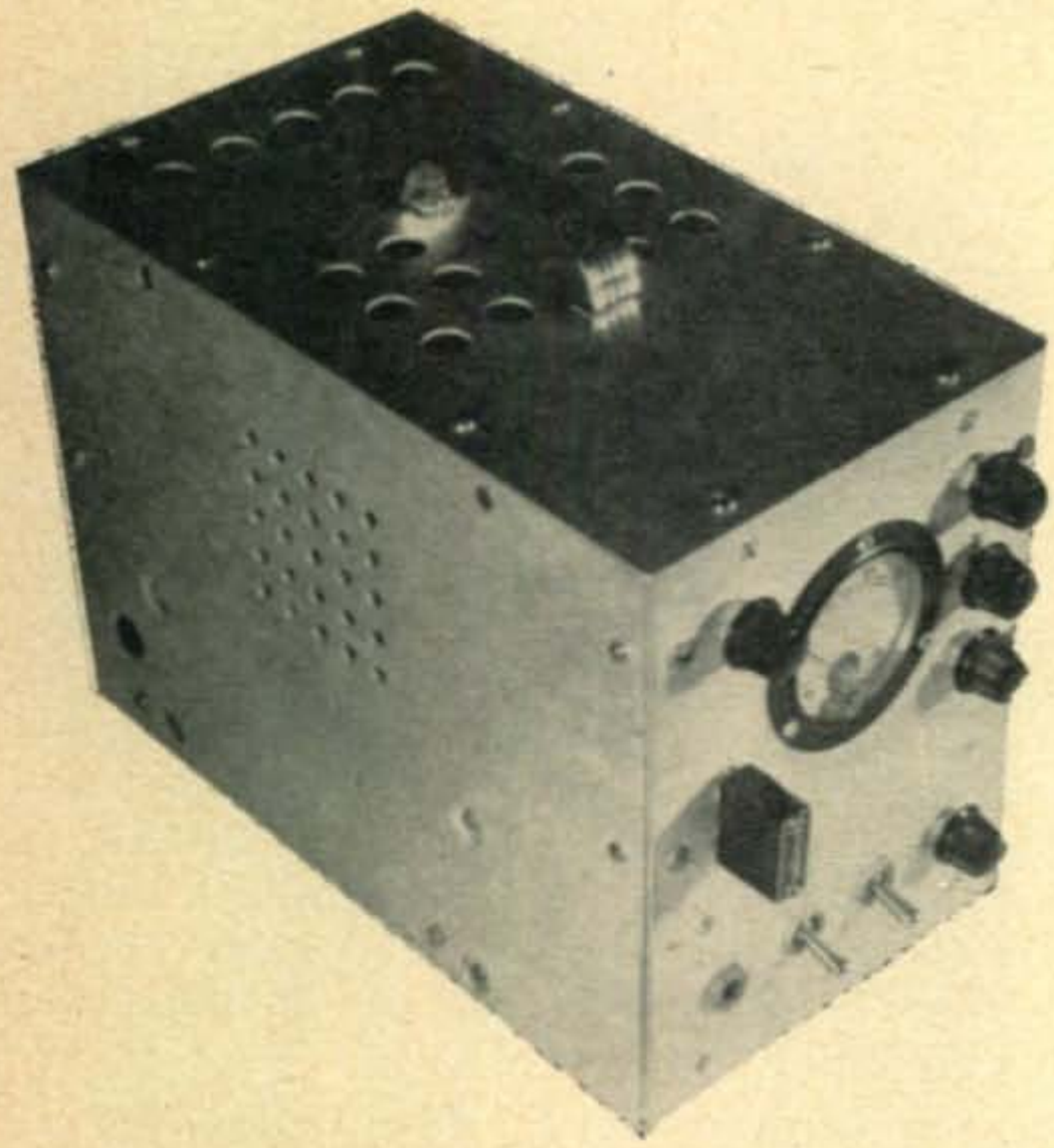
§ 12.194 *Special Operation.* In certain cases, the Federal Communications Commission may authorize specific stations to operate during a CONELRAD RADIO ALERT in a manner not governed by these Rules, provided, such operation is determined to be necessary in the interest of National Defense or the public welfare.

§ 12.195 *Resumption of Normal Operation.* At the conclusion of a CONELRAD RADIO ALERT, each standard, FM and TV broadcast station will broadcast a CONELRAD RADIO ALL CLEAR MESSAGE. Unless otherwise restricted by order of the Federal Communications Commission, normal operation of stations in the Amateur Radio Service may be resumed upon reception of the CONELRAD RADIO ALL CLEAR. Only the CONELRAD *RADIO* ALL CLEAR will authorize termination of the CONELRAD RADIO ALERT.

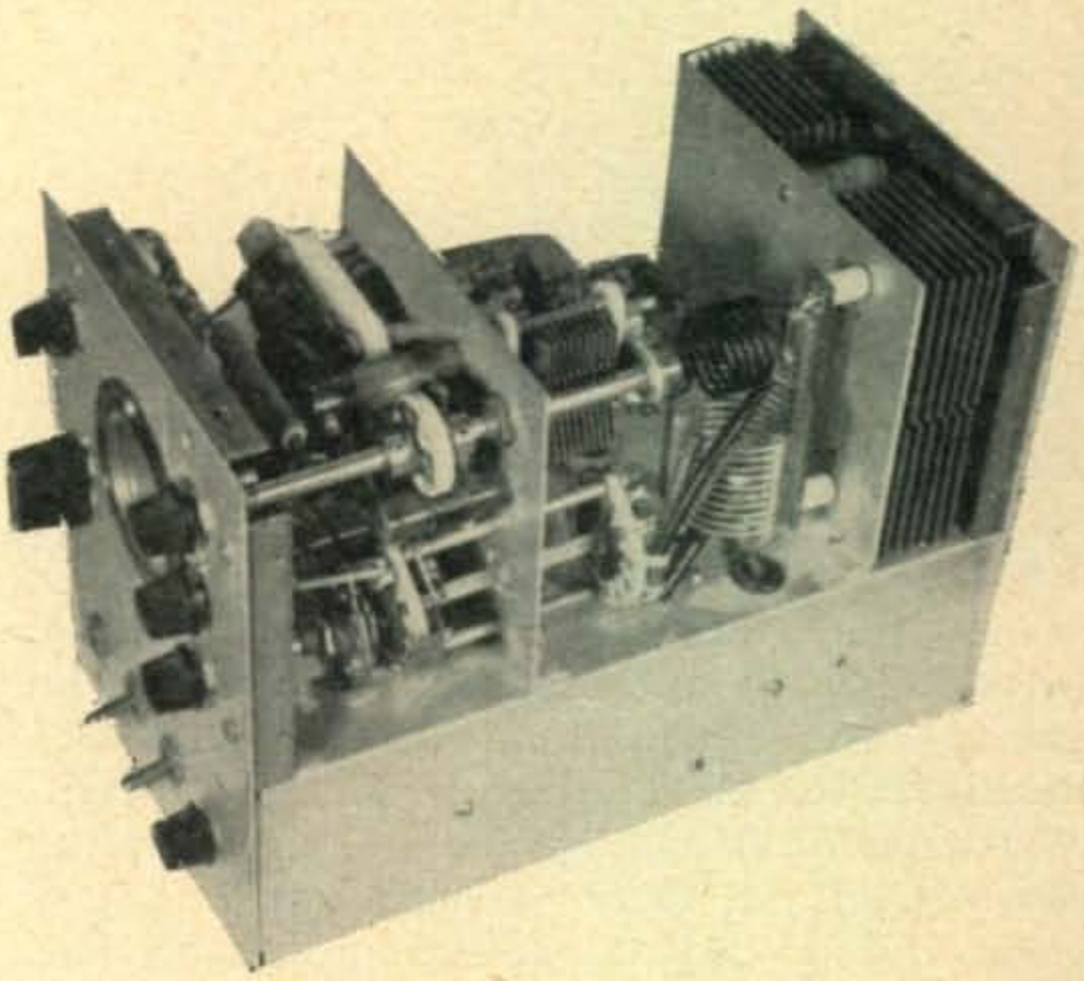
§ 12.196 *CONELRAD Tests.* So far as practicable, tests and practice operation will be conducted at appropriate intervals.

a 75-Watt Selenium-Powered

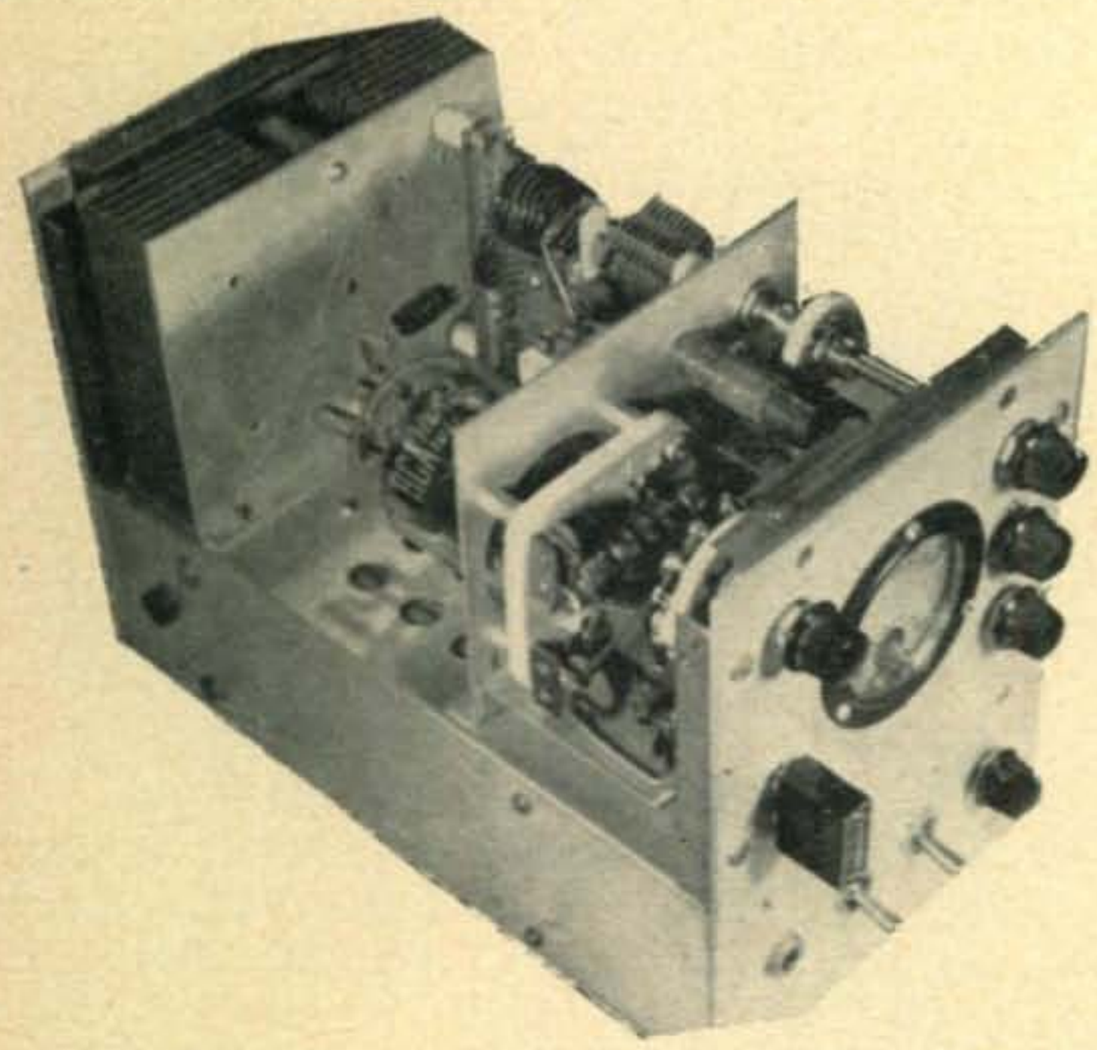
Martin O. Piepenburg, W9OLD
120 N. Ashland, Palatine, Illinois



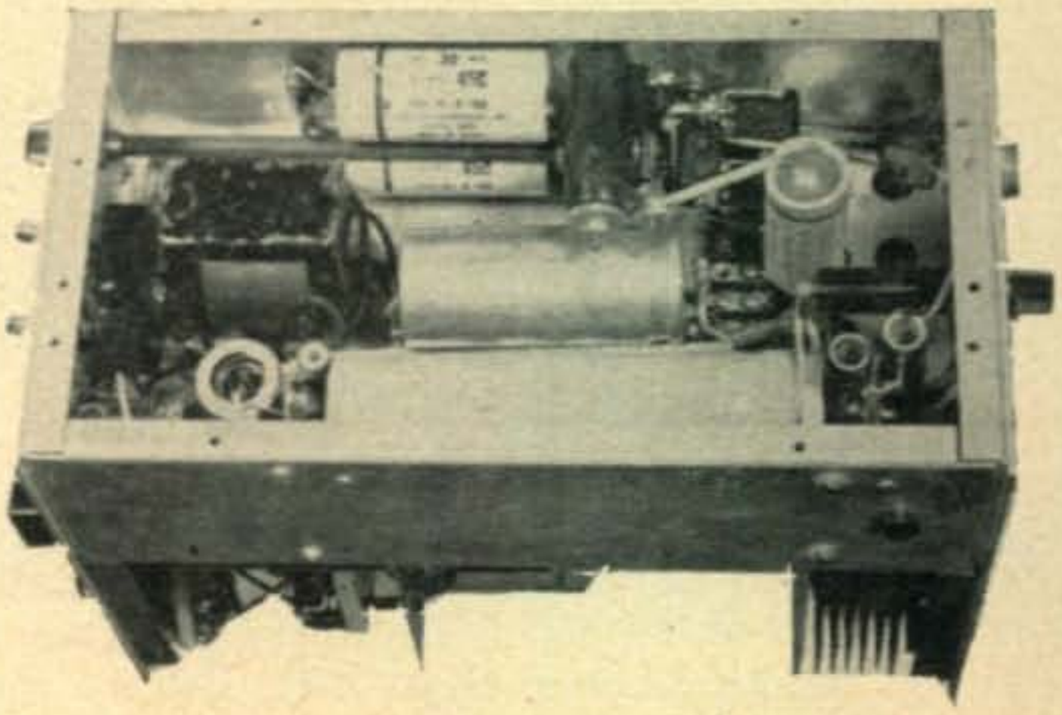
Complete 75-watt transmitter with built-in selenium power supply.



Right side view with cover removed. Note placement of final tank components, oscillator coils and bandswitch.



Completed transmitter with cover removed. Note oscillator shelf near 829B tube base, perpendicular to vertical partition of r-f assembly.



Underside of chassis. Note oscillator tube in lower left corner. Pi-output switch and postage-stamp micas are near upper right corner.

Bandswitching Transmitter

Many of us have at times wanted a small c-w transmitter on hand for such applications as Field Day operation, portable work, Novice operation or just for standby when the regular rig is in the rebuilding process. After some thought as to the economy and size of components, this nifty little transmitter was constructed at W9OLD.

Contemplated features were: Bandswitching on 7, 14, 21 and 28 megacycles, 75 watts input, extreme compactness with very little weight, and of course, freedom from TVI. A VFO would be fine but it was felt that its convenience could be sacrificed for the relative simplicity of crystal control.

After contemplation came construction. The pictured rig is the result. Over-all size is only 5½″ x 10″ x 7″ using a standard aluminum chassis base of 5½″ x 10″ x 3″ dimensions. Front panel layout is as follows: In a line at the bottom, from left to right, are the keying jack, filament and bias OFF-ON switch, plate power OFF-ON switch, and the knob controlling the switching of the pi-output loading condensers. Above the crystal socket is the meter switch. The three knobs at the upper right control final tank tuning, oscillator tuning, and band switching, top to bottom respectively.

Power Supply

The power supply is probably the most unusual feature of this transmitter, so it will be described first. A large power transformer of the necessary power-handling capacity, plus the conventional choke and rectifier tube, would have made the otherwise compact and lightweight transmitter hopelessly unwieldy. A quick look at the selenium rectifier handbook revealed a half voltage quadrupler. In the past I had been somewhat unconvinced as to the usefulness of seleniums. I was brought up to date in a hurry when a quadrupler was quickly haywired on the bench for a trial. Four 15-watt 115-volt lamps in series operated all day as a dummy load from the power supply, with the seleniums operating not cool, but cold. And this with less than 2 percent ripple at a no-load to full-load regulation of 575 volts to 500 volts, or around 15 percent. Not bad at all! The bias supply is also selenium-operated and delivers 45 volts at its output bleeder.

One precaution: The 5-ohm surge limiting resistor, *R7*, should not be less than a 20-watter. The 10 watt unit first tried got pretty sick before it retired from service. The specified 20-watt resistor barely warms up to the job and operates well within its rating. It was necessary to use two condensers, *C30* and *C31*, in series, to arrive at the required capacity of 60 mfd with a sufficient voltage rating. A good grade condenser should be used in this as well as in any other s-r circuit (special etched-plate heavy-duty capacitors are recommended).

As this type of power supply uses a common side of the power line for the negative return a hazard is encountered if the line polarity is incorrect. Floating the whole negative side above ground was impractical, and trusting to the proper plug polarity was entirely unacceptable. The danger was eliminated by using a shielded pair for the line cord. The pair is connected in parallel and goes to only one pin of the line plug. The shield is connected to the chassis and at the plug end the shield is extended to an alligator clip. Since all the hardware in a properly constructed electrical system of a building is at ground potential, it is only necessary to first clip the shield of the line cord to the mounting screw of the outlet plate and THEN insert the line plug. Incorrect plug polarity results in no hazard whatever . . . nothing operates. Merely reverse the plug and we're in business. To assure a perfect ground return and 100% safety, the cover plate should be removed temporarily from the outlet to be used, and the ground side of the power line should be determined by use of an a-c voltmeter or lamp bulb with test leads. With one lead connected to a known ground such as a radiator pipe, the other lead is touched to each of the outlet terminals. The other terminal from the one which gives an indication of 110 volts potential should indicate zero potential, and from this zero-potential terminal a wire or shield-braid may be connected which is to be brought out under the edge of the outlet plate. The alligator clip is connected to this wire instead of to the plate mounting screw.

R-F Circuit

A number of harmonic type oscillators have been tried in the past, some good, others only fair. This one really works . . . and with a reasonably low plate voltage at that. A 6AG7 will work as well as the 5763 if the latter is unavailable. The oscillator is essentially a hot-cathode Colpitts. *L1* and *C2* resonate close to the crystal frequency of 7 Mc. Together with bypassing the screen to cathode this accentuates the harmonic content. Several oscillators of this type have been built for previous rigs and one has yet to be found that would not take off and oscillate nicely on the first trial.

The final tube type centered on the 829B. A 6146 or an 807 would be unable to handle the required input at the relatively low plate

voltage available. Besides, the 829B has a really rugged element structure, something to be considered from a heat-dissipation standpoint due to the small size and complete enclosure of this particular layout.

The currently popular pi-type output tank is a natural for any single-ended final and this one was no exception. It was calculated for a *Q* of 12 using a plate voltage to current ratio of 3 to 1.

A compact straight-line capacity variable condenser of more than 140 $\mu\mu$fd was unavailable for tuning the final tank. As about 160 $\mu\mu$fd is needed to resonate the final to 7 Mc, a 25 $\mu\mu$fd air padder, *C13*, was parralled with *C12*. This padder is set at full capacity and left that way. *C13* may be eliminated if a compact variable condenser of about 200 $\mu\mu$fd is available for *C12*.

Coil-Winding Information

L1—Ohmite Z-1 RF Choke.
L2a—7 mc. 33 turns #28 D.C.C., Close wound, on ½" form.
L2b—14 mc. 15 turns #22 enam. Close wound, on ½" form.
L2c—21 mc. 10 turns #22 enam. ¾" long, on ½" form.
L2d—28 mc. 8 turns #22 enam. ½" diameter, self supporting.
L3—5½ turns #12 enam. ⅞" inside diameter, ⅞" long. Tapped at 5th. full turn from the plate end.
L4—10 turns #16 tinned. 1½" inside diameter, 1½" long. Tapped at ½ turn and 3½ turns from plate end.

Construction

Most of the chassis layout is evident from the photographs. The five selenium rectifiers are assembled on the rear of the upright shield partition at the rear of the main chassis. This partition also mounts part of the final tank, *L4*, on ¾" standoffs.

The r-f portion was built as a separate subchassis to permit a certain amount of pre-testing before assembly to the main chassis. This amounts to checking oscillator operation and adjusting the final grid current on all four bands. Not too evident from the pictures is the mounting of the oscillator shelf of the r-f subchassis. The 5763 tube with its shield is mounted upside down, and projects down into the main chassis through an appropriate clearance hole. Close examination of the left hand three quarter view and the underside view will reveal this arrangement.

Both side plates, front and rear panels, top cover, the r-f deck and the rear partition were made from 14 gauge aluminum sheet. Most of the cutting and bending of these items was done at the local tinsmith's. Half-inch brass angle stock, appropriately cut, drilled and tapped for 6-32 screws fasten together the sides, front and rear panel and top cover. The bottom cover was fashioned from a scrap piece of cane metal and is held in place with self-tapping screws. This allows free circulation of air, as do the various holes punched in the left side cover, top cover, and in the chassis under the 829B and the selenium rectifiers.

Under the chassis are found the filament transformer and all other power supply components. Here, too, are the pi-output condensers and progressive shorting switch. Most of the wiring is done with shielded wire. The few wires not so treated are well bypassed. Incidentally, tip jack *J2*, found on the left side of the chassis, is used to measure final plate voltage without removing any of the cover plates. This facilitates the calculation of final plate power input.

The meter switch, meter shunts, and the milliameter are assembled to the front panel, wired and tested before the panel is put in place. Any meter of 10 ma. or so rating is suitable. Ours was a Weston 506, a 300 ma. unit with a 1.2 ma. basic movement. The internal shunt was removed from the meter and soldered to the meter switch as *Rsh3*. Shunts *Rsh1* and *Rsh2* were made with resistance wire from an old rheostat, wound on 1,000 ohm ½-watt resistors. These resistors are high enough in value to serve as winding forms only. The current ranges of 30 ma. for *Rsh1* and 60 ma. for *Rsh2* were arrived at by using a 3-volt battery and a rheostat of a few thousand ohms in series with a separate meter of known current range, all in series with the meter and shunts to be calibrated. While this "cut and try" method is not accurate to the nth degree, it is simple and works well in practice.

Driver Adjustment

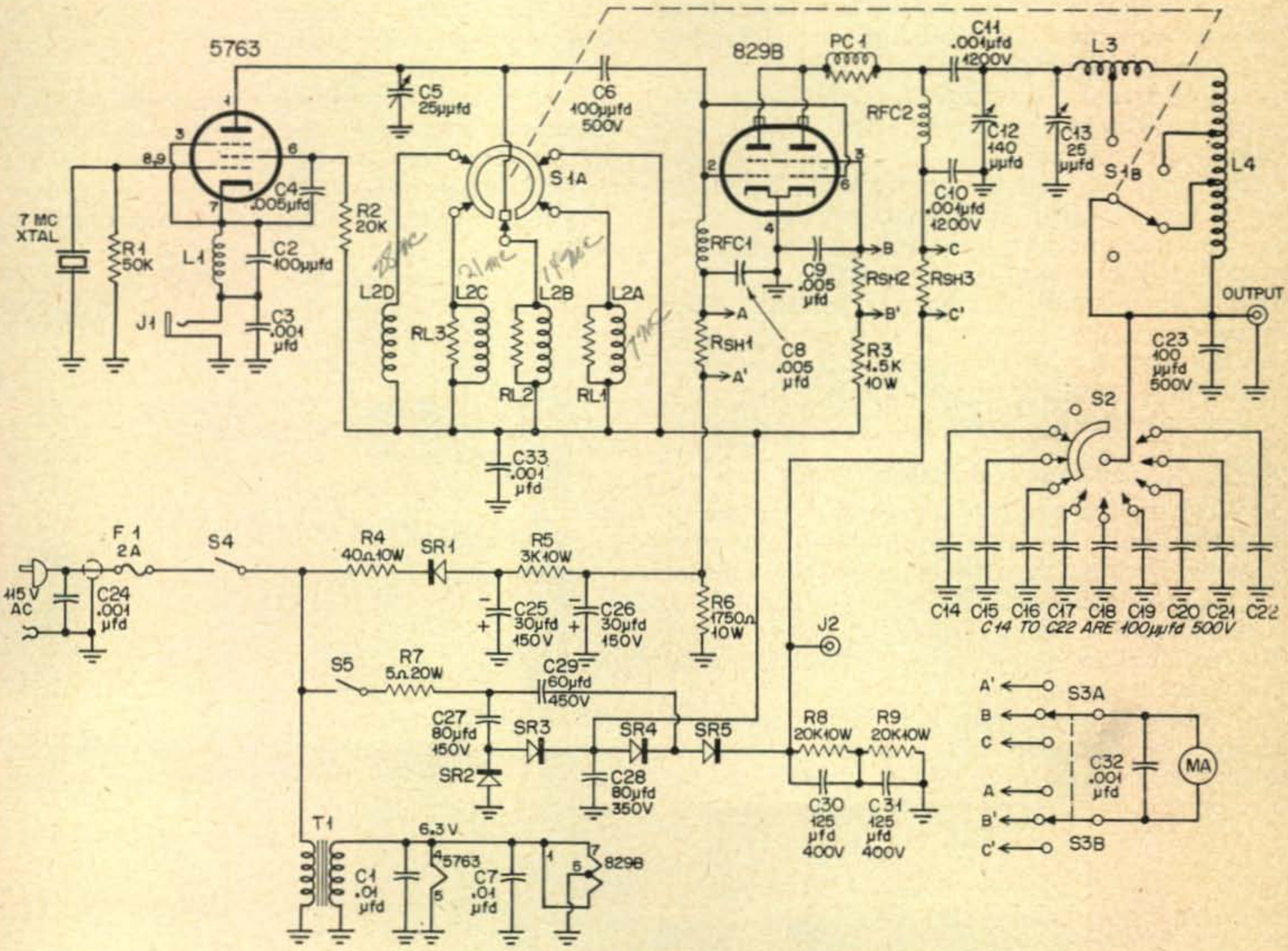
First the power supply should be checked. Next the oscillator. As mentioned before, the oscillator can be tested before the r-f subchassis is assembled to the main chassis. It is not necessary to have the final tank circuit in place. Any 30 ma. meter can be temporarily connected between the bias supply and the final amplifier grid choke, *RFC1*. The oscillator coils should have been wound as specified and roughly checked with a grid-dipper. With only filament voltage on the 829B, fire up the oscillator and adjust each coil in turn by adjusting the end-turn spacing for maximum final grid current with the oscillator tuning condenser *C5* set at half capacity. Forty-meter operation will give the greatest grid current, progressively decreasing toward ten meters. Now shunt the coils with swamping resistors so that the grid

current will be about equal for all four bands. This will be between 12 and 15 ma., decreasing to between 6 and 8 ma. when the final is later operating and loaded. In this particular layout the swamping resistors were 5100 ohms for 7 Mc, 10,000 ohms for 14 Mc, and 12,000 ohms for 21 Mc. None was needed for the 28-Mc band. It is possible that these values could vary somewhat in a duplicated version. After proper oscillator operation is assured the r-f sub-chassis may be assembled and wired to the main chassis.

Final Adjustment

Now to the final amplifier. The final tank components should be in place and all wiring including the metering circuit should be finished. A dummy load is now in order, ours being a 50-watt 60-volt lamp donated by the local surburban railroad. This lamp makes an excellent 72-ohm load and is highly recommended, though an ordinary 60-watt 110-volt lamp may be used.

[*Continued on page 120*]



Complete schematic for hte selenium-powered 75-watt transmitter

C1, C7—.01 mf. disc ceramic.

C2, C6, C14 to C23—100 mmf. 500 volt Mica.

C3, C24, C32, C33—.001 mf. disc ceramic.

C4, C8, C9—.005 mf. disc ceramic.

C10, C11—.001 mf. 1200 volt Mica.

C12—140 mmf. variable. Hammarlund MC-140-S

C13—25 mmf. variable. Hammarlund APC-25.

C5—Same as C13 but with ¼" shaft.

C25, C26—30 mf. 150 volt, electrolytic.

C27—80 mf. 150 volt, electrolytic.

C28—80 mf. 350 volt, electrolytic.

C29—60 mf. 450 volt, electrolytic.

C30, C31—125 mf. 400 volt, electrolytic.

R1—50,000 ohm, ½ watt.

R2—20,000 ohm, 1 watt.

R3—1,500 ohm, 10 watt.

R4—40 ohm, 10 watt.

R5—3,000 ohm, 10 watt.

R6—1,750 ohm, 10 watt.

R7—5 ohm, 20 watt. See text.

R8, R9—20,000 ohm, 10 watt.

RL1, RL2, RL3—Swamping resistors, 2 watt. See text.

Rsh1, Rsh2, Rsh3—Meter shunts. See text.

Rect. 1—75 ma. Selenium rectifier.

Rect. 2, 3, 4, 5—400 ma. Selenium rectifiers.

RFC1—2.5 mh. 125 ma. RF Choke.

RFC2—1.0 mh. 300 ma. RF Choke.

T1—6.3 volt, 3 amp. filament trans.

PC1—6 turns, #22 enam. on 220 ohm 2 watt. res.

J1—Open circuit jack.

J2—Insulated tip jack.

F1—115 volt, 2 amp. fuse and holder.

MA—Milliameter, 0-10 ma. or better. See text.

S1A—1 pole, 10 position ceramic shorting wafer. Centralab type GG.

S1B—1 pole, 11 position ceramic wafer, Centralab type Y.

S2—10 position, progressively shorting ceramic switch. Centralab type PA-2042.

S3A, S3B—2 pole, 5 position ceramic switch. Centralab type 2505.

S4, S5—SPST Toggle Switch.

Note: S1A and S1B are ganged together on a Centralab index assembly with appropriate spacers.

Certificate Seeker's Directory, II

H. S. Bradley, W2QHH
66 Lebanon St., Hamilton, New York

In this sequel to his first article on the subject, W2QHH describes almost fifty operating awards and gives valuable tips for obtaining the confirmations necessary to earn them.

The original *Certificate Seeker's Directory** gave information on over sixty awards and certificates offered to radio amateurs by organizations throughout the world. Since its appearance, much additional information on new awards, modifications and clarifications of the rules for obtaining some of the previously-described ones has been compiled. Also, many amateurs have requested a few hints on the best way to acquire the confirmations required to obtain these awards. Therefore, this supplement is presented.

Getting Confirmations

Working the necessary stations often seems less than half the battle in obtaining operating awards, because they all require written proof of claimed contacts. The writer's better-than-average return on confirmations (QSL cards) has resulted in many requests that he reveal his secret weapon.**

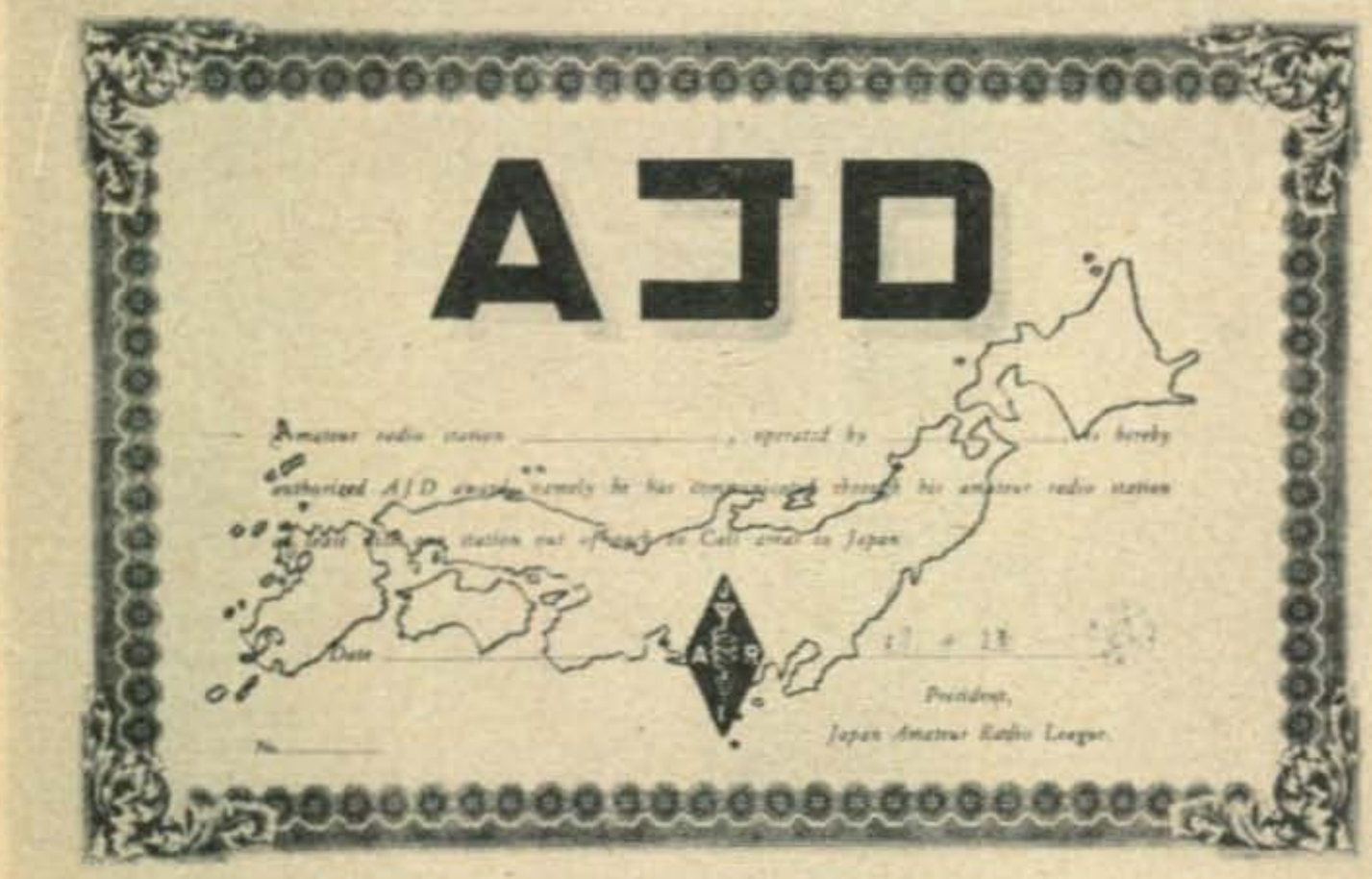
If there is any secret, it is in the following simple, well-known rules that are too often overlooked. These shall be discussed briefly for the benefit of other serious Certificate Seekers.

The first thing is to remember that *you* want the other fellow's card; therefore do everything possible to make it a pleasure for him to send it to you.

Promptness in sending your own card is extremely important. There is an ever-increasing trend on the part of rare DX stations not to QSL "run-of-the-mill" (that is, from their viewpoint) contacts until a card has been received.

Bureaus—Yes or No?

Whenever possible, send cards to rare DX



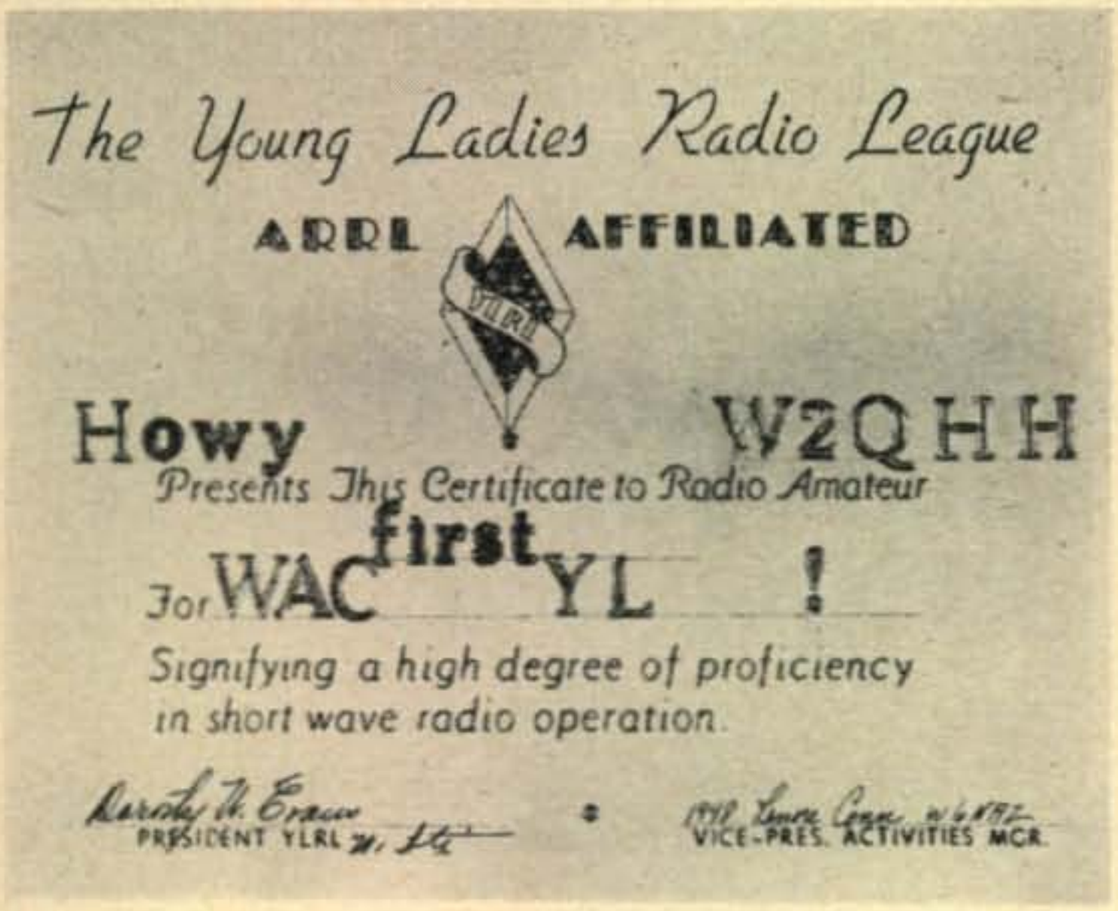
The coveted Worked All Japanese Districts award

*"The Certificate Seeker's Directory," by H. S. Bradley, W2QHH, CQ, February, 1953.

**W2QHH's record in several categories includes 228/228 countries, 82/86 Asians, 289/291 KP4's, 113/113 3.5-Mc countries—Editor.

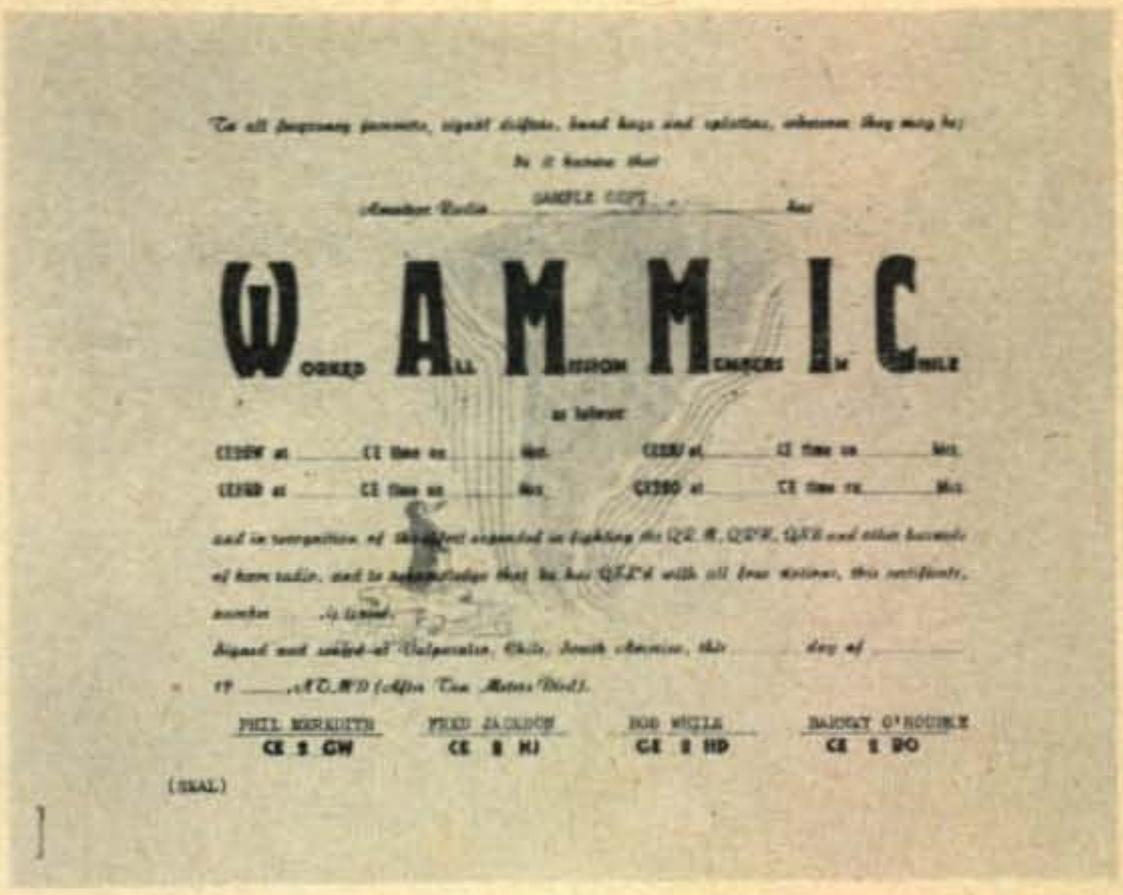
directly, instead of through a QSL bureau, and try to get the DX operators to QSL to you directly. Without intending to discredit in the slightest the wonderful service that QSL bureaus perform, they do have their disadvantages. Some foreign bureaus handle cards only for members of the sponsoring organization. Others distribute cards only once a year. Sending cards through the bureaus increases the chance of their being lost.

This last point merits some explanation. Assume that you are W6XXX and work station



X in country Y and send your card to him via his QSL bureau. Your card is one of hundreds or thousands of cards received by the bureau. All these cards are sorted, probably by call area, and sent to regional distribution points, from which they are mailed to the addressees.

Upon receipt of your card, the DX operator fills out a card for you, and the whole process repeats itself in reverse, with one difference. While the ARRL QSL bureaus do not handle outgoing cards, most foreign ones do. As a result, his card goes through several more hands than yours did. Each time a card is handled or transshipped, there is a possibility of its being lost. Some foreign countries have less efficient mail services than we have. Also, packages of cards sometimes break open, and



few postal employees anywhere in the world know how to route a loose lot of QSL cards to their proper destinations.

It costs you no more to send a single card directly to a DX station than to send it via a bureau. However, the situation is quite different for the DX operator. The demand for his cards is so great that he probably cannot afford to mail them individually; therefore, to get this special courtesy, you should be willing to pay the postage on your card.

Reply Coupons or Stamps?

International Postal Reply Coupons are designed for the purpose of prepaying a reply from an international correspondent. My experience has been, however, that they are practically useless in getting QSL cards. Regardless of the theory of things, many countries, even members of the International Postal Union, refuse to honor them at all. And where there are only one or two DX stations in a remote spot, so many Coupons accumulate that the local post office will not accept them.

Even where the coupons are accepted, exchanging them for postage stamps is an inconvenience to the DX amateur. Much more effective in getting a rare card promptly is to obtain unused stamps of the country involved, affix them to an envelope addressed to yourself and send it along with your card. Then the DX operator need only slip his card in

the envelope and mail it.

Unused foreign stamps may be purchased from stamp dealers. Most large cities have one or more, and the addresses of others are usually to be found in the classified ads of the Sunday Supplement of newspapers, as well as in the classified ads of many magazines.

Recently some DX stations, particularly those of the "DX-pedition" variety have offered to QSL via airmail, directly to all stations worked who include a dollar with their own cards. Otherwise they QSL through the bureaus. This practice has been condemned as "QSL buying" by some, but it can be defended on the ground that it is right that DX men throughout the world have the opportunity to help defray a small portion of the cost of these expeditions to rare countries.

These countries would otherwise be unworkable, because there is no other amateur activity in them. Besides, how else could we expect our cards via airmail?

Acceptable Confirmations

Obtaining printed QSL cards in many remote areas is either impossible or prohibitive in cost. One DX station, for example, was quoted a price of $66.00 per thousand for the simplest possible card. Actually, a printed card is not necessary. Any form of written confirmation in a letter or on a plain card is just as valid as the most elaborate printed card.

When the DX station does not have cards, you can include a simple stamped and addressed one with blanks for the essential information, with your own card. The operator can then fill it in and mail it to you. One of my most prized possessions is such a card from a prominent DX station, stating that, of 48,797 contacts, mine was the only one at that time confirmed!

New Awards and Certificates

In the following listing of new awards and modified information on previously described ones, every effort has been made to check the accuracy of all information. Language difficulties and slightly different interpretations of some of the rules by different informants make it impossible to guarantee complete success. In any event, the decision of the award committee of the sponsoring organization is final in any question regarding an award.

The awards are listed in alphabetical order of the countries issuing them.

Argentina

Certificado Antartico Argentino (CAA) is awarded upon proof of contact with a single LU station located at any of the Argentine Antarctic bases. Space is provided on the certificate for stickers awarded upon proof of contact with each additional base.

This and subsequent Argentine awards are issued by the Radio Club de Argentino, Av. Libertador General San Martin 1850, Buenos Aires (Suc. 61), Argentina, and all contacts must have been made since November 20, 1945.

Cinco Continentes Communicados (CCC) is the Argentine version of WAC. It is awarded to members of the R.C.A. upon proof of two-way contact with the five continents of the world on a single amateur band. North and South America are counted as one continent. Amateurs north of the Equator must submit a confirmation with a station south of the Equator and vice versa.

Certificado Estaciones Moviles Argentinos (CEMA) is awarded upon submission of proof of contact with twenty-five or more Argentine mobile stations (LUØ's).

Todos los Paises de America (TPA), formerly listed as Worked All American Republics, requires twenty-two confirmations, one from each of the twenty-one American republics and Canada. Possessions of other countries: e.g., KP4, VP2, FM8, etc., do not count towards this award.

Todas Provincias y Gobernaciones (TPG) formerly listed as Worked All Argentina. Awarded upon proof of contact with the twenty-six Argentine "states." They are identified by the first letter following the numeral in LU calls. *A*, *B*, and *C* represent the city of

Buenos Aires, and *D* and *E* the province. The remaining letters represent the other subdivisions, with the following additions. The letters *G*, *V*, and *X* each represent two of them. In these, the second letter following the number is also used to identify the area. If it is between *A* and *O*, inclusive, it represents one area, and *P* to *Z* identifies the other.

"101" The Argentine DXCC, requires proof of contact with 101 different countries (no VP8s). Stickers are awarded for proof of contact with each additional block of twenty countries.

In addition, the R.C.A. issues the previously described **Certificado Argentino (CA)** upon proof of contact with 100 LU stations.

Bolivia

Worked CP (WCP): Radio Club of Bolivia. Requires proof of contact with twenty-five different Bolivian amateurs, including at least one contact with each of the six Bolivian call areas. Contacts must have been made since August 21, 1952. Send confirmations to Radio Club Boliviano, Casilla 2111, La Paz, Bolivia.

Brazil

Worked All PY (WAPY): Formerly listed as sponsored by the L.A.B.R.E., is actually awarded by *Antena Magazine*, Rio de Janeiro, Brazil, upon proof of contact with the nine PY call areas.

Canada

Worked All VE (WAVE): Mention of this award had been omitted from our previous listing upon erroneous advice that it was no longer available. It is issued upon proof of contact with the nine Canadian provinces VE1 to VE 7 on two amateur bands. VE8 may be substituted for VE7. No VO contacts are currently required. Send the 18 cards, with fifty cents, to Nortown Amateur Radio Club, Box 356, Adelaide Street Postal Sta., Toronto, Ontario, Canada.

France

Diplome de L'Union Francaise (DUF): Alterations have been made in the requirement for the four grades of this award. They now are:

DUF-1: Five French countries in three continents.

DUF-2: Eight French countries in four continents.

DUF-3: Ten French countries in five continents.

DUF-4: Sixteen French countries in six continents.

For the purpose of this award, the R.E.F. subdivides the French countries on the Official *CQ*/ARRL/RSGB country list into several additional "countries," which are listed in the appendix of this article.

Winners of the DUF-4 are eligible to wear a silver medal, available to French Union amateurs for 600 Francs and to other amateurs for 700 Francs. Applicants for the DUF award can be made directly to the present DUF Manager, Lucien Aubry, F8TM, Bd. de Belleville 1, Paris XI, France. Amateurs outside the United States and Canada may also apply through their national radio society.

Germany

Worked All Europe (WAE) merits some clarification in its requirements (refer to September, 1955, *CQ*, WAE Contest data).

WAE-III: Forty European countries, 100 points and eleven Postal Reply Coupons.

WAE-II: Fifty European countries and 150 points. Subscription to *DL-QTC* awarded. Apparently no coupons required.

WAE-I: Fifty-five European countries, 175 points, and fifteen Postal Reply Coupons.

Points are counted one per contact, except that non-European amateurs may claim two points per contact on the 1.8-Mc and 3.5-Mc bands. All contacts must be made on not more than four bands, choice of the four bands being left up to the individual award-seeker.

Because Russian amateurs now refuse to QSO outside of their orbit (this situation appears to be changing now. See September *CQ*), the D.A.R.C. offers a list of substitute prefixes that will be accepted in their places for WAE. This list will remain valid until one year after

the date upon which normal intercommunication between Russian amateurs and the rest of the world is resumed. The list applies only to 7-Mc, 14-Mc, and 28-Mc contacts (and presumably 21 Mc), and an amateur living in one of the substitute areas may not count a contact with it towards the award. The list follows: UA1-6, DL8 (DM?) Soviet Zone of Germany; UA-Franz Josef Land, GM Shetland Islands; UB5, LA North of the Arctic Circle; UC2, OH8; UN1, SM2: UO5, GM Orkney and Hebrides Islands; UP2, SM1; UQ2, OZ Bornholm Island; UR2, DL7 Western Berlin.

Send proof to: D.A.R.C., Box 585, Stuttgart, Germany.

Great Britain

Worked All British Counties (WABC): *Shortwave Magazine* (London). This award is not likely to be won by many amateurs outside the British Islands. It requires proof of contact with a minimum of sixty U.K. counties on 160 meters! Send proof to *Shortwave Magazine*, 53 Victoria St., London SW1, England.

Hawaii

Hilo Amateur Radio Club Certificate: Awarded upon proof of contacts with fifteen members of the Hilo Amateur Radio Club since September 1, 1935. Address Hilo Amateur Radio Club, P.O. Box 1659, Hilo, Hawaii.

The **Kanai R.C.** (Sec. KH6LG) grants a certificate for working 100 different KH6's.

Maui Amateur Radio Club offers a handsome certificate for proof of contact with fifteen Maui amateurs since October 3, 1952. Proof to KH60L, P.O. Box 434, Puunene, Maui, T.H.

Italy

Certificado del Mediterrano (CDM): Associazone Radiotecnica Italiana. Requires proof of contact with fixed stations in twenty-two countries bordering the Mediterranean Sea and with thirty of the Italian peninsular provinces. Three International Postal Reply Coupons required with application. Members of a radio society affiliated with the IARU may submit a list of contacts verified by their society to the ARI. Others must submit the actual confirmations. Address A.R.I., Segretaria Generale, Via S. Paolo 10, Milano, Italy. See appendix for a list of the countries and provinces workable for this award.

Diploma Torino: ARI, Sezione de Torino. Awarded for proof of contact with Turin, Italy, stations. Non-Europeans must work five. European amateurs must work ten. Italian

amateurs must work fifteen. All contacts must have been made since January 1, 1952. Send proof to A.R.I., Sezione de Torino, Casella Postale 250, Turin, Italy.

Worked All Italian Provinces (WAIP): Radio Club Amatori. Italian amateurs must work seventy-five Italian provinces to earn this award. Other amateurs must work sixty. See appendix for names of Italian provinces. The A.R.I., Via San Paolo 10, Milano, Italy, now sponsors the award, following unification of the two clubs.

Worked All Sicilian Provinces (WASP): This award requires working a minimum of five of the nine Sicilian (IT1) provinces after July 1, 1952. Either phone or CW, but not both, may be used. Send proof with four International Postal Reply Coupons to The Secretary, Sig. Catalano Ugo, IT1TCZ, via Bentivegna 35, Palermo, Sicily. See appendix for list of Sicilian provinces.

Japan

Worked All JA Districts (WAJD) and **Worked Five Japan Stations (WFJS):** Far Eastern Amateur Radio League. Since the licensing of Japanese nationals started on August 1, 1952, the FEARL requires that cards dated after that date submitted towards either award must be from KA stations. JA cards before that date are still accepable. Address FEARL, APO 500, c/o Postmaster, San Francisco, Calif. In addition, the national society, JARL issues "AJD" for proof of contact with each of the Japanese call areas.

Mexico

50 Paises—50 Watts: Liga Mexicana de Radio Experimentadores. Requires proof of contact with at least fifty countries, including Mexico, with a power input not exceeding fifty watts. North American amateurs must work the three Mexican call areas. Send proof with fifty cents (U.S. money) or six Postal Reply Coupons to L.M.R.E. A.C., Liverpool 195-A, Mexico 6, D.F., Mexico. Your local radio club must certify that your power input did not exceed fifty watts during any of the contacts. In lieu of a club, the word of two local amateurs will be accepted on this point. No. 1.8 or 27Mc contacts are accepted! (W2QHH sweated this one out before getting an XE3!—*Editor.*)

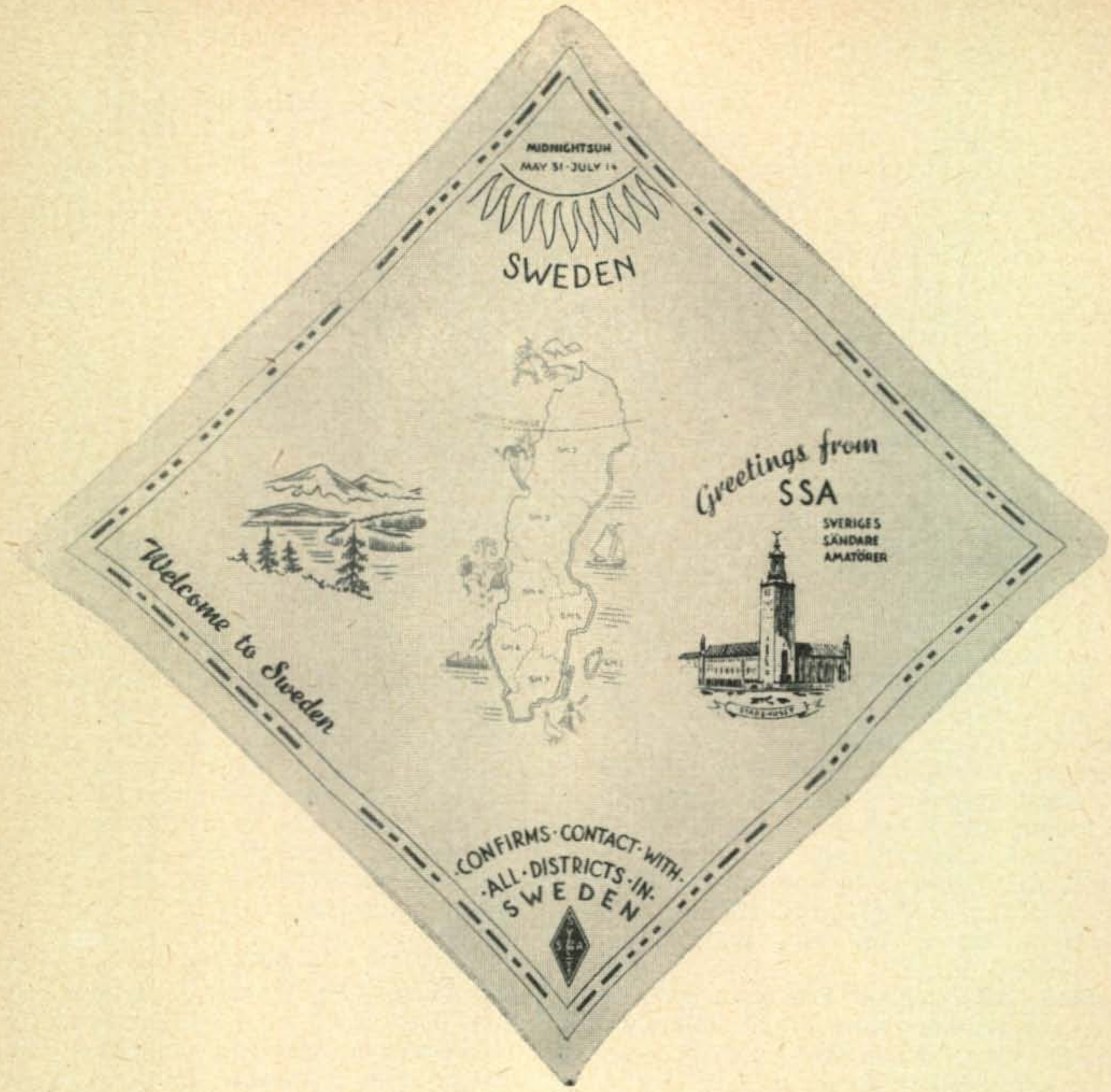
Paraguay

CRCP: Radio Club of Paraguay. Awarded upon proof of fifty Paraguay (ZP) contacts since January 23, 1941. Address The "Bureau," Radio Club of Paraguay, Box 512, Asuncion, Paraguay.

WAZP: Radio Club of Paraguay. Requires confirmation of contacts with the nine ZP call areas since May 15, 1952. Address above.

Peru

Worked OA (WOA): Radio Club of Peru. A list of twenty-five post-war Peru contacts, checked against your log by your radio club



secretary, will earn this certificate. Send list to Radio Club of Peru, Box 538, Lima, Peru.

Portugal

Insular and Continental Portugal Diploma: Rede dos Emissores Portugueses. Requires a minimum of fifty different CT stations. All authorized amateur bands may be used, and both c-w and phone contacts count. At least ten of the contacts must be with the Portuguese province of Estremadura and five with Douro Litoral. See appendix for list of provinces. A list of the contacts, authenticated by one's national amateur society, will be accepted by the R.E.P. The first amateur to win the award will receive the Merit DPCI. Address R.E.R., Travessa Nova de S. Domingos 34, 1°, Lisboa, Portugal.

Puerto Rico

Worked Puerto Rico (WPR): Puerto Rico Amateur Radio Club. Aeronautical or Mobile Marine contacts are not accepted for this award. "Land" mobile contacts are. All contacts must be made from within 100 miles of the original address. The original certificates are awarded upon proof of twenty-five or fifty KP4 contacts, respectively, with stickers awarded for each additional block of twenty-five contacts. Single-band endorsements are available upon request. A **WPR/N** certificate is now available for proof of contact with ten or more Puerto Rican Novices (WP4). Address Puerto Rican Amateur Radio Club, Box 3533, San Juan, P.R.

Spain

The U.R.E. offers a diploma to foreign amateurs who work 125 EA stations, with a minimum of three in each call area. (EA9 and EAØ are apparently combined for this award.) Spanish stations must work a similar number of stations in thirty provinces, with at least forty of the contacts being on CW. Where there is a reciprocal agreement between it and the U.R.E., proof may be sent via one's national radio society. Otherwise, the address is U.R.E., Apartado de Correos 220, Madrid, Spain.

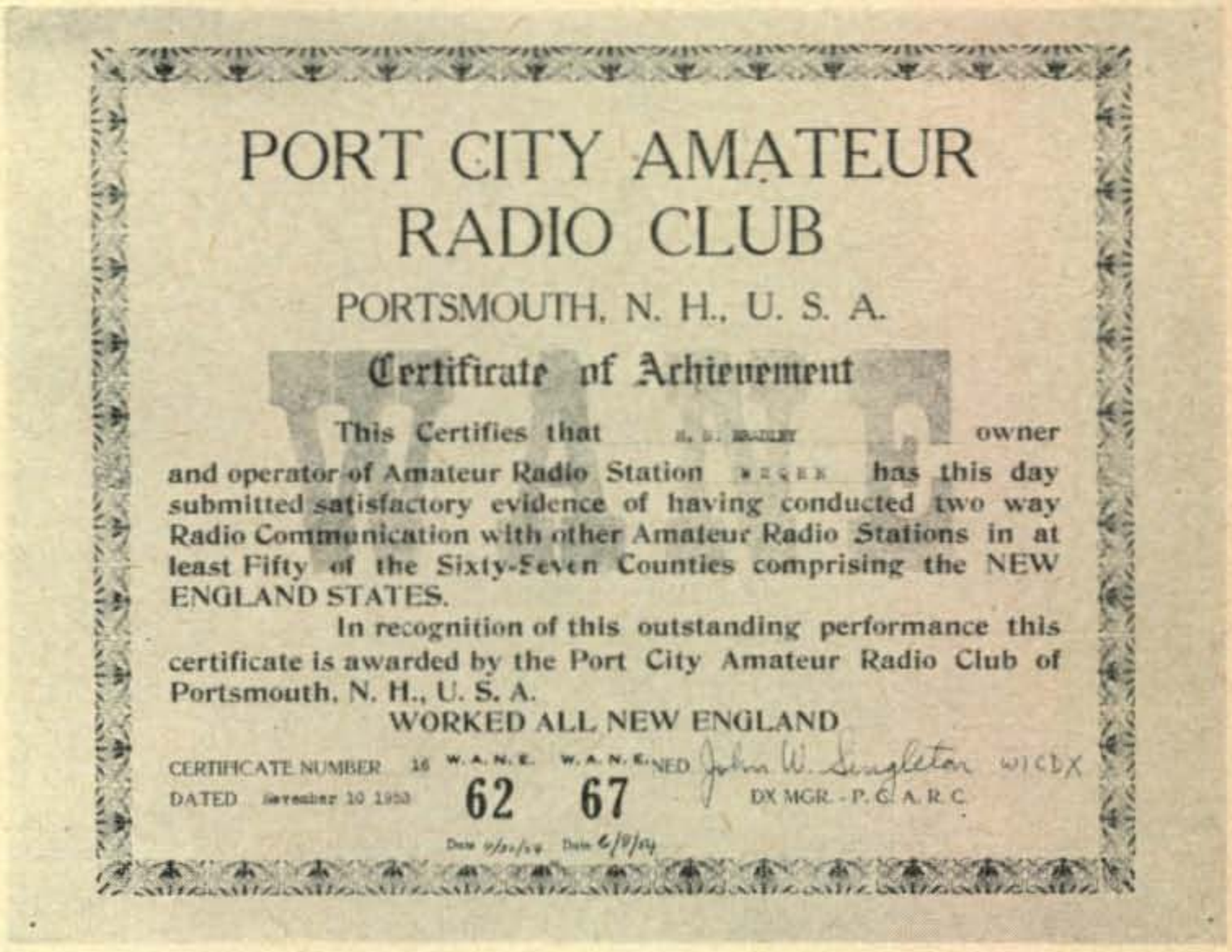
Sweden

If you work 10 members of the Goteberg Society while working for **WASM,** you will earn their **WGSA** award; so check and send your SM6 QSLs via SM6ID. Cards from 10 SM5's in Vasteras, sent to SM5WI will earn your "WAV."

United States of America

Conch Net Certificate: Key West Amateur Radio Club. Awarded upon proof of contact with ten Key West, Florida, stations. Address Key West Amateur Radio Club, Box 210, Key West, Florida.

Lad 'n Lassie: Los Angeles YL Club. Work ten members of the Los Angeles YL Club to earn this certificate. They include K6ACF, K6ANG, K6CDB, W6—AKE, AVF, CEE, CQV, DPV, DXI, EHA, FEA, GAI, GKV, JCA, JMC, JMS, JZA, KER, KYZ, LBO, LMQ, MFP, NZP, PCO, PJU, QGX, QOG, QYL, SGL, TCN, TDL, UHA, WRT, and WSV, K6—ACF, ANG, and CDB. Cards should be sent to W6KER.



PORT CITY AMATEUR RADIO CLUB

PORTSMOUTH, N. H., U. S. A.

Certificate of Achievement

This Certifies that [redacted] owner and operator of Amateur Radio Station [redacted] has this day submitted satisfactory evidence of having conducted two way Radio Communication with other Amateur Radio Stations in at least Fifty of the Sixty-Seven Counties comprising the NEW ENGLAND STATES.

In recognition of this outstanding performance this certificate is awarded by the Port City Amateur Radio Club of Portsmouth, N. H., U. S. A.

WORKED ALL NEW ENGLAND

CERTIFICATE NUMBER 16 W.A.N.E. 62 W.A.N.E.-NED 67

DATED November 10 1950

John W. Singleton W1CDX
DX MGR. - P.C.A.R.C.

Date 9/20/54 Date 6/9/54

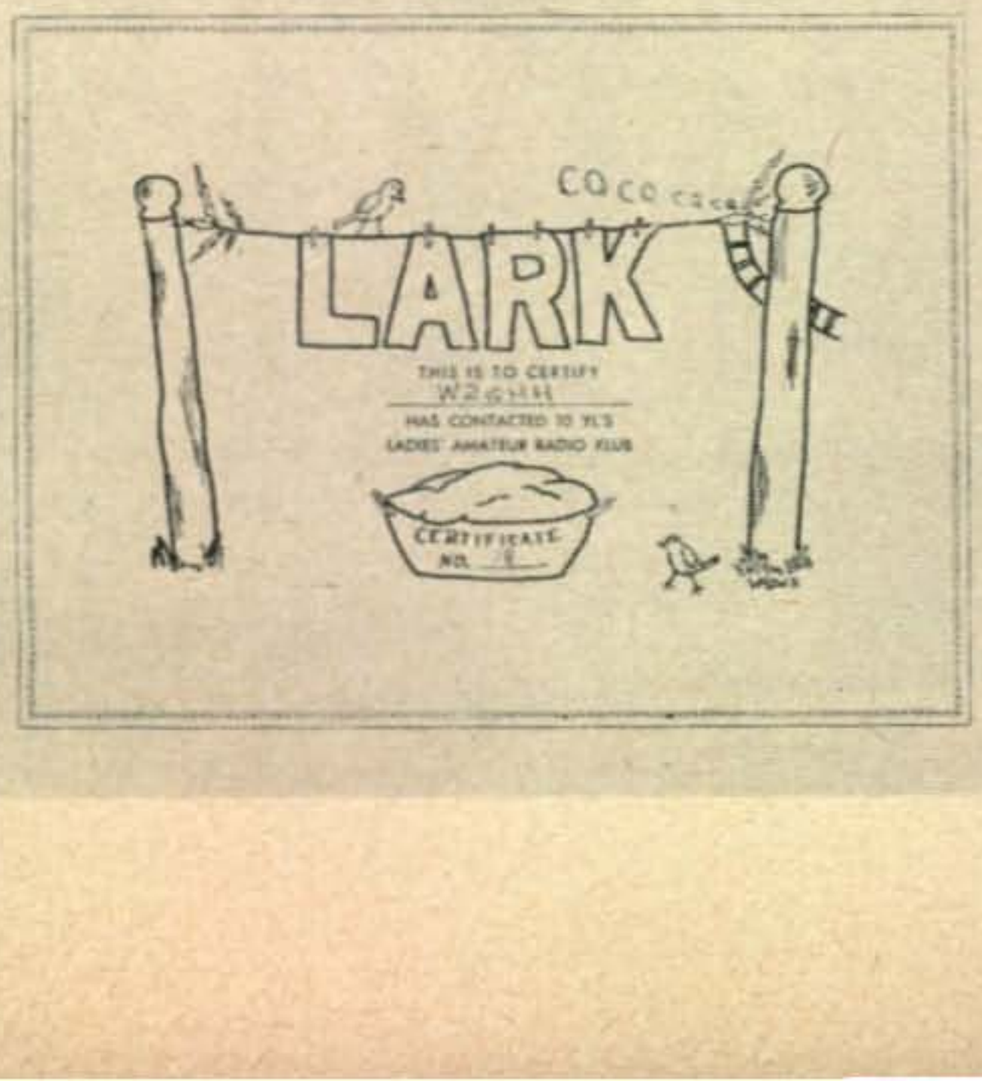
LARK: The Ladies Amateur Radio Club of Chicago presents a certificate to those working ten of its members. Send calls, dates, and frequencies to W9MYC.

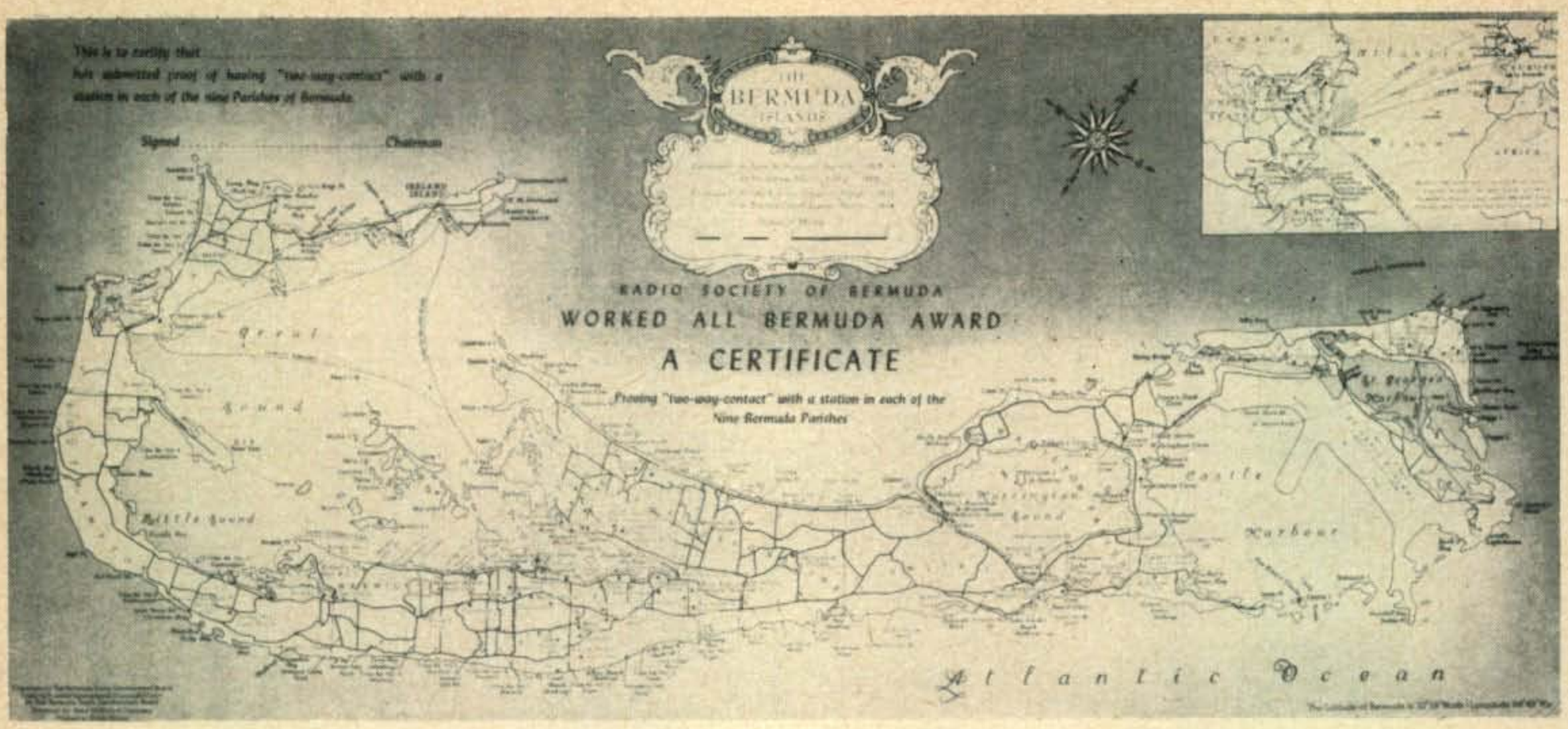
The **Greater New Orleans Amateur Radio Club** offers an attractive certificate upon proof of contact with twenty-five amateur stations in the greater New Orleans area. Address Greater New Orleans Amateur Radio Club, P.O. Box 1057, New Orleans 4, La.

WVT is given by the Tri-County Radio Club (W1UJL current secretary) for proof of having worked at least 13 of the 14 counties in the state of Vermont. Cards for mobile contacts count if postmarked in the respective county.

TT-100: Amateur Radio Teletype Society. Awarded for working 100 other amateur teletype stations, with no more than twenty in any one call area. Details from W2NSD.

YL Century Certificate (YLCC): Young Ladies Radio League. Requires proof of contact with 100 licensed YL operators throughout the world. Prewar and post war count, but all must have been made from within a 25-mile area. Endorsement stickers furnished for each additional block of fifty contacts. Note that one YL operator worked under different calls





counts but once. Confirmations, accompanied by a list in alphabetical order of names of YL's worked and sufficient postage for their return by first class mail, should be sent to Dorothy Dickey, W7GLK, R. 1, Box 347, Ashland, Oregon.

Worked All Arizona Counties (WAAC): Old Pueblo Radio Club, Tucson, Arizona. Awarded upon proof of contact with the fourteen Arizona counties. Get exact address for sending cards from your next Tucson contact.

Worked All New England (WANE): Offered upon proof of contact with at least fifty of the sixty-seven counties of the six New England states. Send confirmations to Port City Radio Club, Box 622, Portsmouth, N. H. Stickers are available for 62 and 67 counties.

Worked Nevada: Southern Nevada Amateur Radio Club. Awarded for proof of contact with twenty-five Nevada amateurs. New address John H. Kelley, W7BJY, Box 373, Boulder City, Nevada.

White Rose Award: York (Pa.) Amateur Radio Club. Issued upon proof of contact with ten amateur stations served by the York Post Office since January 1, 1954. Send proof to Royal M. Gibson, W3LUD, 219 Wynwood Road, York, Pa.

Uruguay

19 Departamentos: Radio Club of Uruguay. This award was originally listed as WACX. It requires proof of contact with each of the nineteen Uruguay "states," since July 1, 1949. The complete lack of amateur activity in at least two of them makes this an almost impossible achievement. Easier to obtain is the next award.

33 Orientales: Radio Club of Uruguay. This certificate is awarded upon proof of contact with at least thirty-three CX stations since January 1, 1953. For either award, a list of the claimed contacts, certified by a national radio society, may be submitted in lieu of the actual confirmations. Address Radio Club of Uruguay, Casilla 37, Montevideo, Uruguay.

Venezuela

Worked All YV (WAYV): Radio Club Venezolano. Issued upon proof of contact with the nine Venezuelan call areas. A second certificate is awarded upon proof of contact with 100 different YV stations. Address The Radio Club Venezolano, P.O. Box 2285, Caracas, Venezuela.

I wish to thank the following amateurs, who supplied some of the information tabulated above: CE4BX, EA4CR, IT1TCZ, KP4KD, KV4AA, LU8CW, W1FPS, W6ZZ, W4RKJ, W7BVZ, and W9NZZ.

Appendix

Areas, with prefixes, counted as countries for French **DUF** awards: France, F; Corsica, FC; Monaco, 3A2; Andorra, PX; Germany, French Zone, DL5; Austrian Zone, FKS8; Saar, 9S4; French India, FN; Viet Nam, Tonkin, Annam, Cochin China, FI (3W); Cambodge, FI (3W); Laos, XW8, Algeria, FA; Tunis, 3V8; Morocco, CN8; Tangier, CN2; Fezzan, 3V8; Sahara, FA; Senegal, FF; Haute Volta, FF; Soudan, FF; Guinea, FF; Ivory Coast, FF; Niger, FF; Mauritania, FF; Dahomey, FF; Togo, FD; Cameroun, FE; Gabon, FQ; Moyen Congo, FQ; Oubangi Chari, FQ; Tchad, FQ; Somali Coast, FL; Madagascar, FB; Nossi Be, FB; Ile Sainte Marie, FB; Iles Glorieuses, FB; Comores Archipelago, FB; Reunion, FR; St. Paul and Amsterdam, FB; Kerguelen, FB; Arch. Crozet, FB; Terre Adele (Antarctica), FB; St. Pierre, Miquelon, FP; Martinique, FM; Guadeloupe and dependencies, FG; Clipperton, FO; Guiana and Inini, FY; New Caledonia and Ile des Pins, FK; Iles Loyaute, Fuon, and Chesterfield, FK; Wallis et Futuna, FW; New Hebrides, FU; Arch, de la Societe (Tahiti, Morea, Manou, Toubouai, Iles sous le Vent), FO; Arch. des Touamotou, Gambier, FO; Iles Marquiese, FO; Iles Australes, FO; Iles Rapa, FO.

Countries and Italian provinces to be

[*Continued on page 109*]

our Cover . . .

CQ's cover this month features the *CQ* monthly QSL Contest. The winner this month is Michelle Herbert, F3YL, XYL of F8BO (her regular-size card has been enlarged for use on *CQ*'s cover).

Cards are getting better all the time, and we have a terrific one which is almost a sure winner for next month. It will take something pretty good to beat this one, but we welcome, yea, even urge you to try!

A winner is chosen each month. The prize is a 2-year subscription to *CQ*.

. . . de W2NSD

NEVER SAY DIE

In preparation for publication soon is an article stressing the importance of publicity to the amateur. There is a natural reluctance on the part of the amateur to beat his drum loudly when he has done something of importance. The cumulative effect of this is that the general public is fairly unaware of the existence of the amateur until he gets a good stiff case of TVI or such.

I doubt if there has been a single real emergency anywhere in this country during the last ten years where amateur radio hasn't played a mighty important role, yet outside of *CQ* and *QST* where do you hear about all this? Now and then, yes, but for the most part we perform our services and then slip away into the night like the Lone Ranger.

A case in point is the recent flood disasters in New England and Pennsylvania. Only three people involved with the tremendous amount of work that went into these disasters went to the trouble to write anything in to *CQ* about what happened, and two of those did so only after being called on the phone. These reports were meagre and gave little information upon which any kind of story or news release could be written. There were NO pictures. This is not in any way to be implied as a criticism to anyone, but is to try to point up a need which is not being met. We have everything to gain and nothing to lose by getting good publicity. I didn't worry too much about not getting the flood story since I believed that *QST* would undoubtedly have the full story, being right in the middle of the whole thing. The PhilMont Mobile Radio Club finally saved the day by forwarding the very gripping personal account of one of the flood-relief mobile hams, John Muroff, W3SAI, which is published in this month's *CQ*.

But *QST* didn't have the story. They had apparently run into the same problem: no news and no pictures. Their October editorial asked for people to send in such items so they could print the story.

There is the background. Publicity is important and very little is being done about it. The solution is simple. The next time you get a tap on the shoulder to help out in an emergency make sure that you keep a pad of notes on just what is going on so you can put it into writing later on. And don't forget your camera. If you have a flash attachment take that along too, it is as important as spare tubes. If you don't have a flash camera you can get one that will do a reasonable job for a few dollars. Jim Morrissett, K2OLK, our assistant editor recently went out and bought a camera, flash gun, film, bulbs, and carrying case for $6.00 from Masters, a local discount house. If we ever have any emergencies around here he is all set. My Brownie (see September editorial picture of VP9L) does a reasonable job too.

If the information and pictures had been available after the floods, stories could have appeared in *Time, Newsweek,* etc., for they were quite interested in doing a story on the amateur aid furnished but were unable to get enough information. These magazines are read by everyone from the President on down and a story in one of them could help us tremendously. Remember that the commercial interests figure that every channel we use is worth more than a million dollars to them. We have an awful lot of these million dollar channels tied up and being used by a few thousand "small boys in attics," as they like to term us. We need publicity. When something happens try to make a story of it and get it in to us or *QST* (not *both*, please) so it can be forwarded thru the proper news channels. *Time* called us several times during the bood emergency, but we had precious little to give them. Had reports come in to us immediately, we could have supplied major news sources, in addition to compiling news- and picture-stories for the next issue of *CQ*.

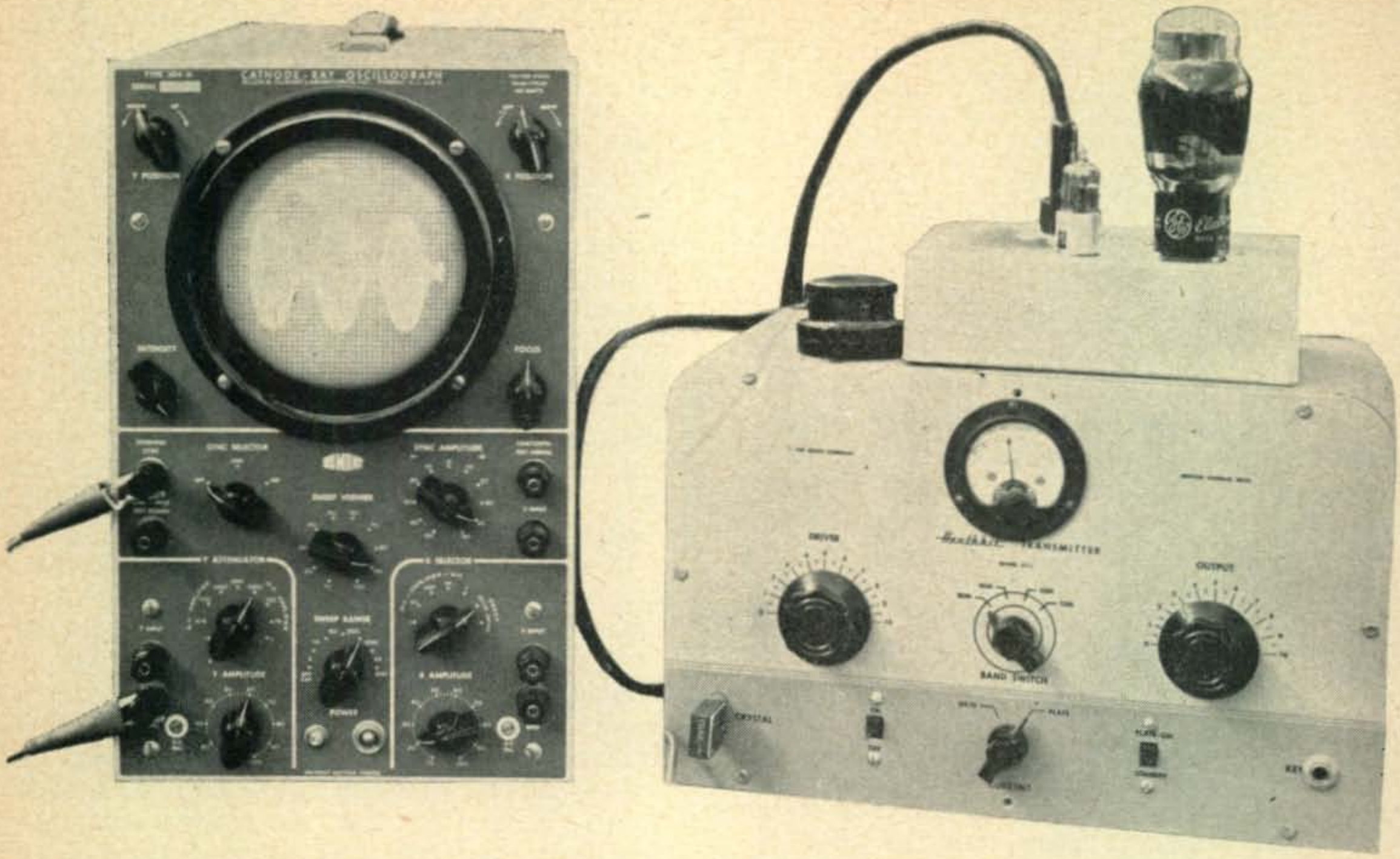
Who's Experimenting?

What has happened to that backbone of amateur radio development: the experimenter? I have been hoping that we would see some articles submitted on amateur TV (had a call from VE2AKT some months ago saying he was writing an article on his TV operations, but nothing has come yet) and facsimile.

The complexity of even greatly simplified TV systems will, I fear, keep amateur TV down to a handful of operators. *Fax* is another story. That could easily go the way RTTY has done (an estimated 2500 teleprinters are in amateur hands) and become an important part of ham radio. I know that I would get a real kick out of being able to send pictures and would probably invest in one of these Polaroid cameras if I had *Fax*.

So, what is the story? Is there no one working on this problem? How about an article?

LXXIII,
Wayne



This photograph gives a good idea of the appearance of the low-power modulator described in this article, as well as showing its performance capabilities. A sine-wave signal from an audio-frequency generator was being fed into the modulator while the pattern on the oscilloscope was being photographed.

a Modulator For the Novice Transmitter

S. T. McNeal, W6LDJ and Hugh Tyler, KN6GCO
Orange Coast College Costa Mesa, Calif.

Many new General-Class licensees would like to add a modulator to their low-power c-w transmitters. The one shown in the photo and diagrammed in *Figure 1* should fill their needs at minimum cost.

It employs a 6L6G driven through a 6C4 by a carbon microphone. Except for a 1½-volt flashlight battery used to supply microphone current, it obtains all its operating power from its companion transmitter. It will modulate an input of approximately 20 watts to the output stage of the transmitter.

Construction

The modulator is constructed on a 5 x 7 x 2-inch chassis. All parts, except for the tubes and microphone, which are inserted from the top, are fastened underneath its top surface. Their positions are not critical; however, mounting of the modulation choke *L1* and the microphone transformer *T1* should be in diagonally opposite corners of the chassis.

The microphone jack and the volume control are mounted behind the 6C4, and the microphone battery is supported by means of a bracket, bent of a piece of scrap metal, in front of the microphone transformer. Wiring is point to point, and the fixed condensers and resistors are supported by their leads between socket terminals and a couple of insulated "tie" points.

The modulator described here is used in conjunction with a *Heathkit AT-1* transmitter. A 4-conductor cable terminated in an octal plug from the modulator is plugged into the "modulator" socket on the back of the *AT-1*. Inside the *AT-1*, *pin 6* of the "modulator" socket is grounded to the chassis, and *pin 7* is connected to the ungrounded side of the filament circuit.

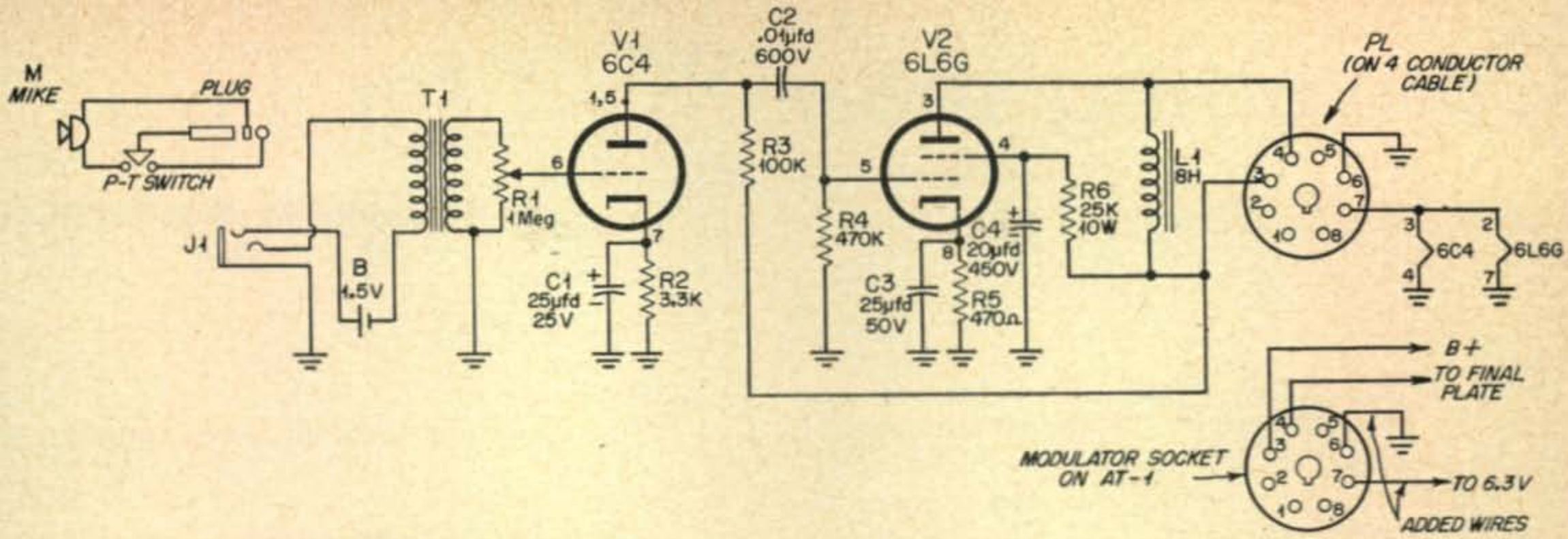


Fig. 1. Schematic diagram of the 6C4-6L6G modulator described in this article. Insert shows how modulator is connected to transmitter.

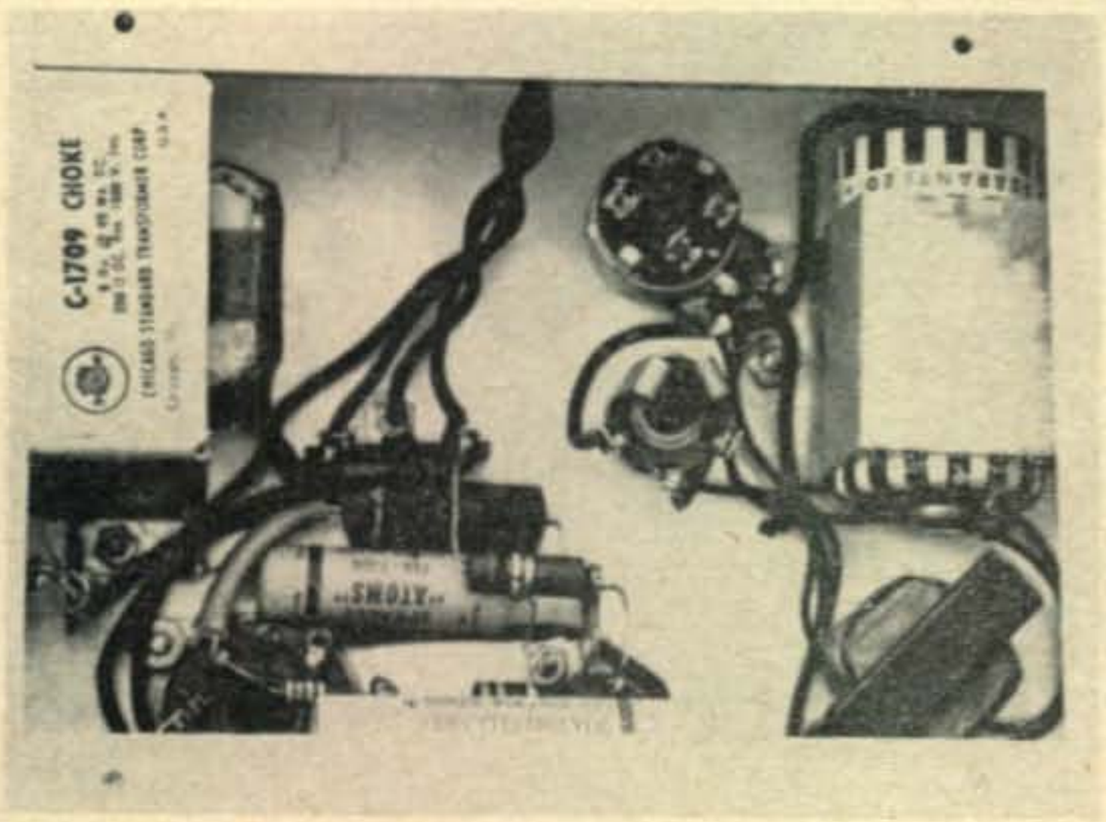
Pin 2 of the 6AG7 socket is a convenient point to pick up the filament voltage. *Pins 3* and *4* of the "modulator" socket are already properly wired.

Operating The Modulator

To place the modulator in operation, remove the shorting plug from the "modulator" socket on the *AT-1*, and insert the plug from the modulator in its place. Adjust the transmitter in the normal manner for a final-amplifier (6L6G) plate current of 50 milliamperes, which represents an input of approximately 20 watts. Press the microphone, push-to-talk switch and talk into the microphone while advancing the volume control to the point where the modulation percentage and quality sound right in the monitor, and the job is done.

The oscilloscope pattern in the photograph indicates how the modulator performs. A sine-wave input signal from an audio oscillator was used while taking this picture.

To restore the *AT-1* for c-w operation, remove the modulator plug and replace the original plug in the "modulator" socket.



Underside of chassis showing simple parts layout.

C1—25-$\mu\mu$fd, 25-volt, electrolytic capacitor.
C2—0.01-μfd, 600 volt, paper or ceramic.
C3—25μfd, 50 volt, electrolytic capacitor.
C4—20-μfd, 450-volt, electrolytic capacitor.
J1—Jack to match plug on microphone cord.
L1—8-Henry, 85-Ma, filter choke (*Stancor* 1709).
M—Single-button, carbon microphone with "push-to-talk" switch. (Surplus or equiv.—*Sonar* F1-P).
PL—Octal plug (*Amphenol* 86PM8).
R1—1-meg. volume control.
R2—3.3 K, ½W resistor.
R3—100 K, ½W resistor.
R4—470 K, ½W resistor.
R5—470 ohms, 2W resistor.
R6—25 K, 10W resistor.
T1—Carbon microphone to grid transformer (*Triad* A-IX).
V1—6C4.
V2—6L6G.
B—1½-volt "flashlight" battery.
Chassis—7 x 5 x 2 inches.
4—conductor cable.

Notes On The Modulator

Adding the modulator to the *AT-1* increases the load on its power supply somewhat. However, the supply is designed to furnish plate and filament power to an external variable-frequency oscillator. The *Heath Company* advises that the supply will deliver safely a maximum of 25 to 30 milliamperes additional current. If the final amplifier plate current is not more than 50 milliamperes, this limitation is not exceeded.

The filament current of the modulator is more than is drawn by a single-tube VFO. Nevertheless, the modulator and the *AT-1* have been operated for periods of 30 minutes into a dummy antenna, without the power transformer becoming too hot to rest a hand on. Therefore, the overload should not decrease the life expectancy of the transformer appreciably.

Do not operate a VFO and the modulator from the AT-1 power supply simultaneously.

Although this modulator has been used only with the *AT-1*, there is no reason why it cannot be used with other similar transmitters—6AG7, etc., driving an 807, 6L6, etc., and operating at a plate voltage not greatly exceeding 400 volts—if their power supplies can handle the added current drain.

Converting the ARC-4 for Two

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Of all the VHF bands, Two Meters has seen the greatest activity. A significant portion of the present population of that band may be attributed to the opening of two meters to Novice 'phone operation.

A Novice license is in effect a one-year written permission, to acquire experience and familiarity with radio apparatus and operating technique.

Unfortunately, the Novice is not gaining his experience in "easy stages" when he tackles 144 Mc first, because of the many special problems associated with v-h-f circuits. Short leads, well-planned layouts, etc. are not automatically brought within the ability of the Novice with the arrival of his ticket. Thus it is that the newcomer (and many an oldtimer as well) turns to items of surplus equipment in order to gain the "knack" of v-h-f construction.

Post-war operation on two meters using modern stabilized transmitter techniques received its shot in the arm from the widespread employment of the military miracle, the SCR-522. Although many seasoned oldtimers have graduated to home-constructed rigs it is safe to estimate that a very large number of them gained their first contact with crystal-controlled two-meter operation through conversion of he 522.

The BC-625

When amateur radio was given the green light after the wartime shutdown these SCR-522 transmitters (BC-625) were available for as little as $15. Little by little, yielding to the inexorable pressure of supply and demand, the price has crept up to a minimum of $50. This is the present-day price less power supply. Investigation has disclosed few other satisfactory surplus items available in sufficient quantities to replace the 522's.

The "Sleeper"

One of the few possibilities appears to have been neglected unduly. This is the ARC-4 war-surplus transmitter-receiver unit. The ARC-4 can be purchased complete with all tubes and dynamotor for $27.95, and is quite easily converted to a neat and efficient two-meter station.* Complete conversion adds about $35 to this figure. This means you can get on the air, sending *and* receiving, for around $65!

As a consequence of the lack of published data on the modification required to adapt the ARC-4 few of them are heard on the air. The

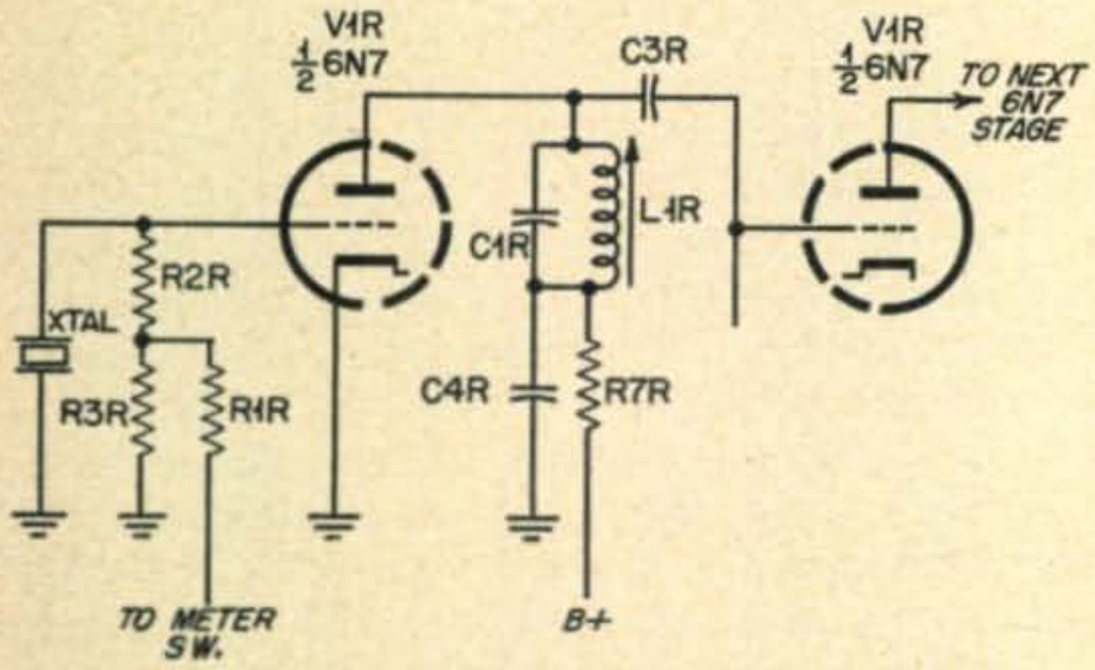


FIG. 1a ORIGINAL CRYSTAL OSCILLATOR CIRCUIT

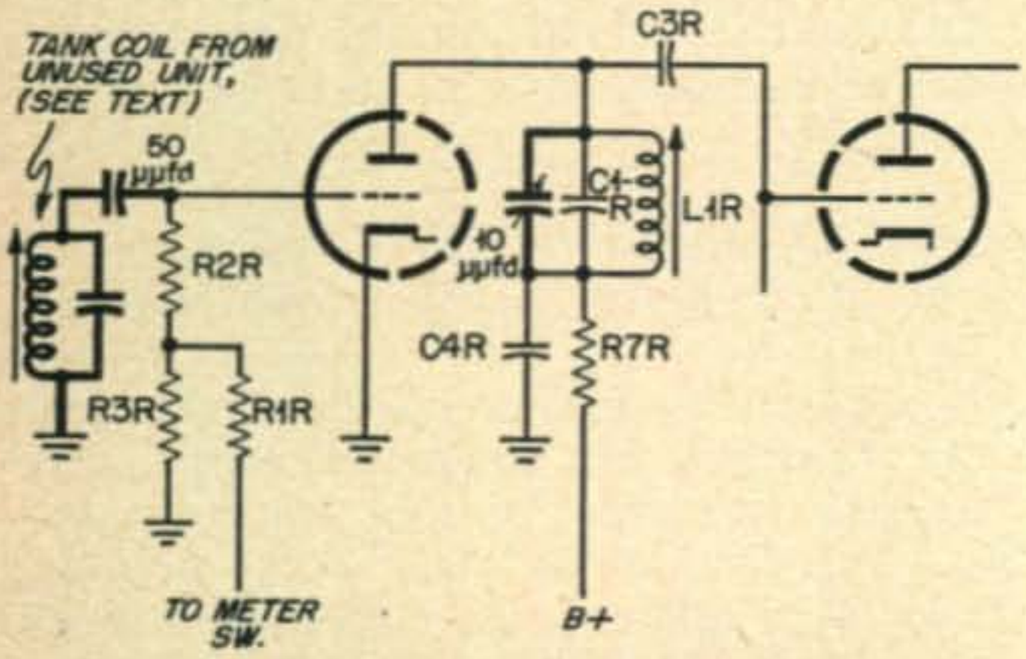


FIG. 1b RECEIVER OSCILLATOR MODIFICATIONS AS INDICATED BY HEAVIER LINES.

Parts List For Conversion

A-C Power Supply delivering 350-400 vdc @ 200 ma. and 12 vdc @ 5 a.
1—10 μμfd. APC type variable condenser
1—30K, 1 Watt resistor
1—15 μμfd. mica condenser
1—100 μμfd. mica
1—National Type MCN dial
1—Flexible Shaft of necessary length
1—Millen type 39001 Flexible coupling
1—feed-through bushing, 7/16" mounting
2—¼" spacers, to mount dial.
1—FT-243 type crystal on any frequency between 6000 and 6160 kc.
1—single-button carbon mike, 100 ohms.
1—0-1 d-c milliammeter and plug, sleeve positive
1—pair headphones, any impedance, 500 ohms preferred
1—500K volume control
Assorted hardware, knobs, plugs, etc. as required

*ARC-4 units with circuit diagrams are available from Communication Equipment Co., 131 Liberty St., N. Y., and other surplus suppliers.

writer has accomplished the conversion successfully and is well pleased with the results obtained. To make it possible for others to duplicate these results the changes necessary have been boiled down to a series of step-by-step instructions, planned to take the amateur through the proceeding in the least painful manner.

General Data

Of what does the ARC-4 consist? It is a complete transmitter-receiver unit, designed to operate on any of four crystal-controlled channels in the 140-144 Mc range. Originally manufactured as an aircraft unit, the rig is powered by a 12-volt dynamotor supply and is, therefore, ideal for mobile operation. 6000 kc crystals are used in the transmitter section. This frequency is multiplied 24 times in four stages. The oscillator triples the crystal frequency and it is doubled in each of the three following stages.

The final amplifier uses an 832-A, which is fully modulated by a pair of class AB 6L6's. Push-to-talk technique is employed and the rig can be coupled to antennas fed with 50-70 ohm cable.

A ten-tube, crystal-controlled superheterodyne constitutes the receiver section of the ARC-4. Two radio-frequency "front-ends" are provided, both feeding a common i.f., 2nd detector and audio. One of these, the "plane-to-plane" unit, is to be removed while the other, the "plane-to-ground" unit, is to be reworked so that it can be tuned across the band, instead of being "rock-bound" at spot frequencies.

The rig has its own power-supply filter circuits but lacks the a-c transformer and rectifier. The only unusual part of the power supply is the need for filtered 12-volt d.c., required to energize the filament, microphone and relay circuits.

The chassis housing the transmitter-receiver unit is 10¾″ high, 8¾″ wide and 19″ deep.

METER POSITION	TUNE	FOR	READING
Osc. IG	——	——	.2 -.6
2nd HG IG	L2R	MAX	.1 -.14
3rd HG IG	L3R	MAX	.08-1.
———	L4R	MAX AVC VOLTAGE*	

*Measured on VTVM plugged between 2nd terminal back on the plug-in socket strip and ground.

Fig. 2. The receiver tuning chart. All readings on 0-1 dcma meter, plugged into "TEST METER" jack on panel, with sleeve positive.

Getting Started

Before actually making your purchase, ascertain that the company from whom you plan to buy your ARC-4 supplies the schematic and parts list for the equipment. These are too large for publication here.

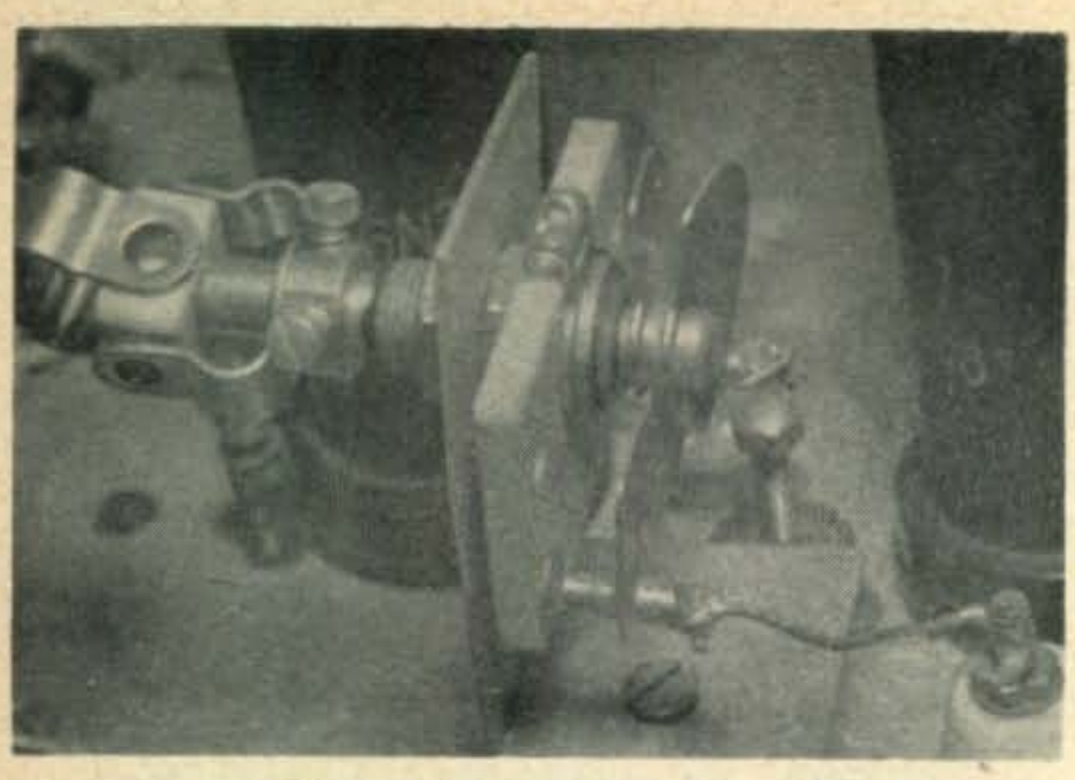
When the rig arrives check to see that nothing has been damaged in transportation. Remove the aluminum cabinet by twisting each of the screw-like fasteners on the back of the case until a click is heard. Pull off the case. Don't be afraid to exert a little force—nothing will be harmed by doing so. See that all the tubes are in place. At this point it might be well to check the tubes, replacing any found defective. Take a look at the underside of the chassis. Though it appears complicated, you will find that *every* soldered joint is accessible.

To accomplish the conversion you will need the following tools, in addition to the parts mentioned in the text: Screwdriver, soldering iron with small tip (a soldering gun may be used); rosin-core solder; long-nosed pliers; wire snippers and a 7/16″ drill. Now we are all set to go to work.

Receiver Modification

In its military aircraft function the receiver

Front Panel of the converted ARC-4. Note position of tuning dial and volume control. The switch in the "on-off" hole is being used at K2CSD as a Transmit-Receive switch.



Detail of variable condenser mounting. Note short lead to feed-through bushing, and shaft coupling.

used a 6N7 crystal oscillator with output on 8500 kc. This was multiplied 18 times to a frequency in the neighborhood of 153 Mc. The injection of this frequency into the mixer stage, along with an incoming 143 Mc signal produced a difference frequency of 10 Mc which was amplified by the three stages of i.f. By changing crystals for others near 8500 kc the "channel" to which the receiver is responsive can be altered.

In order for the receiver to be usable in the amateur fashion the oscillator must be made tunable across a range sufficient, when multiplied 18 times, to track from 144-148 Mc. We do this by substituting a tuned circuit for the crystal and tuning the plate circuit of the oscillator with a variable condenser. This is shown diagramatically in figures *1a* and *1b*.

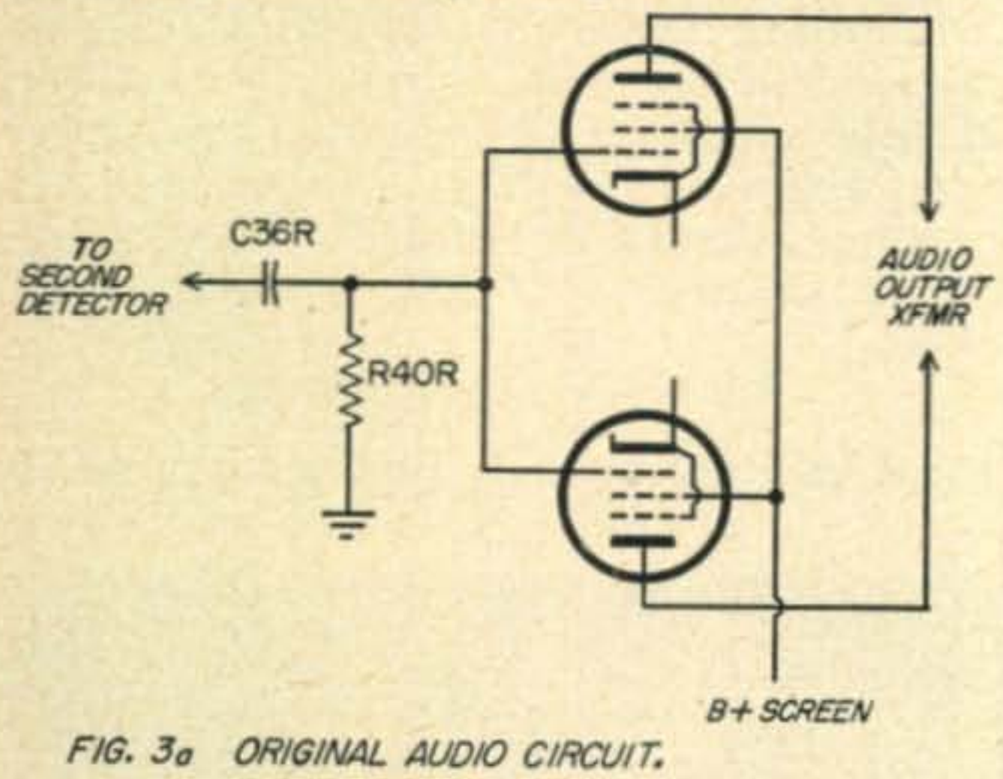


FIG. 3a ORIGINAL AUDIO CIRCUIT.

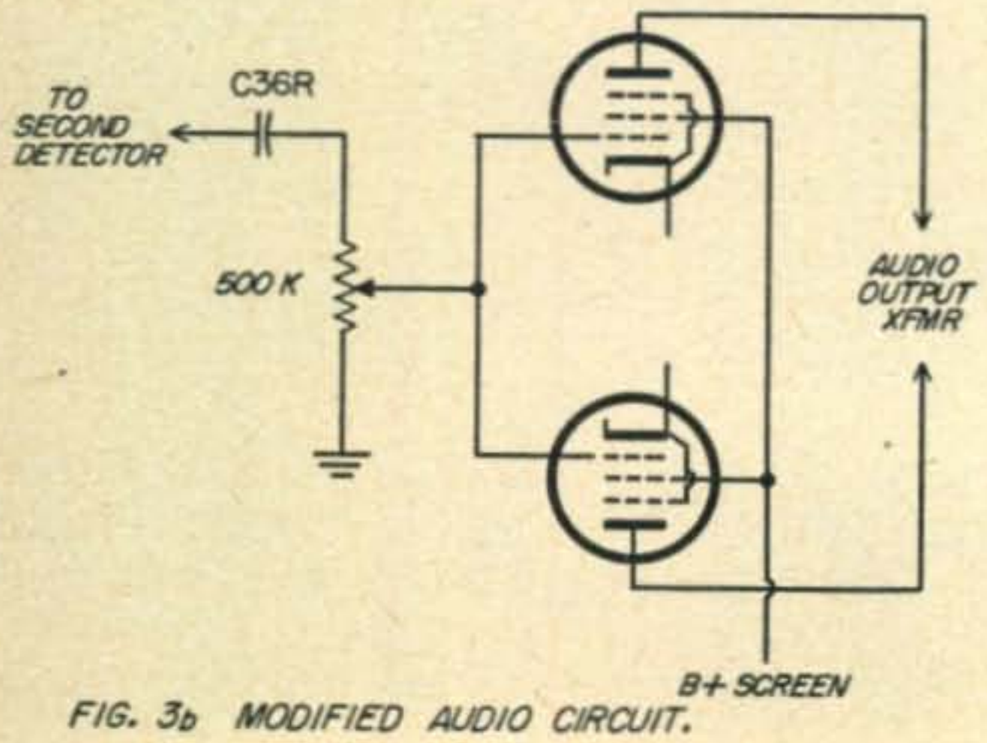


FIG. 3b MODIFIED AUDIO CIRCUIT.

Begin the conversion by removing the plane-to-ground r-f unit. To do so you will have to remove the machine screw at each corner of the plug-in unit and pull the length of coax from the i-f transformer. It will then be found that the plug-in section can be removed by a steady upward pull.

Remove the sides of the plug-in unit and locate the coil inside that has the largest number of turns on it. Make sure that the small condenser connected across the coil is intact. Carefully take out this coil and condenser. Also remove a 50 $\mu\mu$fd ceramic condenser from the unit. On the back of the ARC-4 panel is a metal slide where the trimmer condensers of the plug-in unit were located. Take out this slide.

Returning to the main unit, you will see a short length of metal co-ax running from one of the sockets on the plug-in strip to a feed-through bushing. Now drill a 7/16" hole between the bakelite plug-in strip and the crystal sockets. Mount the coil you have just removed from the r-f unit in this hole. Also mount a new ceramic feed-through bushing with a 7/16" hole where the old one was.

A good soldered ground connection should be made to one end of the coil. Wire the 50 $\mu\mu$fd ceramic condenser between the top end of the coil and the lug on the resistor board to which a wire running from the selector relays is connected. Then remove this lead.

Mount a 10 $\mu\mu$fd APC type variable condenser near where the feed-through bushing is located (see photo). Ground the rotor, and run the shortest possible lead from the stator through the feed-through bushing and then to pin #6 of the 6N7 oscillator tube.

A *National* type *MCN* dial is mounted on the front panel. It is supported on ¼" spacers so that no large hole in the front panel need be drilled to accommodate the drive mechanism. The shaft coupling of the dial is placed so that it extends through the hole marked *"ANT"* at the top center of the panel. If the condenser shaft is not in line with the dial coupling smooth control is obtainable by using a flexible shaft extension of the desired length and a *Millen* type 39001 coupling on the condenser shaft.

Assuming that the power supply to be described in the following portion of this article has been constructed, the receiver can now be tuned up. Set a communications receiver or a grid-dip meter to 8555 kc, and with the ARC-4 tuning condenser set at maximum, tune L1R in the oscillator circuit (not the one you just installed) until the oscillator is heard in the communications receiver or g.d.o. Now set the receiver or grid-dip meter to 8800 kc and, with the tuning condenser of the ARC-4 at minimum, increase the capacitance until the oscillator is again heard. Tune the coil you installed for the best possible bandspread, or until you can cover 8500-8800 kc in about 70 or 80 dial

divisions. After this is done tune up the other circuits with the slugs for maximum meter readings (see the chart in *Fig. 2*).

Double conversion, which provides better selectivity, can be had if a communications receiver is available for use with the ARC-4. The antenna terminal of the communications receiver is coupled to the i.f. output of the v-h-f unit by wrapping a piece of insulated hookup wire around pin #4 of the last 12SQ7 to the rear of the chassis. This is the second detector diode plate. Run the receiver's r-f gain control (if there is one) at half setting and the a-f gain all the way up. Tune the receiver to 10 Mc, or to where the rushing sound from the ARC-4 is heard. This system of dual conversion gives, in the v-h-f range, all the benefits normally obtainable from the communications receiver, i.e., selectivity, ANL, BFO, AVC, etc. If you use this system you may skip the following paragraph and go on to the next.

In the event that dual conversion is not desired, a volume control must be installed in the ARC-4 for comfortable operating. Mount a 500,000 ohm volume control in the hole marked *"grid"* beneath the tuning dial. Ground one end and substitute the control for R40R as shown in figures 3a and 3b. This resistor is the second one from the front on the terminal board alongside the audio tubes. Connect a wire between the grids of tubes VS7 and VS8R, pin #2 on each tube. The tubes are 12SQ7s.

We can now plug an antenna into the coax connector on the front panel, and a pair of 'phones into the 'phone jack. Adjust the volume control to a comfortable level and set the tuning dial to the middle of the band. With a screwdriver tune the three trimmers at the lower left hand corner of the panel for maximum receiver noise. Now tune around the band for a signal or make a "sked" with a nearby amateur. When a signal is heard readjust the trimmers, always going from left to right, for maximum signal strength. This trimming has to be done four times to cover the entire band. It is very important to do this for no signals will be heard if the trimmers are out of alignment. It may prove to be unhandy at first but you will soon become accustomed to it. If no signals can be heard on the band you may tune for maximum receiver noise, still proceeding from left to right.

Transmitter Modification

Modification of the transmitter is quite simple, requiring only the substitution of two small mica condensers and a little work on the relays. Replace C2T, connected between pins #5 and #8 on the transmitter oscillator tube, with one having a value of 15 $\mu\mu$fd. Also replace the condenser across the oscillator cathode coil with a 100 $\mu\mu$fd unit.

Short the relay which is farthest back on the bottom of the chassis by connecting a lead between the lug on the relay, to which a wire

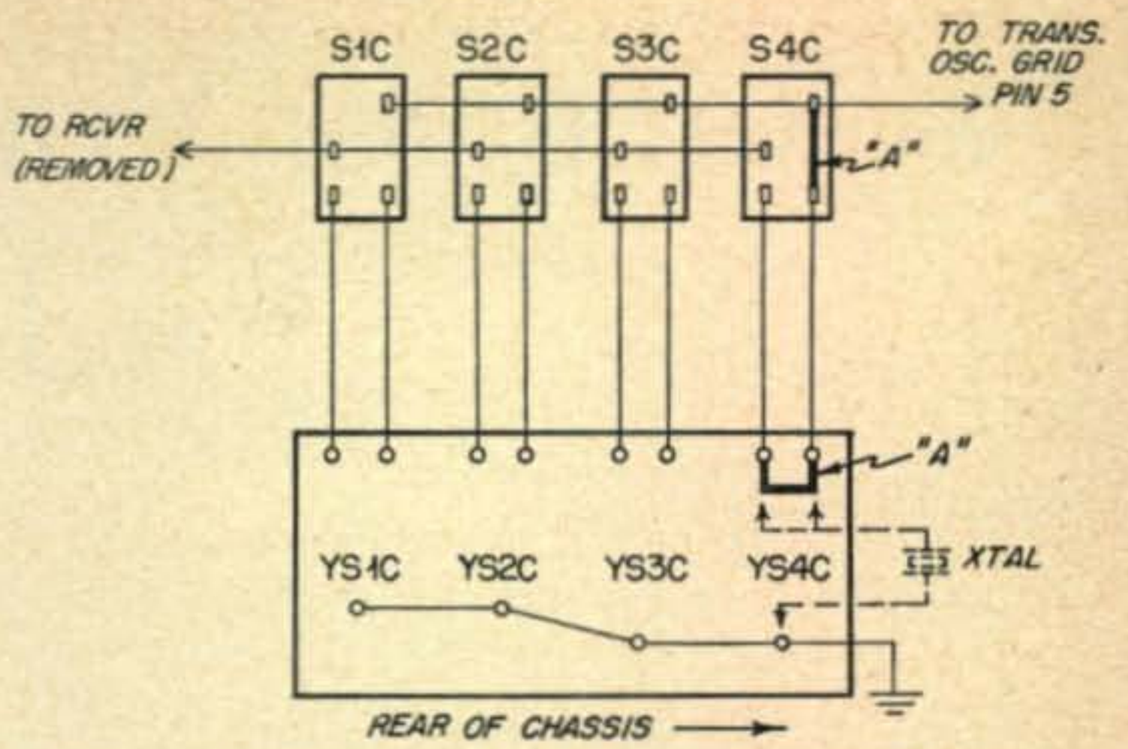


FIG. 4 CRYSTAL SOCKET AND RELAY MODIFICATIONS HEAVY LINES MARKED "A".

with a green tracer is connected, and both of the lugs to which the corresponding crystal socket is wired (see *Fig. 4*). Plug in a crystal of between 6000 and 6160 kc and tune all the transmitter stages for maximum according to the chart in *Fig. 5*. For the Novice Band, crystals ranging from 6045 to 6125 kc should be used. War surplus crystals of the FT-243 type fit the ARC-4 crystal socket. If your meter readings are better than those on the chart, for Heaven's sake don't detune the rig to agree with the chart!

Load up the antenna by increasing the loading capacity (marked "TRAN ANT") a bit and then tuning the r-f amplifier for minimum dip. Keep repeating the process until you get the maximum loading while still able to indicate a dip. This might take a little jockeying around before you get the rig properly loaded, but you will soon get the hang of it.

METER SW. POSITION	TUNE	FOR	READING
Osc. IG	———	——	.25
1st HG IG	L1T-L2T	MAX	.5
2nd HG IG	L3T-L4T	MAX	.4-.5
3rd HG IG	L5T	MAX	.4
RF AMP IG	C6T	MAX	.25
RF AMP IG	L8T	MAX (on side of chassis)	.25
RF AMP IP	L9T	MIN*	.5
AUDIO AMP	——	——	.9
FILAMENT	——	——	.46
PLATE	——	——	.5†

*before loading antenna
†Or more, depending on plate voltage

Fig. 5. Transmitter tuning chart. All readings on 0-1 dcma meter plugged into test meter jack.

Power Supply

No power circuit modifications need be made if the rig is to be used as a mobile setup. If, however, fixed-station operation is desired, you must construct a power supply. For the sake of portability the a-c supply may be built into

[*Continued on page 107*]

A Receiver Variable Selectivity Adapter

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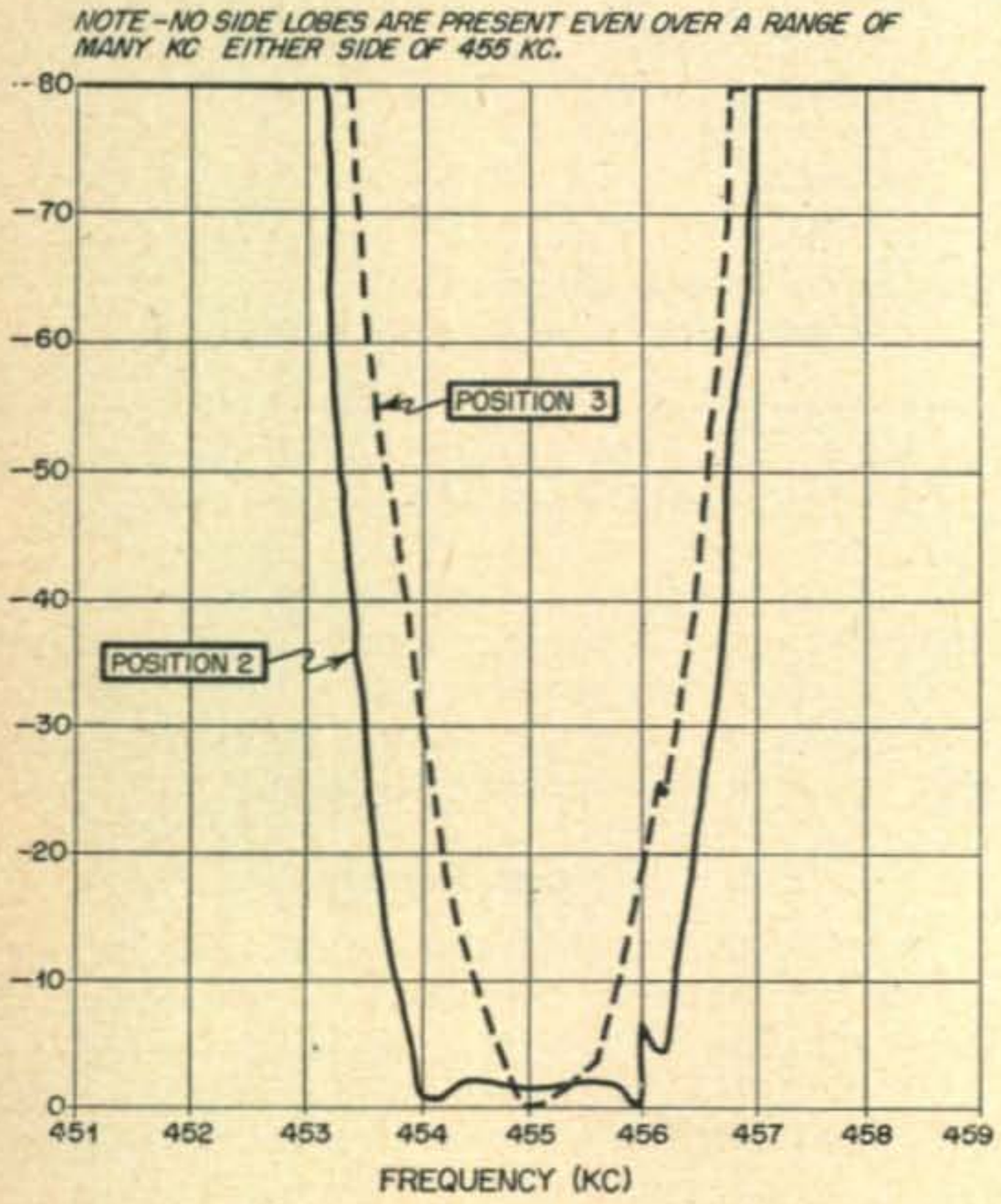
Improving the selectivity characteristics of our receivers has become a very important project. Anyone who has attempted to operate in the congested portion of a band realizes the necessity for such improvements. It is the exception to be able to hear only the station being tuned without receiving interference from other nearby signals. To maintain, let alone increase our usual communication efficiency, it is essential to alter the selectivity curves of most receivers. Improved selectivity characteristics have become the highlight of new receiver design, most of the selectivity advances involving additions to the i-f amplifier section. The subject of this article is a device designed to give any receiver an almost ideal selectivity curve—i.e., limited bandwidth, steep sides, and an essentially flat nose.[1]

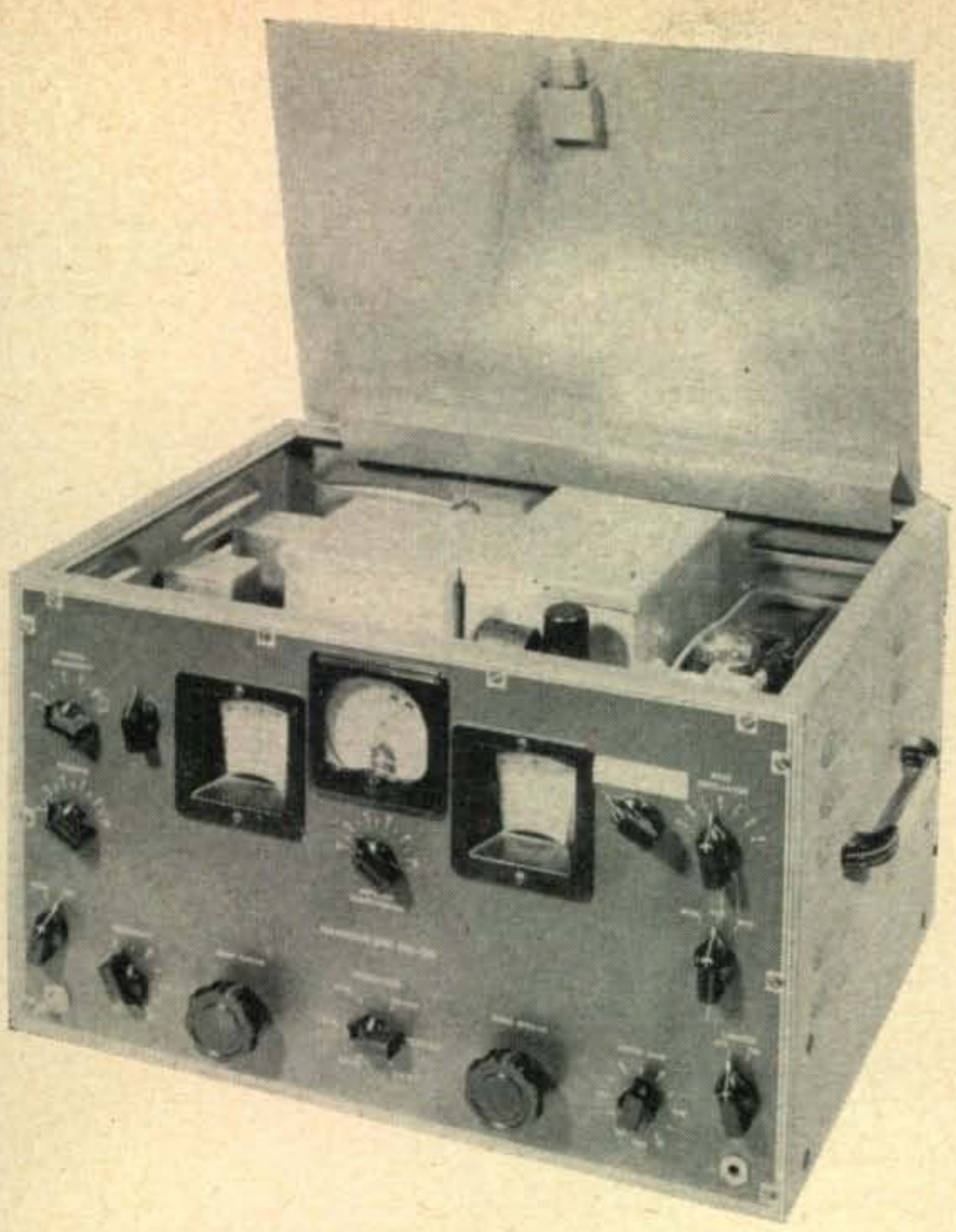
It is mainly the bandwidth and steepness of the sides of the selectivity curve which determine the ability of the receiver to reject unwanted signals on either side of the frequency to which it is tuned. For communication purposes, it is desirable to have a bandwidth only wide enough to accept enough of the audio frequencies for intelligibility in the case of the phone station, or for the reception of a carrier in the case of a c-w station. Bandwidths varying from 1800 to 3000 cycles for phone use have been recommended by various authors, while 100 cycles is usually considered the minimum usable bandwidth for CW.

This selectivity adapter should be of interest to many amateurs in view of its excellent characteristics, relative simplicity, ease of construction, and reasonable cost. It provides suitable bandpasses for either phone or c-w reception by the use of a single selector switch. It can be duplicated by any ham with ordinary skill and the patience to perform the work accurately. The cost of the completed unit was *less than twenty-five dollars*. Although it was constructed for use inside an HQ120X, the basic circuit can be used unaltered in any receiver. Installation of the device is accomplished with a minimum of disturbance of the regular receiver wiring, and does not involve the a-v-c or S-meter circuits.

The adapter is a double-section crystal bandpass unit, consisting of a first section full-lattice filter and a second section half-lattice filter. A selector switch is incorporated to allow use of the regular selectivity characteristics of the receiver, or any of the three bandpasses of the adapter. *Table I* is a comparison chart of the different selectivity curves plotted with the adapter installed in an HQ120X. The three adapter curves are each characterized by an essentially flat nose and steep sides with a deep suppression of all frequencies on either side of the bandpass, many of which would be passed by the usual i-f amplifier to cause troublesome interference. The bandwidths are 2400, 1050, and 85 cycles respectively. Thus the unit is suitable for the reception of both phone and c-w signals, including choice of either sideband of the usual AM, SSB, exalted carrier reception, as well as FSK RTTY. The 1050 cycle filter is useful for the reception of phone as well as c-w signals. The 85 cycle filter, of course, is suitable only for c-w use. Although narrower than the considered minimum width for reception of CW, the 85 cycle bandpass has been found satisfactory. With such a narrow



1. Brown, "Using the Collins F455-31 Filter," *CQ*, March, 1953, p. 13.



HQ-120X with Adapter installed.

bandpass, it is necessary that the receiver have a slow tuning rate. If it tunes too rapidly, one can tune right past the wanted signal.

The selectivity curves are presented in *Fig. 1*. The minor side lobe response noted in the 85-cycle curve is suppressed some 50 db. and is not troublesome in actual operation. The various bandpasses are so calculated that the usual crystal filter of the receiver can be used with the adapter to give additional benefit such as notching out a bothersome heterodyne. Use of the regular crystal filter of the HQ120X in selectivity position *1* in conjunction with the 85 cycle filter, converts the bandpass to a 65 cycle nose and a 775 cycle skirt at 80 db. down without any trace of side lobes.[2]

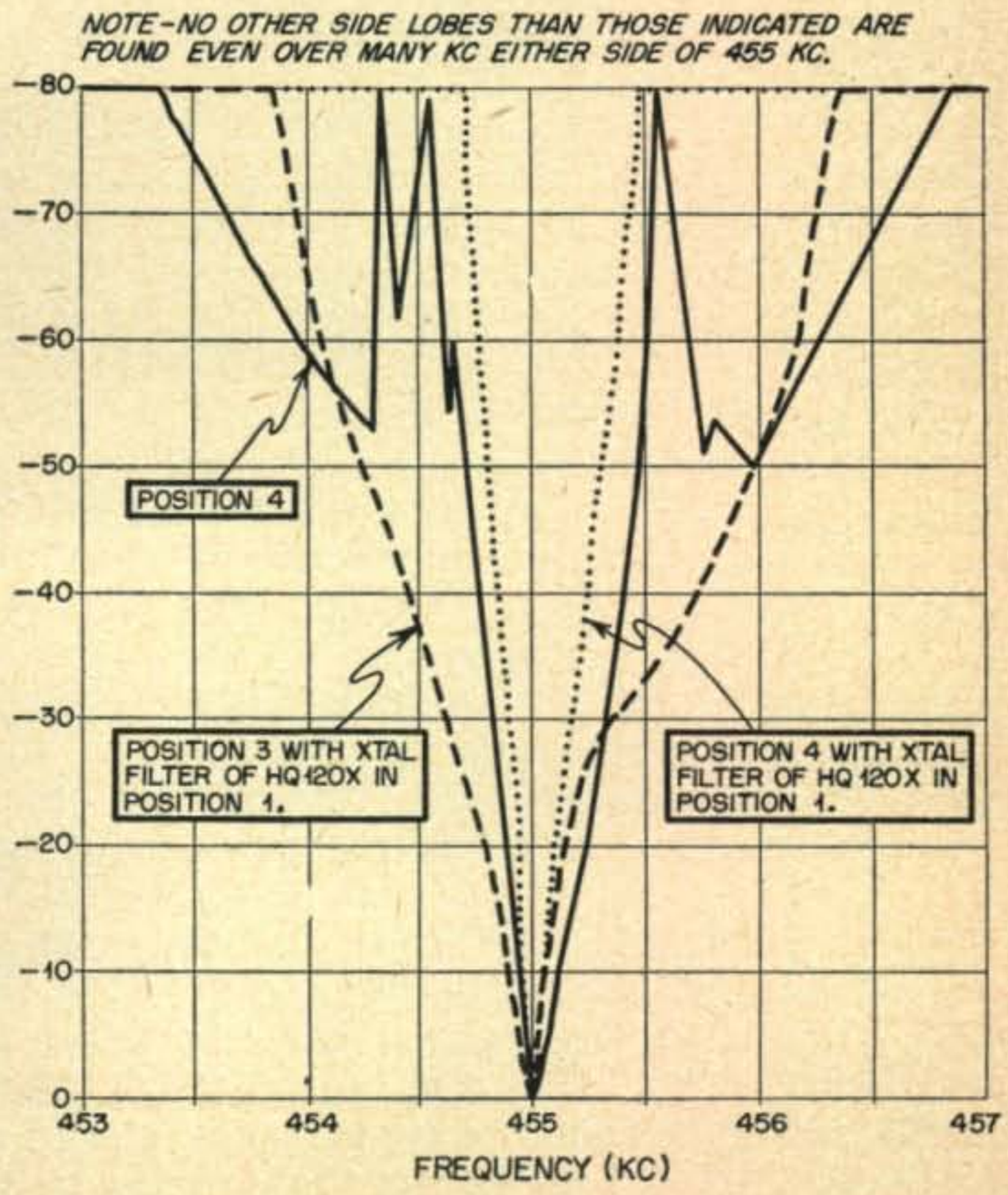
The starting point for this device was the work of Weaver and Brown, and of Good. [3, 4] Their articles give excellent basic information regarding crystal filters. A detailed presentation of the adapter is given to encourage its construction by others. The filter unit is basically simple and is concerned mainly with shielding, connecting switch leads, grinding some crystals (don't run away—it's easy!), and careful but not unusual construction practice. Although there are fourteen surplus Western Electric FT-241-A crystals in the unit, their use is easy to understand. Their frequencies are in the general i-f range of the receiver. Some of the crystals will need alteration, but this is not a major task. The various crystals with their final frequencies are listed in *Table II*. It is probably best to buy crystals slightly lower than the final frequency desired and raise the frequency instead of lowering a crystal of a higher frequency. Extra crystals should be purchased to allow for a few defective ones as well as a few casualties. The grinding technique can be learned in a few minutes of practice on an off-frequency crystal. It is not difficult to move the frequency a few cycles at a time. If the i-f amplifier section of the receiver is out of the frequency range of available crystals, a converter will be needed. The performance of the adapter is such as to merit the additional work of building a converter. The basic details of a simple converter for such use is given in a *CQ* article by Weitbrecht.[5] From a theoretical viewpoint best performance will be obtained in any receiver when the unit is installed between the mixer and the first i-f amplifier stage where the undesired signals can be suppressed at a low level. However, the adapter can be inserted into the i-f system anywhere between the mixer and the second detector.

Circuit Considerations

This adapter was evolved after much careful experimentation with various arrangements of full and half-lattice crystal filters. The final circuit diagram is shown in *Fig. 2*. The full-lattice section is a fixed frequency affair and is the heart of the adapter, contributing especially to the steep sides of the bandpass. The half-

2. Brown, "More on Mechanical Filters," *CQ*, October, 1953, p. 34.
3. Weaver and Brown, "Crystal Lattice Filters for Transmitting and Receiving," QST, June, 1951, p. 48.
4. Good, "A Crystal Filter for 'Phone Reception," QST, October, 1951, p. 56.
5. Weitbrecht, "A New, Simplified Q5-er," *CQ*, July, 1953, p. 25.

Fig. 1. HQ-120X curves with Adapter.



lattice section consists of four fixed shunt crystals and three pairs of series crystals. Only one of the three pairs is used at a time and it is the selection of the particular pair which determines the width of the bandpass. A very small capacitance is shunted across the high frequency crystal of each series pair to help steepen the sides of the selectivity curve. The shunt crystals serve to suppress the side-lobe response of the unit.

The full-lattice section consists of two pairs of similar crystals, each pair being matched to the same frequency as exactly as possible. Exact matching (i.e., within a few cycles) is essential to obtain the best skirt selectivity. The exact frequency of the shunt crystals is not critical, the frequency as indicated by the channel number usually being satisfactory. The different pairs of series crystals are either inserted into or removed from the circuit by a single control selector switch in accordance with the bandwidth desired. The two crystals of each series pair differ in frequency. The exactness of the frequencies is not as important as it is in the full-lattice filter, and there is no matching problem involved. However, the frequencies should be arranged so that the mid-point of the frequency spread between the two corresponds to the i-f frequency of the receiver. If the receiver already contains an ordinary crystal filter, it is important that the frequency of its crystal, the i-f frequency of the receiver, and the mid-point of the frequency difference of each pair of series crystals coincide. In practice a small deviation between the frequency of the crystal and the mid-point of the frequency separation between the series crystals is tolerated. The matching of these frequency points should be more exact with the narrow 85 cycle filter. This allows use of the regular crystal filter, if desired, with any of the bandpasses of the adapter.

Appropriate padder condensers are switched across the primary and secondary circuits of the i-f transformer *T2*, which joins the two sections of the unit, in accordance with the bandpass being used. This facilitates alignment of the filter.

The circuit loss due to insertion of the filter is easily offset by using an additional i-f amplifier stage. This is much simpler than trying to rearrange the circuitry of the receiver to obtain the needed gain. When the filter is switched out of the i-f system to allow use of the regular receiver bandpass, a resistor is switched into series with the grid lead of the 6SG7 to reduce the signal strength to that which it would be if it had passed through the filter.

Two observations will be of interest to anyone wishing to experiment with the filters. It was found that termination of a half-lattice filter into an i-f transformer, even though loaded, degraded the side lobe suppression. Use of a shunt crystal of a frequency within less than approximately one kilocycle of the bandpass caused objectionable side lobe response.

Equipment and Test Methods

Construction and alignment of the filter is not difficult if the proper equipment is available. A signal generator of high accuracy, as well as reset accuracy, with fine vernier tuning, and capable of constant output in the general i-f range of the receiver is necessary. A BC-221 with frequency divisions of approximately 5 cycles and a constant output within one db. was used. A vacuum tube voltmeter is indispensable. A 20,000 ohm per volt voltmeter was tried and found to be inadequate. Two Carborundum stones, #112 (fine side) and #103, were used to grind the crystals. Similar stones to the above could be used with equal facility. A pair of tweezers proved invaluable in handling and supporting the crystals when they were being altered. The tweezers are easier and safer to use if for about the last ⅛" of their length the ends tend to parallel instead of angle acutely toward each other.

The various bandpasses of the filter were plotted on the basis of suppression of the different frequencies as measured by reading the voltage changes at the diode load of the second detector with a vacuum tube voltmeter. The meter was set to read minus volts on the 15 volt scale, the 1-to-10 volt section of the scale being used to measure the voltage changes. The voltages recorded were translated into dbs. by the use of a chart plotting decibels versus voltage ratios. Such charts can be found in most radio handbooks. For each change from 10 volts to 1 volt there is a change of 20 db. (i.e., each time there is a voltage change by a multiple of 10, this is equivalent to a 20 db. change). The use of an S-meter in lieu of this method will give the approximate characteristics of the filter but it cannot compare with the accuracy of the VTVM method.

In order to run the selectivity curves and to check the crystals during construction of the filter, arrange the following setup: 1) Connect a 5000 ohm potentiometer across the output of the BC-221 to ground. 2) Solder a .01 condenser between the center arm of the potentiometer and a shielded wire, the shield of which is soldered to ground of the BC-221 and the receiver. 3) Connect the opposite end of the wire to the main grid of the mixer tube. 4) Break the shielded wire and insert a crystal holder in series with it. The holder is used only when crystals are tested, being bypassed with a jumper when running the selectivity curves. 5) Disconnect the inputs of the preceding r-f stage and h-f oscillator from the mixer. 6) Connect the VTVM across the diode load to ground. In the HQ120X it can be connected on either side of the one megohm resistor leading from the diode input transformer to the grid of the noise limiter tube without materially changing the measurements. The noise limiter

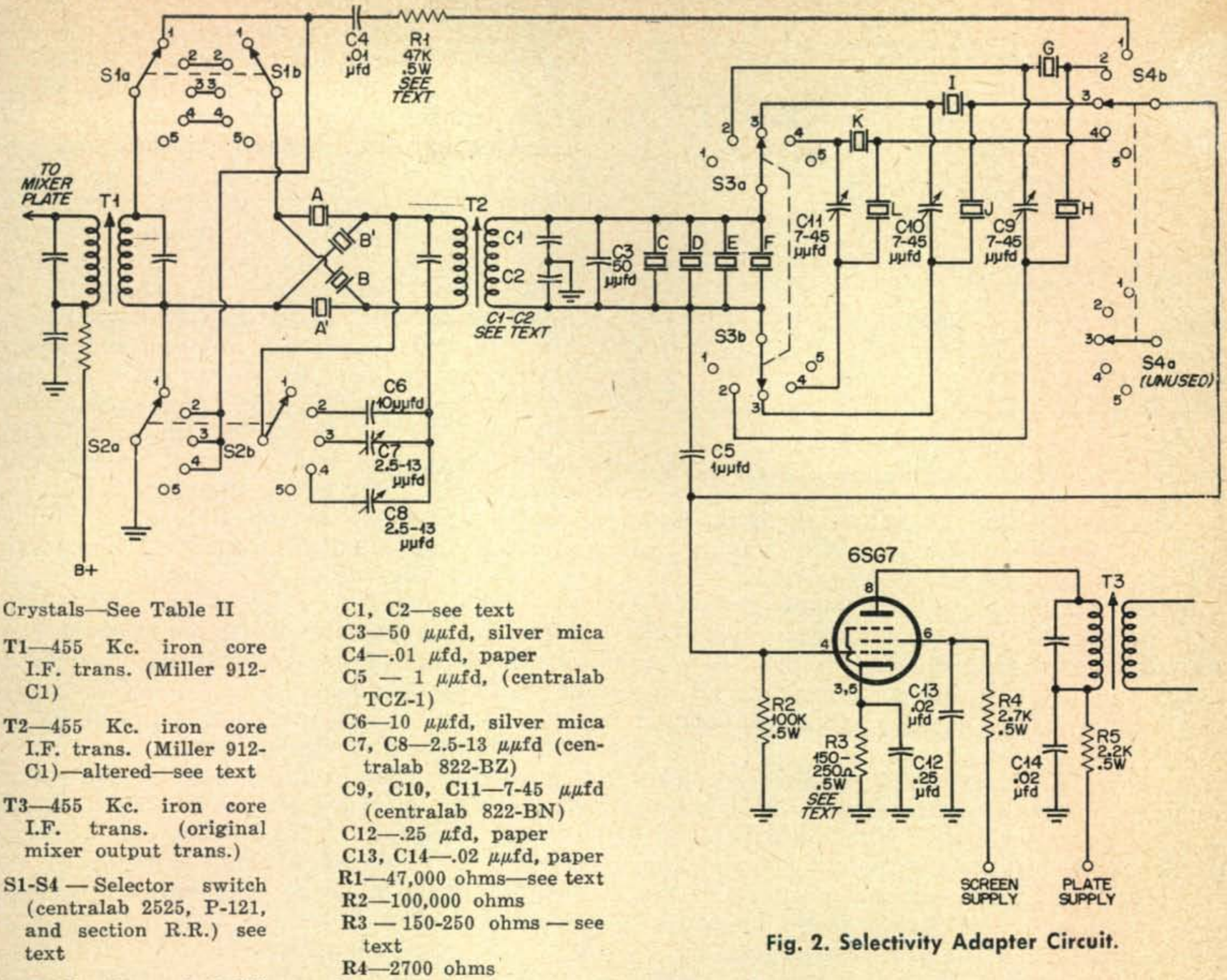


Fig. 2. Selectivity Adapter Circuit.

Crystals—See Table II

T1—455 Kc. iron core I.F. trans. (Miller 912-C1)

T2—455 Kc. iron core I.F. trans. (Miller 912-C1)—altered—see text

T3—455 Kc. iron core I.F. trans. (original mixer output trans.)

S1-S4 — Selector switch (centralab 2525, P-121, and section R.R.) see text

Crystal sockets—cinch ½" spacing (5 double, 4 single)

C1, C2—see text
C3—50 µµfd, silver mica
C4—.01 µfd, paper
C5 — 1 µµfd, (centralab TCZ-1)
C6—10 µµfd, silver mica
C7, C8—2.5-13 µµfd (centralab 822-BZ)
C9, C10, C11—7-45 µµfd (centralab 822-BN)
C12—.25 µfd, paper
C13, C14—.02 µµfd, paper
R1—47,000 ohms—see text
R2—100,000 ohms
R3 — 150-250 ohms — see text
R4—2700 ohms
R5—2200 ohms
Right angle drive—National ACD-1

is made inoperative during the tests. 7) Each time meter readings are taken, and each time the meter scale is changed, first zero the meter needle with the signal generator off and the receiver on. 8) Turn the a.v.c. and b.f.o. off during all tests. The gain should be under manual control only.

Construction of the Adapter

Decide upon the location and mechanical layout of the filter. The mechanical layout is not critical. Convenience of operation, proximity to the mixer tube, and good shielding with allowance of a ⅜" space separating the crystals from the shield walls are important considerations.[6] See the photo for the general layout of the unit for an HQ120. The layout should also fit the newer comparable models of this receiver with very little or no alteration. If the unit must be outboard, experiments indicated an additional i-f transformer may be of value in coupling the mixer output to the filter if the unit is located very far away. Aluminum is easy to work and makes good shield cans. For an HQ120, cut a piece of sheet aluminum to fit exactly the top surface of the shield can enclosing the condenser tuning assembly. Drill holes at the four corners to coincide with the holes already in the shield can and mount the aluminum piece temporarily. Place the shield cans for the two lattice sections in position but do not mount. Note that the smaller can projects laterally beyond the metal base to facilitate coupling the mixer i-f transformer to the full-lattice filter. A wider lip is turned under on this side to provide complete covering for the bottom of the shield. Another shield can 2½" square and 1¼" high contains the resistors and condensers of the 6SG7 stage. The 6SG7 mounts on top of this can. Remove the first i-f transformer and place it on top of the condenser assembly shield can so that it lies lengthwise across the receiver in front of the lattice shield cans, with its tuning screws projecting vertically. Cover its open base wtih a small aluminum sheet which should project above the sides of the i-f can so as to serve also as the base to a smaller shield can which contains the resistor and bypass condenser of the a-v-c line for the next i-f tube (6S7). This resistor and condenser originally lie beneath the chassis surface near the base of the 6S7.

Drill a hole in what will be the front lowermost corner of the above noted i-f transformer

6. Weaver and Brown, "Crystal Lattice Filters for Transmitting and Receiving," QST, August, 1951, p. 52.

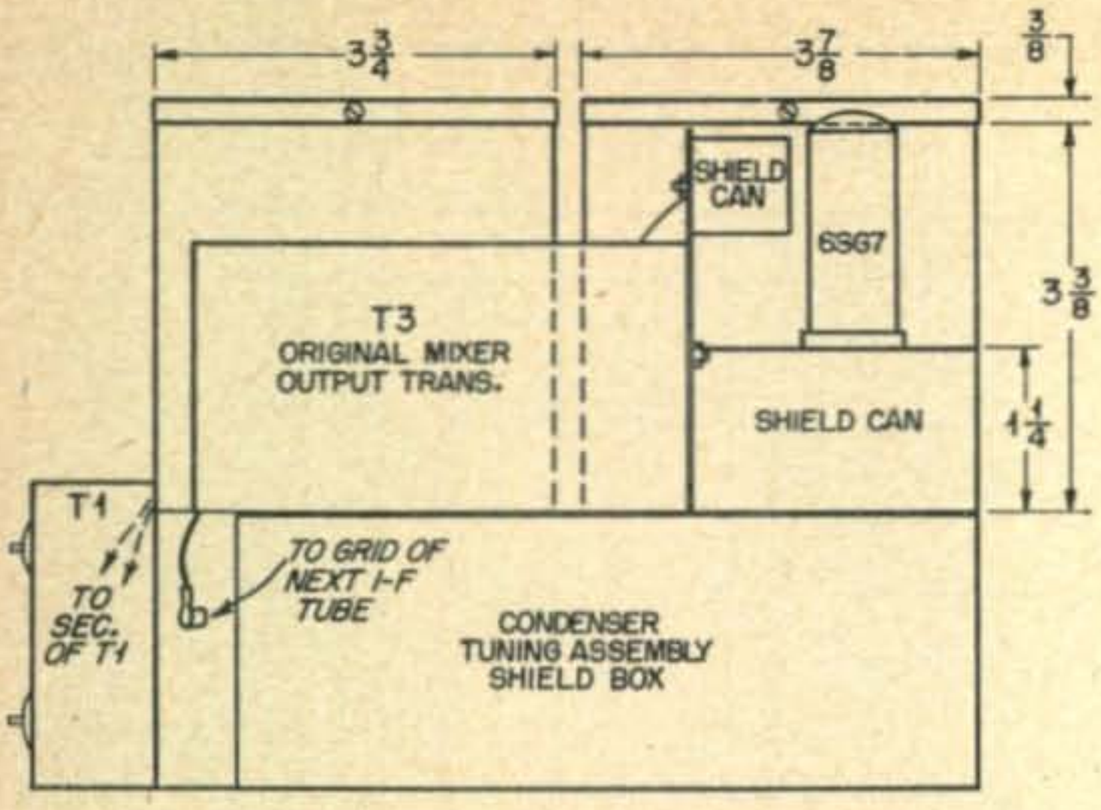


Fig. 3. Front view outline of adapter mounting in HQ-120X.

can to pass the grid lead through to the tube (6S7) of the next i-f stage. With the i-f can still in position, drill a hole on its upper surface near its bottom to pass the black a-v-c line. Drill a hole through the bottom cover (the sheet aluminum) of the i-f can to pass the plate and *B* plus leads to the shield can beneath the 6SG7. See *Fig. 3* for a front view of the adapter layout.

A *Miller* i-f transformer, *912-C1*, replaces the original first i-f transformer. Drill a hole in the upper, rear corner which will be closest to the corner of the overhanging shield can. The secondary leads are pulled through this hole to enter the full-lattice shield by way of a hole drilled near its corner. Another *Miller* transformer, *912-C1*, after altering is placed horizontally, its base pointing toward the shield of the full-lattice filter to which it attaches, its side adjacent to the shield of the half-lattice filter, and with its tuning screws vertical. See *Fig. 4* for mounting details. Drill a hole in the side of the i-f can to allow the secondary leads to pass out to enter the half-lattice filter through a hole in the rear portion of its shield.

After locating the correct placement for the major components of the adapter, mount the shield cans temporarily with metal tapping screws. Insert the screws from the bottom of the aluminum base. Later, machine screws will be passed in the same manner to mount the crystal assemblies. Thus, the base actually rests against the top of the tuning condenser shield can by virtue of the projecting screw heads. Allow space between the two shield cans for the lips of the shield can tops and for a mounting nut for the second division of the selector switch.

The selector switch is essentially two switches, one lying immediately behind the other and being operated by it, thus requiring only one control knob. Each switch consists of two sections. The selector switch is mounted parallel to the front panel, being operated from the panel by means of a right-angle drive. The first main division, or switch, mounts within the half-lattice filter and on the side (audio side of receiver) of its shield can approximately 1⅛" above the bottom of the can and 1⅜" from the front of the can. Placement of this switch determines the vertical positioning of the control knob on the front panel and should be carefully located on each receiver. The second division of the selector switch mounts on the side of the smaller lattice shield can so that its shaft projects into the half-lattice section (drill a hole to allow entrance of this shaft) and exactly in line with the shaft (flat portion) of the first switch division.

Construct the selector switch unit as follows: 1) Remove the rear section of the three section Centralab switch #2525, and reassemble with only the two front sections. 2) Use a P-121 index assembly (Centralab), the section just removed, and a new section (RR) to make a similar two section switch. Before assembling, remove the metal ball from the P-121 assembly. This allows the switch shaft to turn without appreciable resistance. 3) Mount the second switch so that its shaft center is exactly in line with the center of the flattened rear portion of the shaft of the first switch. Cut off the shaft of the second switch to a length that allows at least ¼" overlap of the two shafts. Use a hacksaw to cut a slot in the center of the round shaft so that the flat shaft will fit snugly. A pin through the shafts is not necessary, and the absence of it allows a small amount of inaccuracy in the fit to be tolerated. The second switch will now follow as the panel control knob turns the first switch.

Before mounting the half-lattice shield permanently, place small right angle brackets on either side of the can exactly in line with the selector switch so that the upper surface of the Lucite strip holding the trimmer condensers will lie ¾" below the top of the can. A similar mounting is used for the padder condensers of the full-lattice section, but is fastened to the front and rear of the can. Also, drill a hole, toward the front, in either side of the two adjacent shield cans for passing a shielded wire from one lattice filter section to the other.

The secondary of the i-f transformer, T2, is altered as follows: 1) Remove the i-f assembly from the can. 2) Unsolder one end of the secondary coil from the condenser lead. 3) Obtain another condenser of the same value and

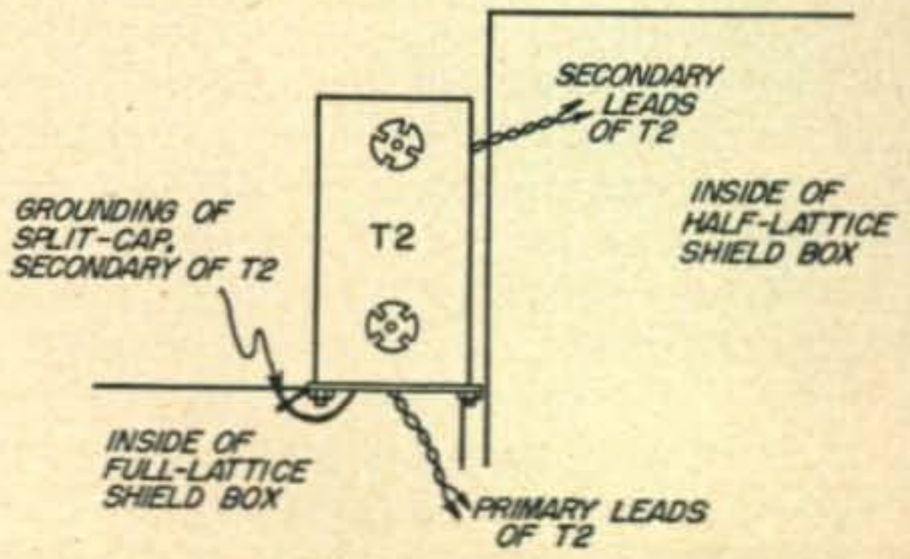
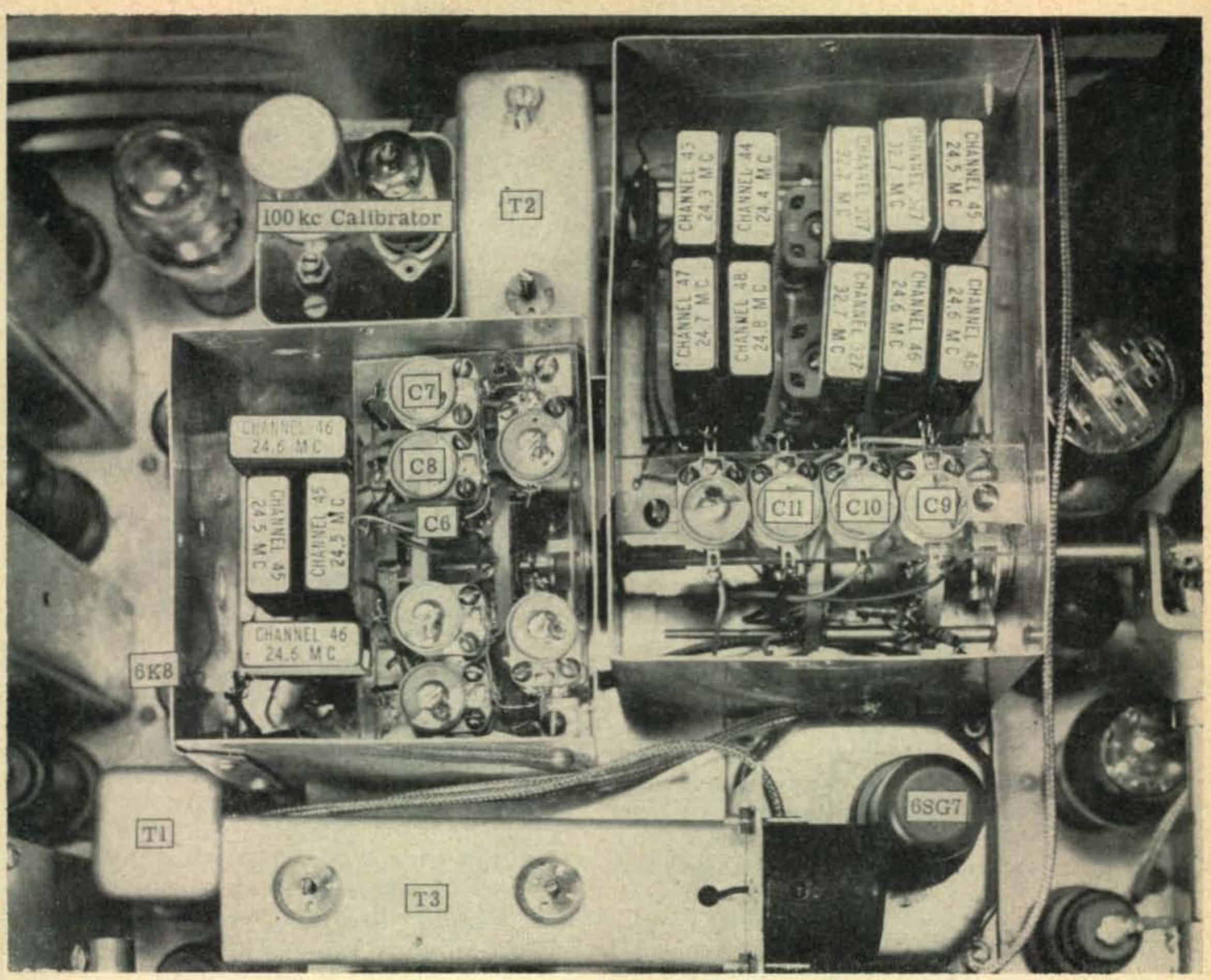


Fig. 4. T2 installation, top view.



Installed Adapter. Note positioning of selector switch and shield boxes.

connect it between the two free wires. 4) Connect a wire to the junction of the two condensers. It will come out of the bottom shield of the can along with the primary leads. 5) Use a grid dip meter or other means to determine whether the secondary will tune to the i-f frequency. Remember that the shunt crystals are across the secondary and add capacitance. One was measured and had a capacitance of 10 $\mu\mu$fd. Remember that the value of padder C3 can be reduced if necessary. 6) Remount the assembly after making any necessary changes in capacitance or inductance to make the secondary tune through the i-f frequency range. 7) The secondary leads are brought through the hole on the side of the can as the i-f assembly is remounted. 8) Mount the bottom shield on the i-f can, and bring the three leads through two holes. Also, place a machine screw through the shield plate from inside to out, and secure it temporarily with Arrowhead Cement or a similar substance. This screw will help fasten the i-f can to the side of the lattice shield. 9) Mount the i-f can onto the full-lattice shield, bringing the three leads inside the shield. 10) Ground the lead of step 4 above inside the shield.

The crystal holders are mounted on ¼" thick Lucite which is transparent and easily worked. The various connections and leads of the crystal units are soldered in place prior to their mounting, the leads being brought through slanting holes drilled through the thick edge of the Lucite. Determine the mounting locations on the base plate of the assembly and drill holes for mounting the 1" brass spacers which support the Lucite mounts. A ⅜" space should separate the crystals from the shield walls. Mount the crystal assemblies after the selector switch is installed permanently.

Using colored wires, attach leads to each switch contact. Make use of identical colors for joining the corresponding leads between crystals, condensers, and switches. Allow plenty of length so that the connections can be made after the components are mounted without having to splice. Lengths of scrap telephone cable such as is used in wiring switchboards are excellent for this purpose. They make an otherwise awkward and trying job an easy one.

Install the selector switch and align the two divisions for proper tracking. Install the .01 condenser, the shielded wire, and the 47,000 ohm resistor unit which serves to carry the signal from the mixer to the 6SG7 when the bandpass filters are switched out of action.

Mount the crystal assemblies and solder all connections except those to the padding condensers. Install the ⅛" thick strips of Lucite containing the padders in their respective compartments and solder their connections. Holes should be drilled adjacent to the condensers in the full-lattice section to pass the connecting leads from the underlying switch and crystal assembly.

In the photograph of the adapter, more padder condensers are shown than are needed. Originally a fourth bandpass filter, later shown to be superfluous, had been incorporated. The original plan had also included provision for switching padder condensers across the secondary of the mixer i-f transformer to allow more flexibility in adjusting the bandpasses. In practice, they were found unnecessary. The full-lattice section needs only one fixed condenser and two trimmers, while the half-lattice section needs only three trimmers. While negative coefficient trimmers were used in the half-lattice section, zero coefficient trimmers in the 4-25 $\mu\mu$fd. range should be satisfactory. The amount of trimmer capacitance actually used was 20 $\mu\mu$fd. or less.

The 6SG7 with its subassembly and shielded leads is now mounted. The power and a-v-c leads can enter into the chassis at any convenient place. The additional power drain of an extra tube is well tolerated by my receiver. A shielded wire carries the signal from the selector switch through the two shields to the 6SG7 grid.

The cathode resistor of the 6SG7 may need to be varied, depending upon the insertion loss of the filter. A 150-250 ohm resistor is a satisfactory starting point. If the gain is insufficient, the value will need to be lowered. If there is enough variance in crystal efficiency so as to make the gain of the receiver vary too much as the different bandpasses are switched into use, the unused portion of the first section of the selector switch can be used to change the cathode resistance with each bandpass. Thus, the variation in signal level coming from the half-lattice filter can be compensated so as to make the overall gain of the receiver constant irrespective of which bandpass is used. This was not necessary with my unit. The value of R1 will vary in different receivers and will be determined in part by the gain of the 6SG7 stage.

Crystal Checking and Alteration

The crystal work can be left until all of the preceding has been accomplished, or can be carried out before the i-f section of the receiver is disrupted. Check the frequencies of all of the crystals as follows: 1) Remove the jumper and place the crystal in the holder. 2) Slowly sweep the frequency of the signal generator through the frequency range of the crystal. A peak response will occur. This is the frequency of the crystal and corresponds to the frequency setting of the generator. Both the potentiometer connected across the signal generator and the r-f gain control of the receiver can be varied to give a convenient voltage reading at the second detector. Now, select crystals with frequencies closest to those needed and set about to alter them. The extreme accuracy as indicated by the measurements recorded in Table II is not necessary for a workable filter. However, it was accuracy that made possible the selectivity curves presented.

To increase frequency, the top edge of the crystal is ground with the stones noted previously. Care must be taken to keep the sides of the crystal parallel and the edges flat to avoid reducing its activity. The greatest danger is the possibility of pulling the supporting wires loose from the crystal. I found the following method satisfactory, ruining only two crystals, and that was because of haste. The cover is removed from the crystal holder and the holder placed in a large vise so that the crystal is slightly above the top of the vise. With the hand partly supported by the vise and grasping the crystal with padded tweezers, the other hand grinds the top edge of the crystal with light, even, parallel strokes of the stone. One danger is that of catching the front edge of the crystal as the stroke starts and tearing it loose from the wire. Grasping the crystal quite firmly, and not hurrying will prevent this. Cut narrow strips of waterproof adhesive (prevents sticking to the crystal) to cover the grasping surfaces of the tweezers to minimize slipping and to cushion the crystal from the metal surface. Many have recommended rinsing the crystal thoroughly in alcohol after grinding. I have not been able to confirm the necessity for this although it may have real merit. An idea of the Q of the crystal can be obtained by measuring the voltages passed at the series-resonant frequency (maximum) and at the anti- or parallel-resonant point (minimum). The anti-resonant point is usually within a few hundred cycles higher in frequency than the series-resonant point, the so-called frequency of the crystal. A maximum-minimum ratio of well over 100 to 1 was common with my crystals. A ratio of 50 to 1 indicates a satisfactory Q according to W7ESM.[7]

For the occasional case of lowering a frequency a plating solution is used. The solution and method as outlined by W7ESM was used. The solution is prepared using 15 Gm. of copper sulfate, 5 cc. of sulfuric acid, and 5 cc. of alcohol in 100 cc. of distilled water. The proportions are not said to be critical. With the solution in a glass container, a heavy piece of clean copper wire is placed to extend to the bottom of the solution and is connected in series with a 300-400 ohm resistor and the positive terminal of a 1.5 volt dry cell. Connect the two crystal holder pins in parallel and connect them in turn to the negative terminal of the cell. The length of time necessary to

7. Morrison, "'Phone Selectivity for the BC-312," QST, February, 1954, p. 19.

Table I.—Comparison of Selectivity Curves

Table II.—Crystals of the Selectivity Adapter
All crystals are of the FT-241-A series, and of the 54th harmonic type except for channel 327 which is a 72nd harmonic type. Channel 327 or channel 45 can usually be used interchangeably, 327 being slightly higher in frequency. Don't worry about the third decimal place figures—they are easily read on the BC-221. The actual frequencies used are not critical. Crystals of other frequencies may be used to accommodate the i-f frequency range desired. The full-lattice section is the only part of the adapter which requires an almost exact match of the crystal pairs to obtain good results.

Table I. COMPARISON OF SELECTIVITY CURVES

Suppression	Without Filter	2400 cycle Filter	1050 cycle Filter	85 cycle Filter
— 6 db.	2.88 kc.	2.43 kc.	1.06 kc.	85 cycles
—10 db.	3.55	2.56	1.20	145
—20 db.	5.06	2.82	1.81	320
—40 db.	8.09	3.25	2.61	620
—60 db.	11.67	3.62	3.13	865
—80 db.	13.96	3.80	3.36	995

Table II. CRYSTALS OF THE SELECTIVITY ADAPTER

Xtal	Channel No.	Final Frequency	Frequency Separation
A	46	455.800 kc.	1.600 kc.
A′	46	455,800	
B	45	454.200	
B′	45	454.200	
C	43	Unaltered	
D	44	"	
E	47	"	
F	48	"	
G	45	454.042	1.905
H	46	455.947	
I	327	454.489	1.037
J	46	455.526	
K	327	454.958	0.085
L	327	455.047	

bring about the frequency change will have to be determined experimentally. Start by plating for 10-15 seconds and then check frequency after the crystal has been washed in water and dried. Reversing polarity will remove plating and raise the frequency. I noted a definite problem with plating the crystals as shown by a lower peak voltage being passed after the plating. However, if the Q is not lowered too much any additionally needed gain can be made up in the 6SG7 stage. The article by W7ESM gives an excellent discussion and bibliography pertaining to the frequency alteration of these crystals.

Aligning the Receiver and the Filter

With the signal generator operating at the i-f frequency of the receiver, turn the bandpass selector switch to position 1, and increase the gain of either potentiometer to give a convenient deflection of the VTVM (lower voltages are preferable) needle. Tune the entire receiver i-f system to peak at the i-f frequency. Now set the selector switch to position 2. Tune the primary of T2 by means of turning the upper screw. Next, turn the lower screw (secondary) outwardly near maximum, but not quite. Retune the whole circuit by adjusting the upper screw of T2, the trimmer C9, and the bottom screw of T1. Do not adjust the bottom screw of T2 to peak the circuit. This screw should not be moved after its initial setting. If no signal comes through or if the circuit cannot be peaked as the trimmer C9 is varied, it is probable that the secondary of T2 is not capable of being tuned to the i-f frequency and will need to be adjusted. Try adding or subtracting from the capacitance of padder C3. A grid dip meter may be helpful. After the circuit has been peaked, the upper screw of T2 should be about ½ to ¾ of the way in, the lower screw remaining almost all of the way out.

Return the selector switch to position 1 and note the frequency at which the maximum response now occurs. It will probably be higher than the i-f frequency as T1 is now without the capacitance of the full-lattice filter across its secondary. If the peak response is too much higher in frequency, this can be corrected to the exact i-f frequency by adding a fixed or variable padder condenser between either S1A1 or S2A2 and ground.

Turn selector switch to position 3 and tune for peak response at the i-f frequency by adjusting trimmers C7 and C10. With the switch in position 4, trimmers C8 and C11 are adjusted for peak response at the i-f frequency.

Now the final adjustments to determine the shapes of the various bandpasses are made. The procedure is as follows: 1) Selector switch in position 2. 2) R-f gain at minimum. 3) Turn the potentiometer control across the BC-221 to give a deflection of 10 volts on the VTVM. If a deflection this great cannot be obtained, provide the additional gain by increasing the r-f gain of the receiver. In lieu of this a lower voltage scale might be used. Actually any voltage scale on the VTVM can be used, providing that the voltages are measured in ratios. It is the proportional change and not the actual voltage measured that is important. In fact, the actual voltage may be very low, but the actual reading of the voltage changes may be made on a higher scale of the meter for the sake of convenience so long as reference points of "10" and "1" are located. They may be actual in the numbers noted or they may be obtained by multiplying the voltage readings by a common

[*Continued on page 108*]

Why and How to on Six

Walt Burdine, W8ZCV
Novice Editor
RFD 3, Waynesville, Ohio

"W8XXX to W8ZCV. Ok Walt on most of that, ur 800 watts was covered up by that kilowatt in Waynesville."

How often have you heard a similar statement on the low frequency bands, especially the 75 meter phone band? I work 75 meters and I like it even if I do only run 60 watts. I just can't seem to separate the stations on my NC-183-D when there are three kilowatt stations on the same frequency, even with the crystal filter. The only stations worked consistently are within a radius of 100 miles with an occasional DX station a rarity. I do have 41 states and 6 countries on 75 phone in the last seven years operating, the 940 foot long-wire antenna helped. There is tooooo much QRM; boy, "hit haint wurth the truble." So, my problem was to find a band where I could do the same and with less power and *lots less QRM*.

Here are some amazing facts for your edification. The F.C.C. has allotted the ham 2,247,640 kc. for the purpose of communication and experimentation, yet about 98 per cent of our operation occurs within the first 2,520 kc. of our frequency allotment. This includes the 10 meter band, yet just a short skip and a jump up the road at 50 mc. we have 4,000 kc. lying alone and practically unused except by a small handful of hardy pioneers. That is where I went. Here is how I did it plus some other data concerning this band.

This article is not written to give you the ultimate in transmitter or receiver construction, it is written to get you going. I will give you the diagrams of some of my brain children for six meters and you can build a modified version, the way most hams do. They are used just to show you how simple it is to get started on six meters. This is not the simplest way to get going, but you can get good results with

COIL TABLE

L1—10 turns #24 E. Wire close wound on ⅜ inch iron slug form.
L2—4 turns #24 E. wire wound on ground end of L.
L3—8 turns #24 E. wire close wound on ⅜ inch iron slug form.
L4—14 turns #24 E. wire close wound on ⅜ inch iron slug form.
Crystal—See text.

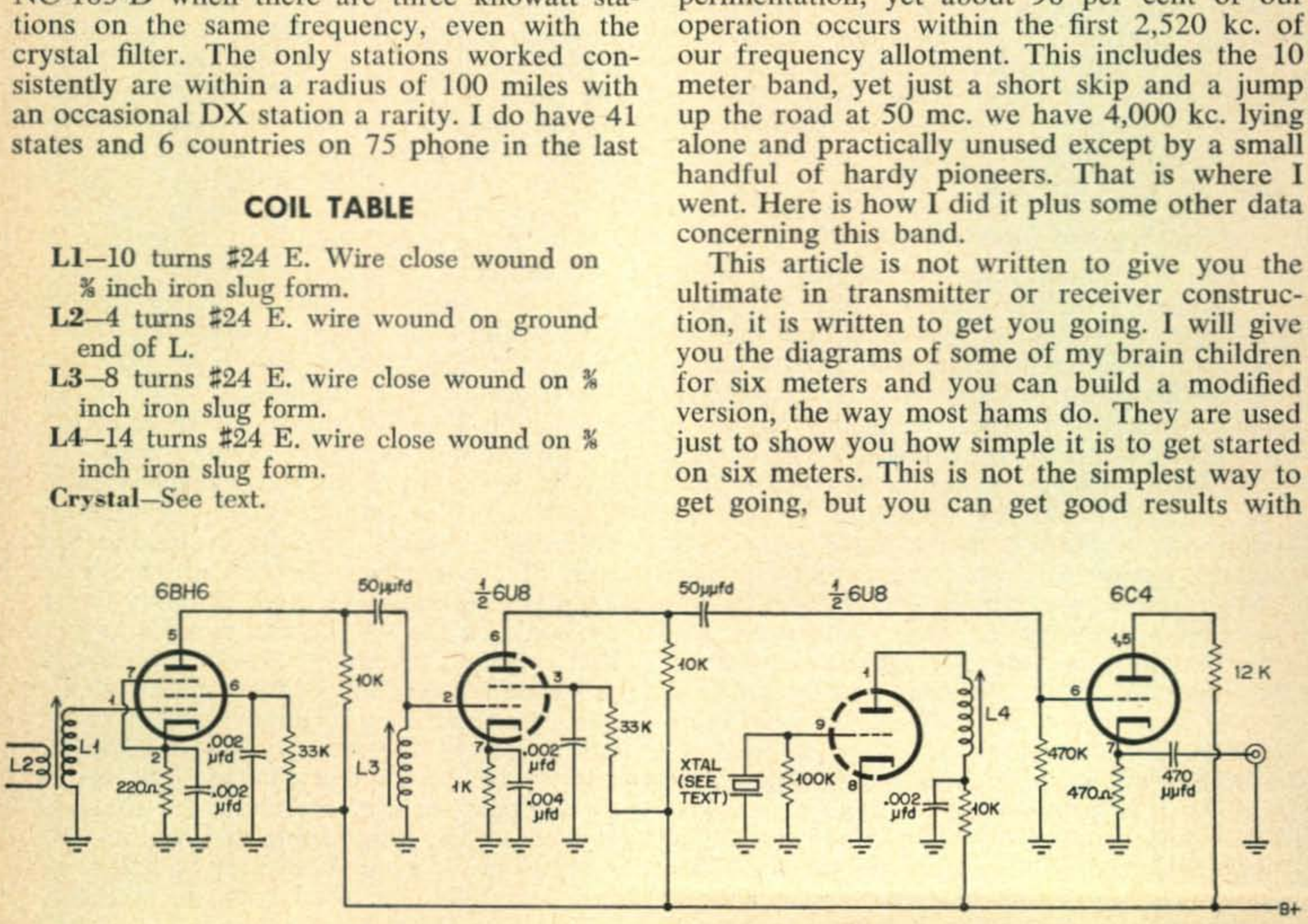


Fig. 1. Six Meter Converter. For coils, see table above.

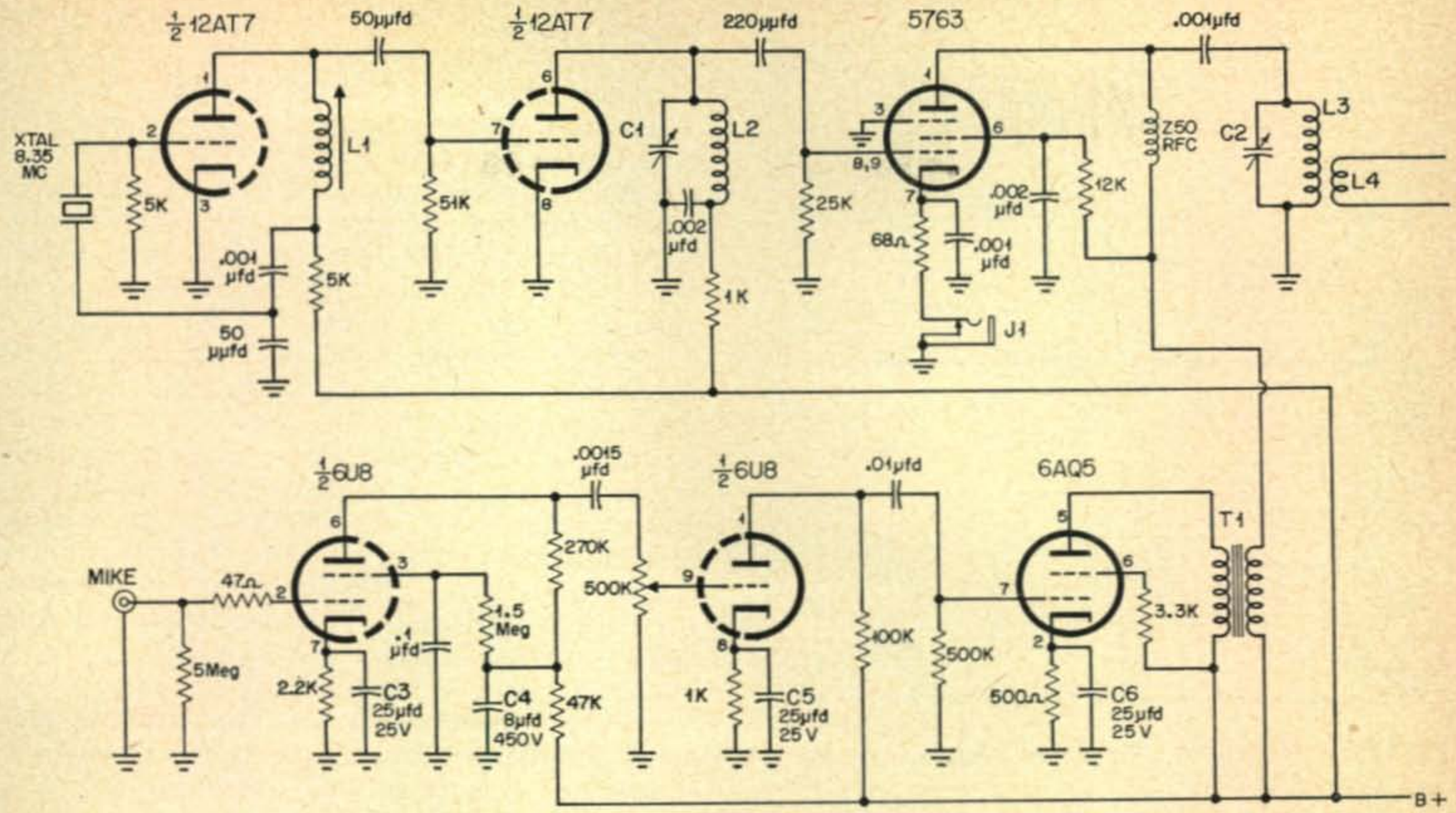


Fig. 2. Six Meter Transmitter. Values not shown are on table below.

this outfit. More activity and considerably more experimentation on six meters is needed. You can help.

As far as we know, at the very high frequencies, only two principal modes of transmission phenomenon need concern us. These are the Sporadic E and the F2 layer transmissions. The Sporadic E transmission is commonly called "short skip." Sporadic E is a condition of the E layer when certain small areas become greatly ionized with respect to the density of the normal E layer. This condition may occur at almost any time of the day or night but is most prevalent shortly after sunrise and just before sunset. This varies inversely with the sunset cycle. The E layer is about 60 miles above the earth. Sporadic E transmissions should extend out to about 1500 miles.

The height of the F2 layer is not constant from hour to hour or day to day. The transmission distance for F2 layer transmission is about 2500 miles, but this is variable, there also being the possibility of double hop F2 layer transmission. This improves the chance of working some real dx.

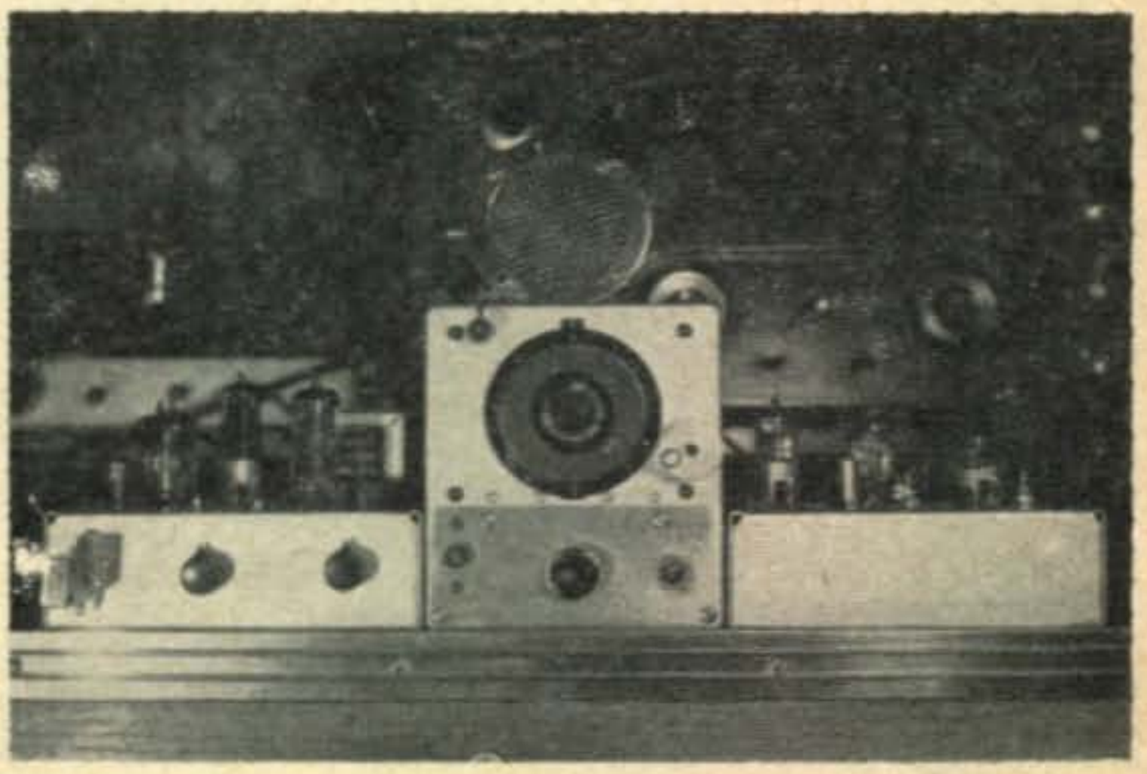
Ground wave coverage is about 50 miles, day or night, with low power and a good beam antenna. High power will increase this coverage to about 100 miles. I've been asked many times about the coverage of ground wave as compared to that of 2 meters. Personally I can see very little difference in coverage. The size of the antenna would have to be taken into this calculation, my two meter antenna is a ten element beam and the six meter antenna is a five element one. The distances in wave length above ground would have to be taken into consideration.

All resistors are ½ watt and all condensers are molded disc ceramics

C1, C2—Johnson. 20 MII
C3, C5, C6—25 Mfd. 25 Volt.
C4—8 Mfd. 450 Volt.
RFC—Ohmite Z-50
T1—10 Watt Modulation Transformer (Stancor A-3812)
L1—21T. #28 E. Wire C.W. on ⅜ in C.T.C. Iron Slug-Tuned Form
L2—9T. B & W 3003
L3—9T. B & W 3002
L4 — 3T Insulated Wire Wound Over Ground End of L3.

Transmitters

Some manufactured transmitters that can be used on the six meter band are the Gonset Commander, The Harvey Wells TBS-50 series, the Silver 700 and the Viking 1 (if it will be converted as described in December 1952 issue of QST page 22). A high powered transmitter can be built using 4E27's in pushpull by referring to the article, "6 The Easy Way," in *CQ*



Complete 6-Meter Station at W8ZCV: Transmitter, BC454, Converter, and D104 mike.

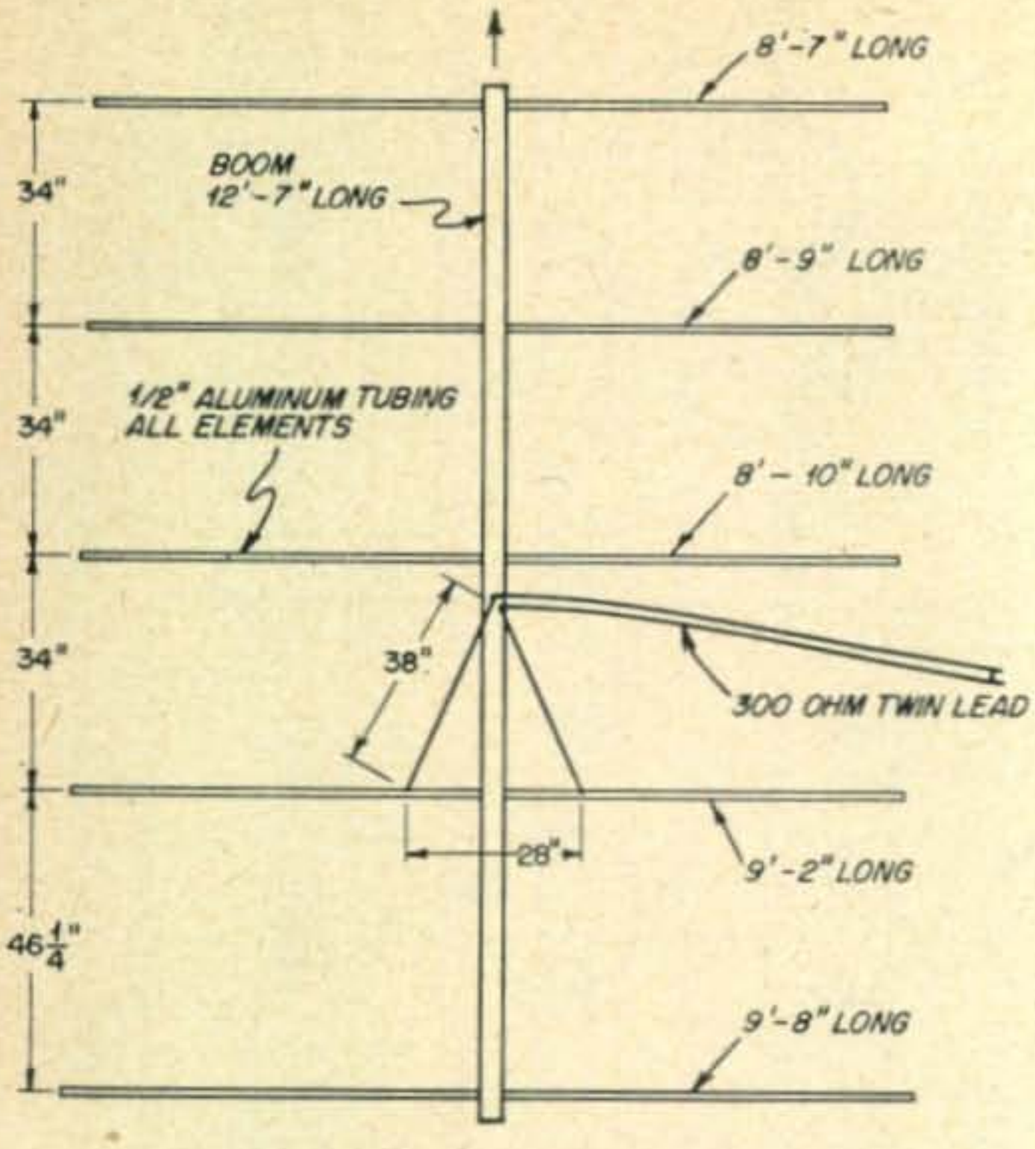
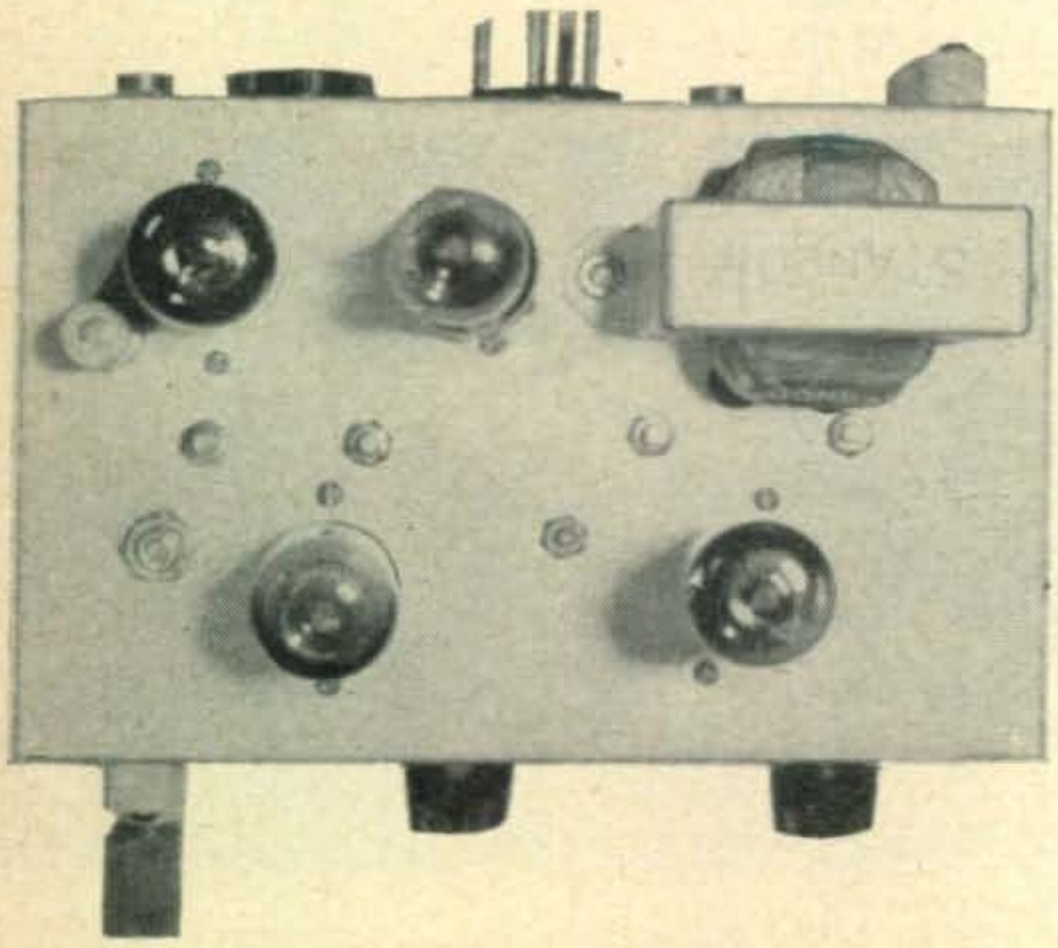


Fig. 3. Six Meter Beam.

for December, 1951 page 13. There's meat in both of these excellent articles. The author has successfully converted the very popular Heathkit AT-1 to work on six meters and the first QSO was with a station in Texas. For the novice who has graduated to technician, this is a very simple way to get going on six meters.

A high powered transmitter is not needed, the average power as taken from 84 QSL cards was figured to be 50.2 watts. The highest power was 480 watts and the lowest was 6 watts. A milliwatts W2 QSO with a W4 in Florida was heard here, the W2 was using a transistor. He figured somewhere around 9000 miles per watt.

Transmitters using AM, FM, CW, SSB, Teletype and Duplex can be used on six meters and you won't have to worry about QRM. Duplex operation is a lot of fun. It takes two antennas, but for local work the receiver antenna can be only a dipole. Low power also is an aid in



Transmitter, top view.

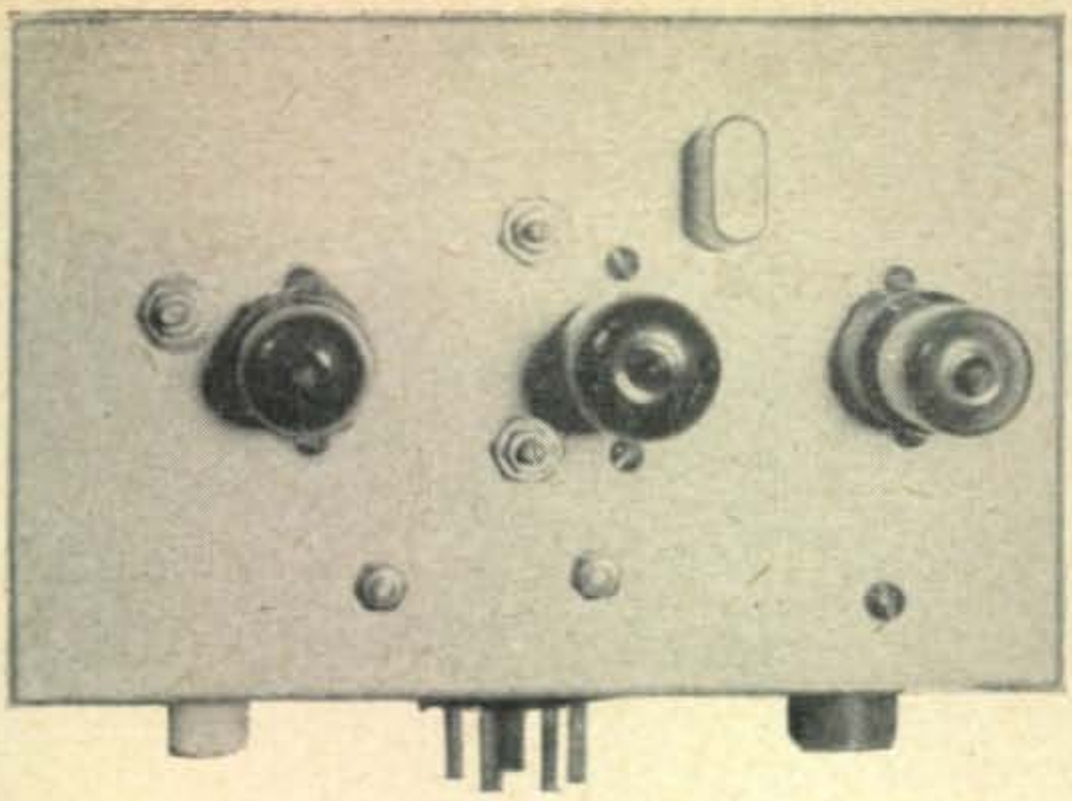
duplex operation. This band is as wide as the spectrum from zero c.p.s. to the top end of the 75 meter phone band, that's 4 megacycles.

The transmitter described here is a low powered unit utilizing four tubes, two of them being dual purpose tubes. A 6U8 is used as a speech amplifier and driver for the 6AQ5 modulator tube. A 12AT7 tube is used as an oscillator tripler using the Robert Dollar overtone circuit and the second half doubles to 50 megacycles. The 5763 amplifier tube did not have to be neutralized in the model shown. This tube puts out a nice signal with 300 volts on the plate, at 45 to 50 milliamperes. This voltage and power makes it a nice unit to use for portable, mobile and emergency use. The RACES have a band of frequencies on six meters. This transmitter can be run from a 300 volt 100 ma. vibra-pack for mobile operation. The size is such that it can be tucked away in any available space, it was built on a 4x6x2 inch aluminum chassis. The quality and quantity of modulation is adequate for the purpose. A dynamic microphone should be used for mobile operation, a crystal microphone will fuse in the heat of a closed car on hot summer days. A Stancor A3812 modulation transformer was used in this model pictured. It is a 5 watt job, but it did not get hot when run for thirty minutes. A little cutting and trying may be needed to get the coils to resonate at the right place due to the differences in the coil forms used at your shop. Neat, clean wiring joints and short leads will not only help the transmitter operation, but it will improve the finished appearance. A keying jack is included to help snare that one that is down in the mud.

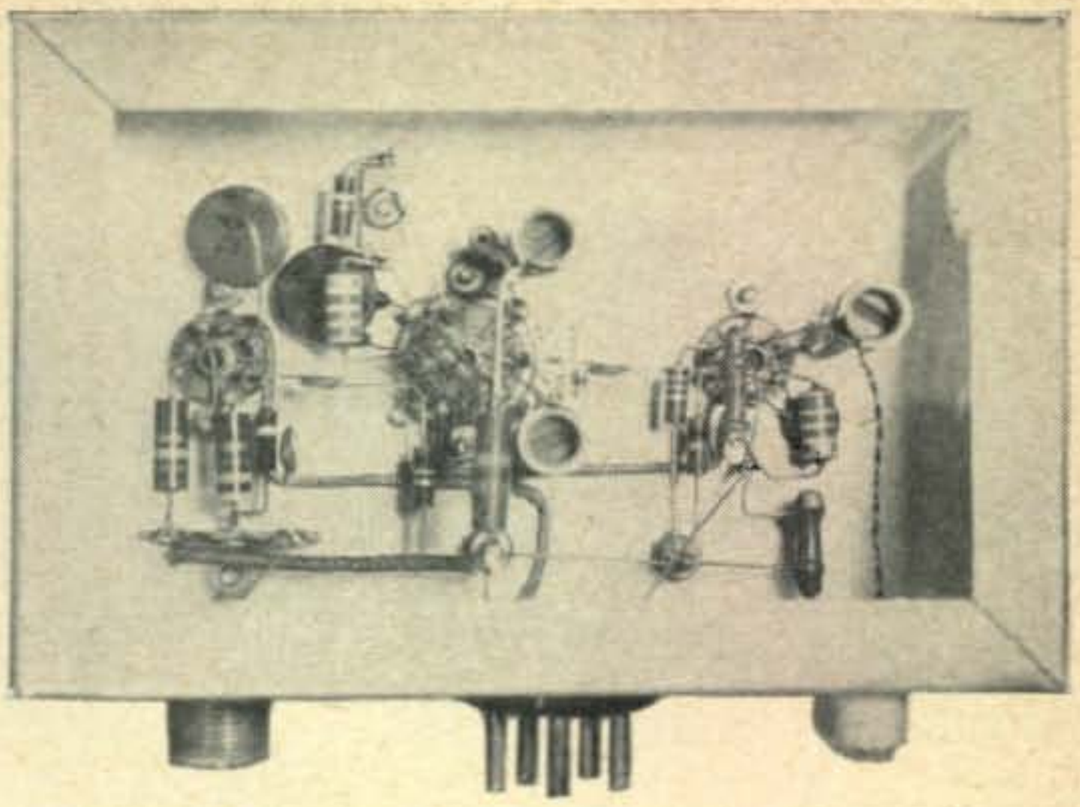
The radio frequency part of this transmitter can be used to drive an amplifier using one or two beam power tubes to make a high powered rig. A lot of fun can be had with this little rig both as a mobile and a fixed station. I have worked coast to coast and border to border and had a 43 minute QSO with CO2TV with about half this power. Not much space is needed to set this transmitter up and it can be used by the ham in a trailer or/and apartment dweller.

The Receiver Problem

Now that we have the transmitter problem licked we must get to the receiver problem. Most medium and high priced receivers sold to the ham within the last few years have included a six meter band as an extra inducement to the future v-h-f man. These receivers usually are lacking in the necessary sensitivity to be useful on six meters. Some of the higher priced ones could be used by adding a low noise preamp, but if we are going that far we might as well build a converter at the beginning. That was my solution and a diagram of that converter is included here. The converter was built on a small chassis, 4x6x2, to match the transmitter. This converter has 3 tubes; a 6BH6



6-Meter Converter, top view.



Converter bottom view.

is used as an r.f. amplifier and one half of a 6U8 is used as the mixer while using the triode section is used as an oscillator. The 6C4 cathode follower will match most any receiver input. The oscillator uses one of the fifth overtone crystals sold by The International Crystal Manufacturing Company, Oklahoma City, Oklahoma. A 44 megacycle crystal is used (a 45 mc unit is shown in the photo) so that we can use the popular BC-455 as the variable I.F. receiver. With this combination I am able to hear anything anyone else can hear.

With a grid dip meter and a few simple tools you should be able to build this unit in one afternoon. The coil dope is included as a guide, you may have to experiment to get just the right frequency coverage. A super-duper converter is in the planning stage here for the serious six meter dx man and some work has been done on another transmitter using the fifth overtone crystals at 50 mc. While experimenting with these high frequency overtone crystals I've noticed less TVI than when using low frequency crystals and multiplying electrically to 50 mc., Undesired harmonic radiation from multiplier stages *can* cause TVI. I have been able to run up to about 30 watts on 50.1 mc. without any Channel 2 TVI. An excellent article on TVI and the six meter man appeared in the June and July issues of QST in 1954. Operation within the first 300 kc. of the band will reduce the danger of TVI in channel 2 territory. You *can* operate on six without TVI.

Antenna

A diagram of the antenna used here is shown. This antenna is straight forward in every way except the use of the delta match. This method of feed seems to get better reports from the other fellow's receiver than any of the other methods used. This antenna is 23 feet high and gets good reports from far and wide. A quarter wave vertical can be used for mobile operation. Another good antenna for mobile operation is the 'halo' that has enjoyed quite a bit of popularity for mobile operation on the two meter band in this section. I have heard quite a few mobile stations on six meters. W8INQ and W8SVU are mobile on six locally and work out fairly good.

I hope this helps you get going on six meters and I hope to work you. I'm sure you'll have fun.

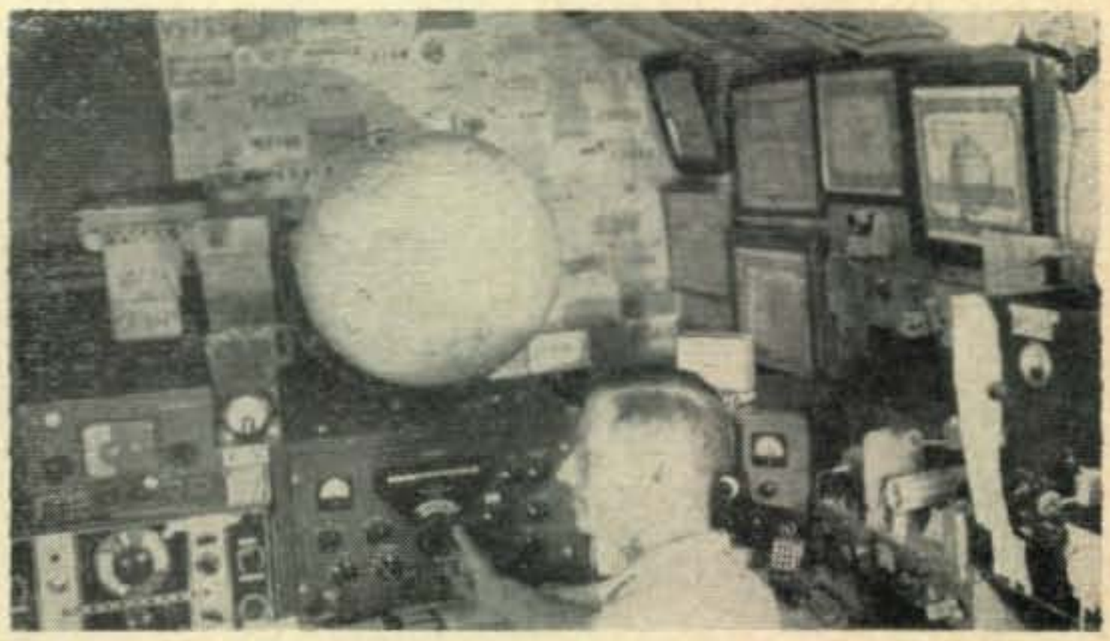
Shreveport Hamfest

On November 20, 1955, the Caravan Club of Louisiana is sponsoring a hamfest at Shreveport. Advance tickets $2.50 adults, $1 for children covering full luncheon and prizes. Write Sec'y, Caravan Club of La., 1521 Lash St., Shreveport, La.

Totah Hamfest: NW New Mexico

The Totah Amateur Radio Club of Farmington, New Mexico will hold its annual dinner and get-together all day November 6, 1955 at Farmington, New Mexico. Pre-registration including dinner is $2.50 each, and may be sent to Mr. Carl Black, W5POI, P. O. Box 783 or Mr. L. M. Norman, W5 CIN, 903 North Butler Ave., Farmington, New Mexico, must be postmarked prior to Nov. 1st. Watch for the CQ Signs upon entering Farmington. We will be expecting mobiles on 3980 kc. Planned activities and prizes to be announced later.

CQ World Globe



CQ World Globe at the shack of famous DXer W2QHH. See page 127.

AFC for RTTY

J. W. McKINLEY, KL7CK
604 12th St., Juneau, Alaska

This article describes a simple device, built from standard and readily available components, that will cure most of the ills of radioteletype reception resulting from drift. The problem of drifting oscillators (VFO, b.f.o., and h.f.o.) can be solved quite readily by the use of Automatic Frequency Control at the receiver.

With the rapid growth of RTTY in the amateur ranks, and the increase in QRM, an increase in the selectivity of receiving tone filters is a must. Add to this the need to use a VFO to dodge the aforementioned QRM and we find that we require an overall system stability beyond the capabilities of most of the equipment, however modern, now in use. Also, there is a trend, the FCC willing, for a lesser amount of shift than the 850 cycle shift now standard, to avoid selective fading. This will call for even more selective filters, the use of which will aggravate the drift problem. Most RTTY operators have discovered that stability and freedom from drift in the order of 50 to 100 cycles is almost impossible with even the most modern equipment. The best of receivers and VFO's at 7 Mc. and above have appreciable drift, and on the higher bands it grows progressively more acute.

Automatic Frequency Control, as dealt with in this article, is an electronic method of varying the b.f.o. of the receiver in such a manner that it will maintain the 2125 cycle marking tone within close enough tolerance to enable the printer to make solid copy. Range of adjustment is provided so that the device will keep control until the signal or receiver (or both) drift so far that upon losing control the signal will be out of the bandpass of the tone filters of the converter or terminal unit.

Method

Assuming that the FSK signal being received has an 850 cycle shift, the two tones coming out of the receiver are 2125 cycles (mark) and

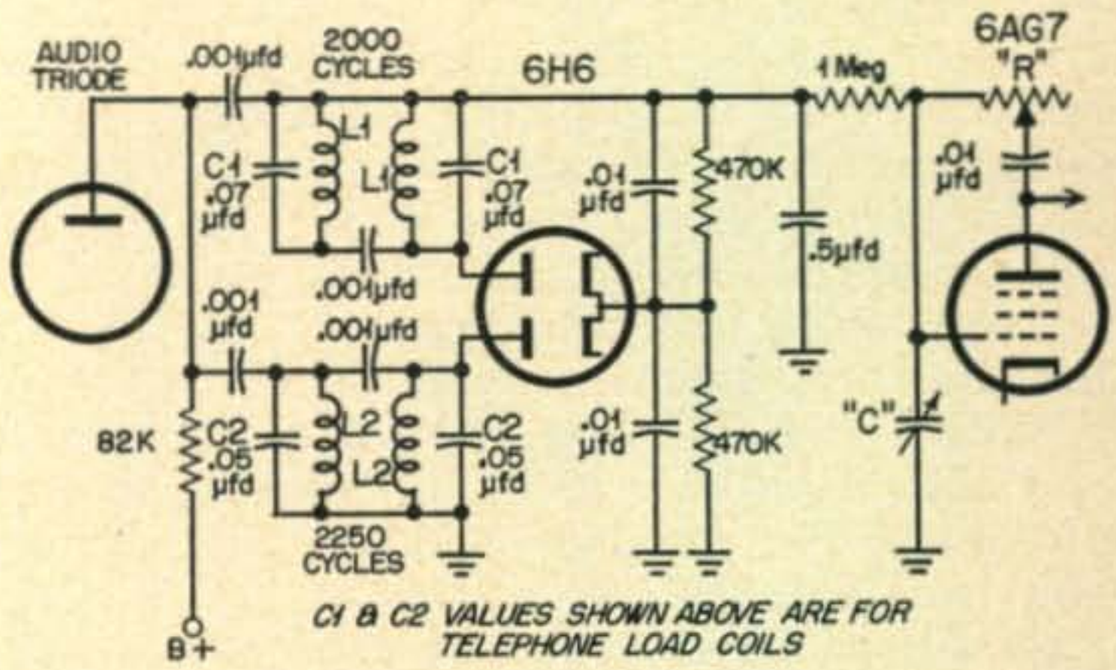


Fig. 1. A.F.C. Adoptor for Building into Receiver

2975 cycles (space), the standard audio tones to which the filters in most terminal units are tuned. Since 2125 cycles is "mark," it is the *resting* tone on radioteletype reception, therefore 2125 cycles is the logical choice for the frequency to be controlled.

If you are the kind of fellow who doesn't mind digging into an expensive communications receiver, this a-f-c unit can be built right in, using the audio amplifier and b.f.o. already in the set. *Fig. 1* shows the circuit of such a unit, consisting only of the discriminator and the reactance tube components.

If you would like to build this a-f-c unit as a separate and complete unit requiring a minimum of "operating" upon your pet superblooper, *Fig. 2* shows the whole schematic diagram. All you need do is feed audio in and couple the output of the controlled b.f.o. to your receiver intermediate frequency amplifier, or to the second detector, by the simple expedient of winding a wire around a tube pin. Power for the a-f-c unit can be "robbed" from most receivers without any strain or pain, in fact the larger receivers even provide a socket on the back for that purpose.

Construction

The complete unit is built on a 4" x 6" x 2" aluminum chassis. Exact placement of parts is not critical. A 2-conductor shielded cable (using the shield for ground) and an appropriate plug or terminal strip is needed to connect to the source of power. Most any value of plate voltage from 200 to 300 volts will be satisfactory. Small flexible co-ax or shielded wire is used for audio input and b-f-o output. None of the components are critical, except the choice of one tube type, resistor "R", and capacitor "C". Both of the latter are variable.

Circuit

Referring to *Fig. 2, V1* is the audio input amplifier and this can be most any triode type. A 6J5 is used in the author's model. *V1* amplifies the 2125 cycle tone obtained from the receiver output either from the 'phone jack or the output transformer; however, it is preferable to take it from the output of the 2125 cycle filter in the terminal unit. The terminal unit output will have most of the QRM and QRN filtered out and I highly recommend that it be used. (At KL7CK, connection is made to the lead to the indicating 'scope.) The output of the audio triode passes through a pair of tuned filters, one tuned 125 cycles *above* and the other 125 cycles *below* the 2125 cycle design center. The d-c voltage obtained from *V2*, the discriminator, varies plus or minus in approximate proportion to the amount the signal is detuned from 2125 cycles. This a-f-c voltage is applied to the grid of a 6AG7 *(V3)*, the reactance tube, which in turn controls the frequency of *V4*, a b.f.o. tuned to the i.f. of your receiver. As the received signal drifts up or down, the corrective voltage applied to the reactance tube shifts the b.f.o. to maintain the 2125 cycle tone. The b-f-o output is coupled to the receiver in place of the regular receiver b.f.o. which is turned off.

Discriminator

Output from the audio triode *V1* is fed into the two tuned filters *L1-C1* and *L2-C2*. The toroids in the author's unit were taken from telephone loading coils and are available from several sources (see Appendix). 50L6-type output transformers or small a-f chokes will do, if they can be tuned to the frequency with an approximate capacitance in the order of .01 to .1 μfd. as this will result in a fairly decent circuit Q.[1] Several TV components are available that would no doubt make fair filters. *L1* and *L2* should be mounted all components wired, and the tubes installed, before tuning. This will include all stray capacities, including the coupling capacities into and out of the filters. If toroids are used, they can be readily mounted on a bolt, as shown in *Fig. 3*. There is little mutual coupling between toroids so mounting them both on the same bolt (for each filter) does no harm; however, do NOT close the loop by mounting the retaining bolt on both ends with metal.

You will note from the schematic that the 2250 cycle filter, *L2-C2*, is grounded at the cold end, but the 2000 cycle filter is not, as it is the source of control voltage. The purpose of the .5 μfd. capacitor across the output of the discriminator load is to give a certain amount of delay so that the a.f.c. will hold on the 2125 cycle mark tone during the few milliseconds that the signal is on space while it is being keyed with teletype characters.

The values of *C1* and *C2* as shown in *Fig. 1* are only approximate and are for the particular coils used by the author. As explained in the "Adjustment" paragraphs, the actual value is arrived at by trial and error, paralleling capacitors. It is not recommended that paper or "disc" ceramic capacitors be used for this purpose. Use mica capacitors, by all means, and

[1]John Evans Williams, Double-Current Keying System for Radio & Carrier Current Transmission, CQ, November 1946, p. 18.

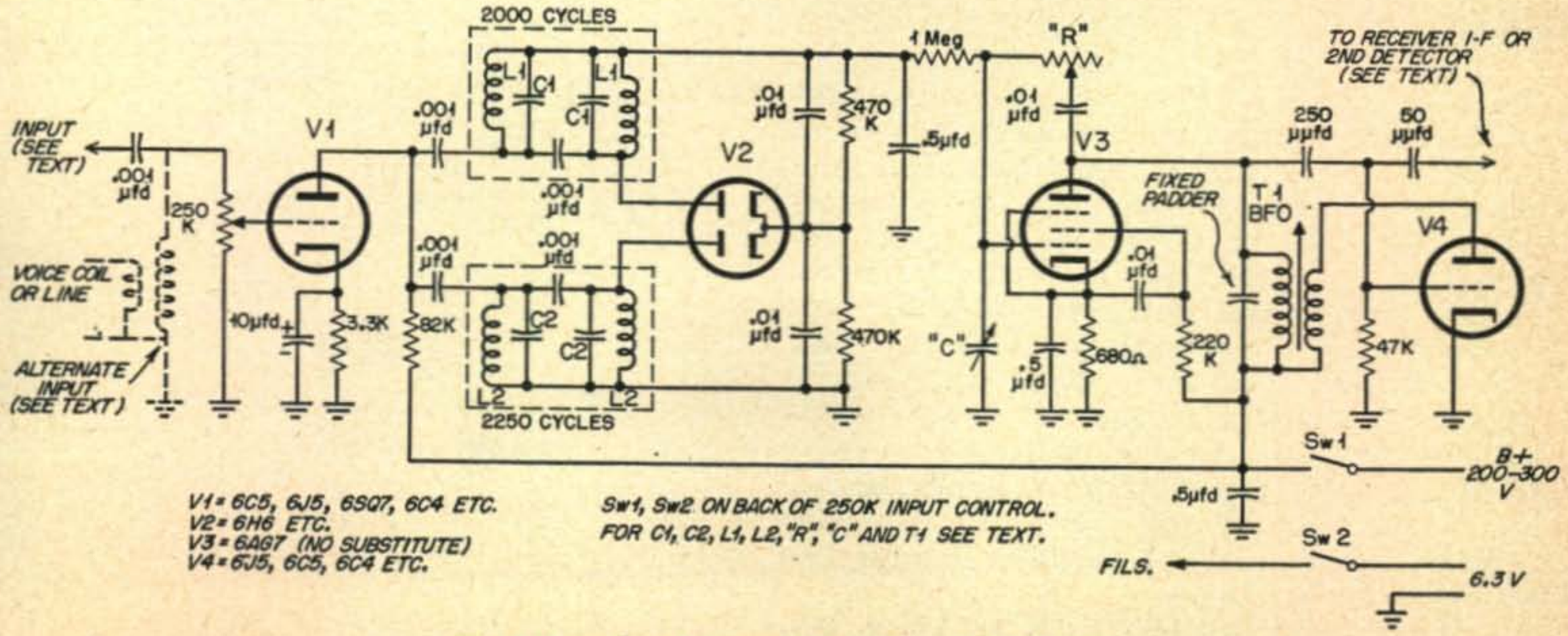


Fig. 2. Complete Schematic Diagram of A-F-C Unit

Via RTTY printer, direct from KL7CK: Here is the dope on ham activities— Licensed in 1933 as K7GSC Class A in 1934—Call changed to KL7CK when the territory of Alaska was assigned the KL prefix in the shuffle after the war— Then received KL7CK and the license with the granddaddy clause—Now it's just plain advanced class I guess—Started with sawed base 210 S— Graduated to 35T's and finally to 100TH's—Worked lots of 10 meter fone in the early 30's when band was wide open all day—Work some fone nowadays not too much—Can be found occasionally on 75, 40 or 20—Have been on RTTY for two years—Started with a Model 12 and purchased a Model 26 last year. Hold commercial radio licenses both radiotelephone and radiotelegraph. Usually can be found about 8:00 pm PST on 7140 or 7143 FSK.

silver micas if at all possible. Then you know the resonant frequencies of the discriminator will stay put.

Reactance Tube and B.F.O.

Now for a bit about reactance tubes. A reactance tube is not at all complicated but may be strange to those of you who have not worked with FM. It is merely a pentode connected in such a manner that it acts as a variable inductance or capacitance when placed across the LC circuit of an oscillator.[2] In this particular case it is connected as a variable inductance across the b-f-o tank, *T1*, and is controlled by the a-f-c voltage from the discriminator. In order for a tube to act as a reactance tube, several conditions must be met. The main consideration is that the tube must have an extremely high transconductance. The 6AG7 meets the requirements, and it is one of the very few that will. Don't substitute an ordinary r-f or a-f pentode or tetrode, as it just won't work.

The ability of the reactance tube to control the b.f.o. depends primarily upon the transconductance, which we have taken care of in the choice of the 6AG7 tube. Next, the relationship between "R" and "C" is of importance. Usually, the larger the value of "R" compared to $1/2\pi fC$, the more the b-f-o frequency will swing. Both "R" and "C" are variable over a restricted range in this unit and will give adequate control. "R" is a 1 megohm potentiometer, and "C" is a 50 $\mu\mu$fd. variable capacitor. A small air trimmer is satisfactory as only a few volts of d.c. appear across it.

The purpose of the 1 megohm resistor between the grid of the reactance tube and the discriminator load is to isolate the .5 μfd. capacitor from the b-f-o circuit, and yet allow application of the control voltage to the grid. Without this resistor it would be impossible to tune the b.f.o.

The Q of the b-f-o coil should be fairly good, as a certain amount of the ability of the reactance tube to perform depends upon the circuit Q, but most any good b-f-o transformer will do. Pick one that has a low value of padding capacitor across the coil as the larger this capacitor the less influence the a.f.c. will have; however, no padding at all could result in erratic operation of the a.f.c. A fixed-pad type with slug tuning will be the best type. A tapped-type of b-f-o coil normally used with a cathode-tapped oscillator will also do. Connect the cathode tap to B-plus, the bottom end to the b-f-o plate, and the "grid" wire to the b-f-o grid through a blocking capacitor of 250 $\mu\mu$fd. The 6AG7 plate then connects directly to the "grid" wire, receiving its plate voltage through the b-f-o coil. Of course, the grid of the b-f-o tube returns to ground through the 47K resistor.

Output of the b.f.o. is taken through a 50 $\mu\mu$fd. capacitor and may be applied to the receiver by placing it near an i-f transformer grid lead, or actually connecting it to the 2nd detector in the same manner as the regular b.f.o. of the receiver.

Adjustment

With no audio input to the a-f-c unit, turn on the b.f.o. in the *receiver*. Set it exactly as you have been using it for RTTY reception and tune the b.f.o. in the a-f-c unit to zero beat. Turn off the receiver b.f.o. and adjust the coupling of the a-f-c unit b.f.o. until you get about the same amount of injection as provided originally by the receiver b.f.o.

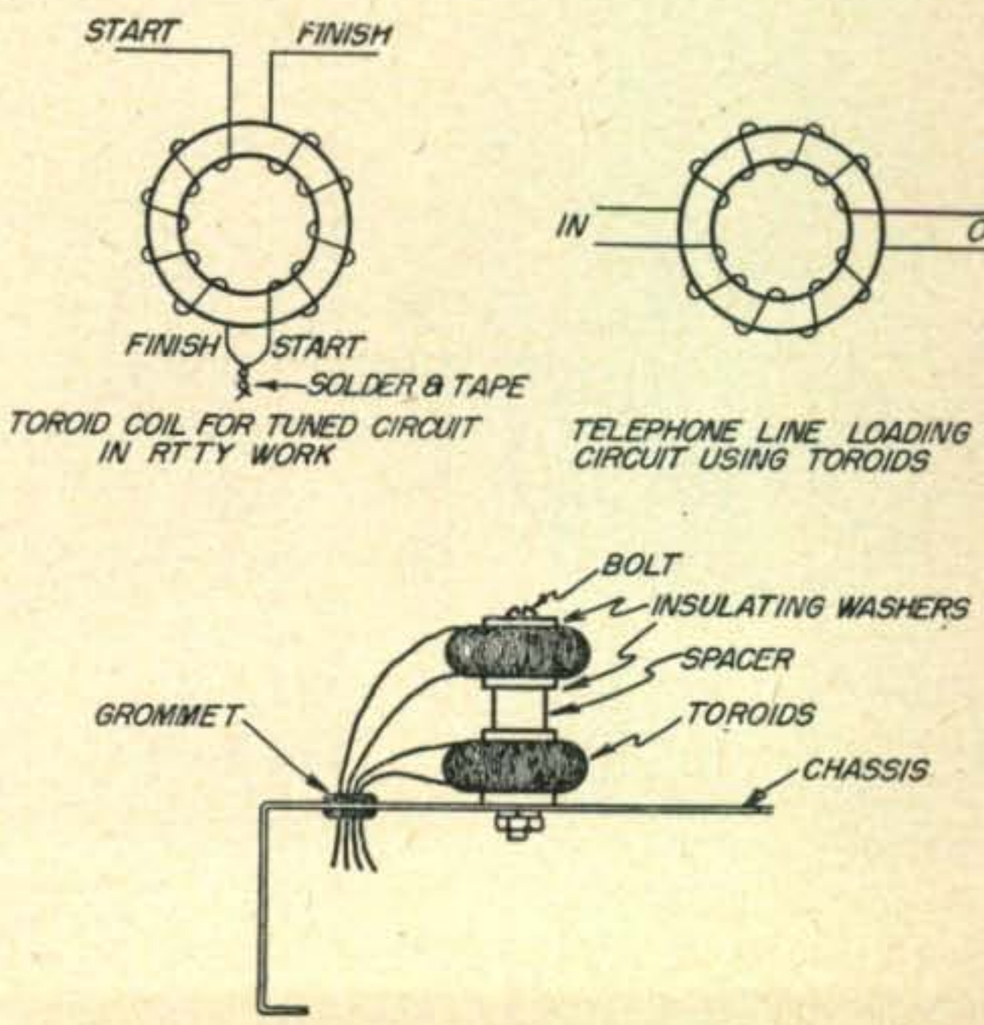


Fig. 3. Toroid Modification and Mounting

[2]Samuel Seely, Electron-tube Circuits, 1st Ed., p. 375, McGraw-Hill Book Co., 1950.

If a reasonably well calibrated audio oscillator, checked against your own terminal unit filters, and an oscilloscope are available, proceed with the tuning of the discriminator filters as follows:

Feed the output of the audio oscillator to the input of the a-f-c unit and connect the vertical input of the 'scope to the plate of *V2* that is fed from the 2000 cycle filter *L1-C1*. Set the audio oscillator to 2000 cycles and the internal sweep of the 'scope to some frequency that gives a nice picket-fence pattern. Tune the coils for maximum pattern height by adding capacitors. A capacitor substitution box would be a great help at this point. Move the 'scope lead to the other plate of *V2* that connects to *L2* and reset the audio oscillator to 2250 cycles. Now tune *L2* in the same manner.

Another way to use the oscilloscope to tune the filters is to hook the vertical input to the *L1* plate of *V2* and the horizontal input to the *L2* plate. You then tune the 2000 cycle filter for maximum height and the 2250 cycle filter for maximum width of the 'scope trace. 2125 cycles will then give a nice round circle. Any needed correction will be apparent as the circle will become egg shaped or lean toward the filter that is in need of some adjustment. For those who have an indicating device in their terminal unit, the center frequency should be adjusted to coincide with the 2125 cycle filter of that unit.

If you do not have an oscilloscope, it is possible to tune the discriminator filters with the aid of a good VTVM. Just connect the VTVM in place of the 'scope, as previously outlined, and tune for maximum a-c voltage on the meter.

Operation

Connect the input of the a-f-c unit to the signal source and you are in business. With a minimum setting of "C" and about half-scale on "R," good control should be realized. Accidentally turning "R" to minimum resistance will place "C" across the b-f-o tank (in series with the .01 μfd. blocking capacitor) and swish, away will go the b-f-o frequency. In actual operation, as the unit starts to lose control due to excessive drift, the beat note will warble and gurgle as the a.f.c. tries to maintain control, and it will give a sudden jump as control is lost. When control is lost, the beat note will jump several hundred cycles and the pattern on the tuning indicator of your terminal unit will show that the signal is out of the bandpass of the TU. Any time you wonder how well your a-f-c unit is working, just turn down its input control and hear how far the note jumps as control is lost.

The use of this a-f-c unit will permit the user to relax, make coffee, fill in the log, and write to radio magazine editors while the Teletype (or Kleinschmidt) machine pounds out solid copy.

Appendix

The toroids used by the author were from Western Electric telephone loading coils and may be obtained from the Graybar Electric Company, or from the following people:

Ralph R. Leland, W8DLT
118 Cambridge Blvd.
Pleasant Ridge, Michigan

M. W. Gates, c/o W6CG
5226 No. Wilmonte Ave.
Temple City, California

Harold A. Wade, W7HRC
3457 37th Ave. W.
Seattle 99, Washington

Edward E. Simmons, Jr., W6CLW
455 So. Oakland Ave.
Pasadena 5, California

Merrill W. Swan, W6AEE
3769 East Green St.
Pasadena 10, California

International Amateur Radiocommunication

The following recapitulation of the International Radio Regulations (Atlantic City, 1947) concerning communication between amateur stations and transmission of third party traffic by amateurs is published for the information and guidance of amateurs in the United States:

Article 42, Section 1. "Radiocommunications between amateur stations of different countries shall be forbidden if the administration of one of the countries concerned has notified that it objects to such radiocommunications." Information available as of September 1, 1955, indicates that Cambodia (FI8, XU), Indonesia (PK, YB-YH), Iran (EP-EQ), Korea (HL-HM), and Viet Nam (FI8, XV, 3W) have so notified. Amateur service has not yet been organized in Jordan (JY) and Roumania (YO-YR). **Laos (XW) and Thailand (HS) no longer prohibit amateur radiocommunication.**

Article 42, Section 2. "(1) When transmissions between amateur stations of different countries are permitted they must be made in plain language and must be limited to messages of a technical nature relating to tests and to remarks of a personal character for which, by reason of their unimportance, recourse to the public telecommunications service is not justified. It is absolutely forbidden for amateur stations to be used for transmitting international communications on behalf of third parties. (2) The preceding provisions may be modified by special arrangements between the countries concerned." Such arrangements permitting third party communications have been effected between the United States and the following countries only: Canada, Chile, Cuba, Ecuador, Liberia, and Peru. Only amateur stations identified by properly authorized call signs having a one- or two-letter prefix beginning with "W" or "K" are authorized by the United States, and third party communication is presently permissible with all such stations except those identified by prefixes KA2-KA9, inclusive.

A Report On HHØA And W6OXS/VP2 Operations

Bob Goldman, W6OXS
14608 Spinning Ave.
Gardena, California

For about six months we had been talking about a DXpedition. From the west coast it was a problem to find a spot rare enough to be worthwhile and still reachable in our vacation period.

We discussed many spots which were out of reach and finally decided that the Caribbean area was all that was available for us in the time we had.

As PZ had not been heard from recently, we thought Surinam might make a good spot for operations. A letter to the American Consulate at Paramaribo brought a nice reply telling us that permission to operate could very probably be obtained, and giving much information about local power conditions, etc., plus the names of several local hams we could contact for assistance.

However, in discussing the proposed trip with KV4AA over the air, St. Martins island was brought to our attention and the (at that time) possibility of separate country status for the two sides of the island. St. Martins being closer by many miles than Surinam, and a prospective new one, we decided to try for it. At that time PJ2MA had not yet shown up as the first to operate from the island. Letters to the French and Netherlands West Indies governments were sent via American Consulates and answers were received which dampened our spirits somewhat.

Lack of reciprocity of licensing* brought a firm negative from the French West Indies, and the ten year residence requirement for Netherlands West Indies licenses was a blow. We were also informed that no provision existed for temporary licensing.

Then George Herringa (PJ2AA) showed up on St. Martins as PJ2MA and word of the possibility of obtaining a PJ license was passed along to us. A letter was dispatched to George requesting assistance in obtaining the license for St. Martins operation and arrangements were also made to stop at Haiti because of the lack of CW activity there, in response to a kind invitation and offer of licensing from the HH authorities. At this time various ham equipment manufacturers were contacted for assistance in return for the advertising possibilities and we are sorry to say that although much interest was shown, no real help was forthcoming.

On June 11th we left Los Angeles in Sam's station wagon. Mobile gear had been installed by W6VUP in preparation for the trip. This consisted of an *Elmac AF-67* transmitter, an *Elmac PMR-6A* receiver and a *Master Mobile* base-loading remote control antenna. We also carried W6MUR's briefcase rig and a small emergency transmitter using a 6AG7 crystal oscillator and 6BQ6 final. Spare tubes, parts and tools were also taken.

The rear of the station wagon was fitted out for sleeping quarters and we drove across country in three days to Miami by alternating at the wheel and sleeping in the back. We managed to make it for almost the cost of the gas due to the thoughtfulness of the XYLs in providing a large box of food. We had a pretty good trip across country in general with many mobile contacts from W6VUP/6, /7, /5, and /4. Once trouble developed in the transmitter while we were operating in motion. The transmitter was pulled from its case, a faulty tube located and replaced, and the rig was put back in operation in just a few minutes—all without stopping the car. This by the way was the only case of trouble encountered in the equipment throughout a trip which included many grueling miles of driving and flying, with much tossing about by baggage handlers!

Schedules were maintained with W6SWG and W6JFJ all the way across the United States. At New Orleans we had a little car trouble and had to stay over for a few hours while new points were installed and the carburetor cleaned.

Upon arrival in Miami we contacted Chuck,

*Since U. S. refuses to grant permission for temporary operation in U. S. territories to any but U. S. and Canadian hams, several countries who normally extend courtesy licensing to foreign amateurs wishing to operate in their territories have refused to license U. S. hams.

W6OXS at key of KV4AA.

W4LVV. Chuck is very familiar with the Caribbean area and proved to be of much assistance to us. By the way, he had cards printed for both FG7XA and FG7XB but never received their logs so we carried the cards to KV4AA who sent them via ship to Guadaloupe. Chuck suggested we stop to see CM9AA for information concerning possibility of FG7 licensing so we left Miami for Havana via PAA, arriving there Wednesday evening, June 15th.

After these hurried arrangements, we arrived in Havana realizing we had not the slightest idea of how to get in touch with Phil (CM9AA). After chasing frantically around town we wound up at station CMQ-TV and there were able to find someone who knew Phil's telephone number. The heart-warming friendliness of the Cubans who assisted us in this was wonderful. When we called, we found to our disappointment that Phil was out of town. We were able to talk with Lilly, his XYL, who gave us much information about FG7 and the problems of obtaining licenses there. Lilly also informed us that FG7XA had gone to France. We left the next morning for Jamaica and there met Gordon, VP5FR.

Gordon gave us the rundown on local conditions and told us how to contact Stan Crow, VP5SC. We had a pleasant evening with Stan and his XYL and learned that very little activity can be expected from Jamaica at the present time. Stan also told us that he was leaving shortly for reassignment, around the early part of September, so VP5SC will no longer be heard, but Stan should show up again soon in some other DX spot.

By a strange coincidence, when we checked into our hotel we discovered that a friend from Los Angeles, Irv Lambrecht, had been registered but checked out the previous day. Later that same afternoon he returned from a trip across the island and we had a great time swapping stories and expressing our amazement at meeting in faraway Jamaica.

We went on to Port-au-Prince, Haiti where we were picked up at the airport by Reggie, HH2RM, and settled in a hotel. We met Herb and his father, Ricardo, HH2W and HH3W, who showed us the epitome of fine Haitian

DXpeditioner W6OXS (center) visits with Guy Nau, HH2GN (left), and Herb Widmaier, HH2W (right).

W6VUP at key of Haitian portable station HHØA.

hospitality, plus helping with our DX projects during our stay at HH-land. Ricardo is quite a photographer and they also have a commercial broadcast station in Port-au-Prince. We operated Herb's mobile rig from the top of a mountain behind town and had many nice QSOs. The designation HH7 is used in Haiti for mobile operation.

We were pleased to note that many of the contacts from HH were firsts for the fellows QSO'd. Apparently phone operation is favored by the HH hams, so we kept pretty much to CW operation. Herb then took us to meet Mr. Max Tiphaine of the government communications service who issued us our permission to operate our own station. We then appeared on the air as HHØA and made many more fine contacts. We had carried the *Elmac* gear, W6MUR's rig and the emergency portable in our suitcases and had been not a little worried about customs at the many places we had to pass through. However we had no trouble, though there were times when eyebrows were raised as the suitcases opened to reveal all of this equipment packed in a nest of clothing!

Almost all of the operation was on 14 Mc because of conditions, but a few 7 Mc QSOs were had. The first non-W station worked from HHØA was W6AFJ/VE2. W1HA, W2NUS, W3QT, W4LYV, W5ADZ, W6YMD, W7PHO, W8ZWX, W9WWJ and WØQVZ were first contacts in each U. S. district. Forty meters was almost impossible because of commercial QRM. Noisy conditions were also prevalent on forty during our stay.

For an antenna we used a semivertical dipole suspended from a convenient tree. Sam, barefoot and in shorts (the heat was terrific) tangled with some ants while stringing the skyhook. This resulted in a considerable acceleration of the project and the antenna was up in no time at all.

One evening while Sam was sleeping and W6OXS was operating the rig, a loud sneeze by Bob caused Sam to jump up in his sleep and in doing so he kicked the a-c power supply plug from the wall socket. HHØA left the air amidst shouting and confusion, but communications were soon restored. Apologies to the K6 station who was in contact at the time.

Another time, and we won't mention the station's call, the entire and very impressive transmission on this "W" operator's part was in French. Neither of us understands more than two or three words of French. But signal reports were exchanged and the QSO logged.

On our last evening in Haiti, the fellows had a party at the home of HH2PR and his gracious XYL. A good time was had by all and we met nearly all the active hams from the Port-au-Prince area. We were also able to visit Armand, HH2X, to see his fine setup. Armand keeps a receiver standing by on 14,285 kcs, and usually transmits on 14,310 kcs, if any are looking for a phone contact.

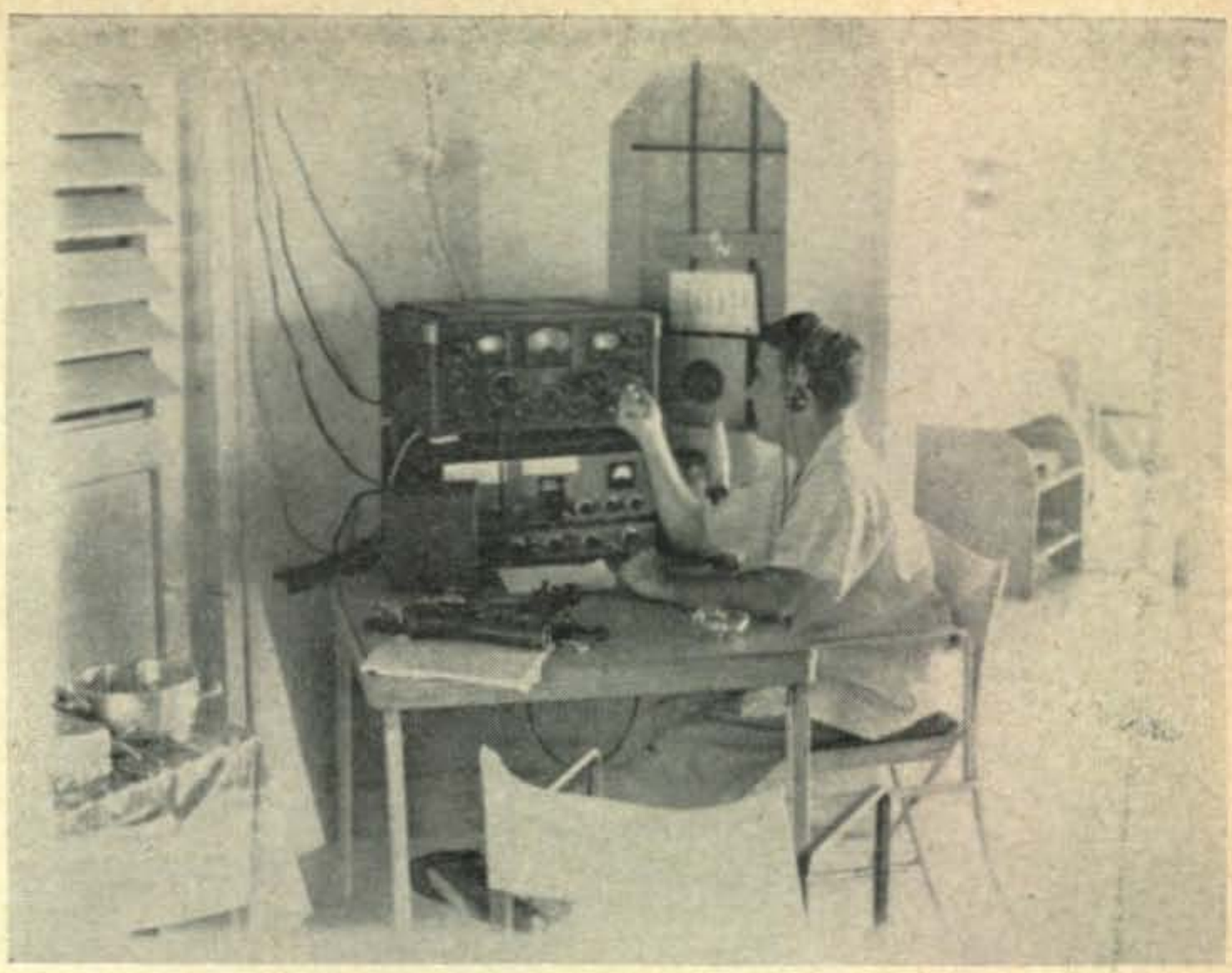
We received a letter from George while at Port-au-Prince and returned a cable formally stating our request for permission to operate from St. Martins. George had obtained the services of Mr. Heufke, of Aruba, in an attempt to modify the regulations that prevented the issuance of a license to us. Even though the license did not come through in time to allow us to operate from St. Martins we believe that the path has been cleared for future PJ2M-operation. George is due much credit for his efforts.

We managed to keep in touch with home while in Haiti through the help of W6MUR, W6SWG, KV4AA and many, many others. The help in getting traffic home was great and I wish it were possible to thank individually each of the amateurs involved.

We left HH-land on June 22nd, flying to San Juan, Puerto Rico, where we arrived that evening, tired and a little worried about our finances and time. First-off in San Juan was an encounter with the United States Public Health Service. We were requested to produce our vaccination certificates. We had left home in such a hurry that we had neglected to obtain them. So we received (ouch!) free vaccinations. A most welcome sight, and one which will never be forgotten, was Maurice, KP4JE, when he drove up to the airport, picked us up, and put us up for the night at his home.

From KP4JE we contacted KV4AA and learned that no further word had been received on the PJ license as yet. The next day we discovered that the information we had obtained in the states about commercial flights to St. Martins was incorrect and that it would be five days before the next plane left. Maurice drove us around trying to find a charter plane but with no luck.

So we flew on to St. Thomas and stayed with Dick (DX) Spenceley and his wonderful family for two days while waiting for news. Dick met us at the airport and during our stay introduced us to Danny Weil, skipper of the YASME,



Sam, W6VUP operating W6OXS/VP2 at QTH of VP2VA.

which he had sailed over from England single-handedly. Danny is going on around the world, and, through the efforts of KV4AA, has been issued a license, VP2VB, with which he plans to operate from many rare spots on his trip.

Dick also found a pilot who was willing to charter to fly us to St. Martins if the license came through. After waiting two days, keeping in communication with PJ2AA, Dick suggested, and we accepted, the kind invitation of Ivan, VP2VA, to visit him for a weekend "DXpedition." We went by boat to Tortola, British Virgin Islands (which count as Leewards) and met Syd, VP2VC, who has just recently moved up from Montserrat. Syd should appear on the air very soon. His present equipment is rather low-powered, running from batteries, but he hopes to improve the setup soon.

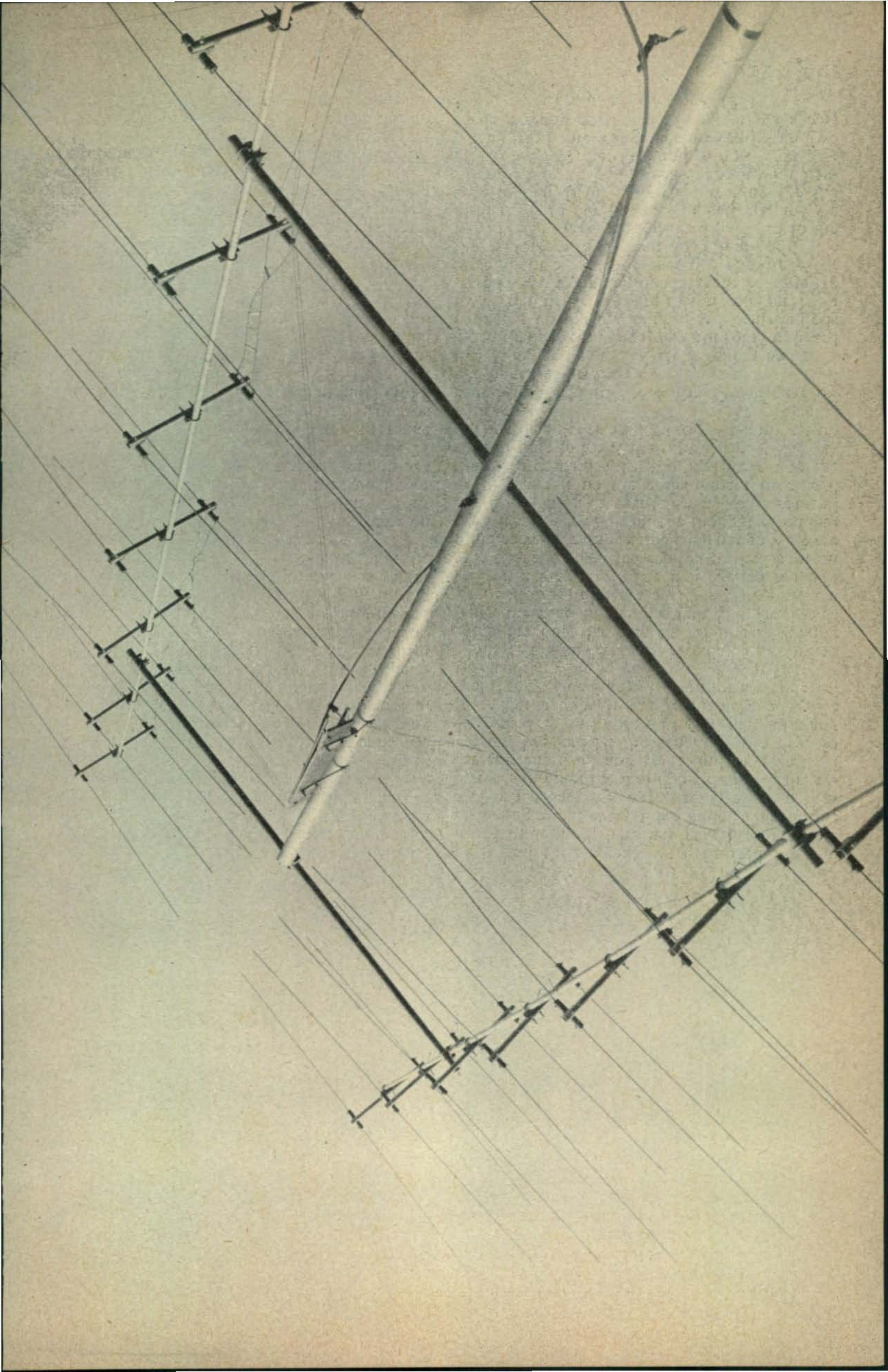
Ivan has a beautiful place at Mayacove on Tortola and it is an ideal ham location . . . far from any man-made noise and with plenty of space for antennas. The receiving conditions were very fine. We used his Viking I and SX-28 powered by a gas-driven generator to make over 300 contacts even though field day was in progress. We started operation at 2200 GMT Saturday and QSO'd with W8WJD. The last contact was with W4TFB at 0757 GMT Monday. Twenty-nine countries and twenty-nine states were contacted. Again very few 7 Mc QSOs. Firsts in the call areas were: W1OJR, K2GMO, W3QT, W4LYV, W5WZQ, W6AM, W7NMK, W8WJD, W9HUZ and WØQDF. First QSO other than W was TI2PZ, with G4CP a few minutes later. European signals were quite strong and many were worked. The few African stations contacted also had quite strong signals. No Asian stations were heard. First 7 Mc contacts were W3DUU and W2RHS. ZL1HY was QSO'd on 14 Mc for our first Oceania contact while FF8AC was first from Africa. TI2PZ and W1FH requested phone reports and their signals were listened for and heard quite well. The gas generator required re-fueling about every three hours. During one spell while Sam was operating at about a contact per minute, the dial lights dimmed, the receiver went dead and we found ourselves off the air. We had let the generator run dry. So we gassed up and were off again, making many more contacts with the fortunately adequate fuel supply. Our thanks to Ivan for a wonderful weekend.

We left VP2VA early Monday morning to catch the boat back to St. Thomas. Walking down the road to the car with Skipper, Ivan's dog, following along, we met a native with a bull on a long rope. The dog excited the bull who charged down the road at us, hell-bent on some early-morning homicide. Though we were tired from lack of sleep, the thought of ending our DXpedition in such circumstances spurred us to make it up the embankment in record time. No casualties, luckily, and we got to the boat in time to make the return trip.

Dick being very anxious to get Danny set up with gear on the YASME for the projected round-the-world trip took the *Elmac* gear off our hands at his own expense (and we should like to suggest that DX clubs taking an interest in this project which may put some unheard countries on the air, might send contributions to Dick in order to retire this investment). We were happy to lighten our baggage because we were about 50 pounds over our allowance for the trip from San Juan to Miami and this would have meant a good-sized payment to the airlines. With our finances in better shape we flew to San Juan, and while waiting for the Miami plane we had a pleasant visit with Beverly (KP4YX), her OM and jr. ops.

The trip home was rather uneventful and we made a really good trip in sixty hours across

[*Continued on page 127*]



V H F

Reported by Sam Harris, W1FZJ

P.O. Box 2502, Medfield, Mass.

Contests

I imagine it will be "snow plow time" before the fellows stop talking about last month's VHF contest. Reports from near and far indicate a turn-out rivaling the low frequency Sweepstakes contests.

As a member of the Waltham Amateur Radio Association, I once again (wearily) wended my way to Pack Manadnock. Complete (this time) with kilowatt two-meter transmitter, sixty-four element beam, four kilowatt light plant and son, Pat (soon to be W1???).

Can you imagine being on top of a mountain with a kilowatt, a 416-A grounded grid converter, a rotatable sixty-four element beam and the band wide open for five hundred or more miles in all directions? As Paul (W1PYM) was heard to say *"This is a contest?"*

In any event the two-meter section headed by Paul Day (W1PYM) and ably assisted by Southard (Sully) Lippincott (W1DDN), Don Upham (W1EOI), Me (W1FZJ), and Pat (W1???), managed a net of three hundred and thirty-four contacts with twenty-one ARRL sections.

Bob Guba (W1QMN) netted nineteen contacts and eight sections on two-twenty Mc; ten contacts and seven sections on four hundred thirty-two Mc.

The six-meter section handled by Bill Coburn (W1ELP), Dick Metz (W1YVB) and helped out by Sully (W1DDN) scored a hundred fifty-nine contacts in sixteen sections.

Grand total for the weekend, five hundred and fifty-one contacts in fifty-two sections for a score of 28,652.

As usual, the New Hampshire Forestry Department represented by Roy Finan provided us with able assistance in all departments from cooking utensils to tying knots in our guy ropes, (to say nothing of superintending a repair job on the front end of my Jeep).

While we were busy on The Pack trying to double our previous record club score, the rest of the boys were doing likewise. Notable among these were the "heard" scores of such single operator stations as W2BVU operating portable from Connecticut with a total score of just under 12,000 points. John had a section multiplier of fifty-two, twenty-one of which were garnered on two meters. Certainly a record-breaking effort for a single operator.

Tony (VE3DIR) turned in a single band score of one hundred and forty-nine contacts in fifteen sections for a new high in the Ontario section. He was closely followed by Ted (VE3BQN) with 130-13 and Les (VE3AIB) with 121-10.

In Western New York, Hank (W2UTH) scored a bang-up 147-23 using six and two meters for a probable win in his section. All in all a real bang-up contest.

Aurora

The use of aurora type propagation to pick up a few new states on the VHF bands has become common-place. The careful monitoring of the bands for evidence of aurora has not. Consequently many reasonably good auroral openings go by the board with no contacts being made. A TV set can afford a good indicator provided it can be left on continuously. W9WOK, for instance, continuously monitors a TV channel to the north of him. In addition to providing him with information on aurora and inversion conditions the proper operation of his transmitter is also indicated.

Another good indicator is an FM receiver. If a station to the East or West can be nulled on the side of a small parasitic array when the front of the array is pointing north, a good visual indication can be had by watching the fluctuations of the tuning eye. The distance of the FM station is of no importance as long as it is far enough away to allow good nulling on the side of the beam and is running a reasonable amount of power so that weak aurora can be detected.

Having discovered evidence of aurora it is not sufficient to point your beam north. Auroral signals will peak anywhere from due north to as much as thirty degrees or forty degrees off north, toward the stations you are hearing. Direction depending on the strength of the auroral disturbance and the distance to the station you are working as well as the direction he is beaming. Continual readjustment of the beam direction is often necessary even during a short contact, due to the rapid shift in distance of the auroral front.

Incidentally, the last opening I caught here netted contacts with **VE3AIB, W8KAY, VE3BQN, W3BGT, VE3DNX,** and **W8GGH.**

← **Looking from the bottom up on the big 64.**

← **Well known VHF stations of VE3AIB with XYL Iris (VE3DER) at the controls.**

The opening was very strong and in addition to working me, the majority of the foregoing also managed contacts with W1KCS and W1AJR in Rhode Island. Of course Ted (VE3BQN) as befits a holder of *The Order of the Bathtub Plug* pulled switches before the Rhode Islanders got on. *Isn't there some way we could add a "pulled switch cluster" to his already resplendent decoration?*

Visits

Visiting hams and their XYL's is always most enjoyable and we've done quite a little of such visiting. However, when the parents of the ham make you feel like one of the family, I say that's really going all out as far as hospitality is concerned. Most of the Moms and Dads have had just about enough of ham radio (having been raised with it). We recently met a pair of parents who outdid themselves (and their son too) by making us welcome in their home. This pair of "dan-dandandy" people are Mr. and Mrs. Sheppard, who belong to Tony (VE3DIR). Believe it or not we even got coffee in bed in the morning.

While I was looking over Tony's rig, recorder, tapes, etc., Mr. and Mrs. Sheppard entertained my XYL royally, just by making her feel at home. I understand that they took her on a very beautiful walk along Lake Ontario, pointed out objects of interest along the way and then brought her back to feed her more coffee. In between talks, walks, etc., we were fed more than is good for anybody, regardless of how hungry they may be. We were urged to stay at the Sheppard residence (or at least to come back) for dinner but unfortunately were unable to do so as we had to get started back to Medfield and the Rhododendron Swamps.

Before leaving Toronto we followed Tony (VE3DIR) around a bit. The first stop was at VE3BQN's QTH. Ted showed us his rig, antenna and some of the extra fine photographic work he has been doing. Very nice set-up, I must say.

From Ted's we were led to the VE3AIB and VE3DER's shack. Again pictures, chatter and good food were the topics of the day. (The cookies were a life-saver on the way home, Iris.)

Finally we tore ourselves away from Toronto and headed toward Lockport, New York. We were practically on the outskirts of Toronto when we became aware of a loud and raucous CQ, being blown on somebody's car horn. Up beside us pulls Les, poor fellow, with my XYL's purse, left at his house. (Women!!)

After a few hours of being lost in Hamilton, Ontario, Canada we arrived in Lockport at the QTH of W2ZOC and K2EPV, Bob and Lila. Another pair of very nice people who insisted on feeding us before we left. We stopped on our way to Toronto and let them lead us in and then stopped again on the way back home, bet they're glad we finally left. Each time we stopped we freshened up, rested and then on our way again.

Bob and Lila led us around Lockport, first to the QTH of Johnny (W2ORI) where we had to make a very quick visit as it was getting darker by the minute and I still wanted to get some photos of a couple of beams. Met Johnny's XYL, Helen, took a couple of fast pictures and then tailing Bob again, this time to W2ALR's shack. Johnny had phoned Larry to let him know we were on the way so he was waiting for us and again we made a couple of fast photos. We were sorry not to meet Larry's XYL, Pat, but had figured in Oakville that we'd be seeing her on the way home. As it happened we just didn't have time to go to the house and get acquainted with Pat. Bob and Lila started us off on our way to the New York Thruway and we finally started wending our weary way home, too late, unfortunately, to stop in Victor, New York, to see Hank (W2UTH) as we had promised.

Incidentally, the main reason for the trip to Toronto was to attend the tri-annual VHF

Ted Sparrow (VE3BQN) obviously enjoying a QSO.

Bob Fogle (W2ZOC); everything from teletype to Cheesecake. →

"DO" at Oakville. In addition to being fed a real good turkey dinner (a la Mildred and Norm at Riverside Lodge in Oakville) I got to meet and ragchew with all the gang who make VHF worthwhile in that neck of the woods.

Dink and Dotty (W8IJG and XYL) were there as were W8PER and W8PEV, the James Malone boys, complete with antennas. (I brought four of their sixteen element beams back with me to make my new 128 element array which I am now using.) Needless to say Helen and I had a wonderful time and hope to return soon.

Correspondence

Toronto, Canada: Iris (VE3DER) writes as follows anent the VHF "DO" at Oakville:

"On September 24th, in Oakville, Ontario, a group of VHFers from Ontario and Western New York, joined forces in their tri-annual meeting held the Saturday following each VHF contest.

"A turkey dinner was called for 6:00 P.M. and fifty-two sat down to honor our speaker W1FJZ and XYL, Helen. In the group represented at dinner were sixteen XYL's from W2, W3, and VE3 land. Three of the XYL's have their own call; namely K2EPV from Lockport, New York, VE3DDA from Brantford, Ontario, and VE3DER from Toronto. Over and above this number were twenty-one W2's, two W3's and three W8's, and of course W1FZJ.

"Around 8:30 we all adjourned to the High School Auditorium, which the Oakville Club had kindly hired for our use. It was there that our number grew to one hundred and thirteen. Of the overall group, inclusive of those at the dinner, there were forty-four W2's; sixty VE3's; four W8's; three W3's, and two W1's.

"The meeting commenced with general welcome, and a post mortem on the September contest. Then VE3DIR demonstrated what can be heard from his QTH, via tape recordings. He concluded his demonstration with a QSO with W1FZJ/1 at New Hampshire. This led to the introduction of Sam, who spoke to the group about the VHF picture as seen from New England. The talk was followed by questions from the audience.

"At approximately 10:00 P.M. we adjourned back to Riverside Lodge for a 'Stomp, Fish fry, Curlew, and Soiree' (so titled by our good M.C., VE3HW).

"Then followed the best ragchewing that this writer has witnessed. All to whom I had the chance to chat, remarked that this feature was one thing ALL Hams are able to partake to the fullest of our ability.

"Due to the usual kindness and ability of Mildred (VE3BGI) and OM., Norm (VE3AGW) the dinner and rag-chewing at their 'Riverside Lodge' was the very best."

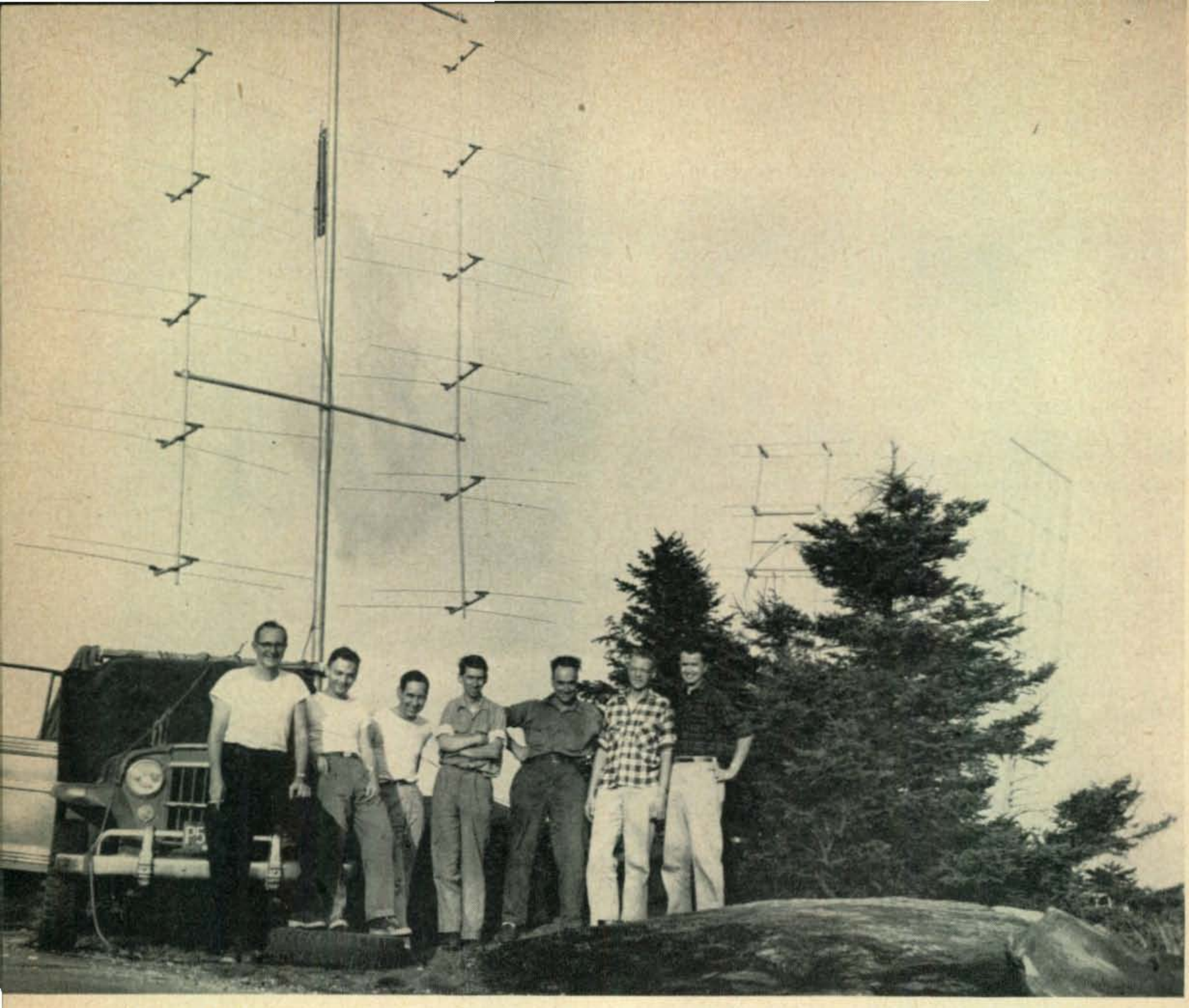
Landale, Alabama: A "newsy" note from Harold (W4VUO) says:

"The Atlanta area boys are having a weekly QSO party on Monday nite, 2000 EST. Frequency 145.350 with eventual establishment of an Atlanta, Georgia net, (Everybody welcome), turnouts of almost all of the East Alabama and Western Georgia two meter operators participating. Spark plug of the net is W4GIS, Larry, at East Point, Georgia. Incidentally the frequency 145.350 is also the Alabama emergency net two-meter frequency. So a CQ. on that frequency will bring results most any night.

Equipment-wise my station remains the same thirty watts with a sixteen element colinear

S.S.W. Contest Scores for August

Station	States	Contacts	Final Score
W1AQE	8	296	9,472
WN1DDN	3	254	6,604
W1RFU	14	154	6,160
W1PYM	6	58	1,508
W2WFB	6	620	22,320
K2APS	10	142	5,112
K2GLS	2	42	840
W3TDF	15	148	6,068
W4HJO	9	370	12,580
W4WNH	7	186	5,580
W4VUO	3	76	1,672
W9KLD/4	1	6	60
W5HEZ (July)	3	96	2,112
W5HEZ (Aug)	3	132	2,904
K6KCI	1	488	4,880
W6LBO	1	350	3,500
W7QDJ	1	6	**32**
W8LAH	11	478	15,298
W8HOH	8	450	14,400
W9KLD	5	96	2,496
WØRSP	6	142	852
VE3DIR	10	174	6,438



The W.A.R.A. gang assembled in front of the two-meter set up on Pack Manadnock. L. to R.—Bill Coburn, Southard Lippincott, Dick Metz, Paul Day, Forestry Ranger Roy Finan, Don Upham.

ready to erect this week, also the 829B final is nearing completion.

Six-meter operation is now in the drawing board stage and by mid-winter the following plan activity on six meters. W4EQM, W4EW, W4FEC and W4VUO."

Good to hear that the boys are getting ready for six-meters. Hope to be there soon myself. Be looking for the two-meter gang on Monday nights, too, from now on in.

Ithaca, New York: From Walt Bain (W2WFB) the following:

(First the skeds he keeps which are in the sked list) "Am looking for skeds to either the Cleveland or Detroit areas both a.m. and p.m. on CW."

Come on fellows, don't let Walt down, I just can't move back to the Cleveland area at the present time.

Bedford, Massachusetts: Steve Morris (W1AQE) says:

"Here is score for August SSW contest, not good, could be better, but flood traffic on seventy-five meters cut seven days activity out. Hi!

We'll excuse it this time, Steve, be sure to have this good an excuse any other time it happens.

That Wn3PBZ could have been good multiplier Sam, but heard weak carrier on peaks while Chick was working you. That 64EI sure must be the answer; you got to hear them at least."

Toronto, Canada: From our close neighbor *and friend, we hope,* Tony, VE3DIR.

"I haven't got Maryland or North Carolina yet for SSW. *Where are you boys?* I liked the column and the whole magazine this month, I don't think the circulation manager will have too much trouble if the calibre stays like that. A classic remark from an O.T. was "Best since the old *Radio* days."

"Total states now twenty-two."

Thanks, Tony, everyone is working hard on the "Bigger and Better CQ."

Dayton, Ohio: Whitey (W8HOH) has this to say:

"The equipment here is a pair of 4125A's, six hundred watts, twenty-four element Finco an-

tenna seventy-five feet high. The converter used for this was 417A-417A-404A into Super-Pro." *Sounds good to us, Whitey.*

Portland, Oregon: Joe Bean (W7VBH) reports that:

"We have some good two-meter men here in Portland. The one outstanding is Len (W7JIP) of 10,000 Mc fame. His gear is professional-looking inside and out and works as good as it looks.

It just aint Possible, or if it is then that's one Ham Shack that is a must to be visited.

His present two-meter rig has a pair of HK54's in the final that really handle four hundred watts efficiently, it's a rehash of an early *CQ* circuit. His latest converter utilizes a single WE416A, silver-plated coils and has a noise figure of 3. His noise generator is something to see and use. The 5722 and immediate components are in a small minibox on the end of a cable so one can use it as a probe as well as connecting it directly to the antenna fitting. A switch in this same box changes the matching impedance through 52 to 300 ohms. A slope-faced cabinet houses the power sources, rheostat and meters. One meter is the mils in and the other is DB's out. It's really a compact and beautiful piece of gear.

Let's hear from you, Len.

My gear is of the '55 Handbook or surplus order. An ARC-5 that is rehashed and covers six, two and two-twenty. For 432 we use a 6524 tripler into a 5894A final. There soon will be four of us on with this set-up. I strayed from the beaten path on my 432 converter and got a pleasant surprise. Made up the two r-f sections as per *QST* for March '54 and used W5NSJ's crystal mixer with L.O. input loop scaled to 5/16" and the injection loop to 1 1/16" one leg and 31/64" the other. Used *QST* for January '54 for the oscillator train with the exception of the last doubler which is a copy of G.E. Ham News reworked by Ralph, W7OKU. The converter when completely finished worked on the first try and has a noise figure of six. Am building new r-f sections with 6BC4's to try for a lower noise figure. Would appreciate any comments or hints on bettering this."

Now this is the kind of information we like to get, Thanks Joe, for the long letter.

Skeds

W2WFB—Ithaca, New York—144.060 to K2HBL—Niagara Falls, N. Y. 144.180 (Phone) 1930 EDT
W2WFB—Ithaca, N. Y., to W2PV—Albany, N. Y. 144.195 (Phone) 0750 EDT
W2WFB—Ithaca, N. Y. to K2EPV—Lockport, N. Y. 144.140 0800 EDT
W8HOH—Dayton, Ohio to W2SYU—Rochester, N. Y. 0700 EST (Sunday)
W2ALR—Lockport, N. Y. to W8RMH—Detroit, Mich. 144.040 144.050 2145 EDST
W4WNH—Elizabethtown, Ky. 144.128 looking for morning skeds
Fort Worth—Dallas 6 meter net 50.550 Mc. 1900 CST Every Tuesday
Eastern Alabama—West Georgia 145.350 calling freq. Monday night net at 2000 EST

Morristown, New Jersey: Bob (K2GLS) sez:

"I didn't do as well this time in the SSW contest as the first time because of the two witches, Connie and Diane. They tried to take my vertical and use it for a broomstick.

Hope it's all fixed up again Bob, sorry it came down.

"Also near the end of the month my AM. rig started to emit FM. in large amounts. I am trying to get a 522 so if I get it I will probably do better this month."

Dallas, Texas: From Bruno Norkus (W5ZUL):

"At present the net is called Fort Worth-Dallas six-meter Net due to more hams from Fort Worth. If Dallas hams become the majority, then we will call it "Dallas-Fort Worth six-meter Net."

Eleven stations answered roll call at the first meeting, W5ZTE, W5ZUL, K5BEL, K5AUN, K5BLP, W5HES, W5FCF, K5BDD, W5FRK, W5YBZ, W5FTH, W5VLR, W5VNU, W5JXU, W5BHJ, W5GEH, W5CNJ, W5HSC, W5IZX, W5KVC, W5YUO, W5URI, W5AVA, and K5AVF are all stations in the net. Net Frequency is 50.550 Mc, with two crystal-controlled receivers monitoring frequency. Net

2-Meter operating position from top of the Pack. 416A pre-selector can be seen on top of NC-240D.

meets every Tuesday at 1900 CST. The following stations also operate mobile: W5ZTE, W5ZUL, W5FRK, W5VLR, and W5VNU."

This is good news, Bruno, I'm sure the boys will be glad to get it.

Glen Ellyn, Illinois: Jerry Kleker (W9QXP) came across with some news too:

"The band was open to the southwest this morning (August 30, 1955) and heard W5HXK in Watonga, Oklahoma, very weakly but then conditions changed and only heard meteor activity, indicating he was still on the air. W5HXK operates on a frequency of 144.009 Mc and is located in western Oklahoma. He is just slightly under eight hundred miles from Chicago, a pretty good haul. We have quite a few openings to the southwest and imagine it won't be too long before we're able to contact him. I'm sure we should be able to work some of the fellows over East this fall DX season if it's anything like it has been in past years. Please pass the word along that there is somebody on out here and we are alookin' awful hard in your direction."

We're practically blind from lookin' Jerry, but we're still at it.

Olympia, Washington: Walt Jacobs (W7PVZ):

"Thought you might be interested in the activities of the VHF boys located out here in Oregon and Washington."

But definitely.

About the biggest event out here was our annual VHF picnic. There were a few stations from up north in British Columbia, as well as a good number of hams from Oregon and a few from our own Eastern section of the state. Counting family and other close friends the group came to well over a hundred. I'll send some pictures.

Good!

W7JIP brought his new crystal controlled converter to the picnic. The rig is built around the WE416-B with air-cooling and all. Len claims the noise figure to be somewheres in the one or two db range. Sam, this guy is one end of the present 10,000 Mc world record contact, and he builds the most bee-u-ti-ful gear you could ever see, everything is silverplated, even those little Erie tubular condensers.

Wonder if the Ed. would send us up around Washington to gather up some news. This is the second letter about Len's wonderful building. (This includes me, Wayne. Signed, Helen.)

Chicago, Illinois: Kenneth Bell (WN9OKB) tells us:

"I have just returned to the home QTH from a three month stay in Southern California (business). I have a 'Gonsetcator' which I use mobile and fixed. Also have a six-element beam and a portable tower which fastens to my auto.

While on the coast I operated mobile from the tops of Mt. Wilson, Mt. Palomar, Mt. Soledad, and Mt. Laguna. Found the West coast gang really friendly and had a fine time.

My job is going to bring me out to the East coast in the near future. I'm going to be living on the summit of Mt. Washington, New Hampshire, for a total of about seven weeks. I hope to be operating from 6300 feet as much as possible. The winds and icing conditions are extremely severe and the antenna will have to be inside most of the time. I'll be up there on the following dates—August 31st to September 6th and from September 26th thru November 22nd. Will be on the air quite a bit and at all hours. Hope to provide a little DX for the fellows and sure am looking forward to talking to the gang.

If anyone is interested in schedules drop me a card at following address: Kenneth R. Bell—Cook Electric Co., Aeronautical Icing Research Lab, Box 535, Gorham, New Hampshire. Will be using Phone and modulated CW."

Too late for early September period Ken, but we've spread the news by word of mouth to the best of our ability. Hope the boys keep you busy.

California: We've heard of a planned International Relay to rival the Trans-Con relay staged last year. Don (W6MMU) president of the "Two-meter and Down Club," hopes to originate a message in Mexico and through the help of the hams up and down the coast, relay this message clear to British Columbia on two-meters. The date will coincide with The VHF field day in September. Another activity will be the presentation of a "Horace A. Bodine Trophy" (the late W6LJO) to the best distance contact on 220 Mc, 420 Mc and above. The cup will be presented four times a year and any ham winning three times will receive a permanent trophy. One catch though, you have to be a member of the club to cash in.

Painesville, Ohio: Bill Richardson (W8SLE):

"From one Ohioan to another may I congratulate you on your new job, *(Thank you)* and I suppose you were Johnny-on-the-spot when the band opened tonight (August 22). Here on six-meters I was able to pick up W1, W9, WØ, VE1 and VE3 on my VHF-152. I have a Harvey-Wells transmitter that is just about giving me fits, I can't get it to work right on six at all. Wondering if you know of any hams using it on six that I might contact?"

Come on gang, let's give Bill all kinds of advice.

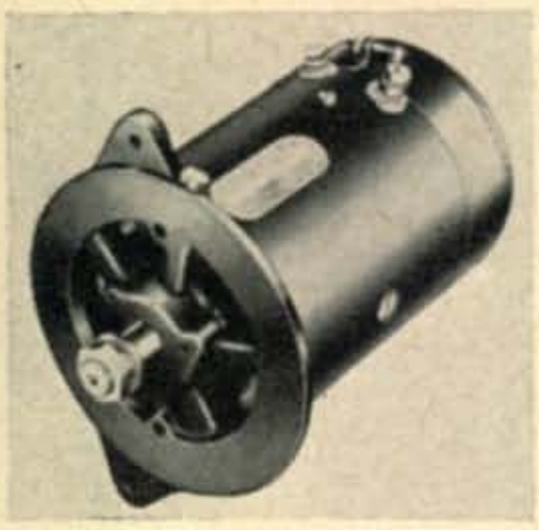
San Antonio, Texas: T. H. Lang (W5GL):

"Activity is increasing on both six and two meters here in San Antonio. We now have a

[*Continued on page 104*]

NEW PRODUCTS

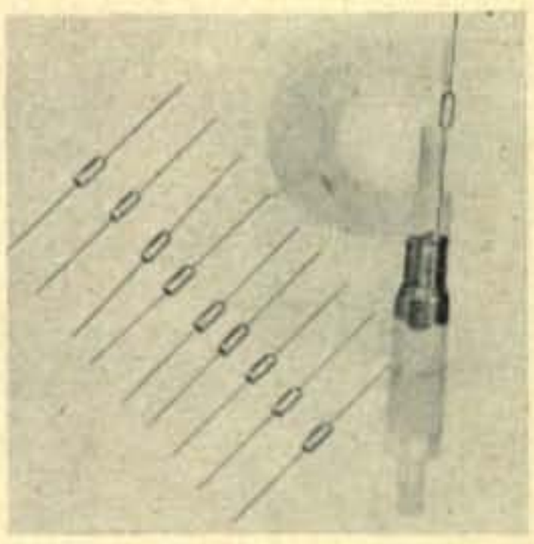
Ever had a yen to run 110-volt equipment in the family car? Perhaps a receiver, an electric razor, or maybe just an ordinary ol' electric light bulb? Pretty tough to do on 6 or 12 volts. This ATR Inverter is designed to convert 6 or 12 volts to 110-115 volts, 60 cycles. Various models are available in wattage ratings up to 125. All fixed up with a pretty handle, this little gadget is ready to be clipped to the battery terminals. The ATR people are on the *qui vive* to send you catalog sheet 254A which gives all the pertinent facts about this inverter. Write to American Television & Radio Co., St. Paul, Minnesota for the real word. You might also ask them about their dandy battery chargers and heavy-duty vibrators!



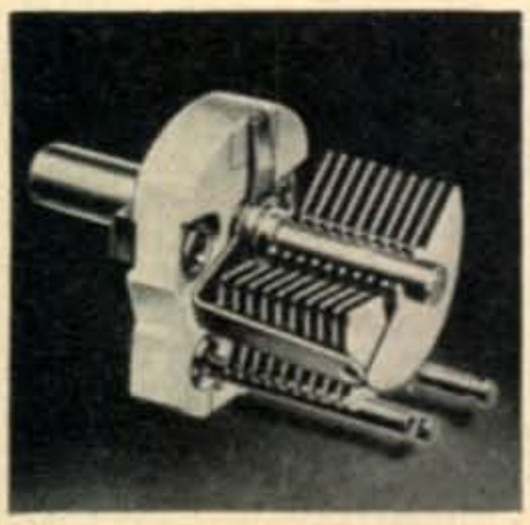
Here's the cure for that ampere-hungry mobile rig of yours. The Electric Auto-Lite people are now marketing a new high output generator which has a maximum normal output of 50 amperes. A foxy, new temperature - compensated current limiting regulator allows output in excess of 60 amperes in cold weather. The units are available with two sizes of pulleys—one for city operation and one for highway operation. The "city" pulley will allow 10 amperes at idling speed, and full output at 20 m.p.h. and above—just the ticket for that new mobile job. Full dope may be obtained from the Electric Auto-Lite Co., Toledo 1, Ohio.

So you don't want to drill a hole in that Cadillac to mount your mobile whip? You are certainly hard to please. However, the Vaaro Division of Davis Electronics will pamper you with their classy bumper mount which is engineered to fit in the place of a bumper mount—the ordinary type, that is. This special jigger *looks* like a regular bumper mount, but it has an insulated mounting for a ham antenna! Isn't that sneaky? A special insert is supplied that is trimmed to fit your car. This unit, plus that new Vaaro all-band whip will really put you in the mobile business with a bang. Davis Electronics, Box 1247, Burbank, Calif. are the manufacturers.

The gents at Chicago Transformer are now grinding out the BO-13 Ultra-linear High fidelity output transformer. If you are a "golden ear" between QSO's, hearken to this: Using the ultra-linear circuit, a full 20 watts is available over the range of 20 to 45,000 cycles, with an intermodulation distortion level of less than 3%. Total harmonic distortion is below 0.1% up to the twenty watt level. Sealed in steel, this transformer and one of Dizzy Gillespie's latest records on your hi-fi is guaranteed to bring the cops to your door in 20 seconds flat. The new Chitran catalog has all the dope on this and other fine transformer products. For a copy of this catalog, write to Chicago Standard Transformer Corp., 3501 West Addison St., Chicago 18, Ill.



You see these pee-wees? They are (believe it or not) electrolytic capacitors! Yes, only ⅛" diameter and 5/16" long, these new Cornell-Dubilier Tantalum units have capacity values between 1 and 8 microfarads at working voltages of 4 to 16 volts. Their small size makes them well suited for printed circuits, transistorized equipment and other services where compactness is of the greatest importance. Low leakage and long life are an important part of the bargain, and the amateur wishing the best of components would do well to look into these and other C-D products. QTH for complete dope: Cornell-Dubilier Electric Corp., South Plainfield, N.J.



Tired of soldering shafts on those itty-bitty war surplus condensers with the screw-driver heads? Your humble servant was amazed when he walked into the local radio emporium and found out that the Hammarlund outfit is making the world-famous APC trimmers with extended shafts. This was almost too good to be true! So into the trash can went all the war-weary condensers, their place taken by the little beauty in the photograph. A miniaturized version of the APC is named the MAPC, and is also available for a modest sum. Who makes 'em? Hammarlund Mfg. Co., 460 West 34th St., New York 1, N.Y.

The new Millen 90672 Antenna Bridge is designed to measure impedances in the range of 5 to 500 ohms at frequencies up to 200 Mc. Employing a special precision differential variable capacitor, the Antenna Bridge is capable of high accuracy over an extremely wide range of frequencies. Know what the SWR is on your transmission line? No? Better check it—maybe you are a cloud-warmer instead of a DX-getter! By means of the Antenna Bridge, the minimum SWR may be obtained on the radiation system at all frequencies. Manufactured by James Millen Mfg. Co., Malden, Mass.

[*Continued on page 104*]

ALL TIMES IN EST

EASTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Northern & Central Europe	0830-1200 (1) * 0800-0930 (2-3) 0930-1200 (3-4) 1200-1330 (2-3)	0600-1400 (3-4) 1400-1700 (2-3)	1530-1700 (2-3) 1700-2100 (3-4) 2100-0400 (2)	1700-0230 (3)
Southern Europe & North Africa	0900-1300 (1-2)* 0700-1000 (2-3) 1000-1300 (3-4) 1300-1430 (2-3)	0600-1430 (3-4) 1430-1730 (2-3)	1600-1730 (2-3) 1730-2000 (3-4) 2000-0230 (3)	1800-0200 (3)
Near & Middle East	0800-1030 (1) * 0730-1130 (2-3)	0530-1100 (1-2) 1100-1300 (2-3) 1300-1800 (1-2)	1730-2230 (2)	1830-2200 (1)
Central & South Africa	0800-1200 (1-2)* 1200-1500 (2-3)* 0730-1400 (2) 1400-1630 (3-4)	0200-1300 (1) 1300-1500 (1-2) 1500-1800 (2-3)	1730-0100 (2-3)	1900-2300 (1-2)
South America	0800-1400 (2-3)* 1400-1600 (3-4)* 0700-1500 (3) 1500-1630 (4) 1630-1730 (1-2)	0630-1500 (2-3) 1500-1730 (4) 1730-0200 (2-3)	1800-0500 (3-4) 0500-0730 (2-3)	1930-0400 (2)
South East Asia	NIL	0700-1000 (1) 1600-2000 (1)	0300-0700 (0-1)	NIL
Australasia	1600-1800 (1) * 1000-1200 (1) 1500-1900 (2-3)	0630-0930 (2) 1200-1800 (0-1) 1800-2200 (2)	0100-0800 (2-3)	0300-0700 (2)
Guam & Pacific	1530-1800 (1-2)	0630-1000 (2) 1530-1830 (1) 1830-2000 (2)	0000-0700 (3)	0100-0530 (2)
Japan, Okinawa & Far East	1630-1800 (1)	0630-0900 (1-2) 1600-1900 (1)	0200-0700 (1)	0200-0600 (0-1)

ALL TIMES IN CST

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Western & Central Europe	0900-1200 (1) * 0730-1130 (2-3)	0630-1330 (3) 1330-1530 (1-2)	1600-1830 (3) 1830-0330 (2)	1730-0130 (2-3)
Southern Europe & North Africa	0900-1200 (2-3)* 0700-1000 (2-3) 1000-1230 (3-4) 1230-1330 (1-2)	0600-1330 (3-4) 1330-1600 (2)	1600-2000 (3-4) 2000-0100 (2)	1730-0100 (2-3)
Central & South Africa	0700-1400 (2-3)* 0630-1330 (2) 1330-1530 (2-3)	0000-1230 (1) 1230-1430 (1-2) 1430-1800 (2-3)	1700-0000 (3)	1830-2200 (2)
Central America & Northern S. America	0900-1400 (2-3)* 0700-1400 (3-4) 1400-1530 (4-5) 1530-1700 (2)	0600-0900 (3-4) 0900-1500 (2-3) 1500-1800 (4) 1800-0230 (1-2)	1800-0600 (4)	1900-0430 (3-4)
South America	0900-1500 (3-4)* 0630-1430 (2-3) 1430-1530 (3-4) 1530-1700 (2)	0600-1500 (2-3) 1500-1900 (3-4) 1900-0200 (1-2)	1800-0530 (3-4)	1900-0500 (2-3)
Japan, Okinawa & Far East	1500-1800 (2)	0700-0900 (1) 1500-1700 (1) 1700-2000 (2)	0100-0800 (1-2)	0200-0600 (1)

ALL TIMES IN CST

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
South East Asia	1500-1830 (1)	0700-0900 (1) 1500-2000 (1)	0200-0600 (1)	NIL
Hawaii	1300-1700 (2-3)* 1100-1900 (3-4)	0930-1130 (2-3) 1130-1800 (1-2) 1800-2030 (2-3)	2100-0300 (3-4) 0300-0800 (2-3)	2200-0630 (3)
Australasia	1600-1900 (1) * 0900-1100 (1) 1400-2000 (2-3)	0700-1130 (2) 1130-1730 (1) 1730-2100 (2-3)	0200-0800 (3)	0300-0700 (2)

ALL TIMES IN PST

WESTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Europe & North Africa	0730-1030 (1-2)	0600-1300 (1-2)	1600-0000 (1-2)	1800-2230 (1)
Central & South Africa	0930-1400 (1-2)* 0700-1300 (2) 1300-1600 (2-3)	0600-0900 (1-2) 0900-1500 (0-1) 1500-1800 (1-2)	1700-2130 (3) 2130-0000 (1-2)	1800-2130 (1-2)
South America	0800-1430 (3) * 0630-1300 (3) 1300-1530 (4) 1530-1730 (1-2)	0600-1400 (2-3) 1400-1800 (4) 1800-2000 (2-3) 2000-0300 (1-2)	1700-0330 (3-4)	1800-0230 (2-3)
Guam & Mariana Islands	1330-1700 (2) * 1200-1630 (2-3) 1630-1900 (3)	0700-0900 (1) 1200-1700 (1) 1700-2100 (3)	0000-0800 (3-4)	0100-0700 (2-3)
Australasia	1400-1800 (1-2)* 1100-1700 (2-3) 1700-2000 (3)	0700-1030 (2-3) 1030-1700 (1) 1700-2000 (3) 2000-0200 (1-2)	2300-0700 (3-4)	0000-0600 (2-3)
Japan, Okinawa & Far East	1400-1800 (2) * 1300-1630 (2-3) 1630-1930 (3-4)	0700-1200 (1-2) 1200-1600 (2-3) 1600-2100 (3-4) 2100-2230 (1-2)	2200-0730 (3-4)	2300-0600 (2-3)
Philippine Islands & East Indies	1430-1700 (1) * 1400-1900 (2-3)	0900-1100 (1-2) 1300-1430 (1-2) 1730-2100 (1-2)	0200-0600 (2)	0300-0500 (1)
Malaya & South East Asia	1500-1700 (1) * 1500-1830 (2)	0700-1100 (1-2) 1500-1930 (1-2)	0330-0630 (1-2)	0400-0600 (1)
Hong Kong, Macao & Formosa	**1500-1700 (1-2)*** **1400-1800 (2-3)**	0700-0900 (1-2) 1400-1700 (1-2) 1700-2100 (2-3)	0100-0630 (2-3)	0200-0600 (1-2)

Symbols For Number Of Days Path Forecast To Open

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

* Indicates time of possible ten-meter openings.

The CQ Propagation Charts are based upon a CW radiated power of 150 watts and are centered on Washington, D. C., St. Louis, Missouri, and Sacramento, California. These forecasts are calculated from basic ionospheric data published by the National Bureau of Standards and are valid through December 15th, 1955.

PROPAGATION

Forecasts By:
George Jacobs, W2PAJ/W3ASK
607 Beacon Road, Silver Spring, Maryland

Propagation Conditions, November

In the Northern Hemisphere solar absorption and atmospheric noise levels (static) continue to decrease. In accordance with seasonal changes in the characteristics of the ionosphere, daytime usable frequencies are higher and night time usable frequencies lower than during the summer and early fall. During November there should be a considerable improvement in propagation conditions on the amateur 10 and 15 meter bands.

The following is an overall picture of band conditions indicating qualitative changes in each amateur band from month to month. For specific times of band openings for a particular circuit, refer to the *CQ Propagation Charts (DX)* on the opposite page and the *CQ Propagation Chart (Short-Skip)* elsewhere on this page.

6 Meters: No openings expected except occasional erratic short-skip openings up to 1200 miles during periods of Auroral activity.

10 Meters: Daytime propagation conditions improving rapidly as the sunspot numbers increase. DX to many areas of the world should be possible on a small number of days during November. Regular layer short-skip openings, between distances of 1300 and 2400 miles also possible on many days during the month.

15 Meters: Will probably be the best all around DX band during the month.

Good daytime DX should be possible to most areas of the world. Regular layer short-skip propagation is expected on most days between distances of 750 and 2400 miles.

20 Meters: Band is closing much earlier in the day because of the shorter hours of daylight during the winter months. Good world wide DX possible from shortly after sunrise to after sunset, local standard time. Regular layer propagation possible between distances of 250 and 2400 miles.

40 Meters: Fair to good DX possible to many areas of the world from a few hours before sunset, through the evening hours, to a few hours after sunrise. Regular layer short-skip propagation possible almost around the clock.

80 Meters: Night time DX fair and improving as static levels decrease. Short-skip openings from regular layer propagation possible around the clock.

160 Meters: Seasonal DX propagation conditions are improving as ionospheric absorption and atmospheric noise levels decrease during the winter months. Some DX possible from a few hours after sunset to shortly before sunrise. Regular layer short-skip openings during the hours of darkness.

During the winter months, the occurrence of sporadic-E layers in the ionosphere decreases considerably from that observed during the spring and summer months. For this reason only occasional Sporadic-E type short-skip propagation will be possible during the month of November.

CQ Propagation Chart (Short-Skip)

The following *Chart* will appear in CQ every other month, with the forecast covering a two month period. This month's *Chart* can be used during November and December. The short-skip propagation forecast is based upon a CW radiated power of 75 watts, using a dipole antenna a half-wave length above ground. Calculations are based upon the approximate center latitude of the United States and actual band conditions in any area of the United States should not vary more than an hour or so from the times predicted in the *Charts*. The hours of day that short-skip (less than 2400 miles) skywave propagation conditions will be optimum in a particular band for a certain

A moderate to severe ionospheric disturbance is forecast for the period Nov. 24-29. The periods Nov. 1-2 and 16-19 are expected to be unstable and generally below normal. Exceptionally good shortwave propagation conditions are predicted for Nov. 4-7.

path distance are given in *Local Standard Time*. The symbols for the number of days that the path is expected to open are the same as those appearing on the *DX Chart* on the opposite page. The author would appreciae comments and suggestions from readers and users of this particular *Chart*.

Review of Shortwave Propagation Fundamentals (Con't)

In previous discussions the normal variations of the ionosphere have been reviewed. Normal shortwave propagation conditions are said to exist when the characteristics of the ionosphere behave according to certain known solar relationships. This is due to the fact that ultra-violet radiation from the sun is predominantly responsible for the formation of the ionized layers of the ionosphere.

CQ Propagation Chart (Short-Skip)

Band (Meters)	Distance (Miles)			
	50-250	**250-750**	**750-1300**	**1300-2400**
10	—	—	—	1000-1600 (2-3)
15	—	—	0800-1700 (2-3)	0800-1700 (3-4)
20	—	1100-1600 (2)	0600-1500 (3-4)	0700-0900 (4)
			1500-1800 (4-5)	0900-1500 (3)
				1500-1800 (4)
40	0800-1400 (3-4)	0600-1900 (4-5)	1630-0730 (4-5)	1700-0630 (4)
	1400-1600 (4-5)	1900-0600 (2)		
	1600-1800 (4)			
80	0500-1400 (3-4)	1700-0800 (4)	1730-0700 (4-5)	1800-0600 (3-4)
	1400-2000 (4-5)			
	2000-0500 (2-3)			
160	1700-0700 (5)	1800-0600 (4)	1800-0600 (3-4)	1830-0500 (3)

The regular, or normal, ionospheric variations are the *daily variations* as a result of the twenty-four hour rotation of the earth about its axis, *seasonal variations* as a result of the earth's relative angular position and distance with respect to the sun and the *sunspot cycle variation* as a result of the approximate 11 year variation in sunspot activity on the face of the sun. These regular variations, behaving in accordance with known solar relationships account for the normal characteristics of the ionosphere. There are also however, certain *abnormal* characteristics of the ionosphere that cannot be explained by the daily, seasonal or long-term variations. Among these abnormal characteristics of the ionosphere are *ionospheric disturbances, aurora activity*, and the *formation of sporadic-E layers*. This month's review of shortwave radio propagation fundamentals will discuss *ionospheric disturbances*.

There occurs from time to time great explosions on the face of the sun. Science is not yet certain as to the causes or the definite physical characteristics of these explosions, but it is believed that during such solar eruptions, the sun emits certain types of radiation which produces violent changes in the structure and characteristics of the layers of the ionosphere. This gives rise to abnormal shortwave radio propagation conditions, often leading to a complete failure of skywave propagation or a "radio blackout." There are two distinct kinds of ionospheric disturbances. One is termed *sudden ionospheric disturbance*, usually abbreviated as SID. SIDs occur suddenly and generally last for short periods of time upwards to two hours. The other type of disturbance is the *ionospheric storm*. Ionospheric storms develop over a period of a day or so and generally continue for several days.

Although both types of disturbances are associated with solar activity, SIDs are distinct from ionospheric storms. Both types have characteristics of a very different nature and both influence shortwave propagation in different ways.

Sudden ionospheric disturbances have an extremely observable effect on shortwave radio propagation. These disturbances are characterized by approximately simultaneous radio fadeouts on a large range of useful high frequencies, with even background noise sometimes disappearing. The fadeouts generally last from a few minutes upwards to an hour or so and then conditions return slowly to normal. Only skywave transmissions are affected, with the

influence noted more so on the lower frequencies than the higher bands. SIDs occur only over circuits passing through regions of daylight.

In 1935, Dr. J. H. Dellinger, an American scientist, first indicated the close association between SIDs and bright, visible eruptions on the face of the sun. These eruptive disturbances which occur fairly frequently in the sun's atmosphere is now believed responsible for causing SIDs. During these eruptions the sun emits large quantities of radiated energy in the form of excessive ultra-violet rays and visible light. When viewed from the earth with proper instruments, the eruptions are visible as bright areas on the face of the sun and for this reason they have been termed *solar flares*.

The occurrence of solar flares are often associated with large groups of sunspots, and the eruptions most often occur in the vicinity of large sunspot groups. The flares rarely last more than an hour before dying out. Excessive ultra-violet radiation from the flare penetrates the upper layers of the ionosphere and is absorbed at the lower part of the ionosphere, somewhat blow the normal E-layer. This radiation creates a region, or layer of heavy absorption about 50 miles above the surface of the earth. This region is generally referred to as the *D-region* of the ionosphere. High frequency waves striking this layer are strongly absorbed and cannot penetrate the D-layer and therefore are not reflected from the regular layers of the ionosphere. The D-layer is formed almost instantaneously with the visual observation of the solar flare, indicating that the radiation from the flare travels with the speed of light. The lower frequencies are absorbed first (i.e. 40 and 20 meters) and are also the last to recover from the effects of the SID. If the SID is of low intensity (a partial fadeout), transmission will continue to be possible on the higher frequencies (i.e. 15 and 10 meters) despite reduced signal strength of the received transmissions. Since the disturbance in the ionosphere is produced by excessive ultra-violet radiation from the sun, SIDs influence only transmission paths completely or partially in daylight areas of the world.

Records compiled by the Central Radio Propagation Laboratory of the National Bureau Of Standards shows that between the eleven year period 1936 to 1947, SIDs were observed at Washington, D.C. on 617 days. This is an average of approximately one SID every six days. SIDs however, occur far more frequently than this average value during the years of high sunspot numbers and less frequently during the period of sunspot minimum. They also have a tendency to reach seasonal maximum occurrences during the equinox and summer months rather than during the winter months at Washington, D.C. Since the sunspot numbers are now rising, a considerable increase in the occurrence of SIDs during the next few years is expected.

Figure 1 is a typical plot of relative signal strength variations of a high frequency transmission received at Washington, D.C. before, during and after a solar flare was visible. The McMath-Hulbert Solar Observatory at Pontiac, Michigan reported a visible solar flare at 2:06 PM EST, June 18, 1955. Simultaneously with the visual observation of the flare, signal strength abruptly fell off by approximately 30 decibels. The transmission remained disrupted for about ten minutes and then began to slowly return to normal. The flare died out by 2:45 PM and by that time the signal strength of the observed high frequency transmission had returned to its normal value.

While SIDs have an impressive influence on shortwave radio propagation conditions, its effects are felt only for very short periods of time, upwards to two hours with the most severe type of SID. For this reason the second

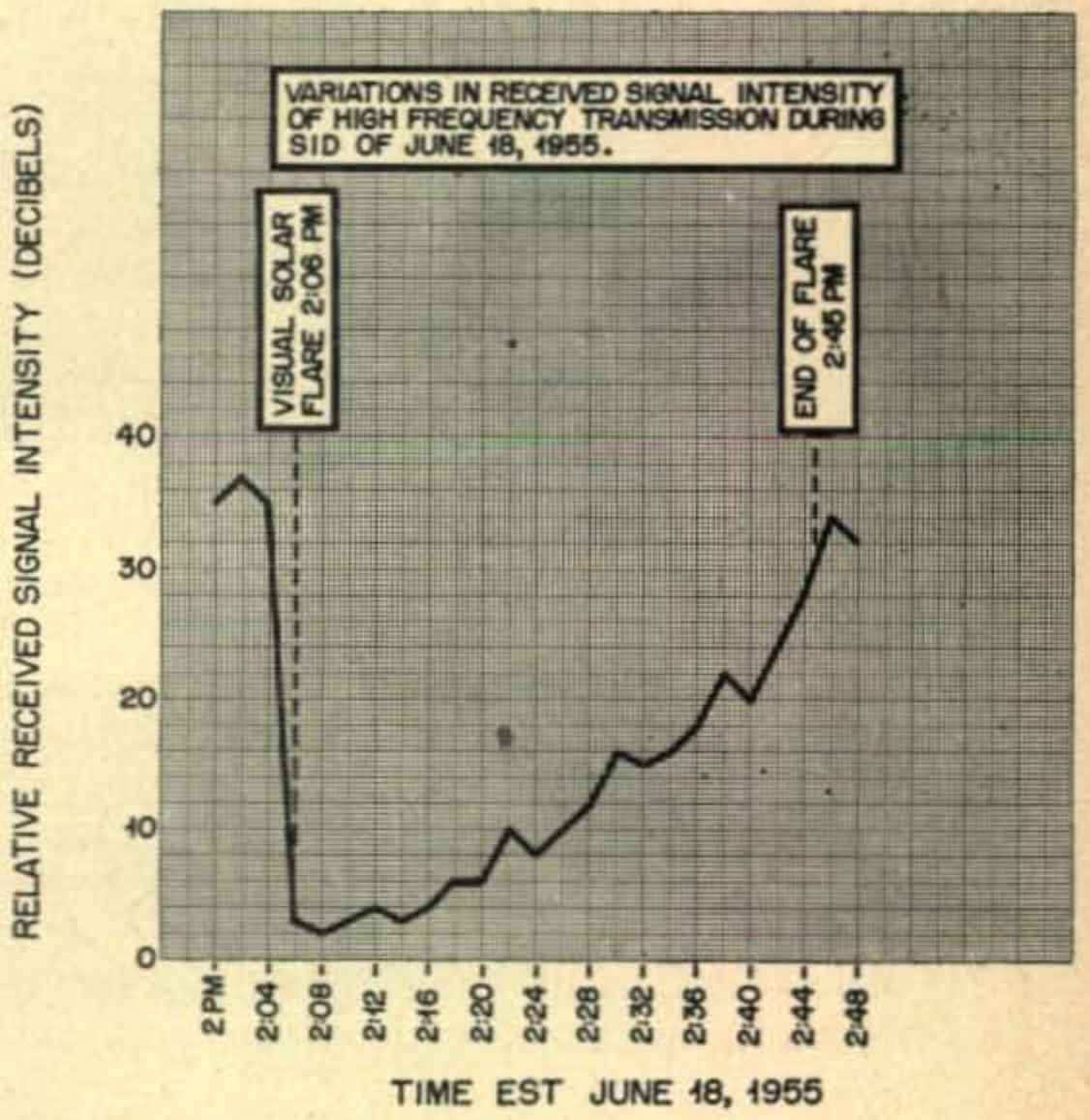


Fig. 1. Signal strength variations during recent solar flare.

type of ionospheric disturbance, the *ionospheric storm,* though less spectacular than the SID actually constitutes a more serious problem to shortwave communication because of its much greater duration. Ionospheric storms, while associated with solar disturbances, are of a different nature, and effect the ionosphere differently than do SIDs. Next month ionospheric storms will be discussed in more detail.

French Propagation Predictions

I have recently learned that as a result of the popularity of the CQ propagation predictions, the French amateur journal *Radio REF* has appointed Serge Canivenc, F8SH as Radio Propagation Editor.

[*Continued on page 110*]

RTTY

reported by

Byron Kretzman, W2JTP

9620 160th Ave., Howard Beach 14, N. Y.

A large percentage of the mail coming to your RTTY Editor is from the newcomer to radioteletype, either from those who have just obtained machines or from those who are giving RTTY serious thought. These fellows are all asking for schematics, articles,—any kind of technical RTTY dope. If we seem a bit basic to you old-timers working across the nation on FSK, be patient. Remember, radioteletype was new to you, once, too.

If at all possible, taking into consideration the particular area in which you live, about the best way to begin RTTY is on 2 meters with AFSK. This is usually most possible in or near a big city. There are many advantages to this approach for the newcomer. It *is* easier to get going on AFSK, and such operation is very valuable training, serving to make you more familiar with your machine and terminal unit before taking the big step to FSK on 80 meters. Problems can pile up for the fellow trying to get going for the first time. Noisy contacts, drifting oscillators, QRN,—all these don't seem so insurmountable once you *know* that you had your machine working on 2 meters.

AFSK Oscillator

Along the above lines, *Fig. 1* shows a schematic of an AFSK oscillator and a diode-keying system which is extremely simple to build and adjust. The oscillator uses the winding from an old audio transformer. Of course the old iron core is discarded. The one actually used had an inductance of 250 mh., although

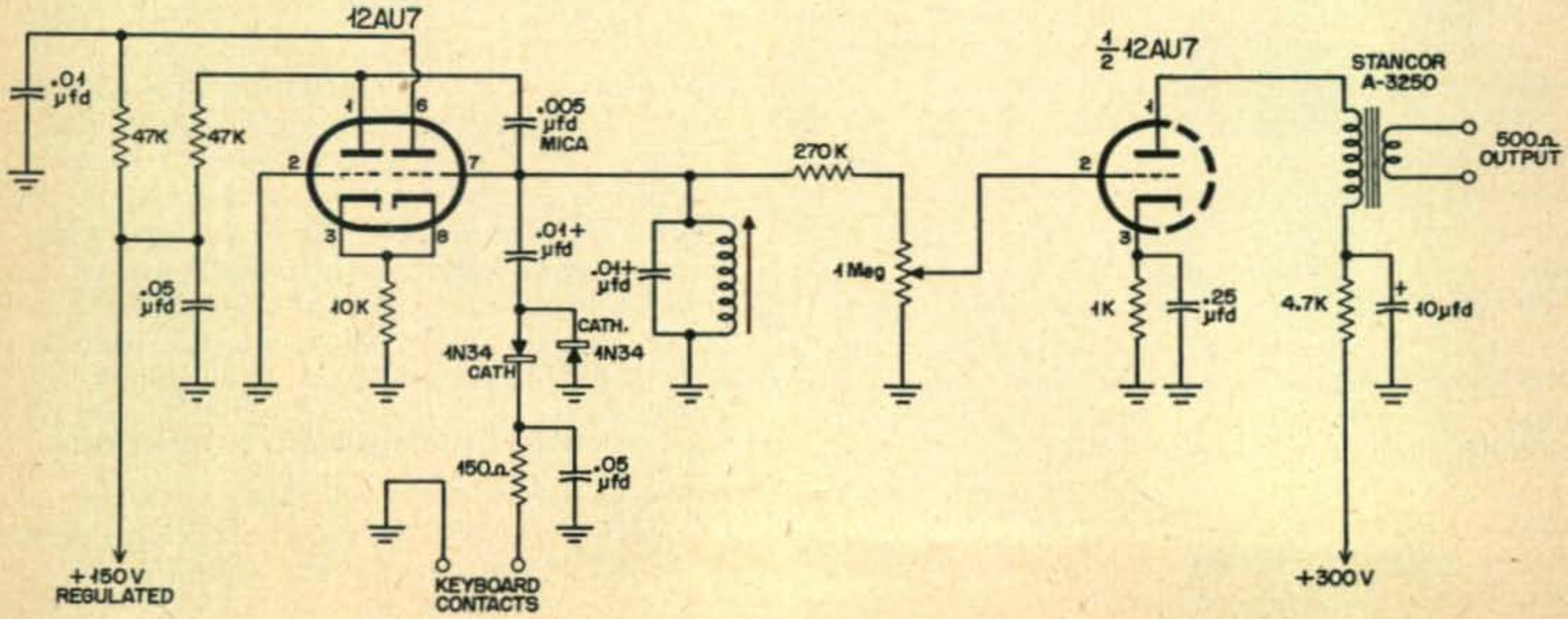


Fig. 1. AFSK Oscillator Circuit.

anything from 75 to 300 mh. will do. An old slug-tuned coil form makes a good mounting and the slug provides a very nice vernier-type adjustment.

The oscillator circuit is of the cathode-coupled variety. No tap on the coil is required, and no feedback adjustment is necessary. It is extremely stable and the wave-form is a very pure sine wave. Using the 250 mh. coil, slightly more than .01 μfd. is used to tune the oscillator to 2975 cycles (space) and approximately another .01 μfd. is required to bring it down to 2125 cycles (mark). These capacitors should be mica or preferably silver mica.

The "self-generating" type of diode keyer is a modification of the one in the original W2PAT terminal unit. Variations in keyboard contact resistance are made negligible by the addition of the 150-ohm series resistor which also, in conjunction with the .05 μfd capacitor, serves as a wave-shaping filter thereby reducing the tendency of the mark-to-space transition to produce transients. A description of this modification was contained in the No. 24 *ARTS Bulletin*. The leads to the keyboard should be reasonably short, by the way.

Don't be surprised if you find that the output *amplitude* is slightly higher on 2975 than on 2125 cycles. This can be equalized in the output or buffer amplifier, if you desire; however, since the *overall* frequency response of ham speech, modulator, and receiver audio amplifiers usually falls off around 2975 cycles, most fellows seldom bother with equalization.

AMATEUR RADIOTELETYPE CHANNELS

National, FSK—(mark frequencies; space 850 cycles lower) 3620, 7140, 27,200, 29,160, 52,600 kc.

National, AFSK—(2125 cycles mark; 2975 cycles space) 27,200, 147,960 kc. calling & autostart; 144,138 kc. repeater & duplex

California, AFSK—147,850 kc. calling & working

Washington, D.C. AFSK—147,960 kc. calling & autostart; 147,495 kc. working

Chicago, AFSK (FM)—147,700 kc. calling & working

German Teletype

While on a recent business trip to Venezuela, I had the rare good fortune to be taken for a visit to the Siemans & Halske agency in Caracas operated by Sr. Hegedus. His chief engineer, Sr. Jose Jimenez, showed me a completely fascinating collection of S & H teleprinter equipment. In actual operation, there were massive page printers in wooden cabinets and smaller desk-top printers, but what really intrigued me was the tape equipment. The picture shows the Model 68 tape printer, a very compact and flexible unit for tape printing and with a keyboard for sending. Several versions

Siemans & Halske Teleprinter 68d

are made, for example, one version prints on narrow tape (like a 21A) while at the same time printing and perforating the regular wide tape. It has a built-in transmitter-distributor, too! Other attachments were a reperforator, and a wind-up reel to take the perforated tape.

The telephone-type dial on each machine seemed a bit unusual, but they told me that automatic teleprinter networks are quite common in Europe. In such operation, the "figures" case of the letter "D" is used to transmit a code group, "Who-are-you?" This signal actuates an "answer-back" unit at the printer, connected by the automatic exchange, which identifies the station connected. If a reperforator machine is used, the query signal will not appear on the tape, being automatically suppressed.

80 Meters

Now that the cool fall days are upon us and QRN has lessened, 80-meter activity along the east coast is picking up. Every Wednesday night, starting at 8:00 p.m., the RTTY net handles traffic on 3620 kc. Most signals are fairly strong and nicely over-ride the line noise and QRM. Stations generally checking in are: W1WB, W1BGW, W1BDI, W1FGL, W1RBF, W2BDI, W2JAV, W2PAU, W2OOG, W2DXD, W2RTW, W2TKO, W2PBG, W3CRO, W3MHD, W3KYR, W3LWQ, W3PYW, W8LEX, and W8GRL. Where is the 4th call area??

RTTY Meeting

As this is being written just *before* the RTTY Meeting in Chicago, held in conjunction with the 11th Annual National Electronics Conference, the details will have to wait until next month. It might be interesting to relate the story behind this momentous gathering, though. While the flash in *CQ* last month gave the date as October 3rd, it was decided at the last minute to begin festivities on Sunday, October 2nd. The idea was to provide daylight hours for the morning tour of local RTTY ham shacks, transportation to be provided. Technical talks and demonstrations were planned for the afternoon, with WØBP, W9TCJ, W9GRW, W2BDI, W2JAV, and possibly others, scheduled. The technical part of the program was planned to be held at the Hallicrafter's plant, with late model Teletype and Kleinschmidt equipment being demonstrated.

The planning committee for this shindig consisted of WØBP, W9GRW, W9SPT, W9THE, W9OCV, W9JBT, and W9BGC.

Across the Nation

KL7CK writes from Juneau, Alaska, passing along some dope on toroids. Don't fail to give his "AFC for RTTY" article in this issue a careful reading. Automatic Frequency Control makes FSK operation as easy as 2-meter AFSK, according to Jerry.

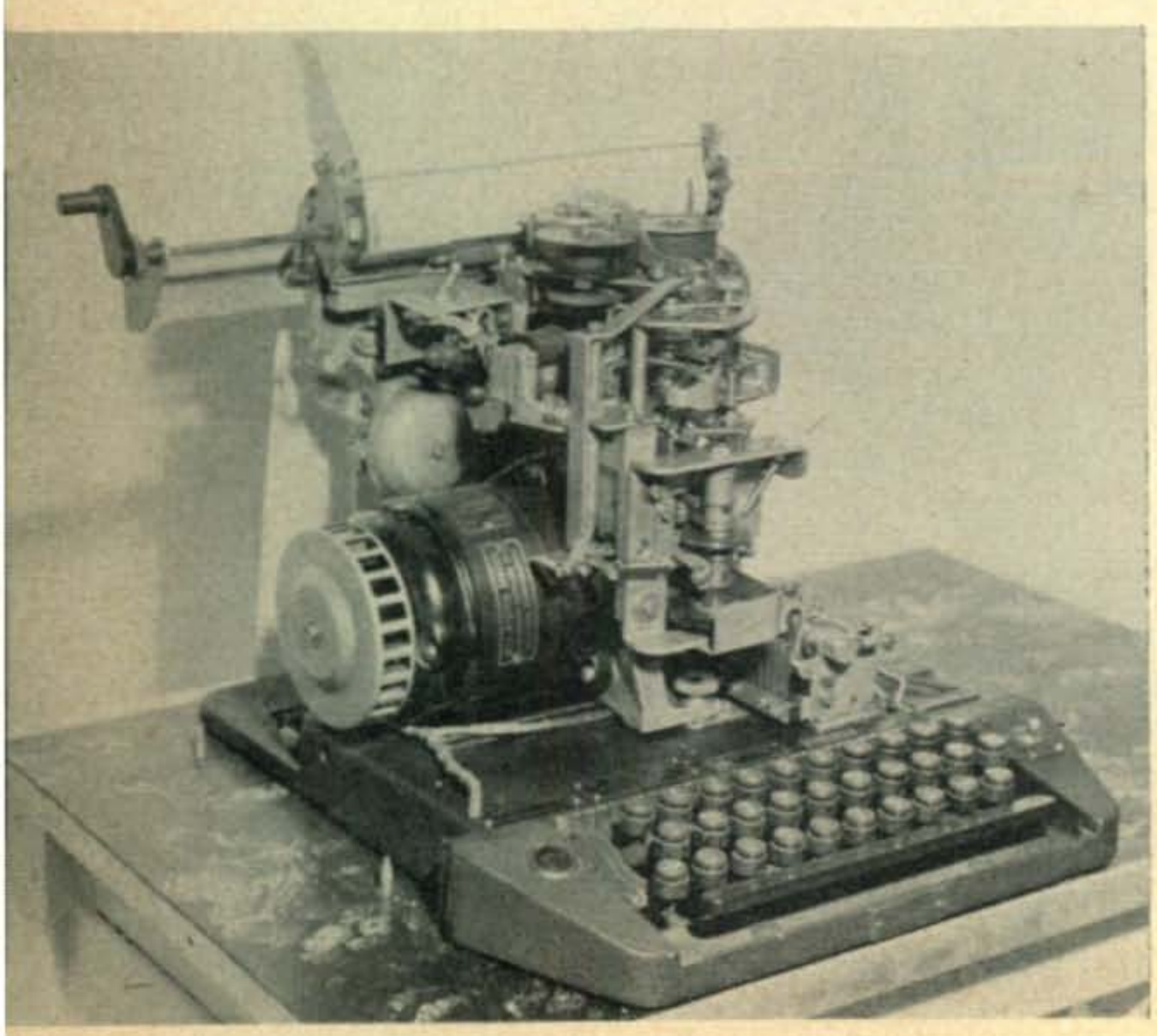
Louis Dod, W4TEM, in Roanoke, Virginia, says that he has been following RTTY since December, 1951 and is at last getting set to get on. Sure need another W4 in the east coast net, Lou.

Mace Warner, WØJRQ in Denver, has a "different" method of FSKing his transmitter, he writes. We can't print it if you don't send us a schematic, Mace. WØWRO is also on in Denver and he and WØJRQ operate mostly 40 and 20 meters.

Jim Moore, W9ZMU, is in Hanover, Illinois, which is about 160 miles from Chicago. He hasn't been able to hear anyone from there on 2 meters as yet, so he plans to keep busy on 80 and 40 meters as well as with MARS. Jim also has an old Crosley READO FAX printer and would like to see some more FAX news. (Me too, Jim.)

New England is showing quite a bit of activity, these days. W1VIY in Trumbull, Connecticut, is planning on some really long-haul 2-meter RTTY with his *horizontally*-polarized beam. (You should have no trouble working W2PAT and W2JAV, Charlie. They are also horizontal.) Bim Dale, W1TWP, has been off RTTY for over a year, but says that he has an FSKer along the Bob Weitbrecht diode-modulator lines that fits into a 32V2 by drilling only *one* hole. We sure would like to see that, Bim.

Merrill Swan, W6AEE, works W2BDI, W1FGL, and W2JAV with little difficulty. He says that this is an ". . . everyday operation,



← **Model 26. Complete unit with cover removed.**

not once in a while." He is looking for W2JTP and some of the other New York area stations. Patience, Merrill, patience.

Bob Weitbrecht, W9TCJ, was busy passing around WØBP's promotion on the Chicago RTTY Meeting. Bob has his heterodyne exciter finished and is giving it on-the-air tests. Don't forget *CQ* for an article on it, Bob. The UHF link for remote control has been temporarily shelved and W9TCJ will use a telephone line for the time being.

Maybe this should be reported under the heading of "Narrow Shift," but BeeP Phelps, WØBP, has a scheme for "Simulated Short Shift" using *two* transmitters keyed on identical texts, always 1 kc. apart with 830 cycle shift on each transmitter. BeeP says, "Phantom reception is a combination of mark from transmitter 'A' and the space from transmitter 'B' . . . the phantom simulates 170 cycle shift, but with space frequency high and mark low . . ." With each transmitter 600 watts, BeeP is ready to go! (—right to jail?)

W1AW

Last month I said I would see if I could find out why W1AW didn't put out official bulletins on RTTY, since W1AW does occasionally operate on RTTY. F. E. Handy, the ARRL Communications Manager is an RTTYer, himself, and it is from him that I received a nice long letter explaining that it wasn't feasible at this time. Speaking of the large code proficiency program now being run, Ed says, in part, "The time for our preparing and checking tapes is a factor where we have a limited number of attendants since we are able to undertake anything only at the expense of other programs that are already considered minimal."

Ed suggests that several of the more active RTTYers across the nation seek appointments as Official Broadcast Stations (through their Section Communications Managers) and put out ARRL official bulletins themselves. "This would give better coverage than to put such material out on a W1AW frequency . . ," he further says.

Drop me a line or two and let's hear what *you* think about all this, fellows.

New York Area

W2MIB had an oil leak in his cellar which put 90 gallons of No. 2 oil on the floor, so his RTTY operation was suspended for a while. Back on the air, Harry says that the ". . . smell lingers on!"

W2PRB is now in operation from his home out in Massapequa, Long Island. How he misses that altitude he had when operating W2PRB/2 from that skyscraper in New York City!

W2BFD's old Model 12 finally broke down, after only about ten years' operation. That's what you get for bragging that your Model 12 was "indestructible," John. Why don't you modernize, John, and get a Model 26? By the way, W2BFD has an article coming up soon in *CQ* on a tuning fork frequency standard. Also, his article on a narrow-shift converter will probably be in *CQ* next month.

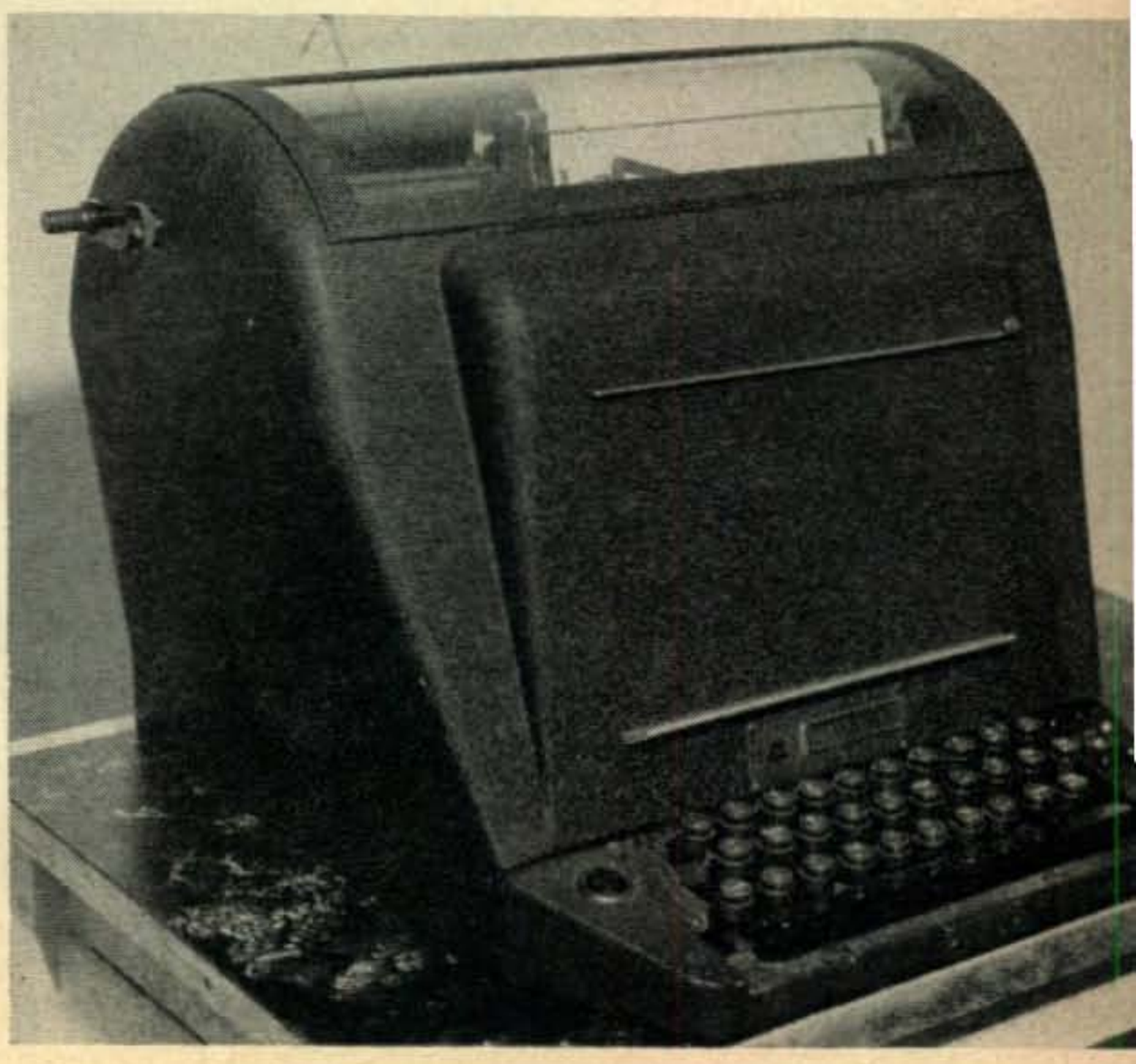
Comments

If at all possible, beg, borrow, etc. a copy of the September issue of *Electrical Engineering* magazine. Beginning on page 798 is a very interesting article entitled, "Research in Signal Corps Teletypewriter and Switching Equipments." Described is some of the new gear used by the U. S. Army. Maybe soon we might be able to find the Model 15 in surplus!

Another magazine article which should be especially useful to RTTYers (if they haven't already seen it) is the article, "Amplitude Limiting for the VFO" by W2PAT in the Feburary 1954 issue of *QST*. Frequency-shifting this VFO should be no problem, and a VFO this stable should be ideal for operation on 40 and 20 meters, after multiplication, where it is necessary to do so much QRM dodging.

You newcomers, particularly, will find much in the way of useful RTTY material by looking up those back issues of *CQ* that contained the old *Amateur Teletype* columns by Wayne Green. Copies of most of those back issues are still available.

Thanks again for your letters, fellows. Don't forget, we are still looking for pictures of RTTY ham shacks. (W9GRW's basement, for example.)



The Model 26 printer and typing unit. (W2SKK unit photographed by → James Bannister)

YL

Monitored by

Louisa B. Sando, W5RZJ

Jicarilla Apache School, Dulce, New Mexico

YL clubs seem to be springing up all about the country. Two new ones to report are the *Twin City YL Club* of St. Paul-Minneapolis and the *Portland Roses*.

The Portland, Oregon, club held its first meeting at the QTH of W7RVM, Helen, on July 26. At their second meeting, September 12, at the QTH of W7QKU, Donna, the YLs unanimously chose the name "Portland Roses." Hereafter the club will meet the first Monday of each month at members' homes. Officers are: W7RVM, Helen Wise, president; W7QKU, Donna Gettman, vice president and treasurer; WN7ZMN, Phyllis Bowers, secretary and publicity chairman. Other members include W7's REU, SPC, TVU, WFO, ZKY, ENU, QXH, KAW, WRA.

Another of the newer clubs is *SPARCYLS* (pronounced "sparkles"). Just a year ago this November, following a supper of the St. Petersburg Amateur Radio Club (SPARC), five YLs

Installation luncheon of the San Diego YLRL. L. to r., standing: Thelma Higley; W6GGX; Jeannette Merrill; Jean Grimsby; KN6LDX, (publicity chairman); W9SZU. Seated: K6CAL (secretary); K6AWP (vice president); W6MWU (president); W6OLP; K6EOG (treasurer).

YLs at the North Dakota State Convention, l. to r., rear: WØ's KJX (D/C for WØ), NQJ, UAI, DBH. Front: WNØVHC, WØBHR, WNØVBH, WØCVQ.

and a potential gathered in one corner of the club room and organized a YL club. *SPARCYLS*, which is affiliated with YLRL, now meets the middle of each month at the club house, 1331 Beach Dr. S.E., St. Petersburg, and the group plans to reactivate its 10-meter *Bustle Net*. The girls are anxious to have interested YLs and XYLs, or potential Hams, contact them as they will be glad to have new members, or help those interested in obtaining their licenses. *SPARCYLS* members include W4's TDK, BIL, WPD, AVA, BAV, HRC, GXZ; KN4's EAC; EBQ, CUY (See photo of officers).

November also is the first anniversary of another YL club—the *Texas YL Round-Up Net*—and the girls have planned a "birthday" celebration in Dallas this month. Though termed a "net," it actually is a club as well with a formal constitution and officers. All licensed female radio amateurs are eligible for membership and any qualified YL or XYL may become a certificated member when she has made roll call for five consecutive weekly meetings. "Meetings" are held every Thursday on 3880 kc at 9 a.m. CST from Oct. 1 to Mar. 31, and at 8:30 a.m. CST from Apr. 1 to Sept. 30. So far YLs have checked in from La., Okla., Ark. and all sections of Texas. Officers for the Net are: W5WXY, Bernice Jack, president; W5SYL, Iva Haley, vice president; W5LGY, Helen Douglas, sec.-treas.; W5ZPD, Cindy Dougharty, publicity chairman; NCS, W5WXY, Bernice; Alt. NCS, W5ZPD, Cindy.

The Canal Zone QRMarys have resumed meetings with one held Sept. 12 at the QTH of KZ5DG. Grace and Kay, KZ5KA, reported on their summer trips Stateside.

YLRL News

YLRL's 16th Anniversary Party will be held on the following dates: Phone: Dec. 7-8, 1955; CW, Dec. 14-15, 1955. Note these are weekdays—Wed. and Thurs.—instead of weekends as formerly. Let's hope the QRM will be less! The rules have been changed somewhat from previous contests; details are given in the separate box.

WØMMT, Marie Ellis, won the election for YLRL secretary-treasurer. However, president W9LOY explains that the revised constitution calls for both a secretary and treasurer. Marie chose the treasurer's job. W3VLX, Lolly Keller, was runner-up and she agreed to take the secretary's job. Her QTH: 3316 Unionville Pike, Hatfield, Pa. YLs interested in becoming members of YLRL may write to Lolly for application forms, or to your column editor.

W1VYH, Betty Wood, is the new W1 D/C. Her QTH: 53 Main St., Topsfield, Mass.

VE6MP, Maude Phillips, has accepted D/C for Canada. Her QTH: 1330 Crescent Rd., Calgary, Alberta.

New Awards Custodians

W6PCA, Opal Jones, has accepted the custodianship of the WAC/YL awards. So send your applications and QSLs to her at Route 1, Box 180, Esparto, Calif.

W4SGD, Katherine Johnson, is new YLCC custodian, so for YLCC applications write to her at Box 666, Fuquay Springs, N.C.

YLRL Directory

On the subject of YLRL and awards, we'd like to remind you that the *YLRL Directory* is still available. It lists over 500 members of YLRL with calls, QTHs, bands operated and other details where such were available. Copies of the *Directory* may be obtained for $1 from W6DXI, Gladys Eastman, 735 Glen Ave., Glendale 6, Calif.

K4ALM, Lucille Spargo, operating MARS station K4FAI, during hurricanes "Connie" and "Diane."

YLs attending the West Gulf Division Convention at Ft. Worth, Tex. (for calls see text). Many of these YLs are members of the Texas YL Round-Up Net. Photo by N. G. Morris.

YRL 16th Anniversary Party Rules

Dates: Phone—Start Wed. Dec. 7, at 1200 EST. End Thurs. Dec. 8, at 2400 EST.
CW—Start Wed. Dec. 14, at 1200 EST. End Thurs. Dec. 15, at 2400 EST.
Operate no more than 20 hours on phone and 20 hours on CW.

Frequencies: All bands. No cross-band operation.

Eligibility: Contest open to all licensed YL or XYL operators throughout the world. Non-members of YLRL not eligible for awards. Contacts with OM's do not count.

Procedure: Call "CQ YLRL."

Exchange: QSO number; RS or RST report; name of State, U.S. Possession, VE District or Country.

Scoring:
a—Add total number of contacts. Multiple contacts with same station, regardless of different bands used, will count as *one* contact.
b—Multiply five (5) times total number of different contacts, regardless of location.
c—All contestants running 150 watts or less input at all times, whether phone or CW, may multiply the result of item (b) by 1.25.

Awards: For YLRL members only (certificates will be awarded to non-members)
Highest phone score—Cup
Highest CW score—Cup
(These cups are awarded on a yearly basis. Any operator winning the same cup three times gains permanent possession of it.)
Should any awards be donated, they shall be given to the Second and Third place winners, both phone and CW.
Certificates for high score for phone and CW in each U.S. District, Possession, VE District and Country. All winners receive certificates.

Logs: Copies of phone and CW contestants logs must be postmarked not later than Dec. 31, 1955. Send directly to YLRL Vice President, Gloria Matuska, W9YBC, 2322 South Second Ave., North Riverside, Ill. When submitting copies of logs, please list phone contacts and CW contacts separately.

YL Get-Togethers

With the YLRL Convention and AWTAR radio net taking up all of the last two issues, reports on some of the conventions are woefully late. But for the record, here they are:

In conjunction with the *Southeastern Division Convention* at St. Petersburg, Fla. June 11-12, members of *SPARCYLS* sponsored a 4th District YLRL Convention. W4BAV, Catherine, tells us the girls started off Sunday a.m. with a YL breakfast at the Suwannee Hotel, then convened in the mezzanine for a YL meeting. *SPARCYLS* president W4TDK, Naomi, was M.C. A message was read from W6CEE, Vada. W4RLG, Frances, gave a talk on the 4th District, and W4JCR, Anita, guest speaker, gave an interesting account of the history of YLRL. W4RLG won an electric fryer, W4UNO received a set of *Zimphones* and the rest received miniature *Raytheon* tubes made into earrings, or silver "mad money" purses. The 23 YLs attending included: W4's RLG, GXZ, HRC, BAV, BIL, TDK, ZQQ, UMM, UPT, YAI, YZT, JCR, ZVW, UNO, GJU, AVA, WPD, DOM; KN4's CUY, EBQ, AGM, CXZ; KN6AFJ/4.

Eight YLs attended the *North Dakota State Convention* at Bismark on June 11-12. WNØVHC, Joyce, aged 12, won the prize for being the youngest Ham there. Her sister Carol is WNØVHB, and her mother is WØBHP, Hazel. OM Curtiss is also a Ham for an all-Ham family. Another mother-daughter team were WØNQJ, Wilma, and her daughter Marilyn, WØUAI. The OM here also is a Ham for another 100% Ham family. Our thanks to WØDBH, Edie, who took time from her busy schedule to send news and photo. Edie is Class A and works 75 when she finds the time—which isn't much after caring for 6 jr. ops (the

oldest is 7 yrs.), doing all her sewing for the children, gardening, and canning some 800 to 900 jars a year!

June 10-12 was a busy weekend—this also was the date of the *West Gulf Division Convention* at Ft. Worth, Tex. Saturday a.m. the YLs attended a special YL breakfast at the Hotel Texas at which W5PFU, Johnnybel, was hostess. W5WXY, Bernie, reports other YLs attending the convention were: W5's CXM, WBL, PWX, FBM, YAJ, BTG, ZEZ, EYE, RYX, SPV, BDB, ZPD, FAE, TTU, SYL, HNV, TYX, VWI, WPR, GPN, PFU, TDM, YCV, QXR, DUR, KQG, OQT, DYA, W4UDR.

The *Roanoke Division Convention* at Old Point Comfort, Va., Aug. 12-14 received competition from hurricane "Connie." Though slightly dampened the YLs enjoyed the technical sessions, banquet, etc., according to W4LAS, Mabel. Those attending: W3's TSC, MSU, CDQ, AKB; WN3's RIW and her 13-yr. old daughter CAI; W4's: BLR, ZXK, ZFF, LAS, RFV, K4BNG.

Members of the *Northwest Young Lady Operators Net* (NYLON) held their second annual picnic at Ellensburg on August 14 with families and friends. *NYLON* members included W7's, FWR, QYN, SYF, ULK, WMS, YAR.

Here and There

Several more nets have been reported in addition to those listed last month. 80 CW, 3610 kc Wed. at 9 p.m. EST, W1WPX, NCS. 75 phone net meeting on 3900 kc Wed. 8 a.m. EST, W4HLF as NCS. WØKJZ, Lydia, with help from twins WØQXA-WØQXF, Janet and Janice, has formed the *Pi-Net* for Minnesota YLs. It meets on 3838 kc on Tuesdays at 9 a.m. CST with WØKJZ as NCS.

During hurricanes "Connie" and "Diane" K4ALM, Lucille, operated many long hours handling emergency traffic at the MARS station K4FAI at Shaw AFB in S.C. The XYL of K4ANI, who is in charge of MARS station K4FAI, Lucy holds an advanced class ticket and is ex-KL7ZQ-W6ETF. It was while she was KL7ZQ in Fairbanks that Lucy hit the news by being the first YL to operate from a dogsled mobile in Alaska.

Congratulations to W4BLR, Kay, on the arrival of a new harmonic on June 16, named Charles David. . . . To W7ZKY, Dee, on the birth of a son on Sept. 9. . . . Condolences to W5IZL, Ruth, whose OM, Ernie, ex-W5AWQ, passed away on June 3.

A number of YLs in the Boston, Mass. area have formed the *North Shore YL Club*. An informal group, they meet once a month at members' homes for a social evening.

W3CDQ, Liz, has been elected president of the Washington Radio Club for another term.

Formerly W1YLP, Dell (ex-KH6TI) is now K5CCJ at her new QTH: 1421 Hamiel Dr., Las Cruces, N.M.

"Queen of the Clan" is now W6QOG. Applications and QSLs for the "Lad 'n Lassie" certificate offered by the *Los Angeles YLRC* should be sent to Helene at 1205 S. Edris Dr., Los Angeles 35. . . . W6UHA, Maxine, is new publicity chairman for the Los Angeles YLRC. . . . Shortly after assisting in the AWTAR network W6NZP, Evelyn, left for a trip with her OM to New Zealand, Australia, India and other points and plans to be gone a year or more.

UFO Patrol

Any YLs having information on UFO (Unidentified Flying Objects) are requested to forward data to W5CA, Tijeras, N.M., who is collecting such material, especially in regard to the communication aspects—radio or infrared. The UFO Patrol is in operation at the low ends of 40 and 20 CW. Call used is UFP, and Hams are invited to call in whenever they wish.

33 till next month.—*W5RZJ*

Officers of SPARCYLS, YL club of St. Petersburg, Fla.
L. to r., W4WPD, publicity chairman; W4BAV, sec.-treas.; W4TDK, president; W4BIL, vice president.

DX

Gathered and reported by

R. C. "DICK" SPENCELEY, KV4AA

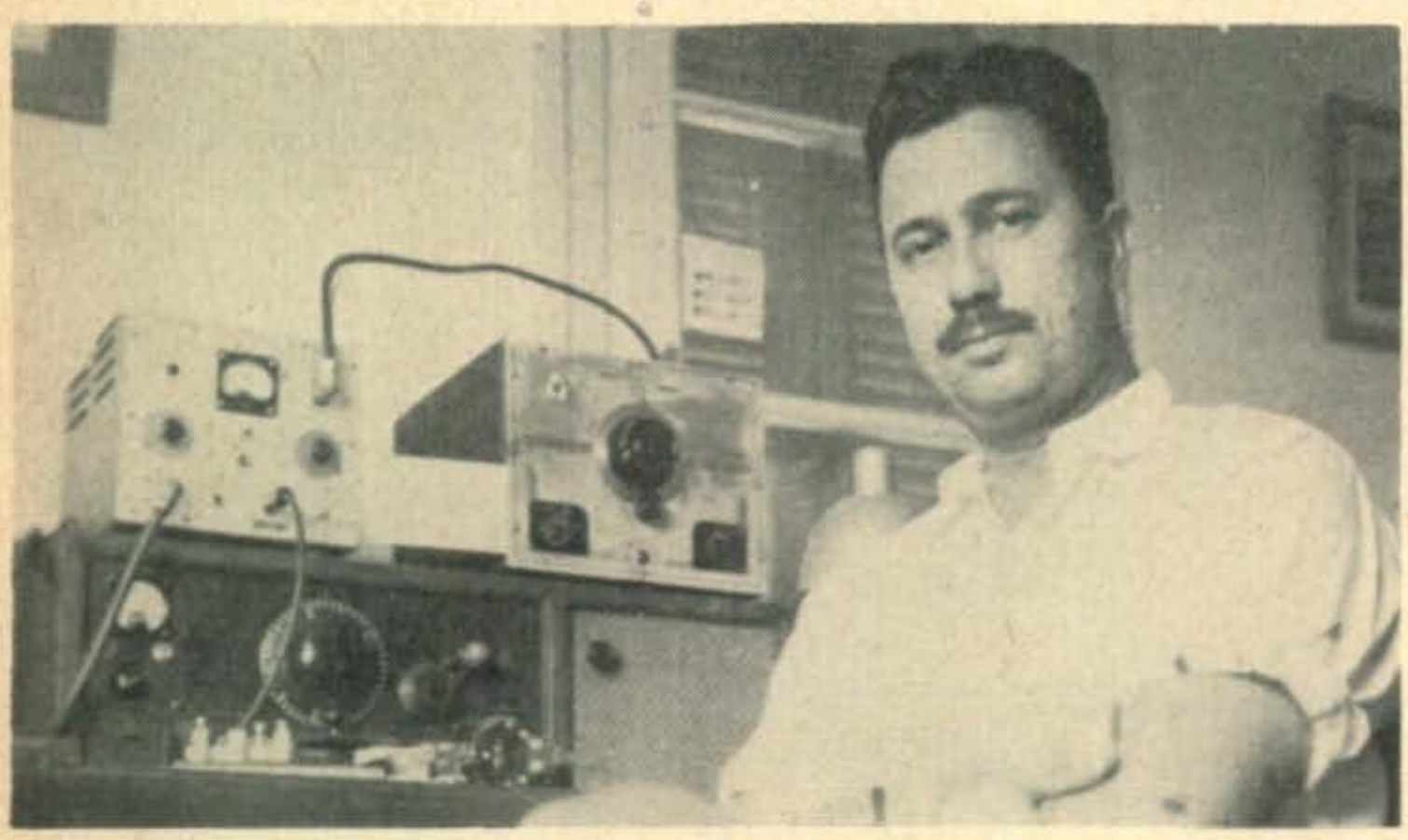
Box 403, St. Thomas, Virgin Islands.

KERMADEC ISLANDS, ZL1: Now that this island group, some 600 miles NNE of New Zealand, has been accepted for "separate country" status we have made inquiries and have been advised that there is no ham activity there at present. A weather station is maintained on Raoul Island, in the Kermadecs, and the staff is changed about every twelve months. This fact should assure some ham activity there in the not too distant future. ZL1AHC was active from this QTH recently and it might be well for the gang to check their ZL1 QSL's on the chance that they may already have contacted the Kermadecs.

QSL's will probably be taken care of via W6MUR or FK8AO.

FRENCH TOGOLAND, FD4BD: Activity from this station continues. Pierre may be found on 14024 between 2100 and 2300 GMT. See QTH's. He is ex-FF8BE.

YASME DX'PEDITION, VP2VB/P: Last word from Danny advised us that he would sail from Balboa about October 1st. First stop will be at the Marquesas with a possible, tho not probable, stop at the Galapagos Islands. Should this have come to pass VP2VB/P



Much in demand as one of the few Egyptian stations on the air, Ib Charmey, SU1IC, of Giza, puts a surprisingly potent (QRP) signal to all parts of the globe. Photo courtesy W6NIF/4

ANDORRA, PX1EX: This expedition, in August, made 620 contacts in 60 countries. All continents were worked. Conditions were excellent on 14 Mcs. and good on 7 Mcs. (for Europe and W1/2/3) but poor on 3.5. QSL's were due to go forward during the first days of October.

WALLIS ISLAND, FW8AB: This station got back on the air around September 4th contacting W6GIZ, W6MUR, W6NZW, W6AOA, W6NTR and W6BYB on that date. His signal is chirpy and drifts about 3 kc. Adrien is usually on daily at 0430 GMT near 14021 (VFO). should be much in evidence at this date. It is estimated the YASME's run from Balboa to FO8 should take around sixty days.

LAOS, XW8AB: Marcel continues his activity from this rare spot and has 87 countries (47 confirmed) and over 1200 contacts in seven weeks of operation (to August 15th). He expects to stay in Laos until next April and possibly will continue for six months more if his health holds up under the rigors of a very unpleasant climate there. His operation is on 14 Mcs., CW, only with no time or material to build a modulator for phone work. Plain, but

adequate, QSL's have been printed locally but 'prettier' ones are expected from France shortly. His xtl frequencies are: 14000, 14013, 14050, 14080 and 14100.

BASUTOLAND, ZS8L: Following ZS1PD's very creditable performance at ZS8L this station seems to have been taken over by an operator named Ken who, according to WØQBA, is a permanent resident there. QSL's should go via Postmaster, Maseru, Basutoland. (See later note.)

TURKS AND CAICOS, VP5DC: Bud continues as the only ham representative of this spot but advises that another ham has applied for a VP5/Turks license and should be on by now. VP5DC knocked off 100 countries during his first 81 days of operation. VP5BM worked 49 countries from Turks but has now been transferred to the Windward Islands where he has applied for a VP2 license.

DX Jottings

F9RS advises that FB8BR may be active in the Comoro Islands in October. . . . VP8BL is active from the Falklands, 2300 GMT, 090. . . . VQ8AG has been working them on 14014, 1200 GMT. . . . Creating quite a stir is YA1AM who says QSL via RSGB. He was overheard telling W6GAL/7 that he would forward him dope on YA6GAL. . . . FQ8AX has been active of late on 080, See QTH's. . . . FM7WF, Milo, has been heard frequently, 020, 1200 GMT while those needing a YN contact might listen for Paul, YN1PM, 14008, 1145 GMT. . . . VQ4FM is ex-VP8AA and missing VP8AA cards should be requested via VQ4FM (VQ4 bureau) instead of from G3JFD who cannot handle. . . . XW8AB seeks a XE contact. . . . K2BU worked one ZA1T, 066, 1650 GMT, name Janis. . . . Canada has assigned VEØ calls for /M and /MM use. This was confirmed by W8KAK who contacted VEØNA aboard HMCS IROQUOIS. See QTH's. . . . Further word from Basutoland in a letter from ZS1PD to W5DMR (West Gulf Bulletin) clarifies our preceding item, we quote: The story is that they refused me a ZS8 call sign and after trying ZS1PD/ZS8 and not finding it very effective, ZS8L who is the Radio Inspector for Basutoland, told me to use his call sign as he is very inactive—When he saw how easy it

Added incentive is given to North and South California DX Club members, DX contest-wise, by this trophy. Similar awards might be instituted between other radio clubs of, more-or-less, equal DX capabilities and would enhance friendly contest competition. Winners of cup (right) are as follows: 1950—SCDXC, 1951—SCDXC, 1952—NCDXC, 1953—NCDXC, 1954—SCDXC. (Photo by W6TT courtesy North Calif. DX'er.)

was to work DX he also started operating—The DX bug hit him so well that I had to help him build a rig. We have now got his 45 watt exciter on the air, using an 807, and he is busy mounting the parts for his 814 final. He says he is going to be the leading DX man in ZS8-land! ZS8D, not to be left behind, started putting up a new 20 meter antenna and ZS8M is polishing up his CW. It seems that I have succeeded in making them DX-conscious. ZS8L's name is Ken Tremeer. On Monday I move off to my new QTH in Rhodesia where I am going farming. There are no mains and I will have to run about 10 watts from a battery rig. That rig, with a couple of 1000 foot rhombics, should do the trick. (See QTH's) 73's, Henry, ZS1PD. . . . W3KDP reports a contact with LS1BA on May 22nd. He claimed to be on Svalbard. While possibly true, the "LS" prefix has been assigned to Argentina. . . . W5MET nailed CR8AC on July 19th. . . . Anyone needing a ZS9G card, according to ZS1OU, might write a nice letter to ZS9G, Dave Baird, P.O. Box 196, Livingston, N. Rhodesia for the desired effect. . . . From W8CLR we hear that MP4KAB is xtal controlled on 14125 and 14150, A3, and has been heard from 1640 to 1700 GMT 5/9. . . . Via W6YY and West Gulf Bulletin we hear that ZL2GX and ZL1PA are getting up an expedition to the Kermadec Islands next January. Operation will be 14 Mcs. CW only. . . . PZ1CD may be heard daily, 14120, 2300 to 0100 GMT (A3?). . . . W4VDF reports hearing 4W1AXB, 14169, around 1400 GMT. See QTH's. . . . LB8YB has now returned to Norway and has given LA6QB, Sec'y NRRL, several thousand QSL's. These cards should leave for the various bureaus in October. . . . W5DMR reports FB8BC, FB8BZ and FB8BS coming in each night, 0330 GMT, A3, 14100 to 14200 VFO. Same goes for Theresa, VQ8AL, on 14110 (Direct path). . . . VK1DY has commenced his QSL'ing now. . . . SU1DD was worked 0400 GMT, 14031, name Gordon and QTH Ismalia. . . . F9RS reports the often heard FC7GE is a pirate. . . . ZS6ANE reports, via West Gulf Bulletin, that Barry, ZS2MI, will now get gasoline via boat and will be able to operate four times per week instead of two. QSL's go via ZS6FN. . . . The Gough Island Expedition, ZD9AD, left London September 1st and will be in transit at least a month. ZD9AD will be active for six months and requests NO calls be made on his frequency. G3HPM is the operator and he will keep weekly skeds with a GW friend of his to pass details of his log for QSL'ing purposes. All QSL's go via RSGB. Gough Island is some 260 miles SSE of Tristan da Cunha and is not separate as a country. . . . Leny, VQ8CB, is active and may be found on 14072/85/110, 1300-1600 GMT. . . . FO8AK will serve three years on Rapa Island. . . . W6LJQ

W6IPH, Fred Fiedler, of Hayward, Calif. was first licensed in 1933 while living in S.F. A PP-813 rig is driven by a 310-B excited to an input of 600 watts. A 75-A-1, with built-in Q5'er handles the receiving end. Antennas: FD on 7 Mcs., a three element rotary on 14 Mcs. and a one element rotary on 21 Mcs. (Photo courtesy North Calif. DX'er.)

Our heartiest congratulations go to the following station upon his achievement of WAZ:

No. 310 G3AAE
J. DOUGLAS KAY 40-172
Doug is the 24th G station to join this select group.

will spend six months in Europe, starting in September, and will put in some operating time at SVØWU besides trying to put Crete on the air. . . . MP4QAD, who is ex-G8JX, VS1CF and MP4BAM, should be active on 21 Mcs. phone at this time. . . . MP4BBL went on leave Sept. 28th and will be back at MP4 after Jan. 1st. . . .

DX-ploits

Frank, W6SYG, heads the list this month as he adds XW8AB to reach a modest 256. . . . Another Frank, W6AOA, sticks close behind with 255 thanks to FW8AB and XW8AB. . . . Al, W8PQQ, goes to 253 with PX1EX while Dave, W8BRA, comes up to date with 23 additions lifting him from 228 to 251! . . . Ben, W2BXA, adds ZD8AA and FR7ZA to reach an even 250 while Glenn, W6ADP, getting back on the job, snagged XW8AB for No. 247. . . . XW8AB gave Oscar, W3JNN, No. 243 while an A3 contact with JZØAG made his phone total 212. . . . Dewey, W6VE, upped to 240 with PX1EX and VQ8CB as Ozzie, W9VND, submitted new list with a 238 total. . . . Ray, W6BUD, added such as VQ6LQ, GC2FZC, YI2AM, ZD8AA, VR6AC and PX1EX to hit the 225 mark as Ray, WØDU, ascended to 223 with HKØAI, LZ1KAB, VQ6LQ and OY4XX. . . . Art, W6SR, went to 215 with help from VS2ET, YJ1DL, HKØAI, FW8AB, I1DCO/M1 and XW8AB (I wish they would use the proper "9A1" prefix at San Marino). . . . Wally, W7ENW, upped to 189 with OY2Z, XW8AB, VP5DC and ZB1JRK as Vip, W6ID, nudged 165 with ZS8L. . . . Glenn, W8KIA, made it 247 with XW8AB while KV4AA stayed close behind with help from the same party. . . . Stan, W1CLX, A3'd wtih VR6AC for an even 240 as Art, W9LNM, upped to 236 with MP4QAL and VS2ET. . . . Howy, W2QHH, adds MP4QAL and HKØAI for a QRP 230 while Mike, W9FKC, rests on 227 with XW8AB, MP4QAL and JZØAG. . . . Van, W9HUZ, goes to 226 with ZS8L, XW8AB and PJ2MA as Bill, W1HA, adds his 39th zone and 220th country with XW8AB. . . . Joe, W8UAS, also makes it 220 thanks to ZM6AT. . . . Ren, W3KDP, nabbed LS1BA, ZS8L and XW8AB for 214 while Joe, W6GPB, hits 209 with additions that include PX1EX, VR6AC, XW8AB, PZ1RM, ZD3BFC and ZD6BX. . . . Buzz, W9ABA, goes to 199 with ZS8L, MP4QAL, VS2EI, XW8AB and ZD3A as Len, W6WO, hits 190 with such as VQ3CC, HKØAI, EA9DF, ZD6BX, YJ1DL and FY7YC while Dick, W5MET, adds 34 new ones which include CR8AC, PX1EX, XW8AB and VS4CT to rest on 184. . . . Bob, WØQVZ, slides to 170 with ST2NG, LZ1KAB, CR4AL, ZM6AS and ZD6BX as Stan, W9NZZ, keyed with YI2AM, OY7ML, VP2GW, etc. for 169. . . . Ted, W8JBI, submits 3A2AW, YJ1DL, VR6AC, VS4CT, XW8AB and ZA1BB to reach 225 as Gus, W2HMJ, goes to 213 with ZS8L. . . . Bill, W8KPL, adds such as PX1EX, ZP5AY, HKØAI and EA9DF to reach 196 while Hal, W6TXL, nabbed XW8AB, ZS8L, ZC4PB, I1DCO/M1, VQ6LQ, YJ1DL, VR6AC, SVØWS and PZ1RM for a 181 total. . . . Sam, W3AXT, upped a zone and a country with XW8AB for 38-177 while Frank, W1WY, submits new list with a 176 total. . . . Dixie, W2ZVS, goes to 180 thanks to XW8AB and Jim, W5FXN, rises to 180 with ZD3BFC, ZS8L and VQ6LQ. . . . Don, W6AM, miked with ZS2MI for a phone total of 188. . . . ZS2MI was No. 247 for W6CUQ. . . . Bob, W4QCW, nabbed FL8AD, 1227 GMT, 14050 while Bob, K2GMO, logs 150 countries for nine months on the air. . . . Overheard on Sept. 16th were QSO's between FD4BD and W2HUQ / W8HGW / W4QCW / W8KIA / W3KDP / W6FOZ / W2JT / WØNLY / W6EBG and W2WZ! . . . Latest at K2BU were ET3LF, MP4JO and ZD6BX (MP4JO said definitely he was in Oman). . . . From W8PQQ we hear that YI3WW says "no such station as YA1AM." . . . Paul, W4BYJ, ups to 60 with I1BUN/T, YV1AD, CR6AI, HB4FE and XE3AF. . . . W8JGU, Bill, moves to 175 with XW8AB, VS1GX, ZS8L and KC6CG and claims he has

Enjoying a boat ride on the Neckar river on August 28th, during a local DARC Hamfest, the following well known DX'ers are, l. to r., Lloyd Colvin, DL4ZC (W4KE), Jacques Simonnet, F9DW, Fred Woerner, 9S4AX and Iris Colvin, DL4ZB.

Here is a view of OY7ML, Martin Haasen, of Torshavn, Faeroe Islands. Martin does an excellent job of handing out Faeroe contacts and QSL'ing. The transmitter is a 75 watt all-band job and the receiving end is taken care of by a 12 tube super-het.

the most countries for his age, 16 years. Any takers? . . . August 23rd contacts between ZS2MI and the following W6's on 14157: W6UHA, W6AOA, W6MBA, W6BUD and W6FSJ were reported. . . . Gene, W2AEF, celebrating 30 years with the N. Y. Central R.R., paused to nab a couple of new ones in ZB1 and EA6-lands. . . . Ben, W2BXA, considers a SSB/DXCC. He has worked 29 countries SSB to SSB! . . . Ed, OH2RY, rises to 223 with ZS8L, VS4CT and XW8AB. . . . The 45 watter at W4BXV nabbed the following on 7 Mcs., CW: G4RZ, HH3DL, F8HV, G5JL, PY2BKV, G4CP, F3NB, FA8DA and VP5BN. . . . Don, PJ2AJ, acquired a 32V2 and proceeded to work FY7YE, KG1AA, HK1DG, OH2LK, VK2BA and OY7ML to bring his total to 73. PJ2AN, Arie, has 98 and is sweating out the "big two." . . . Norm, W9YNB, made it 183 with HKØAI and FY8YE while K2BZT nabbed VQ8CB for his No. 157. . . . Lloyd, WØQGI, went to 122 with KJ6FAB, ZB1GBF and VS1GX—all with a lil 2E26! . . . Warren, WØNGF, upped to 60 with such as FK8AH, FY7YF, CT2BO, HE1OP, HKØAI and EA8BF. . . .

TRANS-ATLANTIC TOP-BAND (160 METER) TESTS. 1955/56

DATES: Every Sunday, December to March inclusive.

TIMES: No set limits, but peak activity between 0500 and 0800 GMT. American stations will be listening for Europe, and other DX, between 1830 and 1870 kc. U.S. frequencies on this band are: 1800/1825, 1875/1900, 1900/1925 and 1975/2000. (*Short Wave Magazine*)

21 Mc

Consistent reports tell of improved conditions on this band accompanied by many hot openings. It will bear watching and we shall try to give it a better coverage than in the past (in fact good reporting almost calls for a DX editor on each band). A sample of what may be expected on 21 may be pictured by KV4BB's half hour WAC on CW between 1140 and 1210 GMT, September 17th. Bill contacted KC6CG, LU3EX, ZB1AY, 4X4FS, ZD6BX and VE3KP!!

Addresses (QTH's)

ET2RP .....APO 843, c/o Postmaster, New York.
FD4BD .....Pierre Dubourdieu, Box 185, Airport, Lome, Fr. Togoland.
FK8AQ .....Box 104, Noumea, New Caledonia, F. O.
FQ8AX .....P.O. Box 218, Brazzaville, F. E. A.
FW8AB .....Adrian Monjoie, Mata-Uta, Wallis Island (or via W6MUR).
KJ6BH .....Mel G. Neims, 6488 Air Base Sqdn., APO 105, PM, San Francisco.
KJ6FAB .....Jack Halser, APO 105, PM, San Francisco.
OK3KEE .....Petter, Box 200, Bratislava, Czechoslovakia.
PZ1CD .....Arnie, Box 848, Paramaribo, Dutch Guiana.
SU1DD .....Via RSGB.
VEØNA .....H.M.C.S. Iroquois, c/o FMO, HMC Dockyard, Halifax, N. S.
VP2VB/P .....Sloop YASME, via KV4AA.
VP9CE .....Howard S. Pedro, Frog Lane, Devonshire, Bermuda.
VR3B .....Deane Laws, c/o Cable and Wireless Ltd. Fanning Island via Suva.
ZS1PD (ZS8L)....H. C. De Wet, c/o J. I. De Wet, "KHARTOUM" GADZEMA, So. Rhodesia.
ZS2MI .....c/o ZS6FN, Box 7243, Johannesburg, So. Africa.
ZS8L .....Ken Tremeer, c/o Postoffice, Maseru, Basutoand.
4W1AXB .....Box 467, Sania, Yemen, Via Cairo.
5A1TL .....Via K2MSG, Box 61, Maybrook, N. Y.

Thanks to the West Gulf Bulletin, WØQGI, W5CFG, WØBCI, W8KAK, W2ERV and W3ZAO.

Here and There

A late QTH just received via DL4ZC is: SVØWS, 7206th AB Group, APO 206, NYC, N.Y. Thanks Lloyd. . . . W7VWS needs only a northern KL7 for their ADC certif. . . . W7PGA/7, with a terrific signal from his 75 ft. high beam. is campaigning to take care of those needing Nevada contacts on 14, 21 and 28 Mcs. . . . G3AIM was forced to cut short his activities from the Hebrides, this summer, due to the passing of his father. . . . Joe, ex-KP4RL, is again active from W2DIN on 21 phone. . . .

[*Continued on page 110*]

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CQA-CRZ	Portuguese Colonies
CSA-CUZ	Portugal
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HCA-HDZ	Ecuador
HEA-HEZ	Switzerland
HFA-HFZ	Poland
HGA-HGZ	Hungary
HHA-HHZ	Haiti
HIA-HIZ	Dominican Rep.
HJA-HKZ	Colombia
HLA-HMZ	Korea
HNA-HNZ	Iraq
HOA-HPZ	Panama
HQA-HRZ	Honduras
HSA-HSZ	Thailand
HTA-HTZ	Nicaragua
HUA-HUZ	San Salvador
HVA-HVZ	Vatican City
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LAA-LNZ	Norway
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LXA-LXZ	Luxembourg
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LZA-LZZ	Bulgaria
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NAA-NZZ	U.S.A.
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ODA-ODZ	Lebanon
OEA-OEZ	Austria
OFA-OJZ	Finland
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PZA-PZZ	Dutch Guiana
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SAA-SMZ	Sweden
SNA-SRZ	Poland
SSA-SUZ	Egypt
SVA-SZZ	Greece
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TFA-TFZ	Iceland
TGA-TGZ	Guatemala
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TIA-TIZ	Costa Rica
TJA-TZZ	France and Colonies
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VZA-VZZ	Australia
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XJA-XOZ	Canada
XPA-XPZ	Denmark
XQA-XRZ	Chile
XSA-XSZ	China
XUA-XUZ	Cambodia
XVA-XVZ	Viet-Nam
XWA-XWZ	Laos
XXA-XXZ	Portuguese Colonies
XYA-XZZ	Burma
YAA-YAZ	Afghanistan
YBA-YHZ	Indonesia
YIA-YIZ	Iraq
YJA-YJZ	New Hebrides
YKA-YKZ	Syria
YLA-YLZ	Latvia
YMA-YMZ	Turkey
YNA-YNZ	Nicaragua
YOA-YRZ	Roumania
YSA-YSZ	San Salvador
YTA-YUZ	Yugoslavia
YVA-YVZ	Venezuela
YZA-YZZ	Yugoslavia
ZAA-ZAZ	Albania
ZBA-ZJZ	British Colonies
ZKA-ZMZ	New Zealand
ZNA-ZOZ	British Colonies
ZPA-ZPZ	Paraguay
ZQA-ZQZ	British Colonies
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ZVA-ZZZ	Brazil
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3AA-3AZ	Monaco
3BA-3FZ	Canada
3GA-3GZ	Chile
3HA-3UZ	China
3VA-3VZ	Tunisia
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3ZA-3ZZ	Poland
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4DA-4IZ	Philippines
4JA-4LZ	U.S.S.R.
4MA-4MZ	Venezuela
4NA-4OZ	Yugoslavia
4PA-4SZ	Ceylon
4TA-4TZ	Peru
4UA-4UZ	United Nations
4VA-4VZ	Haiti
4WA-4WZ	Yemen
4XA-4XZ	Israel
4YA-4YZ	Int. Civil Aviation
5AA-5AZ	Libya
6AA-6ZZ	(No allocation)
7AA-7ZZ	(No allocation)
8AA-8ZZ	(No allocation)
9AA-9AZ	San Marino
9NA-9NZ	Nepal
9SA-9SZ	Saar

Thus . . . IF you were to hear	It would be . . .
DQ1AA	Belgian Congo
HF9KAA	Poland
JV3XX	Mongolia
VB4CK	Canada
XR2AB	Chile
YL4AA	Latvia
ZZ1ZZ	Brazil
4C6AA	Mexico
4V4AD	Haiti
YC3GG	Indonesia
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NOVICE

for the novice and technician

Reported by

Walt Burdine, W8ZCV
RFD 2, Waynesville, Ohio

Dear Readers of Novice Shack:

Vacation is over, children are going back to school, and rigs are being dusted off and readied for the long winter's grind of DX, rag-chewing, traffic handling, emergency work and our own enjoyment. The different phases of amateur radio can hold your interests from your first childhood to the third and still leave you something of interest to do. You might help some cripple, someone that is blind or a youngster to get a license so that he, too, can get in on the fun. Old-timers who have tried this know the inner joy of helping those not as fortunate as we. There are no age, sex or racial restrictions on the enjoyment of ham radio.

Schools are doing a wonderful job training the young folks in radio and quite a few have radio clubs.

Don't become set in your ways! If you only operate one band you are missing part of the fun. Go see a two-meter man; then visit one of the hams that operate single sideband. "Hit won't cost you nuthin' to look," and you might find a way to gain added enjoyment from your hobby. Can you improve the operation of your station? Do you have to throw more than one switch to transmit? Could another ham operate your station without a book of instructions? If your answer is no to any of these questions, then you have something to do this winter to improve your set-up.

I am amazed at the number of readers the Novice Shack has that are not novices. I received 64 letters asking for the coil data for the 15 meter converter in the September issue and only two were from novices. I sure hope

A good chance to work Nevada will be given by Corker Rhines, WN7YNO, of Elko, Nev. He will sked anyone needing Nevada for WAS.

the rest of you that are going to build the converter will find the coil data in the October issue of *CQ*, I nearly got writer's cramps from answering all those letters. I hope this little converter works as well for you as it does for me.

I visited the *Cincinnati Stagfest* Sunday, September 11 and sure met a lot of novices and other hams. The exhibits were very educational and one in particular did attract my attention. There were two amateur television exhibits put on by the younger set, none of whom were over 16 years of age. One display was put on by a non-ham and the other was put on by Dave Ringo, **W4DAF** of Erlanger, Kentucky and Bob Pielage, **WN8VHU/W8VHU** of Dayton, Ohio. The Dayton and Cincinnati radio clubs should be proud of these youngsters. They did more for amateur television with this display than all the written works so far have helped that phase of amateur radio. Both of these displays used the flying spot scanner system of getting the picture and the complete outfit worked very well.

Grandpa (I know his age) A. D. Brooks, Sr., KN4DKE of Havelock, North Carolina has worked 40 states and 6 countries with this super layout. He has sent Al, jr. (with the Signal Corps in Germany) a set of books as advised in Novice Shack. I hope he takes the hint, Al.

Novice Net News

Roy Scott, W4UHF, 3607 Omar Avenue, Tampa 9, Florida sends a note to tell us of the Novice Hurricane Net (NHN). The net meets Sundays 0800 EST on 3725 kc. The NHN is primarily a novice net and its purpose is to provide valuable training in net procedure, traffic handling, WX reports and emergency communications when needed. The cooperation of the Key Stations in devoting their time and efforts towards assisting novices in getting this training is very much appreciated. Stations in other cities are needed and member stations are urged to try to get other stations to join NHN. We would like to issue a regular bulletin and any news about your station or activities will be most welcome.

The following was lifted from *Sparks*, the publication of the Tri-state Amateur Radio Society, Evansville, Indiana: "All KN's and WN's interested in participating in a novice net on 40 CW are asked to call or send a card to WN9RVV, Allen Ratcliffe, 510 South East First, Evansville, Indiana. Phone: 3-6649 or KN9AMT, Joe Hallam, 15 East Missouri Street, Evansville 11, Indiana. Phone: 2-8113. Ideas and suggestions that have any bearing on this net set up will be appreciated.

Along similar lines is a note from Everett Taylor, W8NAF of Dayton, Ohio asking that a National Calling Frequency be set up for two meters. He suggests that 144.990 Mc. for the generals and 145.080 Mc. be used for the novices. The war surplus 8055 and 8060 crystals could be used to get these frequencies. No transmissions are to be made on these frequencies after initial contact.

W1AW Interference

The writer has received numerous requests to try to do something about the interference to the W1AW code practice transmissions. Honestly, if the 3.5 or 7.0 Mc. bands get so crowded that you can't find any place in those bands to operate except on the W1AW frequency, you had better move to the six or two meter band. You won't be able to work much on W1AW's frequency anyway. Be a good sport and find another frequency to operate and let's **keep the W1AW frequency clear** so others can reap the benefits of their code practice transmissions. They would do as much for you. Operate, but co-operate, please. BE A SPORT. Thanks. See *QST* for operation schedule of W1AW. [*Continued on page 98*]

Mick Voris, WN8BCE, Cincinnati, Ohio has worked 16 states with 20 watts to a 6L6 in one month.

Hint of the Month Dept.

While visiting Dave Marquette, W8DHJ, RFD 9, Box 679, Dayton, Ohio, I was struck with the possibility of his operating table as a good item for the new novice. The table was constructed from a sheet of three-quarter inch plywood about 30x60 inches, supported at one end by two of those wrought iron legs that you see for sale now at most stores that sell anything from aspirins to caterpillars. The other end was supported by a homemade filing cabinet. The complete unit was then given a coat of varnish or any color paint that would suit the fancy of the operator. The operating table looked very nice and with the raised shelf on the back portion for the receiver and other items that usually clutter the operating desk it presented a neat appearance. Dave says the table cost about eleven dollars to construct. That should give you the idea. You take it from there.

National Novice-Technician Association

Dear Walt: "I wish to inform the readers of *CQ Magazine*, particularly the *Novice Shack* readers, of a new organization which has been undertaken during the last few months, the purpose of which is to further the operating ability of the novice and technician class license holder. This organization goes under the name of the *National Novice-Technician Association* (*N.N.T.A.*). We will sponsor a QSL bureau called the *National Novice QSL Bureau* (*N.N.Q.B.*).

"There are two factors which confront the new novice. A. It takes at least two issues of the *Callbook* before the novice has his name printed in 'the Book.' By then his license is half expired. B. It's a sure bet that most novices won't have the latest copy anyway.

"So the simplest solution I can think of would be to have a self-addressed-stamped envelope on file at the districts *N.N.T.A.*-sponsored *N.N.Q.B.* All that would be needed would be to tell the contact to QSL via *N.N.Q.B.*"

Have you any comments or suggestions? If so please write to: John J. Markovich, **K6HTG,** N.N.T.A.—N.N.Q.B., 4490 Van Ness, Fresno, California.

Newly appointed members of the **N.N.Q.B.** are:

WN3BBO ..... Robert Reisenweber, 135 West 25th, Erie, Pennsylvania.

KN5ATT.....Thomas E. Devine, 554 Hermine Street, San Antonio, Texas.

KN6HTG .... John Markovich, 4490 Van Ness Blvd., Fresno, California.

WN7ZSE .....Barry T. Joseph, 4542 East 20th Street, Tucson, Arizona.

If you are interested in taking over the bureau in your district please write to the President, K6HTG, for details and requirements.

[*Continued on page 98*]

Here's Bill Nogues, W5GVE (1 week) of Austin, Texas working some hot DX (101 in the shade when picture was taken). He has 36 states and 6 countries with this station and a 22 foot vertical. Bill is 18 and a freshman at the University of Texas.

FT-243 NOVICE CRYSTALS New E-x-t-e-n-d-e-d Frequencies

80 METER NOVICE

3701	3709	3717	3725	3733	3741
3702	3710	3718	3726	3734	3742
3703	3711	3719	3727	3735	3743
3704	3712	3720	3728	3736	3744
3705	3713	3721	3729	3737	3745
3706	3714	3722	3730	3738	3746
3707	3715	3723	3731	3739	3747
3708	3716	3724	3732	3740	3748
					3749

40 METER NOVICE

E-X-T-E-N-D-E-D

7151	7159	7167	7175	7183	7191
7152	7160	7168	7176	7184	7192
7153	7161	7169	7177	7185	7193
7154	7162	7170	7178	7186	7194
7155	7163	7171	7179	7187	7195
7156	7164	7172	7180	7188	7196
7157	7165	7173	7181	7189	7197
7158	7166	7174	7182	7190	7198
					7199

DOUBLING TO 40 METERS

E-X-T-E-N-D-E-D

3576	3582	3588	3594
3577	3583	3589	3595
3578	3584	3590	3596
3579	3585	3591	3597
3580	3586	3592	3598
3581	3587	3593	3599

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2009	2126	2182	2637	2670	2953	2977	3093
2110	2174	2206	2638	2738	2961	3021	

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200 KC. DC-15 in octal base	1.99	3023.5 KC. Aircraft DC-34/35	2.99
500 KC. FT-241	1.99	5,000 KC. FT-243	1.99
1,000 KC. DC-9 in octal base	6.25	8230 KC. FT-243 CAP	1.99
3,000 KC. FT-243	1.99	10.000 KC. SR-5	1.99

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442	444	446
446	447	448
450	451	452
453	454	455
456	457	458
459	461	462
463	464	465
466	468	469
470	472	473
474	475	476
477	479	480

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1110	2040	2245	2410	2615	2985	3160	3655	4280	4785	5305	5780	6073.3	6406.6	6840	7306.6	7508.3	7610	7710	7810	7910	8016.7	8116.7	8210	8316.7	8425	8533.3	8641.7
1129	2045	2250	2415	2655	2990	3165	3680	4295	4790	5327.5	5782.5	6075	6425	6850	7308.3	7510	7616.7	7716.7	7816.7	7916.7	8020	8120	8216.7	8320	8430	8540	8650
1150	2050	2258	2425	2660	3010	3170	3700	4300	4815	5335	5800	6100	6440	6873.3	7316.7	7516.7	7620	7720	7820	7920	8025	8125	8220	8325	8433.3	8541.7	8658.3
1180	2055	2260	2430	2685	3015	3175	3760	4310	4830	5385	5806.7	6106.6	6450	6875	7325	7520	7625	7725	7825	7925	8030	8130	8225	8330	8440	8550	8660
1195	2065	2265	2435	2700	3025	3180	3800	4330	4840	5397.5	5820	6125	6473.3	6900	7333.3	7525	7630	7730	7830	7930	8033.3	8133.3	8233.3	8333.3	8441.7	8558.3	8666.7
1900	2070	2270	2442.5	2710	3030	3185	3825	4340	4845	5435	5825	6140	6475	6906.6	7340	7530	7633.3	7733.3	7833.3	7933.3	8040	8140	8240	8340	8450	8560	8670
1910	2075	2275	2450	2740	3035	3190	3840	4360	4852.5	5437.5	5840	6142.5	6500	6925	7341.7	7533.3	7640	7740	7840	7940	8041.7	8141.7	8241.7	8341.7	8458.3	8566.7	8675
1920	2080	2280	2460	2750	3040	3195	3885	4395	4870	5485	5850	6150	6506.6	6940	7350	7540	7641.7	7741.7	7841.7	7941.7	8050	8150	8250	8350	8460	8570	8680
1925	2085	2282.5	24o5	2765	3045	3202.5	3940	4397.5	4880	5500	5852.5	6173.3	6525	6950	7358.3	7541.7	7650	7750	7850	7950	8058.3	8158.3	8258.3	8358.3	8466.7	8575	8683.3
1930	2095	2285	2470	2770	3050	3205	3945	4430	4885	5545	5860	6175	6540	6973.3	7366.7	7550	7658.3	7758.3	7858.3	7958.3	8060	8160	8260	8360	8470	8580	8690
1935	2100	2290	2475	2775	3055	3210	3950	4445	4900	5582.5	5873.5	6185	6550	6975	7373.3	7558.3	7660	7760	7860	7960	8066.7	8163.4	8266.7	8366.7	8475	8583.3	8691.7
1940	2105	2295	2480	2780	3060	3215	3955	4450	4920	5587.5	5875	6200	6573.3	7000	7375	7560	7666.7	7766.7	7866.7	7966.7	8070	8166.7	8270	8370	8480	8590	8700
1942.5	2110	2300	2485	2785	3065	3220	3980	4460	4930	5633.3	5880	6206.6	6575	7006.6	7383.3	7566.7	7670	7770	7870	7970	8073.3	8170	8273.3	8375	8483.3	8591.7	8708.3
1960	2115	2305	2520	2790	3070	3225	3995	4485	4950	5635	5892.5	6225	6600	7025	7391.7	7570	7673.3	7773.3	7873.3	7973.3	8075	8173.3	8275	8380	8490	8600	8710
1965	2120	2310	2525	2875	3075	3230	4030	4490	4980	5645	5900	6235	6606.6	7040	7400	7573.3	7675	7775	7875	7975	8080	8175	8280	8383.3	8491.7	8608.3	8716.7
1970	2125	2315	2532.5	2880	3080	3235	4035	4495	4995	5655.5	5906.7	6240	6625	7050	7406.6	7575	7680	7780	7880	7980	8083.3	8180	8283.3	8390	8500	8610	8720
1972.5	2135	2320	2535	2910	3085	3237.5	4045	4520	5030	5660	5907.5	6250	6640	7073.3	7408.3	7580	7683.3	7783.3	7883.3	7983.3	8090	8183.3	8290	8391.7	8508.3	8616.7	8725
1975	2140	2325	2540	2915	3090	3240	4080	4535	5035	5675	5920	6273.3	6650	7075	7416.7	7583.3	7690	7790	7890	7990	8091.7	8190	8291.7	8400	8510	8620	8730
1977.5	2145	2330	2545	2920	3095	3245	4090	4540	5065	5677.7	5925	6275	6673.3	7100	7425	7590	7691.7	7791.7	7891.7	7991.7	8100	8191.7	8300	8408.3	8516.7	8625	8733.3
1980	2150	2335	2555	2925	3100	3250	4095	4565	5090	5687.5	5940	6300	6675	7106.6	7433.3	7591.7	7700	7800	7900	8000	8106.6	8200	8306.6	8410	8520	8630	8740
1990	2155	2340	2557.5	2930	3105	3320	4110	4580	5115	5700	5950	6306.6	6700	7125	7440	7600	7706.6	7806.6	7906.6	8006.6	8108.3	8206.6	8308.3	8416.7	8525	8633.3	8741.7
1995	2170	2345	2560	2935	3110	3322.5	4130	4610	5127.5	5706.7	5955	6315	6706.6	7140	7441.7	7606.6	7708.3	7808.3	7908.3	8010	8110	8208.3	8310	8420	8530	8640	8750
1997.5	2185	2350	2565	2940	3115	3440	4135	4620	5135	5722.2	5973.3	6325	6725	7150	7450	7608.3											
2005	2200	2355	2570	2945	3120	3455	4165	4635	5165	5725	5975	6335	6740	7200	7458.3												
2010	2205	2360	2575	2950	3125	3465	4175	4640	5180	5730	5995	6340	6750	7206.6	7466.7												
2015	2210	2380	2580	2955	3130	3505	4190	4680	5205	5740	6000	6350	6773.3	7225	7473.3												
2017.5	2215	2385	2585	2960	3135	3510	4210	4695	5235	5744.4	6006.6	6362.5	6775	7240	7475												
2020	2220	2390	2590	2965	3140	3525	4215	4710	5245	5750	6025	6373.3	6800	7250	7483.3												
2025	2225	2395	2603.7	2970	3145	3540	4240	4735	5285	5760	6040	6375	6806.6	7273.3	7491.7												
2030	2230	2400	2605	2975	3150	3568	4250	4755	5295	5773.3	6042.5	6400	6815	7275	7500												
2035	2235	2405	2610	2980	3155	3640	4255	4780	5300	5775	6050	6405	6825	7300	7506.6												

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Actually, down deep in your heart you knew that our present subscription rate wasn't going to last. It couldn't, really; figure it out. At 50¢ per on the newsstand that comes to $6.00 per year. A reasonable yearly subscription rate then should run around $5.00. We are anxious to encourage subscriptions as much as possible though and therefore have decided to make the new rate only $4.00 per year, two years for $7.00, and $10.00 for three years.*

CQ is going to continue in its new giant size and may, if the subscription list continues to grow, expand even more. All sorts of things are in the works.

Being Christmas and everything and feeling a bit yuleish we will give you one last chance to pick up a real bargain. Until January you can subscribe or extend a subscription to *CQ* at the old rates of $3.00 for one year, $5.00 for two, or $7.00 for three. You had better ask for a complete psychoanalysis for Christmas if you don't flip $7.00 in an envelope right now and extend for three years. Even if you are paid up to 1960 this is a buy that you will want to take advantage of.

Want to make friends? Subscribe for them too. Stop losing back issues to borrowers, see that they have their own library. Make everybody love you. Be generous, send us money. The form faces this page so set to it.

—W2NSD

P.S. If you are reading this in January or later forget the whole thing—you goofed.

*The above rates apply to U.S. Possessions, APO and FPO only. Canada, Mexico, Pan-America: 1 yr. $4; 2 yrs. $7; 3 yrs. $10. All other foreign: 1 yr. $6; 2 yrs. $11; 3 yrs. $16.

LETTERS [*from page 22*]

saw the price. Jim if this is a rush to get more subscriptions I think it is one of the lowest types. I have subscribed or bought *CQ* for years, but I am off it from here out until you come down to 35¢ a copy, when you do this you can renew my subscription and start with the Sept. 55 issue, but until then 73 and I hope you lose your socks. . . .

W. L. Kennamer, W4YPC

Arlington, Va.

Dear Wayne:

I have one comment about the format of the magazine. Although I was not a ham back in 1950, I do know that CQ had a very fine piece of material called The Mobile Corner. It is my understanding that about 15% of all hams have a mobile station (many more than RTTY) and I believe that it would be definitely worthwhile to resume this column.

Charles Walter Stewart, W4WNN

Beltsville, Md.

Dear Wayne:

In your October editorial you state your intention to avoid description of any ham equipment which you classify as a "real dog." Yet in the same issue there are three antenna T-R switching devices dscribed which can produce very sad results in some cases and absolutely horrible ones in others. The tubeless model with germanium diodes across the receiver input can fill the receiver with hundreds of sum and difference products of signals all over the radio spectrum. Broadcast station cross-modulation or nearby ham operation on any band is disastrous. Tests showed this to actually be the case. This possibility wasn't even mentioned in the article.

The receiving gain or loss of the tube systems is mentioned, but the signal-to-noise ratio beating one must take with an untuned input system feeding a vacuum tube is not. If account is taken of this, and the fact that cross modulation, desensitization, and intermodulation are likely to be serious when one of these devices is used ahead of a good receiver, many of the boys would save the money it costs, and would remain happy with their old fashioned switches or relays which don't cause such troubles.

D. McClenon, W3EIS

Dear Editor:

The following is a copy of a bulletin now being broadcast to all amateur radio stations.

This broadcast is to familiarize you with the case in which suit has been instigated by the pacific palisades Civic League and nine neighboring residents against Bill Guimont W6YMD in the Superior Court of Santa Monica. The suit filed seeks a permanent injunction against Guimont erecting a telephone pole and rotary antenna despite valid permits from the Los Angeles building and safety department.

Representing Guimont is Attorney Howard Shepherd W6QJW and cooperating is Mr. Segal of ARRL. Charges contained in the complaint are as follows: 1) To abate a nuisance allegedly created by the existence of amateur radio antenna. 2) Violation of deed restrictions allegedly prohibiting buildings and structures of this type without approval of the Civic League. 3) Alleged property devaluation due to antenna installation.

Injunction also sought to prevent operation of amateur radio station in order to prevent alleged television interference. Legal issues involved have not previously been clearly established. Legal precedent established by the Supreme Court will affect all amateur radio stations. Financial support *now* can win this case for the amateur. Remember your assistance in this matter can prevent future expensive litigation for you as well as protect us all by the establishment of legal precedent in favor of the radio amateur. Send your contribution in any amount to ARRL director Walter Joos W6EKM, 1315 Overhill Drive, Inglewood, California. *Let's back W6YMD! His fight today may well win yours tomorrow!*

. . . de W6AOA

P.S. For further information contact the Los Angeles Council of Radio Clubs.

Late Items

Pierre, **FB8XX,** Kerguelen Islands, has been very active of late on various frequencies on the 14 Mc. band. Best times and frequencies seems to be from 1330 to 1430 GMT near 14100 or 14075. He is also on from 0730 to 0830 GMT and heard on 025, 050 and 075. . . . VK3CX nabbed **3W8AK,** Viet-Nam, on phone, 14 Mc. . . . KA2CR closed in July and now Bob keys from W4PFH/4, HQ 18th AF, Donaldson AFB, S.C. . . . G6LX visited Los Angeles and advised W6SAI that he hopes to be on from **FC7LX,** Corsica, this fall. . . . Pete, **ZC5CT,** has been coming through from North Borneo near 14075 around 1230 GMT. . . . W6SAI and W6VUP contemplate St. Martin trip. Bills license as **FP8AC** may make operation from the French side of this island possible. . . . YU3AE/MM recently called in at Norfolk, Va. his 3 watts sounds like 300 according to W5CFG. . . . W6BZE, aided by W6OME, threw up a new six element telerex beam. . . . PY2CK reports **YA1AM,** on 14094, and **XV5LV** (Maldive Islands?) on 14080. The "XV" prefix is assigned to Viet-Nam by the by. . . . **XZ2AD** was heard on 14073 at 1545 GMT. . . . Bernie, W6TMX, requests QSL's for January to March operation of W6TMX/KG6 be sent via W6TI. . . . Tom, W1CHN/8, now keys from Battle Creek, Mich. . . . **AC5PN** has been heard by VK3CX on 14130 around 1000 GMT. . . . **GD3UB** has put up a 1200 foot V beam and advises he will be on 1820 kc daily at 0500 GMT starting November 1st . . . ex-ZC5VR is now **VS2EW** (Tks W6YY). Also from John: PZ1CD has been active on 14020, 2300 to 0100 GMT. Active on Martinique are FM7WD, FM7WF, FM7WN, FM7WP and FM7WQ. Floyd, **VR6AC,** continues on 14143 xtl Tuesday and Saturday nights 0330 to 0430 GMT, 20 watts, A3. . . . ZL2RC and ZL2AX look for W stations on about 28,500 kc., A3, between 0200 to 0400 GMT Sundays (Sat. night). EA9DF still plans to visit IFNI this Winter if he can find suitable "portable" rig. . . . **ZC5CT** opened from ZC5-land on September 20th. . . . ZS6AJH advises that **ZS9BD** is the only ZS9 now active. He is on 14 Mc. phone. . . . Anyone needing a VR1C card for a 1950 contact should write W6PZ who WAS VR1C during that period. . . .

73's
KV4AA

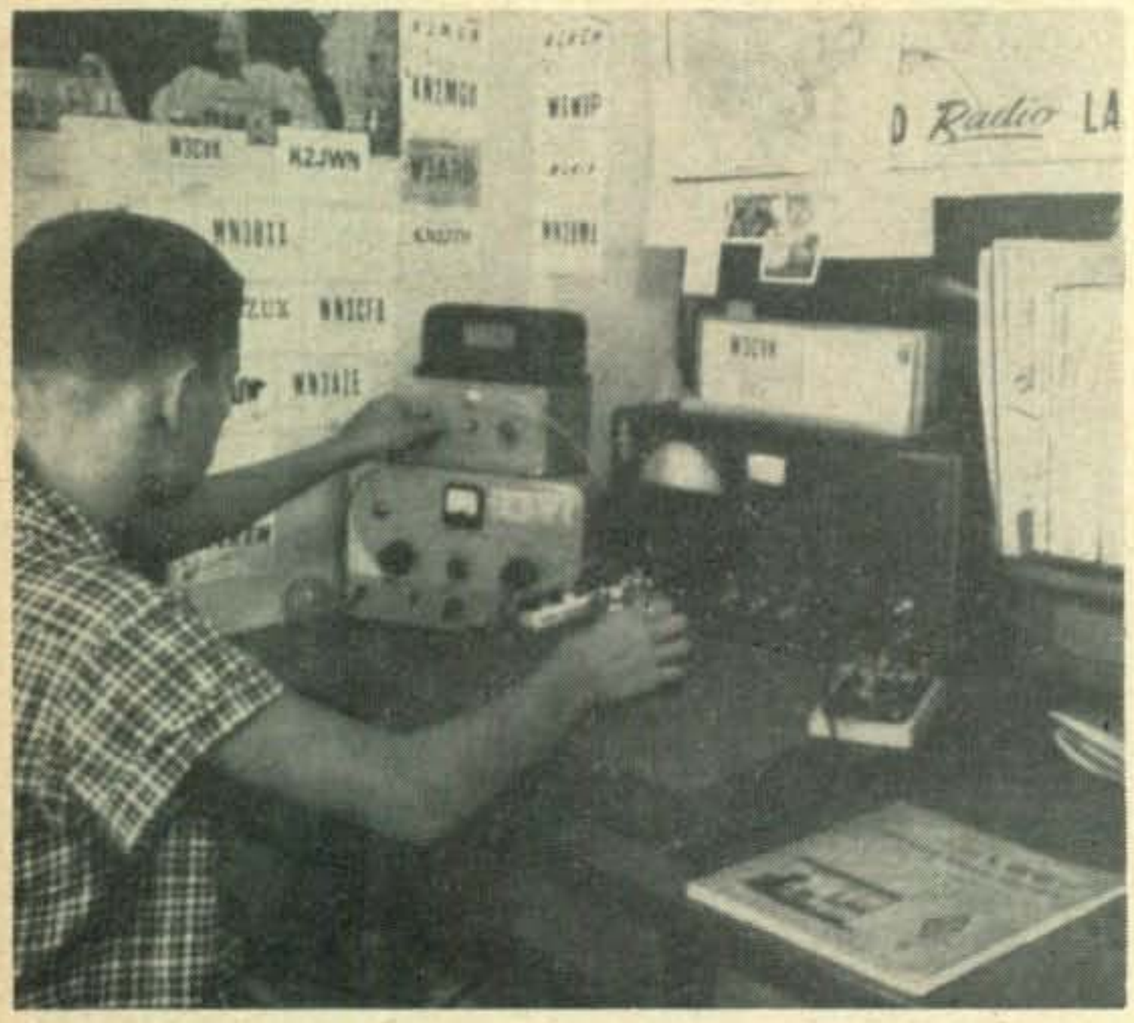
[*from page 94*]

What Do You Talk About?

When talking to the prospective ham one question invariably asked is, "What do you talk about?" This is a good question, and one that requires considerable thought. I usually say, Talk about anything that is of interest to you and to your friend on the other end of the circuit. Talk just like you do to a friend you meet on the street or over the phone. Don't use indecent or profane language, which is forbidden by FCC regulation, and a gentleman or lady shouldn't have to worry on that score anyway. Don't talk politics, religion or discuss race, color or creed. Don't say anything on the air that you wouldn't say about or to a crowd of people to whom you were talking in person. Let everything you say on the air reflect to the good of amateur radio. If you get peeved at what some thoughtless ham says to you on the air, don't satisfy him by losing your temper, go mow the yard or shovel the snow from the sidewalk. Ham radio is for our enjoyment, let's use it that way.

How to Obtain Parts

If you built one of the code oscillators from last month's *CQ* you are probably beginning to get that code speed up to the required speed to pass the test for your license. You are probably beginning to wonder what you are going to use for a transmitter and where you are going to get the parts to build your transmitter.



Allen Schlegel (15) WN3CVK, Wyncote, Pa., a novice of two months, has 19 states on 40 CW.

The problem is not as hard to solve as you may think, if you will use your handbook and a generous portion of the old grey matter. Read the magazines and decide what you are going to build, then start out to get the required parts to make up a "junk-box" (amateur slanguage for any box of parts, new or used into which we delve for parts for the next building project) of transformers, resistors, capacitors and sundry coils. Use your handbook and save your pocketbook.

A very good source of supplies is a local radio and television store. He usually has a supply of big old radio and television sets taken in trade on new sets, and is willing to part with them for a very reasonable price. Some dealers will supply a schematic for the set at a slight additional cost and this will come in handy in identifying parts and transformer leads and also transformer ratings.

The older television sets had more tubes and larger transformers than the newer ones on the market. The power transformer from a ten-inch television receiver has a rating of about 300 volts at 250 to 300 ma., plenty of power for a novice station.

An old radio set can furnish parts for the power supply for the amateur receiver. I would advise the use of new condensers in the filter. Explain to the dealer that the outward appearance is of small importance and that you want to disassemble it to make an amateur radio transmitter. He will help you pick the best for your needs.

Amateur radio clubs frequently hold auctions where local amateurs dispose of their extra parts and swap for some other (sometimes) equally useless extra parts. They usually part with these parts for mighty small sums of money or will trade for your extra yellow cat or camera, gun or at one time I heard of a deal involving an automobile. *(Ed. note: The prospective swapper is cautioned against swapping for imaginary objects, such as promised cash or equipment, or pie-in-the-sky-by-and-by. This doesn't work at all well, even with the best of friends. Swapping is a thing of the moment. All the materials should be à la table.)*

Amateurs themselves will often help the prospective ham get the required parts to put the transmitter together. They usually have a few parts and lots of information on the pitfalls of assembly, wiring and operation. The Old-timer's advice should be noted and taken for all it is worth, after all he has had experience in these things. He will be able to help you on the layout of parts.

The local radio supply houses are there to help you and they will usually sell you ham parts at wholesale price to build your rig. They have a wealth of information at their fingertips to help you solve your problems. Your building problems are good for their business. They carry nationally-advertised parts for your convenience.

The ads in *CQ* and other magazines blossom forth with bargains in radio war surplus by the dozens. By judicious selection of the parts offered you can get a nice supply of parts for a small outlay of cash. Tubes and transformers

[*Continued on page 102*]

.....about this ALL NEW receiver GPR 90

Complete receiver - Amateur Net $395.00
Matching Speaker $16.00 extra

Our Engineering Department has been developing the GPR-90 for over two years and during that time many prototypes were produced. Our objective was to produce a good receiver, rugged enough to last a long time, sell at a reasonable price and maintain a high resale value.

Noise • Many people judge a receiver by the amount of noise it makes when it is turned on. We think the idea is to hear signals, not noise and with this in mind, we reduced the noise to a minimum, so that for one microvolt of sensitivity, the receiver has a 10 db signal to noise ratio. In simple terms this means that the signal plus the noise, is 10 db above noise alone. So when you turn the receiver on and it appears to be too quiet, remember, it is still very sensitive.

Intermodulation • We use a modified grounded grid front end in this receiver, about which there may be some concern with regard to intermodulation (sum and difference spurious carriers.) The front end of the GPR-90 was specially designed to employ a TMC ferrite input transformer, a product designed and produced exclusively by us. The grounded grid stage, used on bands 3, 4, 5, and 6 (where it does the most good), is preceded by a high pass filter which virtually eliminates intermodulation caused by strong broadcast carriers—for example, a 5.88 mc. spurious carrier produced by a 55,000 mv signal at 880 kc. and a 55,000 mv signal at 5000 kc. will be down 92 db. Moreover, the grounded-grid stage always has either AVC applied or is on the RF gain line.

Calibration • Dial Calibration with high degree of accuracy is not easy to attain in a general coverage receiver, but it can be done. It is much simpler to provide highly accurate calibration and tracking over the amateur bands only, but this "specializes" the receiver. The GPR-90 is calibrated to communication accuracy, over its entire six bands. In our case the primary factors in calibration were oscillator drift and condenser curves. We believe that we have adequately taken care of these items and produced a well calibrated receiver.

Audio Selectivity • We think you will like our exclusive audio selectivity and audio spread features. They are usable on CW, phone, and SSB. In the sharp position the peak of the audio curve (exalted 6 db) is approximately 50 cycles wide, and a CW signal peaked at 1200 cycles will actually seem to leap out of the noise, when properly peaked by the B . F. O.

S. S. B. • The GPR-90 will receive SSB signals as well as any communications receiver not specifically intended for SSB. It has adequate stability, rf and audio selectivity, generous B.F.O. injection, which can be raised if desired and the AVC can be used with B.F.O. on. However, we do not feel that the average ham is rushing madly to all-out SSB operation—at least not right away. SSB is a very efficient form of communication but is slightly complicated for the average ham. However, an ideal combination for SSB is the GPR plus a signal slicer and the GPR-90 provides for such insertion of a "signal slicer" between the 455 kc I.F. and the audio output, on the rear deck. TMC will produce such a slicer in the near future in a matching cabinet.

XTAL Calibrator • when the question of a crystal calibrator was raised, it was decided that it came in the category of an acessory and would raise the cost unnecessarily. For those who wish, a kit will be available for simple installation either at home or the factory.

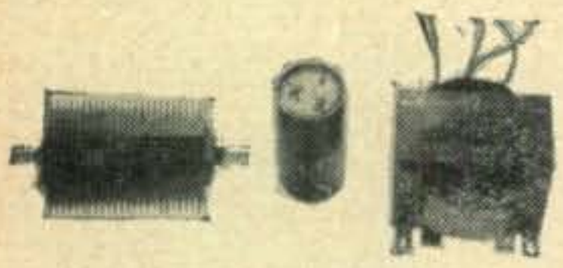
The success of any product is its acceptance by the user. Advertising claims will sell the product but only the product can keep itself sold. If you like the GPR-90 it will be around a long, long time.

Bulletin 179B-C for complete details.

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, NEW YORK. OTTAWA, ONT., CANADA

ESSE INVENTORY CLEARANCE SPECIALS

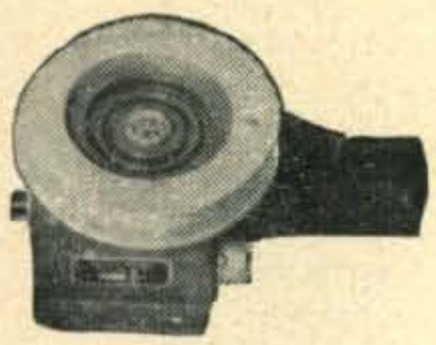


24 V. DC POWER KIT—$19.95

Brand new transformer, copper sulphide rectifier, and 2000 mfd. 50 V. condenser for building 8 amp. 24-28 V. DC supply to charge batteries, or run direct many of the surplus aircraft items from your 110 V. AC source. All quality parts which, if purchased separately, would run over $35.00. Shipping wt. approx. 20 lbs. Your price for kit as shown **$19.95**

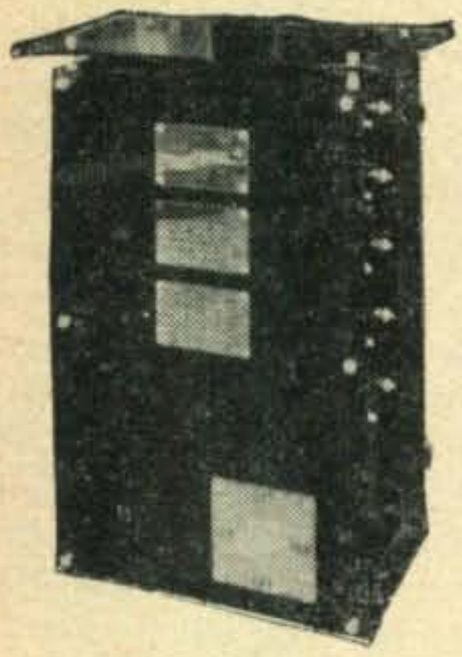
RL-42-B ANTENNA REEL/Motor—$2.50

Used originally for remote controlling of automatic trailing wire antenna. Motor is ⅛ H.P. 24 V. D.C. with oil-less sleeve bearings. The gear train, breaking and disconnect mechanism, reversible and vairiable speed motor makes this an ideal unit for conversion to coil winders, etc. Ship wgt. approx. 5 lbs.



Used—$2.50 ea. **New—$3.95 ea.**

BATTERY CHARGER (ED33511)



Mfgd. by Ward-Leonard Electric Co. Type 16888.19. 115 V. DC. Charging rates 14 Amps. max. Complete with cord, kit of spare parts. Brand new, perfect condition. Overseas packed. For 6 to 15 2-Volt cells. Acquisition cost to Government $300 each. Size approx. 12" wide x 20" high x 10" deep. Wgt. of unit 45 lbs.
BRAND NEW—Price

$12.50 ea.

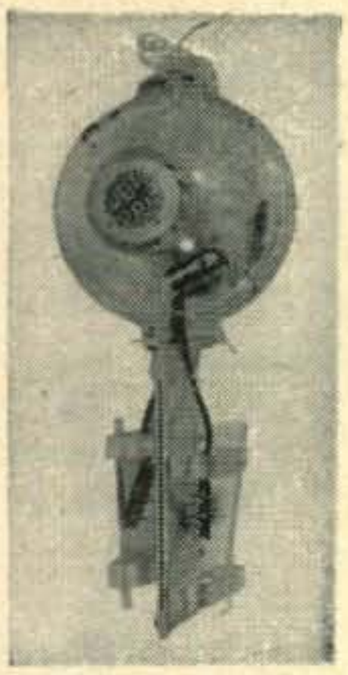
Battery charger (ED33510), similar to above except Charging rates 30 Amps. max. Size approx. 20" wide x 20" high x 10" deep. Wgt. of unit 65 lbs.
BRAND NEW—Price

$14.95 ea.

AN/ART-4 TRANSMITTERS with Target

These small battery operated transmitters were used to transmit a signal back to another plane when the 6 ft. by 30 ft. target was hit. Transmitters operated on 55.5 mc. and 56.75 mc. using 3A5 tubes. They have found favorable acceptance for conversion and use with model radio controlled planes and boats. The target is made of plastic screen which may be used for homes, patios, etc. as it will not rust or rot and outlasts any wire screen. Units are brand new and come in wood box 10" x 12" x 75". Ship. wt. 75 lbs. Our fortunate purchase of a great quantity of these allows for the low price so don't be misled. Many who ordered before have repeated for several more units. Our price while remaining stock lasts.

$3.95 ea.



MOBILE 80 AMP. FUSES

10¢ ea. lots of 10

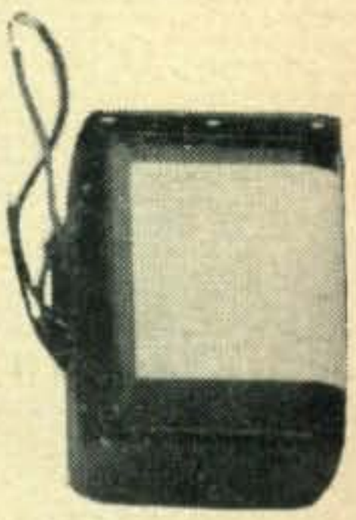
Buss ACK 80 Cartirdge fuses for that mobile rig. Spade or clip type connections. New, box of 10..... **$1.00**

ALPHA HAND MONITOR—$19.95

Brand new, mfd. by Barker-Williamson for the Atomic Energy Commission with acquisition cost of several hundred dollars. Indication of radiation made on O-20 micro amp. meter in panel. Only 27 in stock. No technical data available. A bargain if you know what to do with it. Close-out at **$19.95**

50 WATT OUTPUT TRANSFORMER—New—$7.95

RCA surplus output transformer from the Navy battle announce system. For use with P.P. parallel 6L6's or 2—807's. Sec. Z 4-8-15-60-250 Ohms. Case size 3¼" x 3½" x 4¼", 12" wire leads. Shipping wt. approx. 8 lbs. A comparable transformer is priced at approx. $30.00 Get this new, quality transformer now for only..... **$7.95**



VOLT-OHM METER—New—$5.95

Foundation meter for building your own multitester. 0-1 Ma. basic movement with scale readings of 0-50 ohms, 0-30 DC volts, and 0-30; 0-150 AC volts. Use suitable multipliers for addn. ranges. Full 3" black scale with luminous numerals in heavy waterproof steel jacketed case 3⅛" in dia. Made for rugged aircraft test equip. use by Dejur-Amsco Corp. Ship. wt. approx. 2 lbs. Rectifier for AC use included for $1.00 addn..... **$5.95**

MANIFOLD PRESSURE GAUGE—New—$5.25

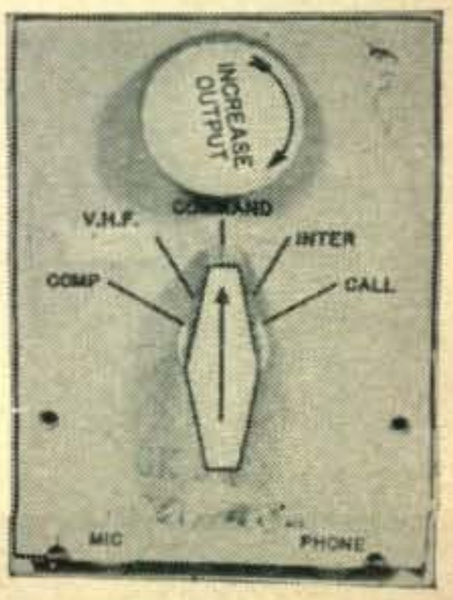
Aircraft instrument type manifold pressure gauge indicating pressures from 10-75 inches of mercury absolute. Use in your car or plane to indicate pressure at various altitudes. Ship. wt. approx. 1½ lbs. NEW..... **$5.25**

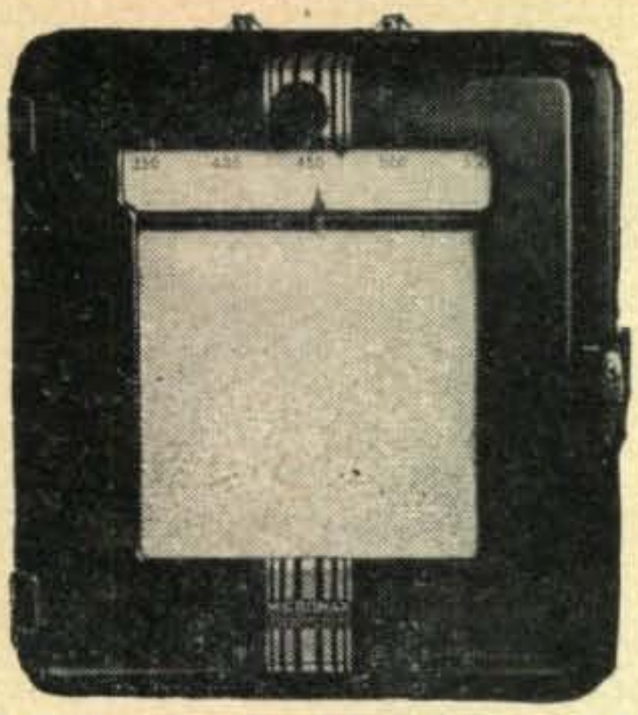
CURLY CORDS—$1.00

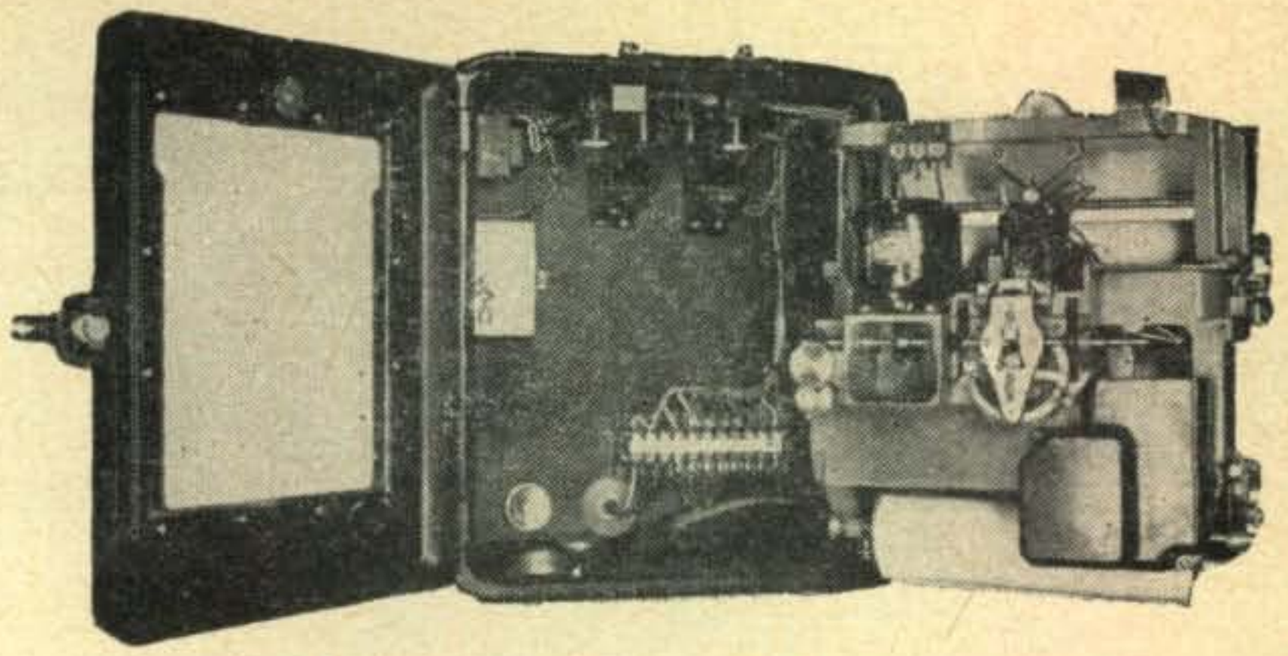
New cord for your mobile mike, handset, telephone, etc. Do away with the tangles. 24" long extends to 10 ft. 3 cond. with term. lugs each end.
Brand new ..... ea.... **$1.00**

BC-366 JACK BOX

Contains 5 pole switch, volume control, phone and mike jack in aluminum case 3¼" x 4⅛" x 2¼".
Lots of 10 or more ....ea. **29¢**

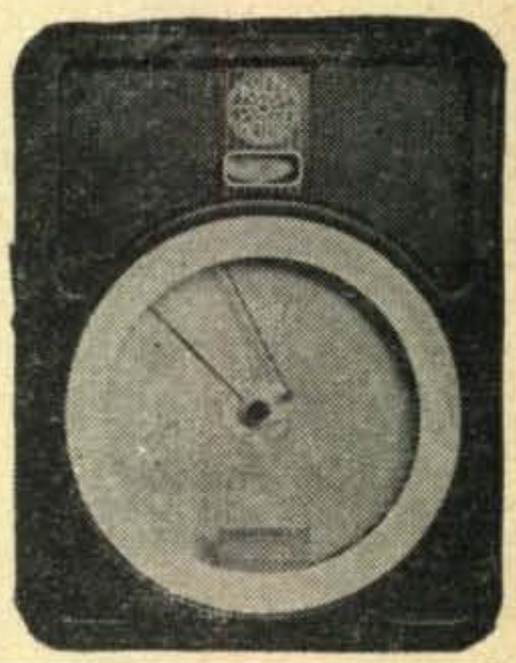






LEEDS & NORTHRUP MICROMAX RECORDERS—$179.50 each

These are the strip type recorders used for controlling and recording a wide variety of processes. Used originally for temp. range of 350-550 degrees C. but may be changed for other applications. Operates on Wheatstone bridge principle using AC galvanometer movement. Original cost was several times our price. These units were removed from demilitarized equipment which in many cases was new; however, all instruments sold as used but guranteed, or money back if not satisfied.



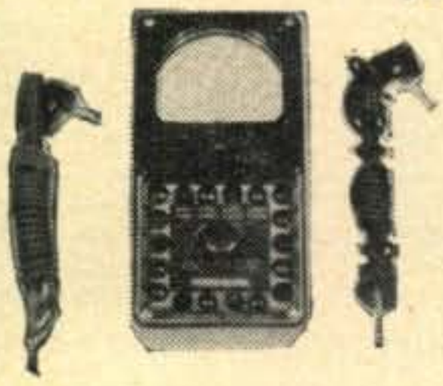
PRICE—$179.50

BAILEY METER RECORDERS

Used in application as above at same temperature range, etc. Operates on electronic principles using vacuum tubes. Used but guaranteed condition.

PRICE—$65.00

SUPREME MODEL 542-B MULTIMETER—$19.50 NEW



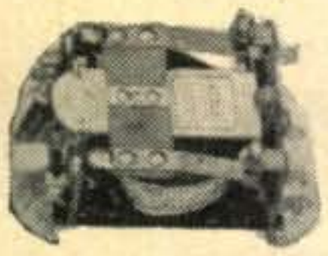
Brand New pocket laboratory at less than your regular price.
Ranges:
4 Dc Mil. ranges—0/0.3/6/30/150
4 DC Volt ranges—0/6/150/300/1500
4 ohm ranges — 0/2000/20,000/200,000/2 Meg.
4 AC Volt ranges—0/6/30/150/600
4 output ranges—0/6/30/150/600
4 Decibel ranges — —6/+10; +8/+24; +22/+38; +34/+50

Complete with leads as shown. Brand new..... **$19.50**

VIBRATOR TRANSFORMERS —Choice $1.00 ea.

6 V. to 300 V. @ 65 Ma. Harvey-Wells $1.00
12 V. to 300 V. @ 65 Ma. Harvey-Wells $1.00
6 V. to 280 V. @ 60 Ma. Philco 32-8313-1 ..... $1.00
All are brand new quality mdse.

LEACH SENSITIVE RELAY TYPE 1037—NEW—$4.95 ea.

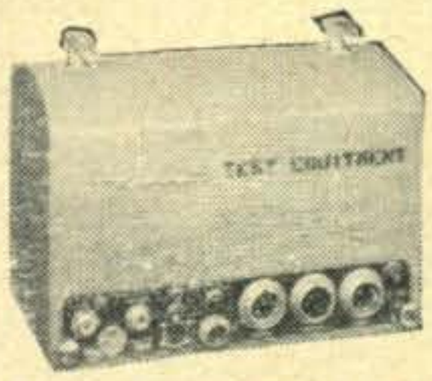


Metal base sensitive relay with ⅛" pure silver DPDT contacts rated to carry 1 amp. at 115 V. AC. Non-inductive. Operates on .040 watts but will operate on considerable less by adjustment of top contacts. 10,000 ohm resistance. Brand new at a fraction of original price. Price ..... ea. **$4.95**

SPECIAL 100'—$1.35

300 ohm TV twin Lead 1,000' rolls— **$9.95**

MOTOROLA FMTU 30 TRANSMITTER—$39.50



Mobile transmitter for the 140-160 Mc. range. Units are used with tubes but less crystals & dynamotor. Uses 2—2E24 tubes for 30 watt output. Only a few in stock so order early. Ship. wt. approx. 45 lbs. Price **$39.50**

Cables, control head & microphone supplied with above for $12.50 additional.

MANIFOLD PRESSURE GENERATOR—$5.00

Mount this on your test bench along with the manifold pressure gauge listed for servicing aircraft suction & pressure instruments. Bellows type chamber gives pressure from 10-75 inches of mercury. Connection for std. ⅛" pipe fitting. Has 3⅛" escutcheon plate and chrome crank. Measures 13" l. x 5" w. x 3½" h. Ship. wt. approx. 6 lbs. Price new ea..... **$5.00**

CITIZENS BAND ANTENNA—New—79¢ ea.

Easily mounted rooftop type antenna for use between 440-500 Mc. Rubber gasket included. Matches RG3U or other 52 ohm line. Co-ax angle & line connector included & alone worth the price. New..... ea. **79¢**

REMIT SHIPPING CHARGE AND INSTRUCTIONS WITH ALL ORDERS, OTHERWISE ORDER WILL BE SHIPPED EXPRESS COLLECT. ALL ITEMS GUARANTEED TO YOUR SATISFACTION OR MONEY REFUNDED IF RETURNED PREPAID WITHIN 10 DAYS OF RECEIPT. MINIMUM ORDER $5.00.

ESSE RADIO CO.

40 WEST SOUTH STREET INDIANAPOLIS 25, IND.

George Westover, W8UVD (13), has worked 40 states and 6 countries with an AT-1 and an S-40-B on 80 CW. This was as a novice. Later he added 3 more countries.

[*from page 98*]

are the best buys offered in the ads of most magazines. Twelve-volt tubes can be used in place of the customary six volt tubes at a great saving. Use the tube section of your handbook and compare the characteristics of the tubes offered.

Mail-order concerns offer the ham who lives out of town an opportunity to get parts to build and most mail-order concerns have hams on their staff to help you in case of trouble. They are often able to help obtain parts that the local jobber does not have in stock. You are not rushed when trying to make up your mind when buying parts from a catalog.

Next month we will take up the design, operational and theoretical functions of power supplies. We will try to explain the whys and wherefores of this important part of the ham station.

11 year old Robert "Bob" Fugate, W8RGJ, 5107 Glenmina Drive, Dayton 10, Ohio got his general at the Dayton Hamvention, April 2, 1955 and is working DX on 20-meter CW with this nice layout. His dad is Art, W8GFH.

Letters to the Editor

Nevada is one of the hardest states to get for the coveted *WAS* award. We now have a good prospect, Corker "Corkie" Rhines (18), WN7YNO, Box 763, Elko, Nevada. Corkie writes:

"I've had my ticket for seven months now and have worked thirty one states, Guam, Alaska, Canada and Hawaii. I run 75 watts to a *Viking II* transmitter. My antenna is a 50 foot vertical which loads very fine on all bands without a *Match-box*. The receiver is a *Hallicrafters S-76*. My dad is W7VIU here in Elko, he has had a ticket for twenty years. His old call was W6KZG in San Jose, California. I am 18 years old and a senior in high school. I will answer all letters and be glad to schedule any one needing Nevada. I QSL 100% to all cards received. 73. Corkie"

You would be the most popular ham in Nevada if you and your dad would get on six meters and help lots of hams finish their six meter WAS. *How about it?*

I find that I am not the only ham "chasin' wimmen." There are others, male and female. This letter from "The Hams of Kilo-watt Korner" bears the signatures: Pete Leone (15), K2IJT, and his sister, Ann Leone (21), KN2LTN, of 200 Park Avenue, Medina, New York and Ron Faulkner (16), K2IQH, and sister Lana, Box 272, Sherburne, New York. They say:

"Dear Walt: We YLs and YL chasers are working together for our YLCC. We would like to make schedules on 75/80 meters with any YLs or XYLs who would help us out, we would appreciate your contact and QSL. Ann will sked anyone needing a YL QSL and Lana is taking her novice test this week and will sked when her ticket arrives. We will answer all letters. We wish to thank K2IQF, W2YNZ and W2TTH for their help in getting our licenses. We will help any needing help in getting a license. 73. "The hams of Kilowatt Korner."

Mick Voris, WN8BCE, 2946 Mignon Avenue, Cincinnati 11, Ohio, writes:

"After receiving my license late in May and working on my set for about a month, I was on the air and making my first contact with W8PMW, on the Fourth of July. Receiver is a *Hallicrafters SX-43*. I worked 16 states with 20 watts and a half-wave 40 meter doublet. My operating time is somewhat limited, holding a job with a super market and working in the Press Box at Crosley Field for the Cincinnati Redlegs. I will be operating from Ohio University at Athens, Ohio, this fall. 73, Mick."

Bud Burke, WN8WKQ/W8WKQ, Super-

[*Continued on page 112*]

You get higher Trade-ins than ever in our big

END OF THE YEAR SALE!

Bob Henry,
WØARA
Butler, Mo.

and only 10% down!

Ted Henry
W6UOU
Los Angeles

hallicrafters

ACT NOW FOR

- Easy Terms
- Fast Delivery
- Personal Service
- Low Prices
- Complete Stocks
- Satisfaction guaranteed. Ask any Ham about Henry. And Henry has the new equipment first.

NEW SX100

For top performance with extra pull power and ability to tune in stations.

$29.50 Down
20 monthly payments of $14.65
$295.00 Cash Price

A few items in stock for immediate shipment are:

Model	Cash Down	20 Monthly Payments	CASH PRICE
S38D	5.00	2.47	$ 49.95
S53A	9.00	4.45	89.95
S85	12.00	5.94	119.95
SX99	15.00	7.42	149.95
SX96	25.00	12.37	249.95
SX62A	35.00	17.32	349.95
R46B speaker			17.95
HT30	49.50	24.50	495.00
HT31	39.50	19.55	395.00
S94-S95	6.00	2.97	59.95

Write, wire, phone or visit either store today.

Butler 1, Missouri
Phone 395

Henry Radio Stores

GRanite 7-6701
11240 West Olympic Blvd. Los Angeles 64

NEW PRODUCTS [*from page 71*]

This, friends, is the new hermetically sealed, Vitamin-Q impregnated ceramic case capacitor, designed for operation at temperatures up to 125°C. And that's plenty warm! Glass-to-metal end seals provide excellent resistance to the effects of humidity and temperature. Next time the a-v-c condenser in your receiver goes west, it would be a good idea to replace it with this low cost, high performance unit. It would make a good replacement item for that TV set that is run 24 hours a day by the youngsters. Engineering Bulletin 226 will be sent on request by the Technical Literature Section, Sprague Electric Co., 85 Marshall St., North Adams, Mass.

Here's the new mobile VHF antenna produced by the H. H. Buggie Co. (Wonder why they don't call it a Buggie Whip?) It is designed for single hole mounting, and is made of stainless steel. Mounted on the top of the family chariot, it makes an inconspicuous yet highly efficient antenna for the VHF bands. The length of the whip can be modified for use at various frequencies in the VHF region. The H. H. Buggie Co., Inc., Toledo 4, Ohio will be most happy to send you the full story of this little gem.

VHF

[*from page 70*]

very active AF Mars net on 144.99 Mc which is doing a good job of recreating interest on two meters. *Three cheers!* The main reason for this letter was to answer Ev Taylor, W8NAF, of Dayton, Ohio. He suggested the establishment of a National Calling Frquency for 144 Mc. For your information we have had a Texas calling frequency of 145.1 in use here for over a year. All activity here is horizontally-polarized with daily contacts being maintained between Kerrville, Austin, San Marcos, Edna and San Antonio on two meters. Activity on six consists of a nightly round-table rag-chew whenever the band is not open.

Band openings have been kind to me this summer. I became active after thirty-five years lapse by buying a Gonset 6 Communicator and six-meter beam. The beam is mounted with its rotator atop a thirty-five foot telephone pole. The location is five hundred feet above the surrounding terrain. Band openings this summer resulted in contacts from Carolina to California. TVI on six meters is practically non-existent, as we only have two TV stations on VHF and one on UHF. Having served my apprentice days on a spark transmitter (5GC El Paso, 1923) it was quite a revelation to work six on

phone during a band opening. I expect to be on with everything in the near future, as a general license is my next goal.

How many openings go unnoticed on six meters because no one turns on and tries after work on week days? I have encountered several openings at night by just trying. I think Tony, VE3DIR, has a good point in his request for some work for people who work odd shifts. I believe we could have more contacts on six meters if more attempts were made after working hours."

We agree with both you and Tony, OM.

Baton Rouge, Louisiana: Jack Whitaker (W5HEZ) comes through for Louisiana:

"As to two-meter news, tonight (August 24) W5HCM was taping some two-meter transmissions so I put the mobile rig on and worked him in New Orleans a distance of some sixty or seventy miles in level terrain. I was using a Gonset Communicator and a ring antenna and he was reading me a solid S-4 all the time. I was reading him as well as locals. As to locals, W5GIX and myself hold down Baton Rouge nightly. W5EUQ, W5ZRL and KN5BGG are on in Alexandria. W5HCM in New Orleans, WN5KRT in Opelousas and sometimes KN5AZT, W5IVI and W5MXJ around the state. Think I was the only Louisiana six-meter man this year."

So glad to get some news from Louisiana, Jack, keep it coming.

Fort Worth, Texas: From W5BMR, Laverne Lakin we get *big* news, *As befits the STATE OF TEXAS.*

"By Gum I'm going to send you a photograph one of these days of a *Typical* Texas beam that will really shake you up. It is so high that the only way we've been able to photograph it so far is from the air, and that doesn't show it off to best advantage!

We're not from Missouri Verne but we're waiting.

In the meantime here's a picture of a Texas DX Hunter on two meters. His handle is Al Hayes, W5JQU, from Forth Worth. With this rig Al is putting two hundred watts OUTPUT into a sixteen element beam. That B staring you in the face is a pair of 826's with a linear tank, 522 exciter, modulated with a pair of 809's. Tests indicate that the efficiency of this rig exceeds 70%. Al is at the controls six to seven p.m. CST, every morning on the lookout for new states to add to his collection.

Personally Sam, this rig scares a 2E26 man like myself. The very thought of putting 80 ma. on the grids of a final scares me stiff!"

Know what you mean.

Lancaster, California: Direct from the compiler of the "VHF Directory," Robert Jefferies (W6SBZ):

"So far I have gotten a nice return, about seven hundred.

Aw c'mon fellows, that ain't even a fraction.

I do wish the fellows would give me the following information. Call, Name, address, and phone number. Their band of operation, type emission, primary frequency, polarity, and power. I have set a deadline of February 1, 1956 and have hopes of a publishing date of May 1st.

At present I have set up the directory in a three section breakdown. Section A—Area, Call by alphabet, name, address and telephone number. Section B—Will list by section, State, city, individual, band, frequency polarization, and power. Section C—will be the area activity, CD and Rag Chew Notes, day, time, and frequency. (Polarization too.)

Believe it or not I can find vertical polarization on two meters used for only local work, that is with the exception of California. Even here the DX boys are going to flip-flops or horizontal.

I do need information from the States of North Dakota, Utah, Wyoming and South Carolina. How about prodding those boys to get in their data. After all I can only include the boys who get in the data.

PROD! PROD! PROD! Ours is coming Jeff, honest.

Clearfield, Utah: Vic Frank (W7QDJ) sends us the following bits of information from Utah:

"Antennas down. A four element ten, fifteen, twenty meter beam going up.

Hey boy, this is VHF.

Also planning six-meter monster and two, one and a quarter, and three-quarter meter arrays. Collecting parts for my KW final for six and two meters. Will send details and pictures next month.

That's more like it, Vic.

Two stations, W7VHS and W7RNW in Ogden on six. W7TFO, Bountiful is getting on. W7JPN, W7EWX and another are active in Salt Lake City on six."

Metamora, Illinois: A suggestion from "Hod" (W9ALU):

"For those of us using two dial receivers (NC183D-KP81 here) as the variable IF of our VHF receiving equipment; setting our receiver to an exact frequency poses a problem. For this reason I suggest that all expeditions and "Big Stick" and DX schedules be carried on at frequencies within three to four hundred kc of the lower band edge. For those using 20-1 IF the band spread dial is calibrated up to four hundred kc, and those whose variable IF starts at 7 Mc, these operators have three hundred kc which is calibrated to a degree of accuracy. Since much of the long haul contacts will be on CW, we have a long way to go before this region becomes crowded."

That's all for now. 73, Sam W1FZJ.

CONVERTING THE ARC-4 TO TWO METERS

[*from page 43*]

the dynamotor compartment, but since this requires working in rather a confined space, it may be preferred to build a separate unit, and connect the two with cable.

Any high-voltage supply delivering 350 to 400 volts d.c. at 200 ma. will be suitable. As before mentioned the filament circuit requires 12 volts d.c. at 5 amperes. To obtain this a toy-train transformer delivering at least 20 volts a.c. in conjunction with a selenium or copper-oxide disc rectifier makes a good combination. The rectifier should be chosen for proper current rating. Any transformer-rectifier combination available capable of 10-15 volts at 5 amps or so will be perfectly satisfactory.

Difficulty will be encountered in locating a plug to fit the socket on the rear of the chassis so a little work will have to be done on the connector. Close inspection will make it obvious that each pin is lettered or numbered. Using insulated hookup wire of #22 or #24 gauge, wire together as groups the following pins: (a) 5, 15 & 16, (b) 1 & 2 (c) A1 & 8, (d) 3, 4, 7, 9, & 10, (e) A2, 16 & 20. Hook a 30,000 ohm 1-watt resistor from A2 to 18. With this arrangement A1 is plus 12 volts d.c. 17 is plus 375 volts and A2 will be the "A" and "B" minus.

It is very important to make good soldered joints, making sure that no two groups are shorted together. This could cause trouble later on. Now hook up your power supply, turn both it and the ARC-4 switch on and make sure that the filaments light up. Also make sure that the power relay at the rear of the chassis closes properly. Plug a single-button carbon microphone into the three-conductor jack on the front panel and by closing the mike circuit with the switch or button, check to see that the changeover relay makes proper contact. If everything seems to be in order you are on the air. If trouble is encountered, check the connections on the power plug and check the power supply voltage.

Any antenna can be coupled to the ARC-4 if the feedline is within the impedance range of 50 to 70 ohms. The writer's antenna is a ground-plane fed with RG 59/U cable. Feedline length is not critical although it is desirable to keep it short (but not under 10 feet). In the case of the writer, the location of the antenna required 150 feet of lead-in yet the performance has been fine and many excellent reports have been received.

If you convert your ARC-4 carefully, in the manner outlined here, you will find its performance leaves little to be desired. The ARC-4 compares favorably with 2-meter rigs costing many times the modest price of the ARC-4.

SELECTIVITY ADAPTER [*from page 51*]

factor. Changes of voltage in the ratio of 10 means a 20 db. change. A voltage change from 10 to about 3.3 indicates a 10 db. change. The starting point of the tests should be with the r-f control at as low a level as possible because it is the increase in gain as obtained through the r-f control that determines how great a suppression can be measured. 4) By juggling the settings of trimmer C9 and the upper screw of T2, a bandpass of approximately 2400 cycles at the nose with no dips greater than 6 db. should be obtainable. This means that after determining the reference points of "10" and "1," and completing the adjustments of the bandpass, as the frequency is varied over a 2400 cycle range the readings on the scale should remain between "5" and "10," and not drop below "5," which is the –6 db. point.

After the nose of the bandpass is adjusted, it is sufficient to measure the suppression characteristics in 10 or 20 db. jumps. Therefore, after the 6 db. points are located on either side of the bandpass, continue to tune away from the i-f frequency until the needle registers "1" on the scale. This is the 20 db. down point. Increase the r-f gain until the needle registers "10" on the scale. Remember, the potentiometer of the signal generator is not touchd again after the initial setting. Continue to tune away from the i-f frequency until "1" is reached again. This is the 40 db. down point. The same procedure is repeated to find the 60 db. down point. The 80 db. down point will be determined probably by reading between "1" and ".1" if a 10 volt deflection has been taken as "10," as many receivers do not have enough gain to give a full 10 volt deflection of the VTVM at this point. The same procedure is used to determine the above suppression points on the opposite side of the bandpass.

After the 2400 cycle filter is adjusted, the other bandpasses are adjusted in a like manner, making use of only the trimmer condensers corresponding to the filter being adjusted. Do not change the upper screw of T2 after it has been used to shape the 2400 cycle bandpass.

A few general remarks are in order for those who wish bandpasses of widths different from those presented. The width is controlled essentially by both the frequency spread between the high and low frequency crystal pairs of the full-lattice filter, and the frequency difference between the crystals of the series pairs. Minor variations in the bandpass width and an irregular nose to the filter can be compensated for in the tuning of the i-f circuits. Increasing the frequency separation of the series crystals increases the width of the bandpass. There is a limiting point, however. With the 1.6 kc. frequency separation in the full-lattice section, 2400 cycles is the limit to which the bandpass can be widened with even an extreme separation of the series crystal frequencies. A fre-

quency separation of 1.89 kc. in the full-lattice filter permits a 2400 cycle nose, but a wider skirt of about 5 kc. at 80 db. down with a slightly less separation of the series crystals. If the reader desires a bandpass wider than 2400 cycles, the frequency separation of the crystal pairs in the full-lattice filter must be greater than 1.6 kc. Such a change in the circuit would, of course, affect the bandpasses of the other two filters.

The work with the filter units has been unusual in that each time one was completed, it worked without further tinkering. It is also unusual to be able to make such profound improvement in a receiver for such a relatively small expenditure in money and time. Yes, that's right! It doesn't take as long as you might think from reading the article. With the circuit worked out, it has taken considerably longer to write about the unit than to build one. The detailed text has been for the purpose of ease of duplication by even someone inexperienced with receivers. The performance of the receiver has brought much favorable comment, both after demonstrations and with on-the-air use. This selectivity adapter has definitely opened a new era in communications reception to the writer. It is hoped that many of the readers will be able to share the same experience. Me?—I'm getting ready to build another filter for use in a single sideband transmitter!

CERTIFICATE SEEKERS II

[*Continued from page 36*]

worked for Italian **CDM** award: EA, EA6, EA9, F, FA, FC, IS, IT, OD5, SU, SV, SV5, TA, YK, YU, ZA, ZB1, ZB2, ZC4, 3A2, 3V8, 4X4, 5A1, 2, 3, 4, Trieste, Crete. Italian peninsular provinces: Alessandria, Ancona, Aosta, Aquila, Arezzo, Ascoli Piceno, Asti, Avellino, Bari, Belluno, Benevento, Bergamo, Bologna, Bolzano, Brescia, Brindisi, Campobasso, Caserta, Catanzaro, Chieti, Como, Cosenza, Cremona, Cuneo, Ferrara, Firenze, Foggia, Forli, Frosinone, Genova, Gorizia, Grosseto, Imperia, Latina, Lecce, Livorno, Lucca, Macerata, Mantova, Massa Carrara, Matera, Milano, Modena, Napoli, Novara, Padova, Parma, Pavia, Perugia, Pesaro, Pescara, Piacenza, Pisa, Pistoia, Potenza, Ravenna, Reggio Calabria, Reggio Emilia, Rieti, Roma, Rovigo, Salerno, Savona, Siena, Sondrio, Spezia, Taranto, Teramo, Terni, Torino, Trento, Treviso, Udine, Varese, Venezia, Vercelli, Verona, Vicenza, Viterbo.

Portuguese provinces: Tras os Montes e Alto Douro, Minho, Douro Litoral, Beira Litoral, Beira Baixa, Beira Alta, Estremadura, Ribatejo, Alto Alentajo, Baixo Alentajo, Algarve, Azores Islands, Madeira Islands.

Sicilian provinces: Agrigento, Caltanisseta, Catania, Enno, Messina, Palermo, Ragusa, Siricusa, and Trapani.

PROPAGATION

[*from page 75*]

Serge informs me that he will prepare *Propagation Charts* similar to those appearing each month in CQ, centered on Paris, Algiers and possibly Dakar. European readers of CQ will no doubt also find the predictions of the REF extremely useful. There is also the possibility that amateur journals in other countries will soon publish similar charts centered on other areas.

Sunspot Cycle

This month's forecasts are based upon a predicted smoothed sunspot number of 38 centered on November, 1955. The observed monthly Zurich sunspot number for July was 26 and for August was 40.2. This resulted in 12-month provisional *smoothed* sunspot numbers of 14 centered on January, 1955 and 16.2 centered on February, 1955.

DX

[*from page 88*]

Howy, W3BQU/5, is active for a spell near Texarkana, Tex. . . . W5BRR mentions the mis-use of "KN" following a regular CQ. As this sign means "Go ahead ONLY the station I am working" it would seem that such use effectively cancels out the "CQ" by saying "Go ahead nobody"! . . . The slightly stronger signal (we hope) heard from KV4AA will emanate from a VIKING KW. . . . W6GAL/7 says if that knothead YA6GAL could see the pile of QSL's piled up at W6GAL he mgiht have a twinge of conscience. We doubt it George. Guys like that would stead the whistle from Whistler's mother without a qualm! . . . W1HX reports the fifth annual meeting of the New England DXCC'ers was due to have been held on October 21st. at Hickory House, Worcester. . . . Henry, W4ZHL, also holds the call of VP2VE, Tortola, British Virgin Islands. . . . W4ZAE received a letter and QSL from UAØKFB! . . . W7VCR/4 did some brass-pounding from Rutledge, Tenn. and then moved on to Greenville, S.C. with the USAF. . . . W1AQE has new QTH in Bedford, Mass. . . . Joe, W5HXF, now keys from K5FHU, Holloman AFB. . . . Wes, W9AND, also keys from W4HSJ, Tampa, while W9TGY/4 is now in Ky. . . . W5VIR plans XE trip. . . . Luis, CE3AG (CEØAA) and xyl had nice visits with G6YQ and got together with W6AWT, I1FO and I1AIV at I1ER's shack. . . . Ralph, W1JOJ,

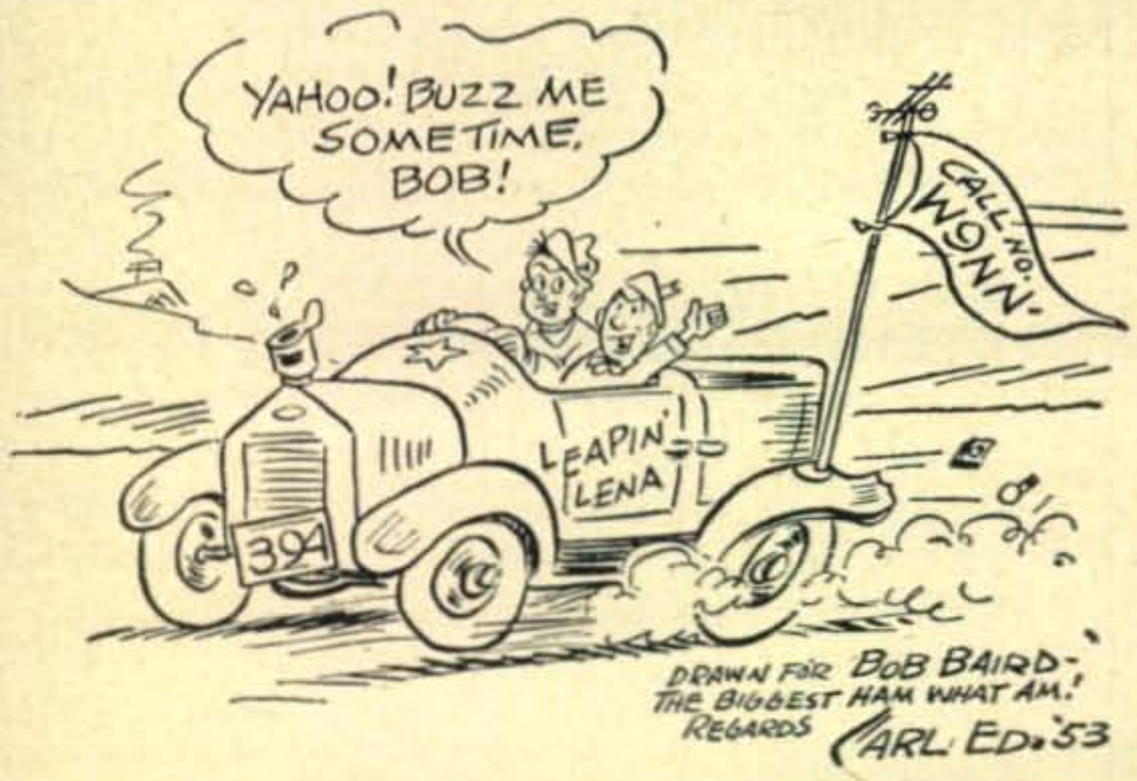
gives up the W1 QSL bureau with Don, W1IPQ, taking over in September. . . . Pvt. W1RAN hope to lend a hand from MARS K4WEE down Fort Bragg way. . . . WØOKH relays that ZL1CI lacks many W 3.5 Mc. cards. If you haven't his please send another "direct". ZL1CI may be found on 3515, 1200 GMT, daily during the Winter. . . . Homer, PJ2AR, and Almeda, PJ2AU (xyl), have moved to Caracas, YV-land. . . . OH2YV says the OHA Award has been delayed a bit but should be QRV by now. SM5AHK was first applicant. . . . Chas. W2OHF, takes his annual Caribbean trip in October and plans to visit KV4BB, KV4BK, VP6LN, VP2GW, YV5FL, HK1TH, VP5AO and VP5AK. W3VKD also visits the Caribbean area and planned to be on from various stations there. . . . We quote, in part, a letter from Enrico Galeazzi, Il direttor generale dei servizi/economici, Vatican City, which may show that ham radio activity there is not entirely impossible. This was received by W2DGW via Cardinal Spellman. "We wish to inform you that the Vatican City State, following a rule adopted also in other countries, could grant permission for the operation of amateur radio sets in its territory only to Vatican citizens or to foreigners residing for employment or other reasons on these premises. In such case, of course, the usual conditions and procedure should be complied with. ———Vatican City is very limited in size and

Honor Roll Endorsements

(To September 15th 1955)

CW/PHONE		W6ID	40-165	WØQVZ	39-170
W6SYG	40-256	W8KIA	39-247	W9NZZ	39-169
W6AOA	40-255	KV4AA	39-246	W8JBI	38-225
W8PQQ	40-253	W1CLX	39-240	W2HMJ	38-213
W8BRA	40-251	W9LNM	39-236	W8KPL	38-196
W2BXA	40-250	W2QHH	39-230	W6TXL	38-181
W6ADP	40-247	W9FKC	39-227	W3AXT	38-177
W3JNN	40-243	W9HUZ	39-226	W1WY	37-176
W6VE	40-240	W1HA	39-220	W2ZVS	36-180
W9VND	40-238	W8UAS	39-220	W5FXN	35-180
W6BUD	40-225	W3KPD	39-214	PHONE ONLY	
WØDU	40-223	W6GPB	39-209	W6AM	38-188
W6SR	40-215	W9ABA	39-199	W3JNN	37-212
W7ENW	40-189	W6WO	39-190		
G3AAE	40-172	W5MET	39-184		

Last complete HONOR ROLL appeared in the September issue. Next complete HONOR ROLL will appear in the January issue.



[*from preceding page*]

most departments of the Holy See have headquarters in Rome for lack of space here. Therefore Vatican City offers practically no possibilities of reception for a DX expedition———(He has the impression that ham radio needs plenty of room)". . . . Capt. Carlsen, W2ZXM, of stay-put fame, visited KV4BB.

6 Meters

The Administration of the Federation of Rhodesia and Nyasaland has informed the ITU that it proposes to allocate the band 50-54 Mcs to amateurs in Nyasaland.

This has some value DX-wise in that with the rising sunspot count, six-meter F2 propagation should be possible on many long circuits beginning with the fall-winter of 1956-57. Six-meter circuits from Africa to Europe should be possible and maybe South Africa to South America, etc. (Thanks W2PAJ/W3ASK).

NOVICE

[*from page 102*]

visor, **Electronic Hobby Shop,** Wright Patterson AFB, Ohio, writes:

"Dear Walt: I just dropped you a line to tell you how much I enjoyed your latest undertaking, *'The Novice Shack.'* We have set up a ham station here at the *Electronic Hobby Shop,* no license as yet. We have started a code class here and are almost ready to give forth with 10 new novices. The instructors are myself and WØQEL, Cecil Hebrew, for the code and W8LWI, Buss Roads and W8LCH, Joe Martino for elements, theory and helping with construction of transmitters. We have a section of the shop set off for the ham shack. I would like to extend the use of our code instruction and facilities to any novice or would-be novice in the Area. I wish you all sorts of luck in the future with your FB column and remain your friend. Bud."

Editor's note: Don't forget to send a list of names and calls of the new novices, Bud.

Bruce J. Fields, KN2JTS, 11 Club Drive, Roslyn Heights, New York, writes:

"Dear Walt: I have read the *Shack* with great interest, and have decided that it is my turn to brag a little. Last month I passed my general and am still waiting. I have worked 34 states. DX is VE-1, 2, 3, K-WP4, LU9, HB9 and KZ5. The rig is a *Viking Adventurer.* The receiver is an *NC-98.* The antenna is a ½-wave dipole. I would like to have schedules with Washington, Oregon, Utah, Colorado and the Dakotas. I will answer all letters and I QSL 100%. 73, Bruce."

Ronald Roche, KNØALL, 2438 3rd Avenue, Mankato, Minnesota, says:

"Hello Walt: I need help on this end. The

ticket here is about five months old. I have worked forty-five states with forty-three confirmed. I need Maine, New Hampshire, Delaware, Mississippi and New Mexico for novice WAS. I am anxious to make schedules with these states and also anyone else needing Minnesota. I also have VE-3, 5, 6, KP-4 and VP-9. The transmitter is a *Viking Adventurer* and the receiver is an *S-40-B*. You can find me almost any night on 7.153 or 21.150 Mc. Good luck on your new job, Walt. Yours truly, Ron."

Doug Westover (16) WØQFD, ex-KN2CHN, W7UYE, 205 Smith Avenue, Kirkwood 22, Missouri, sends this nice letter:

"Dear Walt: In response to W9SQP's letter in the July issue of *CQ*, I would like to say that I am another who has worked his way up through the ranks. I now hold an extra class license. My first call was issued in December of 1952, the general was issued in August, 1953. I took my extra class license exam August 18, 1955 and received my ticket August 23, 1955. I would like to know how many ex-novices now have the extra class license and also their ages. I believe I am the youngest to hold the extra class license. I am 16 and will be a senior in *Kirkwood High School* this year. My station consists of a *Hallicrafters SX-96* receiver, a rebuilt *Heathkit AT-1* with a *VF-1* and a homebrew modulator. I also have a 300 watt rig on 20, 40 and 80 CW. I like CW, and I hope to have a SSB rig before long. 73, Doug."

George Winford (15) KN5AIE, 115 North College, Minden, Louisiana, writes this note:

"Hi Walt: I've never written to an editor before, so here goes. I'm 15 years old and am waiting on my conditional class license to come from the FCC. As a novice I have worked 32 states with 31 confirmed. I need a card from New Mexico. I have a *Globe Scout* running 65 watts and the receiver is an *NC-98*. I operate mostly on 40 meters and plan to go to 20 meters when the other license comes. I would like a sked with anyone in W7 or W1 land and especially with South Carolina or South Dakota. All letters will be answered. 73, George."

Fred Jensen (15) K6DGW, 9321 Kauffman Avenue, South Gate, California, gives some good advice in this note:

"Dear Walt: I have been reading *The Novice Shack* for a long time and figure it is about time I wrote a letter. I am 15 and a junior. I have a *Heathkit AT-1, VF-1* into a pair of 4E27's running 500 watts. The receiver is an *RME-45*. I run a 522 on two and have a homemade converter for two and six meters. I will sked anyone needing California. I still stay close to the novice band but I think that a few of the generals should park at 7150 and go no further. The band is crowded enough as it is and those that can move out a little will help keep the QRM down a little. Most novices tune a few kcs out of their band anyway and

[*Continued on next page*]

[*from page 113*]

those that don't are missing a lot of DX. Not long ago I heard a KN6 calling CQ DX and a CX5 came back to him at the edge of the novice band. He was very loud but the KN6 didn't tune the edge of the band. Naturally he missed the station in Uruguay. It will pay to tune the general band too as many of the DX stations are rockbound and you can work them since they tune the novice band. I would like any comments of novices on fifteen meter antennas and their results on fifteen meters. CU and 73, Fred."

There is lots of meat, well seasoned with "ham ingenuity" in this letter from Larry Seaman, WØVXA, Lenexa, Kansas. It says:

"Dear Walt: I have just read your last article about getting on the air in the September issue of *CQ*, and what I read I think would have scared me out of ham radio, I mean the $100 to get started. My original hamshack was as follows: The receiver was an old *RCA* with a homemade b.f.o. The receiver was given to me for mowing a yard, I had to repair it and the b.f.o. cost me two dollars to build. The transmitter was a 6L6 oscillator amplifier with pi-section output. The transmitter cost me 14¢ to build that fas for a resistor I broke. It was built completely out of parts from old receivers, you can get these at any radio-TV repair shop. The antenna was old telephone lead-in wire from which I had burned the insulation. The meters, coil forms, earphones and key were contributed by fellow hams. This pile of junk worked 30 confirmed states, including 579's from California, Washington, New York and Massachusetts. My present rig cost only $70.00. A *BC-348* at $25.00 (a real c-w receiver), a *Heathkit* transmitter and antenna tuner, $40.00 (second hand and like new) and a better long wire antenna. The experience with my first rig easily carried me over my general and gave me a barrel of fun over any *Viking Ranger*. I'll be glad to help anyone I can. I'm 17 years old. So you future hams *use your handbook and you can save your pocketbook*. 73, Larry."

Bruce Arnold, KN9AKE, 41 Louise Street, Jeffersonville, Indiana, answered my plea for young and old novices as follows:

"Dear Mr. Burdine: I am 9 years old and I have had my license for about two and one half months. My call is KN9AKE. I am using a *Heathkit AT-1* and my receiver is a homebrew super-het. I have worked about six states confirmed and about forty different stations. I am going to get a *BC-348*. 73, Bruce."

Thanks, Bruce, you are the youngest yet.

George Westover, W8UVD, Box 113, Marlette, Michigan, sends along this note:

"Dear Walt: Well I am now a general class but the novice days are only three months away. As a novice with a *Heathkit AT-1* and an

[*Continued on page 116*]

[*from page 114*]

S-40-B I worked 40 states and 6 countries on 80 CW, now with a new 100 watt rig I have added 3 new states and 3 new countries. I would like to sked anyone in W7-land and get QSLs from those that I have worked. On my 14th birthday I was presented with 2 new states and 2 new countries. The new *CQ* is going to be wonderful. 73, George."

John K. Helmbold (14) K6INM, 424 North Newlin Avenue, Whittier, California, writes:

"Dear Walt: I was reading The Novice Shack and I thought I'd write before my novice license runs out. I'm 14 and I just passed my technician class license. I have a *Viking Adventurer* and an *S-38-C* receiver. I've only worked 3 states in my nine months I've been on, but I hope to work some more. I operate 40 and 80 meters. Like you said in the September column, 'Don't wait, get right on the air.' I would like some penpals and some information on the v-h-f bands in your column. 73 and CU, John. P.S. My mom got her call today, it is KN6OAE. J.K.H."

Bob Shaw, KN5BHV, 205 North Pine Street, Hammond, Louisiana, says:

"Dear Walt: Here is a letter from Louisiana. Transmitters are a *Globe Champion* (75 watts of course) and a homebrew 1614 final running 10 watts output. Receiver is an *NC-98*. The present antenna is a 40 meter dipole. I plan to put up an 80 meter dipole 37 feet high and also a 40 and a 15 meter folded dipole 37 feet high. I would like to make a sked with anyone whether need Louisiana for WAS or not. 73, Bob."

John Laney, K4BAI, 3500-14th Avenue, Columbus, Georgia, writes:

"Dear Walt: I am 13 and in the 8th grade. I worked 39 states as a novice in 4 months with 20 watts. After getting my general in April I have worked 47 states and 18 countries with about 100 watts. I would like a sked with a station in North Dakota or any station needing Georgia for WAS. I am VFO on 40 and 80 CW and phone. 73, John."

Paul Hart (16), 303 Colchester Avenue, Burlington, Vermont, is the first writer from Vermont and says:

"Dear Walt: I've had my ticket for five months and have worked 18 states. I have just found the forty meter band and know that is the band for me. My DX is Montana and Colorado. I haven't seen any letters from Vermont, so I'll be glad to sked anyone needing Vermont for WAS or a ragchew. My frequencies are 3730, 3710, 7180 and 7166 kc. I run 35 watts to a *Heathkit AT-1* and use an *S-85* receiver. The antenna is a folded dipole. I QSL all contacts and will be glad to get QSLs from new states especially. Keep up the good work and 73, Paul."

[*Continued on page 118*]

[*from page 116*]

Elliott Richelson, W1DFY, 12 Cabot Street, Waltham, Massachusetts, sends this nice letter:

"Dear Walt: I have been reading The Novice Shack for quite a while and have enjoyed it very much. Keep up the good work. I am 12 years old and have had my general since April, 1955. My rig runs 60 watts to a forty meter dipole and the receiver is an *NC-200*. I have worked 28 states and 11 countries. My dad started with me, he is WN1DIJ. 73, Elliott."

Help Wanted

Alec A. Hugh, 38 Brentford Road, Cross Roads P.O. Saint Andrew, Jamaica, British West Indies. Alec would like to meet someone to help him get started and answer a lot of questions concerning amateur radio in general. (This letter arrived three days after the October novice shack was mailed to the printer.)

Ross W. Reyman, Jr. (16), 3578-30th Street, San Diego, California. Ross wants help in code and theory and some YL penpals.

Henry Kapala (14), 5114-33rd Street, Terrace North, Saint Petersburg, Florida. Henry needs help in code and theory.

Richard Downey (15), 9 New Street, Amsterdam, New York, Telephone: VI 2-8927 needs help in code and theory.

Morton Caldwell (14), Route 4, Lorain Wells, Campbellsville, Kentucky. Morton needs help in getting the code.

Theodore Williard Stone, Westtown School, Westtown, Pennsylvania, needs help in code and general theory.

Doug Risdon (15), 325 South Ann, Fowlerville, Michigan, wants letters from SWLs and anyone interested in amateur radio.

Sam B. Trickey, KN5BDU, Box 5783, Denton, Texas needs help in code and theory for the general.

Samuel Guccione, KN9AXX, 459 State Aid Road, Woodriver, Illinois, says he took his general the same day he received his novice and he will help anyone nearby get a license. His phone is 4-3138.

Mr. and Mrs. B. C. Sadler, 815 Holland Avenue, Wilkinsburg 21, Pennsylvania, Telephone: 1-9974, would like someone to help them in code and theory.

A. Robert Thompson, Liberty Bell Trailer Village, Route #3, Box 107, Langhorne, Pennsylvania, needs help in theory for the general test.

Sammy Spak (17), 278 Caroline Street, Derby, Connecticut. Telephone: REgent 4-8375. Sammy needs help in code.

[*Continued on page 120*]

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF CQ, published monthly at New York, N. Y. for October 1, 1955.

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(Signed) S. R. COWAN, Publisher

Sworn to and subscribed before me, this 19th day of September, 1955.

HARRY N. REIZES, Notary Public

[*from page 118*]

Bernard Kulwin (13), 26180 Mallard Avenue, Euclid 32, Ohio. Telephone: RE 1-5186. Bernard needs help in code and theory.

Fred Hudson, KN6MMN, Route 2, Box 307, Escondido, California, would like to have some help in getting started on two meters.

Terry Kreizel (17), 20504 Hillgrove Avenue, Maple Heights, Ohio. Terry needs help in code and theory.

Joe Mitchell (13), 321 F Street N.W., Miami, Oklahoma. Telephone: KImball 2-4540. Joe needs help in code and theory.

That's all for this month and I hope you have got some good to help you get your license. Get those letters in here by the thirteenth of the month and I will see you at the same newsstand next month.

73, Walt.

"What?" you ask, "No more construction data this month?" A separate article by Walt in this issue describes a complete 6-meter station for the Technician.

75-WATT SELENIUM XMTR

[*from page 27*]

With the dummy load connected, apply power, close the key, and resonate the final amplifier. Adjust the output loading switch *S2* to load the 829B to between 145 and 155 ma. This should be done on all four bands, lighting the lamp to full brilliancy in each case. Swing the tank condenser quickly to each side of resonance and observe the grid and plate currents. No sudden jumps or dips of the meter should appear. Originally the rig had a miserable parasitic oscillation on all bands with the tank condenser at minimum capacity. The trusty grid-dipper came to the rescue by pointing up a resonance at 106 Mc, right at the 829B plate lead. Inclusion of the parasitic suppressor, *PC1*, eliminated this immediately . . . don't forget to include it. Neutralization was found to be unnecessary in this rig and if the general layout is reasonably well duplicated, none should be needed. With the key open, final plate current should be 10 ma. or less if the bias supply is operating correctly.

On The Air

On-the-air operation has resulted in a complete absence of TVI without the use of a low-pass filter at the transmitter. The 72-ohm output from the rig was fed via coax to an antenna tuner to transpose the unbalanced output to balanced output and permit the use of balanced feed to the various antennas used here at W9OLD.

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FOR SALE

FOR SALE: Perfect working condition, TVI-suppressed, commercially built 500 watt phone-CW transmitter complete with 866's splatter suppressor, variac-controlled power supply, modulator (pair 811A's) Millen 90991 final (812A's) Millen 90800 exciter, all in new deluxe 6 ft. locked door PAR-metal cabinet with rack on casters. Plug-in coils all bands, also Collins VFO 310C2 with built-in power supply, Stromberg-Carlson speech amplifier and Harrison 500 watt antenna tuner with all coils. First bid $460 or over takes all. Single package. Phone: DEcatur 2-4119, W1UWB, Julian Sobin, 83 Arnold Road, Newton Center 59, Mass.

SAVE! BUY surplus direct from Government at tremendous savings, radio, electronic equipment, parts, power tools, machinery, hundreds others. List, $1.00. Box 169CAF, East Hartford 8, Conn.

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NEW! PRINTED circuit television antenna, smaller than a transistor. Only $1.98 postpaid. All band radio kit, $5.95. F-M radio kit for car, home or pocket use, $9.95. Free information. Ekeradio, 646 North Fair Oaks, Pasadena, Calif.

HALLICRAFTERS SX-88, $450. Viking I, VFO, 10 xtals, LPF, $225. 2KVA 220 volt Variac, $20. Wilcox F-3, $25, Central Electronics Signal Slicer, AP-1 Adapter, $50. G. H. Goldstone, W8MGQ, 25416 Parkwood, Huntington Woods, Michigan.

PHONE PATCH, hum free, high gain dual controls, line switch, described Feb. *CQ*. Complete kit of parts and instructions, $11.95 . . . NRM WHOLESALE RADIO, 286 Teaneck Road, Ridgefield Park, N. J.

New ICA Deluxe Signatone Code Oscillator (Reg. $15.75) Special $7.95. Key $1.35 extra. Surplus RG-8/U Cable—100 ft. $5.95, 250 ft. $13.25, 500 ft. $25.00. FREE Bargain Bulletin. Visit store for unadvertised bargains. LECTRONIC RESEARCH, 719 Arch St., Philadelphia, Pa.

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ARC-5/T23 transmitter and ARC-5/R28 receiver for 2 meters in good condition. Sacrifice for $39.00. ARC-5 transmitters, $6.00. J. K. Udseth, Skaggs Island, Sonoma, California.

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SELL: SIMPSON Tube Tester #325. Original cost $55 will take best offer. Heath AR-2 receiver, asking $20. K2KLL, 1514 E. 10th Street, Brooklyn, N. Y.

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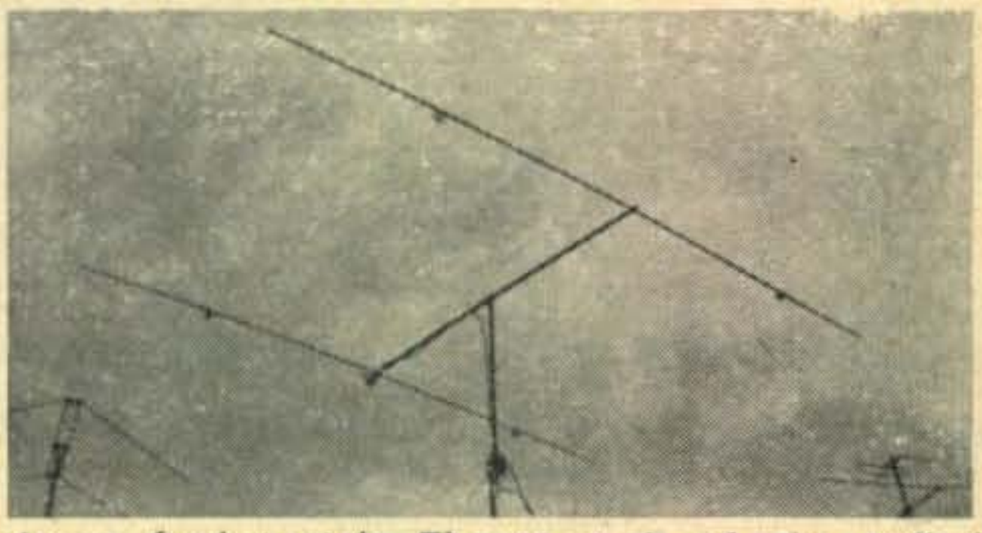

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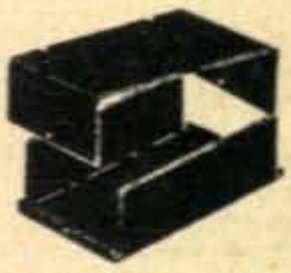

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V.H.F. AN/ARC-4 V.H.F.

Get on 2 meters the easy way!! 15 watts A.M.—PLUS a built-in receiver!! (See this month's "CQ"—Nov. '55) Used but excellent, with all tubes and crystals PLUS conversion data for complete 110 V.A.C. Rig with xtl. control!!! Size: 10½ x 19½ **$22.95**

BENDIX DIRECTION FINDER

MN-26-C. 12-tube remote control Navigational Direction Finder and communications receiver. 150 to 1500 Kc in 3 bands. 28 V. DC input. Ideal for commercial navigation on boats and planes. Complete installation comprises:
MN-26-C Receiver complete with 12 tubes..... **$12.95**

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46-ACJ UHF (ASB) RECEIVER

13-tube, double conversion receiver. Freq. range: 450-600 MC. Employs 446-A Lighthouse Tubes in RF section, mixer, and oscillator circuits. First IF freq. of 55 MC has 2 stages of amplification; 2nd IF freq. of 16 MC has 4 stages of amp. Two video stages follow 2nd detector.
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MD-7 MODULATOR: Provides plate and screen modulation for any transmitter of the AN/ARC-5 equipment. With 28 VDC plug-in dynamotor. Has tubes, mike xfmr, AF ampl., tone osc. xfrmr, push-pull mod. xfrmr, starting & switching relays. With schem. Excel. cond. 21 lbs. **$6.95**

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15 Watt CW-Phone All Band Xmtr

Fixed or Mobile, meter switching 6 or 12 volt models, plate modulation. An ideal first xmtr for the beginner or as a stand-by rig for the old timer. Includes all parts less power supply. $10 down with order balance C.O.D. Kit form with instructions $29.95
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SELECT SURPLUS

ARC-4 TRANSMITTERS. Brand new—original pack. BC-457—4-5.3 MC—$7.95. BC-458—5.3-7 MC—$7.95.
UHF ARC-5-T23. 100-150 MC—Exc. cond. with some tubes and all Xtals—$8.95.
24 V. @ 1.5 A xfmr. Open frame construction—$1.95, 3/$5.00
12V Transformer—3.5 A. Grey case, compact, $1.95, 3/$5.00.
G.E. CHOKE, 2 Henry, 1.0 Amp., Cased, potted, 7 x 5 x 5, Br. new—$5.00—6/$25.00. Brand new boxed 1625—(12v 807) dozen—$2.50.

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HAM SPECIALS

20 Mtr. verticle ground-plane Ant.—$4.50; 40 mtr.	$ 7.95
Special mast base with coax & radial connections	2.50
MP-22 mast base with spring action	1.95
100 Micro-Amp. meter, Weston 2" model 506	4.50
G.E. Constant voltage xformer. 250 VA—$29.00; 500 VA	45.00

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WANTED (Cont.)

TECHNICAL MANUALS WANTED: we need Sig. Corps, Navy and Air Force stock catalog; Maintenance and Instruction TM's for war surplus equipment. Amber Co., 393 Greenwich St., New York 13, N. Y.

WE WANT your used gear. Highest trade-in allowance on National, Hallicrafters, RME, Hammarlund, Gonset, Morrow, Johnson, etc. Write or call: C&G Radio Supply Company, 2502-6 Jefferson Avenue, Tacoma 2, Washington. BR, 3181.

AN/APR-4 receivers and tuning units urgently needed! Engineering Associates, 434 Patterson Road, Dayton 9, O.

NEED BC-348's. James S. Spivey Inc., 4908 Hampden Lane, Washington 14, D. C.

LETTINE VFO, Instructograph wanted. Carlisi, Box 381, 25 South Street, New York City.

WANTED: LATE model monitor for 30-50 Mc. FM. R. Miller, 32 Elm Street, Schenectady, New York.

WANTED: ELECTRONIC tubes, all types. Also want all types airborne electronic equipment: ART-13; BC-788; I-152; ARC-1; ARN/7, etc. Top dollar paid! Bob Sanett, W6REX, 1524 S. Edris Dr., Los Angeles 35, California.

WANTED: ARC-1, APR-9, APR-4, ART-13, BC-348, BC-342, BC-312, BC-610, BC-614, BC-939, test equipment, manuals, 75A, 32V, Teletype. Cash or trade for new amateur equipment: Johnson Viking Ranger, Hallicrafters, Hammarlund, National, B&W, Telrex, Central Electronics, Gonset, Elmac, Fisher Hi-Fi, Pentron, Alltronics Teletype receiving converter, etc. Write: Tom, W-1-AFN, Alltronics, Box 19, Boston 1, Mass. Richmond 2-0048. Stores: 44 Canal, Boston. 60 Spring, Newport, Rhode Island.

WANTED: TUBES—boxed and unboxed transmitting, receiving, and special-purpose industrial types such as Klystrons, etc. Also will buy excess test gear. Hickok tube checkers, Variacs, etc. Will pay cash or swap you for choice equipment and tubes. B. N. Gensler, W2LNI, 330 West 11th Street, New York 14, N. Y.

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1950—July, Oct., Nov., Dec.

1951—All Except November

1952—All Except August.

1953—All Issues.

1954—All Issues.

1955—All issues to date.

50c per copy

CQ Magazine

67 West 44 St. New York 36, N. Y.

HHØA DXpedition

[*from page 63*]

country. Home was a welcome sight. Our only regret was that we were unable to operate from St. Martins. But we certainly felt satisfaction at the number of contacts we made from HH and VP2, especially for the amateurs who got a new country thereby. Chuck, W4LVV, is arranging for QSL cards to be made up, and as soon as they are ready they will be sent to all stations contacted. Those who have sent return envelopes to W6OXS have been mailed modified W6OXS cards and HH7W cards which were provided by Herb. HHØA cards will be mailed when received from the printer.

For anyone else who may be planning to operate from St. Martins, this information may be of help: First check with George, PJ2AA, concerning status of licensing procedure. George tells us that accommodations are available on St. Martins for about $5 or $6 per day including meals.

The big problem seems to be power. The local commercial power is only available for certain hours of the day. There is a commercial radio station from which George was able to obtain power, but the proximity of the station interfered with his reception. The best solution would be to take along an independent power supply, if possible. This would enable twenty-four hour operation at a suitable distance from the commercial station.

As to traveling to St. Martins, the only commercial flight which stops there leaves on Monday from San Juan. The return trip is also made on Mondays. So one should plan to make the connection at San Juan for this plane. The only one we found was KLM, Dutch Airlines. The fare is $37.24 round trip, first class and may be purchased at San Juan. The flight from Miami is no problem. There are quite a few flights via various airlines, costing about $93 round trip, Tourist rate. The baggage allowance on Tourist tickets is 44 pounds, while on first class tickets it is 66 pounds.

We would like to express our thanks to all those who were so helpful in the planning and execution of this trip and only wish it were possible to thank each one individually. Everyone on the air did his part by using good operating practices and we found no difficulty from the usual elbowing practices found when DX stations show up.

For a final word, we must say that the trip was darned expensive. The XYLs were wonderful in giving up their vacations and we enjoyed making the trip and handing out the QSOs. We shall be very grateful, however, to receive contributions of any amount which may be forthcoming from those who feel that the QSO and QSL were worth it. 73 and thanks to you all. (Please address cards to W6OXS, 14608 Spinning Ave., Gardena, California.)

CQ Ad Index

Here is the first receiver in history specifically designed to include all the features most hams want at the price most hams are willing to pay. To determine what hams really wanted, National conducted a world-wide contest, offering prizes for the best suggestions for a "dream receiver"—the receiver hams themselves considered to be ideal. In the NC-300, "the dream comes true"—for its design incorporates all of the most-wanted features submitted in National's contest by thousands of hams. No other receiver available is the result of such thorough searching among hams themselves to *find out* what they want most.

HERE IT IS!

he NEW NC-300 *dream receiver*

WITH ALL THESE "MOST-WANTED" FEATURES *FOR ONLY* $349.95†

eatures a total of 10 dial scales for erage of 160 to 1¼ meters with ional's *exclusive* new converter pro- n with the receiver scales calibrated 6, 2, 1¼ meters using a special 30-35 unable IF band.

ongest slide rule dial ever! Easily read- to 2 kc without interpolation up to 5 mc.

position IF selector—.5 kc, 3.5 kc, —provides super selectivity, gives opti- band width for CW, phone, phone or VHF operation.

eparate linear detector for single side- d . . . decreases distortion by allowing "on" with single sideband . . . will not k with RF gain full open.

li-speed, smooth inertia tuning dial with to 1 ratio! Provides easier, more accu- tuning. Smoothest dial you've ever used.

xclusive optional RF gain provision for CW results allows independent con- of IF gain.

ig, easy to read, "S" meter.

rovision for external control of RF gain matically during transmitting periods.

Muting provision for CW break-in ration.

LUS—THE NEWEST LOOK IN HAM EIVERS . . . "MASSIVE IN THE MODERN NNER" . . . truly a "dream receiver" that be used either as a table or rack model.

UENCY STABILITY
llent as a result of using a newly de- *ped high-stability* capacitor plus regu- d heater and plate supplies in the llator.

ITIVITY
db noise figure, 160-10 meters

CTIVITY
db down 500 cycles, 3.5 kc and 8 kc. ctable from the front panel without tional accessories! Nothing extra to

CALIBRATION RESET
adjustable from front panel to provide exact frequency setting!

DUAL CONVERSION
with better than 50 db primary image rejection on all amateur bands, plus better than 60 db secondary image rejection.
1st IF FREQUENCY—2215 KC.
2nd IF FREQUENCY—80 KC.

WIDE RANGE TONE CONTROL
—for control of both low frequency and high frequency end of response curve!

SOCKET FOR XTAL CALIBRATOR
plus accessory socket for powering converters and future accessories!

CRYSTAL FILTER
at 2215 kc provides notching plus 3 band width positions in addition to the 3 IF selectivity positions. No other receiver has this versatility.

14 CONTROLS
RF gain and AC on/off
Xtal calibrator on/off
AF gain and RF tube gain switch
Tone control
AM-CW-SSB-ACC switch
CW pitch
Main tuning
Calibration correct
On/off limiter
IF selectivity
Xtal selectivity
Xtal phasing
Bandswitch
Phono-jack

10 TUBES (Plus 4H4-C current regulator, 5Y3 rectifier and OB2 voltage regulator)

TUBE COMPLEMENT
6BZ6 RF
6BA7 1st mixer
6AH6 1st osc.
6BE6 2nd mixer
12AT7 1st audio and S meter amp.
6BJ6 1st I.F.
6BJ6 2nd I.F.
6AL5 ANL and detector
6BE6 CWO/SSB det.
6AQ5 audio output

POWER CONSUMPTION
60 watts

POWER OUTPUT
1 watt

POWER SOURCE
110-120 volts AC, 60 cycles

ANTENNA INPUT IMPEDANCE
50-300 ohms

OUTPUT IMPEDANCE
8 ohms

TUNING SYSTEM
combination gear-pinch

BAND DESIGNATION AND LENGTH

160 Meters—	1.8	to	2.0 megacycles
80 Meters—	3.5	to	4.0 megacycles
40 Meters—	7.0	to	7.3 megacycles
20 Meters—	14.0	to	14.4 megacycles
15 Meters—	21.0	to	21.5 megacycles
11 Meters—	26.5	to	27.5 megacycles
10 Meters—	28.0	to	29.7 megacycles
6 Meters—	49.5	to	54.5 megacycles*
2 Meters—	143.5	to	148.5 megacycles*
1¼ Meters—	220	to	225 megacycles*

***Usable with accessory converters**

FREQUENCY RESPONSE
200 to 3,000 cycles for communications purposes.

SHIPPING WEIGHT
60 lbs.

FINISH
two-tone gray enamel.

DIMENSIONS
19½" wide (19" rack out of cabinet)
11¼" high
15" deep

NC-300 ACCESSORIES

CONVERTERS
NC-300C6 for 6 meter band. Coverage: 49.5-54.5 mc
NC-300C2 for 2 meter band. Coverage: 143.5-148.5 mc
NC-300C1 for 1¼ meter band. Coverage: 220-225 mc

XCU-300 PLUG-IN CRYSTAL CALIBRATOR
NC-300S MATCHING SPEAKER

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†*Prices slightly higher West of the Rockies and outside Continental U.S.A.*

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Leading Amateur Designs

...USE RCA TUBES

Look inside the National NC-300! Designed and built by a manufacturer of high-quality amateur equipment for a generation, this receiver features modern circuitry throughout—including double IF conversion, new variable IF selectivity, voltage regulation, current stabilization!

Here are four reasons why RCA Receiving Tubes are preferred in amateur and commercial designs: (1) BACKGROUND QUIETNESS—for increased sensitivity through better signal-to-noise ratio; (2) LOW HUM FACTOR—to get more from the signals down close to the threshold; (3) HIGH UNIFORMITY—that makes tube replacing a "cinch"; (4) SUPERIOR STABILITY—for top performance despite normal variations encountered, even under adverse conditions.

If your present receiver is ready for "re-tubing", why not snap up the "hop" with a new set of RCA Tubes. See your RCA Tube Distributor for the types you need. And for tube data, write RCA, Commercial Engineering, Section K-15-M, Harrison, N. J.

NEW NATIONAL NC-300 Receiver for SSB, AM 'phone, and CW

Tube	Function
6BZ6	RF Amp.
6AH6	HF Osc.
6BA7	1st Mixer
6BE6	2nd Mixer
6BJ6	1st IF Amp.
6BJ6	2nd IF Amp.
6AL5	Det. & Noise Limiter
6BE6	CW Osc.—SSB DET
12AT7	S-Meter Amp. & AF Amp.
6AQ5	AF Output Amp.
5Y3GT	Rectifier
OB2	Volt. Regulator
4H4C	Cur. Stabilizer

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