

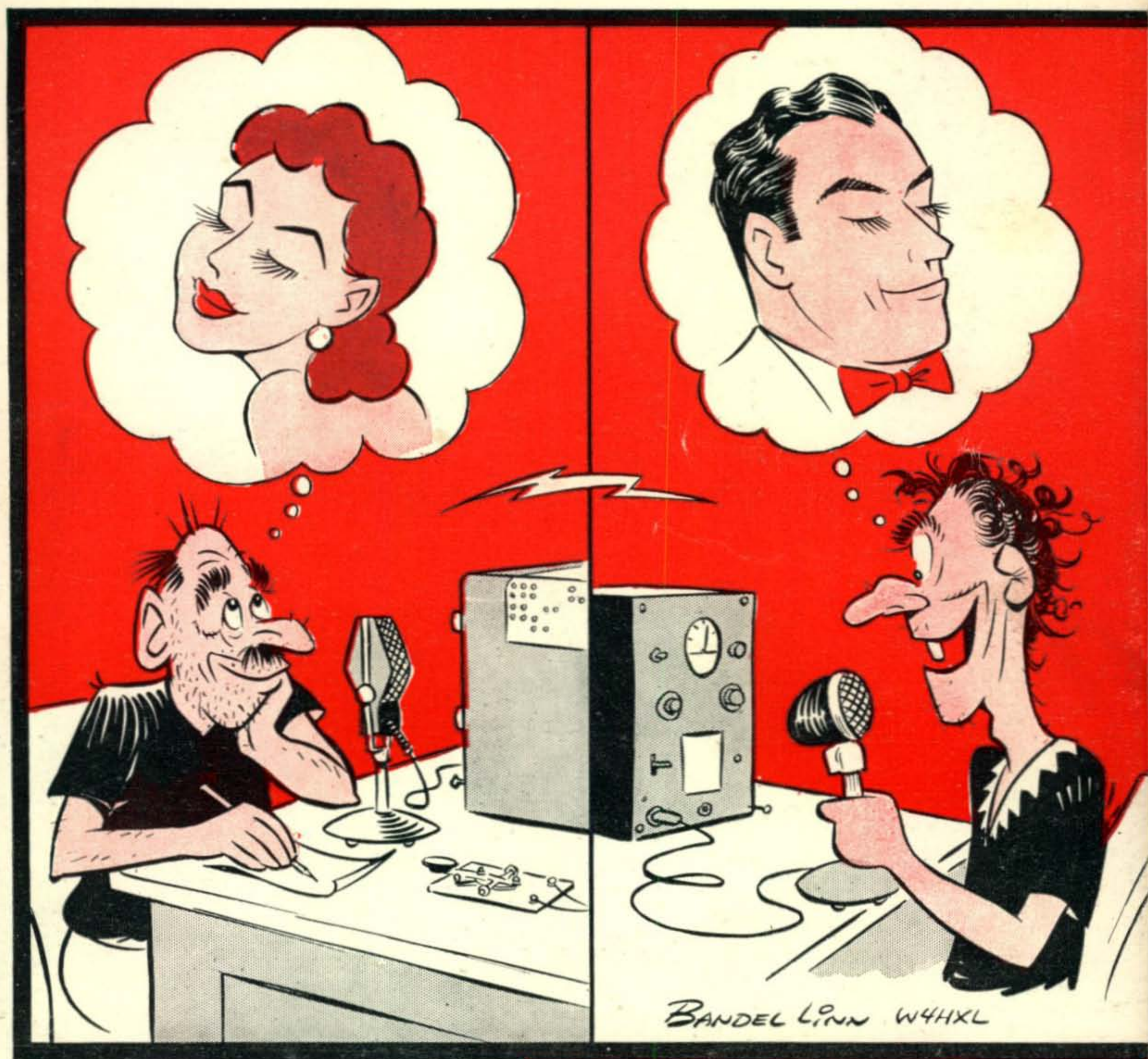
# CQ

JUNE

1955

35c

## RADIO AMATEURS' JOURNAL



In This Issue =

ELDICO SSB-100  
NEGATIVE PEAK INDICATOR  
SSB MOBILE RIG







NOW AVAILABLE AT NO EXTRA COST

# SSB

PR CRYSTALS FOR 75 METER  
AND 20 METER PHONE...IN  
THE 5 TO 5.5 MC. RANGE

Now you can enjoy commercial crystal stability on SSB at amateur prices. Because of increased

demand, PR is now making available Type Z-2 Crystals in the 5 to 5.5 MC. range at \$2.95 . . . for use with SSB exciters, such as the 10B and 20A for operation in the 75 meter and 20 meter phone bands. Pick your frequencies (integral kilocycle) and order from your dealer at this new, low price. Formerly PR crystals in this range were available only in commercial types selling for several times this amount.

On SSB, where stability becomes of utmost importance, there's nothing like crystal control with PRs . . . negligible drift (limited to less than 2 cycles per MC. per degree C). You can avoid the continuous annoyance of drift by depending on PRs . . . then you **KNOW** where you are, and you *know you will stay there!*



5.0 MC. to 5.5 MC. Range

# PR

# Crystals



USE **PR** AND **KNOW** WHERE YOU ARE

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

EXPORT SALES: Royal National Company, Inc., 8 W. 40th Street, New York 18, N. Y.



# ABOUT SINGLE SIDE BAND THESE ARE THE FACTS

**"talk power" equivalent to 1 Kw. AM in the new Hallicrafters Linear Power Amplifier Model HT-31**

## • MORE COMPLETE • MORE RUGGED • MORE RELIABLE

**More complete**—Engineered with a wider range of antenna impedance—50 to 600 ohms.

**More rugged**—Components surpass even the most rigid commercial specifications. Heavier transformers for less heat, and an exclusive Hallicrafters feature, a blower to further reduce heat!

**More reliable**—on-the-air tests assure you of dependable performance. Here in one compact package is a full band switch power amplifier covering 80-40-20-15-11 & 10 meters that's easy to drive, highly stable, extremely versatile, and engineered to Hallicrafters world-famous quality.

### SPECIFICATIONS

Plate Power Input—500 - 510 watts.

Power Output—330 P.E.P. on 80 meters with slightly less on 10 meters.

Drive Power for 80 meter input 10 watts P.E.P. maximum on lowest frequency.

### FEATURES

1. Continuous frequency coverage from 3.4 Mc. to 30 Mc.
2. Pi-network output for efficient harmonic and T.V.I. suppression.
3. Major T.V.I. suppression built in.
4. Does not require an antenna tuner as will feed loads from 50 to 600 ohms.
5. Full power capabilities available on CW because high stable, time proven circuitry does not require trick overload protective devices.
6. No special selection of R.F. amplifier tubes required.
7. Total tube replacement cost including high voltage rectifiers, amateur net only \$14.20.
8. Full metering of all important circuits.
9. Power input in watts shown on meter.
10. May be mounted in relay rack.

### CIRCUIT DETAILS

This power amplifier employs two 811-A zero bias triodes in parallel. The input system is designed to be fed from a 50-70 ohm unbalanced line and requires a maximum of 10 watts drive on 80 meters. The grid tank circuit is balanced to provide all band neutralization. The output tank circuit is a continuously variable pi-network which provides a high degree of harmonic suppression.

### TUBES

2—811-A Triode amplifiers

2—866-A Rectifiers

### POWER OUTPUT

P.E.P.—330 watts

CW—275 watts

### PLATE POWER INPUT

P.E.P.—500

CW—450

### FRONT CONTROLS

Grid Range

Grid Tuning

Meter—Plate/Grid/Power Input  
Watts

Plate Voltage On/Off

Power On/Off

PA Tuning

Antenna Loading—Fine

Antenna Loading—Coarse

### Physical details:

Grey black steel cabinet and brushed chrome control knobs. Piano hinge top. 10<sup>3</sup>/<sub>4</sub>" x 19 relay rack panel—over all size 20" wide x 12<sup>1</sup>/<sub>4</sub>" high x 17<sup>1</sup>/<sub>4</sub>" deep—shipping weight 100 lbs. approx.

### POWER

105/125 V—50/60 cycle AC

# hallicrafters

Chicago 24, Illinois

**Engineered to performance, not to price!**

Model HT-31 Linear  
Power Amplifier \$395.00





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### Foreign Subscriptions

England: RSGB, New Ruskin House,  
Little Russel St., London, WC1.

Australia: Technical Book Co., 297  
Swanston St., Melbourne C1,  
Victoria, Australia.

\* 335 Johnson St., Gary 3, Indiana  
\*\* 555 Crestline Drive, Los Angeles 49, Cal.

June, 1955

Vol. 11, No. 6

Cover by Bandel Linn, W4HXL. Write him.

## Feature Articles

- 13 NEGATIVE PEAK INDICATOR  
*John W. Campbell, W2ZGU*
- 16 ELDICO SSB-100  
*Elbert Robberson, W2FRQ*
- 20 SSB MOBILE  
*Wm. E. Johnson, W8VOK*
- 24 VK1EG: ANTARCTICA  
*Roth Jones, VK3BG*
- 28 CURRENT COMPUTER  
*Richard Saunders*
- 30 EMERGENCY OPERATION: AUSTIN  
*James Price, W5FXN*
- 35 REMOTELY TUNED ALL BAND MOBILE ANTENNA  
*Richard Matthias, W5BIW*

## Departments

- 32 DX AND OVERSEAS NEWS  
42 THE YL'S FREQUENCY
- 40 PROPAGATION CONDITIONS  
44 THE NOVICE SHACK

## Miscellaneous

- 6 SCRATCHI  
11 EDITORIAL  
29 TELETHON  
38 QSL CONTEST WINNERS
- 39 LETTERS TO THE EDITOR  
48 FROM YE OLDE TIMER  
52 DX FLASH  
54 MORE LETTERS  
55 JACK AND THE HIGHEST

CQ—(title Reg. U.S. Post Office)—is published monthly by Cowan Publishing Corp. Executive and Editorial offices, 67 West 44th Street, New York 36, N. Y. Phone MUrray Hill 7-2080. 2nd Class Mail privileges authorized at New York, N. Y. Subscription rates in U.S.A. Possessions, APO & FPO, 1 year \$3.00; 2 years \$5.00; 3 years \$7.00. Elsewhere add \$1.00 per year for postage. Single copies 35 cents. Printed in U.S.A. Entire contents copyright 1955 by Cowan Publishing Corp. CQ does not assume responsibility for unsolicited manuscripts.

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# New HEATHKIT DX-100

# PHONE AND CW TRANSMITTER KIT



MODEL DX-100

Shpg. Wt. 120 lbs.

**\$189.50**

Shipped motor freight unless otherwise specified. \$50.00 deposit with C.O.D. orders.

- R.F. output 100 watts Phone, 125 watts CW.
- Built-in VFO, modulator, power supplies. Kit includes all components, tubes, cabinet and detailed construction manual.
- Crystal or VFO operation (crystals not included with kit).
- Pi network output, matches 50-600 ohms non-reactive load. Reduces harmonic output.
- Treated for TVI suppression by extensive shielding and filtering.
- Single knob bandswitching, 160 meters through 10 meters.
- Pre-punched chassis, well illustrated construction manual, high quality components used throughout—sturdy mechanical assembly.

This modern-design Transmitter has its own VFO and plate-modulator built in to provide CW or phone operation from 160 meters through 10 meters. It is TVI suppressed, with all incoming and out-going circuits filtered, plenty of shielding, and strong metal cabinet with interlocking seams. Uses pi network interstage and output coupling. R.F. output 100 watts phone, . . . . . 125 watts CW. Switch-selection of VFO or 4 crystals (crystals not included).

Incorporates high quality features not expected at this price level. Copper plated chassis—wide-spaced tuning capacitors — excellent quality components throughout—illuminated VFO dial and meter face—remote socket for connection of external switch or control of an external antenna relay. Preformed wiring harness—concentric control shafts. Plenty of step-by-step instructions and pictorial diagrams.

All power supplies built-in. Covers 160, 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Panel meter reads Driver  $I_p$  Final  $I_g$ ,  $I_p$ , and  $E_p$ , and Modulator  $I_p$ . Uses 6AU6 VFO, 12BY7 Xtal osc.-buffer, 5763 driver, and parallel 6146 final. 12AX7 speech amp., 12BY7 driver, push-pull 1625 modulators. Power supplies use 5V4 low voltage rect., 6AL5 bias rect., 0A2 VFO voltage reg., (2) 5R4GY hi voltage rect., and 6AQ5 clamp tube. R.F. output to coax. connector. Overall dimensions 20 $\frac{7}{8}$ " W x 13 $\frac{3}{4}$ " H x 16" D.

## Heathkit

### GRID DIP METER KIT



MODEL GD-1B

**\$19.50** Ship. Wt. 4 lbs.

The invaluable instrument for all Hams. Numerous applications such as pretuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1 $\frac{1}{2}$  meter Ham bands. Complete frequency coverage from 2—250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial

with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

## Heathkit

### ANTENNA COUPLER KIT



MODEL AC-1

**\$14.50** Shpg. Wt. 4 lbs.

Poor matching allows valuable communications energy to be lost. The Model AC-1 will properly match your low power transmitter to an end-fed long wire antenna. Also attenuates signals above 36 Mc, reducing TVI. 52 ohm coax. input—power up to 75 watts—10 through 80 meters—tapped inductor and variable condenser—neon RF indicator—copper plated chassis and high quality components.

## Heathkit ANTENNA IMPEDANCE METER KIT



MODEL AM-1

**\$14.50** Shpg. Wt. 2 lbs.

Use the Model AM-1 in conjunction with a signal source for measuring antenna impedance, line matching purposes, adjustment of beam and mobile antennas, and to insure proper impedance match for optimum overall system operation. Will double, also, as a phone monitor or relative field strength indicator.

100  $\mu$ a. meter employed. Covers the range from 0 to to 600 ohms. Cabinet is only 7" long, 2 $\frac{1}{2}$ " wide, and 3 $\frac{1}{4}$ " deep. An instrument of many uses for the amateur.

# HEATH COMPANY

A SUBSIDIARY OF DAYSTROM, INC.  
BENTON HARBOR 12, MICHIGAN



# New Heathkit VFO KIT



MODEL VF-1

**\$1950**

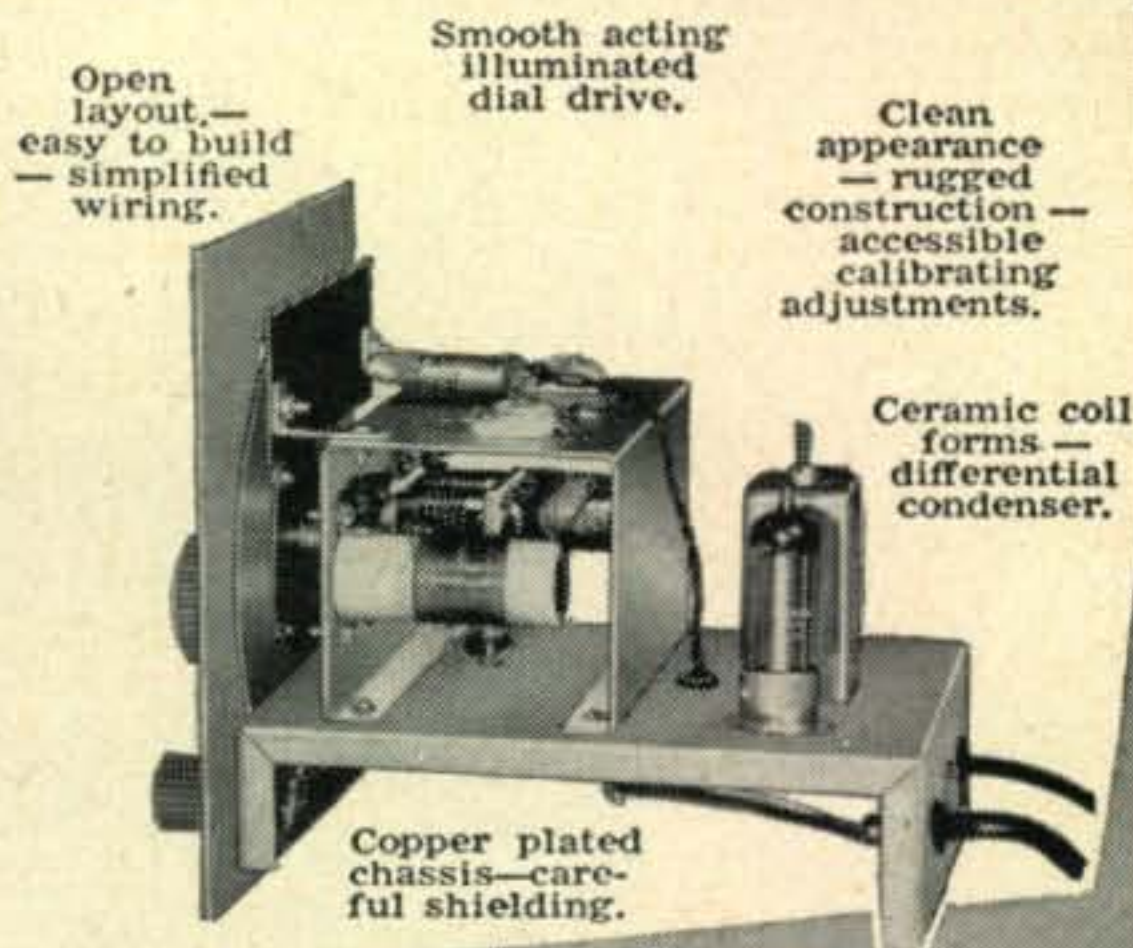
Ship. Wt. 7 lbs.

- 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 bandsread 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 1/2" 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

**\$2950**

Ship. Wt. 16 lbs.

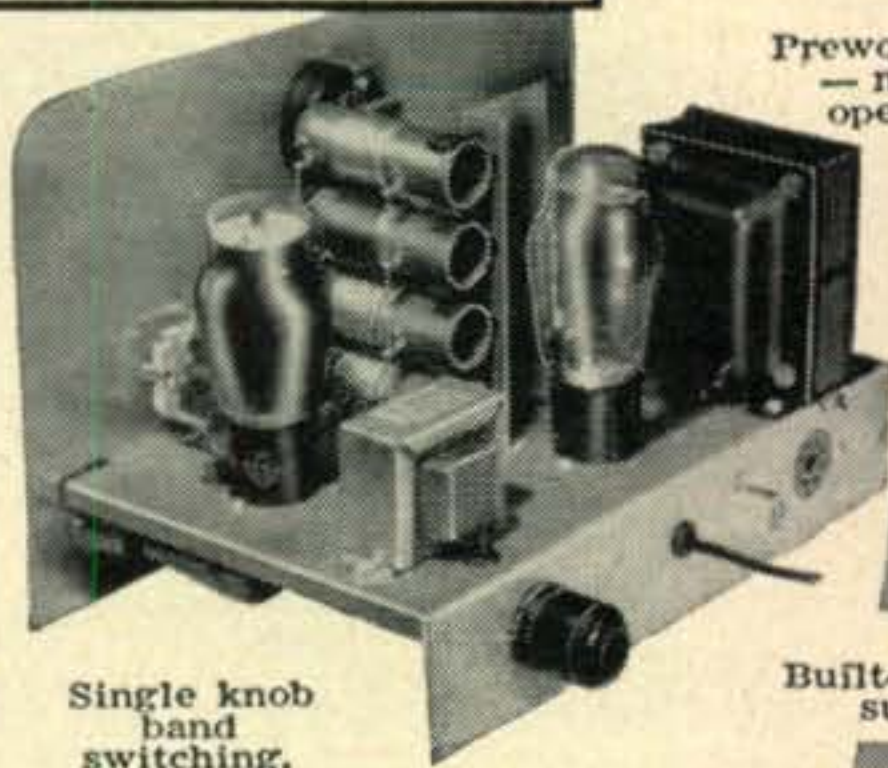
### SPECIFICATIONS:

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: 8 1/8 inch high x 13 1/8 inch wide x 7 inch deep.

Crystal or VFO excitation.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating 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.

Rugged, clean construction.



Prewound coils—metered operation.

52 ohm coaxial output.

Single knob band switching.

Built-in power supply.

## Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Stable BFO oscillator circuit.

RF gain control with AVC or MVC.

5 1/2 inch PM Speaker-Headphone Jack.

Six tube transformer operation.

Electrical bandsread and scale.

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 bandsread 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

**\$2550**

Ship. Wt. 12 lbs.

### CABINET:

Proxylon impregnated fabric covered plywood cabinet. Ship. weight 5 lbs. Number 91-10, \$4.50.

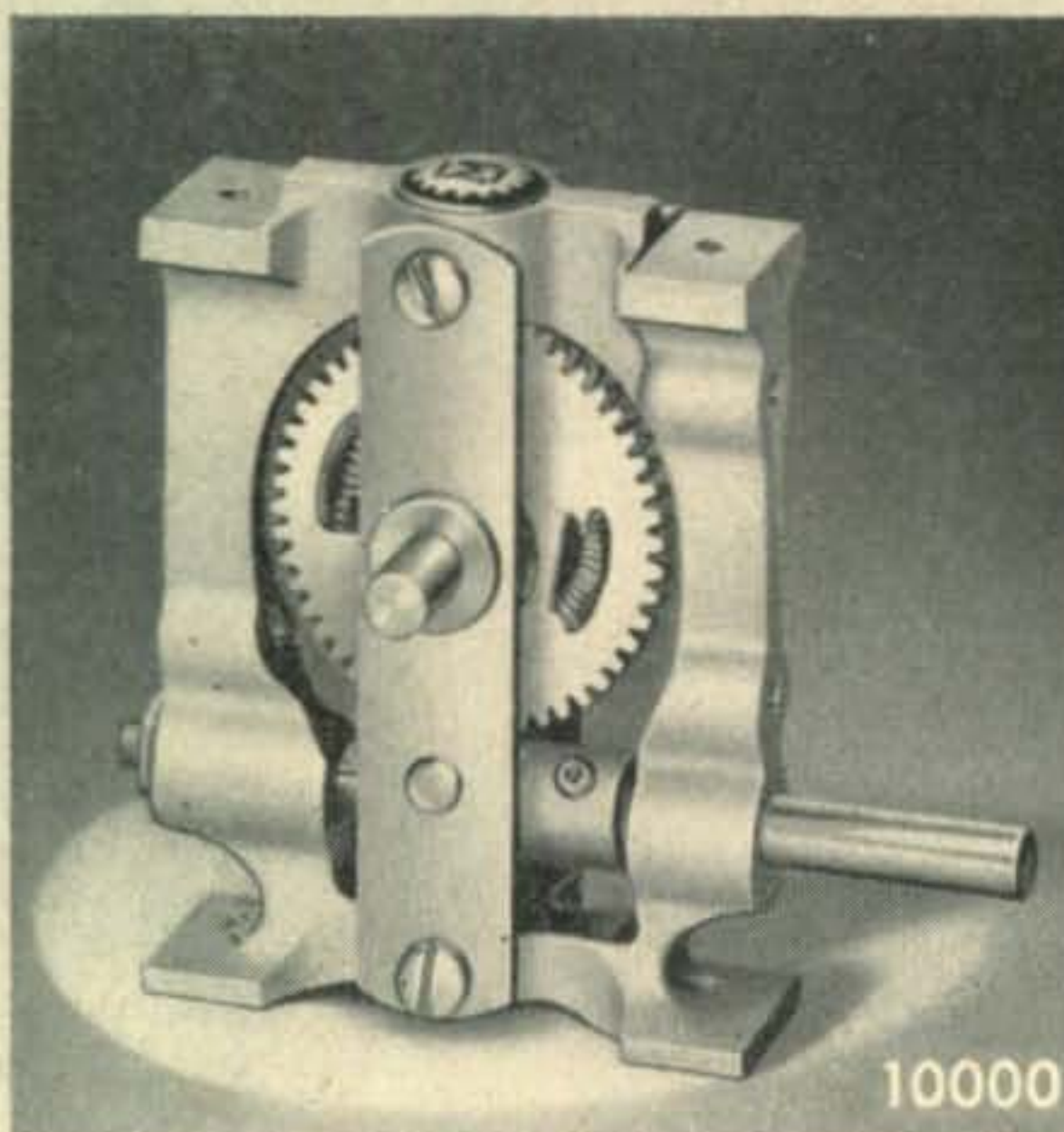
**HEATH COMPANY**  
 BENTON HARBOR 12, MICHIGAN



*Designed for*



*Application*



**The No. 10000  
WORM DRIVE UNIT**

One of our original *Designed For Application* products, tried and proven over the years. Rugged cast aluminum frame may be panel or base mounted. Spring loaded nickel plated cut brass gears work with polished stainless steel worm to provide low back lash.  $\frac{1}{4}$ " diameter stainless steel drive and driven shafts. Available in two ratios, 16:1 and 48:1. Specify ratio in ordering.

**JAMES MILLEN  
MFG. CO., INC.**

MAIN OFFICE AND FACTORY  
**MALDEN  
MASSACHUSETTS**



Feenix, Ariz.

Deer Hon. Ed:

Are having needs to picking mind of another grate tecknickel geenyus, so are riting you post-hasty. You seeing, Hon. Ed., Scratchi are having 1/c problum, and he now up a canoe without a paddle. If I not solving problum, I not being able to go on the air. It are not often that Scratchi getting stumped, so are sure trubble are some simple thing I looking over.

But letting me tell you what happening. In past yeer I making notes on what kind speshul transmitter would be having all feetyours that needing to have to being sooper-doooper transmitter. Things like working all bands but not having any band-change switch, and bilt-in VFO with same-like ackyouracy as WWV, etc.

All Spring I working like madly to bilding Scratchi Dreem Transmitter. Boy oh boys, it are a honey. I telling you, Hon. Ed., I are mostly happy as are making last sodder coneckshun and tightening last water-cooler pipe. Last week I are running tests on it, and it working like everybuddys business. Slicker than greese on porcelin insoolator. Everything are perfect, excepting for one minor detale. Hon. Ed., it won't load. I can't getting enough energy into antenna to tickle a flee.

At first using two turn link, but final plates meter acting like it stuck. Next putting for turns on link, and no change. Not one to being bothered by little job of wire winding, Scratchi slapping ate turns on link—no points in using six turns, as everybuddys know that having to at least use dubbule number of turns to making difference. And what happening with ate turns—are transmitter loading? Not on your tinny-type, Hon. Ed.

At this point Scratch thinking maybe some joker are sneeking up in ded of nite and swiping Hon. Antenna, so I quick-like going outside to checking. Nope, nobuddies taking antenna. It still there, stretching across desert as far as eye can see. Going inside and checking, and yes indeedy, antenna feedline coming rite to link. So, by gollies, needing more turns on link.

Later that evening Scratchi are lower than angel of radiashun from undergrounds antenna. Hon. Ed., I are just having put to thousands and forty-

[Continued on page 8]



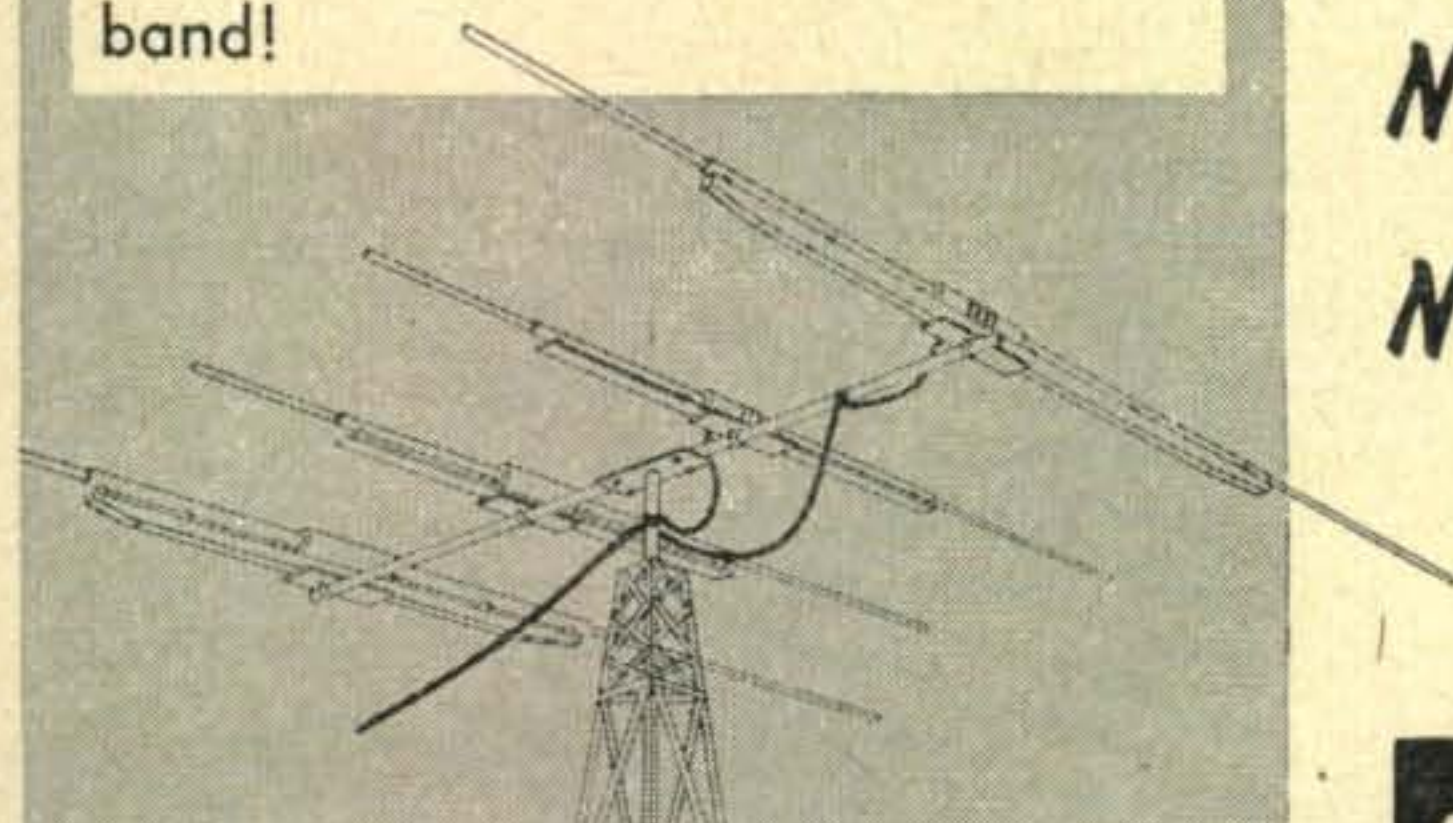
# The **Mosley** "Vest-Pocket"

## TRI-BANDER ROTARY BEAM

with **\*AUTO-LECTRONIC** Change-over

- ✓ ONE Beam
- ✓ ONE Coax Line

\*All you do is tune your rig for operation in the band desired. The MOSLEY TRI-BANDER automatically selects the right combination of elements to give True Beam Performance on that band!



The Tri-Bander is a compensated type beam with four elements mounted on one 15' boom. Two elements function for 20 meter operation and the other two for 15 and 40 meter. Because the latter two bands are not in direct harmonic relation, the beam operates at somewhat reduced efficiency at 21 mcs. but gives maximum performance at 7 mcs. and 14 mcs. Forward gain on these bands is 5 db. and front-to-back is 20 db. SWR is 1.1/1 at resonant frequencies. The Tri-Bander is complete with coils, Auto-Lectronic Coupling Yoke and all necessary hardware. Element sections are pre-drilled and color coded for fast assembly.

Model VPA-3B. Amateur Net \$135.00

### 3 BAND OPERATION!

*No Switching!*

*No Stacking!*

*No Adjusting!*

*just one*  
MODEL VPA 3B  
TRI-BANDER

*Pre-tuned!*

15 METER

20 METER

40 METER

Hams owning a 20 or 40 Meter MOSLEY 'V-P' Beam are invited to write for conversion data. Address Engineering Dept.

Write for your FREE copy of MOSLEY Catalog H-55. Describes other popular 'V-P' Rotary Beam Antenna Models and products of interest to Hams.

**Mosley Electronics, Inc.**  
8622 ST. CHARLES ROCK ROAD, ST. LOUIS 14, MISSOURI





Cat. No. PC-201  
**\$25.00**  
 complete with  
 3 sub-miniature tubes  
 (suggested list price)

## Here's where the fun begins!

### Centralab Ampec® 3-stage P.E.C.\* Audio Amplifiers

*You can use them to build all sorts of exciting, miniature projects — pocket radios, mike preamplifiers, signal tracers, portable megaphones, phonograph pick-ups, hearing aids, model controls—even stethoscopes*

Yes, sir, you can really have a "picnic" with Ampec. It's the highest form of Printed Electronic Circuit and provides complete electrical service from input to output. Wiring, capacitors, resistor, and tube sockets are bonded to a single, master plate.

Even with tubes, Model 2 Ampec is smaller than a book of matches. Model 3 is smaller than a postage stamp—and it has a tone circuit, besides!

Ask your Centralab distributor to tell you more about Ampec. And send coupon for Booklet 42-142 with specifications and applications.

# Centralab

\*Trademark  
Y-1655B

A Division of Globe-Union Inc.  
954G E. Keefe Avenue, Milwaukee 1, Wisconsin

Send me free Booklet 42-142.

Name.....

Address.....

City.....one.....State.....

[from page 6]

ate turns on link, and still can't making final load. In fact, by watching plates meter reel closely, it looking like plate currents are going down, not up!! It are here that Scratchi are out of payshuntz. Not only that, are out of wire to winding links.

Next morning, after trip to amchoor radio store for more wire, are sitting in shack, wondering where to going now. Have you ever seeing link with to thousand and forty-ate turns on it? It are looking like transformer to making lightning bolts. And next coil are having to be, let's see, to times, that are for thousand and ninety-six turns. Sacramento Boulevard!! Well, if thing are worth doing it are worthing doing rite, I always saying. For thousand and ninety-six turns, here I coming.

Later that week Scratchi getting coil finished. Hon. Brother Itchi coming in and together we lifting it up and hanging it from seeling. Then are putting wee bitty old final tank coil and hanging it inside big old link coil. Connecting wires from tank coil to rig, and wires from link to antenna. Turning on rig. Hon. Ed!!! You never gessing . . . By Hon. Uncle Watanabe's Beard, plate meter are going offscale backwards. Backwards, Hon. Ed., backwards!!

If that don't licking the frosting off the cake. All that work, and that monies spent on wire, and now transmitter are not only not loading, but it are sucking energy out of air. Of all the . . . SUCKING ENERGY OUT OF THE AIR!! Scratchi quicklike getting pair of earfones and cristal defector, putting across antenna link. Hokendoke!! Hon. Ed., local BC stayshun coming in like ants to spilled sugar bole.

So that's my problum, Hon. Ed. Should I winding another link with ate thousand one hundred and ninety-to turns, or should just giving hole thing up as bad job. I are sure that just some little thing are cawsing hole trubble, but not being able to putting fingers on it. Please riting post-hasty speshul rush, and also telling me if knowing where can get more wire wholesale.

Respectively yours,  
Hashafisti Scratchi

## West Gulf Convention

June 10, 11, 12 will see the Annual West Gulf Convention at Fort Worth, Texas. This promises to be a full-fledged shebang shindig with pre-con party, dance, speakers on many subjects, hidden transmitter hunt, luncheons, many prizes including 75A4 and SX88, in the fabulous Hotel Texas. For information write Convention Committee, 1125 Fort Worth National Bldg., Fort Worth, Texas.

## FCC Code Rule Amended

The following amendment is effective immediately: 12:46(b) An applicant for any class of amateur operator license, except the Extra Class, will be given credit for the telegraph code element if within five years prior to the receipt of his application by the Commission he held a commercial radiotelegraph operator license or permit issued by the Federal Communications Commission.



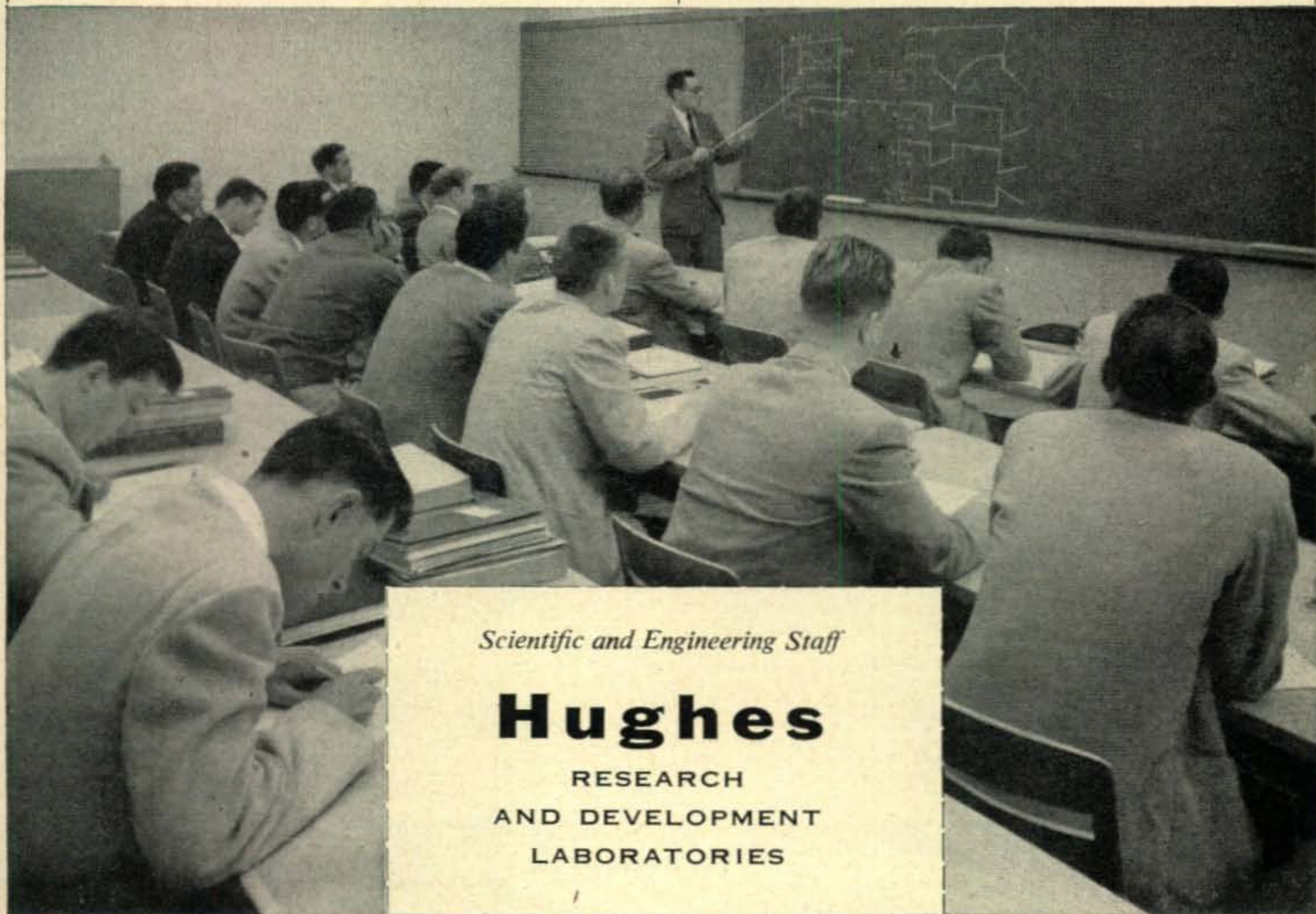
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ENGINEERS AND  
PHYSICISTS WITH  
ELECTRONICS TRAINING  
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CONDUCT CLASSROOM  
AND LABORATORY  
PROGRAMS ON ADVANCED  
SYSTEMS WORK IN THE  
FIELDS OF RADAR  
FIRE CONTROL,  
ELECTRONIC COMPUTERS,  
GUIDED MISSILES.

*The proper functioning of the complex airborne radar and computer equipment produced by Hughes requires well-trained maintenance crews in the field.*

At Hughes Research and Development Laboratories in Southern California engineers assigned to this program are members of the Technical Staff. As training engineers they instruct in equipment maintenance and operation for both military personnel and field engineers.

*Prior to assignment, engineers participate in a technical training program to become familiar with latest Hughes equipment. After-hours graduate courses under Company sponsorship are available at nearby universities.*



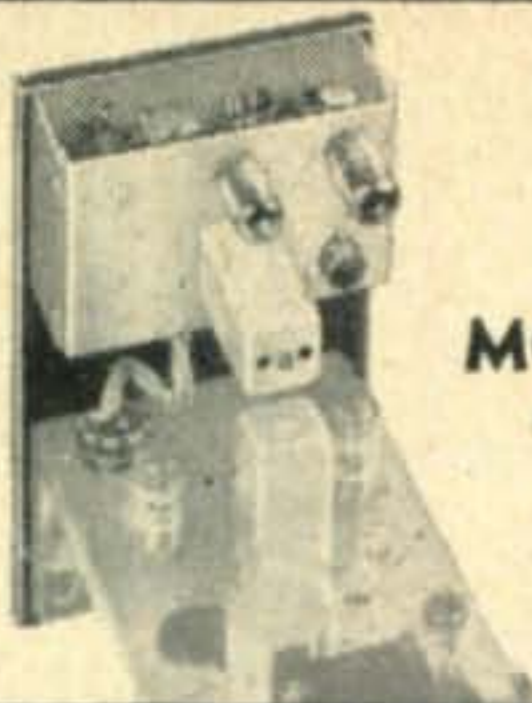
*Scientific and Engineering Staff*

## Hughes

RESEARCH  
AND DEVELOPMENT  
LABORATORIES

*Culver City, Los Angeles County, California*





MODEL AQ



MODEL DQ



MODEL B SLICER

# NEW MULTIPHASE "Q" MULTIPLIER AVAILABLE THREE WAYS

1. It's built-in the new Model B Sideband Slicer.
2. Plug it into your present Model A Slicer.
3. Attractive Desk Model, for installation directly into receiver.

The new Multiphase "Q" MULTIPLIER is a tunable IF electronic filter that provides tremendous receiver selectivity for peaking or rejecting a signal on AM, CW or SSB. It employs a new two tube circuit\* with a special very high "Q" pot core inductor. Continuously variable selectivity from 60 cps to normal IF pass-band. Nulls out interfering heterodynes without affecting speech intelligibility. Peak the desired signal; interfering carriers are attenuated up to 50 db.

\*PATENT PENDING



MODEL 20A

- 20 Watts Peak Envelope Output SSB, AM, PM and CW
- Completely Bandswitched 160 thru 10 Meters
- Magic Eye Carrier Null and Peak Modulation Indicator

Choice of grey table model, grey or black wrinkle finish rack model.

Wired and tested.....\$249.50  
Complete kit.....\$199.50

### 458 CONVERSION KIT

Basic 458 Conversion Parts Kit, 15 to 160 meters, with dial, etc.....\$15.00  
458 Deluxe Case and Panel Kit, matches size and appearance of Slicer...\$10.00

### NEW — FOR 10 METERS

MODEL 458-10 xtal controlled converter package to extend 458 VFO into 10 meter band. For use with above 458 Conversion Kits.

Wired.....\$37.50  
Kit.....\$27.50

## MODELS MODEL AQ

"Q" MULTIPLIER for installation in Model A Slicer. Includes new front panel. Power-IF cable plugs into accessory socket.

Wired...\$29.50 Kit...\$22.50

## MODEL DQ

Desk Model "Q" MULTIPLIER for use with any receiver having 450 to 500 KC IF. In attractive case 5 1/2" W, 4" H, 5" D, with connecting power-IF cable. Power requirements, 225 to 300 VDC at 12 ma., 6.3 V at .6 amps, can be secured from receiver. Can provide added selectivity and BFO for mobile SSB or CW reception.

Wired...\$29.50 Kit...\$22.50

## MODEL B

Sideband Slicer, same as Model A Slicer but includes built-in "Q" MULTIPLIER. AP-1 not needed.

Wired.....\$99.50  
Kit.....\$69.50



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Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts ORM in half. Exalted carrier method eliminates distortion caused by selective fading. Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC TV receiver sweep harmonics.

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## Check These Features NOW IN BOTH MODELS

- **Perfected Voice-Controlled Break-in on SSB, AM, PM.**
- **Upper or Lower Sideband at the flip of a switch.**
- **New Carrier Level Control.** Insert any amount of carrier without disturbing carrier suppression adjustments.
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## MODEL 10B SUCCESSOR TO THE POPULAR MODEL 10A

- 10 Watts Peak Envelope Output SSB, AM, PM and CW
- Multiband Operation using plug-in coils.

Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.

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## QT-1 ANTI-TRIP UNIT

Perfected Voice Operated Break-in with loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic — no relays. Plugs into socket inside 20A or 10B Exciter.

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MULTIPHASE EQUIPMENT

Central Electronics, Inc.

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Chicago 13, Illinois

See Trade Publications on Multiphase "REJUVA-TUBE" — A New CRT REJUVENATOR



There is so much to write about that it is mighty difficult to sit down and just touch on one or two topics. For instance, we now have a VHF Editor for CQ. You will see his column next month when we open the VHF Department with a flourish. I won't tell you who the department editor is yet, but it is someone almost everybody knows for his VHF DX'ing and his low frequency DX'ing. He just moved recently and is busy these days putting up his 64 element two-meter beam and all sorts of other monsters on his various towers.

One of these days we are going to have some discussion on how to improve the quality of QSO's. Whenever I bring up the subject I get 100% agreement: QSO's are by and large pretty dull things as generally practiced. Apparently nobody wants them to be dull, the problem seems to be what to do to make them interesting. Suggestions are hereby solicited. I kind of feel that since we have spent so much time and money in establishing a method of communication that we should use it to some good purpose. Ask me about it on the air some time and then sit back while I unfold my ideas on the subject.

### Heathkit DX-100

Jim Morrissett, W8BAJ/2, our Assistant Editor, has just finished assembling the new Heathkit DX-100 transmitter. Next month we will bring you the whole scoop on this rig. Jim has it on the air almost every evening on all bands so take a look for him. Preliminary checks show the rig to work out fine.

One other thing we are playing around with is a printed circuit kit put out by Telediagnosis. This is the first thing of this nature that I have tried and it is a heck of a lot of fun. The more I work with it the more I am convinced that we are going to see a lot of printed circuits in ham radio in the future. It would be better really to call them printed wiring instead of printed circuits for you still have to use condensers and resistors. We'll have more info for you soon on this kit.

### New Novice Editor

Many of you will be just as disappointed as I was to hear that Herb Brier is leaving CQ. I am sure that we all wish Herb well with his new job and appreciate the fine column that he has been writing for CQ. The Novice Shack has been widely read and of considerable interest particularly because of the radio funda-

mentals that have appeared there. The Novice Shack will not be dropped . . . it won't even falter. Shortly after the Dayton gang heard that CQ needed a department editor they got together and sent in a petition for us to fill the vacancy with Walt Burdine, W8ZCV. I met Walt out at the Hamvention in April and was tremendously impressed by him. He knows his stuff, and *everyone* likes him. I am convinced that he will have no trouble in upholding the high standard of the Novice Shack. All of us welcome Walt as an Editor of CQ.

### Hamvention

Jim and I turned up at the Dayton Hamvention and believe me, it was a humdinger. We both had a swell time. I even won a prize, something that has never happened to me before in all of the hamfests and conventions I have attended. The attendance was near 1800 as near as I could find out, which is quite a turnout for a middle-sized Ohio town. Actually they drained all of the active amateurs for hundreds of miles around. We tuned in on ten meters in the early morning and heard caravans arriving from Cincinnati (21 cars, all on ten meters), etc. The windup was a dinner for about 1100 complete with afterdinner talks. Oh yes, my prize was a Shure "Slim-X" crystal mike, the kind you hang around your neck. It is darned handy and works fine, I'm using it on the 75 meter kilowatt now. Note to Hamvention Committee: we were promised pictures of the Hamvention for a story in CQ, but none have come. Tsk, tsk. We wrote reminders too.

### B. Linn

The cover cartoon is by one Bandel Linn, W4HXL. At one time in my career I worked as a broadcast announcer-engineer for WSPB, Sarasota, Florida (I was W4NSD down there). One of my good friends there was Bandel, who is a nationally known cartoonist (Colliers, etc.) and ran one of the disc jockey shows on the station. Perhaps I should call it a josh diskey show. You know, life in Florida sure was nice. Well, naturally I thought of Bandel when I was looking for something unusual for the cover of CQ.

One more thing. I want more pages in CQ. If you fellows will get your subscriptions in and remember to tell the advertisers that you saw their ads in CQ we will print so many articles that it will take you a month to read the magazine.

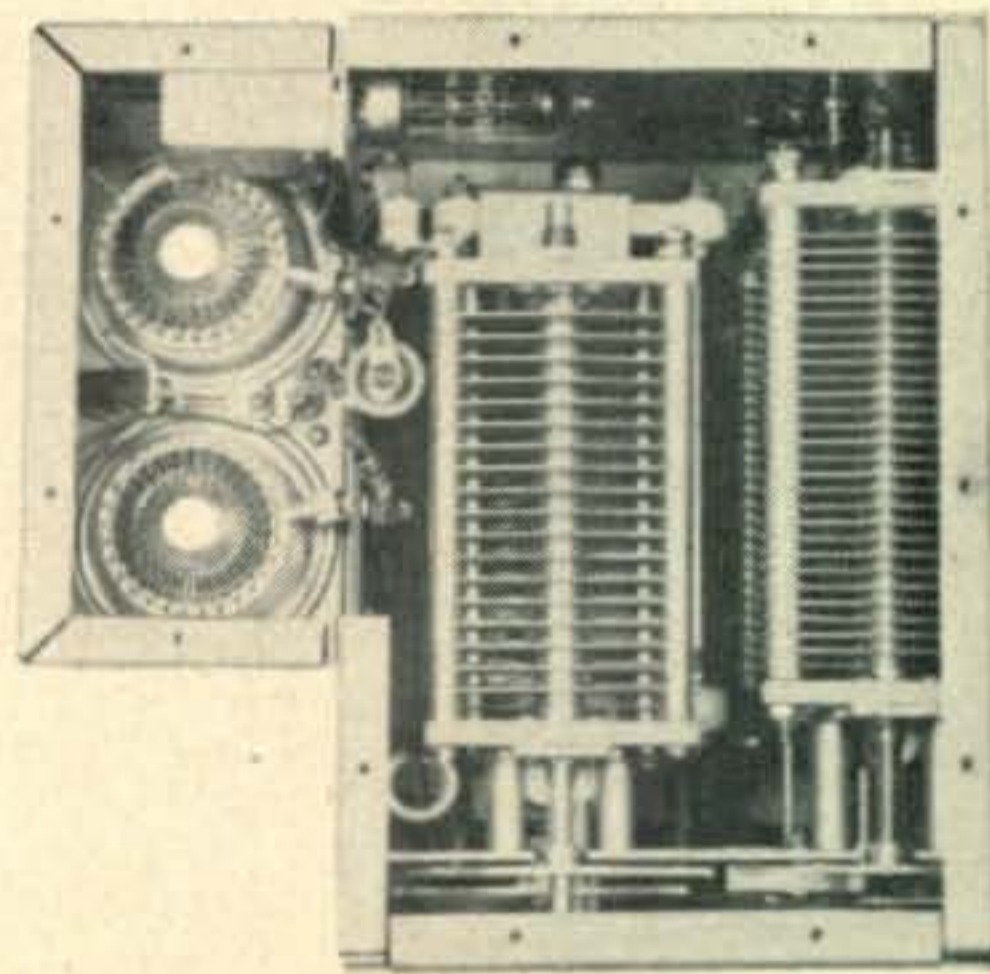
26 + 32

Wayne Green



# Collins versatile KWS-1 transmitter uses pair of Eimac 4X150A's in power amplifier...

Another success in its history of communication equipment accomplishments has been realized by Collins Radio Company with the new KWS-1, one kilowatt amateur radio transmitter. Designed for versatility as well as reliability and top performance, the KWS-1 has a power input of one kilowatt peak envelope power on SSB, one kilowatt on CW and equivalent to one kilowatt AM when received on narrow-bandwidth receiver. Its frequency range from 3.5 to 30mc covers the 80, 40, 20, 15, 11 and 10 meter amateur bands. The modern engineering approach taken by Collins combines outstanding electrical characteristics with uncrowded physical compactness. The KWS-1 exciter and amplifier are housed in a single receiver-size cabinet suitable for placing on the operating desk or power supply cabinet. A pair of easily driven Eimac 4X150A radial-beam power tetrodes in Eimac 4X150A air system sockets are used in the final amplifier. In the words of Collins, Eimac-developed 4X150A's were selected "because of their superior performance as linear amplifiers, their small size and lower plate voltage requirements."



Top view of one kilowatt linear amplifier section of Collins KWS-1 single sideband, CW and AM transmitter, showing pair of Eimac 4X150A's.



Eimac 4X150A radial-beam power tetrode and air system socket.



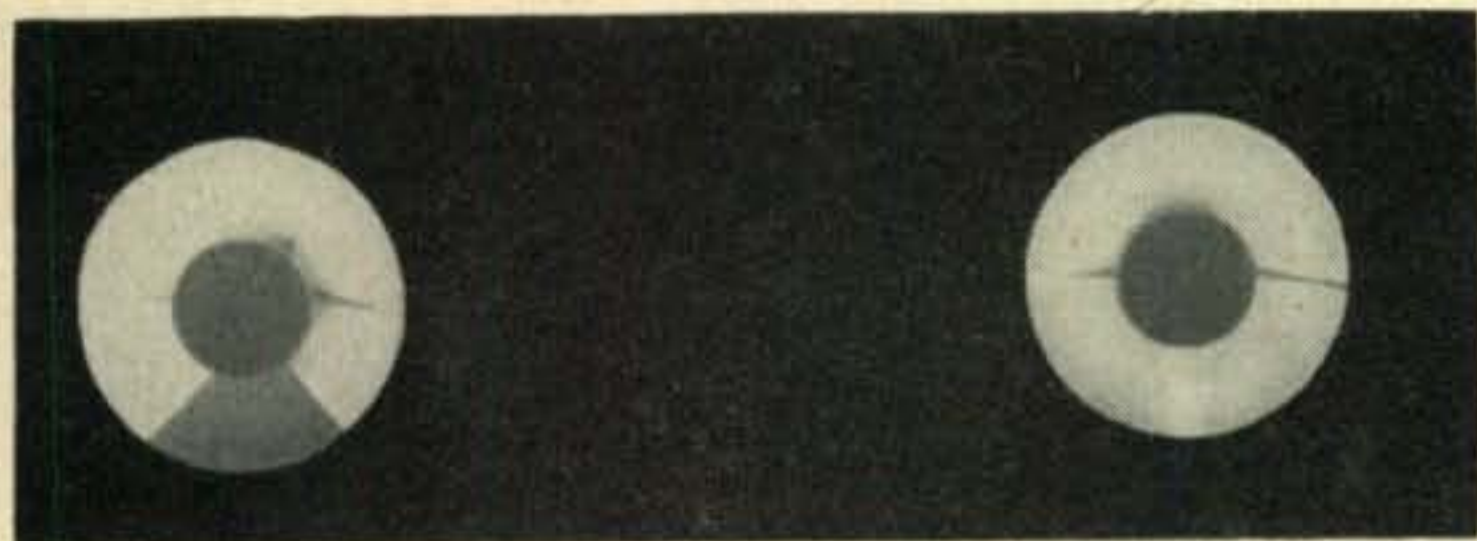
The exciter and power amplifier of Collins KWS-1 transmitter are housed in small, compact receiver-size cabinet.

*Eimac*

**EITEL-McCULLOUGH, INC.**  
S A N B R U N O • C A L I F O R N I A



Negative peak Normal condx.



The FCC is at times thought of by some hams as that scowling agency which growlingly imposes penalties, limitations, and restrictions on the hard-striving ham seeking to make an innocent contact. It does indeed impose limitations on people; it so limits the commercial uses of the frequency spectrum that we aren't competing with 50-kw rigs running 150 wpm. It also clobbers the yayhoo who gets on the band with his 500% modulated rig and makes monkey-chatter for half a megacycle up and down the band. It helps, too, in convincing the bird with the \$99.50 special-bargain TV set that there are limitations on his right to listen in on the r-f spectrum—he's got no business using an instrument that listens to 15 different frequencies at once, any more than you have a right to send out signals on 15 frequencies at once.

Generally speaking, the FCC's rules make large quantities of good sense. Agreed, that like any other human agency (including even you and I) mistakes happen in its operations.

The limitation on negative peak modulation, however, is *not* a mistake; we've all been on the unwanted-receiving end of overmodulation. It's a temptation to crank up the modulation, to get more a-f signal to the other end. If you've got a wiggle-scope on your rig, of

course, it's easy to adjust the a-f gain to get the maximum useful modulation. Without it, the "sure" way is to crank it up till the man on the other end reports no further increase in audio signal received. This means you are now modulating somewhere between 95% and 295%.

Anything over the 100% point gives with the Bumps & Grinds type signal. The a-f signal is supposed to ride along on the r-f carrier with a nice, smooth roller-coaster effect; too much negative peak, however, and the roller coaster track gives out, and the process comes to a crashing stop. Each crash generates a-f harmonic distortion in the receiver at the other end—which just makes your voice sound somewhat like Donald Duck, and isn't particularly bothersome—but it also generates ultrasonic

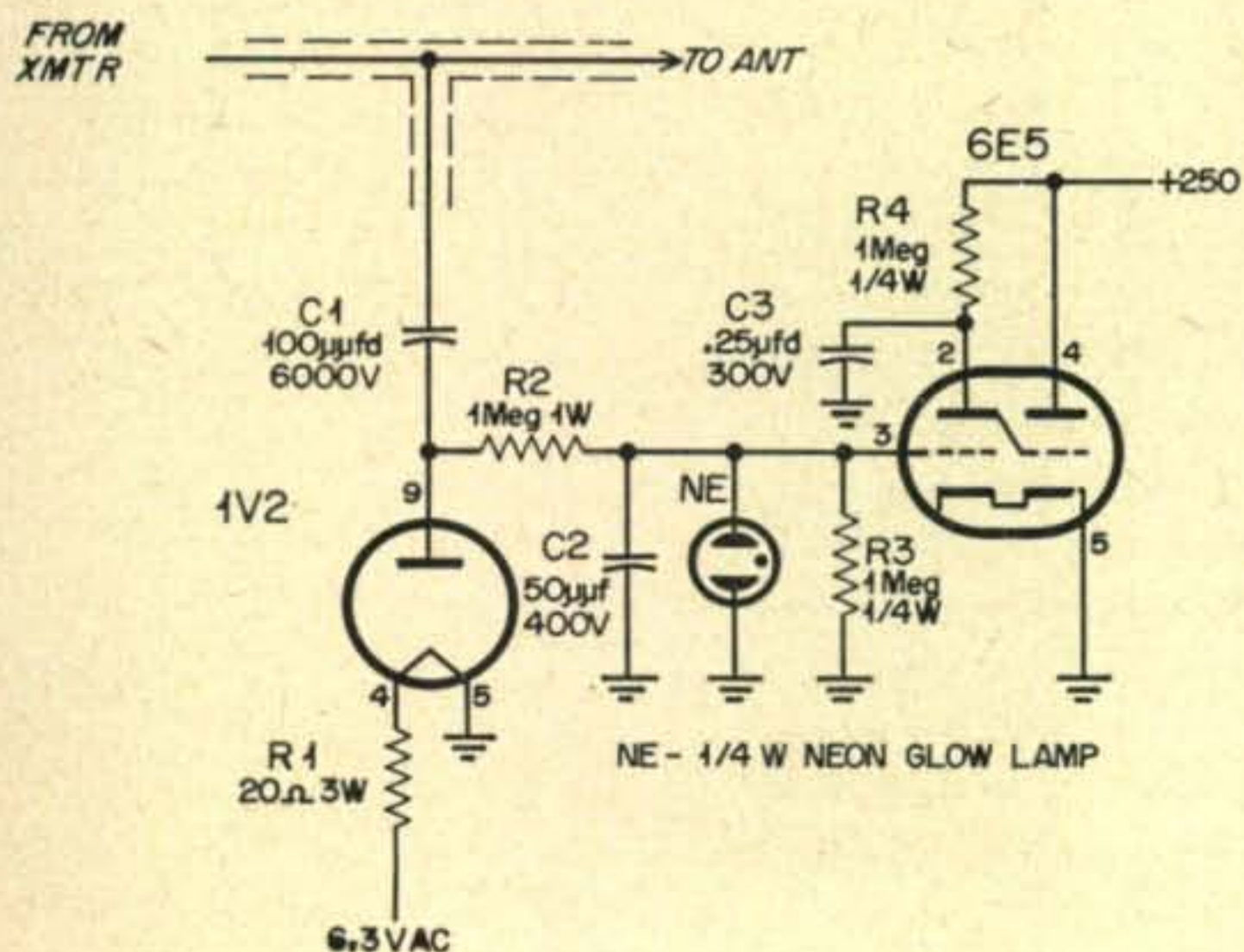
# Negative Peak Indicator

John W. Campbell, Jr., W2ZGU

1457 Orchard Rd., Mountainside, N. J.

stuff that goes way, way out of the carrier band. You can't push 500,000 cycle stuff through any commercial modulation transformer—but when the r-f carrier is dropping nice and steadily, but tries to drop out into the negative energy levels—it suddenly becomes highly imaginary, and the fanciest collection of ultra-sonic modulations conceivable is imposed on the carrier. Just like that, you have side-bands running plus-and-minus 500,000 cycles or so.

A badly designed c-w rig does the same thing, and the result is called "key clicks"; CW is, after all, simply slow pulse-modulation, with square-wave pulses. Make those square pulses sharp-edged enough and you've got fancy harmonics going out. An overmodulated phone rig is a pulse-modulated system, with a pulse repetition rate equal to the audio frequency doing the over-modulating. If your pulse rate happens to be, say 2000 cycles per second, you





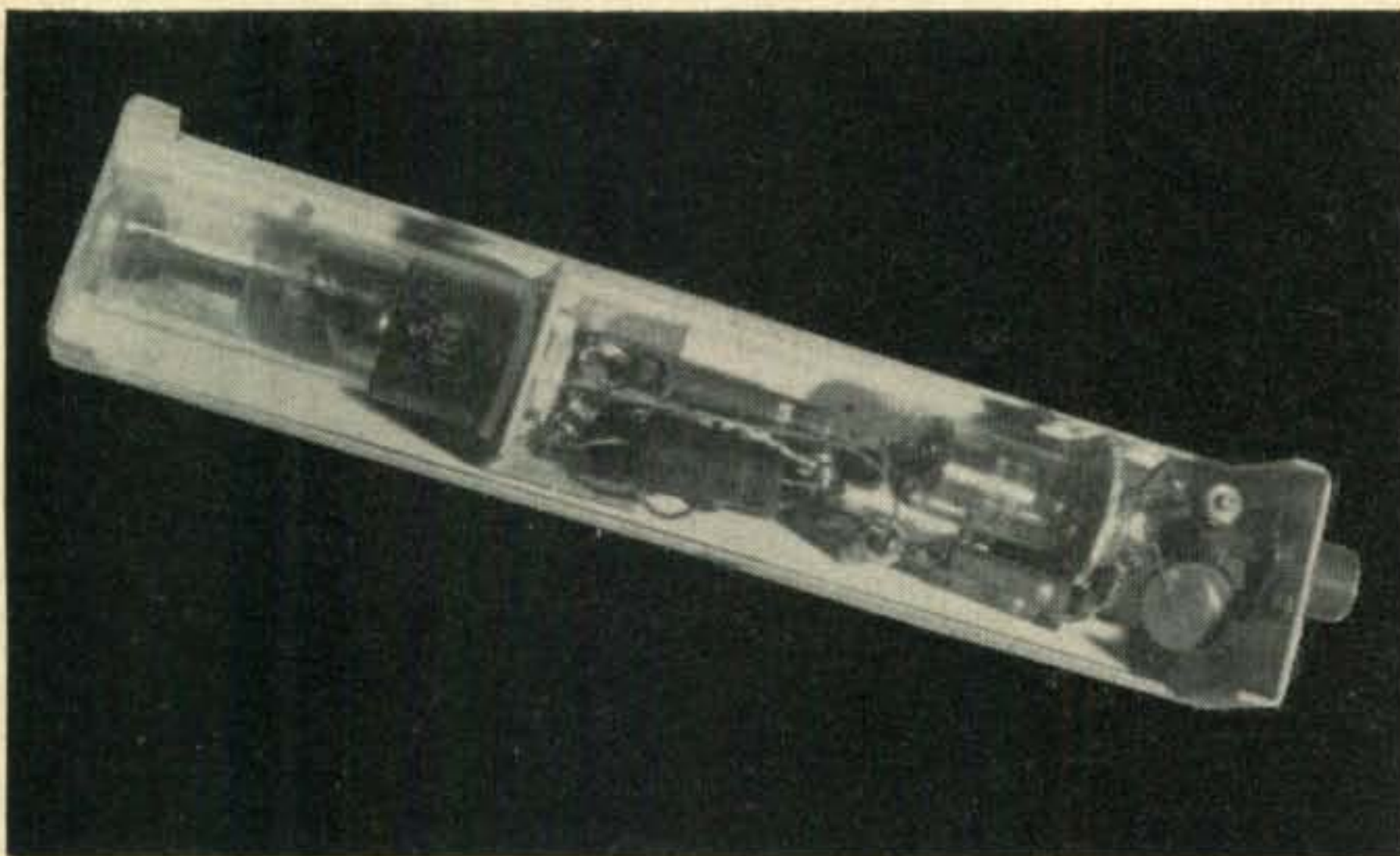
can bet the ultrasonics go from here to way, way out yonder.

The FCC and your ham neighbors are in full agreement; either you or your overmodulation should be suppressed—firmly.

But equally, the FCC and your ham neighbors are in full agreement that you should fully modulate your carrier. The FCC and the hams both object seriously to a carrier on the air with no modulation; it occupies r-f spectrum but makes no effective use of it. Essentially, they want exactly what you want—a carrier that's fully modulated, and isn't overmodulated.

### The Problem

Since a modulation monitor is both legally required, if we're not to be guilty of overmodulation, and it is desirable that we achieve the full modulation both we, the FCC and our fellow hams want—what are the ideal characteristics of the modulation monitor, and how



close can we come to that ideal?

First—let's face it!—it should be cheap, simple, and reliable. Particularly cheap and simple!

It should react instantaneously to a single peak that exceeds 100% negative modulation.

### Eye-Catcher

Ideally, it should be a "warning flag" type of indicator, giving visual indication when, but only when, the danger-condition exists. When you're airing your views on the band, you don't want to have to keep an eye continuously on the gimmick—you want something that'll wave at you when, but only when, it demands attention.

This means that it should be a gimmick that is triggered into action instantaneously, but maintains the "warning condition" long enough for you to see it.

### No Adjustments

Furthermore, ideally the thing should have no adjustments needed, and should work equal-

ly well on any transmitter, of any power, at any frequency.

Hmmm . . . it'll be real nice if we can do all that!

Usually, if you can state the problem you're trying to solve clearly enough, the nature of the problem will, itself, indicate the direction of attack needed. That's true in this case.

### Purely Electronic

If the thing is to act instantaneously, to a single over-modulation peak, it's going to have to be a purely electronic device; no meters need apply. And the specification "visual" added to "electronic" says "cathode ray type." The specification "cheap and simple" added to "cathode ray" means "an 'eye' type cathode ray tube—6E5, etc."

So we need some way of making an eye-type tube indicate negative peak modulation on any AM transmitter at any frequency.

That, necessarily, raises the question, "How are all transmitters, of all powers at all frequencies, exactly alike with respect to negative peak modulation." The answer is obvious: Whatever a transmitter's *positive* peak power is, its *negative* peak power is, necessarily, *Zero*. All transmitters, at all frequencies, are alike in that; there's zero r-f output at the negative modulation peak at 100% modulation. And "no 146 megacycle output" is exactly the same, in every respect as "no 3.9 megacycle output". And whether the transmitter involved *could* put out 5 watts or a full 5000 (perfectly legal as a positive modulation peak!), at the negative peak they're all alike—zero.

O.K.—then what we need is simply an r-f detector hitched to a 6E5.

Now since a 6E5 consists of a triode plus the cathode-ray device, it's perfectly feasible to use the triode section as a detector, and for moderate power rigs—say up to about 100 watts—that's practical enough. That's worth keeping in mind for building—or rebuilding—moderate power rigs; a 6E5 and associated circuitry is so cheap that it pays to build the thing into the rig. It serves, also, as a check on whether you're actually putting out RF, or only think you are.

### Positive-Proof

But while all rigs are alike at negative peak—take a look at what happens on the positive peaks! We'll consider a perfectly possible situation—a full-gallon rig, using positive-peak modulation boost, working into 72 ohm coax, with a somewhat unsatisfactory standing wave situation. We'll say it's got a SWR of 2.5.



Now 100% modulation of 750 watts of RF (the probable maximum r-f output of a rig running a full 1000 watts to the final plates) means that the r-f peak power is  $4 \times 750 = 3000$   $E^2/R$  gives us, in a 72 ohm line, a peak voltage of about 460. Using the 2.5 SWR figure, we get a peak voltage of about 1150 volts. If some positive-peak modulation boost is used, this might hit 1500 volts. That's a little bit hot to put on the grid of a 6E5.

Also, of course, a 100 watt job, working with a really stinko/SWR—as can happen when tuning things up on a new antenna—might run 1000 volts of RF.

So let's design for any transmitter, and any SWR within reason. We want a rectifier-detector that'll stand the hottest jolt we're at all apt to get. Of course, an 866-A could take it—but that's hardly necessary; we want only detectable quantities of output from the rectifier. TV, for all its curse on hamdom, has produced some benefits; there's a little noval-base rectifier, half-wave type, the 1V2, that's rated for 7500 volts peak. Further, the plate-filament capacity is less than  $1\mu\mu\text{f}$ . And it calls for less than one volt at .3 amps. Fine; it'll do the job, and it sells very cheap, because it's intended for use in TV sets, and hence has a mass-market price-tag.

$C1$  in the circuit is a ceramic disc hi-voltage condenser; they're delightfully cheap. Rated 100  $\mu\mu\text{f}$ . at 6000 VDC. The 1V2,  $C1$  and  $R2$  give us a rectified negative bias for the 6E5 grid.  $C2$  is a 50  $\mu\mu\text{f}$ . filter to remove remaining RF.  $Ne$  is one of those tiny neon lamps, about the size of a grain of puffed wheat. Since bad SWR and high power can put some very hot d-c voltages on the 1V2 plate, the neon lamp limits the maximum bias appearing on the 6E5 grid to a reasonable figure, and permits  $C2$  to be an ordinary 400-volt rating condenser.

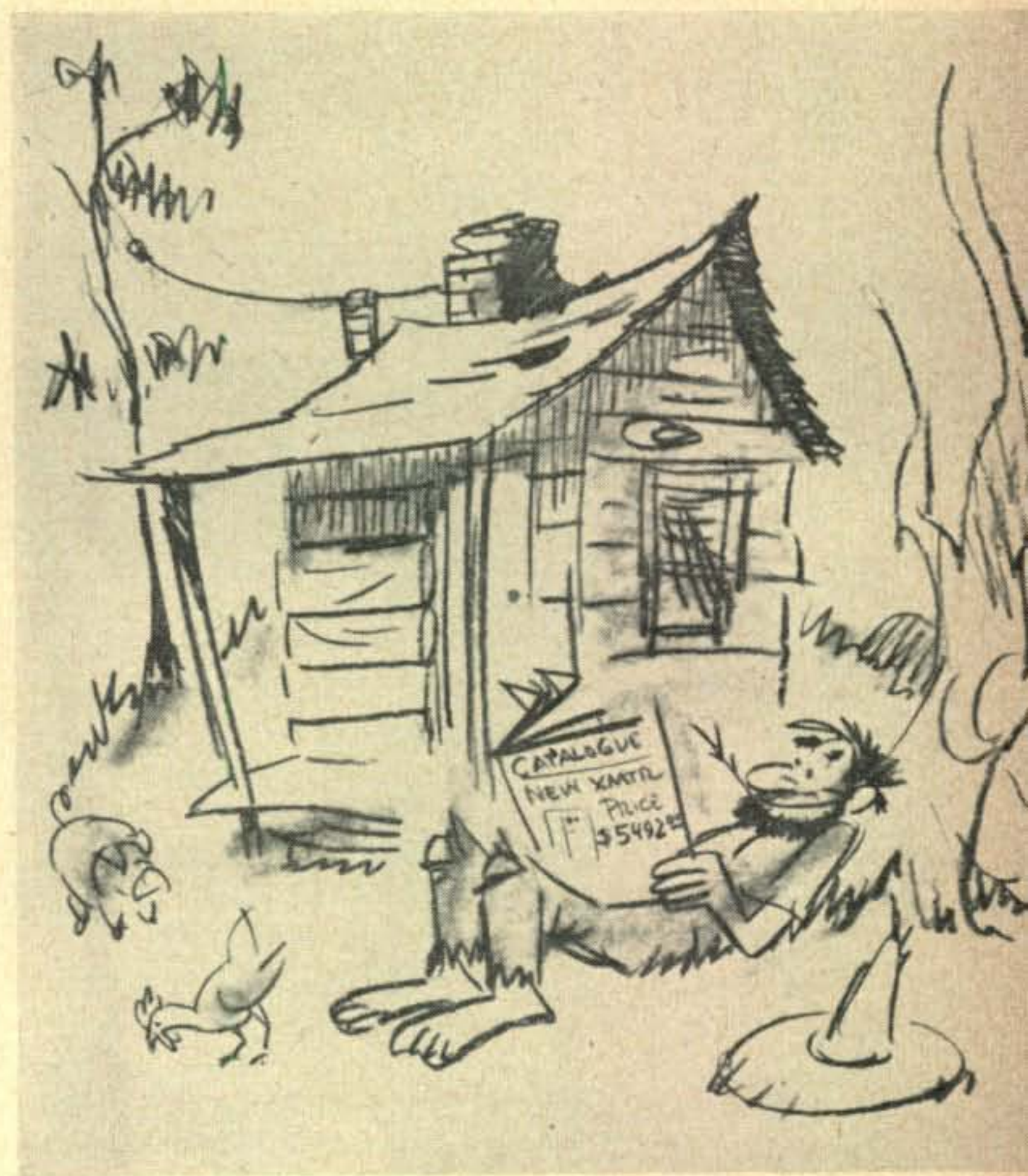
$C3$  and  $R4$ , with the 6E5 triode plate, constitute the desired "warning-flag" system. With no RF present, there is zero bias on the 6E5 triode, and the shadow angle opens out to  $90^\circ$ . That's the normal not-transmitting position of the shadow. The 6E5 triode is then drawing max current, and the control electrode in the cathode-ray section is at lowest voltage. When there's -8 volts bias on the 6E5 grid, the shadow angle is down to 0 degrees—and with minus more-than-eight volts, the eye gets a little "cross-eyed". There's a bright line of overlapping ray beams. This is the normal on-the-air position of the eye.

Now the 1V2 plus  $R2$  and  $R3$  will put one-half the peak r-f voltage in the transmission line on the 6E5 grid as negative bias. To close the eye, then, 16 volts peak RF is needed in the transmission line. In a 72 ohm line, it takes the mighty output of a  $3\frac{1}{2}$ -watt rig to supply that 16 volts. That's provided the SWR is 1.000; of course, with an SWR of 3 or so, any peanut-whistle will close the eye.

*Consequence:* if your net r-f output drops as low as about 3 watts, the eye will wink open. Unless you're running somewhat less than the usual very-low-power rig, the eye stays closed at all times—unless you overmodulate.

But if you hit an instantaneous negative peak of below 1 watt, the bias on the 6E5 grid drops near zero; the triode plate starts drawing juice, and the eye winks open. The plate resistance of the triode is a great deal less than 1,000,000 ohms; it will discharge  $C3$  in a hurry. But the plate load resistor of 1,000,000 ohms takes an appreciable time to recharge that .25  $\mu\text{f}$ . condenser, even after the 6E5 plate stops drawing. Result: the eye winks open instantly when overmodulation occurs—and closes again reluctantly. During any normal transmission, the eye does nothing but glow steadily. If your rig blows a fuse or something, the eye responds by opening; if the eye doesn't close, you're not putting out RF, no matter what your switches say.

The unit built here at W2ZGU was, of course, built for my home station. The transmission line to the antenna is plugged into one end of a coax T fitting, the monitor into the branch of the T, and the transmitter being used plugs into the other end of the T. There's a few extra resistors in the unit in the photographs, and the sharp-eyed will, no doubt, detect an octal socket on the "6E5". I cheated; it's a surplus 1629, and my shack just happens to have a nice, handy 28-volt d.c. bus line running all over. Hence this unit uses 28v. for the filament line, requiring some extra resistors.





# ELDICO SSB-100



Elbert Robberson, W2FRQ

As a ham I've had a couple of AM transmitters, but the phone fever would never last. In a week, the rig would be torn up and I'd be on CW again.

Then K2DFW, a friend who'd picked up the thread of ham radio after a lapse of many years, invited me to his SSB station. It was a long jump from the rotary-gap spark of the twenties to phase-shift carrier and sideband suppression, but Norm made it. And seeing the new phone-operating procedure and hearing amateur SSB signals opened my ears. Here was radiophone that punched through! And you used a sharp receiver and even the b.f.o. I told Norm that if I ever fall for phone, it will be SSB!

The next thing I knew, CQ wanted someone with no pre-conceptions to have a look at Eldico's new SSB transmitter. Not only do I have no pre-conceptions about different amateur phone transmitters—I wouldn't know one from

another. So I went to Mineola to have a look.

"Just what is so special about this job," I asked Don Merten, the man behind Eldico.

"Well, first of all," he said, "it's the first complete SSB transmitting package offered the amateur. Everything needed to put any kind of a signal you want on the air is in this one cabinet. The rig can be used as an exciter for amplifiers up to the legal limit, or it has enough 'sock' to do well on the air by itself."

Then he showed me the pilot model on the lab bench, and went on to give the details.

The same size as the popular 75-A receivers, this sending box puts out on 80, 40, 20, 15 and 10 meters, with full power on all bands, and all bandswitching and tuning accomplished by knobs on the panel. The only parts of the r-f circuit that need any adjustment are the controls for the entirely conventional pi-net output stage. Knobs for the three capacitors involved are neatly grouped on the panel: grid tuning, plate



tuning and loading. No need to get inside for coil changes or link adjustments.

Merten gives power rating four ways, so direct comparisons can be made:

Average input:	100 watts
Peak envelope input:	144 "
Two-tone test input:	60 "
Peak envelope output:	100 "

Besides upper and lower SSB, the rig puts out conventional AM or clickless CW, all immediately selectable on each band by a panel switch.

If you want to be archaic, you can pump a hand key or twist the transmit knob on the panel to talk, or to take advantage of modern break-in phone-operating procedure you can switch the "operation" control knob to "VOX" and have the signal flash on with the first breath into the mike. One more notch on the same switch cuts in a quieting circuit you can connect to your receiver. Speaker noise is then automatically phased out, preventing the station from talking to itself. Both VOX and QT circuits have slotted-shaft controls on the rear of the chassis that you set and forget, while audio gain is handled by a knob on the front.

In addition to a plate-current meter, this outfit has an integral one-inch oscilloscope, giving a voice-intensity modulated trapezoidal picture for instant and constant monitoring as well as tuning and testing.

These features are all nice, and I said so. But I could see there was something Don could hardly wait to get off his chest. So I asked him what he was *really* proud of. In reply, he turned on the rig's carrier, tuned in a heterodyne in an adjacent receiver, and said: "Listen."

Then he lifted the transmitter about a foot off the bench and let it fall. I shuddered. But

the beat-note in the receiver hadn't quivered! The same clear tone was rolling out of the speaker!

He hammered on the panel and chassis. It's on the house, I figured. I got into the spirit and fisted it a while myself. Nary a quaver in the signal. Never since Navy days have I seen a rig that would stay "on" to within a cycle through such an ordeal.

"We have a stable v.f.o.," Don said. This he can say again!

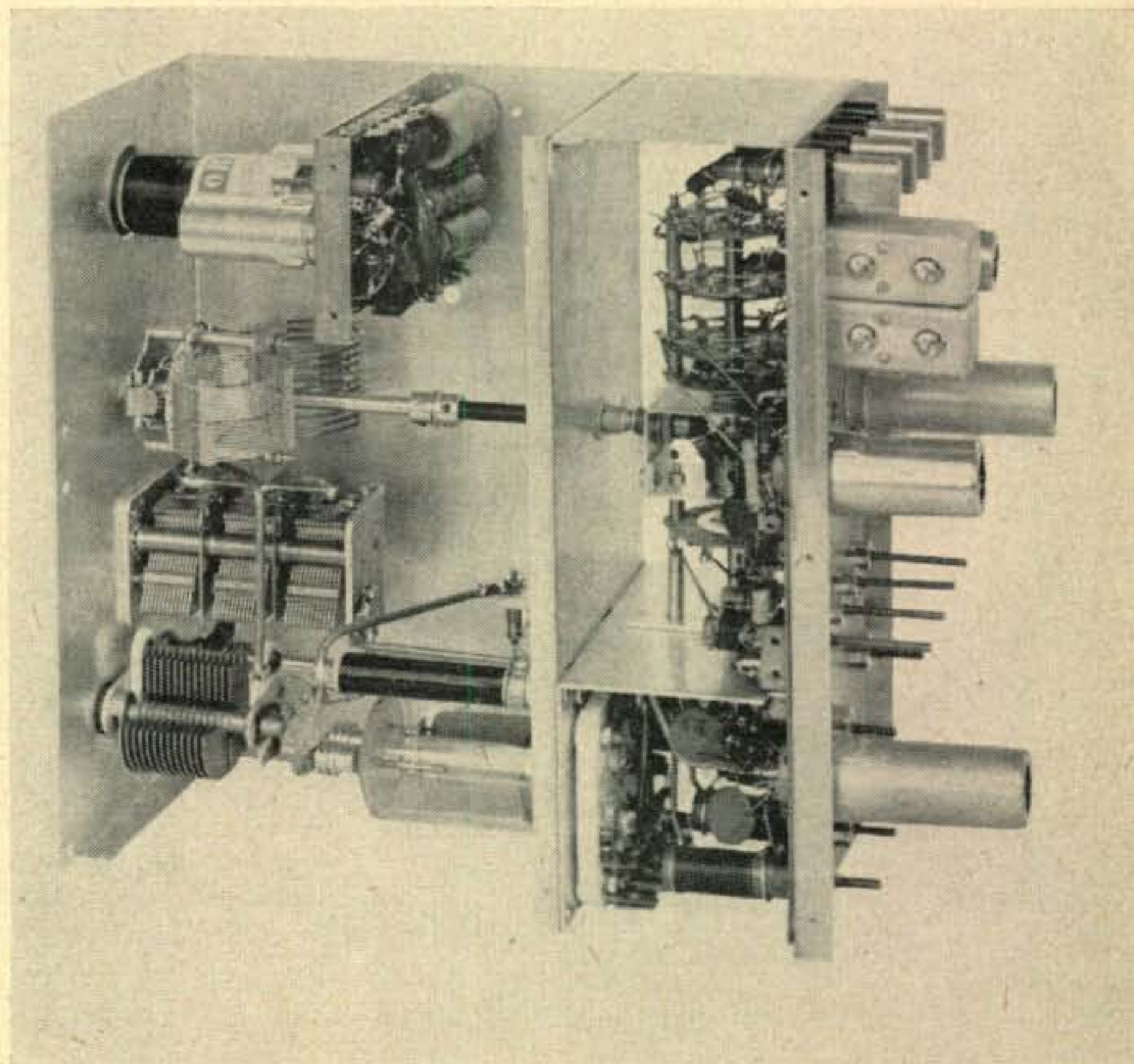
Solid construction, a low-mass permeability tuner, choice of a fundamental frequency favorable to stability all have made this v.f.o. one to admire. The oscillator, a 6AK6 in a derivation of the Clapp circuit, tunes from .8 to 1.0 Mc. The panel tuning control is calibrated directly in ham-band frequencies, displayed on a slide-rule dial. Basic output-frequency coverage is the 200-kc. spread taking in the phone segments of each band. However, coverage of any 200 kc. slice of frequencies may be obtained by using accessory lower frequency crystals in the second mixer.

Provision is included for extremely accurate setting of the oscillator for on-the-nose dial calibration on each band by a screwdriver adjustment on the front panel.

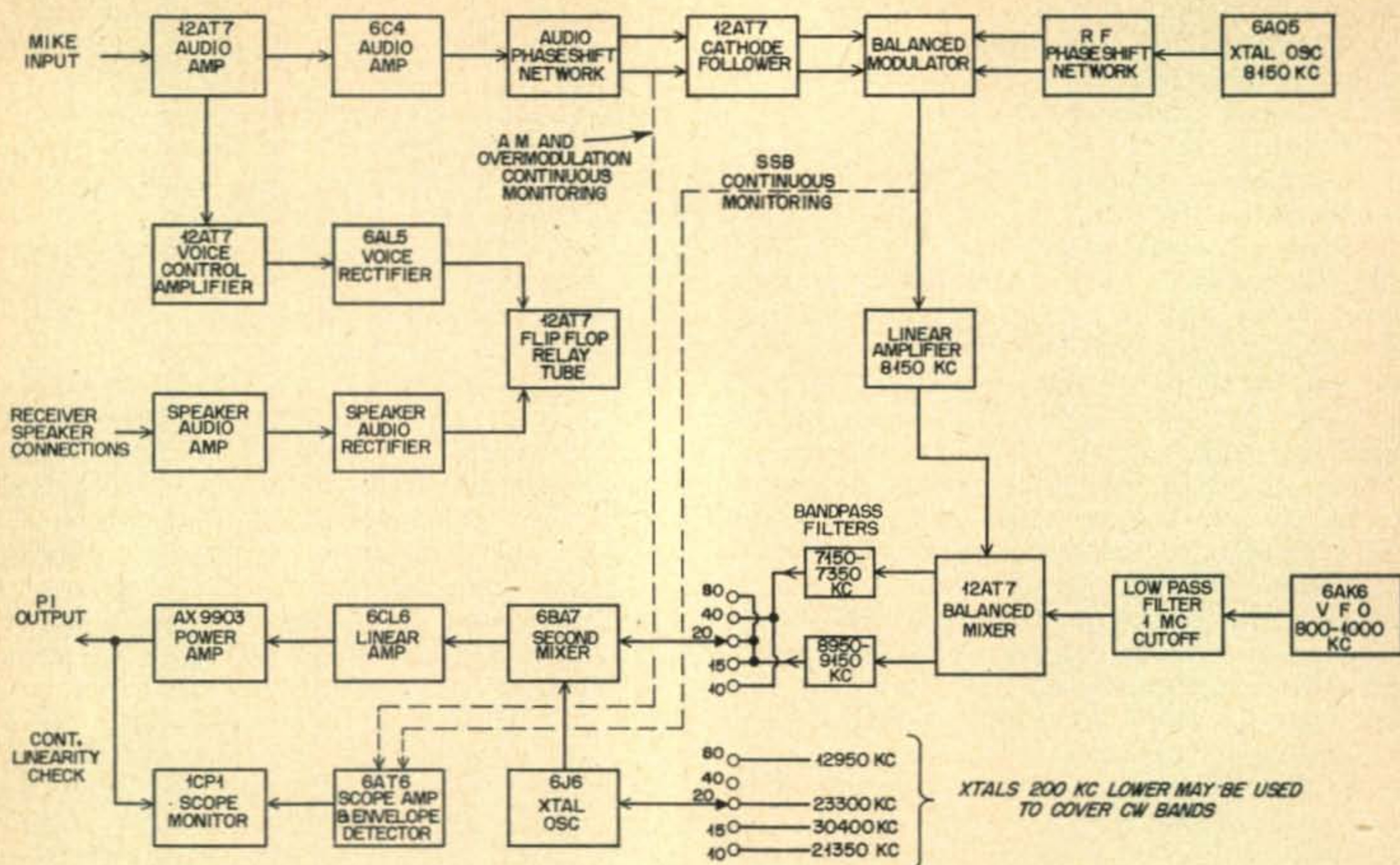
A terminal board on the rear of the equipment provides all you need for external transmitter-operated control circuits, such as receiver muting, and antenna switching. Functions available are s.p.d.t. switching and coaxial relay control in the form of 110 volts a.c. that comes on when transmitting. Other terminals provide for the connection of either a 4-ohm or 500-ohm receiver-output circuit for the "QT" feature.

"Seems like a good transmitter," I told Don.

Compact right-end assembly containing band-pass filters, xtal oscillator and 2nd mixer, linear amplifier, pi-filter linear power amplifier, and linearity & modulation monitor 'scope.







Simplified schematic of the SSB-100

"But besides just having all the parts in one box, what is particularly good about this thing?"

"Well, you don't have to make any adjustments," he said. "No balancing or carrier injection adjustments are necessary—all this is taken care of automatically inside the set. When you get the transmitter, everything has been done. Plug in the a-c cord, connect the antenna coaxial line in the back, plug in the mike. Switch to the band you want, zero the v.f.o. on the frequency, peak the grid, dip the plate, then load. Talk, and you're on the air!"

I've designed some transmitters, too. What you get in a dummy antenna on a lab bench is not necessarily what you'll get in a wire through the woods, or on the desert, or under a layer of ice on a mountain top.

"Is this a fact," I asked: "Just plug it in, and away you go?"

"Absolutely," Don said.

"Mind if I take it home for a check?"

"Wring it out," he said. "I'll help you get it to the car."

He did better than that. He carried it himself.

The road to Port Washington is a system of chuck holes loosely laced together by a patchwork of asphalt. It was quitting time, and I didn't make any attempt to hold back the Hornet. By the time I reached my place, the tube-cathodes could have flipped their oxide.

I plugged in the a-c cord, and connected the coax from my 80-meter vertical into the chassis socket. Since my receiver has no provision for muting, I connected the transmitter auxiliary-relay contacts that close on "transmit" across

the speaker voice coil, using temporary clip-leads. Tuning the transmitter took seconds.

On the air, people said it sounded good. Power into the antenna matched bench-test results. The scope picture on the panel showed proper loading and amplifier linearity. My own scope didn't do any better. Switching from one band to the next was nearly as easy as jumping around with the receiver.

K2DFW from Bellerose, and W2UMT from across the street came in to thump the panel, look at the scope pattern and whistle into the mike. They hadn't seen anything like it.

In the course of bandhopping between 80, 40, and 20 (didn't hear anyone on 10 or 15) greetings were exchanged with most U.S. districts. But I broke no records. I didn't try. DX depends upon good antennas, time and conditions. I was favored with none of these on this particular weekend. All a transmitter can do is generate a signal of the desired characteristics. And in two days of pretty continuous switching around and pummeling, this job (possibly the most mistreated rig in hamdom) kept right on doing just that. It was one phone transmitter I wouldn't tear up. In fact, I was sorry when they came and took it back.

Now, I can't say if this outfit is better than any other SSB rig you can buy. I haven't operated any of the others. But I can say that if anyone does build a better transmitter, that outfit will have to be a superlatively superior rig: in conception, design, and construction.

In the meantime, the ham interested in SSB telephony should be happy with the SSB-100.



Simple Aid to

## Temperature Stabilization

Bruce Hosmer KH6AIW

Spectrum congestion and the general adoption by amateurs of new transmission modes in both 'phone and telegraphy, such as single sideband modulation and frequency-shift keying for radioteletype, has made acute the ever-present problem of greater stability in transmitters and receivers. To whatever degree we narrow-down the acceptance bandwidth of the receiving equipment, in that same degree do we multiply the headache facing us due to instability of the various oscillators involved. It has reached the point where even the sacrosanct crystal is not exempted from suspicion.

Frequency change in oscillators is mainly due to variation in electrode potentials of vacuum tubes and dimensional changes in the frequency-determining elements caused by temperature variation. The former has been quite adequately treated in the literature but drift from thermal causes is still quite a mystery from the amateur standpoint. Responsibility for this should be placed on the lack of proper tools and measuring equipment.

Even when the drift of an oscillator is definitely known to be caused by variation with heat of a portion of the tuned circuit or some other component, the question still remains, "Which is the guilty part?" or, "How much drift is attributable to this part and how much to that?" A simple method of investigation has been employed by KH6AIW to solve just these problems.

Protect Components with the

## Thermal Shunt

Ed Marriner, W6BLZ

There are frequent occasions where a component may be changed in value, damaged or even ruined by the heat of the soldering iron. Germanium diodes, transistors, short pigtailed condensers and precision resistors, to mention a few instances, are often altered in value while being soldered. Polystyrene coil forms and tube sockets may become softened and distorted from heat. One good solution to this problem is the "Thermal Shunt."

The thermal shunt is constructed from 1/4" square copper bar stock and a clothes pin spring. As shown in the photograph, the ends are filed to a point and grooves are cut with a saw to fit the spring.

To use the shunt, just clip it on the resistor or germanium diode pigtail. The copper bar stock, being large and a good heat conductor,

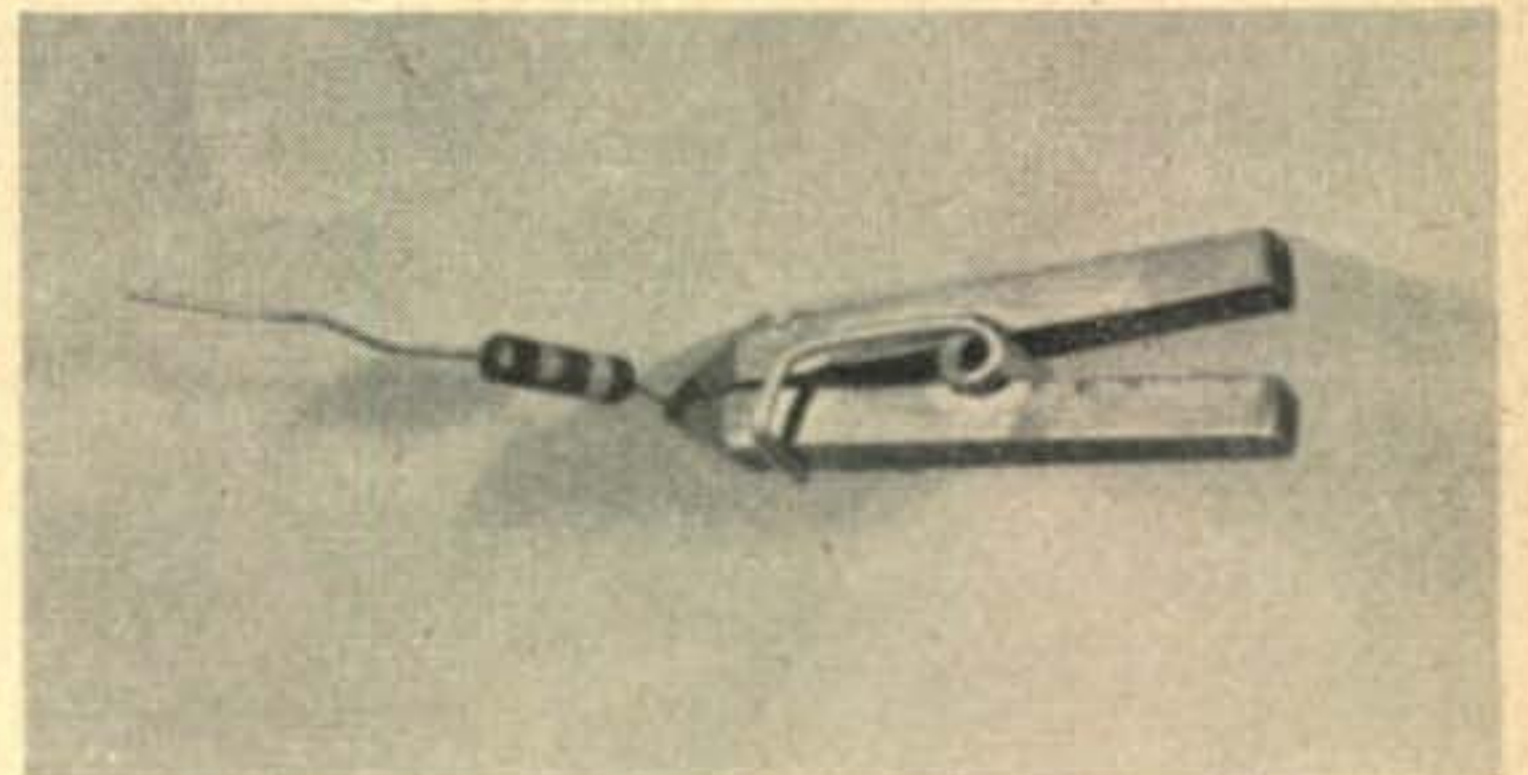
The oscillator under test, be it VFO, receiver local oscillator or BFO, is zero-beat against a stable standard such as a frequency meter, signal generator, crystal oscillator or even WWV. If the standard is a self-excited oscillator it should be allowed to operate for several hours prior to use and should be shielded from drafts and air currents.

A reflector-type Infra-Red lamp, retailing for around \$1.30, makes an excellent source of concentrated heat that can be directed to the various components making up the oscillator without heating up the adjacent parts. A marked change in beat note will occur when the beam is played over the offending coil or condenser.

With compact and miniaturized construction a mask of white paper, with a small hole, should be used to expose only the desired component to the beam from the lamp. A surprisingly large change in frequency can occur from a very brief exposure to the beam. It is necessary to make the test rapidly to avoid heating the entire compartment and, thus, defeating the selective nature of the check.

The most frequent offenders are air-wound coils, single-bearing variable condensers and compression-type padders. The Clapp Oscillator is particularly vulnerable since a very small change in the series-tuned elements can cause a major frequency alteration.

will conduct the heat into the copper. This will leave the resistor cold and will prevent the heat from changing its value. There are dozens of places where this gadget will come in handy in doing small soldering jobs.

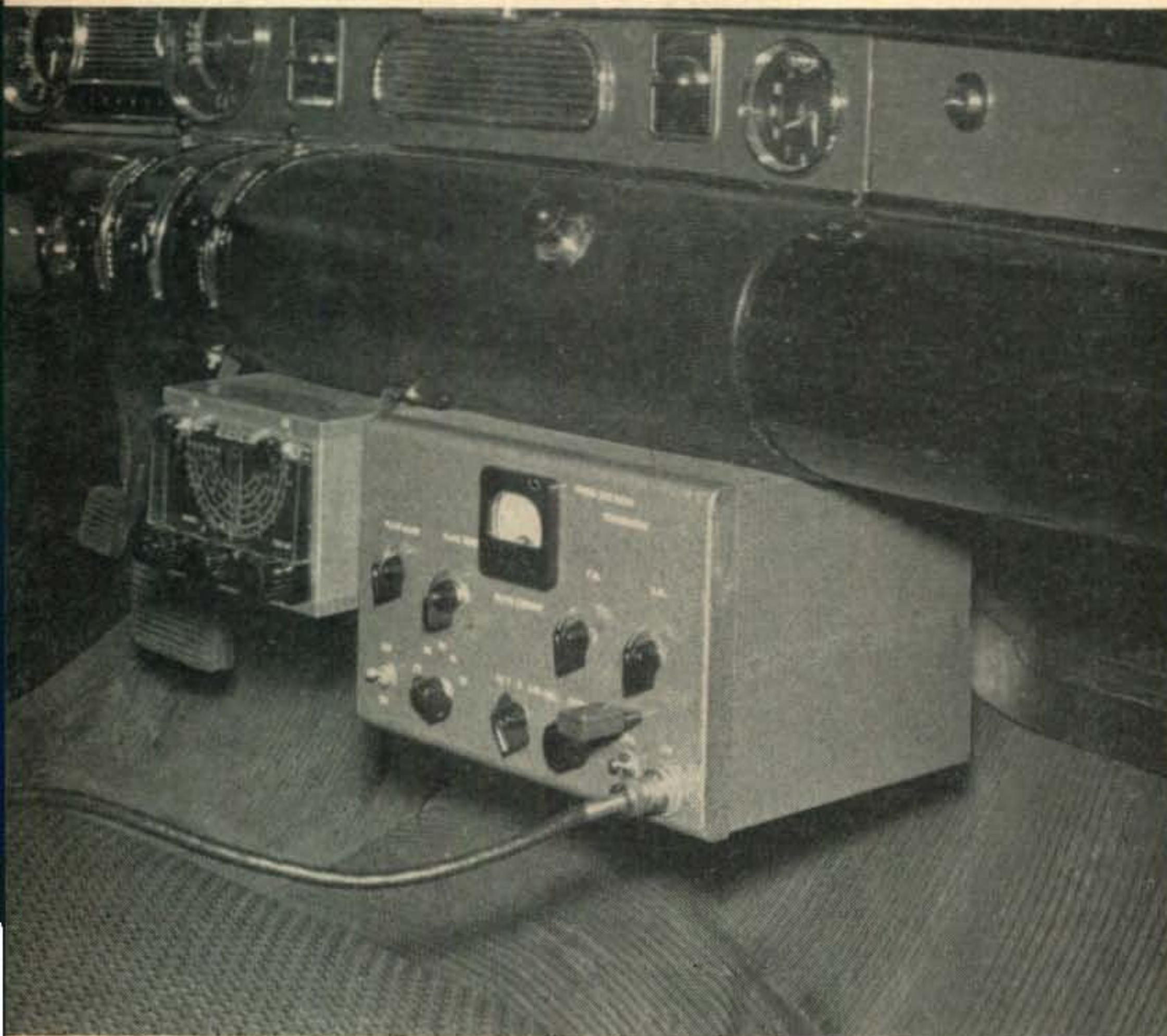


Copper "Clothespin" shunts heat.



# SSB

# M O B I L E



Wm. E. Johnson, W8VOK

*A high-powered mobile installation, approached from conventional angles, seldom gets past the "diagram" stage when once the designer realizes the fundamental inadequacy of automotive electrical power sources. SSB, however, is able to deliver a signal to the distant receiver in every way as effectively as a 400-watt AM rig, with no greater primary drain than 50 watts by traditional methods. Power economy is not the only "selling point" of W8VOK's design for hamming-in-motion. His well-planned arrangement of parts should make this mobile transmitter easy to duplicate.*

You are no different than the rest of us if, after a bad siege of QR-Mary, you daydream of a mobile rig with a power output control knob labeled "POLITE . . . BRUTE FORCE."

High power output can be obtained, in the usual way, by employing a final with larger "bottles," the huskier exciter needed to drive it, and the bigger audio system required to modulate it. When you have constructed it you will

find you need a storage battery big enough to run a submarine from here to Copenhagen, an expensive belt-driven generating system, or a gasoline putt-putt in the rear compartment.

Now here is a mobile transmitter capable of raising the level of your signal at the distant station by 9 DB (approximately equivalent to jacking up your 50-Watt signal to a hefty 400 Watts). This is accomplished with *NO* increase in primary battery power consumption. The slight additional filament drain because of the larger number of tubes is much more than offset by the *ZERO* plate supply demand of the final during speech pauses and between syllables.

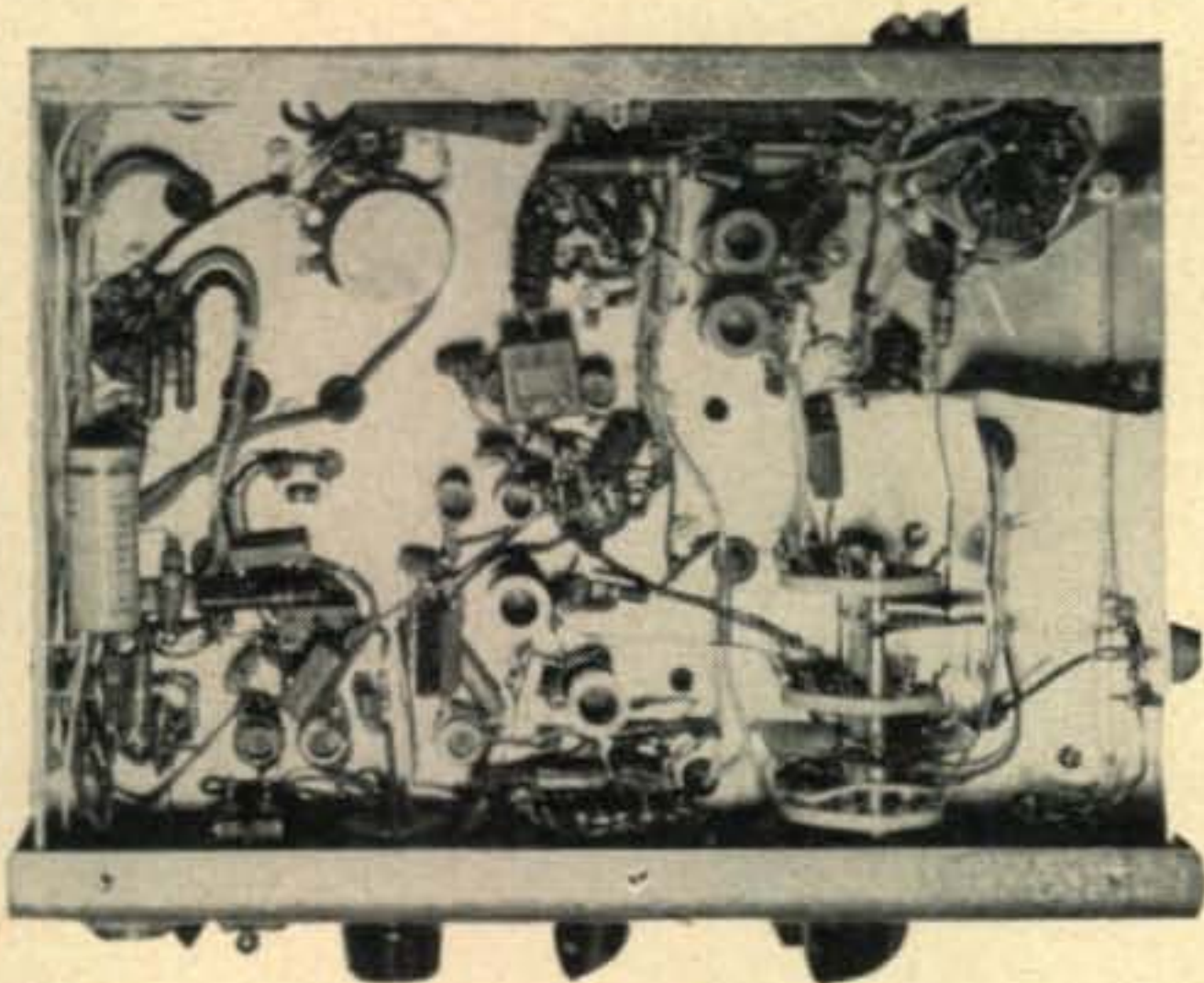
The exciter portion is patterned after the exceedingly popular 10A unit, marketed by the Central Electronics Incorporated of Chicago, Illinois. This not only has the virtue of using a circuit that is time-tried and completely "debugged" but also simplifies the procurement of certain components, from the manufacturer of the 10A, which might otherwise be difficult to obtain. Being able to purchase ready-made the phase-shift network eliminates a time-consuming and laborious task requiring several items



of precision test equipment not available in every ham workshop.

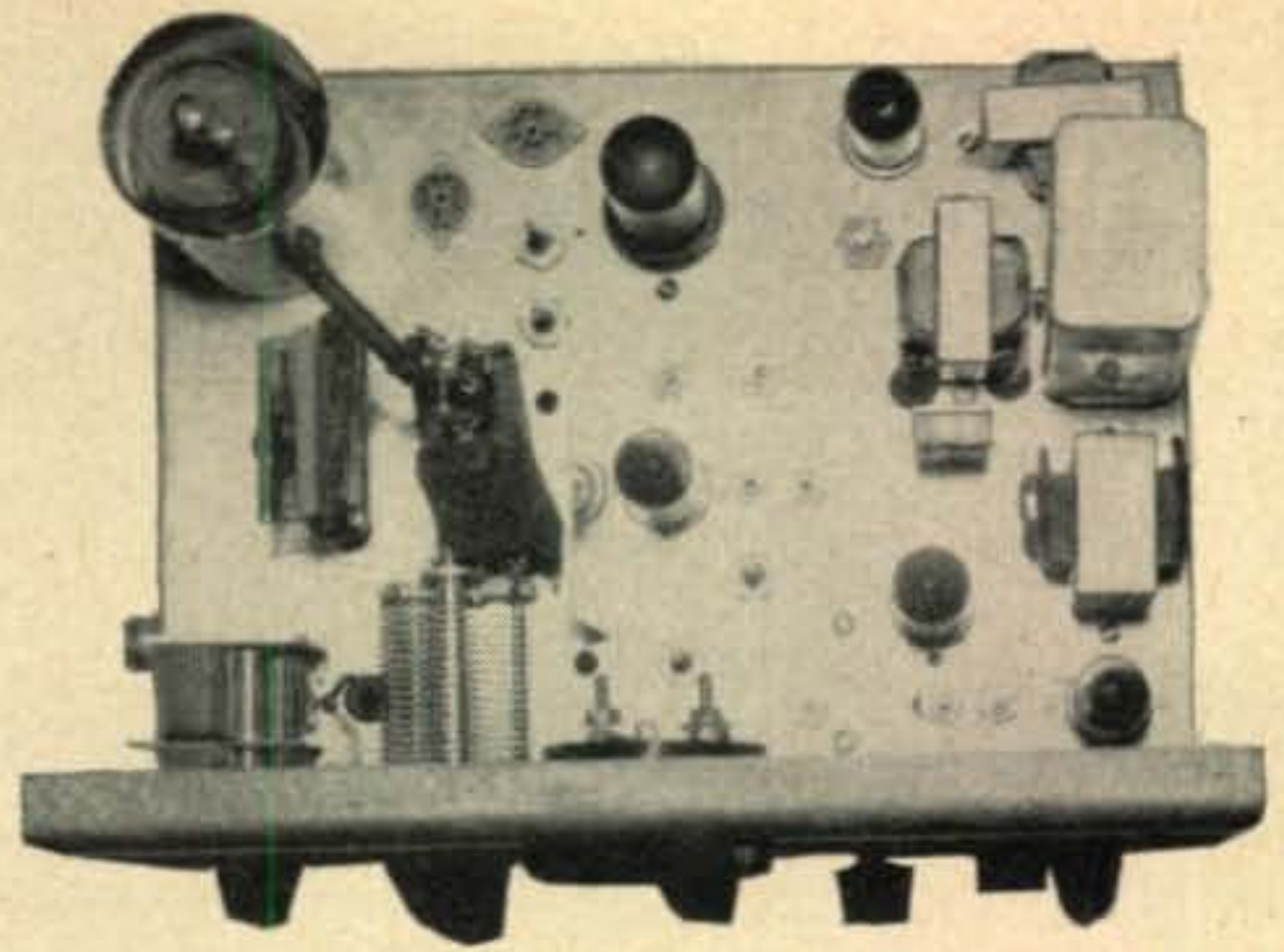
Without delving too deeply into "sideband" theory, which has been well covered elsewhere, the functioning of the transmitter stages is as follows: One half of a 12AX7 low-noise twin triode tube is employed as a dynamic microphone pre-amplifier stage with the second section providing additional amplification. It should be possible to substitute a crystal microphone without circuit alterations. The speech gain control is interposed between the second stage and the control grid of one half of a 12BH7 used to furnish a small amount of audio power which is needed to drive the balanced input of the phase shift network through the coupling transformer, T1.

The audio phase shift network, by means of several series and parallel pairs of R-C circuits, develops two output signals, amplified separately by the two triodes of a 12AT7, which are identical in amplitude but which maintain very close to a 90° phase relationship throughout the voice-frequency range.



These two audio signals, still maintaining their quadrature relationship, appear at the secondaries of T2 and T3. That from T2 is applied to a balanced modulator, consisting of a pair of matched germanium crystals, at the same time that a 9 MC radio frequency voltage is applied to the same modulator. By the mechanics of modulation this produces a double sideband RF signal from which the 9MC carrier frequency has been removed by cancellation in the primary circuit of L3. Slight differences in the two crystals of the modulator are corrected through the carrier balancing control, R23.

In identical fashion the other audio signal, from the secondary of T3, is applied to a second balanced modulator along with a 9 MC signal from the same crystal oscillator. This RF voltage must have a 90° phase relationship with that applied to the first modulator and phase shift is very easily accomplished making use of the principle whereby two resonant circuits, less than critically coupled, and detuned in opposite directions to the half-power points

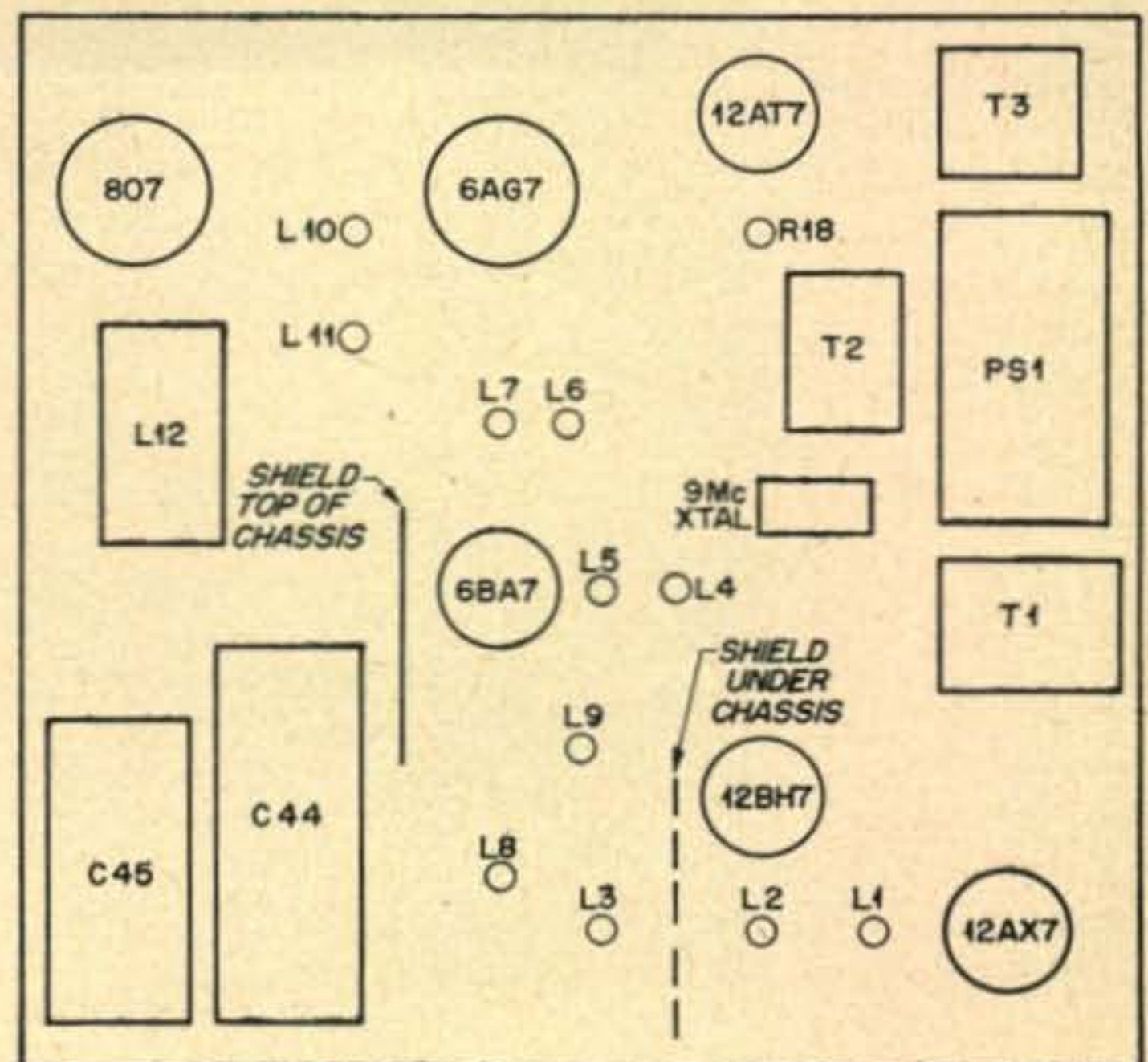


where the resistance and reactance are of equal magnitude, will have a quadrature phase relation.

Combining at the primary coil of L3 we have two double sideband, carrier suppressed currents. Because of the vectorial relationships of the pairs of double sidebands, in one position of the switch S1 the two upper sideband voltages will cancel out while the two lower sideband voltages will add to double amplitude. Reversing the phase of the voltage from T2 in the next switch position will cancel the lower sideband and pass the upper.

After passing through L4 and L5, whose purpose is the provision of additional discrimination against unwanted products of modulation, the lone sideband that remains is applied to the signal grid of the 6BA7 mixer stage. The oscillator portion of the mixer tube is wired as either a Pierce crystal oscillator or to accept the 8-volt output of a VFO operating in the vicinity of 5 MC. As a result of mixing action a number of frequencies are simultaneously present in the 6BA7 plate circuit but the only two holding interest for us are in the 75 and 20 meter bands. All of the undesired frequencies are eliminated by the selectivity of the following tuned circuits and the 15 MC trap.

The 6AG7 stage furnishes drive for the final and is operated as a strictly class "A" amplifier in order that no distortion be introduced into





the sideband signal. Since class "A" RF amplifiers have extremely high power sensitivity stability would be a problem were it not for the tuned-circuit loading resistors R34 and R35 which serve the twofold purpose of stabilizing the 6AG7 and improving the regulation of the RF voltage fed to the control grid of the 807 final amplifier.

A large selection of tubes is available for use as final amplifier but, at the supply voltages common to most amateur installations, there seemed little to choose between them. The old favorite 807 is very satisfactory and has required no special treatment other than the inclusion of the customary parasitic suppressors.

The output circuit uses a pi-network for ease of matching the mobile antenna. The band-selector switches S3, S4 and S5 are ganged for single-knob operation. Coils have been installed for the 75 and 20 meter bands but switch positions are available for three additional bands.

The wiring has been arranged so that, by the provision of an external ac power supply, the transmitter may be used in the shack as a fixed station or as the exciter for a high-power final. An added position on S1 permits the rig to

### All Resistors 1/2 Watt Unless Otherwise Specified

R1—1.0 megohm.	C27—36 $\mu$ fd. mica, 5% tol. 500v.
R2, R5—2200 ohms.	C29—8 $\mu$ fd. ceramic, 500v.
R3, R4, R6—220,000 ohms.	C31, C32—0.001 $\mu$ fd. mica.
R11, R34—10,000 ohms.	C30, C36—200 $\mu$ fd. 5% mica, 500v.
R12—1.0 megohms with taper.	C32, C38—75 $\mu$ fd. mica, 5%, 500v.
R13, R26—47,000 ohms.	C42—0.006 $\mu$ fd. mica, 1200v.
R14, R19, R25—1000 ohms.	C44—300 $\mu$ fd. variable.
R15—400 ohms, 1% tol.	C45—420 $\mu$ fd. per sect. TRF type 2 sections.
R16—1400 ohms, 1% tol.	Sw1—Modulation selector, Central Electronics.
R17, R20, R33—560 ohms.	Sw2—d.p.d.t. Toggle.
R21—1000 ohms, 1w.	Sw6—s.p.s.t. Toggle.
R22—100,000 ohms.	Sw3, Sw4, Sw5—Ganged Mallory Type 181C.
R23, R24—1000 ohms linear pot.	T1—Driver transf., special, Central Electronics
R27—180 ohms.	T2, T3—mod. transf., special, Central Electronics
R28—4700 ohms, 2w.	PS1—Phase shift network, special, Central Electronics
R29, R30—15,000 ohms, 10w.	(a) (b) (c) (d)—1N48 crystal diodes; matched set, Central Electronics
R31—22,000 ohms.	RFC1—0.5 Mh.
R32—150 ohms, 2w.	RFC2—6 turns on 56-ohm, 1w. resistor.
R35—15,000 ohms.	RFC3—1 Mh. r-f choke.
R36—56 ohms.	RFC4—2.5 Mh. r-f choke.
C1, C3—0.005 $\mu$ fd. paper, 400v.	RFC5—30t. on 10,000-ohm, 2w. resistor.
C2—8 $\mu$ fd. @ 450 electrolytic.	
C4—250 $\mu$ fd. mica, 500v.	
C11, C12, C13, C24—0.001 $\mu$ fd. mica, 500v.	
C14, C15, C21, C22—150 $\mu$ fd., 5% tol. 500v. mica.	
C16, C17, C18—0.005 $\mu$ fd. mica, 500v.	
C19, C20—0.001 $\mu$ fd. mica, 5% tol.	
C23, C26, C28, C33, C34, C37, C39, C40, C41—0.006 $\mu$ fd. mica, 500v.	
C25—25 $\mu$ fd. mica, 500v.	

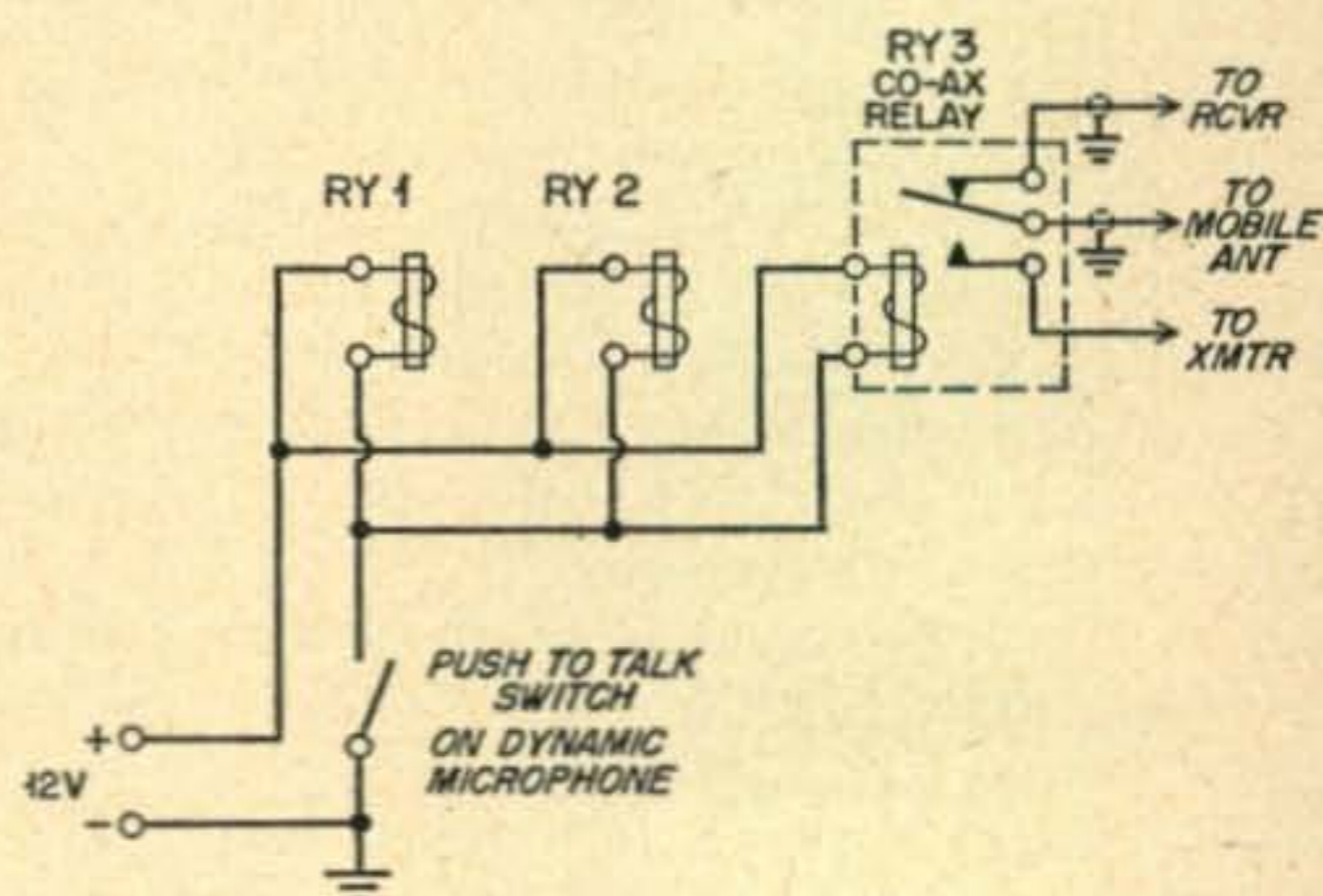
Note: Pin 9 of Sw1 should be grounded.

### Alignment Instructions

- L1—Crystal Oscillator:** Peak for max. output with PM control fully clockwise.
- L2—90° RF Phase Shift:** Peak for maximum output with PM control slightly off balance. Afterward adjust for equal sideband suppression with 1225 cycle audio oscillator to mike input.
- L3—Balanced Modulator:** Adjust for maximum output with PM slightly off balance.
- L4—9000 kc filter:** Adjust the same as L3.
- L5—9000 kc filter:** Adjust the same as L3.
- L6, L7—15 Mc trap:** Use Xtal at 5150 Kc or 3850 Kc. Adjust for minimum 15 Mc. output with the bandswitch in 20 meter position.
- L8-L10—**Adjust for maximum output at 3.9 Mc.
- L9-L11—**Adjust for maximum output at 14.2 Mc.
- R-18—Audio Balance:** Adjust for minimum unwanted sideband ripple with 1225 cycle tone applied to microphone input.

generate phase modulation for NBFM by removal of the audio voltage from T1 and the slight unbalancing of R24.

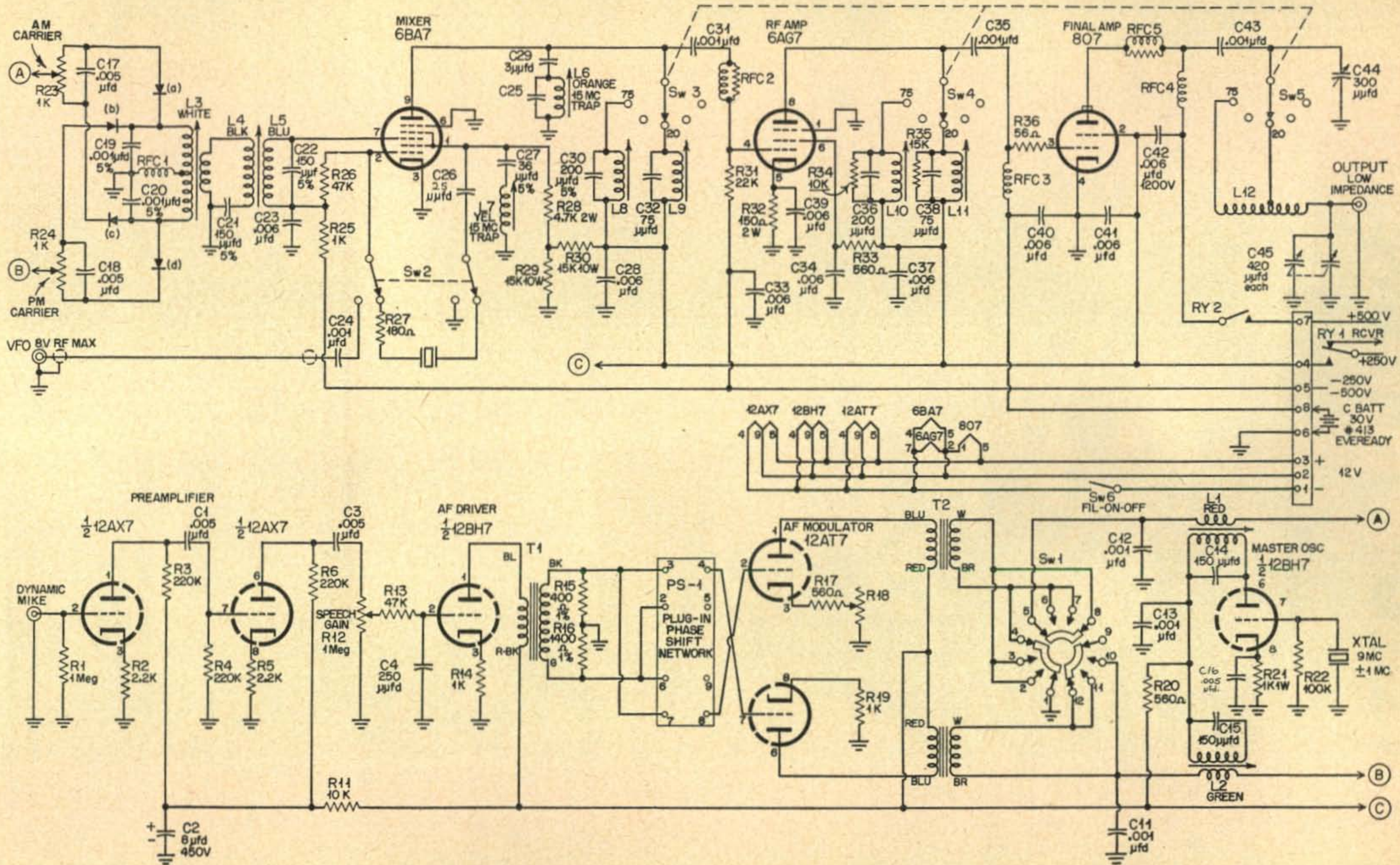
The transmitter is enclosed in a cabinet designed for under-the-dash mounting. Cabinet dimensions are: Width 11 1/4", Height 7" and Depth 8 1/2". Most of the parts-placement details are visible in the photographs since, unlike many mobile jobs, the parts are not stacked in inaccessible layers.



The second resonant coil of the RF phase shifting network, in case you have been wondering whether that one-wire connection to the primary is a drafting error, secures its oscillator voltage by induction. By mounting the coil a short distance from L1, L2 picks up sufficient RF to properly operate its modulator. It is not

[Continued on page 67]





Complete schematic for the SSB mobile transmitter.



# VK1EG: Antarctica



By Roth Jones, VK3BG

The mythical DX gods have made their "Mr. Rare DX" award for 1954. Unanimously they have awarded the coveted title to Australia's Antarctic explorer, Mr. W. J. "Bill" Storer, VK1EG, radio operator to the first year of Australia's permanent base in Antarctica.

Despite a barrage of discomforts experienced by few men, he battled on at MAWSON base, through the sub-zero temperature of the Antarctic continent, logged 1280 QSO's, 113 countries and became the first Antarctic station to make DXCC.

Bill Storer returned to the Australian mainland with his nine other companions on March 23 in the Danish polar ice-breaker, Kista Dan, chartered by the Australian Government to relieve his party, the first to establish Australia's now-permanent base in the Antarctic. Few DX men anywhere have given so much excitement and keen competition as VK1EG, who despite the heavy pressure of his commercial radio schedules, field exploration, etc., found time to devote at least an hour per day (sometimes up to three hours) to his hobby. His sojourn south was reminiscent of the pre-war hunts for Reg Fox AC4YN whose untimely death was recorded in these pages a few years back.

And, to complete Bill Storer's success story,

he returned to Australia after 15 months' isolation with all his QSL cards forwarded thanks to a novel system he introduced before leaving Australia which is mentioned later as guidance for future DXpeditions.

Two earlier articles by the author: "The VK1 Story" March, 1954 and VK1EG (A photo story) Oct. '54 give a fuller account of the early work of VK1. The prefix VK1 is not uncommon. It has been used at Heard and Macquarie Islands since 1948 when Australia manned the two islands in the Southern Ocean and set up scientific bases there but this was the first time VK1 had been used on the Antarctic continent. From March 1955 Heard Island has been closed down in favor of Mawson base, 1000 miles further south. Only VK1 activity in the Antarctic now is Macquarie Island and the second party now manning the Mawson base.

## Dangers

When Bill Storer left Melbourne on January 4, 1954, he knew little of what was ahead of him for 12 months. Little did he suspect then as the Kista Dan sailed through the "roaring 40's then the 50's" that in the bleak sub-zero temperature winter ahead of him he was to be



face to face with death on one of the most hazardous expeditions since Scott's conquest of the South Pole. He knew little of what the radio conditions would be like. But, just in case they "did come good," he took with him a small 70-watt disposals transmitter to keep in touch with Australia and the many good friends he had left behind on the amateur bands.

This was not Bill's first introduction to amateur radio or the Antarctic. Yet, oddly enough, it was the icy south that first introduced him to our fascinating hobby. When he went to Macquarie Island for the 1951-52 relief he took out the call VK1BS. This was his first introduction to amateur radio although his years of war-time experience in the Royal Australian Navy had made him an excellent operator and given him a thorough technical background. His 12-month sojourn at Macquarie Island was not wasted. He learned much of the mysteries of the southern latitudes, made 2500 QSO's and had a tally of 75 countries when he returned to the Australian mainland.

Of all the vivid memories of the Macquarie Island spell his finding of his war-time colleague, Roy Baxter, VK4FJ on 14 mc. was perhaps the most enjoyable. They were in regular contact then and were to be again on the Mawson base spell when VK4FJ was to be the vital link with home and was also to act as his QSL manager.

Setting up the base, erecting antennas and maintaining commercial schedules to Heard Island and the Australian mainland prevented Bill Storer starting up on the amateur bands during the early months at Mawson when conditions were much better than in the rapidly approaching winter. It was not until April 4, seven weeks after the base had been established, that operation began on 14 mc. using batteries for power. The first contact was with John Gore, VK1PG on nearby Heard Island.

In early May the first of two 15 KVA Liston diesel a-c generators commenced running and power was jumped up from a little over 20 watts to 75 watts. Thereafter DX-hunting began in earnest, except that Bill was the *hunted*, not the *hunter*. And the great hunt continued for the rest of the year. Although his sojourn was much longer than many DX men who stage DXpeditions to remote islands and remain for little more than a week, the pile-ups for VK1EG put up a relentless barrage right up until the day he finally sent his QRT and his now historic "Thanks to you all, you've never made me feel lonely" on 14 mc.

Having the world call you is a thrill enjoyed by only the few willing to cast away the pleasures of civilization for the hardship of out-of-the-way places. Bill Storer was no exception. Rarely did VK1EG call CQ. His log shows little more than a dozen CQ entries. The CQ's invited too much competition, unnecessary QRM and, being a top commercial operator,

he was not one to invite QRM—yet it came all the same, like a rushing torrent. Often, the signing of his call sign a few times on an almost dead band would bring it to life with a vengeance. Hardly once in his many months of operating did he not close down without dozens of stations in almost as many countries vainly calling him.

All hands turn to unloading stores. This includes the radioman, Bill Storer, VK1EG, on top of the pile.



Bill at the operating position. The broken arm came from the above unloading operation. In front of him is the Australian AR7 receiver, similar to the National HRO. To his left is the Hammarlund disposals receiver, the mainstay during the year at Mawson base. (All photographs are Official A.N.A.R.E. photographs.)

Reminiscing with me in Melbourne on the morning of his return he told me of many humorous incidents concerning those stations so keen on working him. Perhaps the oddest was the W5, one of the many responding to his CW "I'll listen for 'phone for ten minutes." Said the W5: "Answer this call, Bill, and there's a years sub to CQ waiting for you on your return to Australia." That is bribing and Bill Storer would not be a party to this type of operating. "Those who worked me, worked me through their own skill," he says.





The treasured Antarctica QSL.

Back in Australia Bill Storer sends his apologies to those hundreds who called and missed a contact. But, as he explains, he had his commercial schedules and exploratory work which was planned to a very tight program by the Australian National Antarctic Research Expedition Headquarters in Melbourne.

### Tough Going

Operating an amateur radio station in Antarctica is hard work, calling for immense patience, a thorough knowledge of how various parts behave to various changes in temperature, and wise choosing of the best time of the day to cram in QSO's. He thinks he surmounted most of these troubles by trial and error, but he has come home with many mysteries still unsolved.

Like the one of the aurora displays which are very vivid and intense in these high degrees of latitudes. Often during the height of the display Europeans which had not been heard for days would come in with phenomenal strength, yet other countries like South Africa (normally easy to work due to closeness), America and Australia, which were there prior to the aurora, would disappear. Frequently he found the displays would 'kill' a live band in seconds or conversely bring to life a dead band. Much the same mysterious story was repeated on the commercial channels to Australia, and large numbers of messages had to be sent "broadcast method" getting receipts after the aurora had subsided.

One of his greatest troubles was drift static which frequently blotted out reception on all bands for days at a time. Blizzards around MAWSON base often exceed 100 mph and blow for hours, sometimes days; charging and recharging the antenna, which in turn discharges through the receiver, and no signals can be copied.

### Antennas

Despite these blizzards the two antennae erected by VK1EG during his first month on MAWSON—an inverted V 70 feet high at the apex and 420 feet long and a two element parasitic beam on America—stood up to the

gales and never came down. They are still up although the new party intends putting up a much better array. The V was made of seven core hard drawn copper and the beam one-inch dural supported throughout. (Here's where you want to test your latest 2-element W 6 S A I !!)

Another of his many troubles in the early months was the strange behavior of radio parts and tubes. Often the tube elements would snap for no apparent reason and transformer insulation would break down. He found this was due to the sharp change in temperature from the unheated storage sheds to the  $+60^{\circ}$  in the shack. Frequently the outside temperature dropped to as low as  $-22^{\circ}\text{F}$ . and the temperature in the storage huts was little higher. The 80 degrees difference caused this unusual behavior of equipment.

Later, after bitter experience and often disappointment, he transferred most of his spares to the shack and when replaced they gave no further trouble. Coaxial cable and plastic insulation also behaved poorly at MAWSON. Often the plastic covering on the high voltage leads to his transmitter would contract through the night (when the heaters were turned off to conserve fuel) and drop out from their connecting socket. He thinks MAWSON must rank as one of the most gruelling testing grounds for radio gear in the world. His (ex disposals) HAMMURLUND RGB ex-US Navy receiver was used on an average of 15 hours per day in preference to the expedition's Australian and British receivers. In just over 5000 hours operating the HAMMURLUND receiver broke down only once—an output condenser burned out and was immediately replaced.

### Morale Builder

Despite all these hardships Bill Storer attributes his high morale throughout his southern sojourn to the pleasure and comfort of his hobby. Hundreds of DX men everywhere were ever ready to work him. They were his constant link with civilization, and had there been an emergency, help would have been sent immediately.

During the long winter months when there was no sun it was a pleasure to while away the hours chatting with many of his friends in Australia and America. He cannot speak too highly of the high standard of operating from America and the gentlemanly behavior of those who missed and waited silently for a chance to call, many without any success due to pressure of his own work.

Like most rare DX men, Bill Storer discouraged replies on his frequency, often using the appropriate Q-signals for calling on adjacent frequencies. This he found most successful in cutting down the QRM and strongly recommends this as standard procedure for future DXpeditions.

Pressure of expedition work prevented operation on all bands, although his equipment





Mawson base—southernmost settlement in the world. The Kista Dan is being readied for departure. Barely visible at right center is the 70' pole supporting VK1EG's inverted V-beam.



Typical landscape near VK1EG. Here an expedition scales Mount Henderson, ten miles inland from Mawson, where a depot was established.

(3 stage with 807's in final) was capable of working from 3.5 to 28 mc. He operated only on 14 and 7 mc., the majority of his time being spent on the former which he found more reliable for general DX communication and far less commercial QRM. The only other band he listened on was 21 mc but no signals were heard and the transmitter was not put on the air. Often in the southern hemisphere's late spring and summer 14 mc. was open for 24 hours per day when, oddly enough, many countries elsewhere were reporting extremely poor conditions. His best WAC was less than three hours but by far his greatest achievement was his 113 countries. He was the first VK1 to make DXCC.

Before they parted company in early 1954 George Delahoy (VK1DY), who manned Heard Island throughout 1954 challenged VK1EG to reach 100 countries first. VK1EG won although VK1DY made his 100 countries a few weeks before his departure.

During May and June of last year Bill Storer together with three other members of his 10-man party went on a dangerous exploratory trip which almost cost the party their lives. On May 7 the party set out for the Scullin Monolith (named after a former Prime Minister of Australia) 100 miles east of MAWSON. The whole trip was carried out during darkness and ended in near disaster when the pack ice broke under the weight of their weasel (snow tractor). Desperately Bill Storer called for help on 5400 kcs (a crystal-controlled frequency), from a small battery operated portable set. He had much difficulty in contacting base as the Monolith rising sheer from the frozen sea seemed to be a bulwark to successful communication.

Storer wonders now what would have happened if he had taken a 14-mc crystal along. Perhaps help from the outside world through the commercial channel to MAWSON might

have sent out the assistance they then so urgently needed. The party, near death for almost a week, and faced with the prospect of spending the winter in a tent at the Monolith finally set out for base and arrived there 34 days later. Within minutes Bill Storer was on 14 mc. assuring VK4FJ, who also had been very worried at the extended delay in resuming schedules, that all was well again at VK1EG.

Bill Storer has strongly advised the second party now established at MAWSON to take a 14-mc. crystal with them on field trips.

**SO NO MATTER WHERE YOU ARE SHOULD THIS CALL EVER COME (AND WE IN VK HOPE IT NEVER WILL) GET THAT MESSAGE TO THE AUSTRALIAN NATIONAL ANTARCTIC RESEARCH EXPEDITION IN MELBOURNE QUICKLY. YOU COULD EASILY BE SAVING THE LIVES OF FELLOW HAMS.**

Through painful experience Bill Storer found that any man pounding brass in these isolated areas must be ambidextrous. Before Christmas his right hand was jammed in a tractor. The Doctor was 50 miles away on a field trip. Gamely Bill, then in intense pain, stuck to his post, sent left-handed a message to the Heard Island doctor and recalled his own doctor from the field. Medical instructions from Heard Island helped to relieve the pain until the MAWSON doctor's return some hours later.

#### Log with a Story

Bill Storer's log seems stranger than fiction especially if one asks him to explain the odd pieces in the "remarks column" (His log is of such historical interest several of us here in Australia are asking him to donate it to the Wireless Institute of Australia as a permanent souvenir of the first of the many permanent Australian amateur radio stations to operate from the Antarctic Continent).

[Continued on page 56]



# Current Computer

## Reading Current with a VTVM

by Richard Saunders

12 Central Ave.  
Oneonta, N. Y.

A rather old idea in laboratory and scientific instruments which has seen little or no application by amateurs is the measurement of current flow with a sensitive voltmeter. To do this, an accurate resistor is inserted in series with the circuit and the voltmeter is connected to read the I-R drop across the resistor. If the internal resistance of the voltmeter is high there will be no need to apply a correction since the error will be negligible.

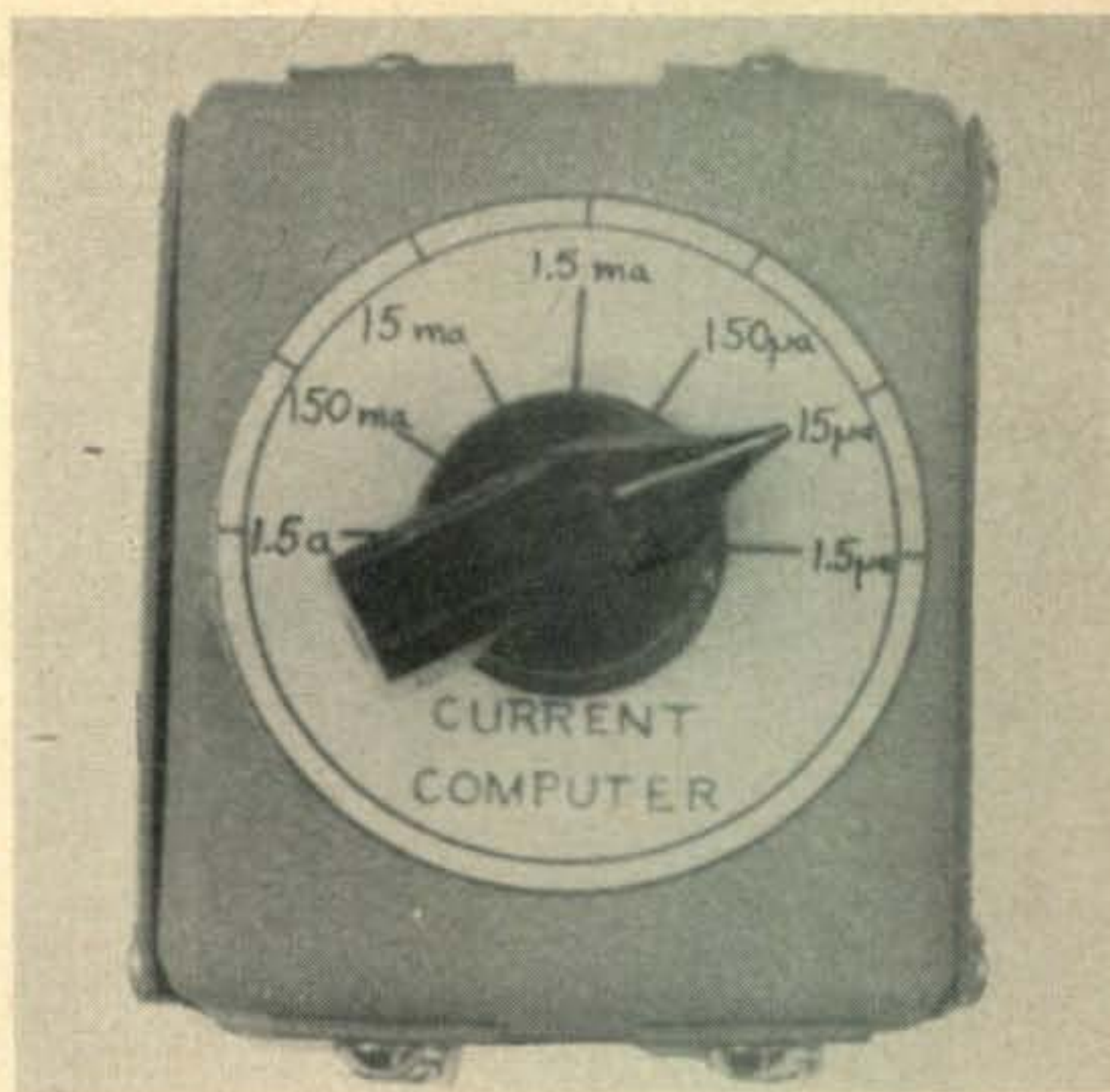
When the author first got his vacuum tube voltmeter a need was felt for a current instrument as well, one which would indicate accurately from microamperes to amperes. Well, we had the sensitive voltmeter, all that was required now was to make Ohm's Law work for us.

The voltmeter was a Heathkit V-6, although there is no reason why any tube voltmeter couldn't be used. The Heathkit job has a 1.5-volt scale on the lowest range and it was decided to employ this for our "universal current indicator." An inspection of the meter convinced us that it would be better not to attempt to incorporate the additional current ranges into the switching arrangements already provided. An "outboard" current multiplier was decided upon.

A single pole 7 position switch was mounted, with the selected resistors, in a home-constructed 2" X 2" X 2½" aluminum box. Terminals were provided at each end for circuit and VTVM connections. However, the mechanical details are of little importance and the individual constructor has a wide choice of housing units which are available on the market. Reasonable care in keeping the components well insulated from ground will retain the accuracy of the method, even on the microampere ranges.

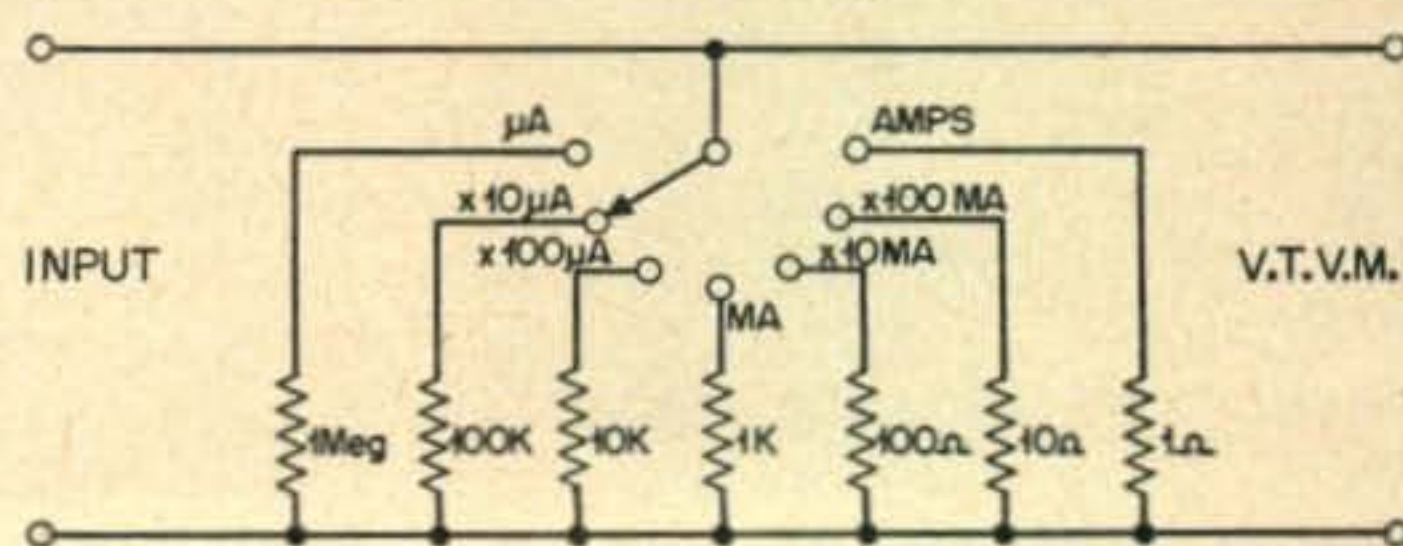
The resistors are selected so that current will be direct-reading on the voltmeter scale. A brief calculation will show that for a most-sensitive fullscale reading of 1.5 volts with a current flow of 1.5 microamperes a resistance of one megohm is required. A resistance of one ohm will have 1.5 volts across its terminals when 1.5 amperes flows through it, etc., etc.

At the higher current ranges some attention should be paid to the power being dissipated in the resistor. The writer used a 1-ohm unit with



a 10 watt power rating, although application of the power formula will demonstrate that not over 2.25 watts is dissipated at full scale. The margin is desirable since wirewound resistors tend to change resistance when run near their full load ratings.

The manufacturer's stated input impedance for the vacuum tube meter will tell you whether a correction needs to be applied to the indicated reading. Since most present-day tube voltmeters have at least a ten megohm input resistance it will be seen that there will be negligible effect except at the highest sensitivity current range. If the current multiplier is always to be used with the same voltmeter a better scheme than applying a correction would be to modify the resistor on the highest sensitivity ranges to a higher value which, when paralleled by the VTVM's input resistance, will come out to the exact value required. In this way the meter will be direct reading and accurate on all ranges. Of course meters having 50 to 60 megohm input impedances need no correction when bridged across a one-megohm "shunt." If the input resistance is known an "ultimate sensitivity" scale is possible using no external multiplier. Fractional microampere measurements can then be made. A good grade of mica condenser will prevent r-f fields and a-c fields from affecting the reading if it is bridged across the VTVM input terminals.



**Input is connected in series with circuit where current is to be accurately measured.**



# Texas Telethon

J. C. Wood, Jr., WN5FLS

P.O. Box 723, Tyler, Texas

When the Tyler Lion's Club recently decided to have a telethon over Tyler's KLTV to raise money for Texas' GONZALES WARM SPRINGS FOUNDATION for crippled children the EAST TEXAS AMATEUR RADIO CLUB was called on to establish communications.

The club set up a portable rig right in the studio, operating as W5ZJN. They were in constant contact with Hams in the surrounding area for the entire 18 hours during the telethon. During this time nearly \$10,000.00 was raised for the crippled children's foundation.

The telephone numbers of hams in the outlying points were flashed on the screen at intervals and the people in these communities would call their pledges to the ham who would in turn relay the information immediately to W5ZJN at the studio where contributions from long distance points could be acknowledged and tabulated as quickly as local calls.

The officers of the Lion's Club had the highest praise for the local Amateurs. One stated "This Club really has an organization—when we called on them they said they would handle everything and they sure have handled it."



Hams who manned the portable station in the TV Studio are shown left to right, W5ZJN—James T. Whitaker, W5YZD — Johnnie Stotts from Nacogdoches, Tex., who came up to help, W5WVH—Rex Ely, W5RAE—James Dafft is sitting on the edge of the desk. These OMs worked from 10:30 PM March 19th to 3:30 PM March 20th without a break.



Overall shot at the station showing TV camera, W5ZJN in background and Peppy Blount, former University of Texas All American Football star who acted as master of ceremonies for the event.





AUSTIN, TEXAS  
July 31, 1954

Mr. James Price, President  
Austin Amateur Radio Club  
1206 West Fifth Street  
Austin, Texas

Dear Mr. Price:

The people of Dood City and its surrounding area join with me in thanking you and all the members of your organization for the fine work you did in assisting the firefighters during the brush fires earlier this week. The system of communications set up by the members of your Club enabling messages to be relayed from the scene of the fires to those men controlling fire equipment and enabling badly needed personnel and equipment to be rushed to different localities when needed, the watch set up by your men to spot new outbreaks and your Austin station which relieved the State radio of much work, all these services were of value in getting the fires under control as quickly as they were. Please extend to everyone our thanks for a job well done.

This type of co-operation and assistance in a time of potential disaster brings about a true feeling of brotherhood.

If we can ever be of assistance to you, please call on us.

Again, our sincere thanks.

Sincerely,

E. C. Lang, Sheriff  
Travis County, Texas

*The above letter was sent to the Austin Radio Club in recognition of valuable assistance rendered by their expertly-functioning mobile emergency net. W5FXN, a prime mover in the organization of this net, tells the story of this incident and passes along some valuable suggestions for other mobile nets.*

At 4 p.m. I was called by the Communications Officer of the Texas Defense and Disaster Relief Division and advised that a serious fire had broken out twenty miles from Austin. By habit acquired in simulated-emergency operations I requested detailed directions as to the Officer-in-Charge, his location and what roads were to be used. I immediately notified W5FTY, asking him to contact all mobile units of the Club's mobile emergency group either by landline or on the net frequency of 29.2 Mc. Next W5ANQ was advised that the club power unit and his portable rig would be needed, since it was doubtful that our regular mobile units could establish reliable communications across the intervening hills. In rapid succession, calls were made advising the local BC and TV stations of our availability for supplying news direct from the scene. I then left my office to dash home for the necessary gear. On arriving I learned that W5TFY had contacted about half the available units. We immediately placed another call to the TV station, requesting they interrupt their program to request all Austin amateur operators to check in on the Austin Area emergency frequency, whereupon many XYL's did an excellent job rounding up the remaining OM's.

Knowing that many non-mobile Hams would hear the announcement and tune 29.2, W5TFY asked any of them that would like to go along as second ops to call him and arrange to have

# Emergency Operation

## —The Austin Brush Fires

by James Price, W5FXN

Box 764, Austin, Texas



With ground plane erected, W5ANQ contacts W5TFY, control station with phone patch in Austin.

a mobile unit pick them up on the way to the fire. Several responded, rendering valuable reinforcement.

As I was leaving the city a request came through that I stop by the Texas Department of Public Safety to pick up a load of hand portable transceivers for delivery to the officer-in-charge.

I then sped to the scene, silently thanking the Texas legislature for our call-letter plates which gave us access through the road-blocks without any delay for questioning. On our way by, someone shouted, "Boy, we're doggoned glad to see you fellows!" My car was #3 mobile through the block, and W5ANQ/5 was already set up and operating while close to a dozen other units were still raising dust over the thirty miles of winding road behind us.

It was really thrilling to see the instant co-operation given us by the highway department and police, and to see a bunch of Hams operating like professionals—with no unnecessary gabbing, but with snappy, efficient procedure. The final thrill came hours later when the firefighters signalled that the fire was under control, and everyone breathed a deep sigh of relief.



I need hardly point out what a fiasco our participation could have been, with greater loss of property and possibly lives, had we not been adequately prepared beforehand.

A mobile net frequency should obviously be chosen with due consideration given the area to be covered and the condition of terrain. For an area the size of New Jersey, 75 meters is an ideal choice. But if your units are low-powered and an area of about 20-mile's radius is desired, 10 or 6 meters would be best. If you plan to operate in a metropolitan area only, it might be wise to consider 2 meters. Regardless of the band chosen, everyone should be sure he is capable of getting on the same frequency, not plus-or-minus 5 to 10 Kc. Of course, in any given band, a relatively unused frequency is best. Short skip QRM can have a disastrous effect on local net operation.

Units must be conversant with net procedures, and should drill at least occasionally, without horseplay or gabbing. It may be difficult for Hams to talk only when they have something pertinent to say, but it's good practice. Net control must have authority as to priority of traffic. Net control should be rotated to familiarize all operators with the duties. Simulated emergencies, with cars dispatched to various points in the area, are excellent practice. The urgent need for brevity, accuracy, then *silence* in these operations must be realized. Talk should be limited to position reports and other concise data. Reporting merely the license numbers of ten passing cars is good training.

As soon as the units have made their final reports, dismiss the net. *Then* let the bull session begin.

When your net is operating with precision, contact the appropriate officials, indicating your availability and furnishing them with names, addresses and phone numbers of key members best able to alert the entire group.

A good phone patch at Net Control can speed up operations.



W5ANQ/M, with Collins 75A1 and Viking II rack-mounted on rear-seat supports. Installation includes a separate dash-mounted 6v. station.



As KN5ABW and W5FXN hoist the ground-plane to position, W5ANQ starts gas generator.

A legitimate emergency can seldom be squeezed between lunch and the dinner bell. Be prepared for at least 24 hours.

Don't stop to pack food. Other organizations will take care of this. You will probably function better during an emergency with little or no food. But Red Cross will probably furnish a better schedule and better chow than you could devise.

Leave the XYL at home. Unless she's a nurse. If the junior op is old enough and adequately prepared, he may prove useful.

The best companion is a level-headed non-mobile Ham or neighbor.

Dress for the occasion, comfortably, in clothes that might be ruined.

As for equipment: A gas-driven power-plant, with plenty of power cord and lights, is useful, but not worth its weight if not ready to roll immediately. A ready P.A. rig may prove useful. Folding chairs, card tables, clipboards and scratch paper, desk light, pencils, extra outlets if you have power.

*Tools:* Flashlight with fresh batteries, long-nose pliers, screwdrivers, diagonal cutting pliers, soldering iron and solder, extra connectors, fuses, tubes and vibrators, and an assortment of parts, which might be necessary for equipment repair. These could well be kept in the car at all times.

Instead of food, bring water, coffee, chewing gum, paper cups, cigarettes if you need them.

Air mattresses, blankets or sleeping bags, rope, field glasses, portable BC set, and a funnel for nourishing the auto—since much emergency operation will find you operating stationarily, with the hood up and motor running to keep the battery charged.

Sounds like a lot of stuff to gather in a hurry, doesn't it? Actually most can be kept in the car or within easy reach. It takes us about ten minutes from the time we are alerted 'til we pull out of our driveways. Or less.

The satisfaction of being able to render valuable assistance in a bona fide emergency would be sufficient reward for ten times the effort required in organizing a good mobile emergency net.



# DX



## and Overseas News

Gathered and reported by  
**R. C. "DICK" SPENCELEY, KV4AA**  
Box 403, St. Thomas, Virgin Islands

**GREAT CORN ISLAND, YNØ, /KS4:** WØAIW, WØEIB and WØMAF were scheduled to sail from Tampa, Fla. on April 15th for Bluefields, Nicaragua. As there is no passenger service, all three signed on as crew members on the banana freighter. YN4CB will join them in Bluefields and has made all arrangements for the trip to Great Corn, some 65 miles distant. Contrary to the information we printed in May CQ Lee, WØAIW, tells us that the FCC has given him authorization to use "/KS4" on Corn and there are indications that separate country status will be considered when this suffix is used. WØAIW has also been assigned the call of YNØYN but has been advised that Corn will not be considered as a separate country under this prefix (This does not sit well with YN'ers!). Plans called for a five day stay on Corn and then HKØ will probably be visited and stops at some of the fishing banks around that area are contemplated. Equipment consisted of a Collins 32V3, 75A3, 75A2 and a Viking Ranger. All bands will be covered but most operation will take place on 14090, CW, and 14120, phone. YN4CB, WØEIB and WØMAF are strictly phone men so WØAIW promises to work hard at the CW assignment. Should all have gone well we shall probably have more dope in the "last minute items" this issue.

**French St. Martin: F.W.I.:** With indications that this spot may qualify for separate status many are eyeing this QTH for a ham expedition. W6OXS and W6VUP plan to fly down, and should licenses be obtained, will operate from there about mid-June. W1PST and CM9AA also have hopes for operation there in June and PJ2AA/PJ2MA may go along, in which case, the Dutch side of the island could be covered. French licenses, for W's, may be hard to obtain in the face of the reciprocity policy of the USA. We feel that a W who has held a french ham license in the past, such as FP8, FO8 etc. might stand a better chance.

**Gambia, ZD3A:** This station has been heard every day, around 2000 GMT, with good signal strength on 14059. The name is Ted (He works for ZD3BFC) and QSL's should go via Box 285, Bathurst, Gambia.

**YACHT "YASME", G7DW/MM:** This 40 foot vessel is manned by Danny Weil who is making a single-handed, trip around the globe. The YASME, presently in KV4-land left England last August and has stopped in at Gibraltar, Gambia, Canary Islands and Antigua. It should leave KV4 about May 1st bound for KP4, KZ5 and FO8. The trip will be leisurely and will extend over the next year and a half. The ham equipment is powered by 24 volt storage batteries and consists of a 30 watt final (1625 tube) and a BC-348 receiver. G7DW/MM is an unofficial call and will be heard on 14032 or 14072.

The radio amateurs of Sicily, backed by the Italian A.R.I., have repeatedly requested to have their country accorded separate status on the country lists (an action which CQ believes has ample justification and has heartily endorsed).

Understandably bitter over the latest refusal for recognition the most active Sicilian stations such as IT1AGA, IT1BXX, IT1TAI, IT1APE, IT1AFE, IT1TCZ, IT1TDT, IT1CTH, IT1MFD, IT1ZTD, IT1ZWS, IT1ZGY and others have decided that they will not contact, nor QSL to, any W or K stations in the future.

This decision was reached with "deep regret" writes IT1TAI, who goes on to say: "We IT1's cherish and feel, and will continue to feel, a deep and loyal friendship and sympathy towards individual American amateurs and our decision grieves, above all, ourselves."

### DX Notes

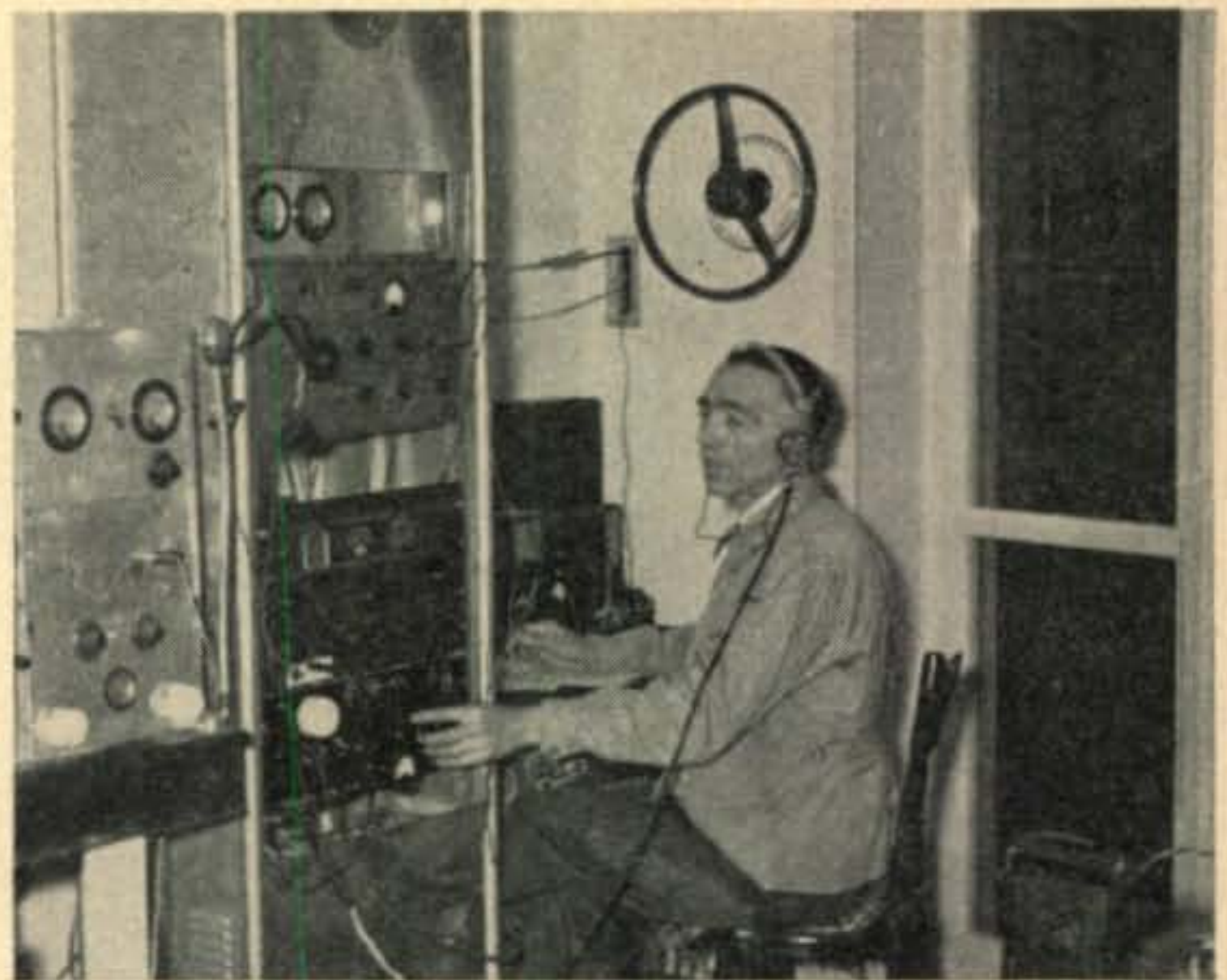
JZØAG, Dutch New Guinea, is QRV every day around 1300 GMT near 14075 kc. QSL's should go via PAØKOP. . . . ET3GB, Box 621, Addis Ababa, is George Brumley, W4UAJ, ex-W9IAI/W5MTV. He runs 100 watts to an 814 and will answer QSL's via air if three IRC's are enclosed. . . . ET3S, Box 499, Addis Ababa, is a former VE3 and leaves ET3 in June. . . . MP4JO appeared on the air and said QSL via W2PCI. . . . 4W1AB has been on saying QSL via W4BRB (you know him Gene?). . . . Via W2GT we hear that W's in Greenland will now use calls from KG1AA to KG1LZ. . . . Ed, W2GT, also advises that ZD8AA's QSL's had not been received up to March 7th and that Toms rig consists of two 807's with 116 watts input. Rx is an Eddystone 750. . . . KT1EXO, ex-TI2EXO, advises us that he plans an IFNI expedition



early next year. . . . KC6CG is on Ulithi atoll and apparently counts as the Western Carolines as his QTH is identical with that of KC6WD given in recent call books. . . . ZD2WAF is ex-ZD9AA, Red, T8C, VFO. . . . Via ZD2WAF and W4QCW we hear that ZD9AB has quit his job at ZD9 and, so, may be soon QRT. . . . DM2ADL advises, via letter from FF8BE, that ex-FD8AB should now be on from Togoland signing FD4BD. . . . From CT1DJ we hear that CR8AB, in Goa, runs 50 watts on 14020, xtl. only. . . . F9RS reports that FU8AA will be on soon with big transmitter. . . . Three new FF's in Dakar are FF8AK, FF8BL and FF8BM. . . . Active on Corsica are the following /FC's: F9JD, F9QV, F8WT, F9VQ, F9UC and F9YP. . . . HR1FV now mikes from ZP5IB. Fred may be reached via the U.S. Embassy, Asuncion and will be glad to supply any missing HR1FV cards. . . . Buck, W4VDF, and W4AMW may accompany the Corn Island expedition as photographers. . . . HB9KU expects to operate from HE1-land in August. . . . Pat, W2AIS, was heard back on the air from KH6ARA. . . . KP4TF still contemplates Navassa Island trip. Brad nabbed ZD9AC on 14060 as did many others. . . . Beda, OK1MB, says OD5AF is also MP4QAW. . . . FB8AK is active on 14000 around 2030 GMT as per W8YIN. The name is Gaston. . . . W2OGE hooked UA4KPA who said to QSL to Box 84 Odessa. . . . SVØWL says he stands ready to accompany anyone who wants to drop over to Crete again. . . . VS6CG advises, via W4CEN, that VS5CT, Brunei, may be heard on 14195, A3. . . . We have just QSO'ed YNØYN/MM, enroute to Corn Island. Lee advises that two stops will be made before reaching Bluefields, One at Cozumel Island, off the coast of Yucatan, and one at Belize, VP1. If all went well they should have arrived at Bluefields on April 23rd and have been heard from Great Corn on April 24th. . . . (West Gulf Bulletin Notes) Via G3AWZ, MP4QAM operated daily from Trucial Oman recently 1500/1600 GMT. He returned to Qatar in May. AB1US is NG but BV1US and C3WV (U.S. Embassy) are OK in Formosa. HC8HM is a new station on the Galapagos, 14317. EA9AR will go to IFNI if he gets transmitter from CO2BL. AC3SQ on daily 1200 GMT. . . . Via So. Cal. Bulletin: VR6AC showed up on 14316, March 28th, for a few QSO's. VQ9NZK due to fire up soon, watch 14080. VU stations know of no VU5 (Andaman Islands) activity in spite of rumors. W6FSJ leaves April 15th and will visit VK, VS, HS, VU, AP, 4X4, ZC4, EA and CT. He plans no operation of his own. W6ODD of /CR8/FIS etc. may be reached at Box 776, Camarillo, Calif. should any QSL's be missing. VR3A says that VR3B is definitely NG! . . . From MP4QAL, Fergus Walshe, Halul Island, Decca Navigator Co., c/o Shell Oil Co. of Qatar, Doha, Qatar via Bahrein, we hear that Fergus runs 125 watts to parallel 807's to a ground plane antenna. QSL's should have been received from London (as this is read). I am on 14050 to 14070 kc daily from 1100 GMT onwards and will try other hours for best W results. I believe I am the only Qatar station left as Tom, MP4QAK, is heading back to the U.K. MP4BBS (G8RP), MP4BBT (W5EVW), MP4BAQ (W5NAX), are on the Motor Vessel SONIC and don't quite qualify for Maritime Mobile. . . .

### DX'ploits

Bill, W6SN, goes to 251 with the addition of HKØAI. . . . Frank, W6MEK, submits new list, also for 251. . . . Frank, W6AOA, stands on 250 with new list while Paul, W9ALI, goes to 250 with ZD8AA, KC4AB, MP4QAH, VR4RO and OY2Z. His phone total jumped to 210 with most of the above plus TI9MHB, KC6UZ and ZD9AB. . . . Howy, W2AGW, upped to 249 with ZA1BB while the same station plus MP4QAL put Arkie, W8NBK, on 249. . . . Not to be outdone Bob, W3GHD, and Walt, W6MX, also reached 249 the former snaring ZD8AA and MP4QAL and the latter, TI9MHB and MP4QAL. . . . G6RH nabbed TI9MHB for No. 246 while Ed, W6DZZ, rose to 245 with TI9MHB, KC4AB, VQ6LQ, ET3LF and MP4QAL. . . . MP4QAL helped E1, W7BD, to No. 239 as Dewey, W6VE, went to 236 with H8EW and MP4QAL. . . . Don, W6LRU, hits 194 thanks to TI9MHB, FY7YC and EA9DF as OH5NK slides to 159 with FN8AD and CT3AB. . . . Bill, W5ASG, lengthened his lead over the 39 zoners by nabbing MP4QAL for No. 248. Bill's phone total went to 183 with help from TI9MHB, HB1MX/HE and 3V8BL.



Well known to all DX'ers is I1ER of Milan, Italy. Op Mario Santangeli is seen at the operating position. (Photo courtesy of W3ASK)

. . . Glenn, W8KIA, also hooked MP4QAL for No. 244 while Mike, W9FKC, added such as ZD3A, LU7ZM, HKØAI, CR4AL and ZD6BX to reach 224. . . . Van, W9HUZ, upped to 221 with MP4QAL, ZD8AA, ZD3A and KC4AB while Bob, W4GG, is just behind with 220 thanks to ET3GB, TI9MHB, HKØAI and ZD8AA. . . . Ray, W2BJ, goes to 217 with HKØAI while Joe, W8UAS, hits 215 with MP4QAL (That guy is certainly a big help!). . . . Chas., W3DKT, reached 213 with TI9MHB while Rey, W3KDP, went to 211 with such as VQ5EQ, TI9MHB, HKØAI and MP4QAL. . . . Carlton, W1ZL, made it 210 with LU7ZM, TI9MHB and HKØAI as G3FXB upped to 187 with SVØWK, ZD3BFC, FK8AC, ET3GB, VQ8AY and ZS8D. . . . Eric, W6MUF, rests on 149 with PJ2AI, VP2GX, VK1DY and YU2AE while Larry, W9ALI, goes to 144 with such as F8FW/FC, KM6AX, VP2AD, HA5KBA and HZ1AB. . . . Hal, W6TXL, goes to 168 as Roger, F9AH, rises to 167 with FG7XB and MP4QAL. . . . Dixie, W2ZVS, reached 174 with ZD3A and UQ2AN as Chris, OH3OE, made it 124 with PJ2AD, OD5LX, CR6AI, SP2KAC and VO6U. . . . Mario, I1ER, added zones 26 and 39 for 37-114 while W4HA, John, miked with MP4QAH, TI9MHB, F8FW/FC, HKØJR, YU1GM and KC4AB for a 187 total. . . . Mickey, W8YIN, added VK1AC, HKØAI, VQ8AY and TI9MHB to reach 185. . . . Ernie, W6KQY, raised his phone total to 185 with GC6FQ, VP5BP, HKØAI and EA9AR while Don, W6AM, went to 182, phone only, with VS5CT and HKØAI. . . . Lewis, WØHX, added such as 4S7LM, EA9BC, FP8AP, ZK1BI, HKØDE, CR4AD, 3V8AS, TF3MB and TI9MHB for a phone total of 157 as Ralph,

*Congratulations to the following two stations upon their entry to the WAZ lists:*

**No. 306 G4MJ H. K. Basterfield  
40- —**

**No. 307 W6CTL William G. Hurd  
40-169**

*A QSL from Zone 2 did the trick for G4MJ while an overdue pasteboard from VK1VU put W6CTL over the top. G4MJ is the twenty-third G to make the grade while W6CTL is the 118th W6 for WAZ.*

*We also welcome the following newcomer to the HONOR ROLL:*

**WØQVZ 36-152**



W6CHV, vocalized with VP8BF, VP5AE, HKØAI, KV4BB, ZD4BK, VP8BD, FO8AJ and VP5BP for a 144, A3, total. . . . TI2BX snagged ZB1DK and ZB1AJX on 21, A3, for an 89 total. . . . George, W3AS, pulled in PY8AT to complete his WAB. . . . KS4AW's card was No. 141 for WØDXE. . . . PAØUN, Dave, has been keying with such as OY7ML, 1400, LB1LF, Jan Mayen, 14005, FK8AJ, VK9WP and FB8BE, all on 14 Mc. while 21, A3, accounted for ZD6RD, EL2X and VS6DD. . . . DM2ADL nabbed VQ8AG on 14 Mc. . . . ZD8AA was No. 203 for Doc, W8WZ. . . . W7PHO went to 100 with FA8IH and VP4LW. . . . W5VIR made it 83 on 21 Mc. with HC8GI, VP5BP, VP5AE and TI9MHB. . . . Lloyd, WØQGI, running 30 watts, went to 107 with IIBLF/T, F9QV/FC, PJ2MA and CE7ZJ. . . . W7VY made it 252 with such as ET3S, FB9BR, EAØAB, TI9MHB and VK1HM/ZC2. . . . Gary, W6NJU, pulled in CX2CF, LU8FV, LU1EQ, KC6CG and LU9ZE on 28 Mc. phone!!

### New and DX Addresses

F8WT/FC—Albert Dobak, Airport de Bastia, Corsica.  
 F9YP/FC—Aerodrome de Calvi, Corsica.  
 FF8BE—Box 68, Niamey, Niger, F.W.A.  
 FF8BK—Armand Grollimund, Seguela, Ivory Coast, F.W.A.  
 FK8AJ—Marcel Jerome, Box 104, Noumea, New Caledonia, F.O.  
 G7DW/MM—Via R.S.G.B.  
 GC6FQ—Col. Peter Northey, Pendeen, Jersey, Channel Islands.  
 HA5KBA—Via W3AXT.  
 I.R.T.S.—Irish QSL Bureau, Mr. I. Morris, EI6U, 9 Shanrath St, Whitehall, Dublin, Eire.  
 JZØAG—Via PAØKOP.  
 K6AQP—Guy Kane, 1159 Clarendon St. West Sacramento, Calif.  
 KC6CG—Ed Pitta, Falalop, Ulithi Atoll, Western Caroline Is.  
 KP6AK—Via KH6OR.  
 MP4JO—Via W2PCL.  
 OY4XX—Henning, Box 195, Torshavn, Faeroe Islands.  
 TF2WAC—Lt. Cdr. P.A. Lagare, HQ I.D.F. APO 81, PM, NYC. or via W1WMS.  
 VK9OK—Len King, Dept. Civil Aviation, Norfolk Island.  
 VP2LA—Alvin, Box 49, Castries, St. Lucia, B.W.I.  
 VP7NX—Via W6RRG.  
 VP8BF—Graham Rumsey, King George Island, South Shetlands.  
 ZD3A—Ted, Box 285, Bathurst, Gambia.  
 4S7YL—Via W5EFC.  
 4W1AB—Via W4BRB(?).  
 4X4GY—Box 93, Nathanya, Israel.  
 9S4 Bureau—Box 310, Saarbrucken. Unlisted stations via 9S4AX.  
 Thanks to DM2ADL, F3DA, F9RS, WØELA, W4HA, W9PWU, Ben Adams Jr., W6ZEV, WØPRM, South Carolina DX'er and the West Gulf Bulletin.



### HONOR ROLL ENDORSEMENTS

(To April 15th 1955)

W6SN 40-251	W5ASG 39-248	W2ZVS 37-124
W6MEK 40-251	W8KIA 39-244	OH3OE 37-124
W6AOA 40-250	W9FKC 39-224	I1ER 37-114
W9NDA 40-250	W9HUZ 39-221	W4HA 36-188
W2AGW 40-249	W4GG 39-220	WØQVZ 36-152
W8NBK 40-249	W2BJ 39-219	W8YIN 35-185
W3GHD 40-249	W8UAS 39-215	
W6MX 40-249	W3DKT 39-213	PHONE ONLY
G6RH 40-246	W3KDP 39-211	W9NDA 38-210
W6DZZ 40-245	W1ZL 39-210	W6KQY 38-185
W7BD 40-239	G3FXB 39-187	W6AM 38-182
W6VE 40-236	W6MUF 39-149	WØHX 37-157
W6IRU 40-194	W9ALI 39-144	W5ASG 36-183
W6CTL 40-169	W6TXL 38-168	D4HA 35-181
OH5NK 40-159	F9AH 38-167	W6CHV 35-144

Last complete HONOR ROLL appeared in the May issue.

Next complete HONOR ROLL will appear in the September issue.

### Here and There

FF8AY is now in France on leave. . . . The Ohio Valley Amateur Radio Ass'n picnic is slated for June 12th at the Cincinnati Police Firing Range, Evendale, Ohio. Plenty of prizes and plenty of games. Admission fee is one dollar for adults and 25¢ for children. Bring the family and enjoy a basket lunch! . . . The Victorian Division of the Wireless Institute of Australia plans to care for Radio Amateurs who will visit Australia on the occasion of the Olympic Games which will be held from November 22nd to December 8th, 1956. It is planned to organize International Hamfests, holiday tours, Amateur displays, etc., for their special benefit. Details for such arrangements will be forwarded at a later date. As a special attraction to Radio Amateurs everywhere, the Federal Executive of the Wireless Institute of Australia has proposed holding a Region III conference of all I.A.R.U. Societies in this region provided sufficient representation can be guaranteed by the Societies concerned. In order to realize the above plans, it is necessary for us to know the approximate number of your members and their families who anticipate visiting Melbourne during the period of the Games. Your reply would be appreciated, by the first of August, 1955, to: The Olympic Games Committee, W.I.A., 191 Queen St., Melbourne, C.1, Australia. Personal enquiries may also be sent to VK3AHH who is a member of the above committee. (Signed) G. W. Dennis, VK3TF, Pres. Vic. Div. W.I.A. . . . Via YU1GM we are advised that SV1SP has completed formation of the new rules and regulations for the Greek Amateurs and, when approved and passed by Congress, there should be many new Greek calls on the air. . . . Duncan, MF2AG, is now G3KEI. . . . A swell time was had by all at the March 20th KP4 hamfest held at Ramey AFB, Puerto Rico. Co-sponsored by the Ramey Amateur Club and the P.R.A.R.C. and the able assistance of Col. Cutcher, KP4AAZ, there was an attendance of 287 and one of the highlights of the occasion was a 45 minute floor show given by band-leader Alvino Rey and his boys. Al sports the call of W6UK. . . . VP8AQ advises that two ships a year call

[Continued on page 64]

The operating load carried by any ham who is the only active radio amateur in his country is imposing. Vic Abraham, HKØAI, on the Columbian island of San Andres, in the Southwest Caribbean, is in this category. Vic has done a fine job towards giving most everyone a new country. The rig is home-made and runs a pair of 807's in the final. Phone and CW.



**Remotely  
Tuned**

**All  
Band**

# MOBILE ANTENNA

**Richard Matthias, W5BIW**

P.O. Box 548, State College, N. Mex.

*An antenna installation which has made it possible, while the car is in motion, to completely re-tune the receiver, transmitter and antenna from one band to another in forty seconds.*

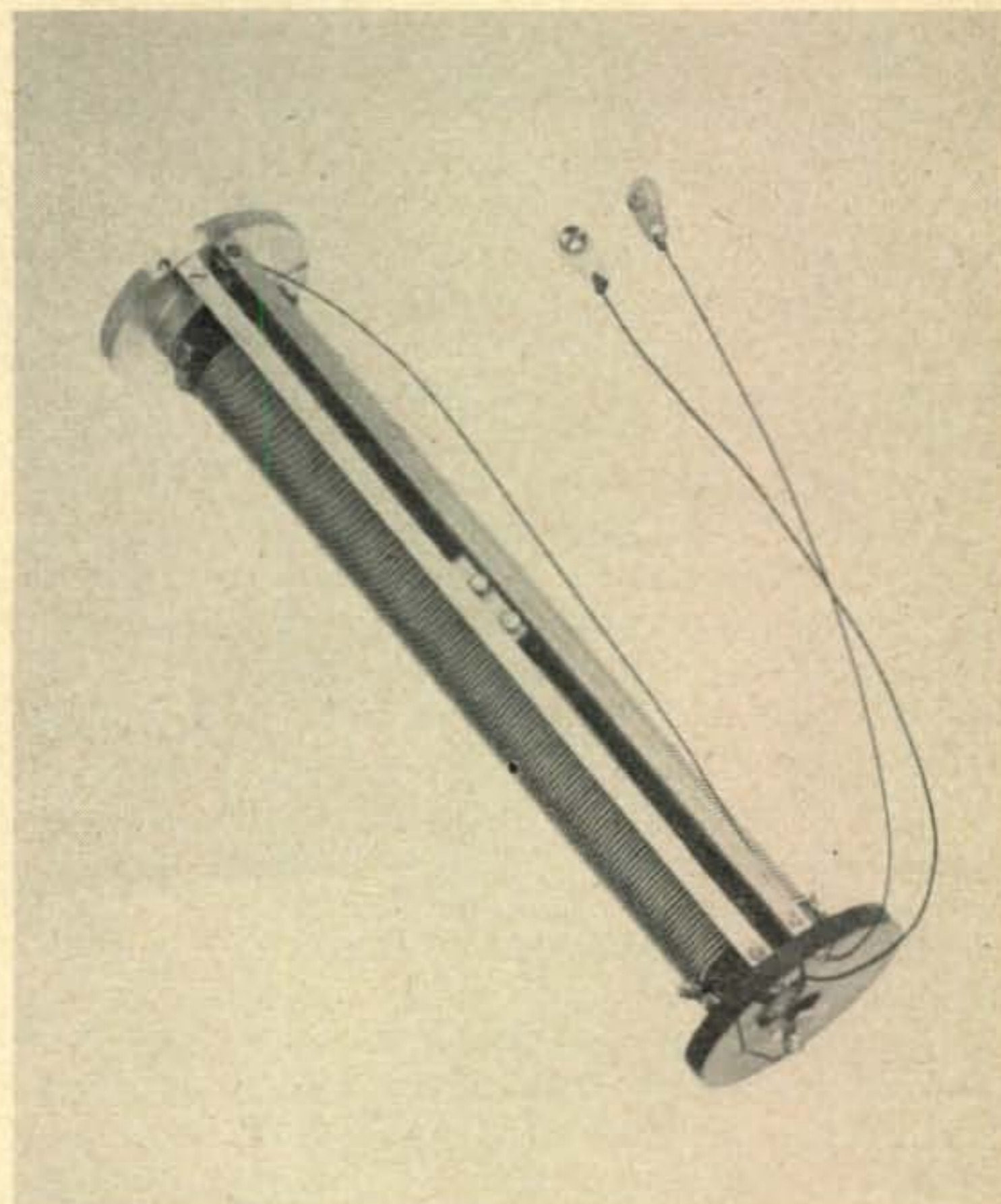
Having a mobile installation that would operate on all bands, 10 through 75 meters, tuned from the driver's seat of the car, it was desirable to have an all-band antenna, also tunable from the driver's seat. There seemed to be no published information for such an antenna. There were many ideas for antennas which tuned with plug-in coils, or with sliding contacts for coils, but none which could be remotely tuned over the entire range of bands from 3 to 30 Mc. After several months of experimenting, an antenna meeting this requirement was developed.

Since a high Q antenna, which is necessary for efficiency, tunes over such a narrow band of frequencies, it is gratifying to be able to tune the antenna while receiving signals in different portions of the band.

Now with the antenna tunable on all frequencies, the VFO on the transmitter is more practical.

The only remaining feature needed was a means of indicating when the antenna was tuned efficiently, insuring maximum signal being radiated. This was solved by a simple pick-up loop which will also be described in this article.

W5BIW has been licensed since 1929. He particularly likes to do his own construction, likes clubwork (is Past President of the Mesilla Valley Radio Club), and mobile operation. His favorite bands are 75, 20 and 10 meters. Presently employed as an Electronics Technician in the Physical Science Laboratory of New Mexico College of A. & M.A.



Mechanical construction of the slider and coil is simple. A weather-proof plastic tube covers the coil.

## Loading Coil

The theory of this antenna is not new. Electrically it consists of a loading coil with a variable tap that shorts turns to the shield. When the tap is set to short out all the turns, the antenna is used on 10 meters. The dimensions of the coil are not critical. If the diameter of the coil is smaller it will be necessary to make the coil a little longer and to add a few turns. Using a metal shield makes it possible to use a coil of less turns than an unshielded coil would require. In the photos you can see several views of the mechanical construction of the loading coil. *Figure 1* is a sketch showing the detailed dimensions. Since the antenna coil is mounted in the center of the antenna, some of the problems of a sliding tap are overcome. It was felt that on a base-loaded coil, the sliding



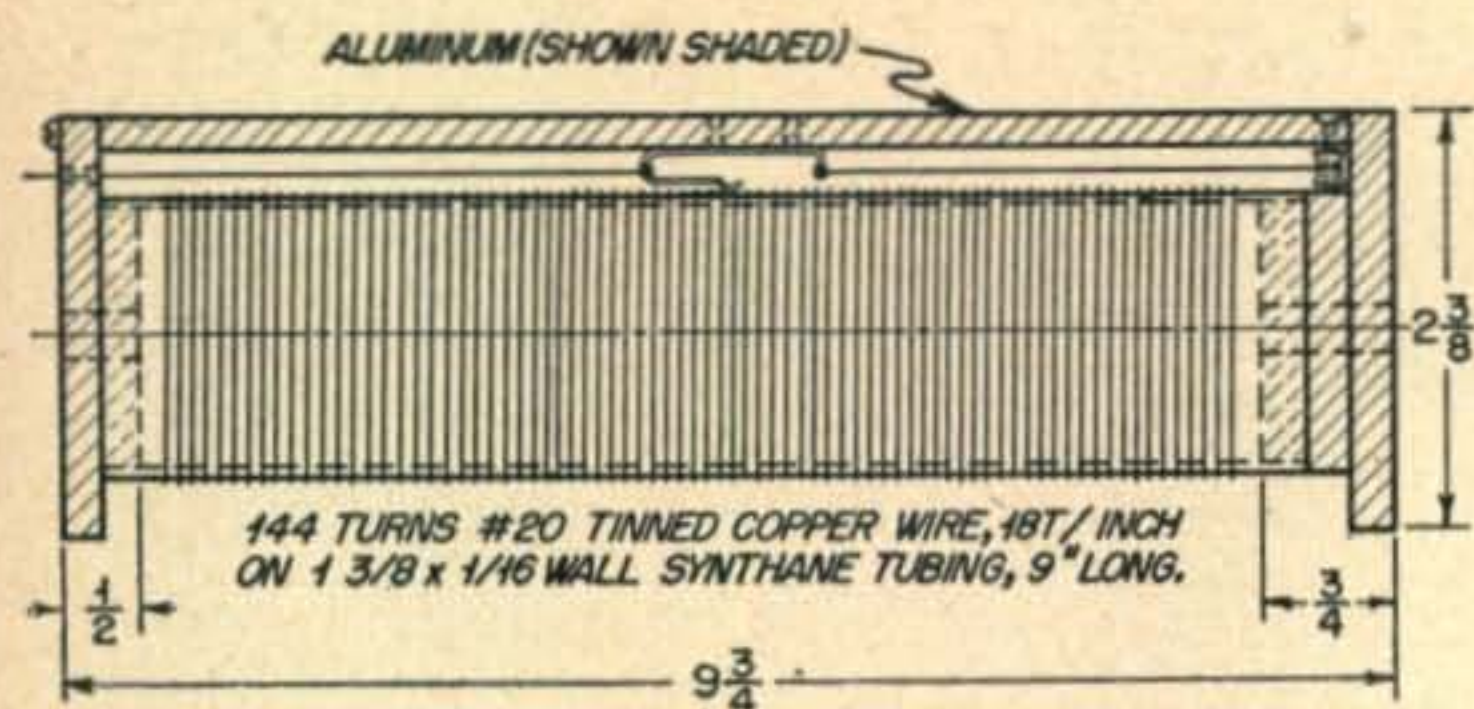


Fig. 1. Detailed dimensions of antenna coil.

contact would probably give some trouble due to the high current at this point in the antenna. The coil has now been in use for several months and the contacts on the coil and tap stay perfectly clean.

### Mechanical System

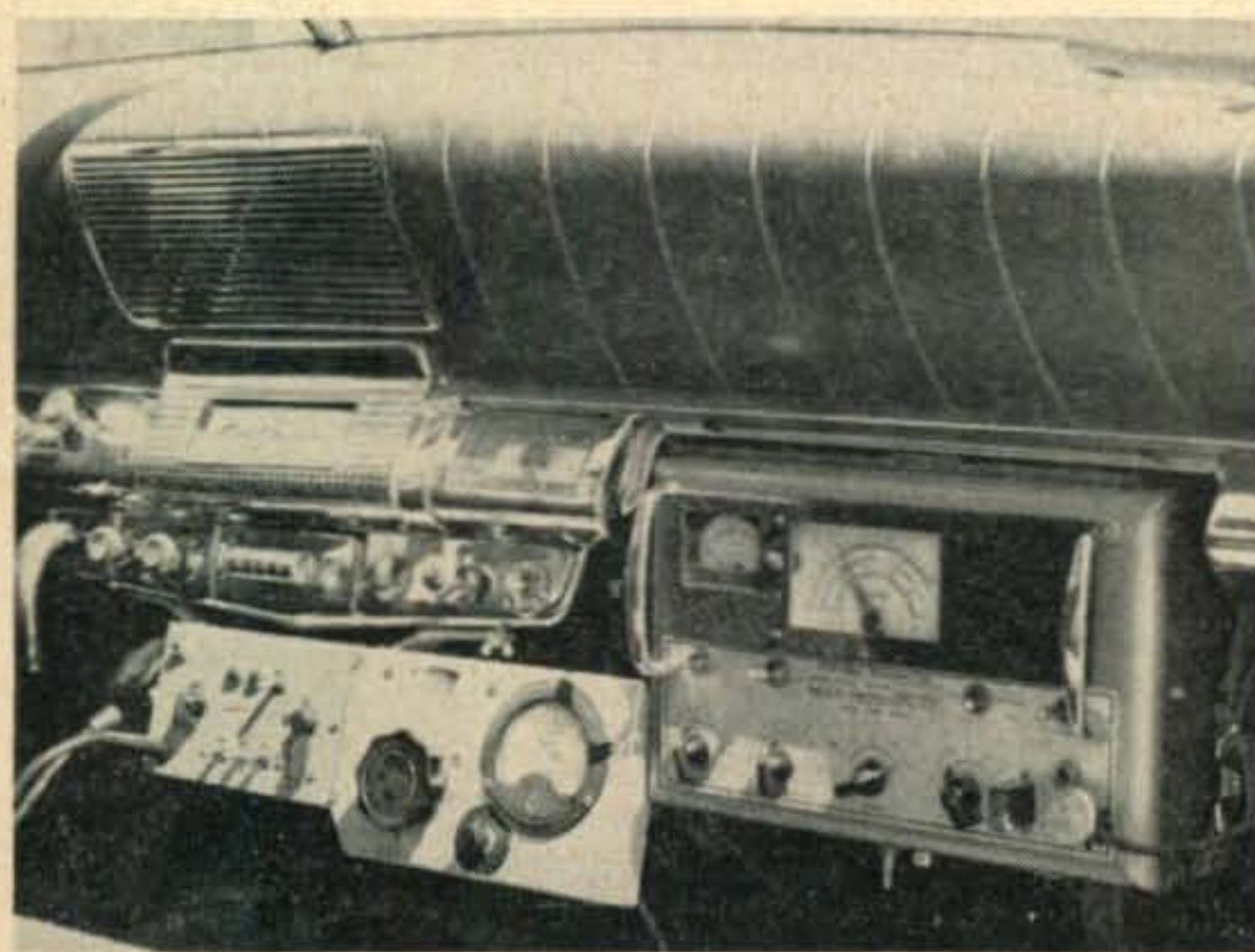
The mechanical system used to move the tap is shown in the photographs and sketches. *Figure 2* illustrates the dial cord and drive mechanism. The dial with the large knob, located on the control panel, is coupled to a flexible speedometer cable. The other end of this cable is coupled to a reel located under the antenna mount. The diameter of the reel is  $\frac{5}{8}$  inches, this diameter chosen because the dial shaft makes four turns for full scale, 0-100, and it was necessary to move the tap on the loading coil about 7 or 8 inches. A  $\frac{5}{8}$ -inch reel drives the dial cord about this much. The gear located at one end of the reel is only used as a stop, and any means could be used. Since the antenna will whip while the car is in motion, there will be some slack in the cable at times. This slack is taken up by a spring-loaded double-pulley mounted directly under a feed-through in the antenna mount. The slack in the line will amount to about one-half inch. The feed-through for the dial cord through the antenna mount was made by drilling a small hole through the center of a  $\frac{1}{4}$ -20 bolt. A  $\frac{1}{4}$ -inch hole was drilled in the base of the antenna mount and



Coil in place. Note dial cord for remote tuning, and field strength loop in rear window.

this bolt inserted.

The dial cord is threaded as follows: One end of the cord is attached to the reel, the cord is wound around the reel a couple of turns, then goes through the take-up pulley, then through the feed-through, up the mast section, and over a pulley mounted below the loading coil, then back through the feed-through, the take-up pulley, and then wound around the reel a few turns, and fastened to the reel. At this point, if the dial is turned from 0 to 100, the dial cord will travel up or down by the side of the mast for a distance of about 7 or 8 inches. The



View of dash-board installation, showing field-strength meter and antenna tuning control. Knob below meter is field-strength sensitivity control.

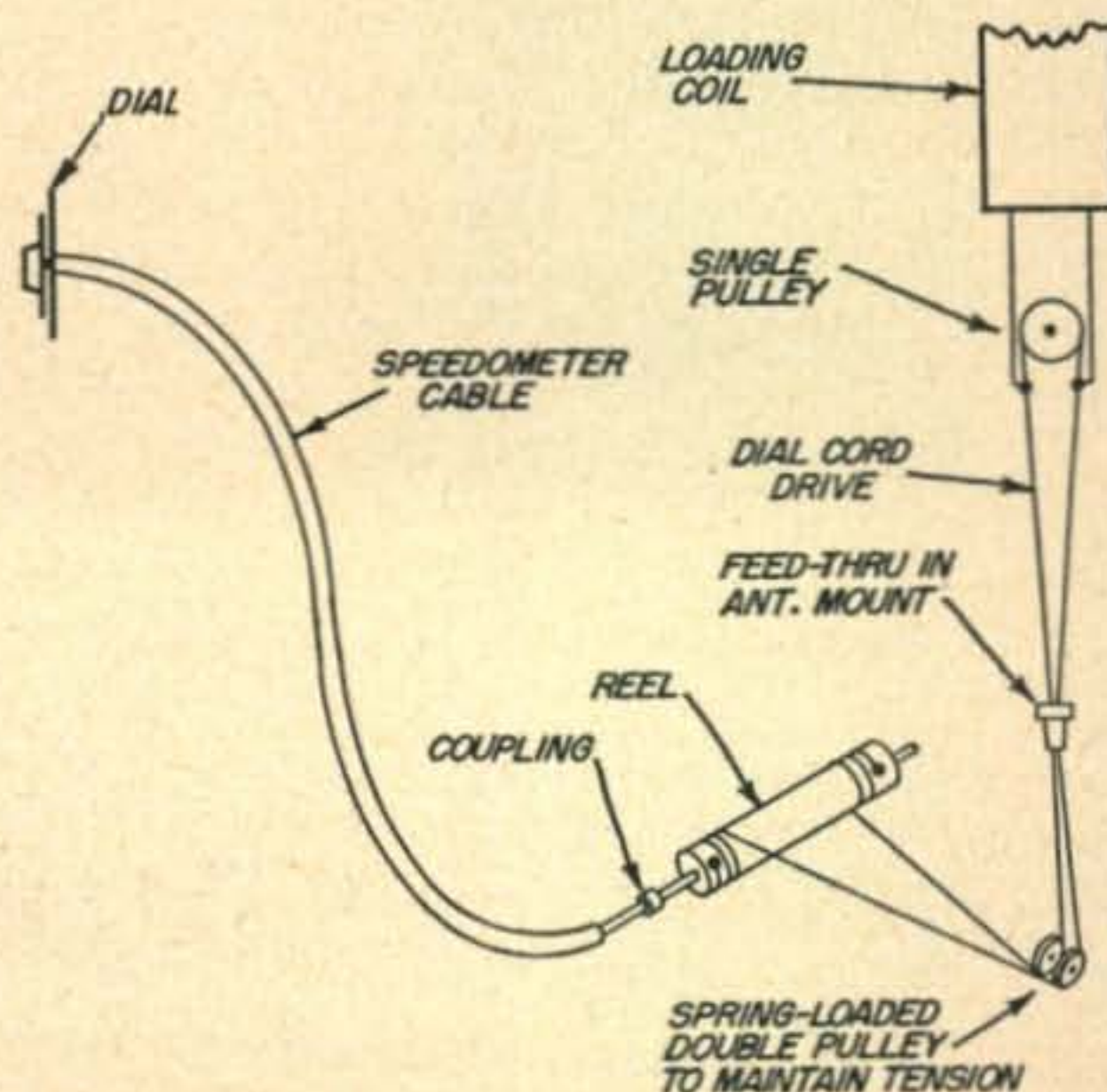


Fig. 2. Dial-cord drive mechanism.



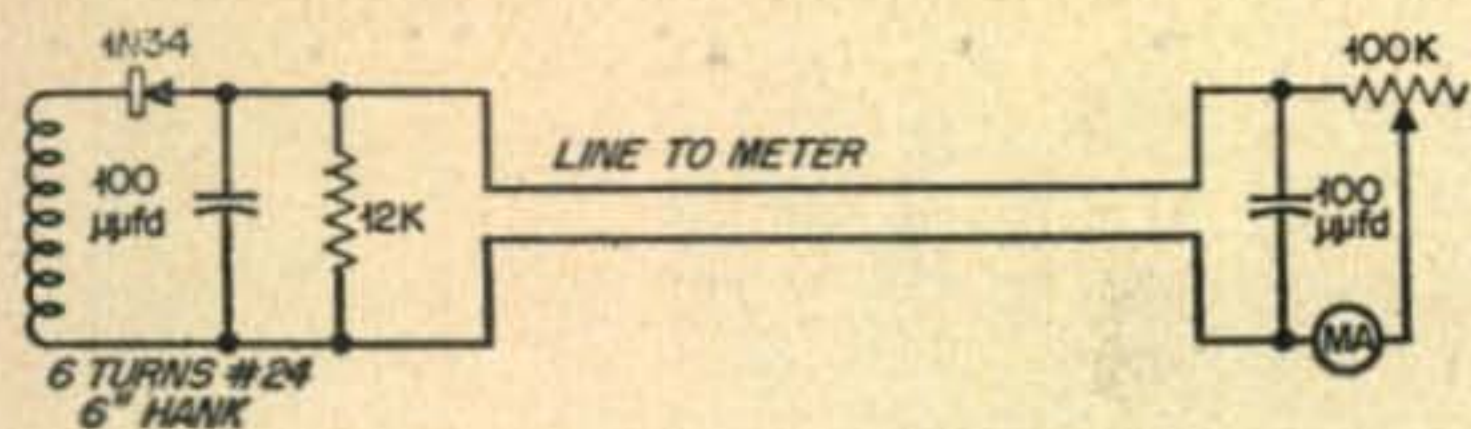


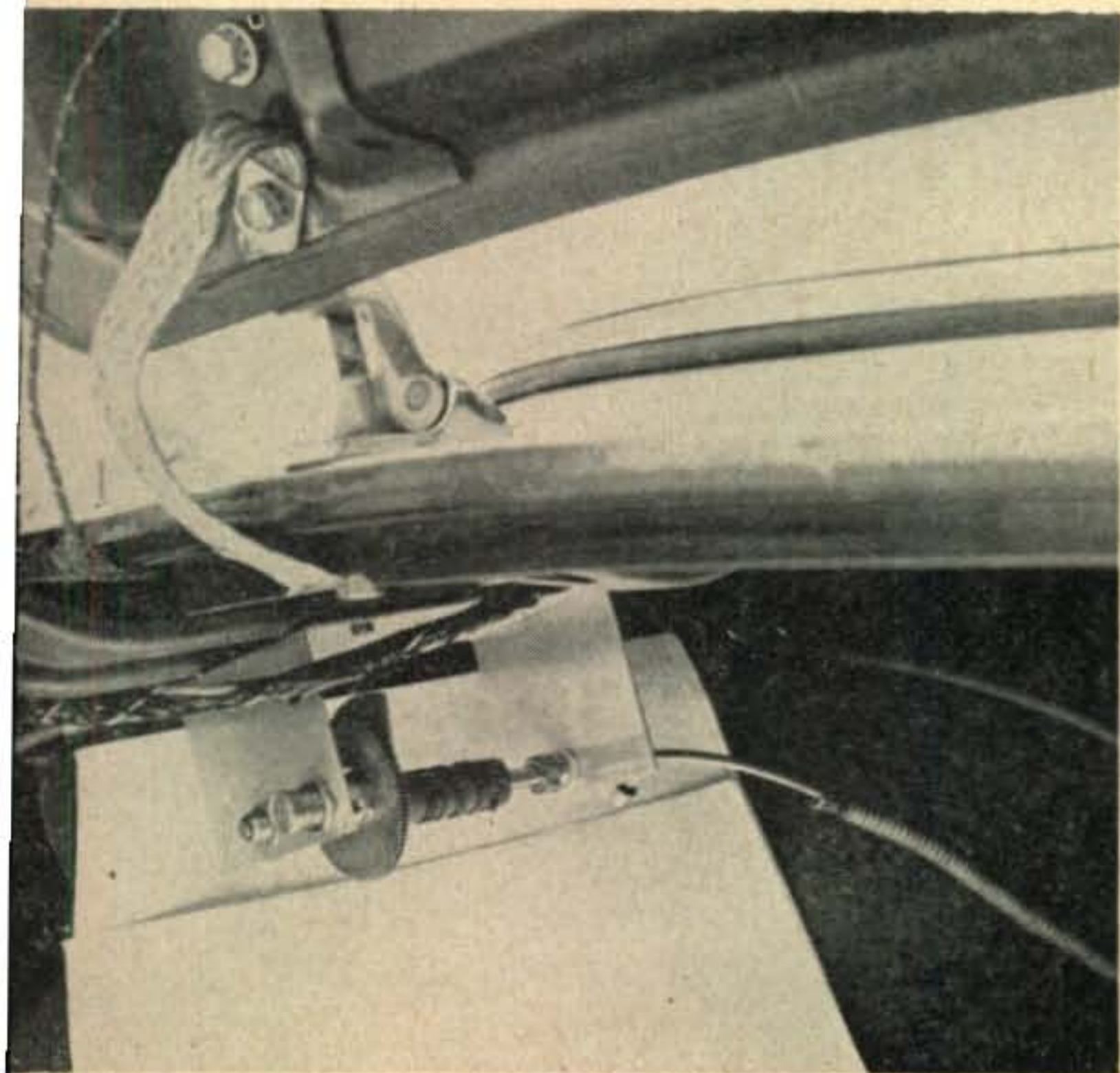
Fig. 3. Field-strength meter diagram.

slider on the antenna loading coil has a dial cord attached, one end of which goes over a roller at the top of the coil, then both of these short lines pass through two small holes in the base of the coil form. One line is to pull the slider up, and the other to pull it down. To connect these two lines to the drive cord, first set the dial on the control panel to 0 which will be the 10-meter position. Pull the line which moves the slider down to the base of the coil and attach it to the side of the drive cord which was traveling down while the drive was being turned to 0. Then the other line coming from the base of the coil is fastened to the other side of the drive cord, leaving approximately  $\frac{1}{2}$  inch slack. Leaving this slack introduces some backlash, but this is not objectionable and makes it possible to set the slider and back up on the dial slightly to relieve any strain on the slider, so that the slider will stay in position when the antenna whips. These short lines from the loading coil are fastened to the drive by means of clamps.

### Problems Encountered

There are probably many ideas which could be used to accomplish this same movement of the slider on the coil. This particular arrangement was used because of the parts and materials which were readily available. It might be

Flexible cable from dash terminates in trunk, controls lower end of dial cord. Gear shown is used only as stopping mechanism.



well here to explain a few of the ideas which were used during development, and which proved to be unsatisfactory. The first model consisted of a dial cord tied to the tap on the coil, and fed through copper tubing directly to the dial. Stretch of the dial cord and friction in the copper tubing proved this method undesirable. Replacing the dial cord with piano wire did not overcome this difficulty. It was decided to try using speedometer cable to drive a reel mounted under the antenna mount, then using dial cord from the reel to the slider on the coil. After the speedometer cable was installed, the dial cord was used without the upper single pulley which is mounted on the mast under the antenna loading coil, the dial cord being connected directly to the tap on the coil. This model did operate but if the antenna whipped or was hit by a tree the tap on the loading coil would be moved, detuning the antenna. This problem was overcome by mounting a single pulley under the antenna loading coil so that some slack could be left in the line going to the tap.

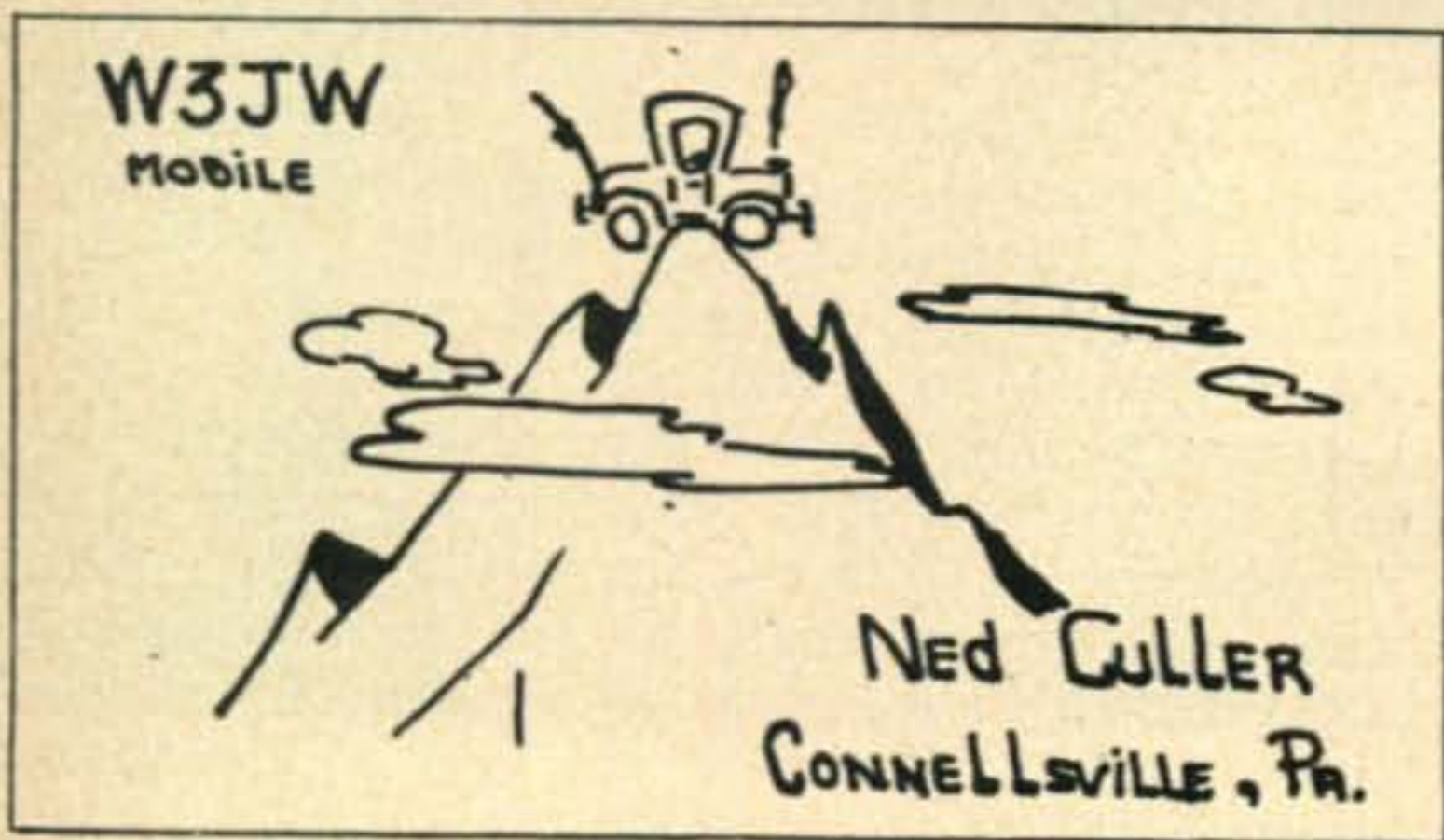
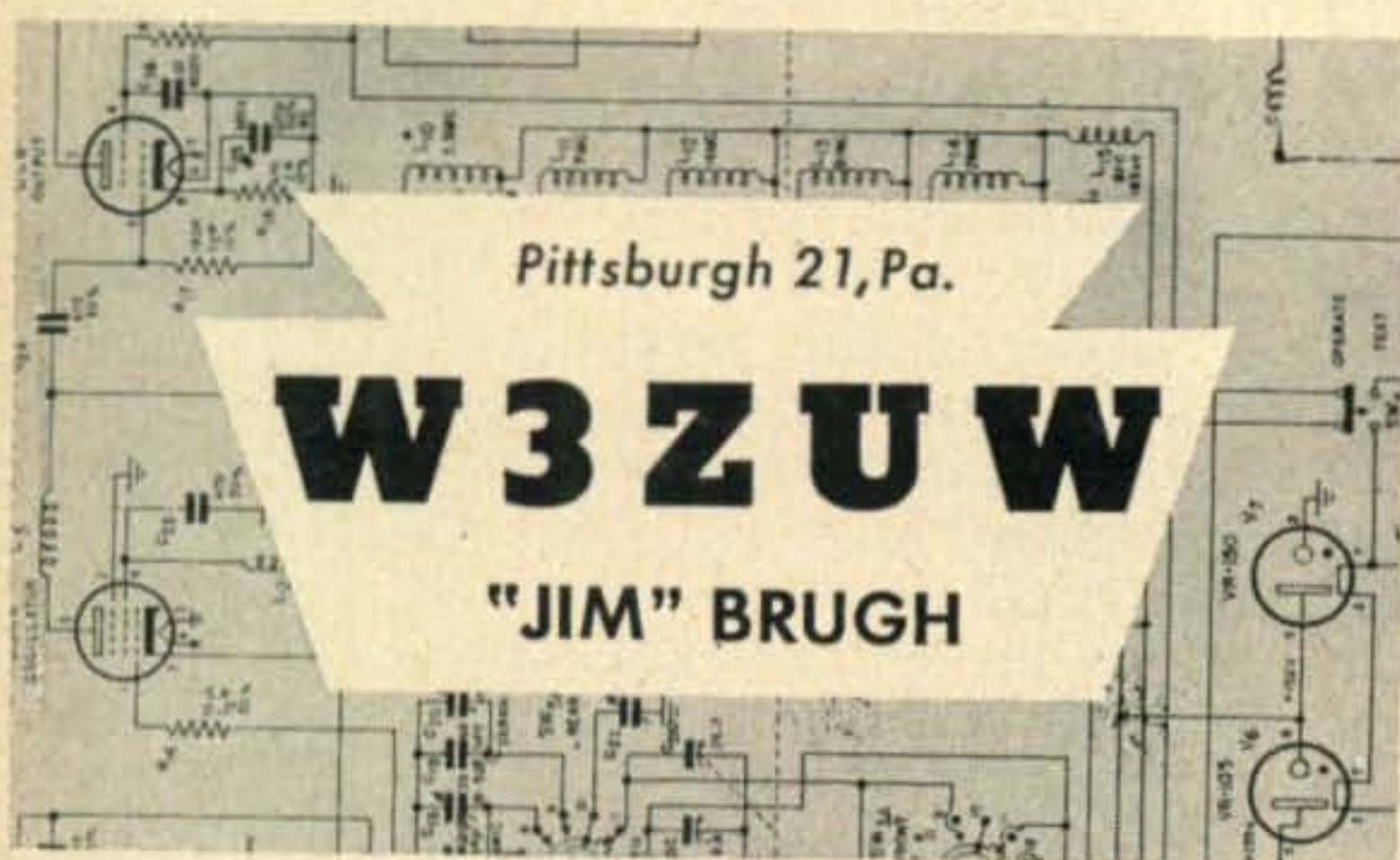
### Tuning Indicator

At first the antenna was tuned by using the indication of the final plate meter of the transmitter. After making several tests it was found that this was not always a good indication of maximum tuning of the antenna. A field strength meter was used and the tap on the antenna could be moved to obtain the greatest reading on the field strength meter. This seemed to be a simple, fool-proof method of tuning the antenna, so a small pick-up loop and an 1N34 crystal was mounted in the rear window of the car, with an indication meter mounted by the side of the antenna tuning dial. *Figure 3* shows the diagram of this indicator system.

### Conclusion

This antenna installation has been in use while making several trips around the state, has been tested while driving over rough roads, has hit trees while transmissions were being made, and through all of these tests has proved to be very stable. Signal reports have been better than those received with fixed-tuned loading coils. Better signal reports are probably a result of proper and maximum tuning for each frequency used. When using fixed loading coils or coils which have to be tuned with the operator standing beside the antenna, maximum efficiency cannot easily be obtained without going through a time-consuming process. This antenna is tuned with the trunk closed, all car doors closed, and the car moving with the antenna leaning back. It is even possible to tune the antenna when conditions are not ideal, such as operating in the vicinity of trees, power lines, or objects which might tend to detune the antenna. The increased pleasure in mobile operation has more than paid for all the work involved in making this installation.





## Contest Winner

W1VRK takes it this month. Any argument? Below are the runners-up. It is difficult to do some winning QSL's justice in the magazine. For instance, the W7VMP card is in beautiful color. Others arriving may be two feet high (Texas style), carved on stone slabs, wood-burned in teakwood, shot thru old road signs with a .22, chiselled in genuine KL7 ice—you can understand the problem. But the deciding factors are cleverness and economy. The prize, by the way, is a 2-year subscription to (guess what?) CQ.



Rev. Leo Brown, W2GVJ



# Letters . . . to the editor

Dear Eds:

. . . Re Information Theory and that brief item I sent in. Man, Info Theory is THE THING for understanding about 2/3rds of what makes communications work. I didn't realize that it wasn't generally known among hams. True, the mathematical discipline of Info Theory is something like the tensor calculus of Relativity, something darn few people can use. But the basic concepts of Info Theory are as generally applicable as the basic ideas of Relativity.

One basic concept has to do with the relationship between bandwidth and maximum information-transmittable-per-second. Consider a communication channel having a band-width of one cycle per second; now it makes no difference whether that is a channel between 2 cps and 3 cps, or 1,000,000 cps and 1,00,001 cps—the width is specified as 1 cps. We'll say we're trying to send the message —.—.— over the channel. Now if it is only 1 cycle per second wide, then the greatest possible change, the most rapid possible change we can transmit, is one change-of-state per second. Now since the dot must be distinguished from the dash, we can make the dot be signalled by "one change per second," our maximum possible rate-of-change. Then the dash must be 1/2-change-per-second, or one-change-per-two-seconds. The inter-dot-dash space must be at least one second long, and the inter-letter space, to be distinguishable, must be two-seconds long.

Now notice that *there is no possible way of sending more information per second on this theoretical channel of 1-cycle width. You can send one, and only one, cycle, or change, per second. It simply can't change faster than one-per-second, because that's what the statement "a width of one cycle per second" means.*

Now if you are willing to take time enough, you can send any message, of any desired complexity, by use of even this narrow channel.

But if we use a channel of 100 cycles width, then we can send 100 bits of information per second.

Now the proposed message, —.—.— contains, actually, 25 bits of information. Count 'em up, allowing 2 units for each dash, 1 unit for each dot, 1 unit for each inter-dot-dash space, and 2 for each interletter space. If you get 21 instead of 25, look again; there are two interletter spaces in front of the first dash, and two more spaces after that last dash—otherwise you wouldn't be able to know that the first dash *was* a first dash.

This means that our 100 cycle channel can handle the —.—.— message in 1/4 second, while the 1 cycle channel would take 25 seconds. But the product of bandwidth times time is constant for any given message.

Now suppose you want to send an informative message of 5,000,000 bits of information. And it must be sent in one second, or the desired effect will not be achieved. Let's say it's a warning message to someone who's about to grab a 2000 volt B-plus lead if not warned, and you've got to get the message through before he reaches it.

Evidently, you need a channel 5,000,000 cycles wide.

Again, suppose you want to send a message of 100,000 bits, and, to have the desired effect, it must be sent in 1/60th of a second. Now you need a channel  $60 \times 100,000$  cycles wide, or 6 megacycles. Television, in other words.

Now notice that the CW boys are quite right in saying they don't take so much bandwidth on the air; since they don't send more than 60 words a minute, or 1 word per second (and it's exceedingly few that can do that!) We can calculate on this basis and determine how many cycles bandwidth they need. Now sending CQ is about as complex a signal as any possible; sending *et*, for in-

stance, takes less bandwidth. So we can call it 13 bits per letter. Five letters per word average gives us 65 bits per word. Interword space will take 4 extra bits per word, so we'll say 70 bits per word.

Triple this, because we made the dash only  $2 \times$  as long as a dot, and allow a slight margin. That makes 220 bits per word, then. Now 60 words per minute is 1 per second, so we have 220 bits per second. This means high speed CW can be sent on a channel only 250 cycles wide. A good superhet with a good filter using crystal filters, can narrow the channel down to this figure readily.

Conclusion: The CW boys are quite right in saying they need far less channel for their work than a phone man does. Since they themselves agree to this, let's re-allocate bands on this basis, and give the CW group the lowest 10 kilocycles of the 75 meter band; that gives them lots of room for their narrow channel transmissions. Certainly they don't need more than half the band, because, as they so truly say, they can use much narrower channel. Not so?

Oh, well—there's validity in the channel-width-rate-of-information-transmission, however, that makes a liar out of the CW boys. Information Theory shows that, too. The CW man can transmit on a narrower channel; true. BUT . . . he can't, even at 60 words a minute, transmit as much information as the phone man can in a minute. The phone man can say "Yes?" in a tone of voice that indicates he considers you a liar, for example, which the fastest bug expert can't transmit in a tenth as detailed a manner, even if we give him 600 words instead of 1 to do it. I can, on phone, say, "A pair of 450TH's? And you're running *one* kilowatt?!" The message transmitted by voice-tone is not legally transmissible by CW, since it's illegal to slander someone in public by saying that you consider him an illegal operator.

The CW operator can't transmit as much information as a phone man in a given time, and, moreover, given unlimited time he can't transmit all the phone man can.

Information Theory simply proves that the net amount of information the CW man can transmit with a given bandwidth-time cannot exceed the information the phone man can transmit with the same bandwidth-time.

Now another aspect of info theory discusses bandwidth vs noise vs signal, and shows that the important question is signal-to-noise ratio, not signal-strength. That's what I was getting at in the item I sent in, who gives a darn how strong a signal you drop in my receiver? Maybe you've got a 100,000 microvolt signal—but there's a neon sign next door that's putting in a 1,000,000 microvolt signal. I can't read a word you send. On the other hand, W6XYZ is putting in a signal of 3  $\mu$ volts, on 20 meters, and the noise-level there happens to be about 1  $\mu$ volt. I can read everything he says perfectly. So you see 3  $\mu$ volts is a stronger, clearer signal than 100,000  $\mu$ volts.

To hell with what the S-meter says; what's the signal-to-noise ratio? Suppose the skip happens to be hotter than an H-bomb and everything over 1000 miles is coming in, from every direction. So I report to you you've got an S-9-plus-15 signal. Of course, there's an Argentinian practically wiping out your signal with an S-9-plus-50 because of the exceptionally hot skip conditions, and the Argentinian is barely readable because of a Calcutta station on almost the same frequency that's coming in the hard way—via the South Pole—but with an S-9-plus-40 signal.

Impossible? No! I lost a Finn I was talking to, on 10 meters back in 1948, when 10 was hot. He was QRM'd out by a W5 who wanted to get a message into New York City. Only this W5 was maritime mobile, working with 120 watts from a ship in the Bay of Bengal, 250 miles west of Sumatra, at the time. My beam was working just fine; the Bay of Bengal lies just the other side of Finland on a Great Circle map.

O.K.—So what's with the S-meter report? Nothing. It doesn't tell a thing. A peanut whistle with a miscut antenna that's dragging on the ground at one end can, if the skip happens to be just right, lay in a signal 2500 miles away that drowns out a full gallon 25 miles away.

What I was suggesting was that we take the Info Theory concept of signal-to-noise to heart, and give S-over-N readings, instead of S readings. . . .

Regards,

John W. Campbell, W2ZGU



ALL TIMES IN EST

EASTERN USA TO:	ALL TIMES IN EST			80 Meters
	15 Meters	20 Meters	40 Meters	
Northern & Central Europe	1530-1800 (0-1)	0500-1400 (3) 1400-1730 (3-4) 1730-1930 (2)	1830-2230 (3-4) 2230-0100 (2-3)	2000-0000 (3)
Southern Europe & North Africa	1500-1830 (1)	0500-1500 (3) 1500-1800 (3-4) 1800-2030 (1-2)	1830-2230 (3-4) 2230-0030 (2-3)	2000-2330 (2-3)
Near & Middle East	NIL	0500-1300 (1) 1300-1500 (2) 1500-1830 (2-3)	2000-2300 (2-3)	2100-2230 (1)
Central & South Africa	1700-1900 (1)	0500-1230 (1) 1230-1600 (2) 1600-2000 (3) 2000-2100 (1)	1900-0100 (3)	2000-2330 (1-2)
South America	1430-1730 (1-2)* 1300-1600 (2-3) 1600-1830 (3-4) 1830-1930 (1-2)	0530-1600 (2) 1600-2100 (3-4) 2100-0200 (1-2)	1900-0300 (3) 0300-0700 (2)	2000-0400 (2)
South East Asia	NIL	0700-1100 (1) 1100-2100 (0-1)	0300-0500 (0-1)	NIL
Australasia	1800-2200 (1)	0630-0900 (1) 1600-1930 (1) 1930-0000 (1-2)	2200-0530 (2) 0530-0800 (3)	0130-0600 (1-2)
Guam & Pacific	NIL	0630-1100 (1-2) 1100-2030 (0-1) 2030-2300 (1-2)	2330-0800 (2-3)	0030-0600 (1-2)
Japan & Far East	NIL	0630-1100 (1-2) 1100-2200 (1)	0200-0600 (1)	0330-0500 (0-1)

ALL TIMES IN CST

CENTRAL USA TO:	ALL TIMES IN CST			80 Meters
	15 Meters	20 Meters	40 Meters	
Western & Central Europe	NIL	0500-1700 (3) 1700-1930 (1-2)	1900-0000 (2-3)	2000-2300 (1-2)
Southern Europe & North Africa	1330-1830 (0-1)	0600-1400 (2-3) 1400-1830 (3-4) 1830-2000 (1-2)	1830-0100 (3)	1930-0000 (2)
Central & South Africa	1400-1800 (1)	0500-0730 (1-2) 0730-1400 (1) 1400-1900 (3) 1900-2000 (1-2)	1830-0000 (3)	1930-2230 (1-2)
Central America & Northern So. America	1400-1700 (1)* 1100-1800 (3-4) 1800-2000 (1-2)	0630-1600 (3-4) 1600-2100 (4-5) 2100-0100 (2)	1800-0500 (4-5) 0500-0730 (2-3)	1830-0400 (3)
South America	1300-1800 (1-2)* 1200-1500 (2) 1500-1830 (3-4) 1830-1930 (1-2)	0600-1500 (2) 1500-2100 (3-4) 2100-0200 (2-3)	1900-0500 (3-4)	2000-0400 (2)
Japan & Far East	NIL	0600-1000 (1-2) 1000-1800 (1) 1800-2300 (2)	0200-0500 (2)	0330-0500 (0-1)
South East Asia	NIL	0730-1130 (1) 1130-2000 (0-1) 2000-2230 (1-2)	0330-0630 (1)	NIL
Hawaii	1930-2200 (1)	0900-1630 (2-3) 1630-0000 (3-4)	2230-0500 (4) 0500-0900 (2-3)	0000-0600 (3)

ALL TIMES IN CST

CENTRAL USA TO:	ALL TIMES IN CST			80 Meters
	15 Meters	20 Meters	40 Meters	
Australasia	1800-2200 (1)	0700-1000 (1) 1500-2000 (1) 2000-0000 (2-3)	2300-0400 (3) 0400-0700 (2-3)	0000-0600 (2)
WESTERN USA TO:	80 METERS			
Europe & North Africa	NIL	0600-1500 (1) 1500-1700 (1-2)	1900-2300 (1)	2000-2230 (0-1)
Central & South Africa	0700-1100 (0-1)	0600-1400 (0-1) 1400-1800 (1-2)	1830-0000 (2)	2000-2230 (1-2)
South America	1200-1800 (0-1)* 1100-1500 (2) 1500-1830 (3-4) 1830-1930 (1-2)	0600-1500 (2) 1500-1630 (2-3) 1630-2000 (3-4) 2000-0100 (1-2)	1900-0200 (3-4)	2000-0100 (2-3)
Guam & Mariana Islands	1700-2200 (1-2)	0700-0900 (2) 1030-2000 (2) 2000-0000 (3-4) 0000-0300 (1)	0100-0500 (3-4)	0130-0400 (2-3)
Australasia	1300-1800 (2) 1800-2100 (3)	1100-1800 (1) 1800-2030 (2) 2030-2230 (3-4)	2130-0530 (3-4)	2230-0430 (2)
Japan, Okinawa & Far East	1900-2200 (0-1)	0730-0900 (1-2) 0900-1900 (2-3) 1900-0200 (3-4)	0030-0500 (3-4)	0200-0430 (2-3)
Philippine Islands & East Indies	1900-2300 (1)	0700-0930 (2) 1300-2130 (1) 2130-0200 (2-3)	0230-0500 (1-2)	0330-0430 (0-1)
Malaya & South East Asia	2030-2300 (1)	0730-1130 (2) 1130-2300 (1) 2300-0130 (2-3)	0400-0600 (0-1)	NIL
Hong Kong, Macao & Formosa	1800-2230 (0-1)	0700-2200 (1-2) 2200-0200 (3-4)	0230-0530 (2-3)	0300-0500 (1-2)

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, for the most part, calculated from basic ionospheric data published by the CRPL of the National Bureau of Standards and are valid through July 15th, 1955.

Symbols For Expected Percentage of Days of Month Path Open:  
(0) None (1) 10% (2) 25% (3) 50% (4) 70% (5) 85% or More.

\* Indicates time of possible ten-meter openings.





# Ionospheric

## Propagation Conditions

Forecasts by

**George Jacobs, W2PAJ/3**

607 Beacon Road, Silver Spring, Md.

### General Shortwave Propagation Conditions—June

- 6 Meters:** Occasional short-skip openings between 1000 to 1400 miles expected as a result of seasonal sporadic-E propagation. When skip stations are observed at less than 500 miles away on ten-meters, check six-meters as the chances are very good that the band will also be open in the same general direction but with the skip out about 1000 miles or more.
- 10 Meters:** Occasional DX from most parts of the USA to South America possible during the daylight hours. Frequent short-skip sporadic-E openings expected (up to 30% of the time) with the skip distance between 500 to 1300 miles.
- 15 Meters:** DX conditions not as good as during the fall and winter months, however fair DX is still possible from the USA to South America and other southern areas. Fairly consistent regular F2 layer short-skip openings at skip distances greater than 2000 miles, expected from approximately 1100 to 2100 *local standard time*. Sporadic-E layer short-skip openings are expected to occur on most days with the skip between 400 and 1300 miles.
- 20 Meters:** This will be the best band during June for DX. It will open shortly after sunrise and remain open until a few hours after sunset, with DX possible to most areas of the world. Regular F2 layer short-skip, with the skip distance between 1000 and 2200 miles should be possible between 0600 and 2200 *local standard time*. Frequent sporadic-E openings, with the skip distance between 300 and 1300 miles, are expected on most days of the month.
- 40 Meters:** Fairly good DX openings to most areas of the world expected from a few hours before sunset to a few hours after sunrise. F2 layer short-skip should be possible around the clock with the skip distance greater than 600 miles during the evening and night hours between 100 and 600 miles during the daylight hours. Higher static levels will be noticed during June than during the winter months.
- 80 Meters:** Seasonally higher static levels and ionospheric absorption will result in poorer DX conditions on this band than during the winter months. However, DX conditions on some nights should be fair to many areas of the world. During daylight hours, propagation will be limited to within approximately 200 miles from the transmitter.
- 160 Meters:** Because of ionospheric absorption daytime propagation is limited to about 50 miles. Nighttime propagation should be possible to distances up to about 1800 miles.

This overall picture of band conditions is intended to indicate qualitative changes in each amateur band from

month to month for both DX and short-skip propagation conditions. For specific time of band openings for certain popular DX circuits, refer to the *CQ Propagation Charts* on the opposite page.

### Sunspot Cycle

This month's *Charts* are based upon a predicted smoothed sunspot number of 17 centered on June, 1955. The monthly Zurich sunspot number reported for March, 1955 was 4.7 resulting in a provisional 13-month running smoothed sunspot number of 7.5 centered on September, 1954.

### Review of Shortwave Propagation Fundamentals (con't)

In April we discussed the role of the ionosphere in shortwave propagation, and the fact that strongly ionized layers will reflect higher frequencies than will weakly ionized layers and that the degree of ionization of the various layers of the ionosphere is dependent for the most part upon the ultra-violet radiation received from the sun. As we know from observing seasonal weather changes, the sun's activity is anything but constant. This month we shall discuss some of the variations in the sun's behavior and its influence upon the ionosphere and shortwave propagation.

### Daily and Seasonal Solar Variations

The position of the sun with respect to the earth's atmosphere, varies both daily and seasonally. The daily variations are due to the earth rotating about its axis every twenty-four hours. This changing position between a fixed point on the earth and the sun causes not only a variation in visible light resulting in night and day, but also a corresponding variation in the ultra-violet intensity that reaches the ionosphere at that specific point above

Moderate ionospheric disturbances are forecast for June 12-16 and 19-21. Exceptionally good shortwave propagation conditions will most probably occur during June 8-10 with the period June 26-28 somewhat unstable.

the earth. During the daytime hours, when ultra-violet radiations are strongest, the ionosphere is strongly ionized, and relatively high radio frequencies are reflected back to earth. During the hours of darkness, very little ultra-violet radiation reaches the ionosphere from the sun, and the region decreases to a single weakly ionized layer. If, during the night, we were to use the same high frequencies that we use during the day, we would find that the signal would penetrate completely through the weakly ionized layers and not be returned to earth. Therefore, at night, we must use a lower frequency which

[Continued on page 64]



# the YL's Frequency



Monitored by

**Louisa B. Sando, W5RZJ**

*Jicarilla Apache School, Dulce, New Mexico*

Last call! Soon after this is in print YLs from all over the U.S., from Canada, Alaska and Hawaii will be gathering at the Miramar Hotel in Santa Monica, Calif., for the First International Convention of the Young Ladies' Radio League. Any and all YLs are welcome, whether or not members of YLRL.

Sponsored by the Los Angeles YL Radio Club, with W6UHA, Maxine Willis, as Chairman, the convention has received careful planning and much hard work from the Los Angeles area YLs. Details of the convention have been reported here for a number of months. Briefly, this is the program as now (April) set up. Friday: Registration and reception. Saturday afternoon: Luncheon with style show, technical speaker, business meeting, exhibits. Saturday evening: YL-OM banquet, installation of officers, prizes. Sunday: The picnic originally scheduled has been cancelled, and a tour is now planned.

Each YL attending the convention will receive a handcrafted copper bracelet and a handsome certificate.

Convention tickets for the YLs, to cover all activities, will be \$10. OM banquet tickets will be \$6. Those wishing to stay at the Miramar, should get reservations in early. If you need help in mak-

ing reservations, or want to stay in a YL's home, contact W6JZA, Elsa Wheeler, or K6ANG, Billie Blakesley. YLs planning to attend the convention should communicate with W6UHA by June 15th, if possible.

Be seeing you!

## WAS/YL, YLCC, WAC/YL

Since there have been many inquiries regarding the YLRL awards available, we again publish here the rules governing these awards. First of the awards to be established was WAS/YL. To date (April '55) these lucky Hams possess them: W2QHH, W1FTJ, W4ARR, W8HWX, W3OP, W4SGD, W9CMC.

Note, as indicated in the rules, W1MCW, Lou Littlefield, is custodian of WAS/YL, and applications for this award should be made to her.

Most popular YLRL award is the YL Century Certificate for confirmed contacts with 100 or more YL operators. Just a year ago we reported the first fifteen certificates to be awarded. Here is the up-to-date list:

W1BFT	W4ARR (3)	W3RXV	W6KER
W2QHH (6)	W8HUX (2)	W9OMM	W6QGX
W3JSH	W3OP	W7RT	W4LAS
W8HLF (4)	W9CMC (2)	W9NN	W7ULK
W4SGD (3)	W4KYI	W2OWL	W8SPU
W4CKB	W4VJX	W8MBI	W6JZA
W3OQF	W8SDD	W0HFP	W6FKH
W7HHH (2)	W1VOS (1)	W7FWR	W4YYJ
W8ATB (2)	W0TAB	W6EHA	W4BLR
W8HWX (3)	W6WRT	W8VQD	W1AW



Calling all YLs! Come to the First International YLRL Convention June 24-26 at Santa Monica, Calif. YLRL's president, W6CEE, Vada Letcher (left), and W6MFP, Agnes Langevin, operate portable beside the pool at the Miramar Hotel, site of the convention. Top prize will be a Gonset Communicator similar to the one shown here.



The number following the call indicates the number of endorsements issued for confirmations of contact with each additional 50 YLs. Note that W2QHH has (6), having confirmed contacts with 400 YLs!

W7GLK, Dot Dickey, who is YLCC custodian, tells us she is resigning. Another custodian will be appointed when new YLRL officers take over in July; in the meantime, send cards to Dot.

Least known of the YLRL awards is WAC/YL. The YLRL offers a WORKED ALL CONTINENTS-YL award to any amateur offering proof of two-way communication with a YL operator on each of the six continents. No formal rules have been drawn up for this award, but essentially the rules for the other awards apply. YLRL's vice president (currently W6KER, Gilda Shoblo) handles inquiries and applications for the award.

To date, only one WAC/YL certificate has been issued. The proud possessor is W2QHH, Howy, who received it in 1948 (see "YL's Frequency," CQ, March, 1949).

### YLRL Directory

For YL or OM alike who may be seeking any of these YLRL awards, we recommend the *Directory* of the Young Ladies' Radio League, just off the presses, and listing all of the over 500 members of YLRL with call, QTH, bands operated and other details wherever they were available. Copies of the *Directory* are available for \$1 from W6DXI, Gladys Eastman, 735 Glen Ave., Glendale 6, Calif.

### Ham Radio to the Rescue

Back in the January, 1952, issue of CQ we told you about Pat Parks of Rotan, Texas, who had recently received her license as W5TTU. Pat was seriously ill after tuberculosis had hit first one lung and then the other, and had become completely discouraged—until she found Ham radio. At the time she credited it with saving her life, and it gave her incentive to carry on. Now, 3½ years later, Pat is making fine progress, as you can see from the photo here. She says she was so busy organizing a net and being NCS from 9 to 12 daily that she didn't have time to feel sorry for herself. Called The Ladies and Knights of the Roundtable, the net has given many other shut-ins a chance to forget themselves. Pat also is a member of the North Texas Emergency Net, MARS, CAP, is EC for Rotan, checks into the Texas YL Round-up net, and is 5th district chairman for YLRL as well as chairman of its Nominating Committee for '55. FB, Pat!

### Here and There

Congratulations to W9YXK, Rita, on the arrival of a new YL in March. . . . To W5VXK, Delores, who was televised recently from her hospital bed while announcing



The 8th Annual Michigan Amateur Radio Convention held at Grand Rapids March 19 brought together these YLs. L. to r., standing: W8's SJF, Gladys; QOW, Emma; ORP, Donna; WN8UAU, Retta; W8UAP, Marion; RIR, Beth; W9AQB, Norma; W8KLZ, Betty; ONI, Hope; NDS, Paulina; QOM, Ann; W9LOY, Cris. Seated: W8LIV, Barbara; WN8UVV, Jeanne; W8FPT, Wava; ATB, Esther; W1YLP (ex-KH6TI), Dell; W8MBI, Marie. W8EIR, Kate, also attended.

the arrival of her new daughter to W5YKE, Martha, via Ham radio. . . . To Hope Plummer, ex-W2RTZ, who is now Hope Brock, with new call W8UFZ.

W5EYE has received an operator-of-the-month certificate from Army MARS, Marion works 60 to 100 hours per month handling traffic on MARS frequencies. . . . W5SYL, who is control station for all-Texas Wing CAP, was complimented recently for her fine work in aiding during a plane search, at which time Iva was on the air for 14 hours monitoring and relaying. . . . W5ZPD, Cindy, had an FB write-up in the Texas Medical Center



W5TTU, Pat Parks, while awaiting recovery of her health, spends much of her time operating from this bedside position.

News for the efficient way she assisted in handling traffic for a patient in a Houston hospital.

Our thanks to W8ATB, Esther, for news of the Grand Rapids Convention (see photo). At the gathering the YLs were easily identified by their prominent badges be-ribboned in red, white and blue. A special YL meeting was held and the girls enjoyed perusing the YLRL album and scrapbook.

The Tuesday 75-meter YL net, with W4HLF, Arlie, as NCS, is planning a picnic at Big Meadow on Sky Line Drive, Va. July 31. All YL's and their families are welcome.

W3QOG, Emma, has been visiting in South Africa. . . . KL7RN, Jeanne, joined the YL nets while vacationing Stateside. . . . W0TQQ, Jerry, has been vacationing in Hawaii. . . . WN1BHS, Susan, while on a trip abroad, visited ex-King Farouk's palace and saw his custom Swedish-built radio station.

New members of the San Francisco YLRL include W6FEA, Gertie; K6DEN, Eve; W6FKY, Aileen; W6ZKD,



The first and only WAC/YL certificate issued to date, awarded to W2QHH, Howy Bradley, in 1948, was a special job in silver letters on a YLRL proficiency certificate.



# the Novice Shack



Conducted by

Herbert "Herb" S. Brier, W9EGQ

Pictured on this page is the attractive Viking "Adventurer" transmitter I assembled from a kit supplied by the *E. F. Johnson Company*, Waseca, Minnesota, for review. It is a crystal-controlled, 45-watt, code transmitter for the amateur bands between 3.5 and 29.7 Mc, housed in a 10½ X 8¼ X 7¼-inch aluminum cabinet. It is finished in dark brown, with the center of the front panel finished in gray, to match the plate and grid milliammeter.

The crystal oscillator uses a 6AG7 tube in a modified Pierce circuit. Eighty-meter crystals are used for 80-meter output and for 40-meter output if desired. Forty-meter crystals are used for output on all other bands. The oscillator tube becomes a buffer-doubler when driven by an external variable-frequency oscillator.

The oscillator drives an 807 power amplifier, which utilizes a *pi*-type tank circuit, capable of feeding power into a fairly wide range of antenna impedances.

Band changing is accomplished by means of a 5-position switch in conjunction with tapped coils in the oscillator and amplifier plate circuits. A dual-range milliammeter, plus a 2-position switch, permits measuring the 807 grid and plate currents. Maximum 807 grid current indicates when the oscillator is properly tuned.

The conventional power supply utilizes a 5U4G(A) rectifier and a capacitor-input filter. It delivers an output of 450 volts, d.c., at 150 milliamperes. An accessory socket makes this power available for other uses when the transmitter is not in operation.

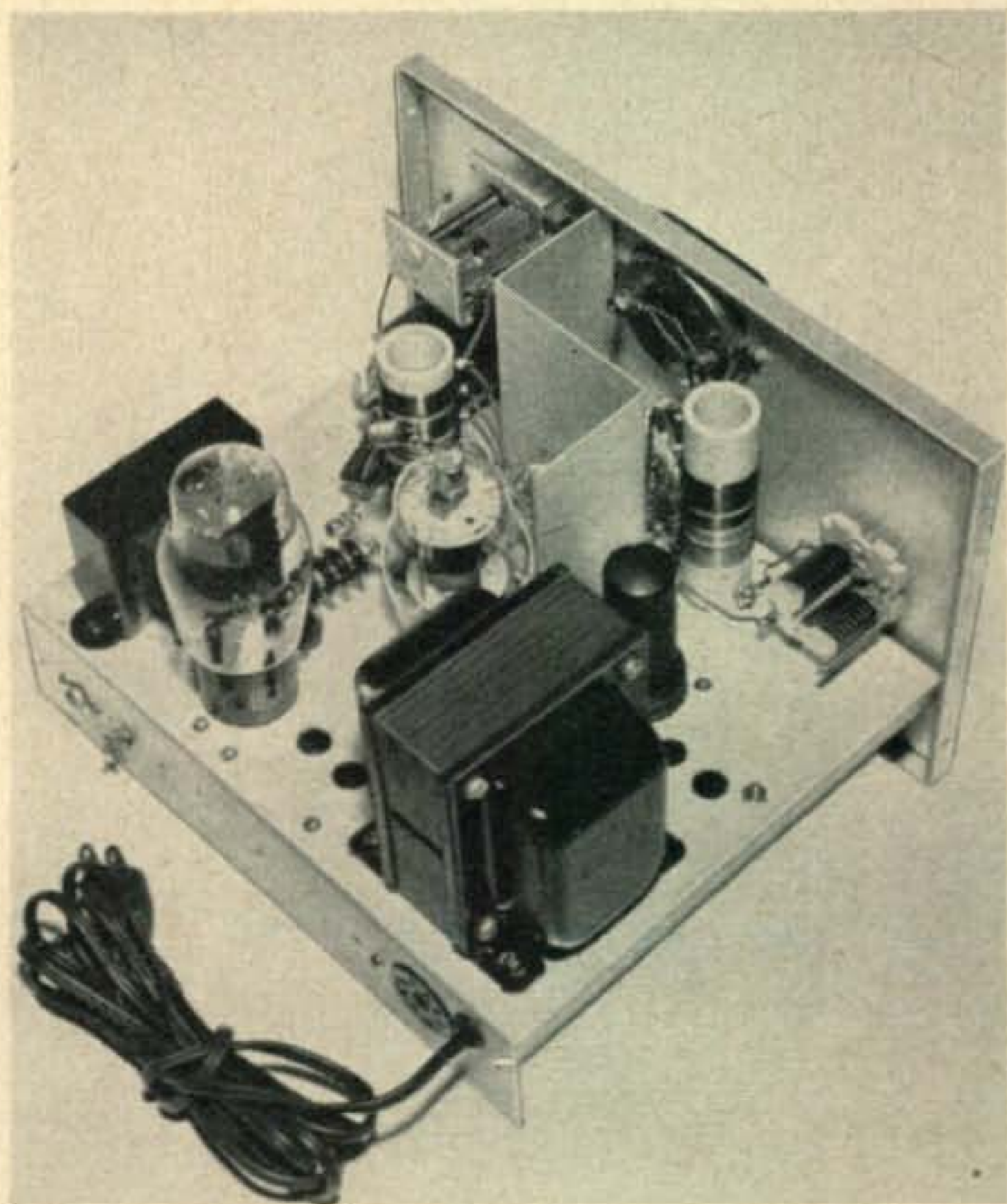


Viking "Adventurer".

Besides the metal cabinet, precautions against television interference include inductance-capacitance filtering of the 117-volt power leads and the "hot" key lead, as well as bypassing of the meter and filament leads. Also parasitic suppressors are incorporated in the plate and grid leads of the 807.

## Assembling The "Adventurer" Kit

Anyone who can follow clear, step-by-step instructions will have no trouble in assembling the "Adventurer" kit. All holes are drilled; therefore, the only tools required are one small and one medium screwdriver, a pair of pliers for cutting the hook-up wire to length and tightening a few panel nuts, a ruler, a small knife, a soldering iron or soldering gun, and a few feet of rosin-core solder.



Completed "Adventurer" kit: Rear view with cover removed.

The first step in assembling the kit is to mount the components, which is done with a lock washer on every mounting screw. I identified each component as I mounted it by marking its "code number" in pencil beside it on the chassis. Doing so saves a lot of page turning in the instruction



book during the wiring operation, because the wiring instructions follow the form, "Connect terminal No. 2 of X3 to terminal No. 4 of SW2." Without such identification of the components, I usually forget what I am supposed to do with them by the time I locate them in the appropriate illustration in the instruction book.

Although not a job that can be rushed, wiring is quite simple, because the wiring instructions are very explicit. Not only do they tell where each wire is connected, they also tell how long to cut it and where to lay it on the chassis.

### Testing The Transmitter

After completing the wiring of the transmitter by following instructions exactly, I plugged in the tubes and line fuse and performed the preliminary tests outlined in the instruction book, before putting it in the cabinet. Then I connected a 40-watt, 117-volt light bulb to the male half of the antenna connector, which I plugged into the antenna output socket for use as a dummy antenna.

When the transmitter was fully loaded to 45 watts input, the bulb glowed with a brilliancy equivalent to about thirty watts output on all bands up to 15 meters. However, there was a noticeable reduction in output on the 10-meter band. The only other noticeable difference in the operation of the transmitter on the different bands is that the controls tune more sharply on the higher frequencies.

Tuning any new transmitter into a lightbulb load before connecting it to a radiating antenna is always wise. It permits the operator to see the effect of each adjustment on transmitter output. Thus, it helps to visualize what happens when an actual antenna is substituted for the light bulb. The tuning procedure is the same with either; however, the actual settings of the amplifier tuning and loading controls will differ.

### On-The-Air Tests

For the first on-the-air test, I tuned the "Adventurer" up to a doublet antenna on 3708 Kc. Between 5:40 p.m. and 8:00 p.m., with time out for dinner, I worked three states on four calls. The states worked and the reports received were West Virginia, 579X; Georgia, 589X; and Wisconsin, 599X.

Transferring operations to 7,185 Kc, I worked a KN2 and a KN3 the next afternoon, in spite of poor conditions. Reports received were RST 449X and 579X.

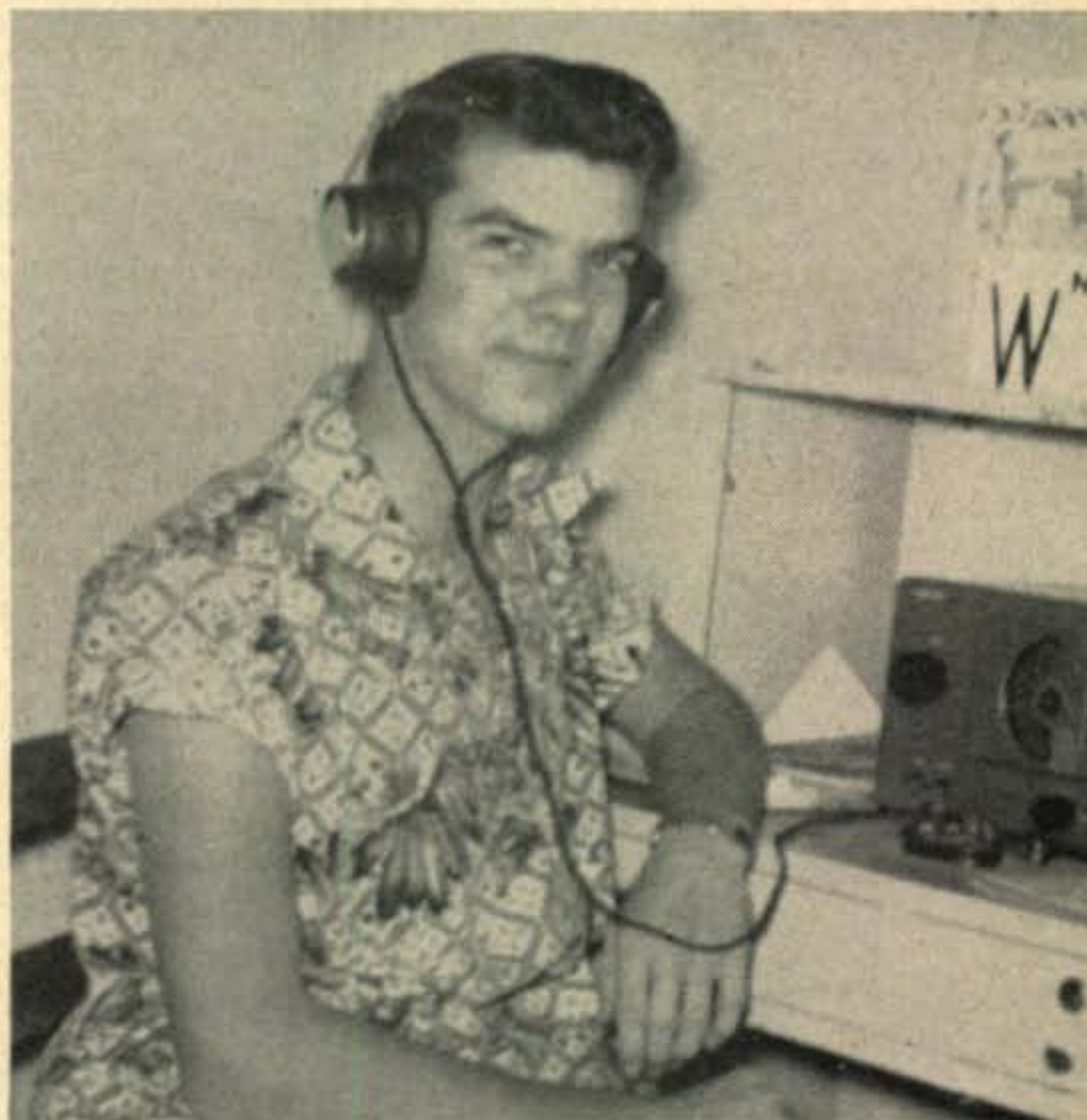
Ten meters and 15 meters were both dead and 20 meters was very weak at the time of the test; therefore I did not try to establish contacts on them. Instead, I checked how well the transmitter would load the different antennas I had available on the various bands. I could load all of them without difficulty. Nevertheless, the "Adventurer" will not feed power into all types of antennas equally well. For that matter, neither will any other transmitter.

*[Continued next page]*

**Chuck Bunnell (14), WN8UAZ worked 44 states and six countries on the 80-meter novice band, with his TR-75TV transmitter and SW-54 receiver. The secret, he says, is to stay up all night and listen, listen, and listen! Write to him at 2125 Sheffield St., Middletown, Ohio.**



**Mildred B. Gallaher, KN4BEA, Winchester, Kentucky, made over 450 contacts in 46 states and seven countries in less than four months as a novice. She runs 75 watts and operates on 80 and 40 meters.**



**A typical Novice station, WN5HVH, consisting of an S-38C receiver and an AT-1 transmitter. Van Orrick, (15), Shamrock, Texas is the operator.**





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440	444	447	451	454	457	461	464	468	472	475	479
441	445	448	452	455	458	462	465	469	473	476	480

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1000 KC. Type DC-9. In octal tube base type holder.....	3.45	2931 KC. DC-34.....	2.99
2009 KC. DC-34.....	2.99	2973 KC. DC-34.....	2.99
2110 KC. DC-34.....	2.99	2977 KC. DC-34.....	2.99
2126 KC. DC-34.....	2.99	3023 KC. DC-34.....	2.99
2142 KC. DC-34.....	2.99	3043 KC. DC-34.....	2.99
2166 KC. DC-34.....	2.99	3053 KC. DC-34.....	2.99
2174 KC. DC-34.....	2.99	3055 KC. DC-34.....	2.99
2182 KC. DC-34.....	2.99	3088 KC. FT-243.....	2.99
2182 KC. FT-243.....	2.99	3093 KC. DC-34.....	2.99
2206 KC. DC-34.....	2.99	3093 KC. FT-243.....	2.99
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2500 KC. FT-243.....	1.99	3193 KC. FT-243.....	2.99
2559 KC. DC-34.....	2.99	3123 KC. DC-34.....	2.99
2567 KC. FT-243 & DC-34.....	2.99	3125 KC. DC-34.....	2.99
2629 KC. DC-34.....	2.99	3188 KC. FT-243.....	2.99
2632 KC. FT-243.....	2.99	3193 KC. DC-34.....	2.99
2637 KC. DC-34.....	2.99	3193 KC. FT-243.....	2.99
2637 KC. FT-243.....	2.99	3198 KC. FT-243.....	2.99
2638 KC. DC-34.....	2.99	3203 KC. FT-243.....	2.99
2638 KC. FT-243.....	2.99	5000 KC. FT-243.....	1.99
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1129	2525	2915	3340	4710	5840	6400	7140	7540	7783	8030	8273	8516
1150	2530	2920	3410	4735	5850	6405	7150	7541	7790	8033	8275	8520
1195	2535	2925	3420	4780	5852	6406	7160	7550	7791	8040	8280	8525
1525	2545	2930	3455	4785	5860	6425	7173	7558	7800	8041	8283	8530
1915	2550	2935	3465	4815	5873	6440	7175	7560	7806	8050	8290	8533
1930	2557	2940	3510	4820	5875	6450	7200	7566	7808	8058	8291	8540
1940	2560	2945	3525	4840	5880	6473	7206	7570	7810	8060	8300	8541
1950	2565	2950	3640	4845	5892	6475	7225	7573	7816	8066	8306	8550
1965	2570	2955	3655	4852	5900	6500	7240	7575	7820	8070	8308	8558
2015	2575	2960	3680	4880	5906	6506	7250	7580	7825	8073	8310	8560
2017	2580	2965	3700	4900	5907	6525	7273	7583	7830	8075	8316	8567
2020	2585	2975	3760	4930	5925	6540	7275	7590	7833	8080	8320	8570
2025	2590	2980	3800	4950	5940	6550	7300	7591	7840	8083	8325	8573
2035	2595	2985	3885	4980	5950	6573	7306	7600	7841	8090	8330	8575
2040	2600	2990	3940	4995	5955	6575	7308	7606	7850	8091	8333	8580
2055	2655	2995	3950	5030	5973	6600	7316	7608	7858	8100	8340	8583
2060	2660	3005	3980	5035	5975	6606	7325	7610	7860	8106	8341	8590
2065	2665	3010	3990	5090	5995	6625	7333	7616	7866	8108	8350	8591
2090	2680	3015	3995	5127	6000	6640	7340	7620	7870	8110	8358	8600
2105	2685	3020	4035	5165	6006	6650	7341	7625	7873	8116	8360	8606
2125	2690	3025	4045	5180	6025	6673	7350	7630	7875	8120	8366	8608
2130	2695	3030	4080	5205	6040	6675	7358	7640	7880	8125	8370	8610
2135	2705	3035	4095	5235	6042	6700	7366	7641	7883	8130	8375	8616
2140	2710	3040	4110	5245	6050	6706	7373	7650	7890	8133	8380	8620
2195	2715	3045	4135	5285	6073	6725	7373	7658	7891	8140	8383	8625
2300	2720	3050	4165	5295	6075	6740	7375	7660	7900	8141	8390	8630
2305	2750	3055	4175	5300	6100	6750	7383	7666	7906	8150	8391	8633
2320	2755	3060	4190	5305	6106	6773	7391	7670	7908	8158	8400	8640
2350	2760	3065	4215	5327	6125	6775	7400	7673	7910	8160	8406	8641
2355	2765	3070	4220	5335	6140	6800	7406	7675	7916	8163	8408	8650
2360	2770	3075	4255	5385	6142	6806	7406	7680	7920	8166	8410	8658
2365	2775	3095	4280	5397	6150	6815	7408	7683	7925	8170	8416	8660
2370	2780	3110	4295	5435	6173	6825	7416	7690	7930	8173	8420	8666
2375	2785	3130	4300	5437	6175	6840	7425	7691	7933	8175	8425	8670
2390	2790	3135	4330	5485	6185	6850	7433	7700	7940	8180	8430	8673
2415	2795	3140	4340	5500	6200	6873	7440	7706	7941	8183	8433	8675
2430	2815	3145	4395	5545	6206	6875	7441	7708	7950	8150	8440	8680
2435	2825	3150	4397	5582	6225	6900	7450	7710	7958	8191	8441	8683
2440	2830	3155	4445	5587	6235	6906	7458	7716	7960	8200	8450	8690
2442	2835	3160	4450	5645	6240	6925	7466	7720	7966	8206	8458	8691
2450	2840	3165	4490	5660	6250	6940	7473	7725	7970	8208	8460	8700
2455	2845	3170	4495	5675	6273	6950	7475	7730	7973	8210	8466	8706
2460	2850	3175	4535	5687	6273	6973	7483	7733	7975	8216	8470	8708
2465	2855	3202	4540	5700	6275	6975	7491	7740	7980	8220	8473	8710
2470	2860	3205	4580	5706	6300	7000	7500	7741	7983	8225	8475	8716
2475	2865	3210	4610	5725	6306	7006	7506	7750	7990	8233	8480	8720
2480	2870	3220	4620	5730	6315	7025	7508	7758	7991	8240	8483	8725
2485	2875	3225	4635	5740	6325	7040	7510	7760	8000	8241	8490	8730
2490	2880	3230	4680	5750	6335	7050	7516	7766	8006	8250	8491	8733
2495	2885	3235	4782	5760	6340	7073	7520	7770	8010	8258	8500	8740
2505	2890	3240	4800	5773	6350	7075	7525	7773	8016	8260	8506	8741
2510	2895	3290	4806	5775	6362	7100	7530	7775	8020	8266	8508	8750
2515	2905	3310	4820	5780	6373	7106						

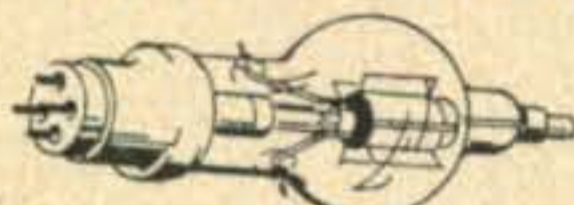
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Complete with Reduction Gear Box; reduces to approx. 60 R.P.M. Motor Rating 110/220 V AC 60 Cycles, 1725 R.P.M. 1/4 h.p. BRAND NEW. Wt. 80 lbs. **\$29.95**

## SENSATIONAL PACKAGE OFFER OF 3 RECEIVERS COMPLETE WITH TUBES & DYNAMOTORS!

<b>75 MC RECEIVER</b> Used, clean. Ship. wt. 14 lbs. Ea. <b>\$4.95</b>	<b>COMMAND RECEIVER</b> 6-9 MC. With tubes, used, good cond. Wt. 10 lbs. Ea. <b>\$4.95</b>	<b>ARC-5 RECEIVER</b> 3-6 MC. Less dial plate. Ship. wt. 10 lbs. Used, clean. Ea. <b>\$4.95</b>	<b>ALL THREE RECEIVERS</b> (Wt 40 lbs.) <b>ONLY \$9.95</b>
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**TUBES—NEW! GUARANTEED**  
Eimac 35T0 Ea. **\$2.95** SCP1 **\$2.95** ANY 2 TUBES VT-127A **2.95** 7BP7 **2.95** **\$5.00**

**COMMAND EQUIPMENT**  
**THE FAMOUS "Q-5er" 190-550 KC.** With tubes. Used, good condition. **\$10.95**  
Wt. 10 lbs.  
**3-6 MC.** With tubes, less dial. Used, good condition. Wt. 10 lbs. **\$7.95**  
**6-9 MC.** With tubes. Used, good condition. A hot buy! Wt. 10 lbs. **\$4.95**  
**BC-456 MODULATOR.** With tubes, good condition. Reduced! Wt. 20 lbs. **\$2.45**

**CONDENSER SPECIALS!**  
2 MFD. 6,000 V. CONDENSER. Used. Ea. Ship. wt. 17 lbs. **\$6.95**  
2 MFD. 5,000 V. CONDENSER. Oil filled. BRAND NEW. Each, Ship. wt. 7 lbs. **\$5.95**

**POWER SUPPLY COMBINATION SPECIAL**  
**1 EA. POWER TRANSFORMER:** Input: 115 VAC 60 cycles. 525 Kva. Output: 1120-0-1120 V. 500 MA. Manufactured by American Trans. Co. Ship. Wt. 60 lbs. BRAND NEW—Ea. **\$14.95**  
**1 EA. SWINGING CHOKE:** 5—25 henry. 550 MA. Brand New. Ship. Wt. 19 lbs. Ea. **\$8.95**  
**4 EA. FILTER CONDENSERS:** 4 Mfd. 1500 VDC. Each, \$1.95. Brand New. All 4. Ship. Wt. 12 lbs. **\$7.80**

Regular Value—\$31.70  
**COMBINATION PRICE— \$27.95**  
**ALL 6 ITEMS.**  
Total Ship. Wt. 91 Lbs.

Items may be purchased separately at individual prices.

**CODE PRACTICE TAPE—NEW!**  
REELS NO. 10, 13, 14. **\$1.25**  
Ship. wt. 1 1/2 lbs. ea.

**METALLIC RECTIFIER**  
Magnesium copper sulphide. Input 18 VAC. Output 12.6 VDC @ 4 amps. New **\$1.95**

**SELENIUM RECTIFIER**  
Input 115 VAC. Output 25 VDC @ 1.5 amps. New. **\$3.95**

**MD-7 MODULATOR**  
Complete with tubes and dynamotor. Excellent cond. Ship. wt. 19 lbs. **\$7.95**

**MARINE BAND RECEIVER**  
1.5 to 3 MC. With 28 V. dynamotor. Brand new in original box. Ship. wt. 19 lbs. **\$14.95**

**ARR-2 RECEIVER**  
234-258 MC. Complete with tubes and dynamotor. Can be converted to 220 MC band. Tube line-up: 3-6AK5-7-9001; 1-12A6. Clean condition. Ship. wt. 11 lbs. **\$7.95**

**455 KC IF TRANSFORMER** **59c**  
Iron powder sleeving. Brand new. Each. **\$1.00**  
2 for only **\$1.00**

**NOTE:** All orders must be accompanied by check, cash or money order with payment in full. NO C.O.D. California buyers: Add sales tax. Check your postal zone and add sufficient postage. For items weighing more than parcel post limit (20 lbs.) shipment will be made via railway express freight collect.

# U. S. CRYSTALS, INC.

**805 SOUTH UNION AVENUE**  
**LOS ANGELES 17, CALIF.**



# CRYSTAL PACKAGE SALE!

Genuine Govt. Surplus Crystals!  
Same day shipment!  
Assorted frequencies!

## START YOUR OWN CRYSTAL BANK NOW!

U. S. CRYSTALS OFFERS THIS GIGANTIC BARGAIN! SET UP YOUR OWN CRYSTAL RESERVE!

**SAME DAY SHIPMENT! SATISFACTION GUARANTEED!**

**WARRANTY!** Crystals in all packages on this page are GENUINE government surplus crystals manufactured by NATIONALLY-KNOWN companies such as Bliley, Piazza, Monitor, John Meck, Cecor, Telicon, etc. U. S. CRYSTALS, INC. GUARANTEES YOUR SATISFACTION OR YOUR MONEY BACK IN FULL!

### SPECIAL PACKAGE DEAL NO. 1



**100**  
CRYSTALS!

**SPECIAL PACKAGE DEAL NO. 1 CONSISTS OF:**

80.....FT-243 10.....FT-171 10.....DC-34-35

**MIXED FREQUENCIES!**  
At least 20 HAM BAND frequencies! For operation on 160, 80, 40, 20, 10, 6 and 2 meters on either FUNDAMENTAL or HARMONIC frequencies.

**SHIPPING TERMS:** Same day shipment! Shipping wt.: 5 1/2 lbs. Check postal zone and ADD SUFFICIENT POSTAGE to cover cost of mailing.

**SPECIAL PACKAGE DEAL NO. 1** Regular value \$69.00!  
**\$9.95**

### SPECIAL PACKAGE DEAL NO. 2

**Guaranteed to oscillate!** Consists of 5 choice crystals:

1-ZENITH MODEL DC-18-A 1,000 KC CRYSTAL; Built-in 12 V. automatic thermostatic controlled heating unit. 8-pin octal base. Reg. value \$5.95  
1-SR-5 BLILEY. 10,000 Kc. Reg. value \$1.99  
1-FT-243. 5,000 Kc. Reg. value. 1.99  
1-FT-241. 200 Kc. Reg. value. 1.99  
1-FT-241. 500 Kc. Reg. value. 1.99

Total regular value \$13.91  
**\$8.95** POSTPAID Satisfaction guaranteed!

### SPECIAL PACKAGE DEAL NO. 3

**36 FT-241 LOW FREQUENCY CRYSTALS**

**FOR SINGLE SIDE BAND**

Frequency range from 370.370 Kc. to 435.185 Kc. in steps of every 1.852 Kc. approximately. Channels: 0 to 35.

**SPECIAL PACKAGE DEAL NO. 3** POSTPAID! Satisfaction guaranteed!  
**\$3.95** Regular value \$14.04

### SPECIAL PACKAGE DEAL NO. 4

The Biggest Crystal Bargain Ever Offered! Consists of:

1 Special Pkg. No. 1. Reg. value \$9.95 1 Special Pkg. No. 3. Reg. value \$3.95  
1 Special Pkg. No. 2. Reg. value 8.95 Total value \$22.85

**SPECIAL PRICE FOR ALL 3 PACKAGES** ..... **\$19.95** POSTPAID! Satisfaction guaranteed!

### SPECIAL PACKAGE DEAL NO. 5

**Guaranteed to oscillate!**

22 FT-241—SINGLE SIDE BAND LATTICE FILTER PACKAGE

Includes 2 ea. 455 Kc. IF transformers

Chan- nel	Crystal Fre- quency (KC)	Chan- nel	Crystal Fre- quency (KC)	Chan- nel	Crystal Fre- quency (KC)	Chan- nel	Crystal Fre- quency (KC)	Chan- nel	Crystal Fre- quency (KC)
38	440.741	42	448.148	46	455.556	50	462.963	54	470.370
39	442.593	43	450.000	47	457.407	51	464.815	55	472.222
40	444.444	44	451.852	48	459.259	52	466.667	56	474.074
41	446.296	45	453.704	49	461.111	53	468.519	57	475.926

Regular value: \$19.38  
Same day shipment. Satisfaction guaranteed.  
**SPECIAL PACKAGE NO. 5** POSTPAID **\$9.95**

### SPECIAL PACKAGE DEAL NO. 6 FOR SINGLE SIDE BAND

80 FT-241—LOW FREQUENCY CRYSTALS  
Including One Channel 70, 500 Kc.

ONE EACH of frequencies from 370.370 to 516.667 Kc. in steps of every 1.852 Kc.  
Regular value: \$63.20  
Same day shipment. Satisfaction guaranteed.  
**SPECIAL PACKAGE NO. 6** POSTPAID **\$14.95**

### SPECIAL PACKAGE DEAL NO. 7

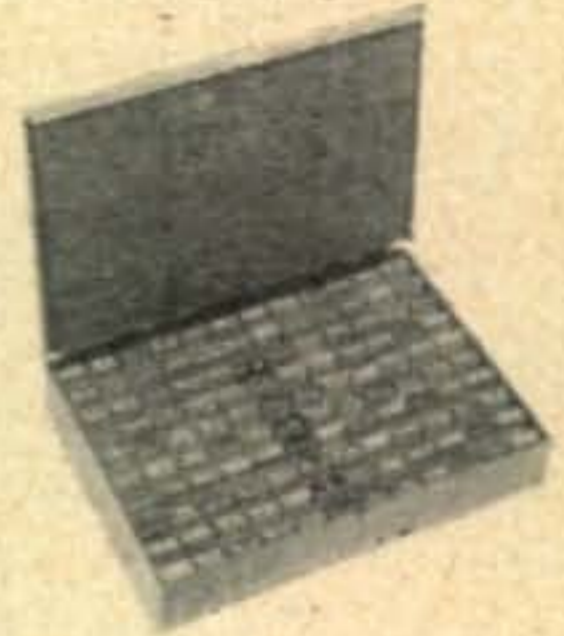
120  
FT-243

Complete with CRYSTAL storage box

Regular value \$87.75

Same day shipment. Satisfaction guaranteed.

**\$24.95**



SPECIAL PACKAGE NO. 7  
Ship. Wt. 9 lbs.

4035	5205	6373	7373	3
4045	5235	6406	7406	7
4080	5305	6440	7440	3
4095	5327	6473	7473	3
4110	5335	6506	7506	7
4135	5397	6540	7540	3
4175	5437	6573	7573	3
4190	5485	6606	7606	7
4215	5500	6640	7640	3
4255	5587	6673	7673	3
4280	5706	6706	7706	7
4295	5740	6740	7740	3
4340	5773	6773	7773	3
4395	5806	6806	7806	7
4397	5840	6840	7840	3
4445	5873	6873	7873	3
4450	5906	6906	7906	7
4490	5940	6940	7940	3
4495	5973	6973	7973	3
4535	6006	7006	8006	7
4620	6040	7040	8040	3
4680	6073	7073	8073	3
4695	6106	7106	8106	7
4735	6140	7140	8140	3
4840	6173	7173	8173	3
4845	6206	7206	8206	7
4852	6240	7240	8240	3
4930	6273	7273	8273	3
4950	6306	7306	8306	7
5030	6340	7340	8340	3

### SPECIAL PACKAGE DEAL NO. 8

120  
FT-243

Complete with crystal storage box

Regular value \$87.75

Same day shipment. Satisfaction guaranteed.

**\$24.95**



SPECIAL PACKAGE NO. 8—Ship. Wt. 9 lbs.

5675	6425	7175	7925
5700	6450	7200	7950
5725	6475	7225	7975
5750	6500	7250	8000
5775	6525	7275	8025
5800	6550	7300	8050
5825	6575	7325	8075
5850	6600	7350	8100
5875	6625	7375	8125
5900	6650	7400	8150
5925	6675	7425	8175
5950	6700	7450	8200
5975	6725	7475	8225
6000	6750	7500	8250
6025	6775	7525	8275
6050	6800	7550	8300
6075	6825	7575	8325
6100	6850	7600	8350
6125	6875	7625	8375
6150	6900	7650	8400
6175	6925	7675	8425
6200	6950	7700	8450
6225	6975	7725	8475
6250	7000	7750	8500
6275	7025	7775	8525
6300	7050	7800	8550
6325	7075	7825	8575
6350	7100	7850	8600
6375	7125	7875	8625
6400	7150	7900	8650

### SPECIAL PACKAGE DEAL NO. 9 CRYSTAL BANK COMBINATION SPECIAL!

Regular value: \$173.50

CONSISTS OF PACKAGE DEAL NO. 7 AND PACKAGE DEAL NO. 8!

240 FT-243

Same day shipment. Satisfaction guaranteed.

**SPECIAL PACKAGE NO. 9**  
Ship. Wt. 18 lbs.

Complete with 2 crystal storage boxes.

**\$39.95**

### SPECIAL PACKAGE DEAL NO. 10 CRYSTAL BANK SUPER PACKAGE!

CONSISTS OF PACKAGE DEALS NO. 1, 2, 3, 5, 6, 7, 8!

The most colossal buy ever offered in crystal history!

Regular value: \$353.03

Same day shipment. Satisfaction guaranteed.

**GRAND TOTAL: 483 CRYSTALS** **\$89.50**

**SPECIAL PACKAGE NO. 10—Ship. Wt. 30 lbs.**

**TERMS:** All items subject to prior sale and change of price without notice. Minimum order: \$3.95. ALL crystal orders MUST be accompanied by check, cash or M.O. WITH PAYMENT IN FULL. NO C.O.D. Postpaid shipments made in U. S. and possessions only. Calif. buyers add sales tax. ADD SHIPPING COSTS FOR ALL PACKAGES OTHER THAN THOSE SENT POSTPAID.

**U.S. CRYSTALS, INC.**

805 SOUTH UNION AVENUE  
LOS ANGELES 17, CALIF.



from

# The Olde Timer

Mike Caveney, VE3GG

It was Bill Barron of Hamilton who first told me about commercial radio broadcasting. Said they were hearing musical programmes from Pittsburgh down there, but I would have to wind special coils, and told me what he was using.

I built the coils, but no success for several nights, and then—one night—I heard a woman's voice—singing. The shock was so great, I felt both sides of my face go cold, as I snatched off the phones and called my wife. The lady was singing, "My Wild Irish Rose."

Unless one has become accustomed for years to hearing nothing but trumpeting, snarling, grunting dots and dashes, he has no conception of the startling effect when—for the first time one hears the human voice—a woman's song—the sweetest music ever heard in a happy home.

A sour note was struck, however, as I listened. I heard the first commercial ever to be on the air. It went this way:

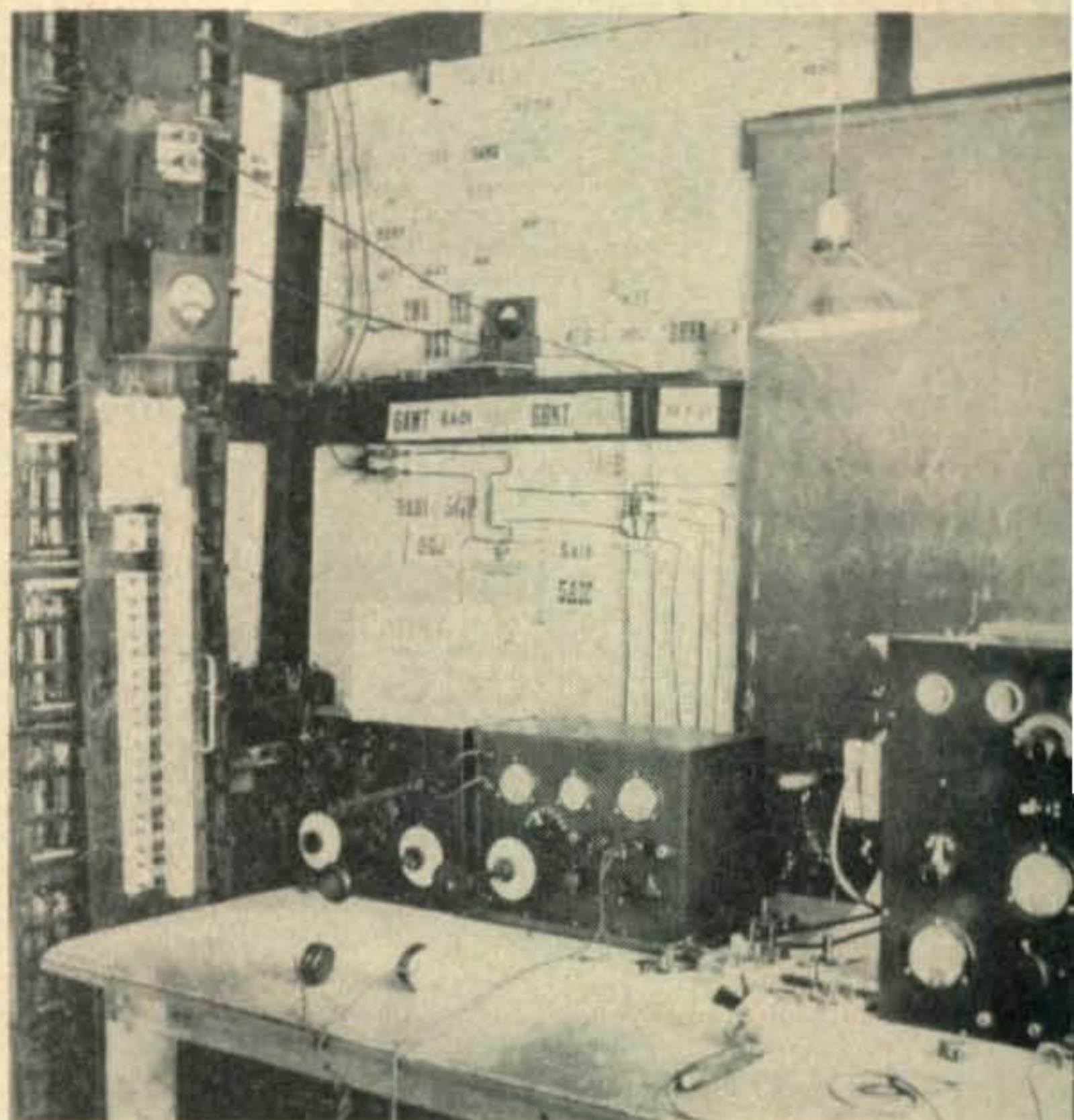
"If your room feels a little cool, and yet does not warrant starting your furnace, because the days are warm, you can make it much more comfortable, by using one of our Westinghouse Cozy Glow Heaters for those chilly evenings."

This first commercial ever heard evidently prompted me in 1922, when requested by "Colliers" to write 2000 words on radio at ten cents per word—to sound a warning note,

which sounds now—somewhat prophetic, because I said:

"This magic—called radio, as a means of communication, is destined to annihilate Distance—and make a golf ball of our globe. When your President speaks, a million tongues of lightning will flash his words around the world. But—before it is too late—let us assign the major portion of this miracle to the best brains of the universe for educational purposes, and the brotherhood of man. The making of tomorrow's citizens, the world over, is of paramount importance. Let us do this NOW—before we fall into the sorry plight of listening to commercial interests, scuffling among the stars for the Almighty dollar."

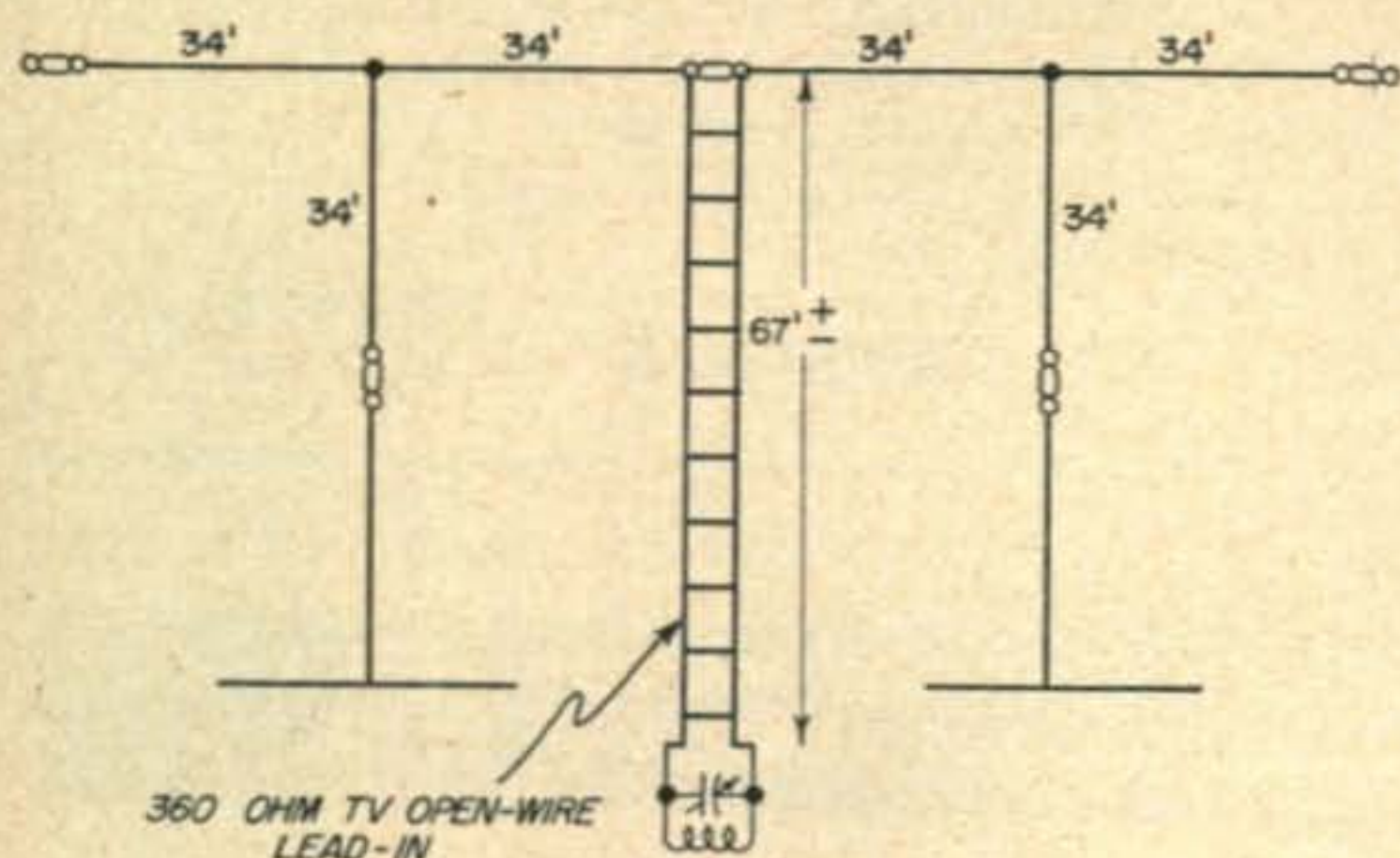
AND—SEE WHAT HAPPENED!



VE3GG shack at Sandy Falls, Northern Ontario, 1923.

## Vertical Additions to Dipoles

KP4JE reports that the addition of two vertical sections to a 136' dipole will perform



"wonders" for your signal. Since altering his antenna as in *Fig. 1* he has had consistent good reports from VK's on 20 and 40 meters, pulled in his first KR6 on 7010 kc., and gets reports of "loudest signal on the band" on 21 mc. He believes this all-band antenna is the next best thing to 3-el beams for each band.

O. M. Grainger claims that the fact that the vertical sections, which are full waves at 28 mc., are fed at the top makes "all the difference in the world" in signal strength, and that the mixed polarization makes for much less fading on weak signals.

The idea looks simple enough to try without a great outlay of labor. It is not recommended for those chaps presently complaining of QRM from VK and ZS.



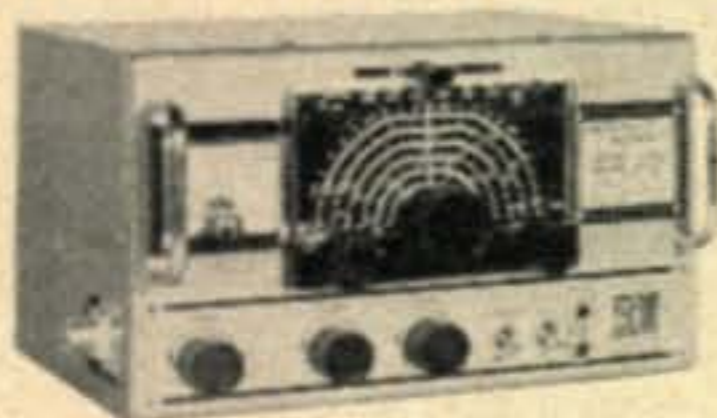
# Lets' go Mobile

WITH  
**WORLD RADIO LABORATORIES**

"The World's Largest Distributor of Amateur Radio Equipment"

**HERE'S THAT  
Famous  
Multi-Elmac  
PAIR!**

**Multi-Elmac  
TRANS-CITER AF-67**



Designed as exciter, speech amplifier, VFO, driver, or complete low power xmtr. Single control band-switches all stages simultaneously 160-10 meters. A-1 NBFM or A-3. VFO or crystal operation. Five circuit meter switch provides for meter readings. 60 watts input to plate of Final tube (6146) maximum. Co-ax connector and universal Pi matching network. Grey hammertone finish. Size. 11 1/4 x 7 x 8 1/2". Power requirements: 500 volts at 170 ma. and 225 VDC at 60 ma.

**ONLY \$9.65 PER MO.  
PAY JUST \$17.70 DOWN  
Cash Price \$177.00**

**Multi-Elmac  
PMR-6A RECEIVER**



Here's a complete 10 tube, dual-conversion communications receiver. 6 bands; - 600 KC to 2000KC, 3.5 to 4.0 mc, 6.9 to 7.4 mc, 13.95 to 14.45 mc, 20.95 to 21.65 mc, and 28 to 29.7 mc. 10 tuned circuits provide high selectivity. Built-in noise limiter. Built-in BFO. Full 3 1/2 watts audio output with less than 1 microvolt signal. Voltage regulated to local oscillator, BFO, and second converter. Antenna input matches 50 ohm coax. 6 VDC or AC at 3.3 amps. 250 VDC at 90 milWamps. Size 4 1/2 x 6 x 8 1/2.

**ONLY \$7.33 PER MO.  
PAY JUST \$13.45 DOWN  
Cash Price  
\$134.50**

**YOU PAY ONLY 10% DOWN AT WRL ON ALL EQUIPMENT**

**Elmac PMR-12A \$134.50**

Same as PMR-6A Except For 12 Volt Operation  
**Mounting Rack for Both PMR-6A & PMR-12A \$6.95**  
**PSR-6 Power Supply \$24.50**  
**PSR-12 Pow. Supply \$24.50**

**WRL's Completely Bandswitching  
65 WATT GLOBE SCOUT**

65 watts on CW, 50 watts on fone

Transmits on 10-160M amateur bands. Metering provided. Pi Network antenna tuner. Self-contained power supply. May be used mobile; provisions for dynamotor attachment. 100% modulation of Final. Thoroughly TVI-screened cabinet. An ideal rig for the novice. Cabinet 8"x16"x8".



Pay Just \$795 per mo.  
**Cash Price: \$99.95**

**Our Financing Requires Only 10% Down**

**ASK ABOUT OUR . . .**

- ✓ 500 Watt Globe King
- ✓ New WRL Kits
- ✓ Hi-Fi Equipment

**FREE 1955 CATALOG!**

Tells the whole story on over 15,000 items for beginner, novice, or amateur. Send for yours today.



**LEO SAYS: Send for our latest Mobile  
Flyer and Reconditioned Equip-  
ment List . . . Today!**

**PLEASE SEND COMPLETE INFORMATION ON ITEMS CHECKED BELOW!**

**RUSH ME:  1955 CATALOG  HI-FI BOOKLET!**

C-6

All Prices Subject to Change Without Notice

WORLD'S MOST PERSONALIZED RADIO SUPPLY HOUSE



Quote Your Top Trade Value of My \_\_\_\_\_  
For Your \_\_\_\_\_  
(WRL Equipment Desired)

- Elmac AF-67    PMR-6A    500 Watt Globe King  
 65 Watt Globe Scout    Mobile Flyer    Rec. Eqpt. List

Name: \_\_\_\_\_

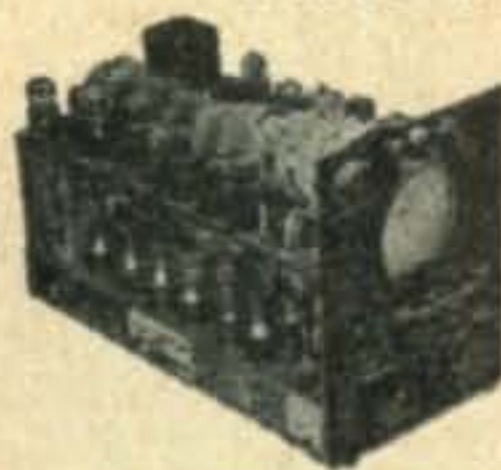
Address: \_\_\_\_\_

City and State: \_\_\_\_\_



# ESSE SPECIALS

## APN-4 RADAR SCOPE

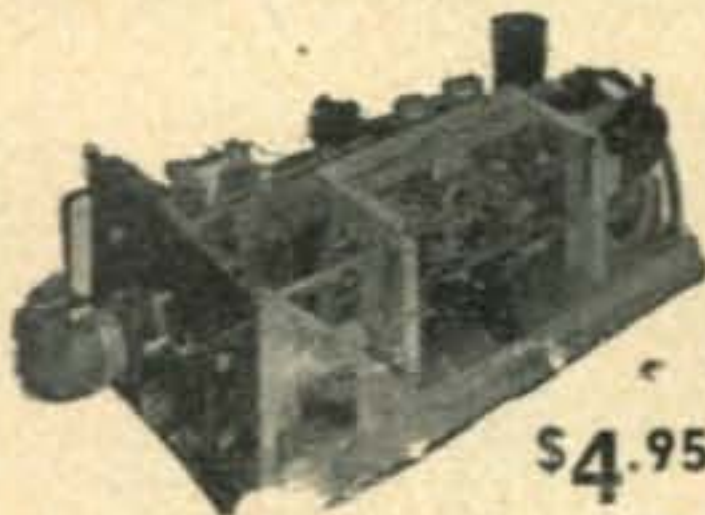


Loran indicator scope. Ideal for conversion to service scope or other uses. Parts alone worth many times price. Contains 27 tubes such as 6SN7GT's, 6H6GT's, 6SL7GT's, 6SJ7GT's, and 6CP1CR, 100 Kc. crystal. In aluminum case approx. 9"x12"x18". Wgt. approx. 15 lbs. packed. Removed from surplus aircraft.

PRICE **\$29.75**

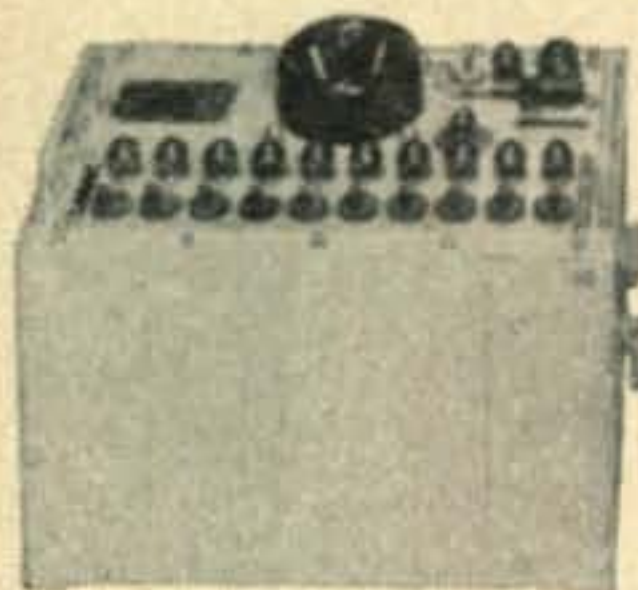
## T-39/APQ-9 RADAR XMTR

Described in Feb. '50 "CQ" for conversion for the 420-450 Mc. amateur band and citizens band. Also contains many parts for the UHF experimenter such as 2-8012 tubes, fan and motor, switches, pots, gears, counter, etc. Equipment removed from aircraft. Our Close Out, quantity limited. Ship wt. 43 lbs.



**\$4.95**  
ea.

## TYPE 1-A NAVY INTERPHONE \$37.50



New Navy 1-A surplus interphone master station for up to 10 sub-stations. 115 V. 60 cycle internal transformer type power supply. Consumes 90 watts in talk position, 50 watts in listen position. Has heavy PM moisture proof speaker and microphone unit. Volume is controllable and indicator lights indicate each station. Heavy construction. Size 14" W. x 8 3/8" H. x 10" D. Wgt. of unit 50 lbs. Housed in gray enameled metal cabinet.

NEW. Price..... **\$37.50**

## RADIO RANGE FILTER—FL-5-C

Similar to the FL-8 filter much desired for ham use. Uses external range-voice switch allowing remote mounting. Size 3-11/16" x 4" x 2-15/16". Ship wgt. 3 lbs.

BRAND NEW..... **\$1.75**



## TU-7, TU-26, and TU-10-B Tuning Units



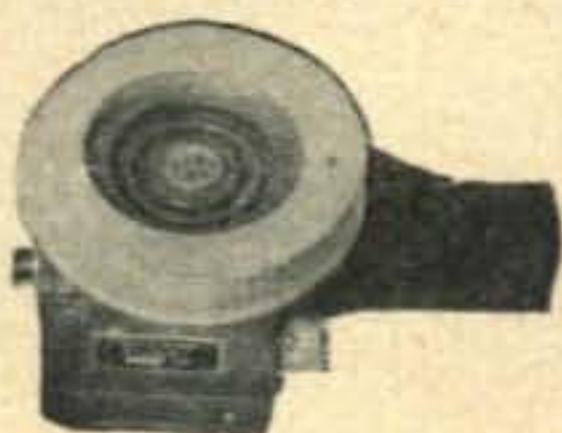
**\$1.95**  
ea.

Used in the BC-375 transmitter, but the most favorable and acceptable piece of surplus gear for obtaining good cheap useable parts. The TU-10-B contains three double spaced transmitting type variable condensers of 16, 27 and 7 plate varieties, 3 mica transmitting type micas, 2 isolantite shaft couplings, antenna coupling switch, two precision vernier dials, chokes, inductances and other useful parts. Better order plenty before supply is exhausted again. TU-7, and TU-26 also in stock, same price. Ship wt. 13 lbs., size 7 3/8" x 16 1/2" x 7 1/2".

Used—\$1.95 ea. New—\$2.50 ea.

## RL-42-B ANTENNA REEL/Motor—\$1.95

Used originally for remote controlling of automatic tralling wire antenna. Motor is 1/8 H.P. 24 V. D.C. with oil-less sleeve bearings. The gear train, breaking and disconnect mechanism, reversible and variable speed motor makes this an ideal unit for conversion to coil winders, etc. Ship wgt. approx. 5 lbs.



Used—\$1.95 ea. New—\$2.50 ea.

## EF-8 GAS ENGINE DRIVEN GENERATOR

**\$42.50 ea.**

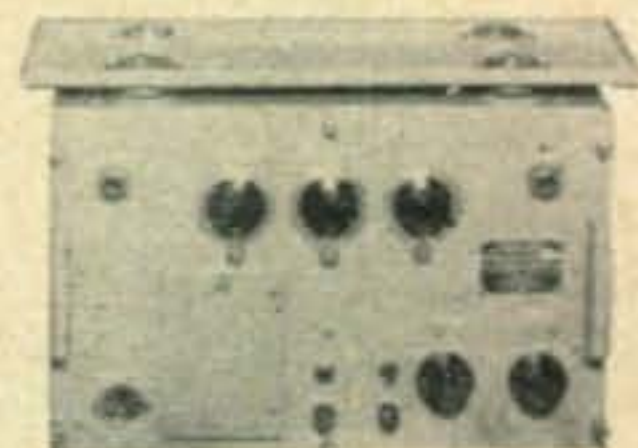


Small 1/2 hp. Lauson gasoline engine driven generator for your mobile and field day use. Supplies both 12.6 V. DC 2 A. filament current and 500 V. 85 milliamper DC plate current. Engine is completely shielded and filtered for minimum noise elimination. Unit comes complete with spare parts, 50 ft. cord, gasoline and oil cans, set of tools, carrying case, and instruction book. Size 21 3/8" long x 16-

1/16" h x 10 3/4" wide. Wgt. packed, including accessories, 130 lbs. Wgt. unpacked 64 lbs. Brand new Navy surplus..... **\$42.50 ea.**

## OAV-1 TEST SIGNAL GENERATOR—\$39.50

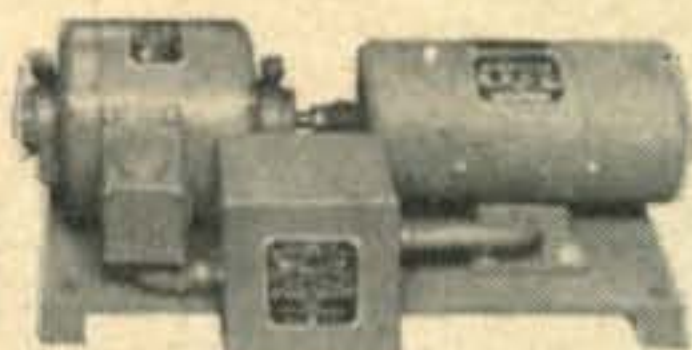
This signal generator was used to provide a test signal of constant frequency for operation and alignment of IF amplifier stages in the CG-46ACQ type receivers. The generator covers the range between 150-250 megacycles. Amplitude modulated square wave output is obtained at frequencies of .1, 1, 10, and 100 Kc. depending on the position of the Freq. mod. Pulse switch. A 15 Mc. signal is also provided by a second osc. stage. Power is supplied by internal 115 V., 60 cycle AC supply connected to source by cord provided. Wgt. of unit 62 lbs.



BRAND NEW with instruction book. Price **\$39.50 ea.**

## TYPE CAEN-21887 MOTOR GENERATOR SET

**\$35.00**



115 V. 60 cycle 3400 RPM GE enclosed motor of 1/4 Hp. drives a DC generator with outputs of 400 V. 155 Ma.; 400 V. 20 Ma. and 15 V. @ 3.5 amps. Makes an ideal power supply for surplus transmitters supplying both HV and filament. Unit weighs 82 lbs. and measures

22 1/2" L. x 8" H. x 10" D. overall. BRAND NEW—Motor & Gen..... **\$35.00**

## R-1/ARR-1 RECEIVER — \$2.95



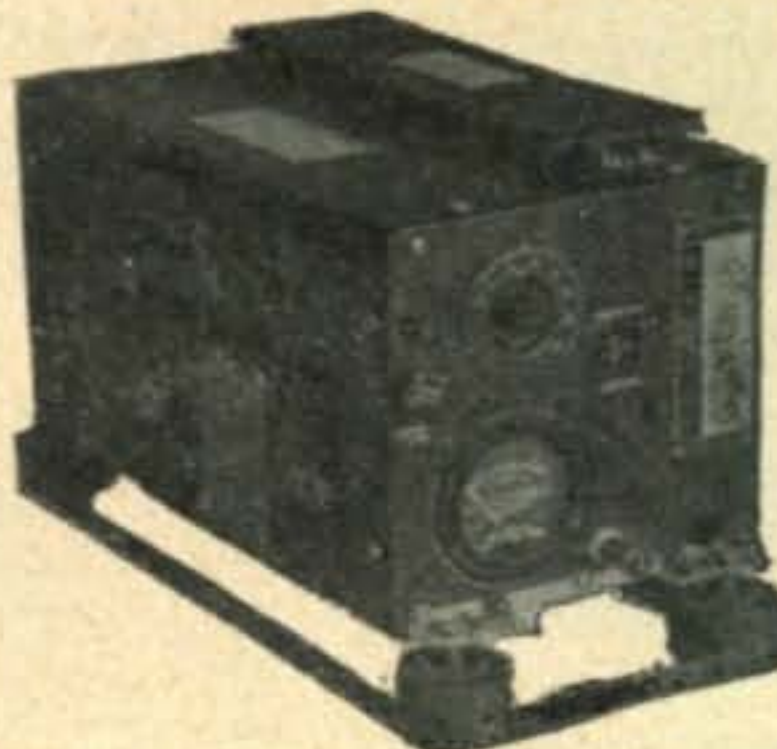
Described in "Radio TV News" Jan. 1949 for use as 220 Mc. converter. Essentially a two stage RF acorn tube superhet converter as it now stands. Small enough for mobile only 3 1/2" W x 3" H x 10" D. Rugged Aluminum construction. Uses four 954 acorn tubes included. Filaments now operate on 12 or 24 volts by merely throwing switch in unit or very easily modified for 6 V. operation. Dial is calibrated in range of 234-258 Mc. Operation can be changed for use from 50 to possibly 300 Mc. Also, the ARR-1 could be used for a preselector. Wgt. of unit 4 lbs. Cover not shown but included. Complete with conversion as written in above mag. Brand new demilitarized units

Price, Brand New—**\$2.95**

ARR-1 Antennas for above receiver and frequencies—NEW **\$1.25 ea.**

Co-axial antenna relay for use with above or other transmitter-receiver combinations—NEW **\$1.25 ea.**

## BC-AS-230 TRANSMITTER—\$3.95



Brand new transmitters made to operate on 12 V. dc. Ideal for mobile use in new cars with 12 V. system. Contains four tubes with power output of approx. 25 watts. 0-1.5 amp. RF ammeter alone worth the price. Freq. range 195-13,975 kc. with full set of plug-in coils (one only picked at random packed with transmitter & included) Wt. approx. 13 lbs. Shock mt. included.

BRAND NEW Price **\$3.95**





### LEEDS & NORTHRUP MICROMAX RECORDERS

These are the strip type recorders used for controlling and recording a wide variety of processes. Used originally for temperature 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 guaranteed, or money back if not satisfied.

**PRICE—\$139.50**

### BC-455-B RECEIVER—\$4.95

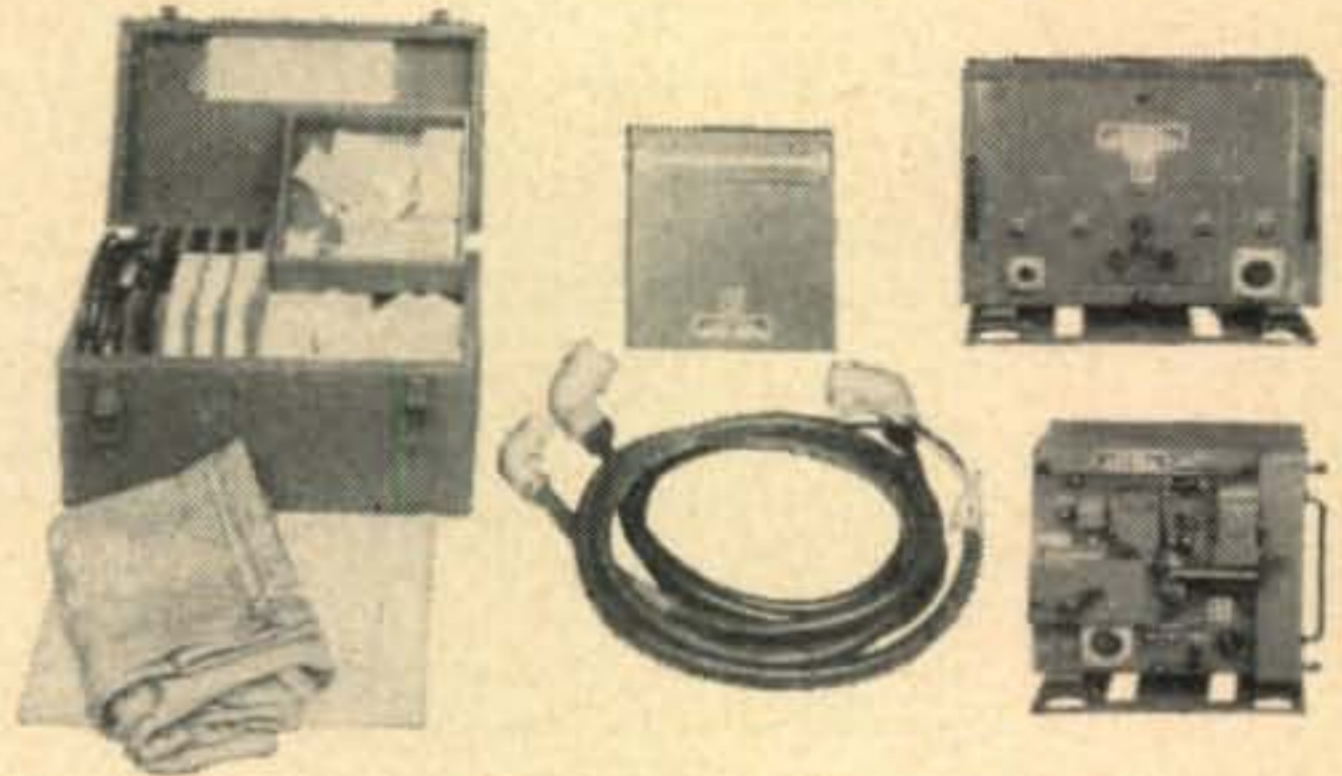
Ideal receiver for mobile or fixed operation. Excellent sensitivity and frequency stability are found in these receivers. New surplus release order—new supply will not last long at this price. Complete with tubes and guaranteed. Less dynamotor.

**Used \$4.95**

**New \$6.95**



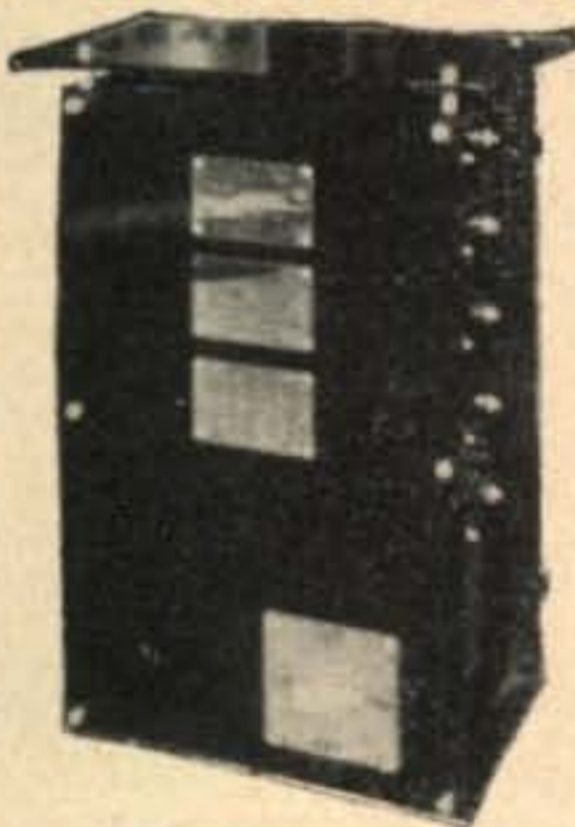
### New FACSIMILE SET



Brand New RC-58-B facsimile set complete with BC-908-B amplifier & mounting, BC-918-B Recorder-Scanner with mounting, MC-308-B writing stand, spare parts chest, covers, and cords ready to operate on your 12 V. DC source. Wire or radio may be used as transmitting medium. Messages may be transmitted at the same time as one is being received. Ideal for ham, bank, or business use. Wt. packed 200 lbs. approx.

**BRAND NEW orig. package  
\$195.00 each, 2 for \$350.00**

### BATTERY CHARGER (ED33511)



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**NEW—Price**

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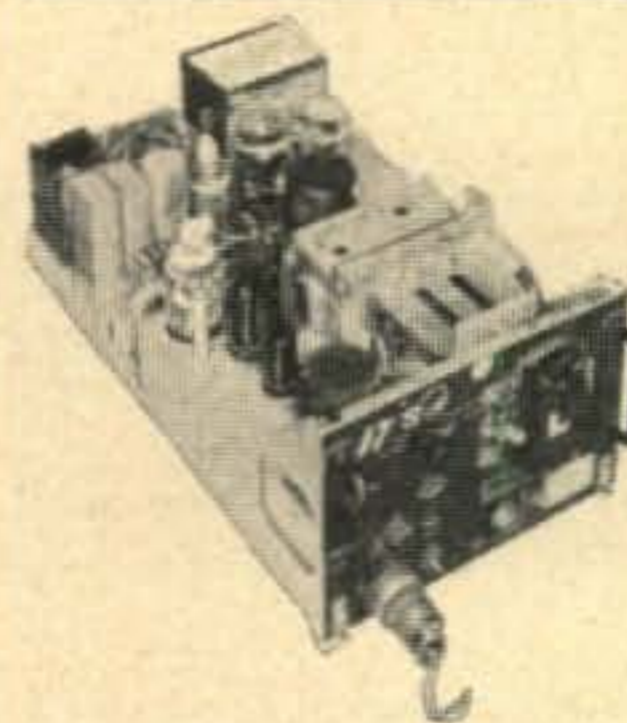
Shp. wgt. 5 lbs. **BRAND NEW—\$2.35 ea.**



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Contains 2-5R4GY; 1-2X2; 1-S07; 1-031A photo multiplier; 1-6AG7; 2-6AC7; and 2-36SAS Western Elect. tubes, VHF osc. circuit, motor, etc. Built-in 115 V. single phase 400 cycle power supply. All tubes included. Size 21" L. x 10 1/2" W. x 7 3/4" H. in metal case. Wgt. approx. 45 lbs. **USED BUT GOOD**

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## DX FLASH

As we write the activity on Corn Island is on its final day. Over 1500 contacts have been made by YNØYN on phone and CW. Messrs. WØAIW, WØEIB, WØMAF and YN4CB planned for a two day stop at San Andres (April 29, 30) and will leave Nicaragua for home on May 2nd. YNØYN came on the air around 1500 GMT, April 24th, on phone. First contacts were as follows: WØSHA/4, W5AES, W8IZT, W2GTF, W4EBO, W5DMR, W9JUV, W8GZ, W5EFC, KV4AA, WØWEE, W4JXJ, W4JGO, W1MCW, W9NDA, W3VKD, W3LXE. Shifting to CW at 1800 GMT first contacts were: W3GAU, W5MIS, W7AH, WØSZQ, KV4AA, W3CGS, WØDU and W1FH. It was somewhat puzzling to us why the suffix /KS4 was not more frequently used at Corn as a letter from Lee, WØAIW, had indicated that Corn might qualify as a separate country when this call was used. He did, however, sign WØAIW/KS4 whenever requested by any particular station. Thus a situation might conceivably arise, should Corn be declared separate under the /KS4 call, which would leave those who had contacted them under the YNØYN call out in the cold as far as a new country was concerned. We advised YNØYN of this in three separate QSO's but were told that the call YNØYN was used so as not to "offend" the YN authorities in, what appeared to be, a slightly touchy situation. This will, no doubt, be clarified at a later date. We feel that Corn could qualify as a separate country, with the /KS4 call, as it is separated from Swan Island, the original KS4, by 350-odd miles. The line of sight between Corn and Swan is also broken by a shoulder of Nicaragua and Honduras. Reasonable precedents are set by KG4-land, leased from Cuba and, possibly, KZ5-land. . . . Regarding the sloop "YASME," mentioned earlier in this column, plans are going ahead to turn this round-the-world trip into a super-duper, two years long, DX expedition. Tentative plans call for stops at such rare places as the British Phoenix Islands, Tonga, Union Islands, Nauru, Solomon Islands, Portuguese Timor, Andaman and Nicobar Islands, Seychelles, Aldabra Island, St. Helena, Ascension Island and, possibly, many others. Should things go well Danny's boat will be outfitted with new radio gear and a portable VP2 call will probably be used. Equipment will be set up ashore at each stop—more later. . . . VQ6LQ got back on the air, April 27th, and should be now "going steady." . . . VS5CT, Brunei, constructed a key from wood and strapping and now puts an imposing CW signal on 14040. . . . A QSL was received, hand-made, from Tom, ZD8AA, who advises that regular QSL's are expected from Capetown momentarily. KV4AA was not the first contact but the fourth. The first three were W2BHU, CO2SW and W9VP. ZD8AA assures that he will stay on the air but things get well nigh impossible on Sundays when the whole band is calling him (20 kc above his frequency etc.) and contacts are slowed down to about three an hour. ZD8AA should also be on phone by now. Tom requests cards be sent by regular mail as airmail just languishes in the London P.O. waiting for a ZD8-bound ship. . . . KJ6BG has been heard near 14070. . . . OH1NK, OH1PI and OH1ST will go to the Aaland Islands during the latter part of May signing OH1NK/Ø etc. There is a permanent station there with the call of OHØNB but he is a newcomer and generally on 3.5 Mc. Moves will be made toward a separate status for Aaland. . . . We are advised that the call ON4QX/AC4 will be on the air in July from Nepal. Ops will be Bob, ON4QX, or Peter. How about using AC6 or NEØ Bob? . . . FLASH! W6KIP/6 contacted VS6CQ on 160 meters between 1305 and 1325 GMT on April 3rd. CONGRATS ON THIS "FIRST"!

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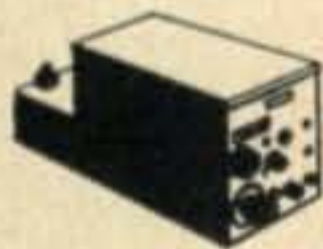
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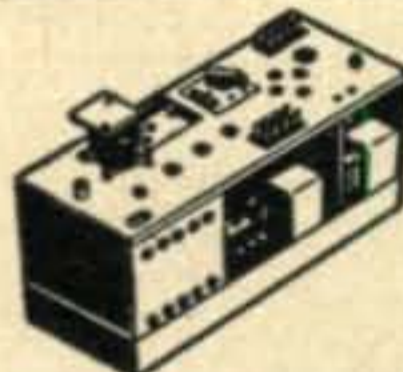
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Freq. range 415-420 MC. 5 stages of 30MC. IF amplifier. Complete with R.F. and I.F. sections. Less dynamotor, tubes, tube shields with conversion data. Excel. cond. Weight 14 lbs.



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With 27 tubes.

**\$19.95**

No Crystal and schematic

Less Tubes & Crystal **\$14.95**

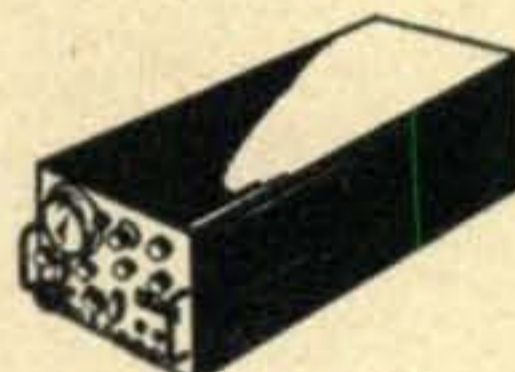
### AC POWER SUPPLY

Complete 110 V. 60 cps. power supply for Command Equipment, LM frequency meter, GF/RU receiver-transmitter. Output voltage: Sec. #1, 5 V & 3 amps; Sec #2, 800 VCT @ 150 MA; Sec. #3, 13 V @ 6 amps; Sec. #4, 25 V. @ 2 amps. With tubes and manual. New Cond.

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**Amateur net \$15.75**

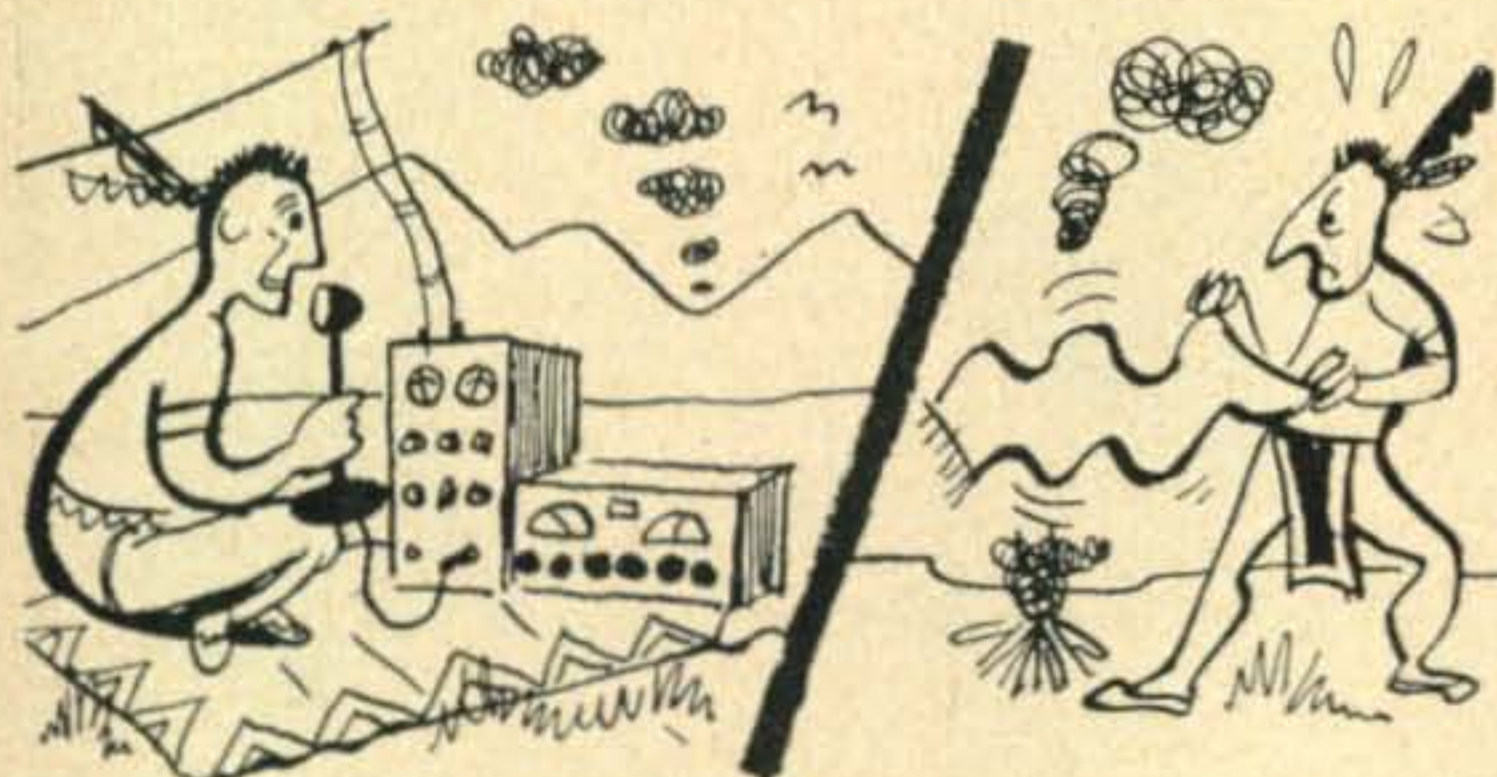
CPO 130-A Earphone model—same as above.

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## Letters...



Dear Sir:

In the February Zero Bias column, it was asked whether a regular column was desired for the handicapped amateurs. Since I come under this class I was very much interested in your suggestion on running a regular column. I read in the March issue where you mentioned it again. I feel as though many of the handicapped amateurs neglected in voicing their approval, such as I have until now. The ones which I have talked to are very much in favor of this and they as well as myself would be more than glad to contribute to your column.

Since I am almost totally paralyzed I had to modify the rig so that it could be operated by using my elbow. The log is kept by having it fastened to the back of my hand and writing by pencil between my teeth.

The layout here is S-40B receiver, TBS-50D transmitter, Viking mobile VFO. Will send the enclosed photo for what it may be worth to show my interest,

73,

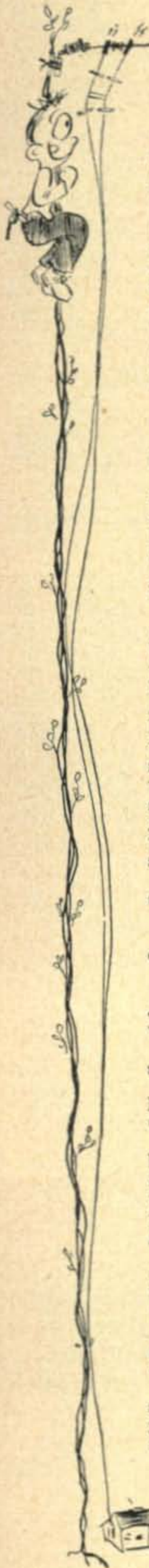
Larry, W8PIJ





# Jack and the Highest

(with tenor accompaniment)



Hi, kiddies. Here's Uncle George again with a chorus of *Jack and the Beanstalk*, or *How High the Bean*. Once upon a time, out in cornland where almost nobody digs, there was a hip kid named Jack who could blow pretty cool c.w. and had eyes for Asia on 160 but wasn't making it. Jack got his kicks in a small pad that was far out, in the sticks, that is, and one day his old lady sent him off to the rib man with Dizzy, the cow. They were real stony and down, and Mama wanted Jack to get strong by unloading the chops. So Jack dug out, and pretty soon he and Diz cruised by a real nervous type in dark rims and a sharp set of threads.

"Hey, Man," said the man, "what gives with old Butterball?"

"Curtains," said Jack, "but don't tell her I clued you."

"Well, now, Friend, if you'll just step inside," said the man, "I happen to have something that'll really flip you," and in less than eight bars Jack was conned into trading Dizzy for some seeds, like. When Jack made it home his old lady was real bugged.

"Jack, my boy," said she, "you have goofed. One more honk like that and it's back to Guy Lombardo," and she heaved the seeds into the air shaft. The next bright, Jack fell out early to try for an AP4 and dug the view out the window. Lo and behold, there was a new mast that was really a gasser, and before you could spell Paul Quinichette, Jack was on his way up with some wire and such. Several sets later, Jack made the very end, and just as he was hanging on the first egg, there was a tap on his shoulder. There stood the biggest stud he had ever seen.

"Weirdsville," said Jack, "who's your agent?"

"I am the Giant," said the giant.

"Why, you must be one of Shorty Rogers' cats," said Jack. "What do you blow?"

"Fee, fie, fo, fum," said the giant.

"Well, oo, oo, bobba dee, Daddyo," said Jack. "I didn't know Rogers had a vocalist with the band."

"I smell the blood of an Englishman," said the giant.

"You're wiggling," said Jack. "The G's haven't been coming through all week. Conditions are a real drag."

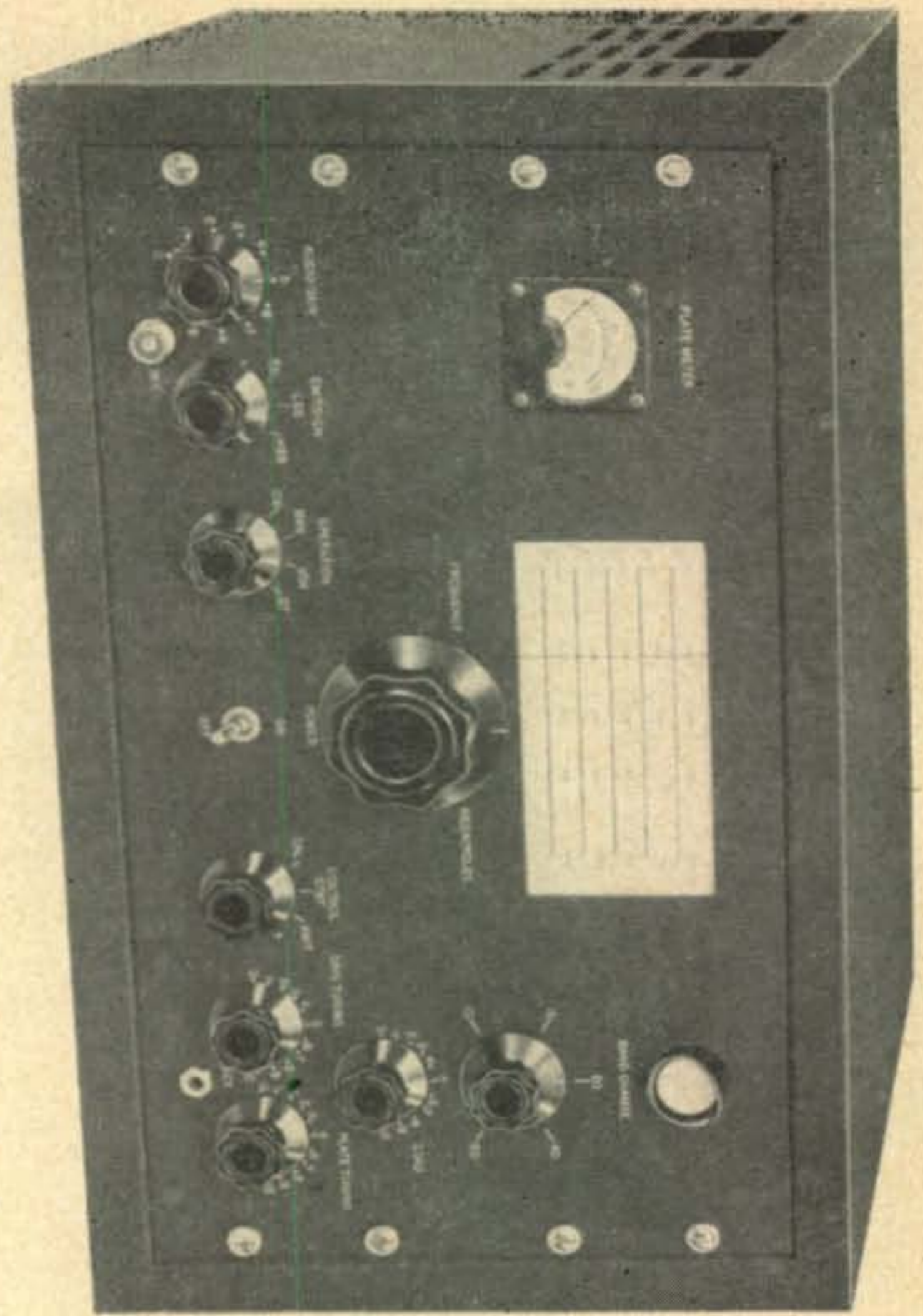
At the mention of conditions, the big boy broke up and admitted he was prewar SM2CA, and he and Jack had a ball. They finished stashing the guys and feeders, and the giant promised to fall in for another gig.

"Say," he said to Jack, "I found a real cool joint the other night. If your date happens to have a friend who's a fairly tall chick, ring me up and . . ."

"Later," said Jack. "Right now I'm going to split and try this thing on 4X4RE."

Which he did, and 4X4RE came on strong. And the moral is that if at first you don't succeed, try some seed. Crazy, no?

—G. Franklin Montgomery, W3FQ8



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T-23 UHF ARC-5 100-156 MC, with tubes and xtals, good cond.—\$19.95.

ARC-5 modulators, excellent condition, w/some tubes \$3.95 ea. include postage

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## VK1EG ANTARCTICA

[from page 27]

One of the entries reads "WE BEAT THOSE AFRICANS BUT THEY WERE TRIERS." It turned out to be the result of an amateur radio chess competition—VK1EG's team at MAWSON versus ZS2MI's team on South Africa's nearby MARION ISLAND. Each had four in the team with the operator as captain. Phone was used on 40 meters and the match lasted 14 days. There was to have been a second match but both expeditions were then busy packing up for their return to civilization.

Another entry "IT'S COLD ON GRAHAM LAND TOO" turned out to be a long but friendly argument between himself, VP8AB and VP8BE, the British Falkland Island Dependencies Expedition at GRAHAM LAND as to which was the coldest. They were both at 12° F.

Then, as if to raise anyones curiosity the New Year's eve entry "WHAT A NIGHT" called for a bit of explanation but Bill assures the writer this was a solid 90-minute 14 mc. QSO with Heard Island when everybody at both stations wished each other a Happy New Year at midnight with the sun still shining brightly on the melting ice.

Behind the other frequent entry "Good ol' Roy" is a story of comradeship which makes one proud to be a member of the amateur radio fraternity. As mentioned earlier, Roy Baxter, VK4FJ was VK1EG's main link with home, his people, his fiancee and many Australians. They contacted 83 times under conditions which were very poor, with repeats common. Every contact VK1EG would send his log, as from the last QSO, and VK4FJ would, in turn, send the QSL cards through the bureau, they having been printed well before Bill left for the south.

As a double check (in case some one has unfortunately missed out on a QSL) Bill has brought back with him his log which will be checked subsequently with that radioed to VK4FJ. His card, in three colors (see accompanying illustration) with a map of the sector of Antarctic claimed by Australia is a prize rating high in any DXers collection.

Through his hard work, keenness and willingness to work as many countries as possible, Bill Storer has proved that the ends to which amateur radio can bring pleasure are limitless. His only disappointment, and he feels this rather deeply, is that the A.R.R.L. will not make the Australian sector a separate country. His only hope is that when Australia's claim is subsequently recognised VK1 at MAWSON will be a separate country.

This year the fight for MAWSON should not be as hard as the last. Many of Bill Storer's contacts with Australia were to those about



to join the 1955 expedition to MAWSON. Thanks to him five of them have taken out tickets and should now be active. They are:

Dr. Rob Allison, VK1RA;  
 Jack Ward, VK1JW;  
 Hugh Oldham, VK1WO;  
 Frits van Huulsen, VK1VH; and  
 Eric Macklin, VK1EM.

Vale VK1EG. You have certainly earned your title "Mr. Rare DX for 1954"; you gave us a thrilling chase which, to many of us, were but a memory of the good old days.

Bill Storer had hoped to be operating from his own home QTH in Muswelbrook, New South Wales by now. But, alas, recent floods which devastated this part of Australia passed four feet deep through his home ruining his own transmitter beyond recovery. Many VK's have sent him their surplus gear which he hopes to assemble and get back on the air as soon as possible.



Roth Jones, VK3BG, served as a signals officer with the Royal Australian Air Force for six years and claims some knowledge of geography. That is why to him DX has been of great interest down the years. His call is familiar on all DX bands, 'phone and CW and he is well known among the American DX fraternity with whom he is in almost daily contact. Roth Jones is a journal-

ist with one of Australia's oldest daily newspapers, "The Age," and has covered the majority of big news events for this paper since he resumed there after World War II.

## Shack and Workshop

W6OCW sends in an idea which should appeal especially to those of you doing a lot of experimental work. Most amateurs have a veritable "graveyard" of extremely perforated, stripped chassis to show, attesting to noble inventions which worked or failed but, work or fail, wound up in the old junk heap looking like high grade Swiss Cheese.

By turning his chassis over and mounting all the parts for the new "gismo" on the bottom plate, W6OCW has an "everlasting" chassis. When the piece of gear thus constructed is discarded, the chassis remains whole and may be reused endlessly.

If there are any controls that should be mounted on the side of the chassis a 1½" edge is turned up on the bottom plate which now forms the top and the controls are mounted there. The plate can be fastened to the chassis with sheet-metal screws. Common galvanized sheet metal, available at any roofer or tinsmith shop, is easily worked and costs very little.

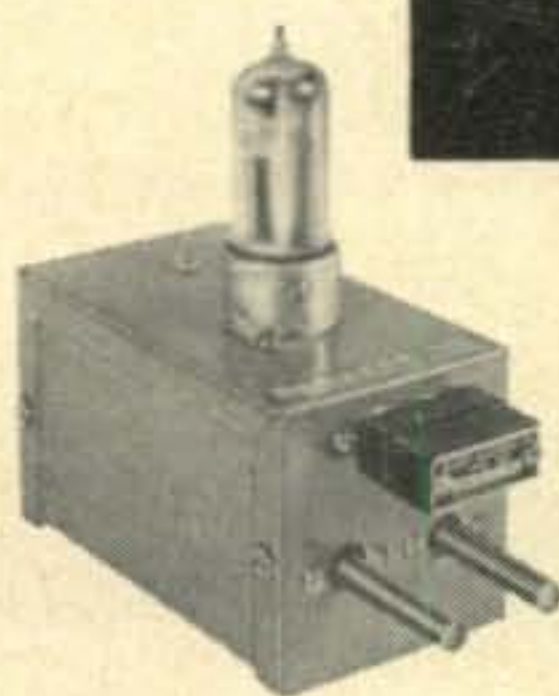
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by Jack N. Brown, W3SHY

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by William I. Orr, W6SAI

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CQ-3

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### NOVICE SHACK

[from page 45]

Probably the simplest "all-band" antenna for use with it, but certainly not the most efficient one, is single length of wire approximately 85 feet long mounted as high and in the clear as possible. The best, simple, single-band antenna for use with it is probably a  $\frac{1}{2}$ -wave doublet, fed in the center with 75-ohm coaxial or "twin-lead" cable. In fact, one cut for 40 meters (flat top approximately 67 feet long) will work well on both 40 and 15 meters. It will also probably work fairly well on 80 meters by tying the feeders together and operating it as a random-length antenna.

One precaution is required in tuning the transmitter. Start tuning with the amplifier *tuning* and *load* capacitors fully meshed. On the lower-frequency bands and with some antennas, it is possible to tune the *pi* network to deliver output at twice the desired frequency. This condition occurs with both capacitors set near minimum capacity. If a dip in the 807 plate current occurs at two settings of the *tuning* capacitor, always choose the one requiring the most capacity.

### Keying

Straight cathode keying of both the oscillator and the amplifier is employed in the "Adventurer." Three different crystals keyed well on all bands. I could detect no chirp at all on either 80 or 40 meters. Very careful listening did reveal a very slight one on 20 meters, which became more pronounced on 15 and 10 meters. However, even on 10 meters, it was not objectionable.

### Television Interference

Used without a low-pass filter, the "Adventurer" caused no interference to any of the locally-used television channels (2, 5, 7, and 9) when operated on 80 meters. Forty-meter operation caused a small amount of interference to channel 2. Operation on 20, 15, and 10 meters caused progressively more-severe interference on channels 2 and 5.

Inserting a low-pass filter between the transmitter and the antenna feed line removed the last trace of TVI from 40-meter operation. The filter also reduced it to negligible proportion on 20 and 15 meters, but 10-meter operation still produced objectional interference on channel 2.

Under no conditions was there any interference on channels 7 and 9. The television receiver used as the monitor was located five feet from the transmitter.

### Conclusions

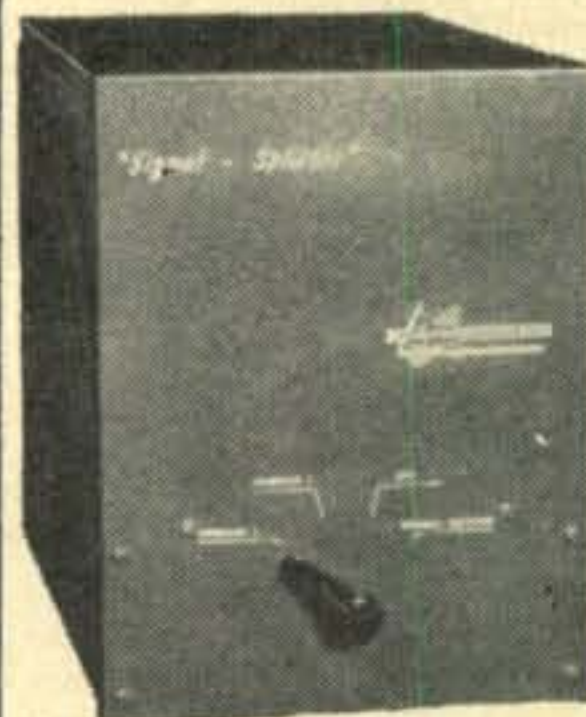
The "Adventurer" kit is well designed and uses good-quality parts. When assembled and operated in accordance with instructions, it performs well. Television interference should seldom be much of a problem, especially when it is used with a good, low-pass filter. All in all, the transmitter performs as the manufacturer claims that it will.

[Continued next page]

now first with the

## "Signal-Splitter"

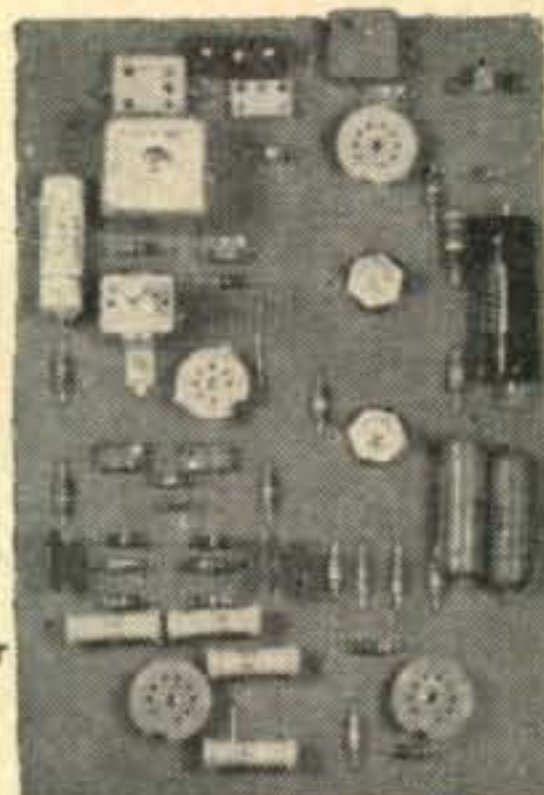
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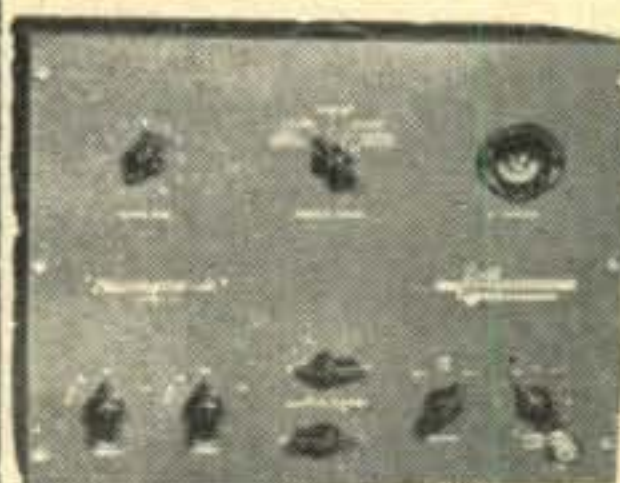
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- ✓ plug in adaptor available for 50, 85, 100 and 915 KC receiver IF frequencies
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- ✓ NORMAL RECEIVER switch position gives the original receiver conditions without adaptors
- ✓ 40 DB or more suppression on suppressed sideband
- ✓ requires 18 MA at 200-250 V and 1.2 A at 6.3 V from receiver
- ✓ plug in power supply available fits inside cabinet
- ✓ size 7" x 9" x 13" in gray hammertone and crackle cabinet
- ✓ connecting cables terminate in an octal plug

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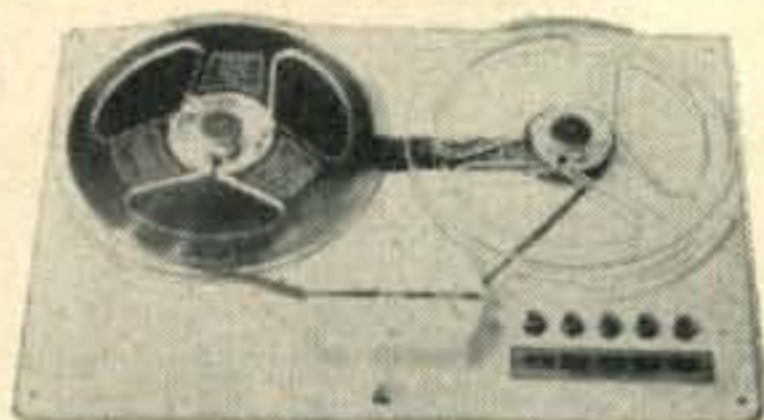
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### THE RADIO STATIONERS

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[from preceding page]

## News For And About Novices

John Null, WN8VKP, P.O. Box 71, New Martinsville, W. Va., reports, "I have been on the air for a month and a half. I have worked 25 states and VE2, 3. Best DX is Fresno, Calif.

"My rig is an AT-1, running 30 watts. My antenna is 50 feet long with a loading coil. I worked 10 states with a 16-watt rig and a shorter antenna at first. My receiver is an old 10-tube *Silver-tone*.

"I would be glad to arrange skeds with any stations needing West Virginia, and I will answer all letters received."

## Help Wanted

Nelson Myers (16), 557 Broadway, Hanover, Pa.  
Alvin P. Arthur, P. O. Box 371, Ticonderoga, N. Y. Telephone: Ti-24. (Needs help with code, and will answer all letters received.)

Chuck Meyer (21), 1630 Central, Kansas City 8, MO. Telephone: Grand 8973.

Dick Schonfeld (27), M.R. #10, Butler, Pa.

Leonard Knigin (16), 8678 Bay Parkway, Brooklyn 14, N. Y. Telephone: ES-2-7109. (Needs help with code and drawing diagrams.)

Mark Lanyn (15), 541 Broadway, Hanover, Pa.

Mike Davis (12), 548 College St., Bellaire, Texas. Telephone: MO-50303.

Leon Underkoffler (14), Rose Ave., Woodcliff Lake, N. J. (Needs help with the code and wants someone to give him the Novice examination.)

Ned Chatelain (15), The Woods Schools, Langhorne, Pa.

Ken Hastings, 4237 Raymond St., Brookfield, Illinois.

Howard Hobson, 1224 Whitby Road, Richmond, Va. (Needs help with the code and would like to hear from other shortwave listeners.)

Richard Coulson (12), 406 E. Sanger, Hobbs, New Mexico.

Paul E. Denwalt (17), 1828 Lariat Lane, Oklahoma City 15, Oklahoma. Telephone: ME 7-2983.

Steven Rosenthal (13), 85 Strong Street, Bronx 68, N. Y.

John Lakey (13), 433 Pennsylvania Ave., Shreveport, La. Telephone: 7-2693. (Needs help in "everything." Has been SWL'ing since getting an NC-98 for Christmas.)

Peter Linder (16), 1323 Kimberley Drive, Philadelphia, Pa. Telephone: GR-7-4781.

Steve Glazer (15), 2075 Walton Ave., Bronx 53, N. Y.

Dominic St. John (13), 30 Lincoln Terrace, Leominster, Mass. Telephone: LE-7-3232.

Carl Hammer, 2380 Wisteria Street, Baton Rouge, La.

Ben Collins (18), 34 Summer St., St. Johns, Newfoundland, Canada.

Attila Csaky (17), 2912 East Broad Street, Richmond, Virginia. (Will do best to answer all letters received.)

Paul A. Trush (14), 15 Montrose St., South Orange, N. J. Telephone: SO 2-5963.

Each month, *CQ* publishes the names of those requesting help in obtaining their amateur licenses. To be listed, send your name and address to: *Novice Shack*, *CQ Magazine*, 67 West 44th St., New York 36, N. Y. Requests received by June 15 will appear in the August issue.

Bill Waltz, 5019 46th, N.E., Seattle 5, Wash., writes, "Dear Herb, Thanks for your card telling me that you



would list my name in the 'Help Wanted' column. But I'm afraid that I did not write the request for the listing. I expect to have my Novice license by the middle of May; therefore, if it is not too late, please turn my space over to someone else. 73."

I print this note to request that no one send in anyone's name for listing in the "Help Wanted" section without his specific consent. He may not consider it the favor that you intended it to be. Besides, it may prevent someone who actually needs and wants help from getting it.

Bill Welsh, W1SAD, 1228 Cambridge St., Cambridge 39, Mass. writes, "The classes of the El Ray Club are still in continuous session. We turn out about 20 to 30 new amateurs a month. Anyone who is willing to work for his license is welcome to join us. I make it a practice to contact everyone from this area whose name appears in the 'Help Wanted' list. 73."

George Ebberts, WNOVHQ, Box 31, Steen, Minn., writes of a record to be proud of. "Have had my Novice license for about nine months. I have 46 states, Hawaii, Puerto Rico, and five Canadian provinces confirmed. Need Wyoming and Nevada for W.A.S., and I would like to make schedules with these states.

"My rig is a *Lettime*, running 50 watts. Antenna is a 66-foot doublet, and receiver is an NC-125. I do most of my operating on 80 and 40 meters. Have been on 15 meters, too, but not much luck there.

"I'd like to hear from other hams. I will answer all letters. 73."

Sheila Goodhue, KL7BHE/8, 436 E. Siebenthaler Ave., Dayton 5, Ohio, told me something about being a Novice in Alaska in contacts over the air and in a letter. Her story is "I was WL7BHE in Anchorage, getting my license when my husband Ed, KLPIV, bet me \$100.00 I could not do it. Before becoming an amateur myself, I used to go to bed hating amateur radio. Now I am fascinated by it.

"I took my General Class examination in Anchorage and the license was waiting for me when we got to Dayton. You can take my word for it, I find hamming much more fun here than it was in Alaska. There, I was able to make only 16 contacts as a Novice, because the distances to be covered were so great, and almost always interference from the W6's covered me up. Here I can make a great variety of contacts. 73."

Jimmy Tucker, WN5GTR, 1303 W. Louisiana St., McKinney, Tex., says, "Fifteen meters is my favorite band. I think more Novices should use it when the band is open. I use a Globe Scout transmitter, running 40 watts, an S-40A receiver, and two folded dipoles fed 180° out of phase in the attic as an antenna. I have worked 38 states, three Canadian provinces, Puerto Rico, and Hawaii. I'll be glad to make schedules with Novices, especially in Alaska and Puerto Rico, on any Novice band.

"My brother Don, W5BNH, used to be a Novice. He helped me get my license. 73"

Dr. Norman F. Riley, W1ATI, 55 Lindsey Street, New Bedford, Mass., solves a problem. "After the pain and strain of removing the 'N' from my call letters, there had to be a way to remove it from my QSL cards. I tried covering it with white crayon and white paint and glueing paper over it. Finally, I tried an eraser. Behold! It worked.

"Like any good experimenter, I tried several different erasers. One good soft one worked about as well as another. After the erasing was done, I tried filling the gap with a dash or different designs, but I finally decided that a clean job with the eraser was as good as anything.

"I pass the idea on for what it is worth. 73."

Norm sent along one of his cards with the N erased as a sample. It looked good; so I immediately tried erasing the N from a QSL card from a different printer. It worked on that one, too. Herb.

Dick Smith, WN9LDB, 803 North Anderson St., Elwood, Ind., reports, "I have worked 22 states, with 20 confirmed. Most of my operating is done between 0630

[Continued on next page]

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**50c** per copy

**CQ Magazine**

67 West 44 St.

New York 36, N. Y.

[from preceding page]

and 0730 every morning on 40 and 80 meters. I still need a W7; so how about one writing to me? I'll answer all letters received.

"My equipment includes an AT-1 transmitter, with an AC-1 antenna coupler, and an NC-125 receiver. I also have a home-built field-strength meter. 73."

Dave Corsair (20), KN2KHZ, 53 Seymour Ave., Newark 8, N. J. writes "Got my ticket in the middle of December, but didn't get on the air until the end of January. Since then, I have made 130 contacts in the United States and Canada. States total is 21—19 confirmed. Best DX has been 1200 miles.

"I operate on 80 meters with a Globe Scout transmitter, running 65 watts, and an NC-98 receiver. Antenna is 75 feet long, end fed. Am using a wet ground to help things along.

"I will be glad to give a helping hand to anyone needing help with good old CW. 73."

Mildred B. Gallaher, KN4BEA, Lexington Road, Route 1, Winchester, Ky., has a record to make one drool. She writes, "I am the XYL of W4PJC. My license was issued December 7th, our ninth wedding anniversary. In a little over three months on the air, I have worked 46 states, VE2, 3, and 7, KV4, WP4, ZL1, CM7, and WH6 for a total of 464 contacts. I would certainly like to schedule stations in North and South Dakota, the two states I need for Novice WAS. Also, I shall be happy to schedule anyone needing Kentucky.

"I operate on 80 and 40 meters with a 75-watt transmitter. Antennas are a full-wave centered one for 80 meters and a 'long wire' and a  $\frac{1}{4}$ -wave vertical for 40 meters. My receiver is an NC-173.

"Needless to say, I have lost lots of sleep chasing DX and new states; however, it has been a lot of fun. I certainly like CW, and when my General-Class license arrives, I am going to try 20-meter CW.

"The OM has been a ham for 15 years, being formerly W9PJC and DL4KC. He conducted a code and theory class in our home this winter, turning out six new amateurs. 73."

Glenn, W9HBP, RFD 3, Appleton, Wisconsin, reports, "I just got through listening to a new Novice call CQ for seven minutes. I wonder how many others, besides me, got tired of waiting for him to stand by and tuned away, looking for someone else to work.

"Since last June, I have made 400 contacts in 46 states with my Heathkit transmitter. I still need Nevada and Vermont, and I would like to arrange skeds with stations in them. Also, I'll be glad to sked anyone needing Wisconsin—QSL card guaranteed.

"I am a Sophomore in High School. School work and ham radio do not mix, hi. 73."

Thomas McEvoy (40) WN4GMR, 71 Carlisle Drive, Miami Springs, Florida, says, "Thought I would drop you a line while I was still a Novice. Just passed the General Class exam, but no tickee yet. Your instructions a while back on working DX helped me to gather in 46 states (confirmed), VE2, VE3, KC4AB, Puerto Rico, and Cuba in nine months as a Novice. I missed Montana and South Dakota.

"The 15-meter band is opening up nicely most afternoons, but not many Novices there. I think the boys are passing up a good DX band.

"My rig is a Viking Ranger feeding a long-wire antenna, and my receiver is an HQ-129X. 73."

James M. Douglas, VE3DJX, Box 366, Napanee, Ontario, Canada, writes, "In a year of operating, I have 46 states confirmed and about 30 countries. I operate 80, 40, and 20 meters and spend a lot of time in the Novice bands handing out first VE3 QSL's. If anyone wants a schedule with me, he needs only to drop me a line. 73."

That uses up our space for this month. I'll see you again next month. Please, until further notice, address letters for the *Novice Shack*, c/o *CQ Magazine*, 67 West 44th Street, New York 36, N. Y.

73, Herb, W9EGQ



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4-400A	49.50	464A	1.50	955	.30
4-1,000A	95.00	471A	1.50	956	.30
1C38	30.00	705A	.50	957	.35
1D32	22.50	717A	.85	958A	.50
4X150A	27.50	723A/B	10.00	1625	.25
5U4G	.40	724B	.95	1629	.20
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211/VT4C Ea. . . . 50¢ 100 for. . . . \$39.50

## VARIAC NO. 200-C

7.5 A. MAXIMUM 0-130 V.A.C. 60 cyc. OUT-PUT Excellent cond. With pointer knob and scale. **\$14.95**

## ARC-5 SPECIALS! WORLD'S LOWEST PRICES! EYE 'EMI BUY 'EMI!

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BC-442 ANTENNA UNIT With vacuum condensers. . . 3.95

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APS-13 TRANSCEIVER. New in original carton. . . \$14.95  
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Size: 8" high x 7" deep x 9" wide. NEW, IN ORIGINAL CRATE. ONLY **\$22.50**

400 V. POWER TRANSFORMER: 800 VCT @ 200 MA 6.3 VCT @ 6 A. 5 V. @ 3 A. Dim.: 4 1/2" x 3 1/2" x 3 1/2" in standard commercial case. Fully shielded. Pri: 110 VAC 60 cy. New. **\$3.95**

NOTE: Send full amount with order. Unless otherwise specified, material shipped via RR Express, shipping costs COD. Californians add 3% sales tax. All items subject to prior sale. Minimum order \$5.00.



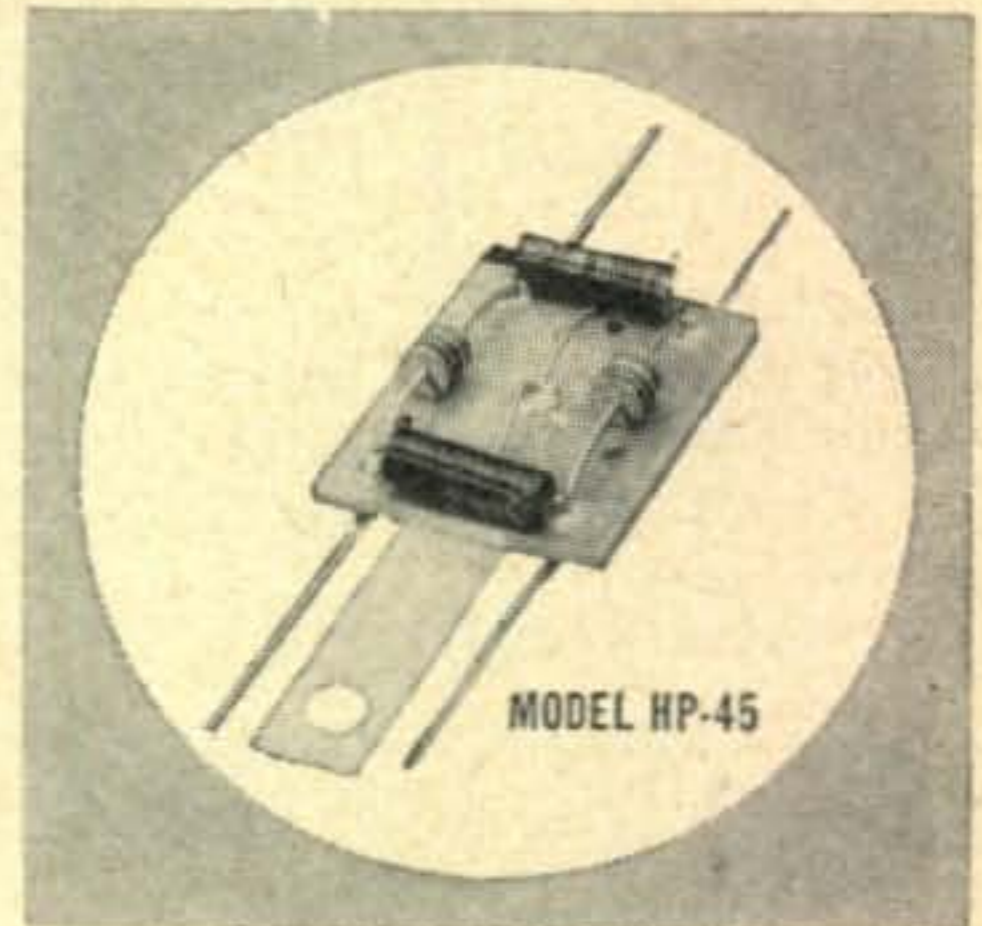
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DIVISION OF I. D. E. A., INC.  
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stronger daytime ionosphere and higher reflected daytime frequencies during the winter than during the summer. On the other hand, here in the northern hemisphere, we have the longest periods of darkness during the winter months. This permits the ionosphere more time to de-ionize and become weaker because of the lack of ultra-violet radiation, than during the summer months. Consequently, winter night time reflected frequencies are considerably lower than summer night frequencies.

Next month we will examine these daily and seasonal variations in respect to an actual circuit and see how the frequencies used on a particular circuit vary in accordance with these solar variations.

### Eclipse

As mentioned last month, a total eclipse of the sun will occur on June 20th. It will be visible, clouds permitting, over the Indian Ocean, south India, southeastern Asia and the North Pacific Ocean. While not visible in the United States, its influence upon shortwave radio will no doubt be noticed here. I would be very interested in hearing from readers who may notice such effects during the total eclipse of June 20th.

## YL's FREQUENCY

[from page 43]

Betty. . . . W3CDQ, Liz, is now a member of the Quarter Century Wireless Assn. . . . WØKJZ, Lydia, is V.P. of the St. Paul Radio Club. . . . W2EEO, Madeline, is giving SSB a try.

An FB letter from W5RFK, Deloris, who is now with her OM at Ramstein, Germany (60 miles SW of Wiesbaden). Her new call is DL4HO and Larry's is DL4BS. At writing (mid-March) they had their kw rig all ready to go and were awaiting fair weather for an antenna raising

## WAS/YL

YLRL offers a **WORKED ALL STATES-YL** award. Here are rules for earning the certificate.

1. The WAS/YL award, Worked All State-YL, is available to all amateurs.
2. Two-way communications must be established on the amateur bands with all 48 of the United States. Any and all amateur bands may be used. A QSL from the District of Columbia may be submitted in lieu of one from Maryland.
3. Contacts with all 48 states must be made with stations operated by licensed women operators.
4. Contacts with all 48 states must be made from the same location. Within a given community one location may be defined as from places no two of which are more than 25 miles apart.
5. Contacts may be made over any period of years provided only that all contacts are from the same location as defined in #4.
6. 48 QSL cards, or other written communications, from stations worked confirming the necessary two-way contacts, must be submitted by the applicant to: Lou Littlefield, WIMCW, 19 State Ave., Cape Elizabeth, Maine. Sufficient postage must be sent with the confirmations to finance their return. The YLRL will not be responsible for any loss or damage to same.

[Continued on next page]

## THE ANSWER TO A HAM'S DREAM!

### E-Z WAY TOWERS

#### CRANK UP AND DOWN • TILT OVER

##### SPECIFICATIONS:

All Steel construction. Electric arc welded. Continuous diagonal bracing on two sides and climbable ladder-type horizontal bracing of 3/8" rod on third side. 1038 extra hard steel 7 1/2" Δ has legs of 1/2" rod, diagonals 1/4" rod. 9 1/2" Δ legs 1/2" structural pipe, diagonals 1/4" rod. 11 1/4" Δ — Legs 3/4" structural pipe, diagonals 5/16" rod. Rotor mounting plate drilled for Vee DX VB Rotor.

ANTENNA AND ROTOR NOT INCLUDED IN PRICE  
VEE DX VB ROTOR \$25.77

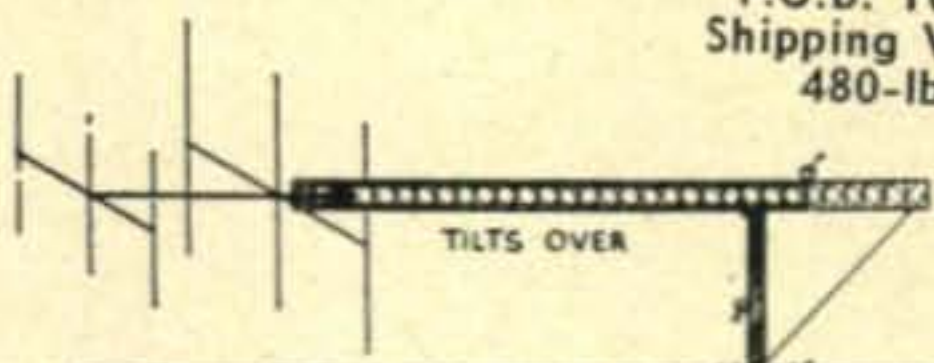
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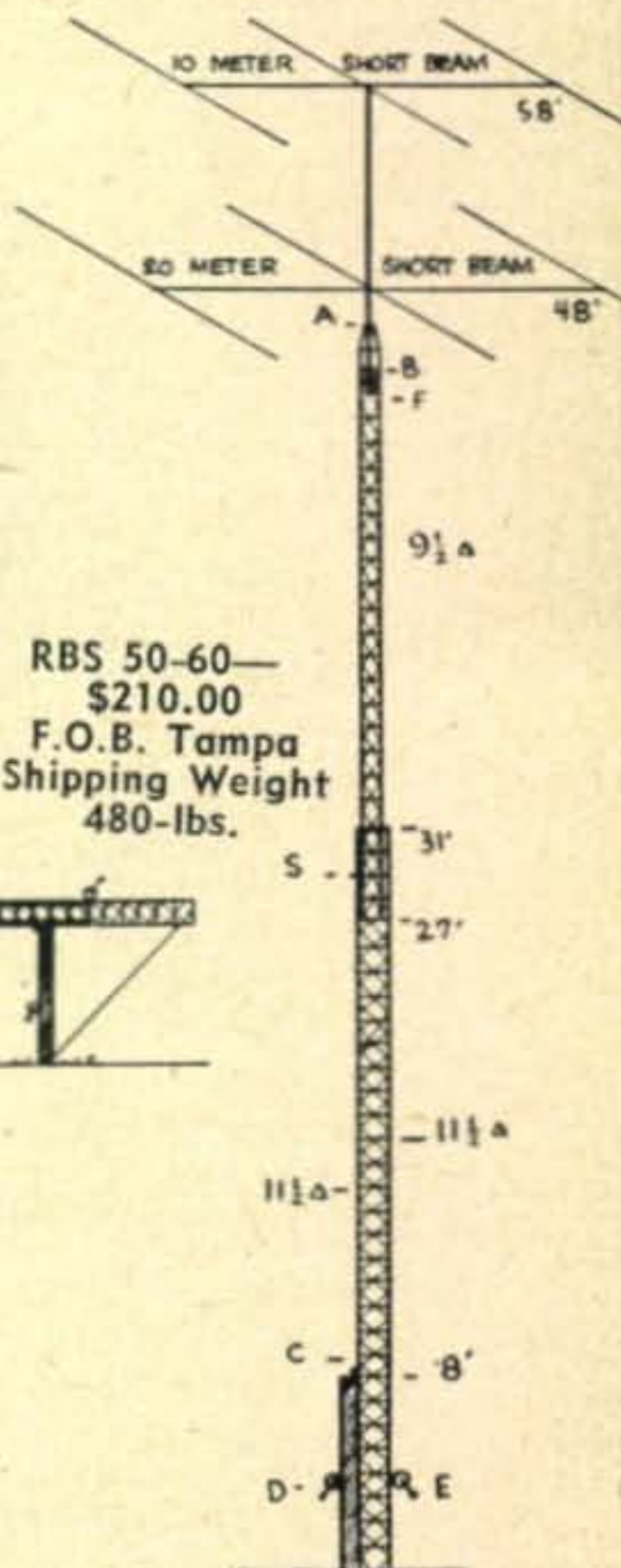
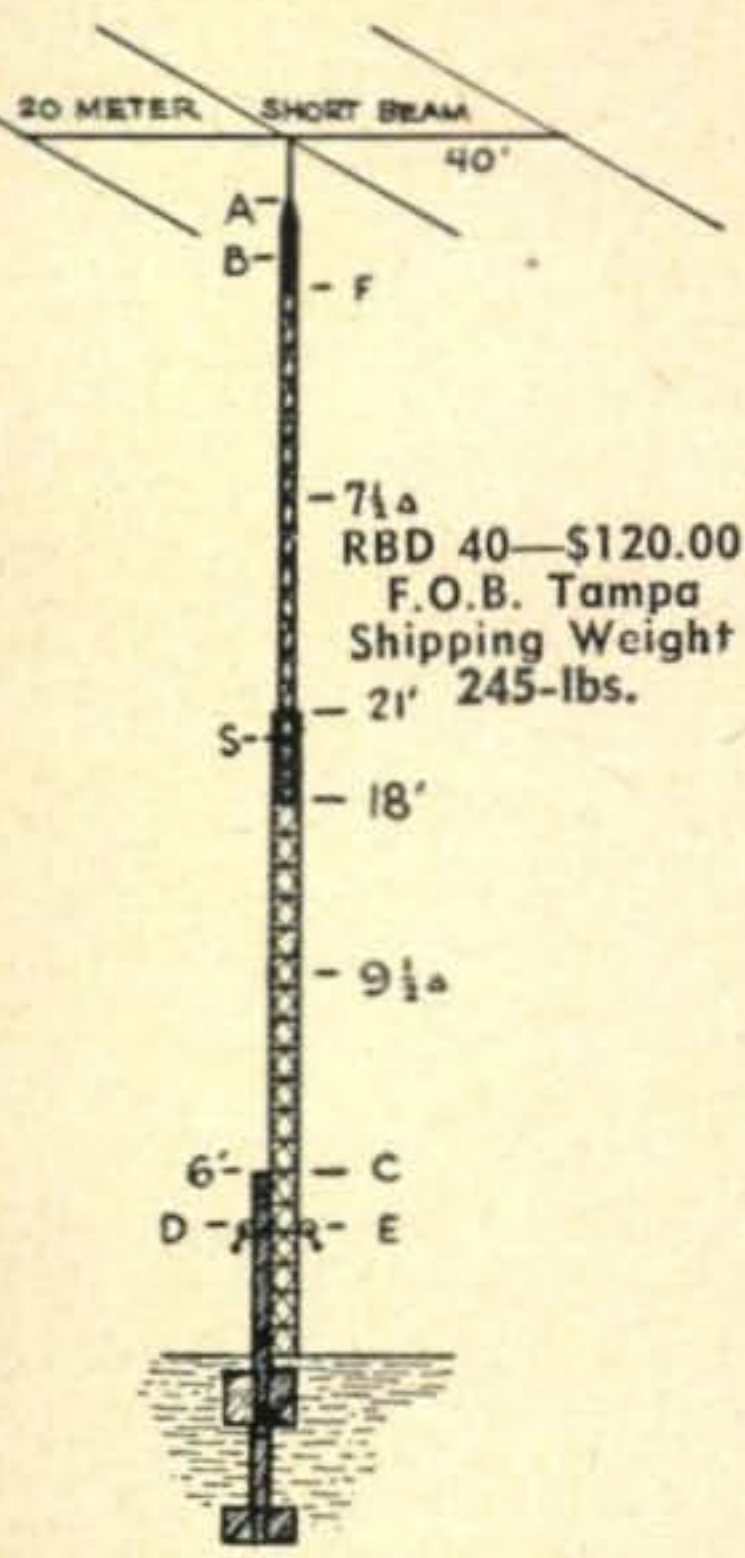
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E-Crank To Raise and Lower  
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(Patent applied for)

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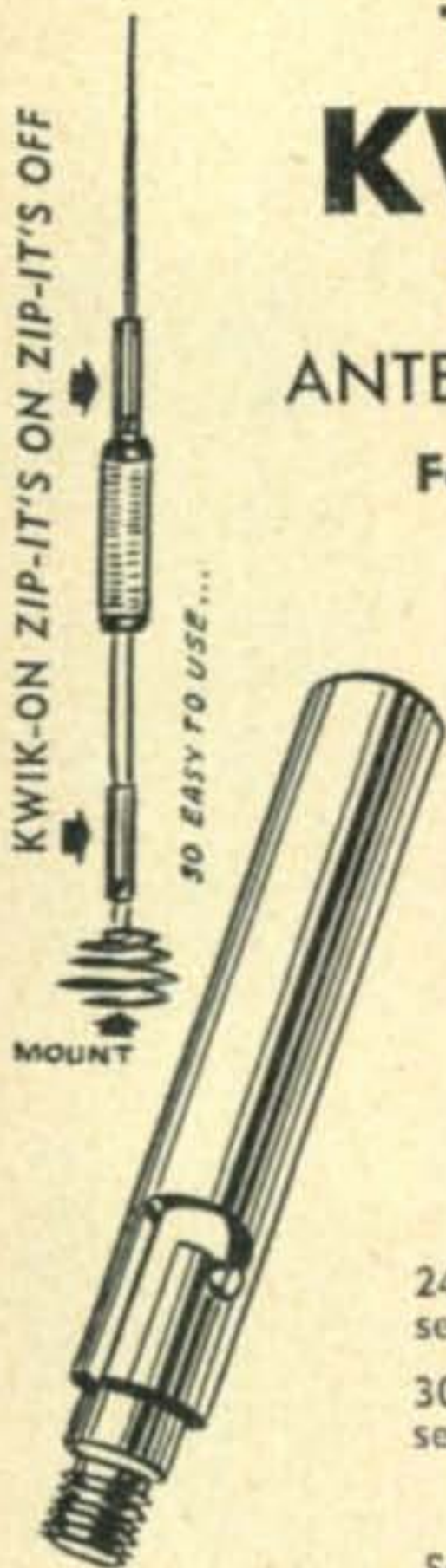
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[from page 65]

party. Deloris said they are located on the highest point of the base with nothing to the West of them to keep their signal from being heard, so were anxiously awaiting W contacts. Her QTH: c/o Maj. L. Dyvad, AO 359511, Hq. 12th AF ACS/Comm., APO 12, NYC. Deloris is looking forward to visiting W5ZER, Isabel, and her OM who are now in England.

33 es CUL—W5RZJ

**YL Century Certificate**

The YL Century Certificate for confirmed contacts with stations operated by 100 or more different licensed women amateur radio operators is issued by YLRL upon compliance with the following rules.

1. Two-way communication must be established on authorized amateur bands with stations, mobile or fixed, operated by 100 *different* licensed women amateurs. Any and all amateur bands may be used.
2. All contacts must be made from the same location. Within a given community, one location may be defined as from places no two of which are more than 25 miles apart.
3. Contacts may be made over any period of years, provided only that all contacts are from the same location as defined in 2.
4. Contacts with YLs anywhere in the world are recognized, provided only that confirmations clearly indicate the stations contacted were operated by duly licensed women amateur radio operators.
5. 100 QSL cards, or other written communications from the stations worked confirming the necessary two-way contacts, accompanied by a list of claimed contacts, including the full name of the operator, alphabetically arranged, and the date and time of contact, must be submitted by the applicant directly to the YL-CC custodian. Sufficient postage must be sent with the confirmations to finance their return by first class mail. The YLRL will not be responsible for any loss or damage to same.
6. Endorsements: Confirmations of contacts, accompanied by alphabetical list, as described above, from stations operated by additional YLs may be submitted for credit each time 50 additional confirmations are available. Endorsements will be made to the original certificate as application is approved.
7. Decisions of the YL-CC custodian regarding interpretation of these rules as here stated or later amended, shall be final. All inquiries regarding cards, applications, or the certificate should be addressed to her. Address: Dorothy Dickey, W7GLK, Route 1, Box 347, Ashland, Oregon.



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 New in overseas pack. **\$19.95**

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 1 brand new complete APS/13 Transceiver with all tubes and dynamotor. With manual. **\$12.95**  
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**SPECIAL COMBO ALL THREE** **\$16.50**

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**SURPRISE!** All brand new! This is a must!

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**RG-8/U 52 OHM COAX CABLE:** Brand new with connectors. 50 ft. roll. **\$2.95**

**R-1/ARR-1 RECEIVER**  
 For conversion to 220 MC bandconverter. Excel. cond. With conversion dope. Each. **\$2.95**

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 5-25 Hy. SWINGING CHOKE. 200 MA. New, boxed. A real buy. Ea. **\$3.95**

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 For ARB or Any Receiver—2 Tube Phasing Circuit No 180° Ambiguity — Gives True Bearing in Three Seconds — With Schematics. NEW. In overseas pack. **\$27.50**

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## SSB Mobile

[from page 23]

critical in placement so long as one remembers that the RF voltage should be several times larger than the audio voltage from T3.

The various power supply potentials are brought in through a Jones plug on the rear of the chassis. Filament connections are arranged so that a choice of either 6 or 12 volt operation is had. All tubes, with the exception of the 807, receive their plate supply from the receiver vibrator supply. This leaves the PE 103 dynamotor to run just the final. During speech the voice peaks cause the 807 plate current, as indicated on the panel milliammeter, to kick up to 100 mls. At the same time the dynamotor output voltage varies between 500 and 585 volts.

### Coil Winding Data

L1 through L7—pre-wound, Central Electronics  
 L8, L10—National XR50 forms, 32t. closewound #28 enamel  
 L9, L11—National XR50 forms, 17t. closewound #20 enamel  
 L12—B & W Miniductor, 1" dia., 40t. 1 1/4" long with tap at 6th turn for 20 meters

In the car push-to-talk operation is used but the Jones plug is wired so that voice-control operation can be had for fixed-station service.

Results with the transmitter have been very gratifying. The east coast has been worked on 75 meters in the evening. It is not uncommon to work 200 to 300 miles on 75 during the QRM hours. The rig has done a good job on 20 meters also. We have contacted W4HB at Miami, Florida, for an hour QSO in the late evening, while on our vacation in northern Michigan. A solid contact also was had with W8EGB, operating portable 5 in New Mexico, for over two hours on 14295 KC with the usual 20 meter QRM all around us.



W8VOK, first licensed in 1941, also held KA2BD (Philippine Islands) in 1946. Bill holds Class A Amateur, First Class Radiotelephone and Second Class Radiotelegraph tickets, and lists 75 and 20 as his favorite bands, with mobile his favorite mode. Bill enjoys construction work, and is employed as an Electrical Engineer by R.C.A. Home address: 23812 Hollander, Dearborn, Michigan.

DON'T buy that Cadillac! For the same money you can get a 3300-year subscription to CQ, or 2200 one-year subscriptions for yourself and your friends. Another way to build an even better CQ: When writing advertisers, mention where you saw their ads.



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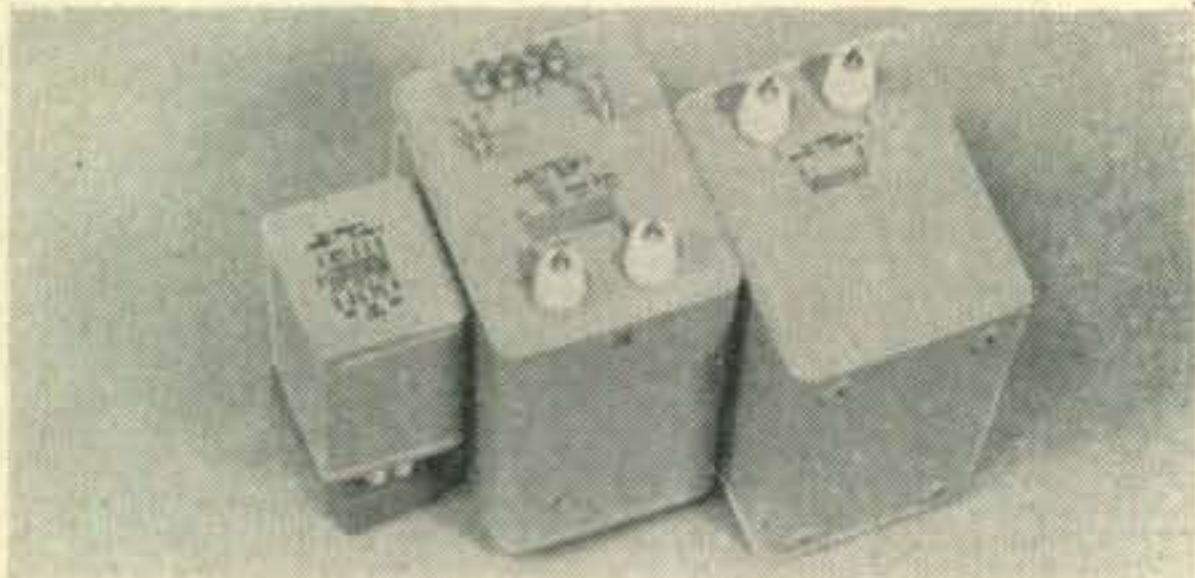
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Matched, compact, hermetically-sealed components for KW power supply. Ideal for new Collins KWS-1K, etc.

- Power xfmr. Pri: 115 v. 60 cy. with taps for 1/4, 1/2, and full power. Sec: 3400 v. @ 400 ma. 39 lbs.—8"x5 5/8"x7 3/8".
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- Filament xfmr for 4—866A's in bridge circuit. Pri: 115 v. 60 cy. Sec: 2.5 v. @ 5.0 A, 2.5 v. @ 5.0 A., and 2.5 v. @ 10 A.



Combination only **\$45.00** shipped prepaid in U.S.A.

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SELL: PP 813 CW transmitter in 66" enclosed rack, Heath VFO, 3-element 20-meter and 4-element 10-meter beams, \$250. Dixie Kiefer, W2ZVS, 266 Midland Ave., Montclair, N.J.

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COLLINS 32V3, L/P filter, spare 4D32, perfect, \$595. Also 75A2A, 3 & 6 kc., xtal cal., latest modifications, speaker, phone patch, \$425. Both for \$995 fob Cincinnati. Write Mel, W8LLX, Terrace Park, Ohio.

SELL: SX-43 with R-42 speaker, excellent condition, \$140; converted ARC-4 with power supply, \$35. W9YIP, 477 Robinson Street, West Lafayette, Indiana.

2-METER BEAMS: 6-element, horizontal or vertical, all seamless aluminum, \$6.95 prepaid. Wholesale Supply Co., Lunenburg 1, Mass.

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SELL: Xmtr 813 PA 811's mod; Bud Cabinet; 3 element 10m. beam and 21-ft. mast; 10-20m. mobile xmtr—Gonset tri-band; Super-Pro. Best offer. J. A. La Manna, W2HPE, 77 Ave. F, Lodi, N.J.

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REMEMBER BLOSSOMLAND Amateur Radio Association's hamfest picnic, July 30 at Warren Dunes State Park, 15 miles south of St. Joseph, Michigan on U.S. 12. 10-meter transmitter hunt. Bring gear for swap and shop. Registration fee, \$1.00 in advance or \$1.25 at park. Advance registration through R. T. Hatch, W8JFW, 3225 Cleveland, St. Joseph, Michigan.

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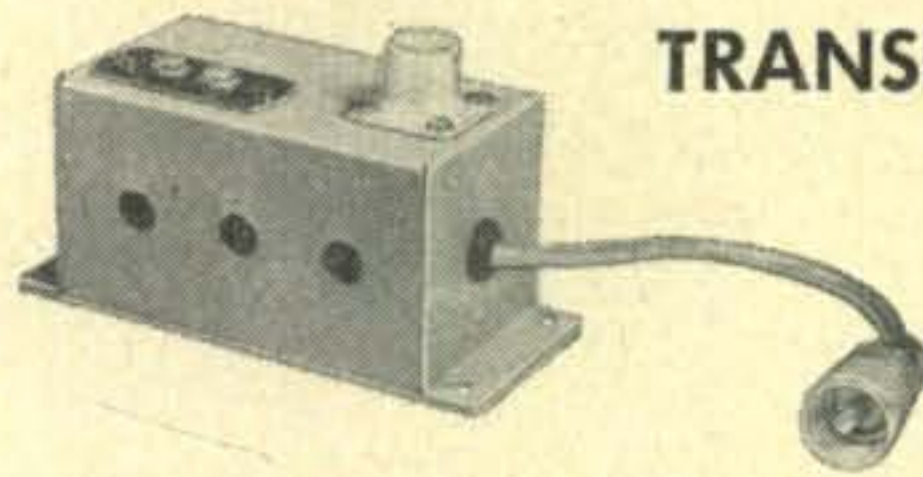
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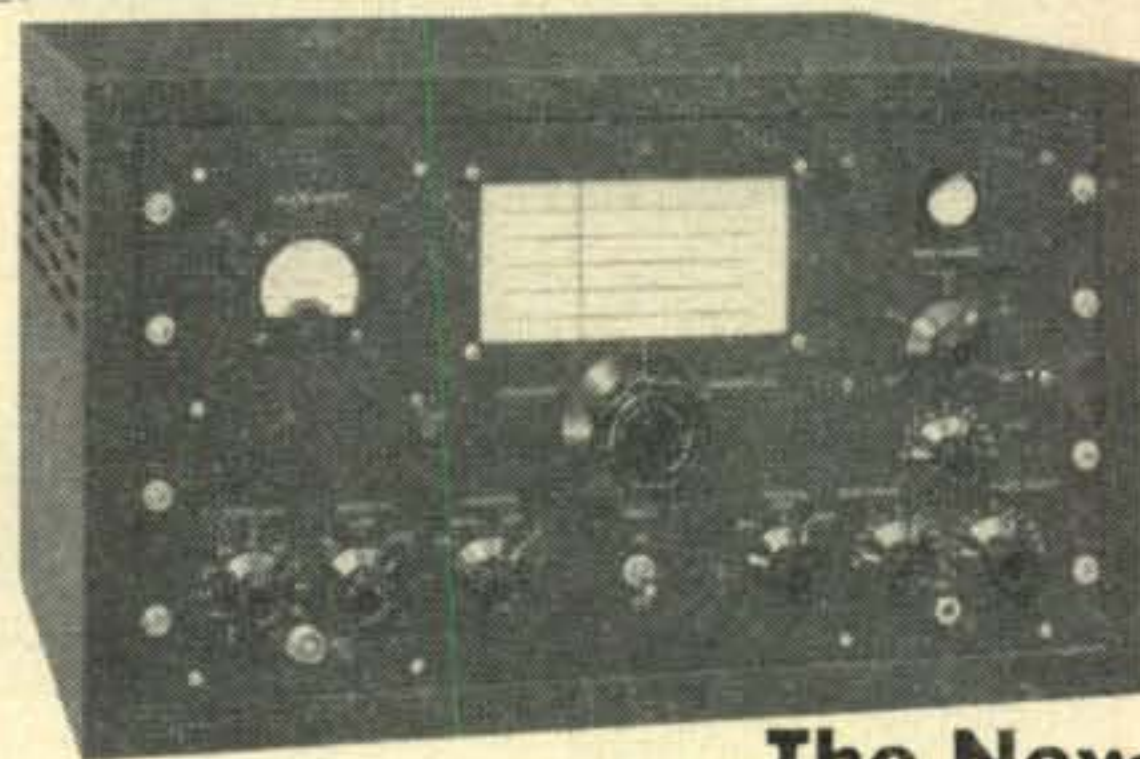
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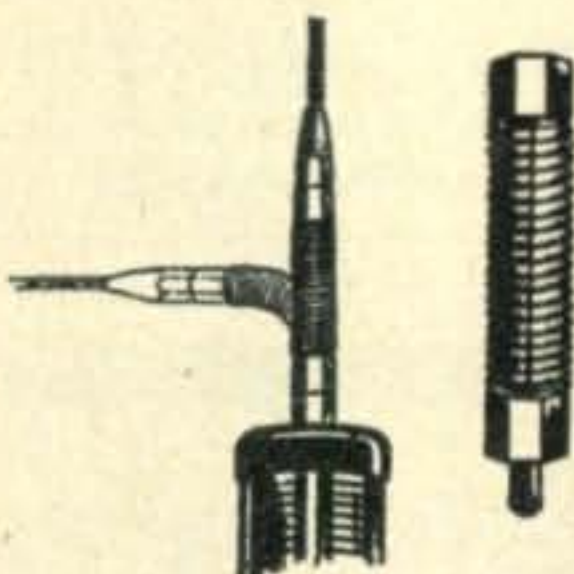
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## CQ Ad Index

Air Tone Sound & Recording Co.	60
Algeradio Electronics Co.	70
Allied Radio Corp.	54
Arrow Sales, Inc.	53
Barry Electronics	68
Belvision, Inc.	66
Bliley Electric Co.	57
Bud Radio, Inc.	54
Central Electronics, Inc.	10
Centralab	8
Clevite-Brush Development Co.	60
Collins Radio Company	Cover 2
Columbia Electronics Sales	67
Curle Radio Supply	70
Eitel-McCullough, Inc.	12, 56
Eldico	55
Engineering Associates	70
Esse Radio Company	50, 51
E-Z Way Towers, Inc.	65
Farr Electronics Co.	66
Glass, J. J. Co.	64
Hallicrafters Co.	2
Harvey Radio Company, Inc.	71
Heath Company	4, 5
Hughes Research & Dev. Labs.	9
Hundley Crystal Co.	70
Instructograph Company	68
Lakeshore Industries	59
Millen, James Mfg. Co.	6
Mosley Electronics	7
National Company, Inc.	Cover 3
Neo-Tech Products	61
Petersen Radio Company, Inc.	1
Pierson-Holt Company	71
Radio Stationers	60
RCA Tube Dept.	Cover 4
Regency	63
Rex Radio Supply Co.	56
Rohn Manufacturing Co.	62
Surplus Emporium	66
Transitron	70, 71
United Catalog Publishers	72
U. S. Crystals, Inc.	46, 47
Vaaro Elec. Engineering Co.	66, 72
Valparaiso Technical Institute	56
V & H Radio Supply Co.	63
World Radio Laboratories, Inc.	49

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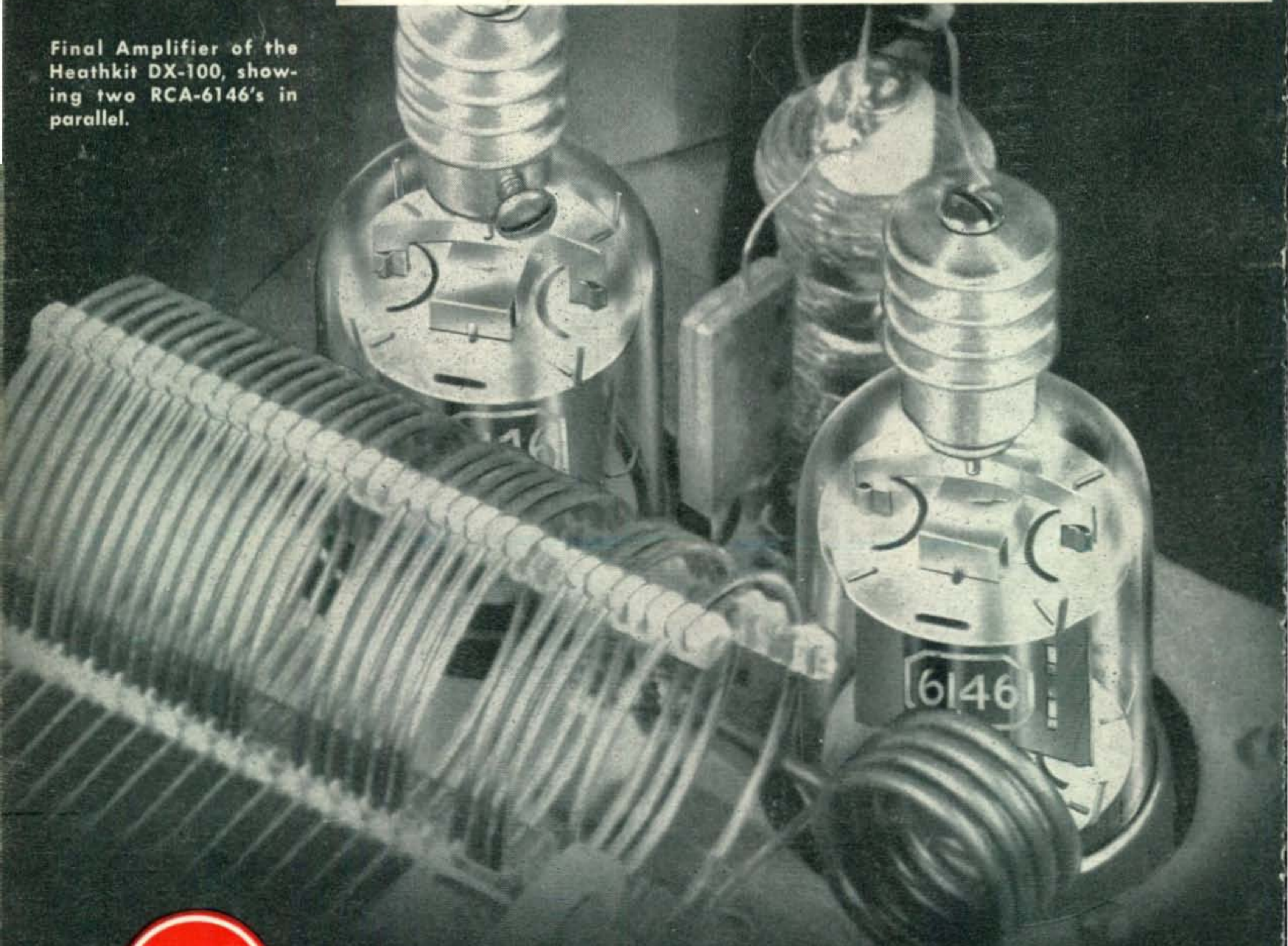
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