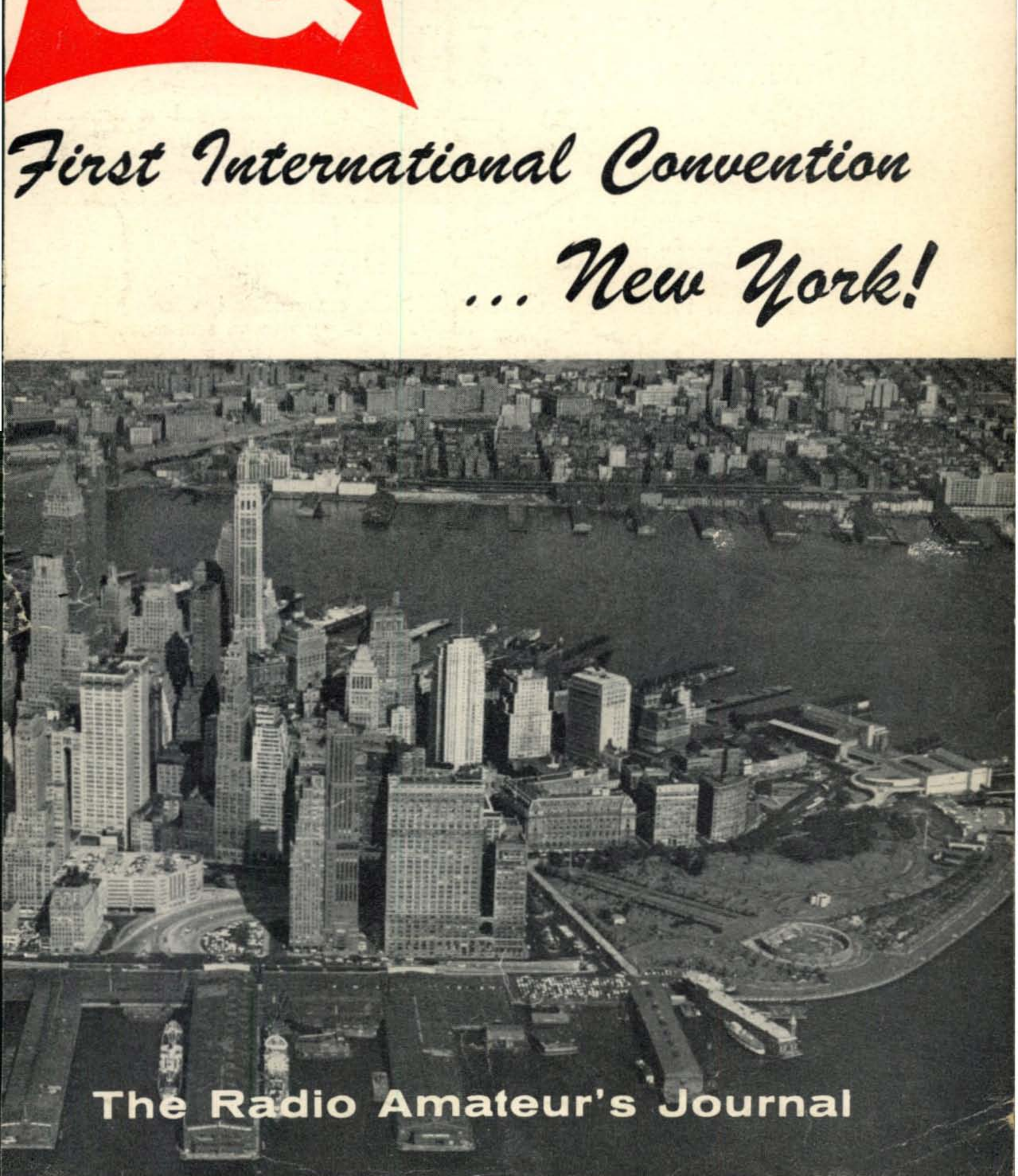
February 1960

50¢

CQ

First International Convention ... New York!



The Radio Amateur's Journal

GOOD REASONS FOR ADVANCED SSB PERFORMANCE IN COLLINS S/LINE

FREQUENCY STABILITY
MECHANICAL FILTERS — Collins Mechanical Filter sideband generation has two steep sided skirts with a 2:1 bandwidth at the 60:6 db points. It assures clean voice signals without additional audio filters.

AUTOMATIC LOAD CONTROL
RF FEEDBACK — RF feedback around driver and PA stage improves linearity, reduces distortion products, giving cleanest signal on the air.

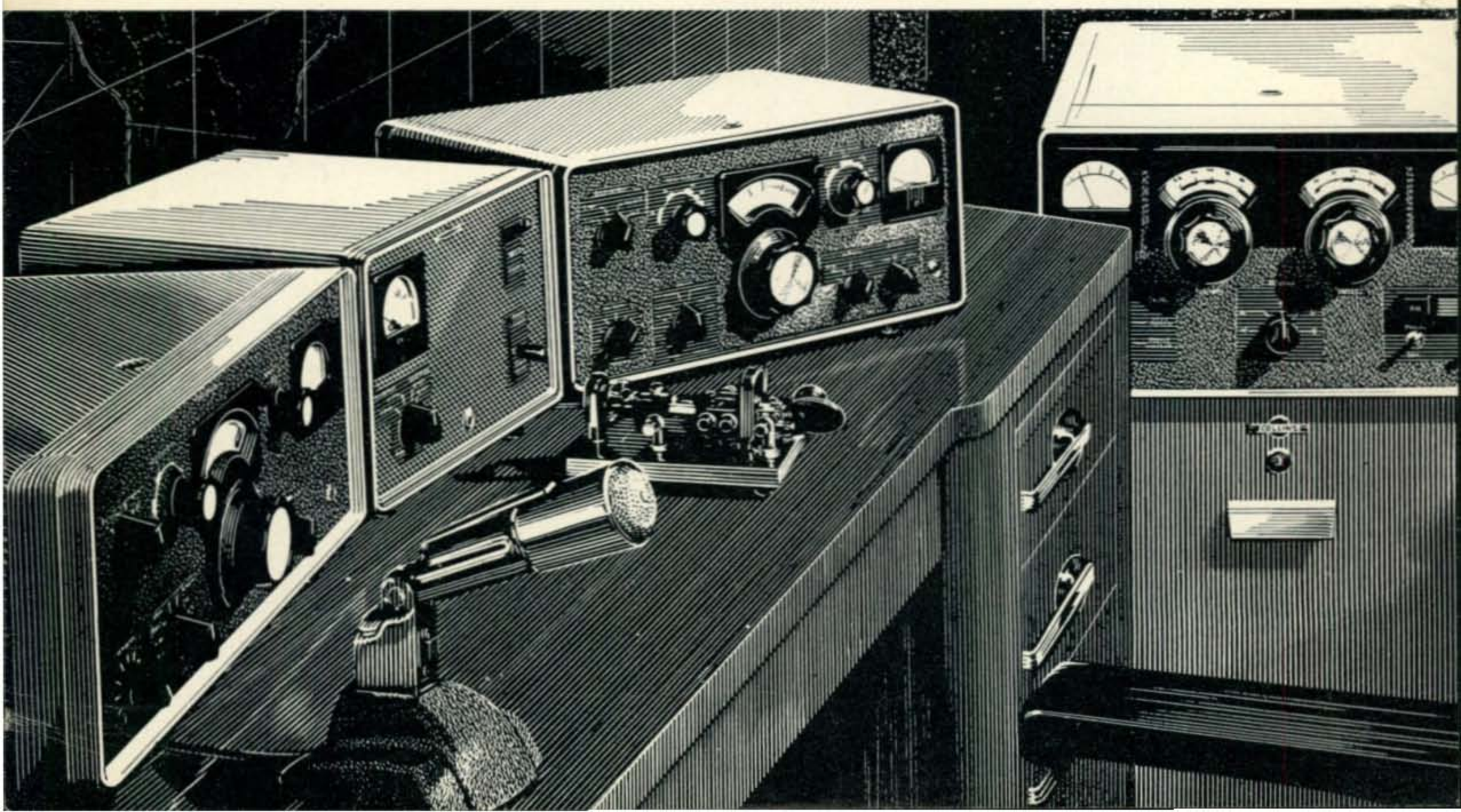
ONE KC DIVISION ON ALL BANDS
MORE QSO'S PER KC
DUAL OR SINGLE PTO CONTROL — A flick of a switch selects a single control for transceiver operation, or you can transmit and receive on separate controls. Highly stable permeability tuned oscillator gives positive indication and the best frequency calibration available.

OPERATING AND FRONT PANEL SIMPLICITY
LIGHTWEIGHT — Modern, compact design makes the Collins S/Line easy to move and assemble. It's light enough to carry along on a field day, on weekend trips, vacations — or anywhere you want improved SSB communication.
COMPLETE STATION COMPATIBILITY

These are the outstanding features that make Collins S/Line the advanced system for amateurs. For maximum talking power and greatest operating convenience specify Collins S/Line. See the complete S/Line on display at your Collins distributor.

For further information, check number 1 on page 126.

COLLINS



It pays to insist on PR *crystals*

STANDARD OF EXCELLENCE SINCE 1934

Z-2

Z-9A
Z-9R

Z-1

2XP

AMATEUR TYPES

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

Rugged. Low drift, fundamental oscillators. High activity and power output. Stands up under maximum crystal currents. Stable, long-lasting, hermetically sealed; ±500 cycles..... **$2.95** Net

24 to 27 Mc., PR Type Z-9A

Third overtone; multiplies into either 2-meter or 6-meter band; hermetically sealed; calibrated 24 to 27 Mc., ±3 Kc.; .050" pins. **$4.95** Net

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Commercial Crystals available from 100 Kc. to 70 Mc. Prices on Request.

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Type Z-1 Aircraft
3023.5 Kc., .005%..... **$3.45** Net

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For Lear, Narco and similar equipment operating in the 121 Mc. region, requiring crystals in 30 Mc. range. Each.... **$4.95** Net

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Official assigned frequencies in the range. Calibrated to .005%.
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Type Z 1, TV Marker
Channels 2 thru 13.... **$6.45** Net
4.5 Mc. Intercarrier, .01%..... **$2.95** Net
5.0 Mc. Signal Generator, .01%..... **$2.95** Net
10.7 Mc. FM, IF, .01%..... **$2.95** Net

Type 2XP
Suitable for converters, experimental, etc. Same holder dimensions as Type Z-2.
1600 to 12000 Kc., (Fund.) ±5 Kc..... **$3.45** Net
12001 to 25000 Kc. (3rd Overtone) ±10 Kc..... **$4.45** Net

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

TYPE Z-9R CITIZENS BAND CLASS "D"
FCC assigned frequencies in megacycles: 26.965, 26.975, 26.985, 27.005, 27.015, 27.025, 27.035, 27.055, 27.065, 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175, 27.185, 27.205, 27.215, 27.225; calibrated to .005%. (Be sure to specify manufacturer of equipment) ..... **$2.95** Net

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TYPE Z-9R RADIO CONTROL CLASS "C"
FCC assigned frequencies in megacycles: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255; calibrated to .005%. (Be sure to specify manufacturer of equipment) ..... **$2.95** Net

Type Z-6A, Frequency Standard

To determine band edge. To keep the VFO and receiver properly calibrated.
100 Kc. .. **$6.95** Net

Z-6A

PETERSEN RADIO CO., *Inc.* 2800 W. Broadway
COUNCIL BLUFFS, IOWA

EXPORT SALES: Royal National Corporation, 250 W. 57th Street, New York 19, N. Y., U. S. A.

For further information, check number 3 on page 126.

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Bob Adams, W3SW — *sideband*

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contributing editors

E. L. Klein, W4UHN — *printed circuits*

Norman McLaughlin, W3LNT — *grounded grids*

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

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

CQ CERTIFICATES:

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

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

Special SB Certificates are available from the Sideband Department for operators providing proof of contact (QSL cards) with stations in 50, 75 and 100 countries using two-way sideband. Send cards directly ot the SB Editor.

TECHNICAL INFORMATION:

Please check the 11-year cumulative index which was published in the January 1956 CQ for information about articles in past issues of CQ. The December 1956 to 1958 CQ yearly indexes will bring you up to date. Most back issues are available at $1 from us. Check our "Back Issue" ad for details on those not available. Reprints of the Cumulative Index are available free. For further information see the Ham Clinic column.

DISCLAIMER:

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

← **For further information, check number 4, on page 126.**

CQ—The Radio Amateur's Journal

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DEPARTMENTS

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publisher	**S. R. Cowan**
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BUILD YOUR OWN HEATHKIT® HAM GEAR

HEATHKIT HAM EQUIPMENT IS DESIGNED BY HAMS WHO KNOW YOUR PROBLEMS AND NEEDS.

PROVEN, "ON THE AIR" PERFORMANCE

"SENECA" VHF HAM TRANSMITTER KIT

Beautifully styled and a top performer of highest quality throughout. The "Seneca" is a completely self-contained 6 and 2 meter transmitter featuring a built-in VFO for both 6 and 2 meters, and 4 switch-selected crystal positions, 2 power supplies, 5 radio frequency stages, and 2 dual-triode audio stages. Panel controls allow VFO or crystal control, phone or CW operation on both amateur bands. An auxiliary socket provides for receiver muting, remote operation of antenna relay and remote control of the transmitter such as with the Heathkit VX-1 Voice Control. Features up to 120 watts input on phone and 140 watts on CW in the 6 meter band. Ratings slightly reduced in the 2 meter band. Ideal for ham operators wishing to extend transmission into the VHF region. Shpg. Wt. 56 lbs.

HEATHKIT VHF-1 **$159.95**

DX-20 CW TRANSMITTER KIT

Designed exclusively for CW work, the DX-20 provides the novice as well as the advanced-class CW operator with a low cost transmitter featuring high operating efficiency. Single-knob bandswitching covers 80, 40, 20, 15 and 10 meters using crystals or an external VFO. Pi network output circuit matches antenna impedances between 50 and 1,000 ohms. Employs a single 6DQ6A tube in the final amplifier stage for plate power input of 50 watts. A 6CL6 serves as the crystal oscillator. The husky power supply uses a heavy duty 5U4GB rectifier and top-quality "potted" transformer for long service life. Easy-to-read panel meter indicates final grid or plate current selected by the panel switch. Complete RF shielding to minimize TVI interference. Easy-to-build with complete instructions provided. Shpg. Wt. 19 lbs.

HEATHKIT DX-20 **$35.95**

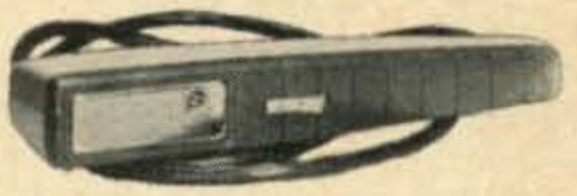
HEATH COMPANY Benton Harbor, Michigan — a subsidiary of Daystrom, Inc.

Mobile Gear...for the Ham on the Go!

"CHEYENNE" MOBILE HAM TRANSMITTER KIT

All the fun and excitement . . . plus the convenience of mobile operation are yours in the all-new Heathkit "Cheyenne" transmitter. The neat, compact, and efficient circuitry provides you with high power capability in mobile operation, with low battery drain using carrier controlled modulation. All necessary power is supplied by the model MP-1 described below. Covers 80, 40, 20, 15 and 10 meters with up to 90 watts input on phone. Features built-in VFO, modulator, 4 RF stages, with a 6146 final amplifier and pi network (coaxial) output coupling. High quality components are used for long service life and reliable operation, along with rugged chassis construction to withstand mobile vibrations and shock. Thoughtful circuit layout provides for ease of assembly with complete instructions and detailed pictorial diagrams to insure success. A spotting switch is also provided. A specially designed ceramic microphone is included to insure effective modulation with plenty of "punch". Plan now to enjoy the fun of mobile operation by building this superb transmitter. Shpg. Wt. 19 lbs.

HEATHKIT MT-1
$99.95



"COMANCHE" MOBILE HAM RECEIVER KIT

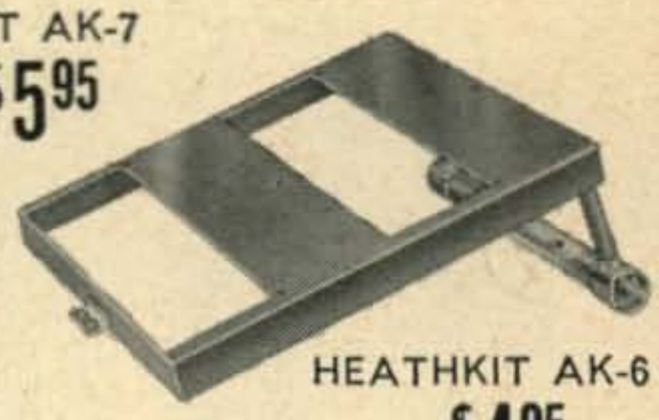
Everything you could ask for in modern design mobile gear is provided in the "Comanche" . . . handsome styling, rugged construction, top quality components . . . and, best of all, a price you can afford. The "Comanche" is an 8-tube superheterodyne ham band receiver operating AM, CW and SSB on the 80,.40, 20, 15 and 10 meter amateur bands. A 3 mc crystal lattice-type IF filter permits the receiver to use single conversion without image interference, and at the same time creates a steep sided 3 kc flat top IF bandpass characteristic comparable to mechanical type filters. The neat, compact and easy-to-assemble circuitry features outstanding sensitivity, stability and selectivity on all bands. Circuit includes an RF stage, converter, 2 IF stages, 2 detectors, noise limiter, 2 audio stages and a voltage regulator. Sensitivity is better than 1 microvolt on all bands and signal-to-noise ratio is better than 10 db down at 1 microvolt input. One of the finest investments you can make in mobile gear. Shpg. Wt. 19 lbs.

HEATHKIT MR-1
$119.95

MOBILE SPEAKER KIT

A matching companion speaker for the "Comanche" mobile receiver. Housed in a rugged steel case with brackets provided for easy installation on fire wall or under dashboard, etc. Uses 5 PM speaker with 8 ohm voice coil. Measures 5" H. x 5" W. x 2½" D. Shpg. Wt. 4 lbs.

HEATHKIT AK-7
$5.95



HEATHKIT AK-6
$4.95

MOBILE BASE MOUNT KIT

The AK-6 Base Mount is designed to hold both transmitter and receiver conveniently at driver's side. Universal mounting bracket has adjustable legs to fit most automobiles. Shpg. Wt. 5 lbs.

HEATHKIT MP-1
$44.95

MOBILE POWER SUPPLY KIT

This heavy duty transistor power supply furnishes all the power required to operate both the MT-1 Transmitter and MR-1 Receiver. It features two 2N442 transistors in a 400 cycle switching circuit, supplying a full 120 watts of DC power. Under intermittent operation it will deliver up to 150 watts. Kit contains everything required for complete installation, including 12' of heavy battery cable, tap-in studs for battery posts, power plug and 15' of connecting cable. Chassis size is 9 1/16" L. x 4¾" W. x 2" H. Operates from 12-14 volt battery source. Circuit convenience provided by self-contained relay which allows push-to-talk mobile operation. Shpg. Wt. 8 lbs.

POWER METER KIT

This handy unit picks up energy from your mobile antenna and indicates when your transmitter is tuned for maximum output. A variable sensitivity control is provided. Features a strong magnet on a swivel-mount for holding it on a car dashboard or other suitable spot. Has its own antenna or may be connected to existing antenna. Sensitive 200 ua meter. Shpg. Wt. 2 lbs.

HEATHKIT
PM-2
$12.95

HEATHKIT®

COMPANION UNITS

HEATHKIT TX-1 **$234.95**

"APACHE" HAM TRANSMITTER KIT

The many features and modern styling of the "Apache" will provide you with just about everything you could ask for in transmitting facilities. Emphasizing high quality the "Apache" operates with a 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, built-in switch selected circuitry provides for single-sideband transmission using the SB-10 External adapter. The newly designed, compact and stable VFO provides low drift frequency control necessary for SSB transmission. A slide rule type illuminated rotating VFO dial with full gear drive vernier tuning provides ample bandspread and precise frequency settings. The bandswitch allows quick selection of the amateur bands on 80, 40, 20, 15 and 10 meters. This unit also has adjustable low-level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation. The final amplifier is completely shielded for TVI protection and neutralized for greater stability. A cooling fan is also provided. The formed one-piece cabinet with convenient access hatch provides accessibility to tubes and crystal sockets. Die-cast aluminum knobs and control panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. A "spotting" push button enables the operator to "zero beat" an incoming frequency without putting the transmitter on the air. Equip your ham shack now for top transmitting enjoyment with this outstanding unit. Shpg. Wt. 110 lbs. Shipped motor freight unless otherwise specified.

HEATHKIT SB-10
$89.95

SINGLE SIDEBAND ADAPTER KIT

Designed as a compatible plug-in adapter unit for the TX-1 "Apache" transmitter, this unit lets you operate on SSB at a minimum of cost, yet does not affect the normal AM and CW functions of the transmitter. By making a few simple circuit modifications, the DX-100 and DX-100-B transmitters can be used, utilizing all existing RF circuitry. Extremely easy to operate and tune, the adapter employs the phasing method for generating a single-sideband signal, thus allowing operation entirely on fundamental frequencies. The critical audio phase shift network is supplied completely preassembled and wired in a sealed plug-in unit. Produces either a USB, LSB or DSB signal, with or without carrier insertion. Covers 80, 40, 20, 15 and 10 meter bands. An easy-to-read panel meter indicates power output to aid in tuning. A built-in electronic voice control with anti-trip circuit is also provided. 10 watts PEP output. Unwanted sideband suppression is in excess of 30 db and carrier suppression is in excess of 40 db. An EL84/6BQ5 tube is used for linear RF output. Shpg. Wt. 12 lbs.

MODIFICATION KIT: Modifies DX-100 and DX-100-B for use with the SB-10 Adapter. Model MK-1. Shpg. Wt. 1 lb. **$8.95.**

HEATHKIT AR-3
$29.95
(less cabinet)

ALL-BAND RECEIVER KIT

A fine receiver for the beginning ham or short wave listener, designed for high circuit efficiency and easy construction. Covers 550 kc to 30 mc in four bands clearly marked on a slide-rule dial. Transformer operated power supply. Features include: bandswitch, bandspread tuning, phone-standby-CW switch, phone jack, antenna trimmer, noise eliminator, RF gain control and AF control. Shpg. Wt. 12 lbs.

CABINET: Opt. extra. No. 91-15A. Shpg. Wt. 5 lbs. **$4.95.**

HEATHKIT QF-1
$9.95

"Q" MULTIPLIER KIT

Useful on crowded phone and CW bands, this kit adds selectivity and signal rejection to your receiver. Use it with any AM receiver having an IF frequency between 450 and 460 kc that is not AC-DC type. Provides an effective "Q" of approximately 4,000 for extremely sharp "peak" or "null". The QF-1 is powered from the receiver with which it is used. Shpg. Wt. 3 lbs.

OF DISTINCTIVE QUALITY

ACCESSORY SPEAKER KIT

Handsomely designed and color styled to match the "Mohawk" receiver this heavy duty 8" speaker with 4.7 ounce magnet provides excellent tone quality. Housed in attractive 3/8" plywood cabinet with perforated metal grille. Speaker impedance is 8 ohms. Shpg. Wt. 7 lbs.

HEATHKIT AK-5
$9.95

HEATHKIT RX-1 $274.95

"MOHAWK" HAM RECEIVER KIT

Styled to match the "Apache" transmitter the "Mohawk" ham band receiver provides all the functions required for clear, rock-steady reception. Designed especially for ham band operation this 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc and covers all the amateur frequencies from 160 through 10 meters on 7 bands with an extra band calibrated to cover 6 and 2 meters using a converter. Specially designed for single sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled wired and aligned front end coil bandswitch assembly assures ease of construction and top performance of the finished unit. Other features include 5 selectivity positions from 5 kc to 500 CPS, bridge T-notch filter for excellent heterodyne rejection, and a built-in 100 kc crystal calibrator. The set provides a 10 db signal-to-noise ratio at less than 1 microvolt input. Each ham band is separately calibrated on a rotating slide rule dial to provide clear frequency settings with more than ample bandspread. Front panel features S-meter, separate RF, IF and AF gain controls, T-notch tuning, T-notch depth, ANL, AVC, BFO, Bandswitch tuning, antenna trimmer, calibrate set, calibrate on, CW-SSB-AM, receive-standby, upper-lower sideband, selectivity, phone jack and illuminated gear driven vernier slide rule tuning dial. Attractively styled with die-cast aluminum control knobs and escutcheons. No external alignment equipment is required for precise calibration of the "Mohawk". All adjustments are easily accomplished using the unique method described in the manual. An outstanding buy in a communications receiver. Shpg. Wt. 66 lbs. Shipped motor freight unless otherwise specified.

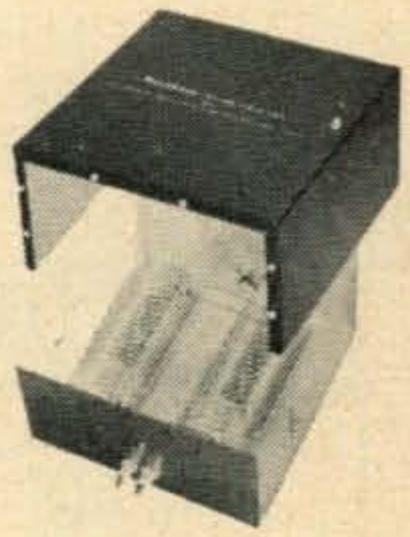
HEATHKIT AM-2
$15.95

REFLECTED POWER METER KIT

The AM-2 measures forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt of energy and covers 160 through 6 meters. Input and output impedance provided for 50 or 75 ohm lines. No external power required for operation. Use it also to match impedances between exciters or RF sources and grounded grid amplifiers. Shpg. Wt. 3 lbs.

BALUN COIL KIT

Match unbalanced coaxial lines, found on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance with this handy transmitter accessory. Capable of handling power input up to 200 watts, the B-1 may be used with transmitters and receivers covering 80 through 10 meters. No adjustment required. Shpg. Wt. 4 lbs.



HEATHKIT B-1
$8.95

HEATHKIT VX-1
$23.95

ELECTRONIC VOICE CONTROL KIT

Eliminate hand switching with this convenient kit. Switch from receiver to transmitter by merely talking into your microphone. Sensitivity controls allow adjustment to all conditions. Power supply is built in and terminal strip on the rear of the chassis accommodates receiver and speaker connections and also a 117 volt antenna relay. Shpg. Wt. 5 lbs.

HEATHKIT VF-1
$19.50

VFO KIT

Far below the cost of crystals to obtain the same frequency coverage this variable frequency oscillator covers 160, 80, 40, 20, 15 and 10 meters with three basic oscillator frequencies. Providing better than 10 volt average RF output on fundamentals, the VF-1 is capable of driving the most modern transmitters. Requires only 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a. Illuminated dial reads direct. Shpg. Wt. 7 lbs.

Save 1/2 or more...with Heathkits

HEATHKIT DX-100-B $189.50

DX-100-B PHONE AND CW TRANSMITTER KIT

A long standing favorite in the Heathkit line, the DX-100-B combines modern styling and circuit ingenuity to bring you an exceptionally fine transmitter at an economical price. Panel controls allow VFO or crystal control, phone or CW operation on all amateur bands up to 30 mc. The rugged one-piece formed cabinet features a convenient top-access hatch for changing crystals and making other adjustments. The chassis is punched to accept sideband adapter modifications. Featured are a built-in VFO, modulator, and power supply, complete shielding to minimize TVI, and a pi network output coupling to match impedances from 50 to 72 ohms. RF output is in excess of 100 watts on phone and 120 watts on CW. Band coverage is from 160 through 10 meters. For operating convenience single-knob bandswitching and illuminated VFO dial on meter face are provided. A pair of 6146 tubes in parallel are employed in the output stage modulated by a pair of 1625's. Shpg. Wt. 107 lbs. Shipped motor freight unless otherwise specified.

HEATHKIT DX-40 $64.95

DX-40 PHONE AND CW TRANSMITTER KIT

An outstanding buy in its power class the DX-40 provides both phone and CW operation on 80, 40, 20, 15 and 10 meters. A single 6146 tube is used in the final amplifier stage to provide full 75 watt plate power input on CW or controlled carrier modulation peaks up to 60 watts for phone operation. Modulator and power supplies are built in and single-knob bandswitching is combined with the pi network output circuit for complete operating convenience. Features a D'Arsonval movement panel meter. A line filter and liberal shielding provides for high stability and minimum TVI. Provision is made for three crystals easily accessible through a "trap door" in the back of the cabinet. A 4-position switch selects any of the three crystals or jack for external VFO. Power for the VFO is available on the rear apron of the chassis. Easy-to-follow step-by-step instructions let assembly proceed smoothly from start to finish even for an individual who has never built electronic equipment before. Shpg. Wt. 25 lbs.

Free Send now for latest Heathkit Catalog describing in detail over 100 easy-to-assemble kits for the Hi-Fi fan, radio ham, boat owner and technician.

HEATHKIT

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pioneer in do-it-yourself electronics

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All prices and specifications subject to change without notice. Please include postage on orders to be shipped parcel post. 20% deposit is required on all C.O.D. orders. All prices are NET F.O.B. Benton Harbor, Mich., and apply to Continental U.S. and Possessions only.

QUANTITY	KIT NAME	MODEL NO.	PRICE

For further information, check number 5 on page 126.

The 1960 Convention... NEW YORK

The 1960 Convention will be held in New York City, the first big ham convention to be held in the City in over ten years. There will be extensive programs in every phase of amateur radio, exhibits by virtually every manufacturer in the field, and tours of the feature attraction for out-of-towners: New York City.

In order to take advantage of vacation times, usually good weather, and hotel room availability the Convention will be held from August 11-14th (Thursday-Sunday).

One of the largest hotels in New York was selected for the Convention, the Statler-Hilton (ex Hotel Pennsylvania). The convention will take over one complete floor of this huge hotel as well as having the Pent-Top suite for on-the-air ham stations.

Now is the time to plan to come to this biggest of ham radio Conventions. Hotel reservation committees will be in operation in June to assure you of a place to stay. Foreign amateurs who are interested in visiting, but are short on dollars should get in touch with the Housing Committee which will arrange for them to stay with a local amateur family.

Amateurs in the New York area that are interested in helping with the Convention are requested to drop a card to International Amateur Radio Convention, Inc., 300 W. 43rd St., N. Y. 36, with your name, call, address, and phone number. If you are interested in any specific phase of the Convevntion, note that too. Here is a chance to be an official of the Convention and help ham radio.

Here are some of the committees that are being formed:

Hotel Reservations	DX
Hospitality	VHF-UHF
See New York	RTTY
Theater & TV Tickets	Mobile
Publicity & Advertising	Traffic
Technical Program	Novice
Tickets	Technician
Prizes	Television
Exhibits	YL
Liaison Committee (MARS, CD, Etc.)	Sideband
Transportation	Civil Defense
Code Speed Contests	MARS
FCC Licensing	Antennas & Propagation
Convention Ham Station	Old Timers

New Gimmick

Congratulations to PY3ANB, Paulo Eduardo Steinhaus of Sto. Angelo, Brazil for thinking up a new dodge for conning U.S. hams out of dollars. Paulo has been busy sending letters to hams in the Callbook pointing out that he is a collector of money from different countries. He encloses a Brazilian one cruzeiro note in exchange for which he requests the U.S. hams to send one dollar to enrich his collection. This will also enrich Paulo if my pegging the Brazilian note at ½¢ is correct. Readers having an irresistible compuplsion to send people dollars should be advised that the editor of CQ is also a collector of money, foreign or domestic, makes no never mind.

HARC

Delegates from 20 Hudson Division amateur radio clubs met at New York State Civil Defense Headquarters on December 5th and organized the Hudson Amateur Radio Council, Inc. The Council announced the following goals: 1) They will attempt to found a central headquarters for ham activities in the Hudson Division. 2) They will assist local hams and the FCC. 3) They will see that a hamfest or convention is put on annually in the area. 4) They will remain close liaison with the founder, Mort Kahn, the ARRL Hudson Division Director, to make the needs of ARRL members in the Division known to League Headquarters.

Feenix, Ariz.

Deer Hon. Ed:

Getting out your hammer and chisel, on acct. shortly you going to be chiseling Scratchi's name in Hon. Hall of Fame. No kiddings, Hon. Ed., Scratchi coming up with gratest idea since invenshun of vacuum toobs.

You doubting? Then lissening. What are three gratest problums facing radio amchoor today? I'll telling you. They are 1) Not having enuf radio-freakwency spectrum space, and 2) everybuddies sending see-w at to high speed so not everybuddies can reeding, and 3) everybuddies wanting to running more power.

Now, Hon. Ed., if I solving all three problums with one peechy, terrific, 1/c idea, you agreeing that Scratchi are having leg up on being Hon. Geenyus? Well, I doing it. Are calling it Scratchi's All Problums Solushun. Yes indeedy, SAPS are the answer.

And another thing, Hon. Ed., to reely showing how grate an idea this is, I thinking it may even be legal. I'm not reel surely, but maybes not even Hon. F.C.C. can objecting.

It all coming to me one day when I having QSO on see-w and I watching the plate current meter bouncing back and forth. You knowing how it is. Even if key-down current being 500 mils, when you sending series of dots, old plate meter just vibrating there at about 200 mil point.

Then I thinking—what happening if just sending one dot. I trying it. Meter only going up to maybe 150 mils. Well, if meter only showing 150 mils plate current, then Scratchi not using full kilowhat. Running 2,000 volts, and 150 mils times 2,000 volts only 300 watts.

I reelizing that key-down having 500 mils and hencely one kilowhat, but honestly now, Hon. Ed., who ever sending see-w with key-down? Just can't having QSO that way.

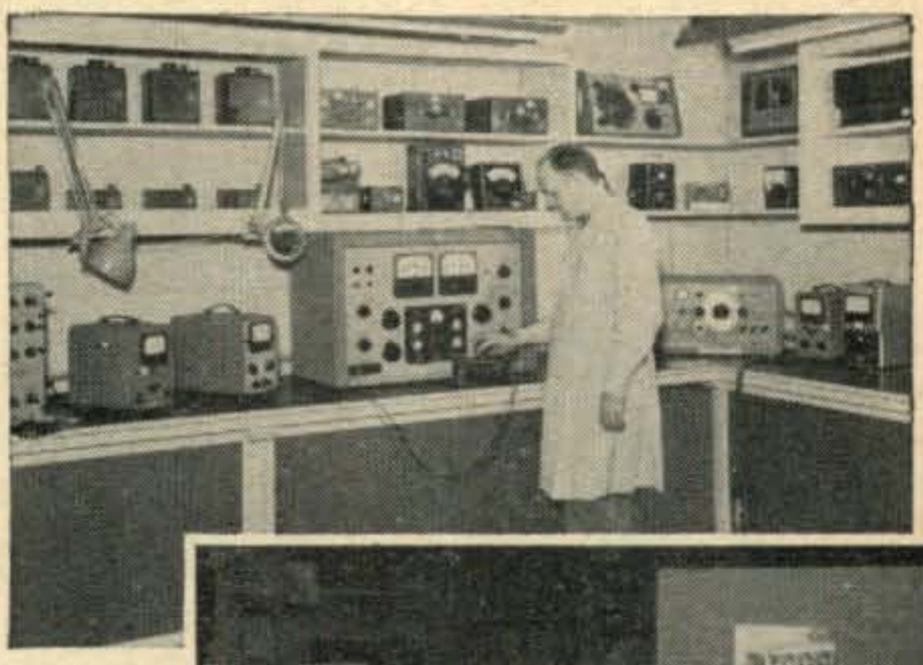
So, Scratchi desiding to running full kilowhat. Getting much bigger toobs for final so they drawing lots more current. Loading them up so when sending single dot on bug, plate meter going up to 500 mils. Not knowing how much current being drawn if holding key down, but then, Scratchi not caring. Power supply groaning as it is on one dot. Howsumever, you

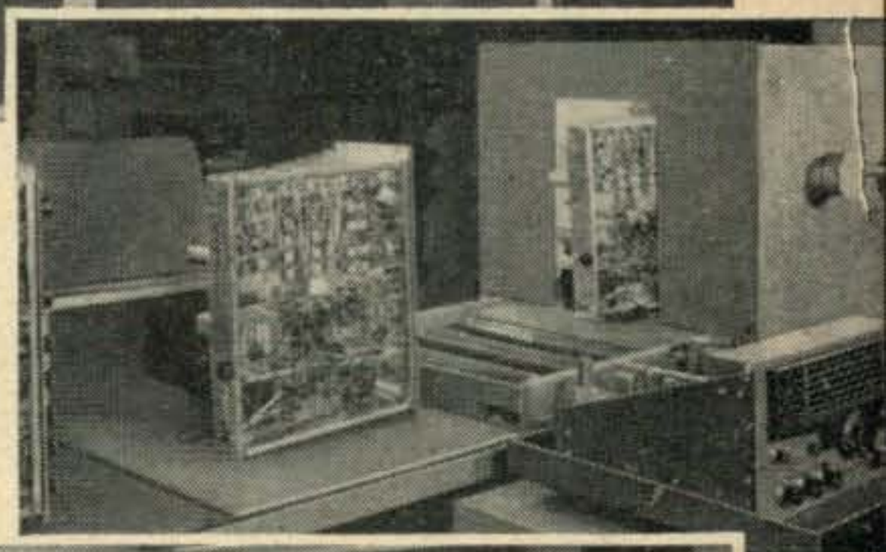
[*Continued on page 94*]

Quality in communications equipment is built in three stages. First: *Imaginative design.* Second: *Uncompromising craftsmanship.* Finally—*positive proof of performance.* In the quarter-century since we manufactured our first receiver, the name Hallicrafters has earned a world-wide reputation for creative engineering. Behind that reputation is a story, little known and unpublicized, of quality control and performance evaluation unequalled in the industry. Here is where dependability is proven in advance, where the test of time is met *before the equipment leaves our factory* . . .

at hallicrafters *the test of time is only part of the story*

Quality begins with quality components. Periodic samples of *more than 28,000 parts* are subjected to 100% inspection, rejected if exacting specifications are not met. Thousands of testing procedures are used in this department! Even the laboratory instruments used in our quality control and production procedures are calibrated periodically against the finest known standard devices in our Calibration Laboratory.





Why we shake and bake them. Extra care pays off in the long run. We virtually eliminate two common sources of trouble with the unusual procedures shown here. Loose or faulty connections are detected on the shake table. Later, assembled units ride smoothly through an oven —where heat far in excess of normal operation actually relaxes and equalizes tensions on all components to insure long term frequency stability.

Measuring VFO frequency drift vs. temperature is the sole function of this entire department. For more than four years, every HT-32 VFO has been subjected to this exacting and critical procedure. Units are placed in oven (center), and frequency drift is automatically plotted over a temperature range from 86° to 175° F. The slightest deviation from standard means rejection. Here's one of many reasons why Hallicrafters transmitters are famous for stability.

Worked for a lifetime in 30 days! In this department samples of daily production are measured against engineering standards by every conceivable operation check—for selectivity, sensitivity, alignment, hum and noise, distortion products, power, etc. Here too is another proving ground for Hallicrafters durability—continuous life tests where equipment is operated at full power for extended periods. These and many other test procedures we've developed over the past 26 years are your guarantee that the new ideas born at Hallicrafters are *proven ideas.*

We'd like to show you the complete story. Won't you drop in next time you're in the neighborhood, Monday through Friday, 8:30 to 5:00 PM?

hallicrafters **4401 West Fifth Avenue, Chicago 24, Illinois**

For further information, check number 6 on page 126.

CLUB BULLETINS

Marvin D. Lipton,

311 Rosemary Road, Toronto 10, Ontario, Canada.

Club Meetings

No matter how congenial its members are, a radio club usually will not survive if meetings are not worth-while. This fact is recognized only too well and numerous club executives have written in asking what others in similar positions do to make meetings attractive. In an attempt to answer such questions, I have quoted notices of meetings as they were printed in papers coming to me. In following this procedure, I have selected club bulletins at random and if I have accidentally overlooked an outstanding program of your group please inform me so that I might tell of it in a future column.

"The next program will be a talk by Bob Cooper on the subject of the Long distance Television reception—(Flysheet), *Stockton A.R.A.* Bill's film on antennas, their operation and theory followed by the usual question and answer period proved beneficial to all members—(Key Klix), *North Bay A.R.C.* The next meeting will be a real one! Through the CQ Club Bulletin we have arranged for a colored film of the KC4AF DXpedition.—(CKRC INK), *Central Kansas R.C.* Dale Dwelley, W6STY, will use a tape recorder with his talk to recount some of the hilarious things that go on in the broadcasting world when people think the mike is off. Dale has worked on 9 BC stations.—(Chewed Rag), *Hayward R.C.* The biggest affair of the entire year for the CARA is our big annual Christmas Party in the main ball room of the YMCA. Ladies and Gents, Sat. Dec. 19.—(Carascope), *Columbus A.R.A.* After the business session we will have a film titled The Part An Amateur Radio Operator Plays During A Disaster.—(The Spritzer), *Lancaster Radio Trans. Soc.* In the Syracuse Museum of Fine Arts over 1000 local members of the Institute of Radio Engineers will pay tribute to four of the world's most famous Old Timers in the development of Electronics.—(Rags Review), *R.A. of Syracuse, N.Y.* Mr. N. Reddick of the Linde Co. will present a program on the proper use of a 'scope and will demonstrate its proper application in testing transmitters, receivers, etc.—(Ama-Chewer), *Indianapolis R.C.* Rumor has it that this will be one of the biggest auctions the club has held in years.—(The Yarc-Mitter), *Yonkers A.R.C.* Carl Mosely was very interesting and the opportunity to see and discuss antennas was welcome.—(County Static), *Genesee County R.C.* Annual family meeting will feature one of the superlative films prepared for N.B.C. by Bill Hartigan of the WRGB news staff: "Assault on Antarctica", narrated by Admiral Dufek.—(SARA News), *Schenectady* A.R.A. Cliff Leal, G3ISX, gave a repeat performance of "Aerials for the Amateur". Graphs, diagrams and models illustrated his presentation—(North Kent Newsletter), *North Kent R. Soc., England.* John Gazeley gave a most informative talk on *vhf*. He dealt with records, demerits of the super regen, *trf* receivers, converters, oscillator circuits, coax line, overtone crystals, lecher lines and rf stages.—(Southgate Newsletter), *Southgate Finchley R.S.G.B. Group, England.* One of the highlights will be a demonstration and discussion of a transistorized SSB generator by Al, W8BJP.—(The Farl Bolt), *Ford A.R. League.* The task of laying telephone cables across oceans will be outlined by Harold West, Plant Design Engineer, Long Lines Dept., A.T.T. Co.—(QUA), *First U.S. Army MARS.* Title of the program will be "Stump the Experts". We can have fun and learn at the same time.—(Ham Hum), *Ak-Sar-Ben R.C.* The program for this meeting consists of a film by the Bell Telephone on transmission lines.—(Ragchew), *Nevada A.R.C.*

[*Continued on page 94*]

IT'S HAMMARLUND...
for SSB at its very best!

the
ALL-NEW HQ-180
for general coverage

An advanced design 18-tube superheterodyne receiver with full dial coverage from 540 KCS to 30.0 MCS. Bandspread on all amateur bands within frequency range of receiver.

$429.00 (Optional clock-timer, $10.00)

the
PROVED CHAMPION
*of amateur band receivers—*HQ-170

No amateur receiver has ever gained as fine a reputation as the HQ-170. A 17-tube superheterodyne receiver tuning the 6, 10, 15, 20, 40, 80 and 160 meter amateur bands.

$359.00 (Optional clock-timer, $10.00)

Hammarlund shows the way to new standards of performance in SSB with the HQ-170 and HQ-180 receivers. These receivers incorporate the Hammarlund slot filter that allows attenuation up to 60 db for razor-sharp tuning, selectable sideband, selectable IF amplifier tuning, separate product detector, BFO control, crystal calibrator, selectable rates of AVC and other advanced features. Pick the one that suits you best. You can't buy better, or be more satisfied than with a Hammarlund SSB receiver . . . they're tops!

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A HALF CENTURY OF QUALITY PRODUCTS — 50th Anniversary

For further information, check number 8 on page 126.

QSL contest

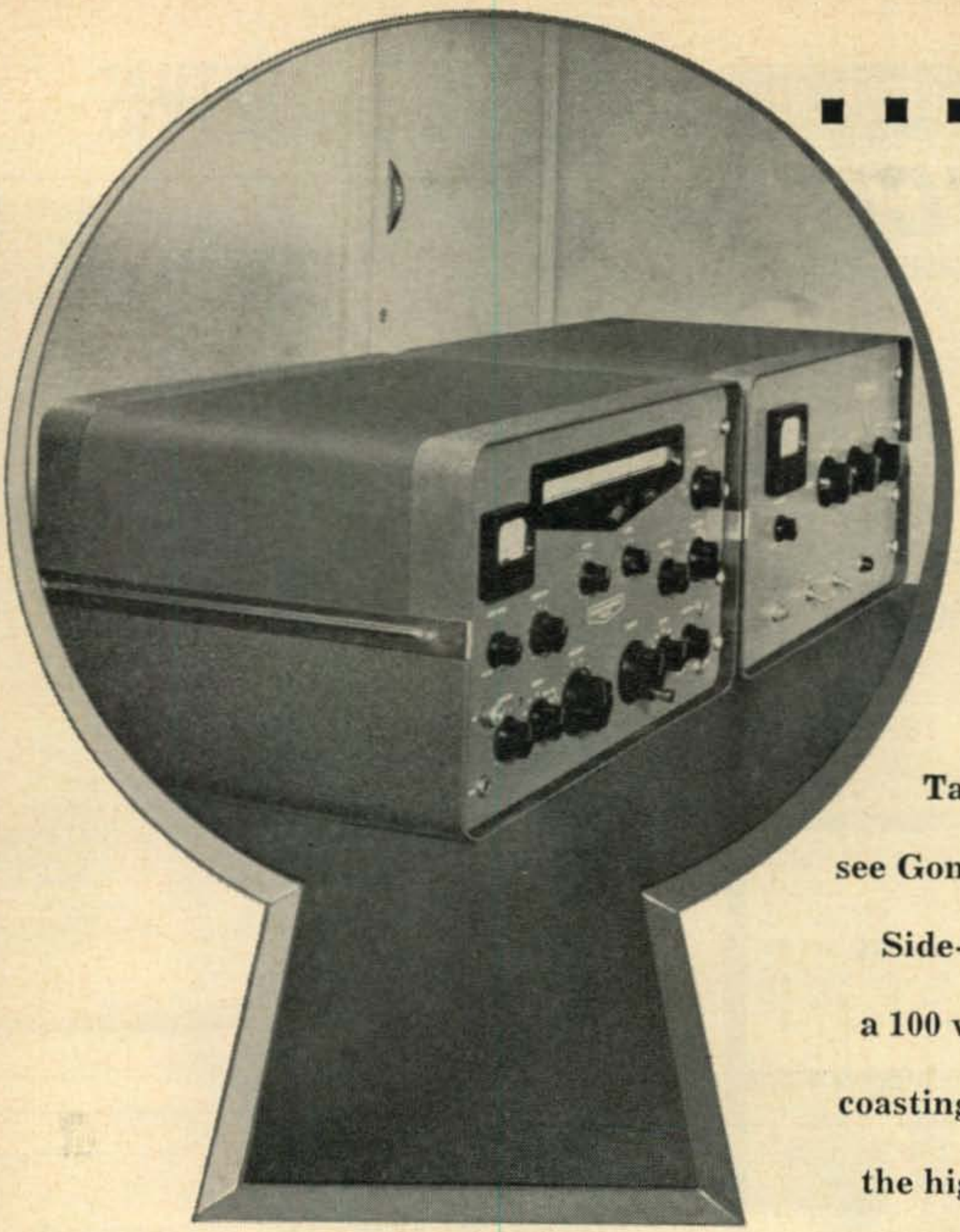
Winner

This month's winner was hard to select. There were many, many fine entries. In order to keep our QSL editor employed, however, a decision had to be made. The Lucky winner? Michigan's own Lee Embrey, Jr., W8TQN. Lee's humble (hah!) artistic endeavors will undoubtedly result in a year's FREE CQ. It should be there, Lee, by the time those Canadian Geese get where they're going. Congrats!

Big Losers

As usual, there are some lucky losers too. KØLUB, KN9RXR and Sweden's SM3ATK fill this category with attractive "Almost but not quite" entries. Some consolation tho, an Extra copy of CQ to these lads.

We have lots of subscriptions to give away yet, fellows! Mail us YOUR card pronto. Few think they are winners, but some always are. That someone can be YOU.



....A 1000 WATT PEEK...

Take a thousand watt peek ... see Gonset's GSB-100 and GSB-101. Side-by-side, fully integrated ... a 100 watt P.E.P. transmitter, just coasting as a full-feature driver for the high efficiency, grounded-grid 1000 watt P.E.P. linear. Observe all the extra operating conveniences . . . the clean cut functional design. Consider the truly outstanding SSB signal this powerful combo can put on the air for you. Check price tags and bring real sideband dollar value into clear focus. Here's your thousand watt peak!

GSB-100 SSB TRANSMITTER/EXCITER

SINGLE SIDEBAND TRANSMITTER/EXCITER, BANDSWITCHES 80-40-20-15-10 METERS. RATED 100 WATTS P.E.P. OPERATES ON SSB WITH SELECTABLE SIDEBANDS. ALSO PM, AM AND CW. EXCELLENT KEYING CHARACTERISTICS. HAS PI NETWORK OUTPUT. USES QUARTZ CRYSTAL NOTCHING FILTER TO SUPPRESS CARRIER. HAS STABLE, CALIBRATED VFO. EXCELLENT VOX SYSTEM, HEAVY-DUTY AC POWER SUPPLY.

GSB-101 SSB RF LINEAR AMPLIFIER

1000 WATTS P.E.P. INPUT LINEAR USES STABLE, EFFICIENT GROUNDED-GRID CIRCUITRY, 4-811'S. HAS PI NETWORK OUTPUT, BANDSWITCHES 80-40-20-15-10 METER BANDS. SUPPLIES FOR POWER AND BIAS AND ANTENNA RELAY ARE BUILT-IN. LINEAR DRIVES BY GSB-100 OR OTHER EQUIPMENT SUPPLYING 60-70 WATTS OF DRIVING POWER.

For further information, check number 10 on page 126.

GSB-100 SSB TRANSMITTER/EXCITER

499.50

GSB-101 SSB RF LINEAR AMPLIFIER

459.50

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For further information, check number 11 on page 126.

MARS BULLETINS

First Army MARS Net Celebrates Anniversary

On January 3th, The First U.S. Army MARS SSB Technical Net celebrated its second anniversary. During two years of operation, the net has presented sixty-three talks and forums by electronic scientists and engineers from many parts of the country.

In order to expand the activities of the net in the Boston area, Colonel Clinton W. Janes, W4KS/1, of Acton, Mass., was appointed as associate net director for the section.

Wednesday evening at 9 PM EST on 4030 kc Upper Sideband.

Feb. 3—"Application Of Quartz Crystals In SSB Filters" by W. E. Benton, Division Chief, Manufacturing Engineering, Western Electric Company, Andover, Massachusetts.

Feb. 10—"Design Philosophy Of A Modern SSB Transceiver" by Chuck Carney, Manager Amateur Equipment Sales, Collins Radio Company, Cedar Rapids, Iowa.

Feb. 17—"Harmonic And Intermodulation Distortion In High Fidelity Amplifiers" by Milton Snitzer, Technical Editor, Electronics World, New York, New York.

Feb. 24—"High Power Transmitter Stations" by Herbert C. Hawkins, Project Engineer, Long Range Radio Branch, U.S. Army Signal Development Laboratory, Fort Monmouth, New Jersey.

Feb. 1960 Schedule
Air Force MARS Western Technical Net

Sundays, 2-4 PM PST
7832.5 kc, 3295 kc, 143.46 mc.

Feb. 7—"Mobile and Portable High Frequency Antennas" by Mr. Don Johnson, Jennings Radio Co., San Jose, Calif.

Feb. 14—"Modern Telemetry Techniques" by Mr. Robert Burr, Director Marketing, Arnoux Corp., West Los Angeles, Calif.

Feb. 21—"Technical Net Session, Conversion Discussion and Project Reports" by Net Members.

Feb. 28—"L3 Carrier System" by Mr. George T. Masters, W6GHE, Pacific Telephone and Telegraph Co., San Francisco, Calif.

Air Force MARS Eastern Technical Net

2-4 PM EST Sundays
3295 kc, 7540 kc, 15,715 kc

Feb. 7—"Principles of Infra-Red." Staff discussion. Rome Air Development Center.

Feb. 14—"UHF Radiotelephone Systems." John Longly, Engineer, New York Telephone Company.

Feb. 21—"Oscillator Circuit Considerations." Robert Gunderson, Editor, Braille Technical Press.

Feb. 28—"Quality Control Techniques." Alfred Stein, Engineer, Riverside Plastics Corp.

March 6—"The I R E National Convention." George Bailey, Chairman of the Convention.

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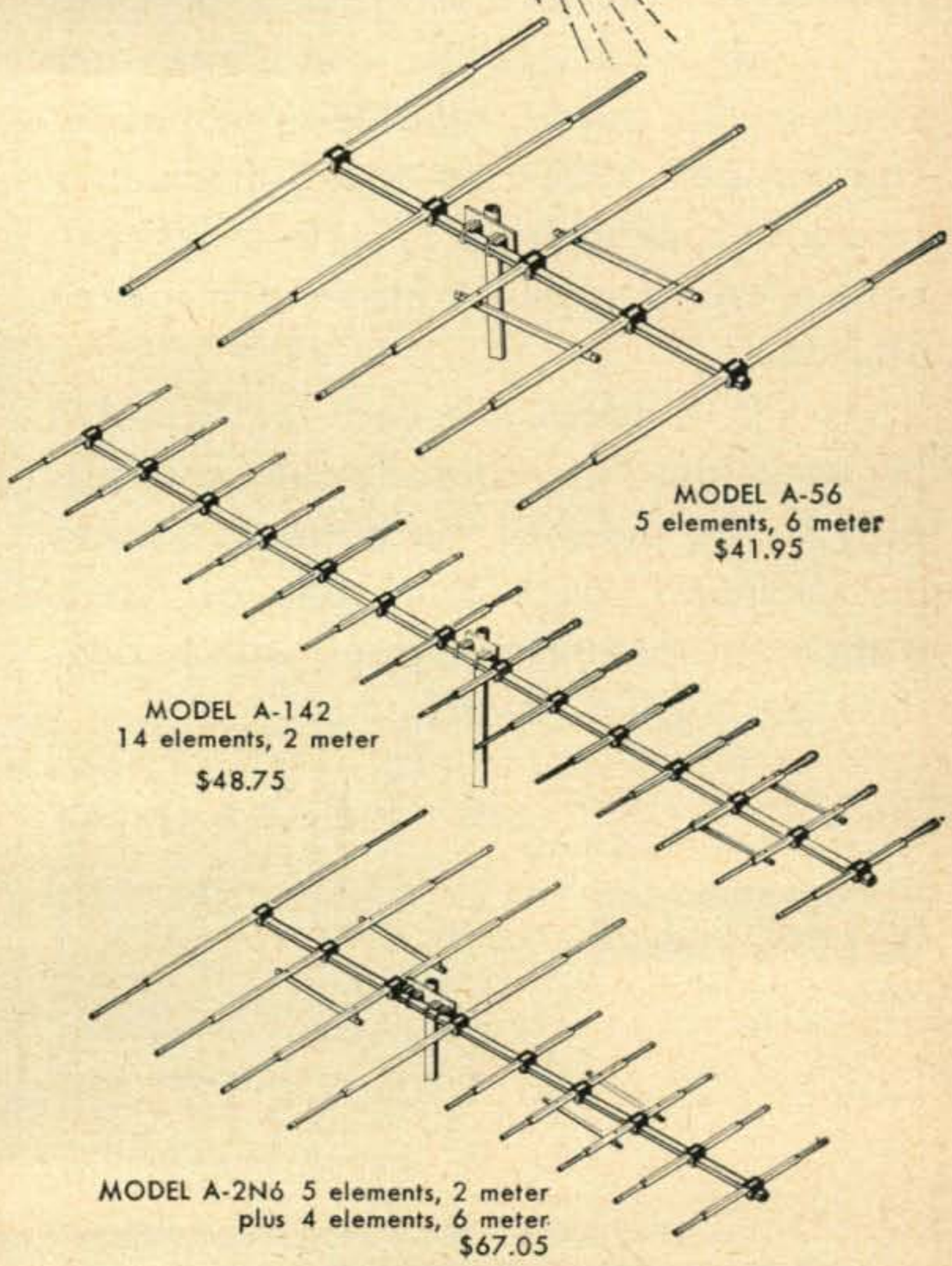
CORROSION...

and WEATHER DAMAGE!



MODEL A-56
5 elements, 6 meter
$41.95

MODEL A-142
14 elements, 2 meter
$48.75

MODEL A-2N6 5 elements, 2 meter
plus 4 elements, 6 meter
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POWERMASTER VHF BEAM ANTENNAS

All models are built of heavy ½" and ⅝" O.D. elements, designed for many years of trouble-free "air time."

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Letters..... to the Editor

Dear Wayne,

Since you printed my letter in the September '59 issue, in which I submitted a list of calls of those people that are licensed pilots as well as hams, I have been receiving letters and QSL's from people all over the country requesting that I add their call to the next list.

Attached you will please find these additions which I do hope you will be kind enough to print for the benefit of all concerned.

Should others find that either they or their friends fall into the category of the above and would like these calls added to the list, please have them send this information to my home QTH as listed above.

Many thanks 73
Jack M. Gutzeit, W2LZX

W1SBM	K3IBE	W6OJK	K4LKY
W2FDL	W3IXL	W6RMT	K4LMZ
K2JHM	K4ABZ	K8GBE	K4OJV
K2JVQ	W4BHR	K8LTS	K4QNG
K2MGQ	W4EEF	W9EMR	K4QYX
K2MMM	W4EHD	K9HFN	W4RRH
W2RCQ	W4HCZ	W9IZI	K4RUX
W3AMO	K4RHG	K9KVC	W4UDG
W3DJV	W4VIW	W9OQP	W4WSS
K3IBD	W6BZ	W9PMO	W4YIU
W9TRN	W9VXE	W9WNT	K4YYJ
WØIBZ	W4FHB	W4GQV	W4ZKE
			K8KSA

Charging

Dear Wayne:

The small mercury battery charger is a direct adaptation from the German (or Japanese) rechargeable flashlights which are available everywhere these days. The German-made ones depend upon a Cadmium cell for current while the cheaper Japanese variety seem to contain some sort of sealed wet accumulator.

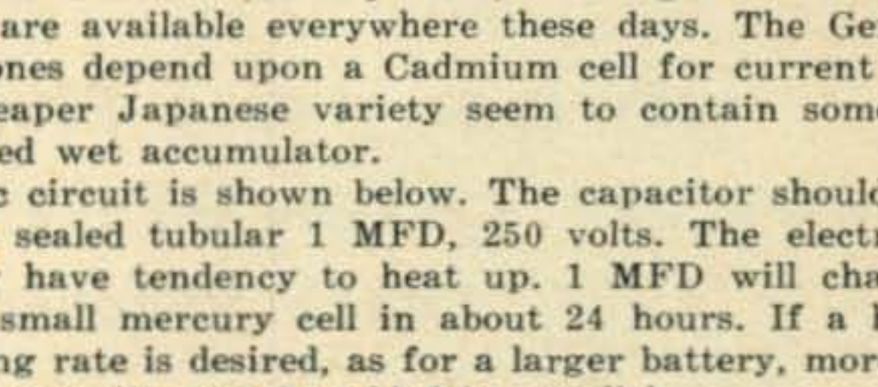
Basic circuit is shown below. The capacitor should be a plastic sealed tubular 1 MFD, 250 volts. The electrolytic variety have tendency to heat up. 1 MFD will charge a single small mercury cell in about 24 hours. If a higher charging rate is desired, as for a larger battery, more condenser capacity may be added in parallel.

The output voltage is "peak" voltage of about 150 v. and as the resistance of the battery being charged is essentially zero ohms, the limiting factor in charging is the number of milliamperes delivered as dctermined by the number of microfarads in the capacity used.

I have tried various types of rectifiers. The miniature selenium type works well. Of course it must be sufficiently rugged to pass the number of milliamperes which the circuit will deliver under the shorted conditions.

Why don't they tell us these things? Particularly people with Mohawk Tape Recorders?

Elliott R. Weyer, W2LLZ



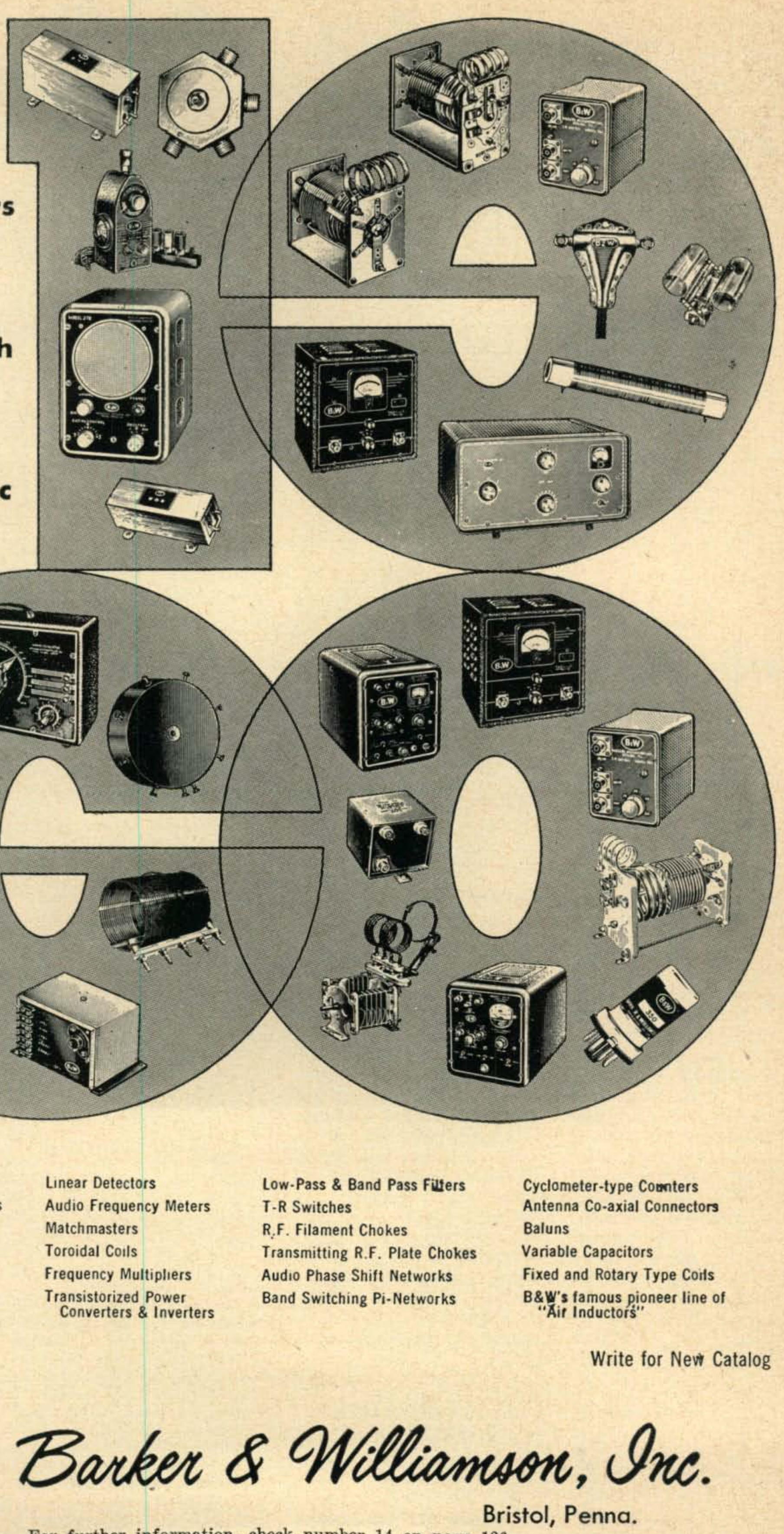
Phone Patch Feedback

Dear Wayne,

I've been running a kw on SSB, 10 through 80, specializing in 15 & 75. I like to run phone patches, but have been

IN 1960

as in the past 28 years B&W will continue to supply amateurs with the world's finest equipment and electronic components



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Single Sideband Generators
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For further information, check number 14 on page 126.

running into trouble with *rf* feedback. Not much, but enough. And, as a side consequence, when I am transmitting others in the house hear me on the phone. So I took my life in my hands and called the phone company.

To make a most interesting story real short, you cannot at present run 100% successful phone patches with one trace of *rf* using the new modern type 500 telephone. They pick up *rf* and rectify it in the new type of equalizer circuit built into them. The other type, model 300, in use since WW II, does not do this. As a result, if you have any 500 type phones you can expect difficulties.

They tried all sorts of filters, by-pass condensers, etc., etc. We built the project into practically a national emergency with the result that there is now an official inquiry regarding the 500 phones for the research headquarters in Camden, N.J. to mull over and a possibility that tariffs may be set up for these devices, which will, once and for all, legalize them beyond any question.

Irvin M. Hoff, K8DKC
Ann Arbor, Michigan

Violations

Hi Wayne,

I read with much interest an article entitled "11,133 More FCC Violation," by W6EUV. However, I'm afraid I'll have to disagree with his statement that there is no correlation between the increase in licenses to the number of violations. Granted that according to statistics the analogy is insignificant, but he is excluding the fact that this a a time when the majority of new hams are a product of mass production type club sponsored license classes and of commercial equipment!

Hank Clark, K8CSI/6 ex KZ5AD

de K3JRK

Dear Sir:

Just a few lines to let you know of a recent change so that the necessary records can be set accordingly. I would also appreciate a note in the publication of the change so that my many "friends" ? ? ? will know of the change and perhaps have a laugh or two and think to themselves that it couldn't happen to a nicer fellow.

I am no longer operating under the call of W7IAA/3, I have applied to the FCC for a second call with a very flowery complimentary letter in which I requested the W3IAA, but apparently it reached the desk of someone with a sense of humor because they have assigned me the call K3JRK.

I can just see a lot of the boys pronouncing the last three letters and having a smile or two. The body and the address remain the same, but the call has been matched to the body.

Sincerely,
Jack E. Ellis

Reciprocal Licensing

Dear Wayne:

The letter from Edwin K. Cole, K7IDF/KL7ABC, in the November issue, is the best letter to the editor I've ever read. Wish you could get him to contribute articles from time to time.

There was a blurb in the Novice department about "the current ban on American ham," in Turkey. It gave as the reason, the lack of a reciprocal licensing agreement. This does not explain the ban as it actually applies, not just to Americans, but also to Turkish citizens as well. It even applies to MARS activities!

I know of one Turkish station, operating illegally with the call TA2AR. He runs 80 watts and works the twenty meter 'phone band.

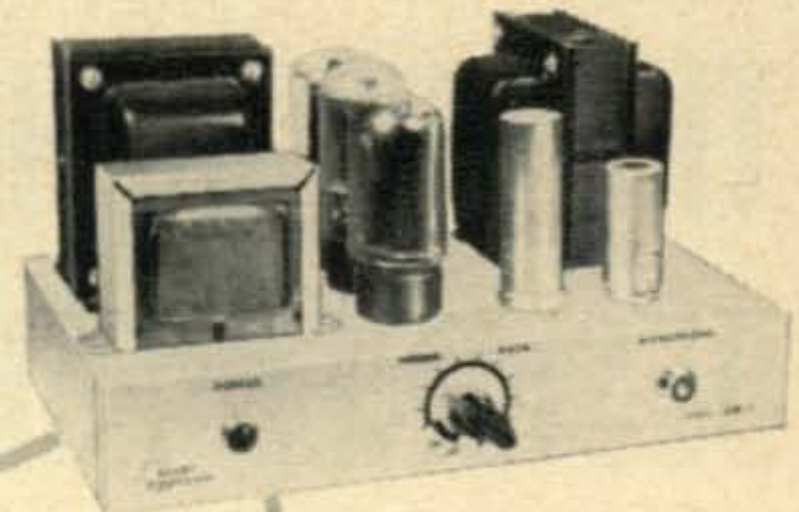
My interest in this matter stems from the fact that I would like to operate from TA land, although I left my gear in storage when I came to Ankara. Also, I'm interested in helping the Turks, even if they eventually legalize ham radio for Turks but continue the ban on licensing foreigners. I am convinced that Turkey *needs* ham radio in her ambitious modernization program.

I have written to the AR2L to ask them to expedite their "chipping away" at the problem. I've written the FCC to investigate what will be required to authorize a reciprocal *operating* arrangement whereby I could operate here as W4MXU/TA2.

[*continued on page 122*]

SIMPLY PLUG IN

NO CIRCUIT CHANGES OR INTERNAL CONNECTIONS



The Globe Chief Deluxe is a top quality, self-contained transmitter for 90w CW use, bandswitching 10-80M (75w meter indication for Novice use). Convert to phone by simple plug-in of UM-1 or SM-90. Provisions for antenna changeover relay. Choice of grid block keying or cathode keying with VFO. Built-in power supply. New wide range pi-net. Standard coax antenna fitting. Simplified 3-color diagrams for ease in kit construction. Wired, **$79.95.** In kit form, **$59.95.**

The UM-1 is a Class A or AB-2 modulator, driver for higher power modulator, or PA amplifier. Matches output impedances 500-20,000 ohms. Carbon or crystal mike may be used. Supplies up to 40w audio with proper output tubes. Provisions for addition of external meter for monitoring modulator cathode currents, for remote control of modulator. Wired, with tubes, **$49.95.** In kit form, less tubes, **$34.95.**

The Screen Modulator SM-90 is the perfect, low-cost method of converting CW to AM phone. It is perfect for coupling with the Globe Chief Deluxe, but contains instructions for adapting to use with similar CW Transmitters. Is self contained. Printed circuit board included for easy, simplified construction. Contains all parts and complete instructions. In kit form only, **$11.95.**

TOMORROW'S PRODUCTS TODAY

The new Globe Champion 350 is a bandswitching 10-160M, powerful transmitter for 350w CW, 275w AM, 450w SSB (PEP). Use with external SB exciter and retain top AM performance. Extensively TVI-suppressed, filtered and bypassed. High level Class B modulation without clipping distortion. New cable drive VFO; smooth tuning and non-slip. Pi-Net 48-300 ohms, built-in VFO, push-to-talk, antenna changeover relay. New keying circuit virtually eliminates key clicks. **Wired, $495.00.**

The Globe Patcher PH-1 is a hybrid phone patch for operating VOX on sideband, push-to-talk on AM. Mounts almost anywhere; easy to install and to operate. Balance control, Standby switch for landline call without energizing transmitter. Completely shielded. Wired form only, **$29.95.**

For information on the complete line of Globe Electronics products see your nearest distributor or write to

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22-30 SOUTH 34TH ST. COUNCIL BLUFFS, IA.

ASK ABOUT GLOBE'S NEW 2-WAY RADIO CITIZENS BROADCASTER

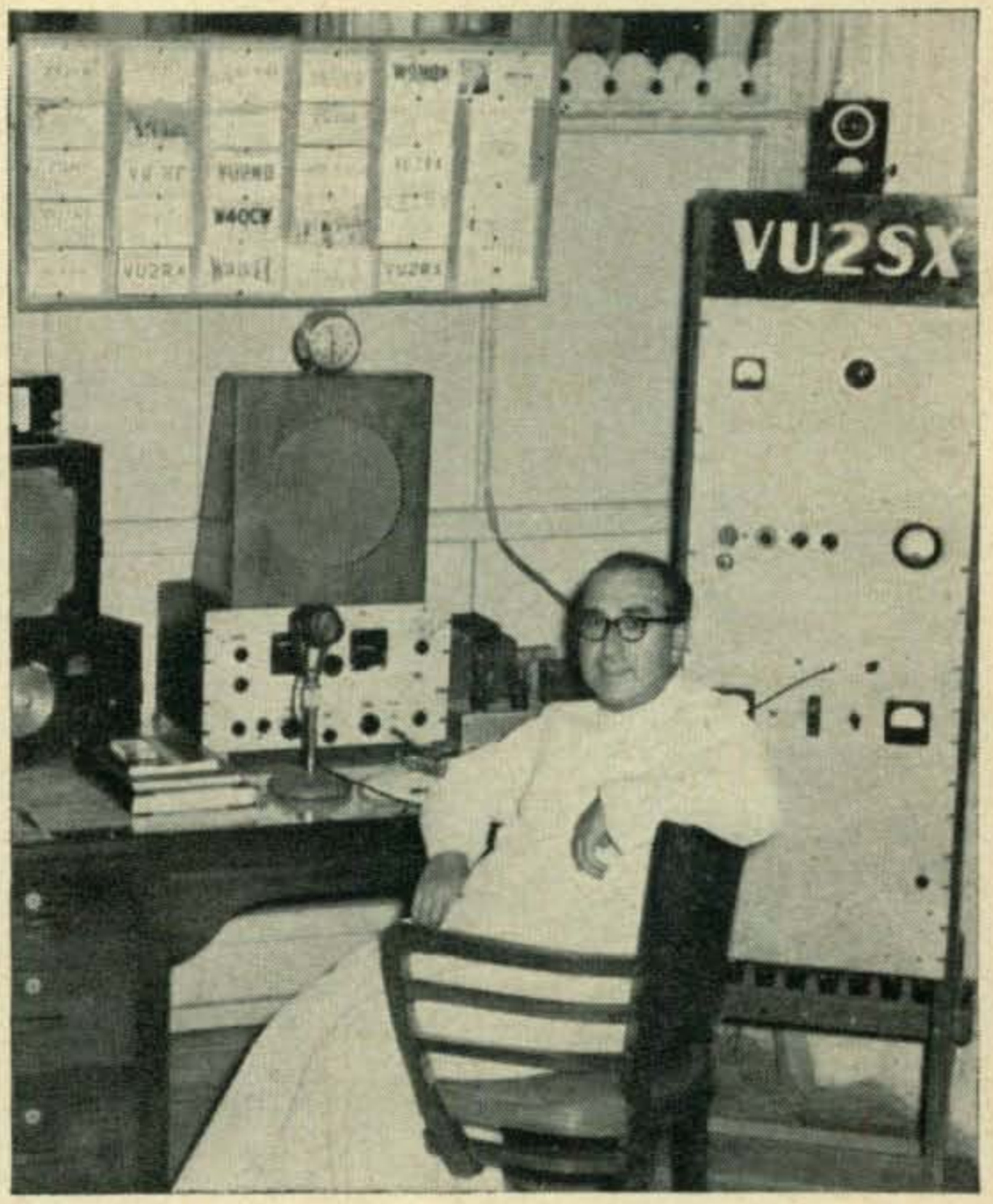
For further information, check number 16 on page 126.

Announcements

Rev. Fr. Ralph Conesa—VU2SX

It is with the deepest regret and sorrow that we announce the sudden death of Reverend Father Ralph CONESA, S.J. on November 20, 1959.

Born on February 14, 1908 at Saragossa, Spain, the late Rev. Fr. CONESA joined the Society of Jesus in 1924 and five years later was sent to India where he took his Ph.D. For some years he taught at the St. Xavier's High School and in 1940 he went to the Dublin University where he took his M.A. in education. On his return to India, he was given the principalship of the St. Xavier's Technical Institute, which post he held till the time of his sudden demise.



The late Rev. Fr. CONESA was also a very keen radio amateur and held the call-sign VU2SX. To thousands he was popularly known over the air as "CON". He had endeared himself to all who came in contact with him by his kind and amiable manners, and an affable and genial nature. He led an exemplary life—rich in fullness, activities and unselfishness. As the Secretary, since inception, of the Amateur Radio Society of India (Western Zone), he was its guiding spirit and did much to promote and popularize amateur radio in the Western one.

In his passing away, amateur radio in India has suffered a severe loss. But though his voice is now silent over the air, his memory will always be cherished by those who had the good fortune to know him. May his soul rest in peace.

Ninth Annual SSB Dinner

The SSB Amateur Radio Association will sponsor the Ninth Annual SSB Dinner & Hamfest on Tuesday, March 22nd, at the Hotel Statler-Hilton, 33rd St. and 7th Avenue, N.Y.C. All amateurs and their friends are invited. This dinner, held during the week of the I.R.E. Convention, attracts many outstanding radio amateurs and communications men from all parts of the world.

Equipment displays open at 10 AM and the dinner starts at 7:30 PM. Bill Leonard, W2SKE, will be master of ceremonies. Tickets purchased in advance are $8.50 each and $9.50 at the door.

[*continued on page 121*]

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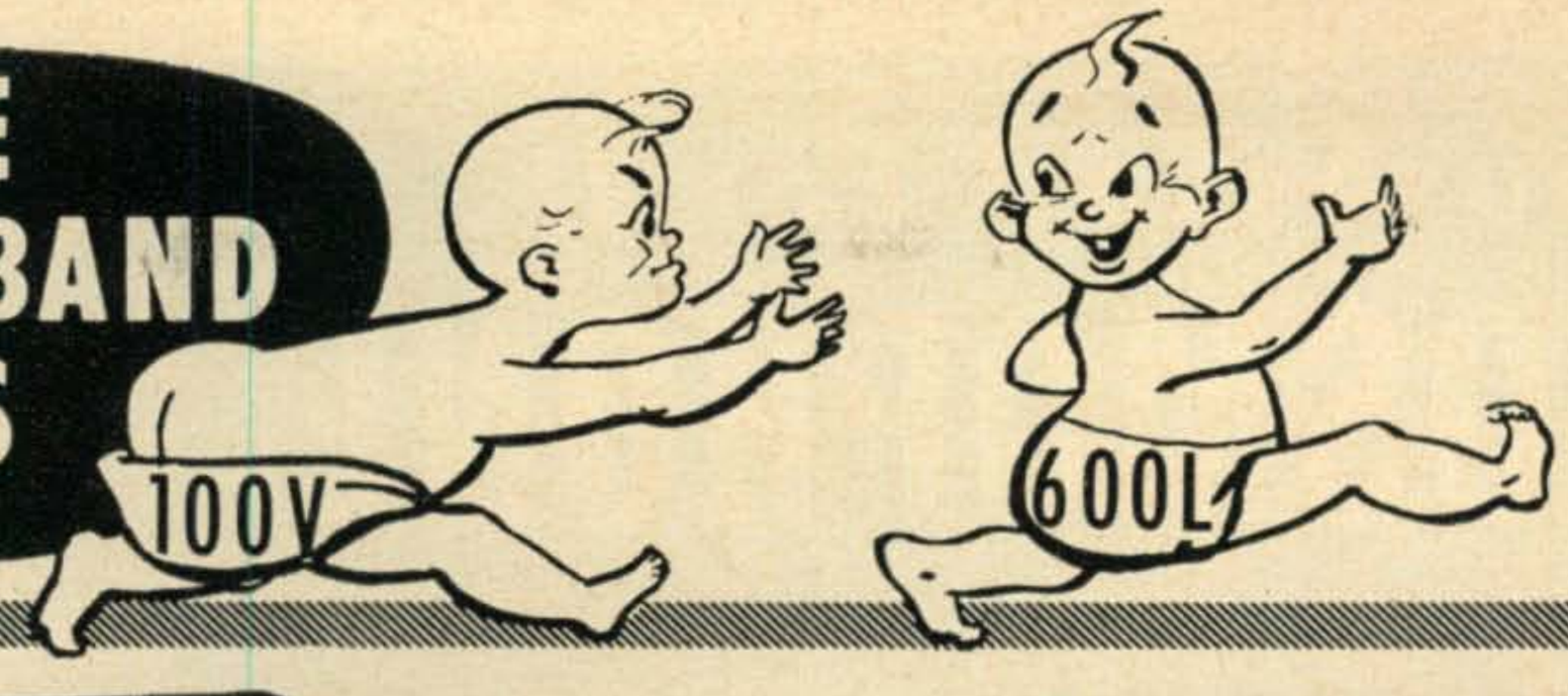

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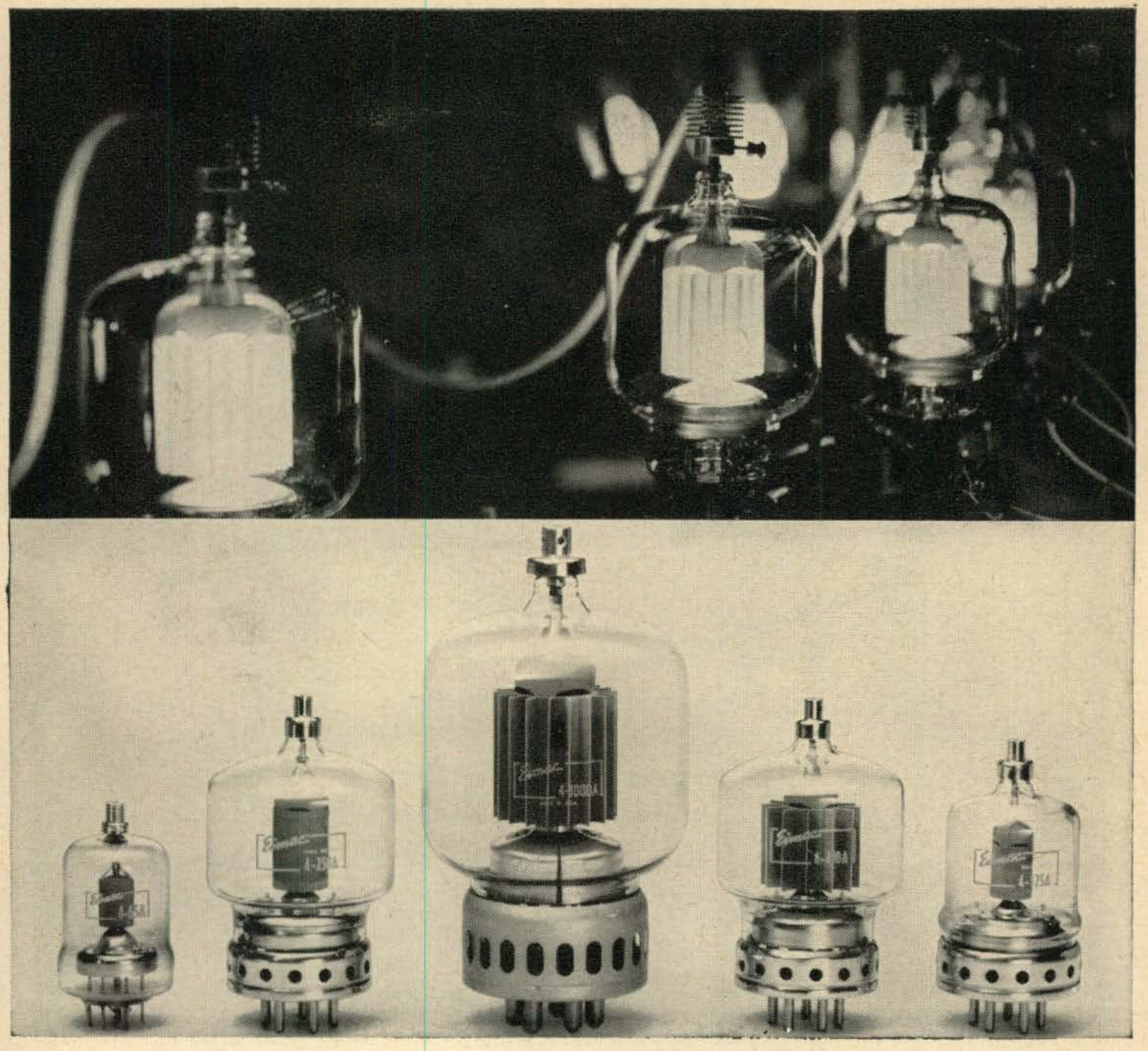

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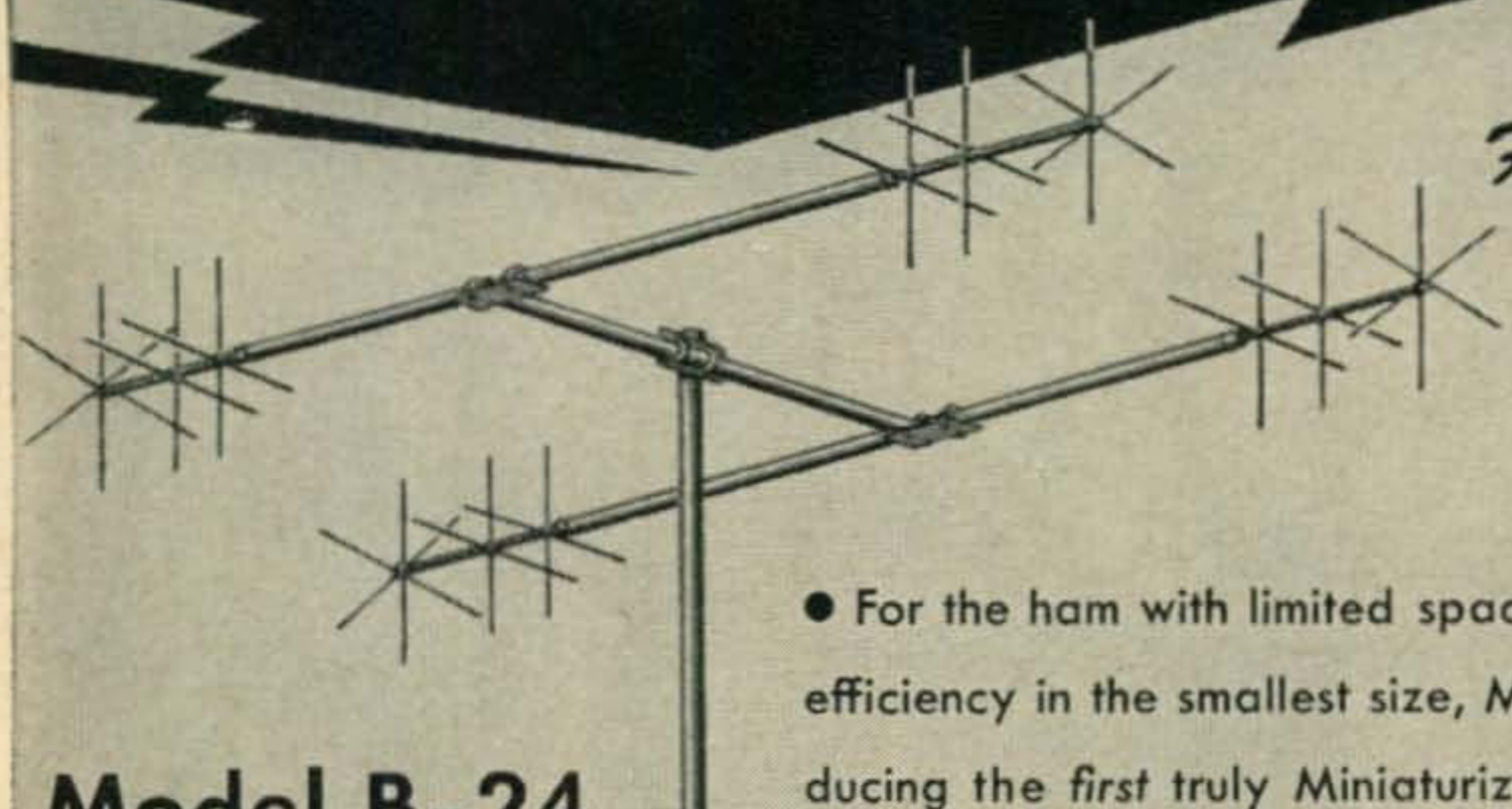

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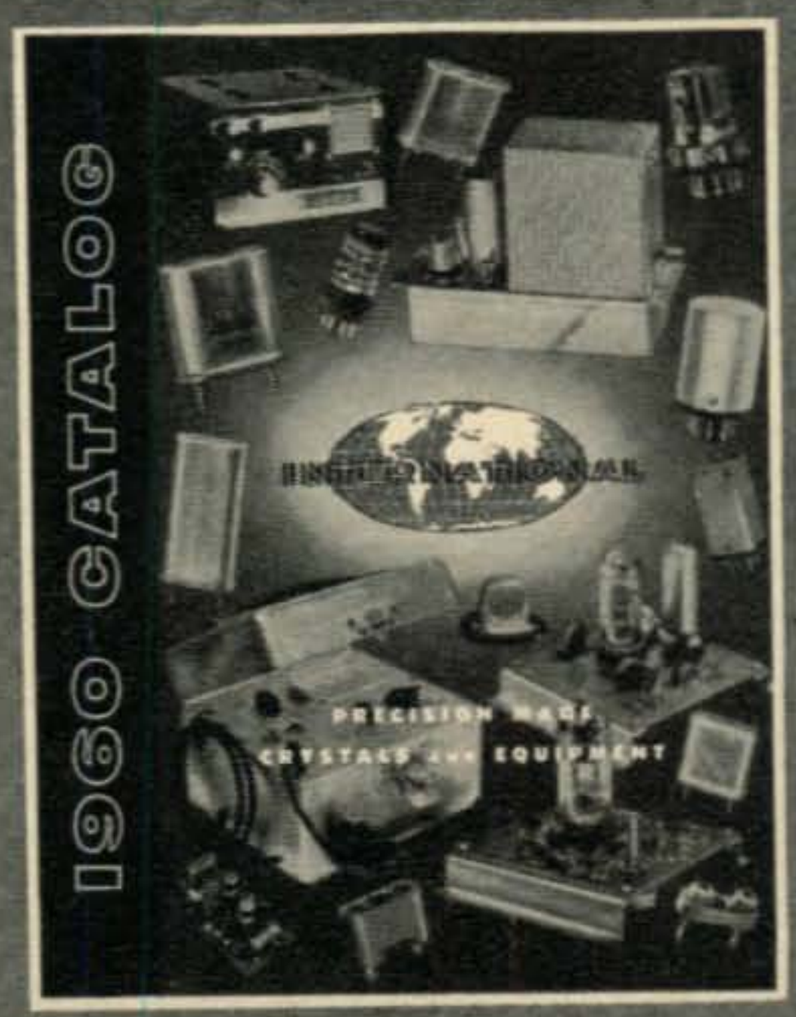

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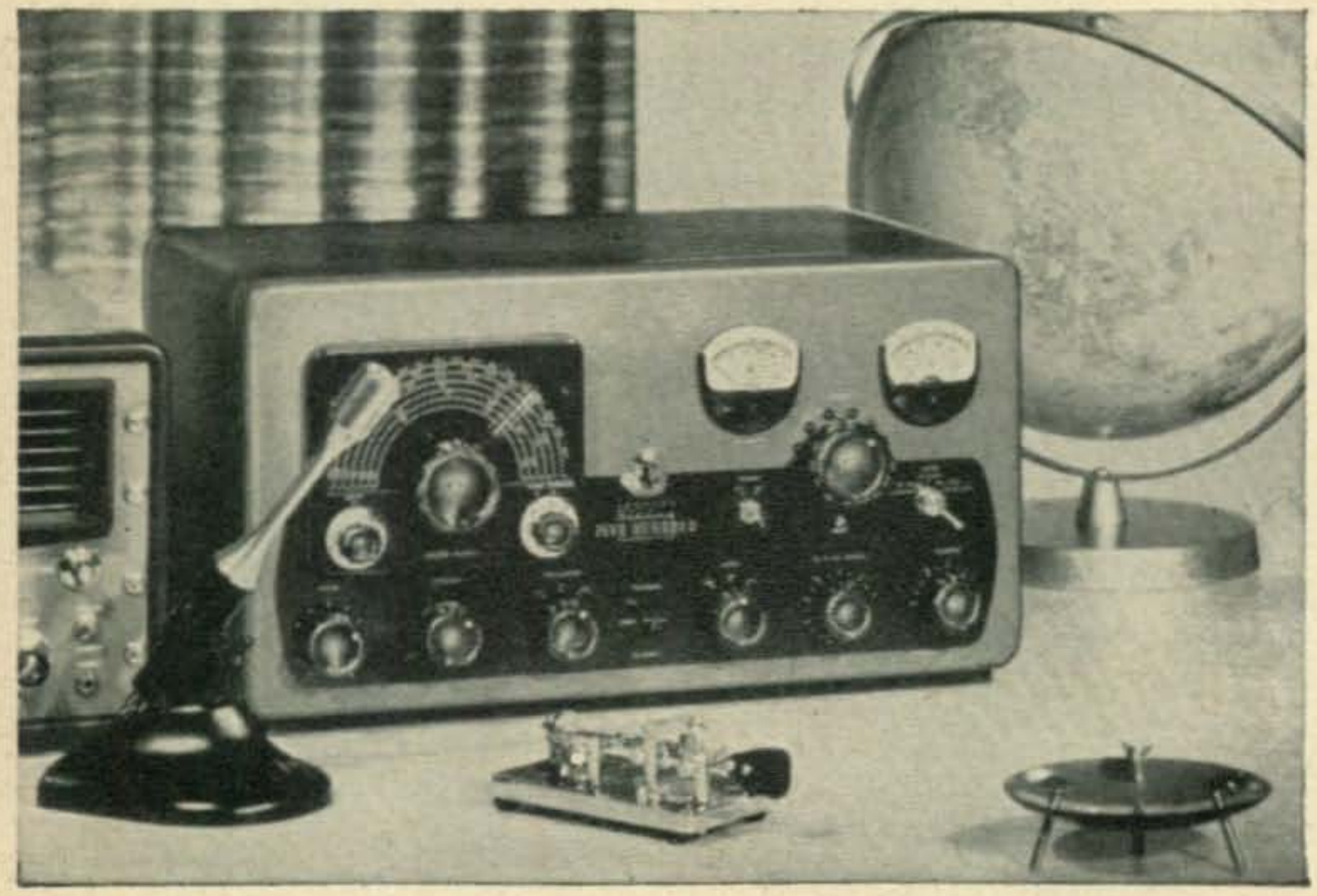

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A Viking II And A Heath SB-10 Together? Why Not?

Arthur DeBruycker, W2YGW/K2LSF
378n Trimmer Road
Spencerport, N. Y.

This article is directed at those who might be interested in using a Viking II with a Heath SB-10 Single sideband generator as an inexpensive means of getting on the air with single sideband.

Recently the Heath Company marketed a single sideband generator kit for a nominal sum. It was designed for use with their DX-100 and Apache TX-1 transmitters. This is not to say that it will not work with other transmitters; it will just take more work to make them compatible.

There are a large number of Viking II transmitters now in use, and it is reasonable to assume that there would be a large percentage of them used on sideband if it became convenient to *put* them on sideband. Just this situation came up recently when K2ELK came to me and asked if I thought we could make them work together.

The following is a description of what we did in order to make the Viking II compatible with the Heath SB-10. It will be assumed at the start that you will also purchase the Heath MK-1 Conversion Kit,* because all the parts supplied will be used and the price is reasonable even if you happen to have most of the components in your junk box. Besides, it is easier to work with new parts. (Parts list at end for those who want to roll their own).

Because all of the information given in the MK-1 conversion manual is directed at Heath equipment, it is advisable that you do not spend too much time following it. A detailed set of instructions for the Viking II is outlined below.

*Designed for converting the DX-100 and DX-100B for use with the SB-10.

Conversion

1—Drill a ⅜ inch diameter hole symetrically opposite the meter. This hole is for

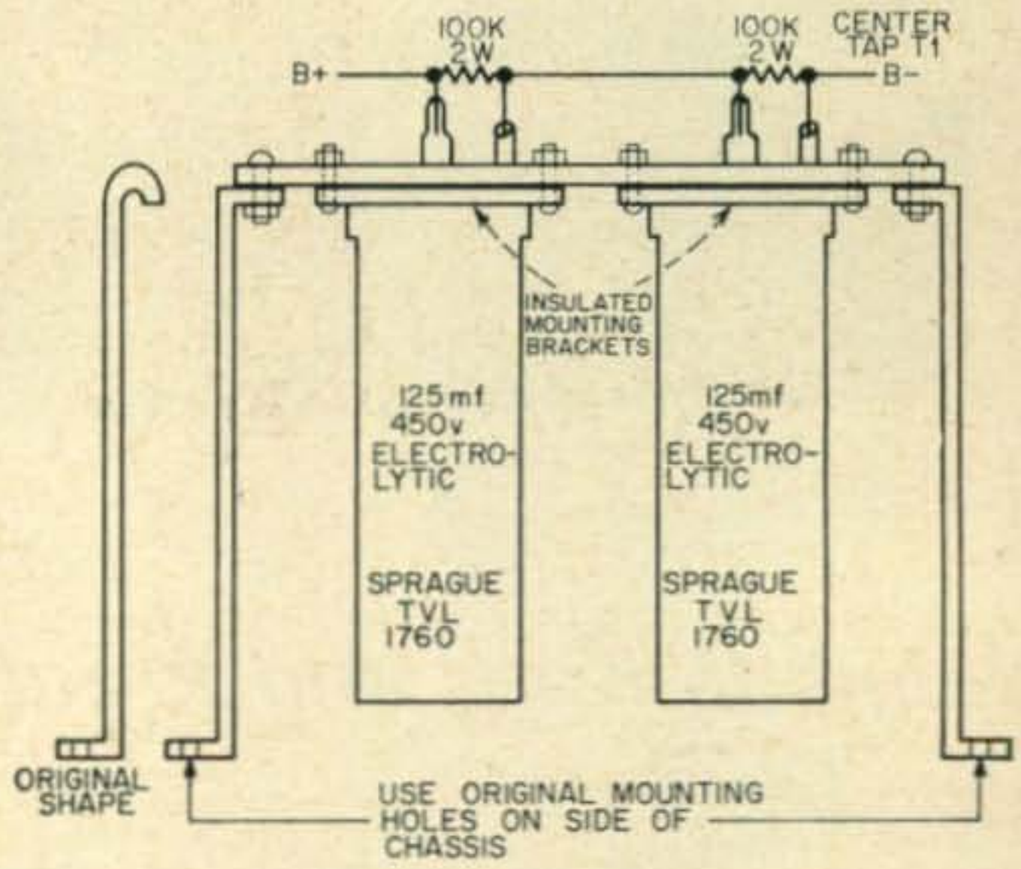


Fig. 2—Filter assembly that replaces C9. The condenser mounting plate is secured to the brackets that held down C9 after the bracket shape is modified.

mounting the switch supplied in the conversion kit. Wire the switch as follows before installing it: From pin 3 (refer to figure 4 in manual) a wire 2 feet long. From pin 4, a wire 16 inches long. From pin 6, a wire 17 inches long. From pin 7, a wire 13 inches long. Pin 8 is grounded to the grounding strap provided, after installation. Mount switch.

2—Mount the two coax connectors (83 1R/SO239) on the back panel in a convenient spot. (ours were placed above the chassis to

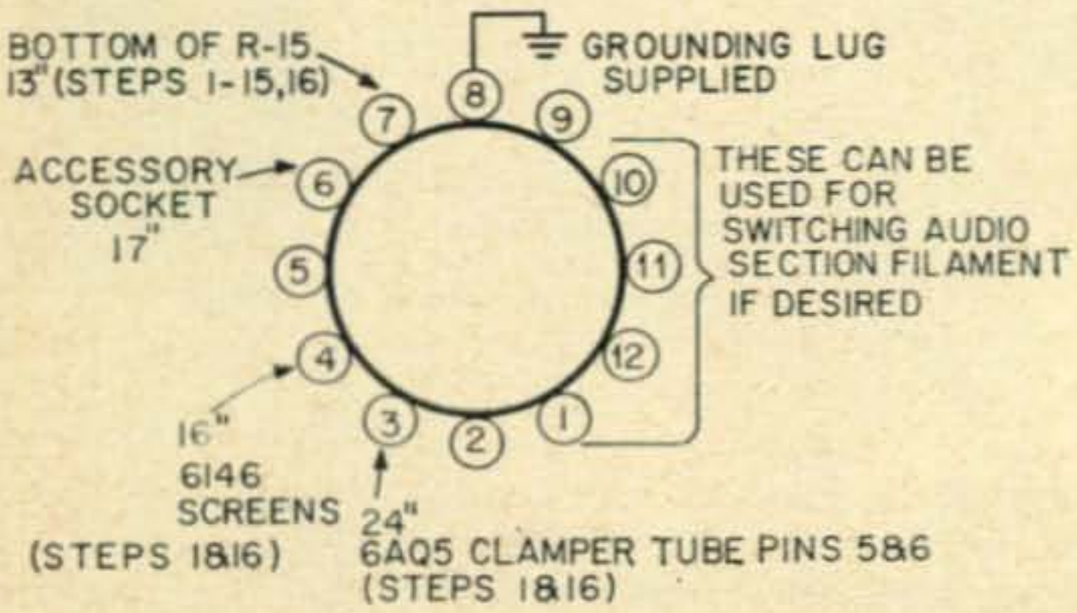


Fig. 1—Lead data for the SSB/AM switch supplied in the Heath MK-1 conversion kit.

the left of the low voltage power transformer, but could be placed below the chassis if desired.

3—Remove C9 (10 mfd @ 1000 volts—High voltage filter), and make a bracket to hold the two 125 mf, 450 volt condensers that will replace it. Mount the condensers on their insulated washer and place 100,000 ohm 2 watt resistors in parallel with each. This is shown in fig. 2. Connect a wire from the center terminal of one to the B plus lead you removed from C9. Connect the ground side of this condenser to the center terminal of the remaining condenser. Connect the can side of this remaining condenser to the other lead

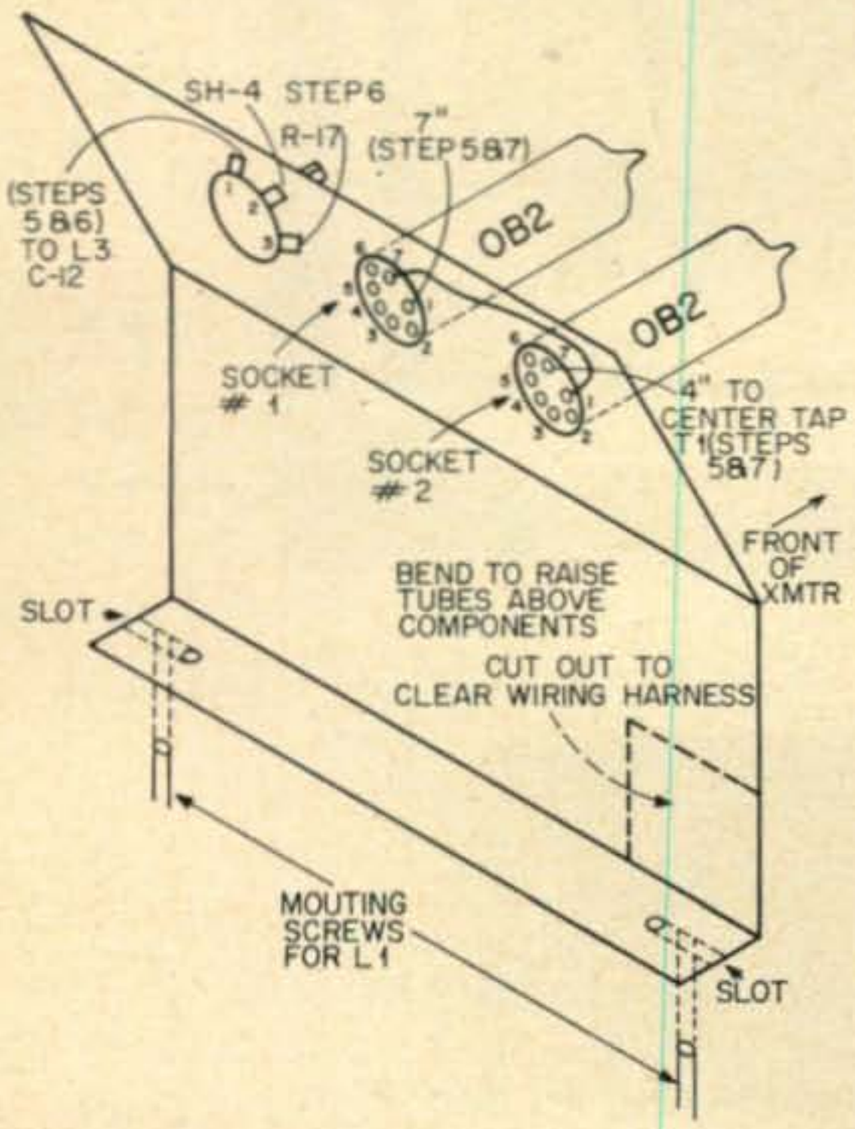


Fig. 3—Modifications for the VR tube mounting bracket. While fig. 3 of the Heath conversion manual shows the plate as being flat it must be bent as shown in order to clear the components in the Viking II.

(center tap of T-1) you removed from C-9. Check polarity again to make sure it is correct. Make sure that neither condenser is grounded, or you will not get any plate current reading on the 6146's.

4—Remove C10, C11 (low voltage filter) replace with a dual 40 mf, 450 volt electrolytic tubular type.

5—Take the VR tube bracket and slot the mounting holes to the ends of the bracket as shown in fig. 3. A part will then have to be removed so that the bracket will fit in the place designated. After making sure that it can be mounted satisfactorily, mount the pot, and the tube sockets, using the hardware supplied. Connect a wire 6 inches long to pin 1 of the pot. Connect a piece of wire 8 inches long to pin 2 of the pot. Connect a wire 7 inches long from pin 1 socket 1. Connect a wire from pin 7—socket 1 to pin 1 socket 2. Connect a wire 4 inches long from pin 7 of socket 2.

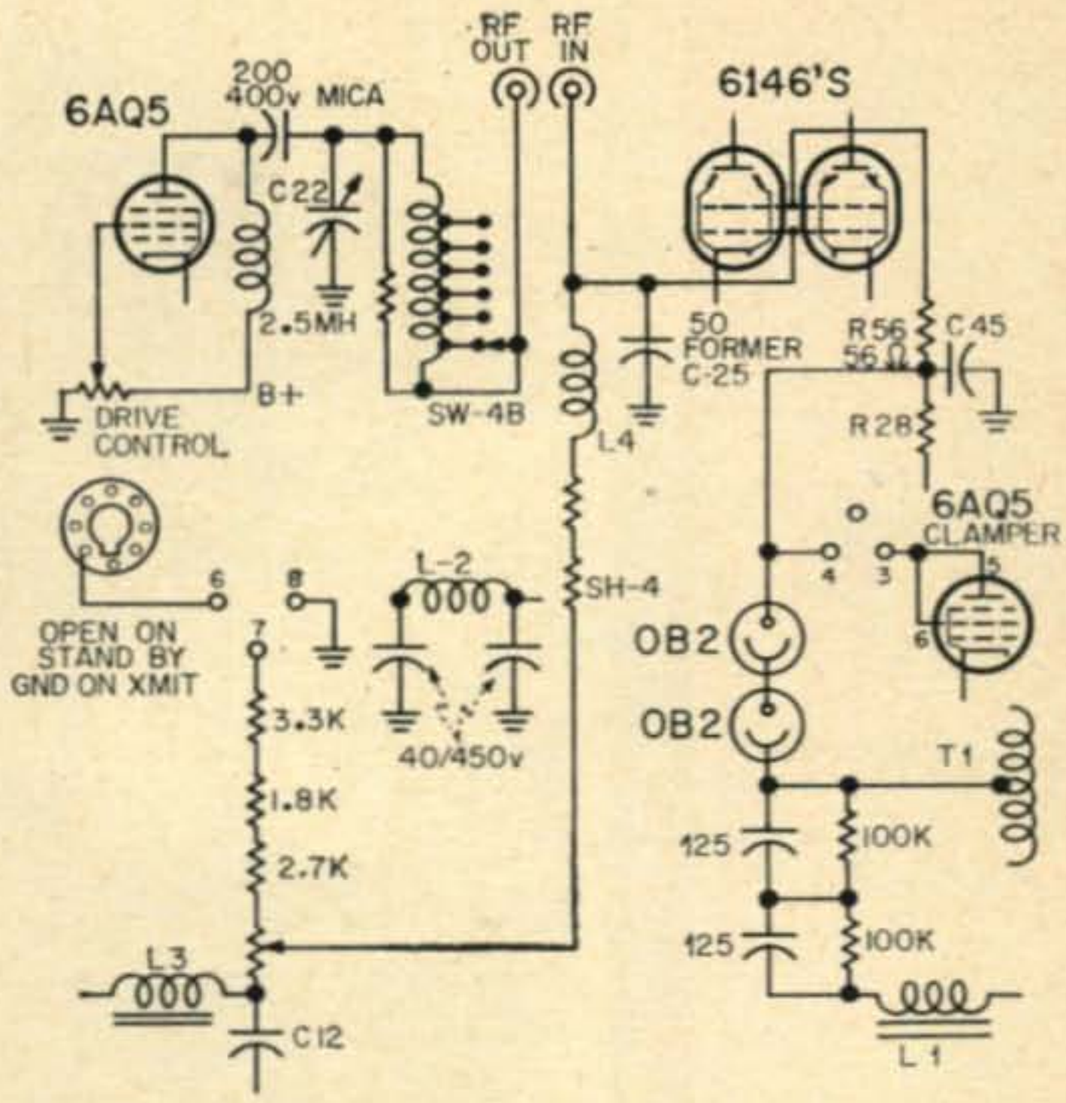


Fig. 4—Areas of the Viking II that were modified to accommodate the SB-10.

6—Mount the bracket just wired in the transmitter to the front two screws of L1, and connect it as follows: Remove the end of the wire from L3 (bias choke) which goes to R17. Connect it to pin 3 of the pot. Connect the wire from pin 1 of the pot to L3. Remove the wire from R17 to SH4. Connect the wire from pin 2 of the pot to SH4.

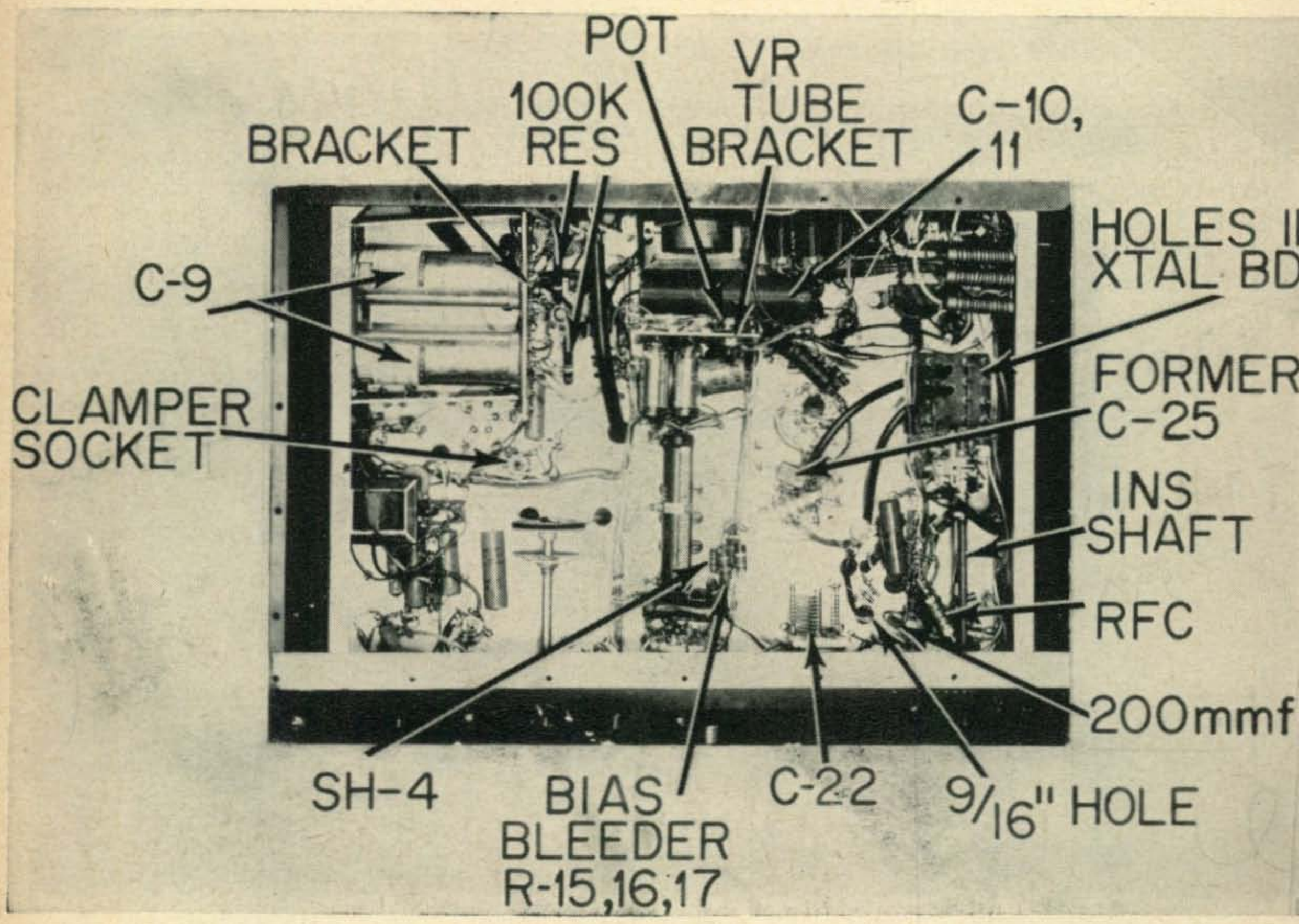
7—Remove the wire from the junction of R56, R28. Connect the lead from pin 1 socket 1 on the VR tube chassis to this point. Connect the lead from pin 7 socket 2 to the center tap of T1 (minus side of C9). Leave the tubes out of the VR tube chassis until you are ready to test the unit.

8—Remove the shaft from the crystal selector switch. Remove the wire from pin 5 of the 6AQ5 driver tube socket and install a 2.5 mh, 125 *ma rfc* between pin 5 of the 6AQ5 driver tube socket and 300 volt supply. Also at pin 5, 6AQ5 socket, connect a 200 mmf 600 volt mica condenser.

9—Remove C23 (driver tube plate tank bypass) and L20 from the circuit. Enlarge the hole these components passed through to at least ½ inch, being careful not to damage the band switch which is immediately above this hole. (We used a 9/16 drill in a chuck which we turned by hand).

10—Take a piece of RG62/U (part of conversion kit) and free about 3 inches from the shield. Solder the end just freed to the band switch at the same place from which you removed L20, working through the hole you enlarged in the chassis.

The other end of this piece of coax goes to one of the coax connectors you mounted on the back panel. We drilled two holes through the crystal socket board to allow the coax to pass to the upper part of the chassis. Use as little of the coax as possible, because you will need



the rest of the piece for the other connection. Label this connector RF OUT.

11—Take the remaining piece of coax and connect it to the other coax connector, passing it through the other hole in the crystal board. Free an inch or so from the end and connect it to the bus bar that connects the 6146 girds. (pins 5).

12—Remove C25 (paralleled .000025 mfd) from C22 (driver plate tuning). Ground the end you have just removed, to the 6146 cathodes.

13—Connect the 200 mmf condenser from the 6AQ5 driver (step 8) to the point on C22 from which you removed C25.

14—Replace the shaft removed from the crystal selector switch with an insulated one, in order to reduce the shunt capacity of the driver tube plate choke to ground. This may not be necessary, but was an added precaution.

15—It was found that when the 3000 ohm pot was added in series with the bias bleeded, the voltages did not correspond to the original values. The bias bleeder values were changed as follows: R17 same value, but changed to 2 watts; R16 changed to 1800 ohm 2 watts; R15 changed to 3300 ohms 2 watts. The grounded end of R15 is removed from ground and mounted on an insulated tie point. (part of conversion kit)

16—Pass the leads you connected to the switch (which you wired and mounted in step 1) through the chassis where the *rf* drive control leads pass. Connect as follows: The wire from pin 3 goes to the plate (pin 5) of the clamper tube (6AQ5). Remove the other lead from pin 5 (6AQ5 clamper). The lead connected to pin 4 of the switch is connected to the junction of R56, R28 (screen supply 6146's). The wire connected to pin 6 of the switch goes to the accessory socket, on any unused pin. The wire connected to pin 7 of the switch goes to the insulated terminal where R15 is connected (step 15). Pin 8 is connected to the grounding strap supplied in the kit.

17—We deemed it desirable to make the keying jack open circuit. We provided for keying the oscillator through the connecting cable between the SB-10 and the accessory socket. This unit has grid block keying installed, so the accessory socket is a little more complicated. This poses no serious problem and the key is useful for zeroing purposes because it turns on the oscillator without turning on the 6146's.

18—Overheating of T2 could be a problem, therefore a filament transformer was added to take care of some of the extra drain, but I believe that the unused portion of the switch could be used to disconnect the filaments to the audio section of the Viking II. If you don't elect to open the filament circuit, removal of the tubes is recommended. This reduces the drain by 2.4 amps. The SB-10 requires 3.5 amps

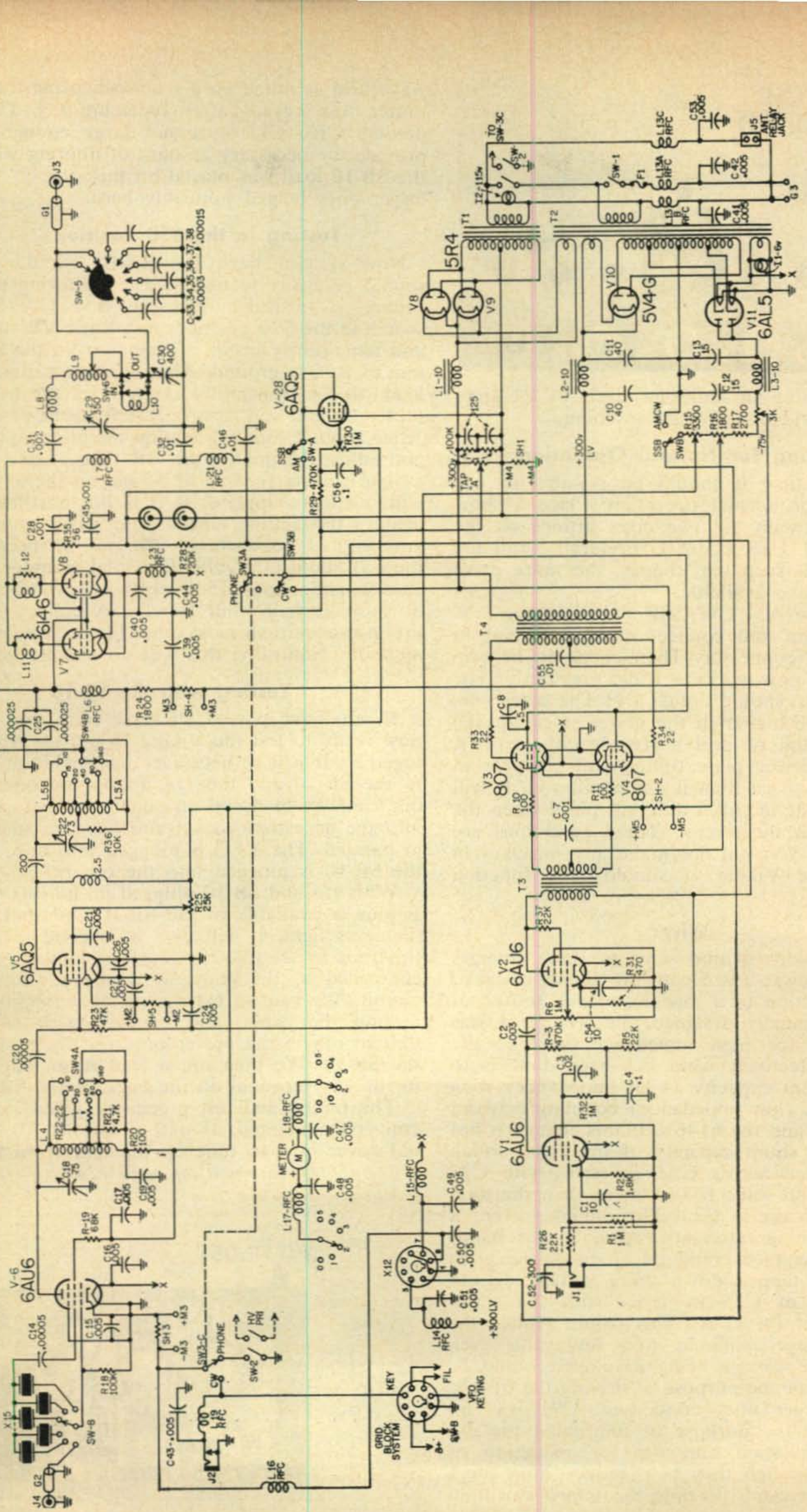


Fig. 5—Complete diagram of the Viking II after modification.

thus providing an additional drain of 1.1 amp, which should not damage anything.

Testing for Normal Operation

At this time it should be possible to test the unit for normal operation. Place a short jumper between the two coax fittings on the back panel. Use RG62/U preferably and the shorter you keep the jumper, the more drive you will have available.

Place the AM CW/SSB switch in the AM CW position and connect a dummy load to the output connector. Then check to be certain that it now works as it did previously. The changes you should notice are: The place current will be higher in the driver stage for the same amount of grid current on the 6146's. Also the driver plate tuning will resonate in a different place than it did previously. It will also resonate in still a different place when the SB-10 is in the circuit. These conditions are normal. If you did not make any mistakes in wiring, the Viking II should now function normally.

Why?

The reasons behind some of these changes are as follows: The Heath SB-10 was designed for connection to a low impedance source of *rf*. As originally designed, the Viking II was connected for high impedance drive to the 6146's. Effectively what has been done is to change from capacity (high impedance) to a pi-network (low impedance) coupling between the driver and the 6146's. If this change is not made, the shunt capacity of the coax, which is connected across C22, in series with C25 would be on some bands, more than the total capacity in use in C22. This would prevent it from reaching resonance. Also, on the bands where resonance could be attained, the grids would be tapped down on a voltage divider consisting of C25 in series with the shunt capacity of the coax. This would reduce the drive voltage available, to a low value even though the voltage being developed would be sufficient for the purpose of driving the 6146's.

The larger filter condenser (C9) was installed for the purpose of improving the dynamic regulation and not for reduction of hum. (Although they help reduce hum too.) It was interesting to note the improvement in waveform as noted on a scope when the transmitter was keyed, after replacing C9. Condensers C10, C11 were not large enough to provide the necessary amount of filtering when the SB-10 load was placed on this supply. The larger ones helped noticably here.

Testing in the SSB Position

Now if you have the SB-10 wired, you should be ready to test it. The following procedure is in order: Set the AM CW/SSB switch in the SSB position, install the VR tubes and temporarily install a jumper from the bottom of R15 to ground. Also, connect a dummy load to the transmitter output. Set the transmitter on end and turn on the filament power. After about 1 minute, turn on the plate voltage and adjust the pot on the VR tube chassis for a plate current reading of 55 *ma* on the 6146's with no drive applied. If it is not possible to achieve this setting, check your work again—you goofed somewhere! *Be careful* because there is about 600 volts *dc* available under the chassis and about 1500 volts *ac*, which will do more to help your beneficiary collect your life insurance than most other things you could mention. Naturally, this will do *you* no good.

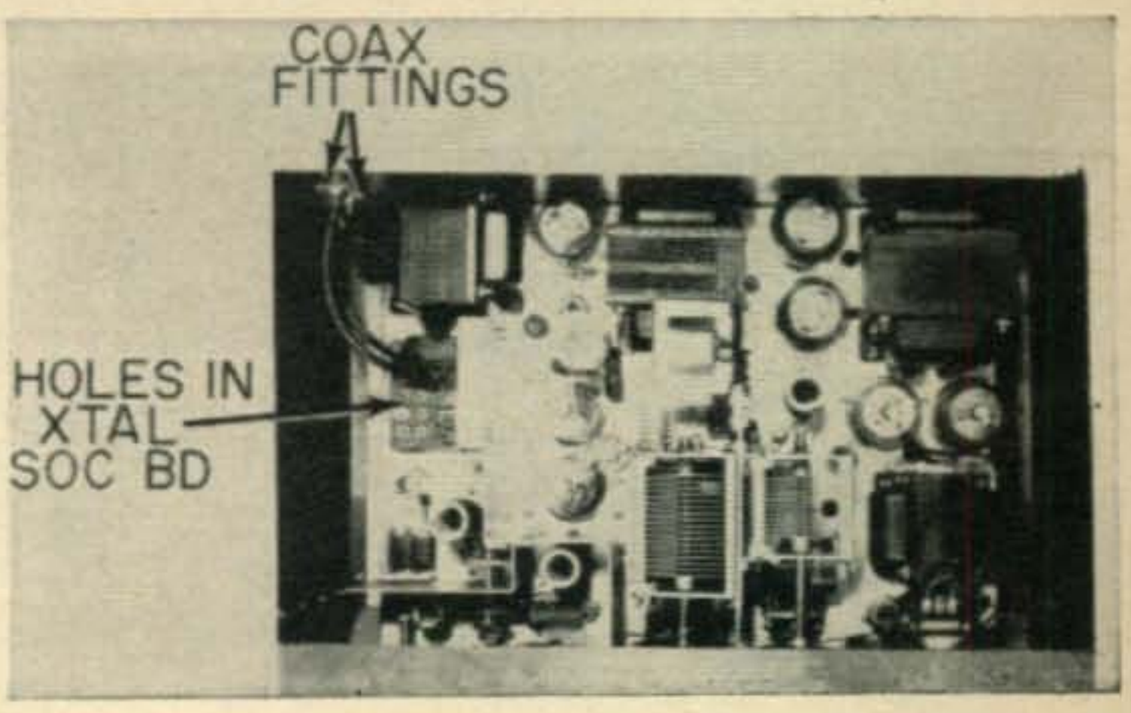
Testing with the SB-10

If you have passed all these tests, you are now ready to test the Viking II and the SB-10 together. It will be necessary to provide power to the SB-10 and the *vfo* if you use one. In our case we made up an adaptor which plugs into the accessory socket and has two sockets in parallel. The VFO is plugged into one, and the SB-10 is plugged into the other.

With *vfo* and SB-10 plugged in, be sure that B plus is available in the SB-10 and that the filaments light. It will also be a good idea at this time to see that the blocking bias is being controlled by the relay, as is also the keying circuit. We ran an extra wire by wrapping it around the cable, and connecting it to an unused pin in the power plug on the back of the SB-10. We then ran a lead from that pin to the key terminal on the back of the SB-10;

The tuning and test procedure given in the conversion manual, as well as the SB-10 manual cover how to tune up the unit from here

[*Continued on page 124*]



Ham Shackles

Pauline Karrol

It took me a while after I got married to grasp the fact that I had a ham for a husband. Not the Virginia variety which has been smoked to a turn, but a real live one.

Of course I knew my beloved was interested in amateur radio. The subject had been mentioned during our courting days, but my ideas about it were rather hazy at the time for I had other things on my mind. Actually, I thought of amateur radio as just another hobby, like stamp collecting, playing golf or hi-fi. This illusion was soon shattered. From just a hobby it may turn into a vocation and can even reach a stage of obsession, then addiction and finally affliction.

I discovered that ham radio is not confined to a certain time or season. Like the guardians of the U.S. mail, neither rain nor sleet nor fog, or the fact that you're expecting a houseful of guests will keep these characters from their assigned microphones and telegraph keys. The message must get through!

What if Junior *did* fall down the front steps and crack open his skull? Before the OM does anything about it, (Jim) K Zero something or other in Ottumwa, Iowa must get a signal report. The boy's head will be taken care of in due time, but meanwhile Jim will be so pleased to hear that he's coming in 5 and 9 plus 10 dee bees with that little old set he made all by himself out of the parts from Aunt Bertha's hearing aid and his grandmother's corset wire.

Seldom will the whole family eat a hot meal. The moment you put the potatoes on the table, the head of the household will make a perfect contact with Fred from Florida. After the exchange of QTHs, QRMs, QTC and so on, comes a complete weather report on each side and a full account of the afternoon traffic jams or some other trivia. Finally, when the band is fading and your nerves are frayed, in he walks, all smiles. To a ham, time is so relative!

Then the average table conversation goes something like this:

"Guess I'll have to put up another antenna," he says as I offer him some stew. "Yep, guess my standing wave ratio's too high."

"Did you pay the electric bill?" I try to change the conversation.

"How about holding the field strength meter for me after we eat, while I check my front to back ratio on my beam?" he asks, completely ignoring my question. (Front to back ratio indeed! His "front to back ratio" increases day by day for lack of proper exercise!)

Suddenly he gets a strange gleam in his eyes, drops his fork, and with a mumbled "excuse me", rushes from the table.

"What's the matter now?" I ask a bit irritated. "Aren't you going to finish your supper?"

"I just remember, I've got a schedule with Ken over in the Islands. I'll finish later."

"Later" is anywhere between 10 PM and 2 AM.

When I realized I couldn't fight the "ham gang", I tried to join them. But alas! This is easier said than done. There is no honorary or auxiliary or associate membership. Either you're in or you're not. I'm still out. It isn't because I didn't try. I braved my way through the handbook and license manual, but my poor brain retained very little. I guess I'm one of the unfortunate dopes who can't comprehend the difference between a radio tube and a tube of toothpaste.

The Morse code was another hopeless struggle. All I remember is dit dit dit dit space dit dit, which I think means hi. Oh, I can also blast out an SOS on the car horn in case of necessity on a lonely road at night. The rest of the code remains as much of a mystery to me as the language of the Amazon headhunters. And it doesn't help a bit if the OM pointedly tells me about a thirteen year old girl who just got a General license.

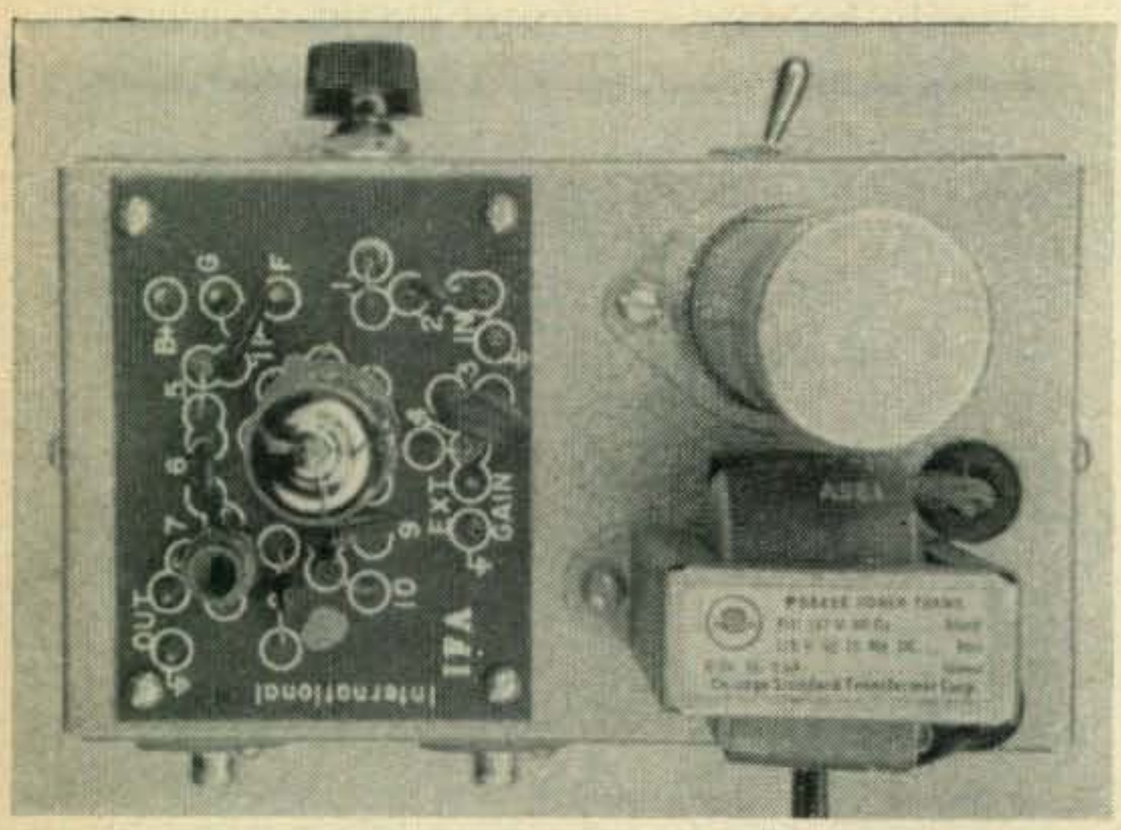
After I discovered that a mere demonstration of desire and good will do not count with the FCC when it comes to granting a ham license, I resigned myself to the fact that I shall have to remain only an XYL, though the name still irritates me a bit.

But we XYLs must not despair. We must look at the big advantages. What other women's husbands have such fascinating, educating, aggravating (I mean interesting, but it doesn't rhyme) hobbies? Think how nice it is to hear Rodney in VK-land tell your husband about the lovely weather they're having down yonder in Melbourne, Australia—just right for a swim. Doesn't that lift your spirit when you're wondering how you'll make it to the market through all that ice and snow? And while you're scraping the egg yolks from the breakfast plates, does it not give you satisfaction to find out that Frau Meier in Oberweisach, Germany is just finishing her supper dishes? Of course it does!

[*Continued on page 123*]

Complete IF Amplifier For Converter To Receiver Service

Donald A. Smith, W3UZN
POB 623
Hagerstown, Maryland



Many receivers in use by Amateurs today lack sensitivity when used with a crystal converter for the *vhf* bands. The Novice operates on 144 *mc*, the Technician on 50 *mc*, and both often start their Amateur activity with inexpensive or older model receivers.

The old adage, "you gotta hear 'em before you can work 'em," is as true as ever. The *if* amplifier described here will help you attain this needed sensitivity when using a crystal controlled converter for the *vhf* bands with your receiver. Yes, even if you are using an *ac/dc* type receiver of the low cost variety!

The range of the *if* amplifier should be chosen for the output frequency of your converter. For example, if you are using an output frequency of 7 to 11 *mc*, then you would build the amplifier for 7 to 11 *mc*. The unit shown in the photo, was used with a converter output frequency of 600 to 3600 *kc*. Any frequency between 600 *kc* and 30 *mc* may be used however. Simply state the frequency desired when ordering the printed circuit board.

The printed circuit is used for the basis of the unit and it comes complete with all parts which mount on the board. The unit is mounted on an *LMB* box type chassis, 5½ x 3 x 1¼ inches and contains its own *ac* operated power supply. The *ac* power supply provides the unit with two important features. First, no power is required from the receiver. Secondly, the supply will permit the unit to be used with an *ac/dc* type receiver.

The supply uses the relatively new Silicon diodes for rectification, in a voltage doubler circuit. They are used because of their small size and reliability. A gain control is provided to prevent overloading of the receiver when receiving very strong signals. The unit is not at all critical and no trouble should be encountered by the builder, even if inexperienced. The two jacks on the rear panel of the chassis are furnished with the printed circuit boards.

Construction

The first step in the construction of your *if* amplifier is to make the cut-out for the printed circuit board. Using a ruler, draw the cut-out size necessary on the chassis, making it approximately ¼ inch smaller than the actual printed circuit board. Drill holes around your marks, (inside the layout) and then file the sides smooth. You may then drill the holes for mounting the transformer and filter capacitor. Finish the drilling with holes for the toggle switch, gain control, jacks and line cord.

Wiring

When the drilling is finished, mount and solder the parts on the printed circuit board. Use a small soldering iron for this. A 25 to 50 watt iron is fine. Then mount the parts on the chassis, mounting the printed circuit board last. Proceed to wire the various parts under the chassis.

Notice that there are various points marked

[*Continued on page 115*]

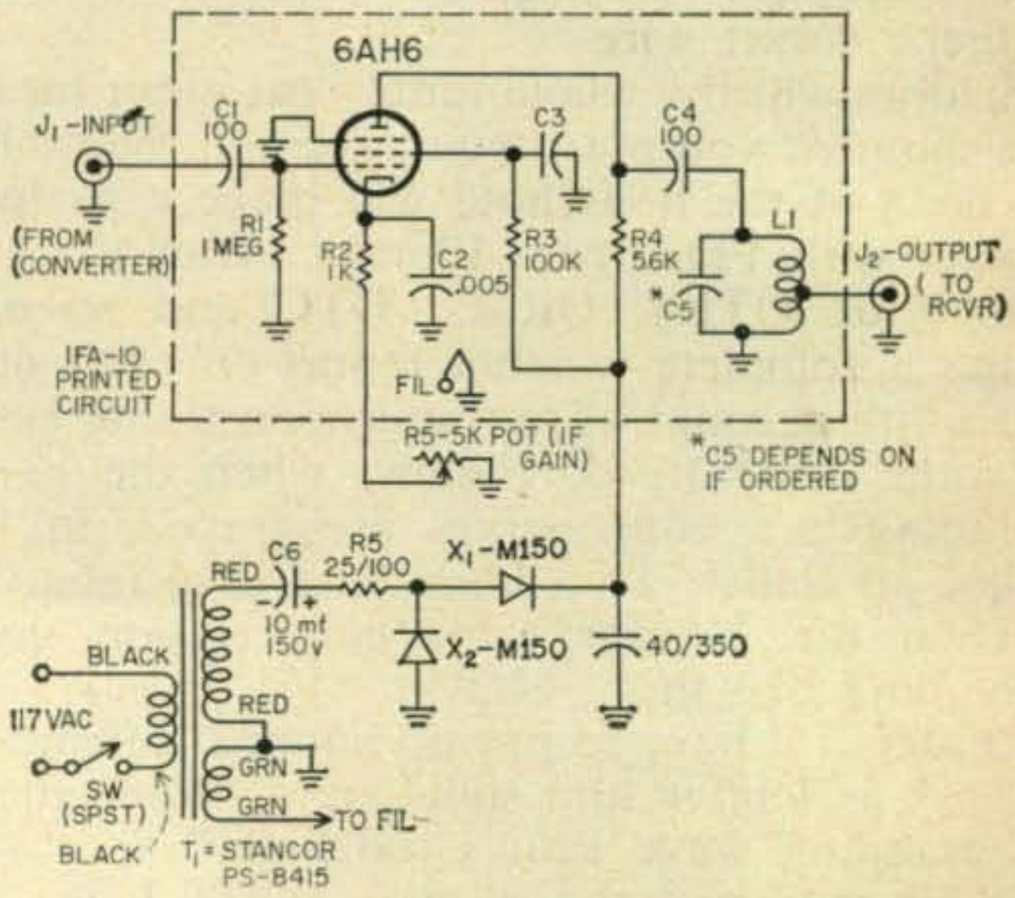


Fig. 1—A complete if amplifier for insertion between the converter and receiver. All parts shown within the dotted lines are part of a printed circuit kit marketed by International Crystal Co., 18 N. Lee, Oklahoma City, Okla. Desired operating frequency must be specified since it determines the value of L1 and C5.

Drift Transistor Exposed

Don Stoner, W6TNS

The word DRIFT is a well-known term in physics used to describe the motion of charged particles in ionized gasses under the influence of an impressed electric field. Charged particles move much faster in a given direction by "drifting" in an electric field than they can by random diffusion in the absence of an electric field. In keeping with the analogy between the drift phenomena in gaseous discharges and in semiconductors, the word "drift" is applied to transistors which incorporate a "built-in" accelerating field.

The electric field in drift transistors, which literally propels the charge carriers from emitter to the collector, is achieved by the graded distribution of an impurity in the germanium base region (see fig. 1). This built-in accelerating field, a feature not available in conventional transistor designs, results in greatly decreased transit time and therefore a much higher upper frequency limit.

The successful use of the drift field principle lies in the critically accurate control of impurity distribution in the base region during manufacture. The density of the impurity distribution in the base decreases exponentially from very high values at the emitter to low values at the collector. The impurity distribution introduces a constant electric drift field which accelerates (propels) the charge carriers through the base region. Compared with the performance of conventional transistors, in which the charge carriers move by means of diffusion—a comparatively slow process because of its random nature—the acceleration of charge carriers by the drift field represents a major improvement. Because of the accelerating field in drift transistors, the transit time of the charge carriers is substantially less than the transit time of the carriers in a conventional transistor. This results in greatly increased high performance.

The high impurity density in the base near the emitter results in a *low base resistance*, while the low impurity density near the collector contributes to *low collector capacity* and results in a high collector breakdown voltage. The extremely low value collector capacitance makes neutralization unnecessary in most applications and permits the design of simple and economical circuits.

The combination of low base resistance, high collector breakdown voltage, low collector capacity, and short transit time, makes possible the design of high-power gain, high frequency circuits with excellent operating stability and good automatic gain control capabilities over a wide range of input signals.

The RCA drift transistors listed, have four flexible leads and are hermetically sealed in metal cases. The fourth lead is connected to the case internally to minimize interlead capacity and reduce coupling to adjacent circuit components. ■

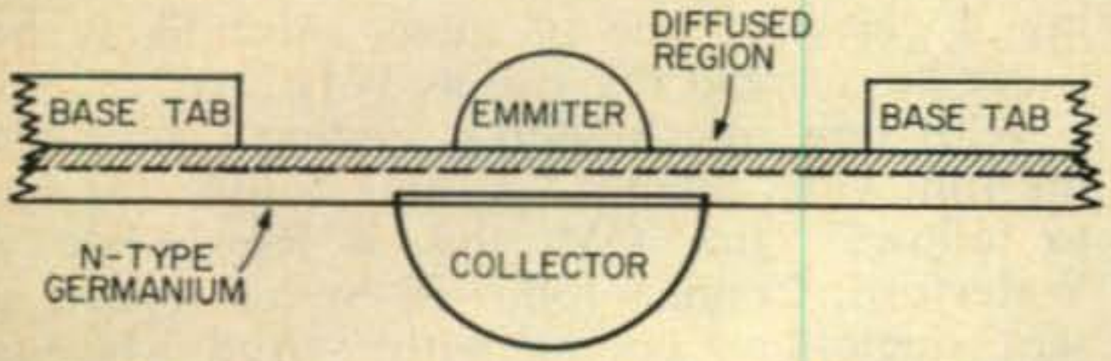


Fig. 1—Cross sectional view of the drift transistor structure.

Construction of a typical drift transistor. This unit is designed for use in broadcast radios as an if amplifier

Germanium pnp alloy junction drift transistors

Type	Service	Fo-Max	Net price
2N247	rf amplifier	132mc	$3.22
2N274	rf amplifier	132 mc	3.22
2N370	rf amplifier	132 mc	3.22
2N371	rf oscillator	132 mc	3.22
2N372	rf mixer	132 mc	3.22
2N373	if amplifier	132 mc	2.25
2N374	converter	132 mc	2.33
2N384	vhf amplifier	250 mc	6.44
2N544	rf amplifier	132 mc	2.42
2N640	auto rf amp.	132 mc	*
2N641	auto if amp.	132 mc	*
2N642	auto converter	132 mc	*
2N643	switch—20 mc	—	*
2N644	switch—40 mc	—	*
2N645	switch—60 mc	—	*

*not listed in Allied catalog

Twenty-three Millions a Year - - -

Roy L. Gale, W1BD
187 Niantic River Road
Waterford, Conn.

That's just what the man said! And he couldn't be giving away any secrets on the earnings of a QSL-printer, either, for any ham who has laid down three inflation dollars for seventry-five cents worth of material and three hours of labor, knows that figure would be a gross understatement. No, it must be something else.

Twenty-three million pieces of first-class mail go to the Dead Letter Office annually. That we know. But we don't know how many of these are QSL cards that were not addressed properly.

Our Novice friend spent weary months in studying for the precious ticket. Perhaps his call letters weren't simple and pretty—like, for instance, W1BD—but to him they looked mighty good. Can we blame him for thinking that everybody else must have heard about it? And, of course, his postmaster had been duly notified of the matter. So he thought!

For no good reason at all, this situation brings to mind an incident that took place 47 years ago, when I was station agent at a little place in Vermont. The railroad is now defunct, but the story isn't:

One Monday morning a young farm lad breezed up to the ticket window and said in a man-about-town way: "Well, I guess I'll have to have a ticket."

Time may have distorted my memory of events a little, but I believe that my face was fairly straight when I answered him: "Where to?"

"Why, Marshfield, of course!" he said, without even trying to conceal his disgust at my ignorance. After all, shouldn't everybody in town know about this eleven-mile trip that he had planned weeks before? Stupid me! I soon gave up the job and went back to school.

Four decades later, our ham radio operators—old enough to know better—were acting in much the same way. A ham would spend as much as five cents for a QSL card, affix a 3-cent stamp to it, and blissfully drop the thing into a postbox. And then he waited, waited, waited for the reply that didn't come. Why? Was our Pony Express slipping? Not at all. But, you see, the card was addressed in this manner: "ARS KNØ——, Opr. Bob, Kansas City, Mo." My 1929 atlas informs me that Kansas City had a population of 325,000 even at that early date.

Three years ago, I had a brilliant idea. I would get on a Novice band and show those beginners how to do things right. Surely, they would listen to me, an OT with 34 years of ham experience! Then came the disillusionment.

Many Novices shied away from answering my two-letter call. Perhaps they thought that I was a bootlegger. After much fruitless calling, I corralled one of them, most likely because he misread my call as W1BDW.

With slow, machine-like sending I gave him the following, intended as an example for him to follow: "gm, OM, this is Roy Gale in Waterford, Conn.," followed by his report, all sent single and ending with: "And who are you?"

The reply staggered me. "gm, Roy. Who is Gale?" and to show me the modern, progressive way of doing it, he continued: "name name name is is is Paul Paul Paul QTH QTH QTH Pawtucket Pawtucket Pawtucket R.I. R.I. R.I. Ur sigs 579 579 579 vy fb wl benu 73s pse QSL, etc." He was gone.

So this was the new way! What is this thing "nostalgia" that makes some of us yearn for the good old days"?

It would appear that I had committed some grave social error in giving my full name, an error which became more apparent when he sent me a QSL addressed to: "ARS W1BDW, c/o Chief Op Roy, Waterford, Conn." For

several minutes I pondered the meaning of "ARS." Our postmaster must be better informed, for he delivered the card to me, possibly because he knows the identity of only two hams in town, both oldtimers. All QSL's addressed as above to any of the dozens of hams in this town find their way into the postbox of one or the other of us. We constitute the dead-letter offices.

Another ham gave his first name three times, even though I had just given him an R5S9 report. When I said: "OK, but what is your last name?" he came back with: "Name is Frannie Frannie Frannie Frannie." I was almost convinced that his name was Frannie; also that he had a very poor opinion of my copying ability. I tried again. This time he ran the count up to five before I kicked my rectifier tube under the table and took a bite out of my 3730 *kc* crystal. I was fully convinced that I wasn't cut out to be a missionary. I hadn't been devoured by cannibals, which was something. Too old and tough, maybe. Or possibly the flavor was "off."

One card that came to me was marked: "KN1G—, Ch*ei*f Opt Cub, etc." To date I haven't located Cub, but as the Gale shack is situated at the edge of a dense virgin forest, I am optimistic about the matter. One evening I heard one of Cub's AM harmonics wobbulating my FM Receiver, but before I could get a good beam on him with my fixed-position antenna, he was gone. Some day he may amble out of the woods into my garden, and then I'll know whether he is a small bear or a little fox.

Another elusive type of ham is the one who fabricates a nickname from his last name. For instance, a QSL recently put into the Gale dead-letter box was addressed as follows: "ARS K1H—, Opr. Pete, Waterford, Conn." Now, I wanted that card to use as an illustration in this story, but unfortunately, my XYL, W1AWP, guessed the identity of Pete. "Oh," she said, "I'll bet that is Sam Peterson on Silver Spur Road." Sure enough, it was he, and I lost my illustration. OW's should be more co-operative, you know.

Though I spend little time hamming, I get much enjoyment out of listening to other hams. One afternoon, I tuned my receiver to the 75-meter phone band to listen to a group that congregated there twice each day. This day, one XYL operator was in a very distressed mood. A QSL had been returned to her, marked "Addressee Unknown," although postmasters seldom take the trouble to do this.

"Why," she was saying, "was it returned? What did I do that was wrong?"

My fellow D. L. O. ham friend replied: "How did you address it?"

"Why, to Operator Bill, Buffalo, New York."

Although I am really psychic at times, I didn't have to call this occult power into play to show me that my friend was smiling broadly when he came back with: "Oh, I guess Bill probably hasn't lived there long enough for the postmaster to know that he is a ham." We have to be polite to the gals; bless 'em!

One card in my collection was addressed merely to "43 Rope Ferry Road" here in town. No good! Many beginners are neither skillful in sending nor in receiving numerals. Even if the name "Bob" had appeared in the address, it would have availed nothing. This road is two miles long, and "43" proved to be a hog pasture, with never a two-legged ham in sight.

If the poet, George Herbert, had lived three centuries later, he most likely wouldn't be thinking about a battle being lost because a horse threw a shoe, but would write something like this:

"For want of a surname
a QSL was lost.
For want of a QSL
a contest was lost."

Very early in life, I took means to prevent ever being called by a nickname. When I was born, my parents placed several names before me, most of them beginning with "R," although the only one I can now recall is "Rupert." Imagine a shy chap like me being addressed as "Chief YL-Chaser Rupie!" I squelched the racket by naming myself "Roy." So help me, that statement is 95 per cent true. Honesty compels me to add that it required six years for me to make up my mind. The editor of a well-known ham magazine—the name of which escapes me at the moment—once called me "Fire Blower." Could be; I dunno. I won't argue; I'm peaceable.

"Wipe that smile off your face and say 'sir' when you address me!" snapped Major Spit-andpolish at the trembling recruit. But when he resumed his QSO with a total stranger, he said: "Name is Mortimer, but everybody here calls me Mort." Just like that! A regular Dr. Jekyl and Mr. Hyde.

Unlike dogs, cats, and other animals, a person is given two or more names with which to establish his identity. Then he becomes a ham and henceforth uses only a nickname. The insertion of one's call letters in an address serves no purpose whatsoever, since it is meaningless to anybody except the addressee. It may boost his ego slightly.

"Twenty-three million pieces of mail annually ——" said the radio commentator. Because hams are among the worst offenders, let us assume that one million pieces are QSL's. At a low average expenditure of five cents for a card and postage, this amounts to a mere $50,000. In these days of whirlwind inflation, this is hardly worth mentioning. No, we wouldn't even stoop to pick it up. But it does help the QSL printers a wee bit.

The last resting place of Cub,
a ham who had no surname.
He died while waiting for
a QSL that never came. ■

A Coax Wavemeter for 300 to 2000 MC

W. Massey, W4ECL
Route 4, Box 96-D
Pensacola, Fla.

One of the most troublesome problems in amateur *uhf* and microwave work is that of measuring frequency. The coax wavemeter described here allows one to measure frequencies in a part of this range with reasonable accuracy. The accuracy is more than sufficient for many uses since, when working with crystal controlled oscillators and frequency multipliers, it is only necessary to establish the frequency close enough to tell which harmonic one is on.

The accuracy of the wavemeter is better than ±10% and is still better if carefully constructed and used. For the most accuracy the wavemeter can be calibrated if the necessary equipment is available.

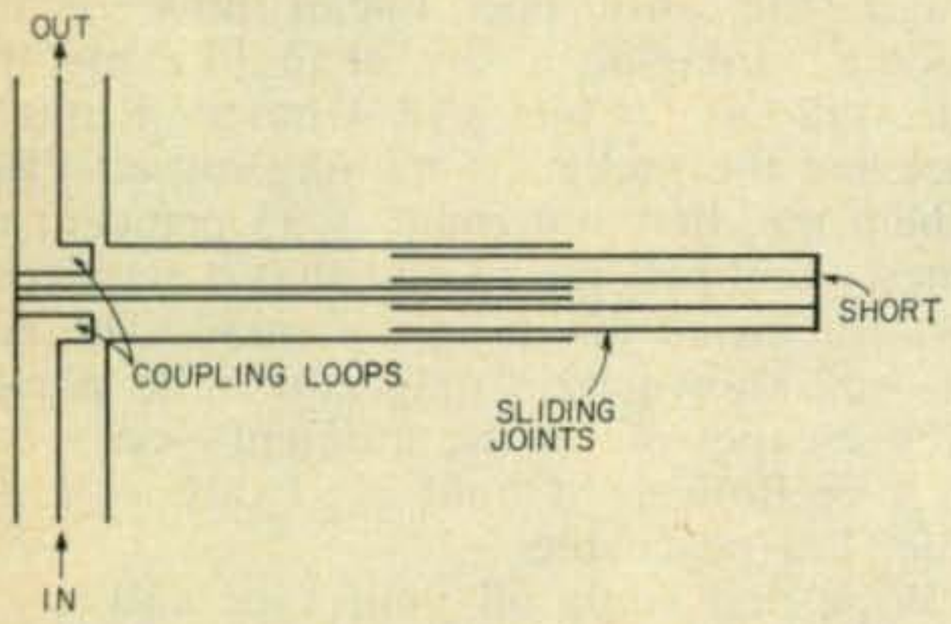


Fig. 1—Coax wavemeter with input and output loops. A direct connecting type may be made as in fig. 2B.

Fig. 2A—Loop coupled model. Sliding section is inserted in T section as shown in fig. 1.

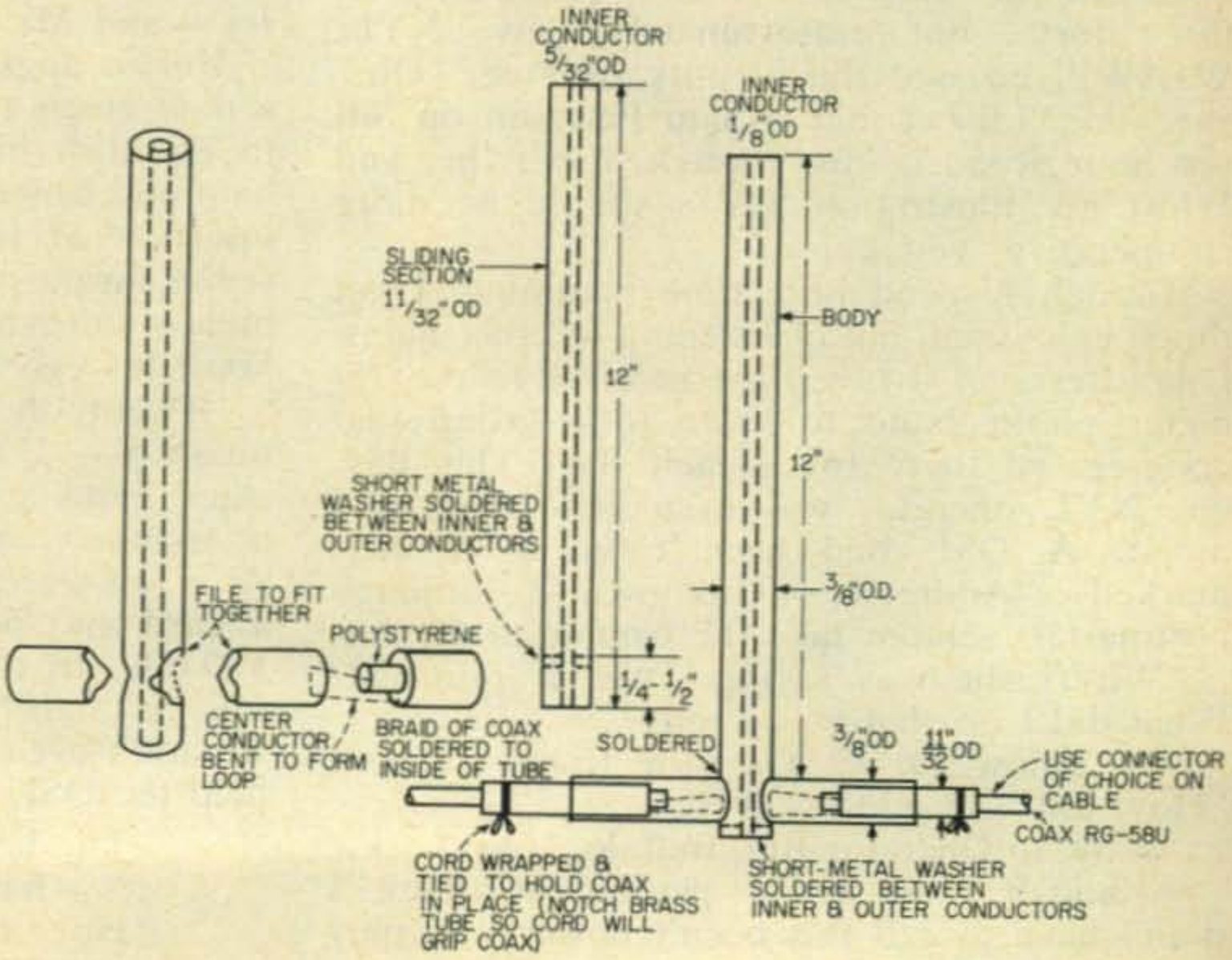
The wavemeter is basically a section of coax transmission line of variable length with shorts at both ends. Coupling loops are provided to couple energy in and out of the cavity. (See fig. 1.)

At frequencies for which the line is a half wave length or some multiple of a half wave length long, energy is transferred from one loop to the other much more effectively than at other frequencies.

The secret in the construction of this wavemeter is in the use of brass tubing available at most hobby shops. This tubing comes in sizes from less than 1/16 inch in diameter to a size somewhat less than ½ inch in diameter. The diameters and the wall thicknesses are chosen so that pieces of the tubing will telescope with a good fit. The tubing is reasonable in price since a 12 inch piece costs less than 50 cents. About six pieces will be needed along with the connectors so the total cost should be less than five dollars.

For the details of construction see the drawings in fig. 2.

As is obvious from the drawings, construction is not a highly precise operation. The tubing can be cut in any number of ways. The neatest way probably is to use a fine toothed saw such as a razor saw, also available at hobby shops. The hardest operation is to get the ends of the pieces that fit against the body to the right shape. This shaping and the shaping



of the holes over which these pieces fit can be accomplished with a rat tail file. These pieces do not have to fit perfectly since the gaps can be covered with solder. Where dimensions are not given on the drawings they can be chosen at the builders convenience.

When the construction of the model with loops is finished it is necessary to position the coupling loops. This is not critical and can be done by remembering that maximum coupling occurs when the center conductor of the wavemeter and the loops lie in the same plane. Coupling drops as the loops are pulled away from the center conductor. Since, if anything, the coupling is apt to be too light the easiest thing to do is to run the loops in until they hit the center conductor and then back them out a little. Once the loops are positioned, the tubes to which the coax is soldered can be soldered to the tubes connected to the main body to prevent the loops from shifting position.

Construction Methods

There are all manner of ways in which these things could be constructed. One can mount BNC receptacles on the side arms and fasten the loops to them. If a sturdier junction between the body and the side arms is desired, it is possible to buy a brass 'T' used with copper tubing and jam the brass tubing into it before soldering. If a loop coupled model with more coupling is desired the coupling can be increased to some extent by using loops with more than one turn.

Operation

To use the wavemeter it is necessary to pick up some of the signal to be measured and run it through the wavemeter into a detector of some sort. See fig. 3.

The detector can be a 1N34 diode or some such feeding a milliammeter. The length of the wavemeter is varied until a peak is found. If necessary the sliding section is pulled out and reversed. With the short toward the loops it is possible to measure from 500 *mc* up. With the short in the sliding section away from the loops the range is from about 300 to 500 *mc*. If only one peak is found the frequency can be computed by taking the distance between the shorts to be one half wave length. If it is possible to find several peaks the previous method can be used if the sliding short is in the position nearest the loops which will give a peak. It is also possible to take the distance between points at which peaks are found as one half wavelength. The frequency in megacycles can be found by using the formula.

$$f(mc) = \frac{5905}{L\ (\text{inches})}$$ where L = ½ wave length

If one has access to an accurately calibrated signal generator in the right frequency range it is possible to calibrate the wavemeter for improved accuracy.

The table below gives the performance of the loop coupled model.

The following gives some of the performance data for the two models constructed here. Measurements were made with the wavemeter

[*Continued on page 114*]

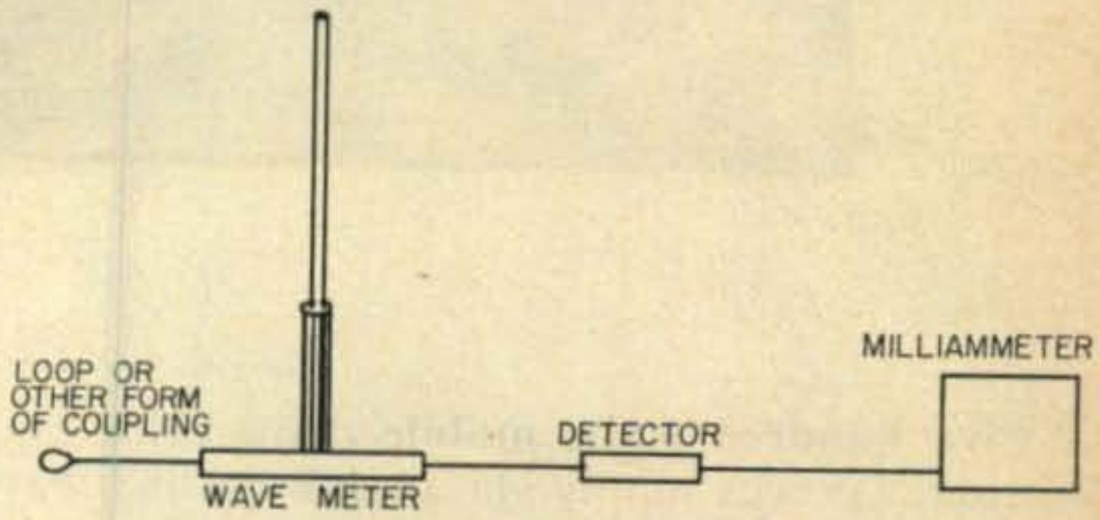


Fig. 3—The output of the wavemeter is fed to a detector and then to an indicating milliameter.

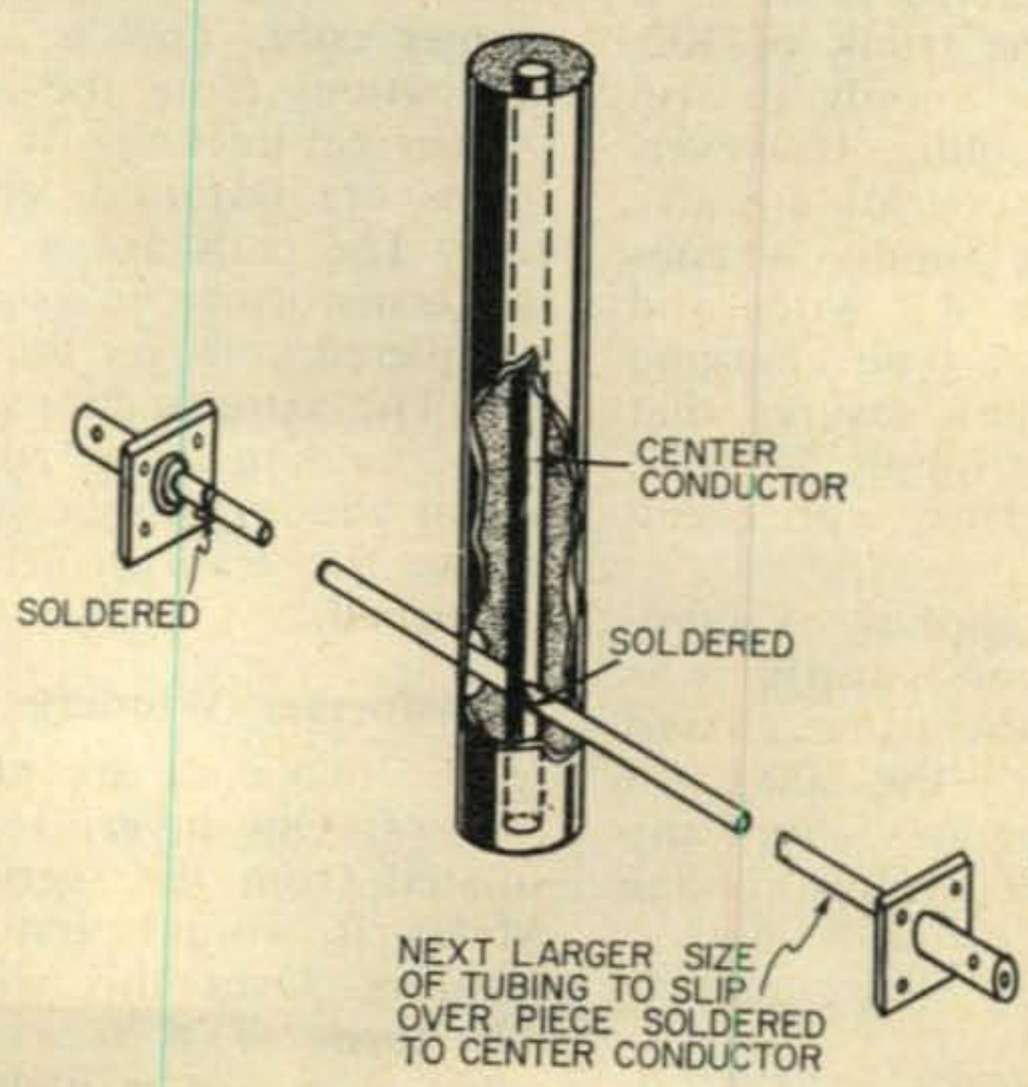
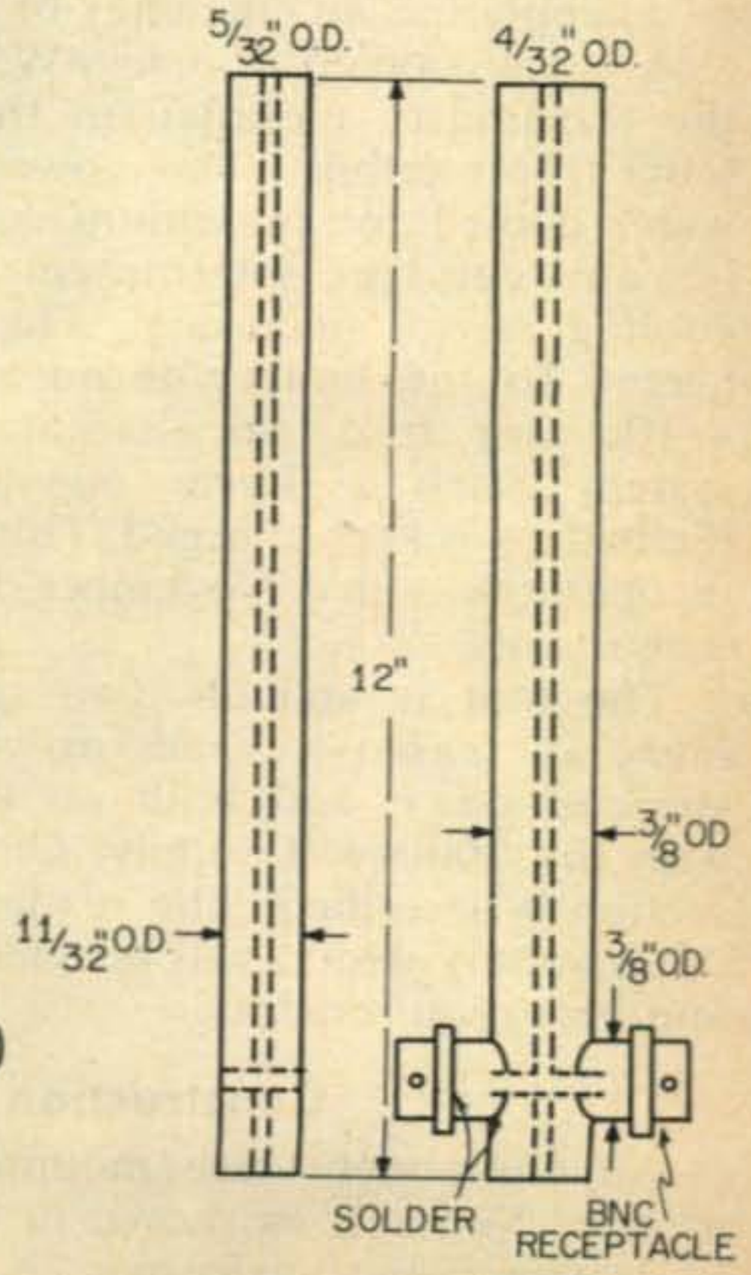
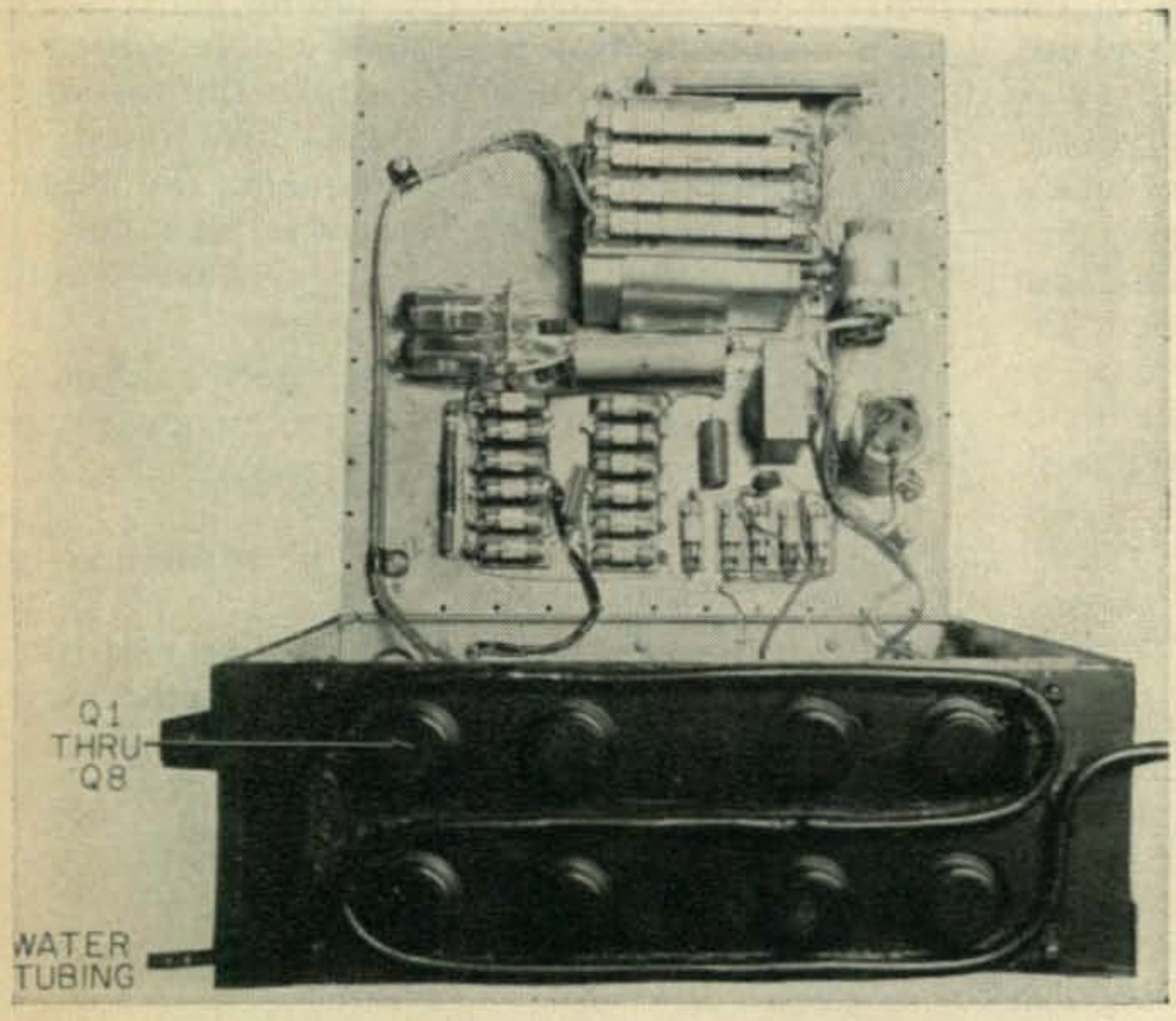


Fig. 2B—Wavemeter with input and output connection made to the center conductor.



HALF GALLON WATER COOLED TRANSISTORIZED POWER SUPPLY



Murray Gellman, K2CBO
1268 East 12th Street
Brooklyn 30, N. Y.

Five hundred watts mobile demands a high efficiency power supply. Transistors, which have been a happy solution to low and medium power mobile power supplies are used in this 2000 volt supply. This light weight transistorized supply has an efficiency of about 75%.

A water cooled *Eimac* 4W300B is used in the transmitter mounted in the trunk of K2CBO's automobile. The power supply is also water cooled for maximum cooling. However, for amateur type intermittent operation water cooling is not necessary. The supply is connected to the battery through #2 wires and a 100 amp fuse. An alternator type charging system (such as Leece Neville) assures that the battery is kept charged. This supply has been in operation since November 1958 with excellent results.

The unit is actually two supplies. A commercial transistorized power supply was stripped down and built on the same chassis with the 2000 volt supply. Only the 2000 volt section is described. The reader may adopt any other supply which will provide his low voltage and bias requirements.

Construction

All components are mounted on a SeeZak 4x 4 x 12 chassis as shown in the photographs.

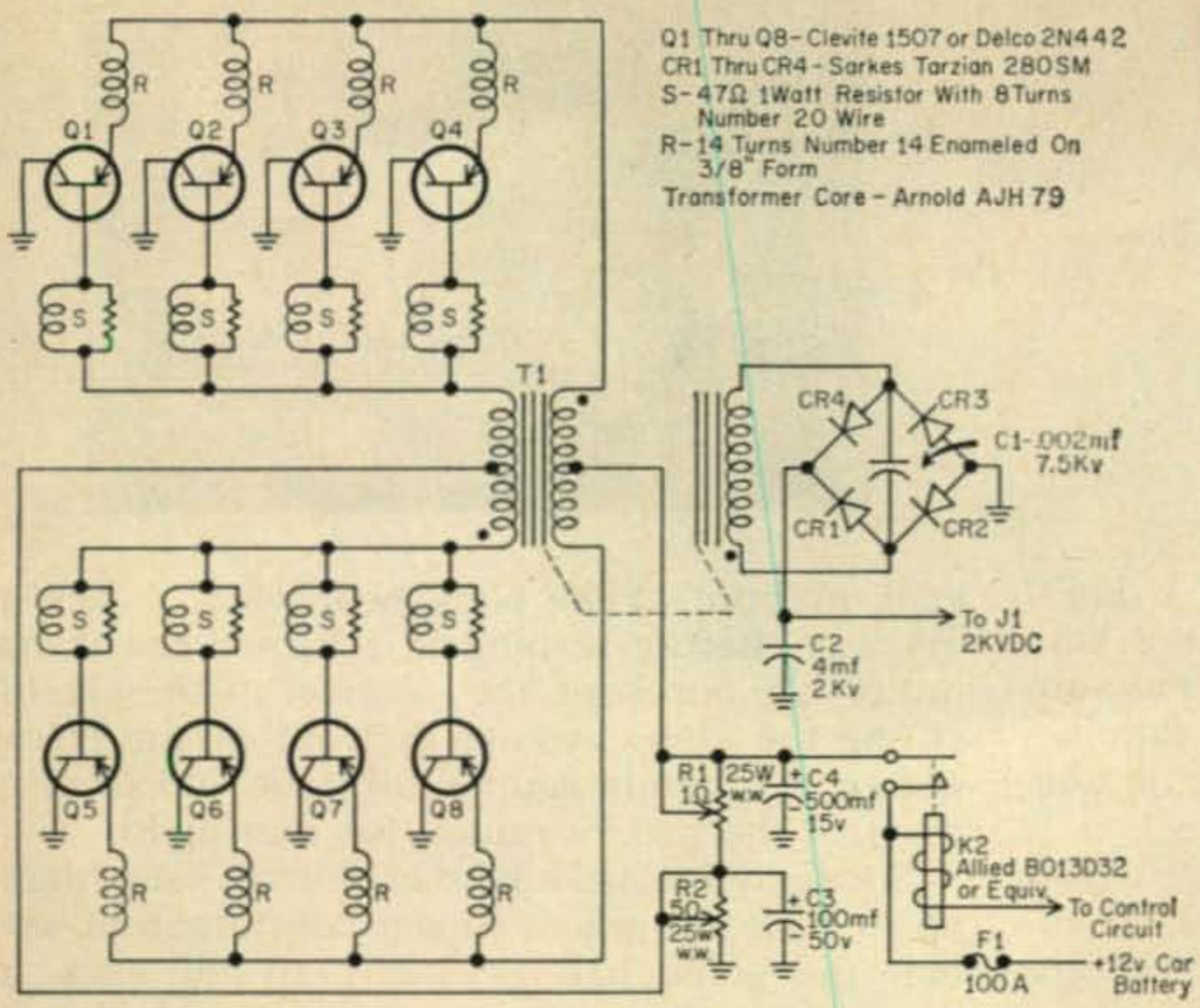
A suitable transformer is available from *Signal Transformer Co., Brooklyn, N. Y., part no. C1102.* The transformer may also be constructed by the ambitious amateur.

Transformer Core

An *Arnold AJH-79* stripped down from the inside to ⅜ inch thickness is used as the transformer core. This is achieved by peeling the laminations from the inside of the core until the correct thickness is reached. Two cardboard forms are required, one for each leg of the core. The coils are wound on the forms, and the transformer is assembled by slipping the completed coils on the core (as shown by fig. 1). The core sections are strapped together with banding strap (used by crate packers). When winding connections have been properly made, the transformer should be baked and varnished.

Transformer Windings

The two coils are identically constructed as follows: One layer, 18 turns of #15 wire insulated from the secondary by 2 x .002 inch Mylar is wound first to form the feedback winding. Over this wind the secondary with 976 turns of #26 wire. Eight layers of 122 turns each are insulated from each other by .003 inch Kraft paper. Over the top layer wind. .002 inch Mylar to insulate the secondary from



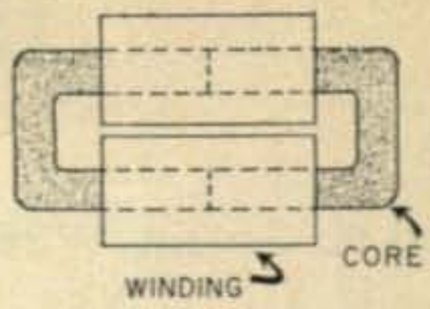


Fig. 1—Core and winding arrangement. Core is from a stripped down Arnold AJH-79.

Fig. 2—Circuit of the 2000 volt transistorized, water cooled power supply.

the next winding, the primary. Wind two layers of 5 turns each of 50 x 350 HF rectangular wire insulated from each other by 2 x .005 Kraft paper, to form the primary.

Proper connections of the windings after putting the transformer together may be made by using a two volt *ac* transformer and an *ac* voltmeter. Connect the primary windings in series and connect the two volt *ac* transformer across the total primary. Measure the voltage across each half of the feed-back winding. The two voltages should be identical. The feed-back windings are then connected in series. Measure the voltage across the entire feed-back winding. If the voltage is less than half, or zero, compared to the measurement of each section, reverse the series connection. When properly connected the total voltage should be double that of each section. Follow the same procedure as for the feed-back winding to determine proper conections for the secondary winding.

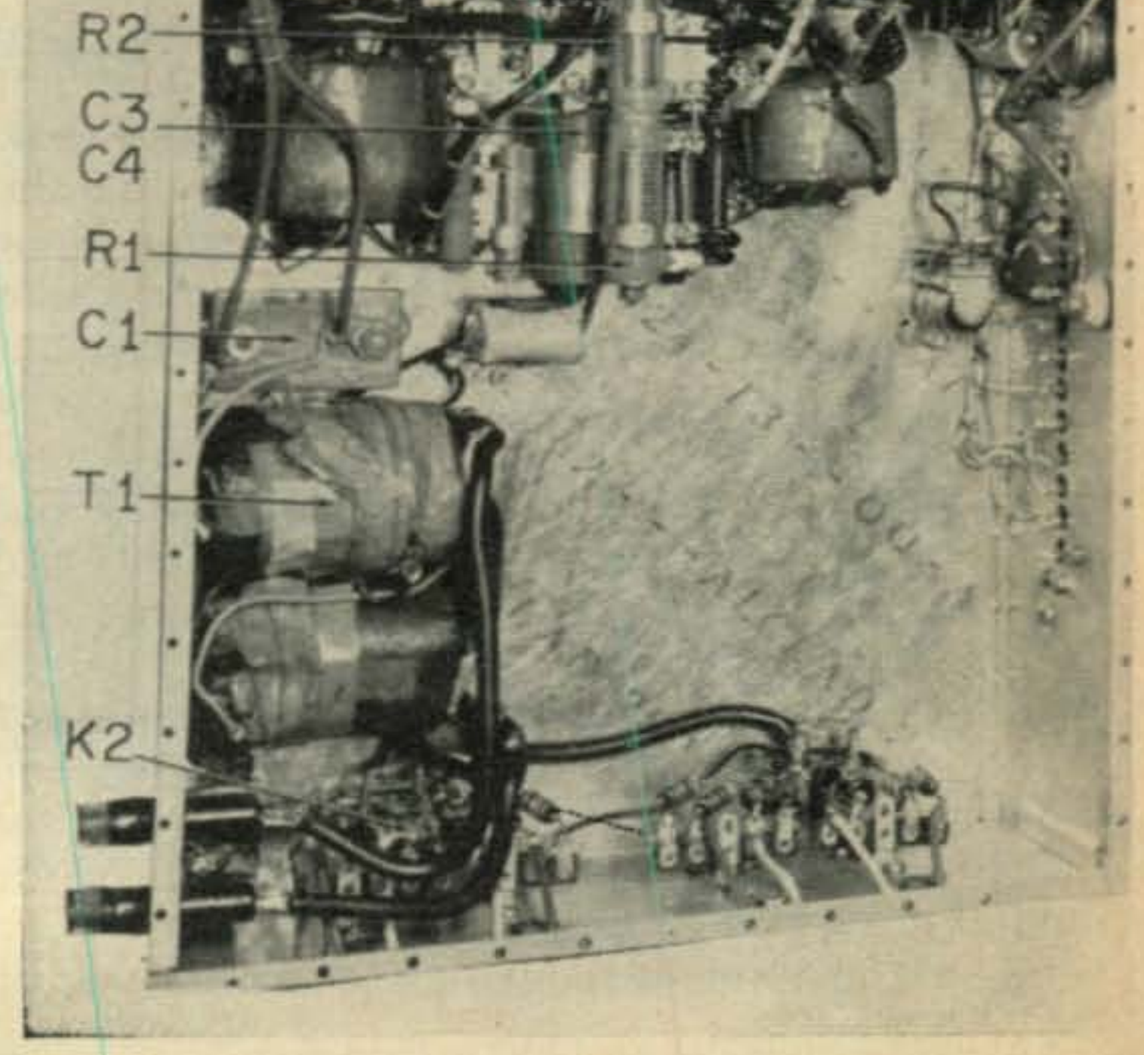
Transistor Mounting

The next step in construction of the power supply is to mount the transistors in a manner which insures proper cooling. A copper plate, 3⅞ x 11 x ¼ inches is used to mount the transistors. If water cooling is used, make three hair pin turns of ¼ inch OD soft drawn refrigerator type copper tubing, and solder to the copper plate using a blow torch and heavy soldering iron. About 4 feet of tubing is required. Drill all holes for mounting the plate and transistors. Coat the transistors with *Amphenol 53-307* silicone compound before mounting them on the copper plate. This compound effectively transfers the heat generated by the transistors to the copper plate.

The completed transformer, transistor plate, and other components may now be mounted on the chassis for wiring. Examine the photographs for the layout of parts. Eight suppressors are

[*Continued on page 113*]

Inside view of both the 200 and 2000 volt supplies. Only the 2000 volt unit is described.



Esp

Russel A. Garlin, W3BCZ
211 Berry St.
West Pittson, Pa.

Do you beleive in the supernatural? I don't, or do I???? At five o'clock this morning (the 13th) I suddenly awoke and I knew, just as sure as I'm sitting here writing this, that a familiar voice was calling me from somewhere in this world.

Let me go back a few months and give you some background material which will, I am sure, sway your belief just a little in case you are one of those who are not superstitious.

My radio station (W3BCZ) is located at my summer home. About fifteen miles up in the mountain and my reason for having it there, aside from the fact that the surroundings are beautiful, is the complete lack of complaints from TVI (no neighbors). During the summer months I am on the air several nights a week but when the frost comes on the punkin I move back to town where the heat is a little more plentiful. I do manage to shovel my way through occasionally during the winter.

Several months ago after finishing a QSO with a foreign station (DX is my hobby and as a rule I do not listen much in the American section of the 20 meter band) I tuned the receiver back across the American band and happened to hear a W3 calling me on my frequency. He was signing portable KH6 and so I immediately retuned the *vfo* and gave him a call. We had a very nice QSO and I found that he was from a neighboring town (Swoyersville) and was now stationed on the French frigate Shoals 400 miles northwest of Hawaii. At the end of the QSO he told me he would be returning in a few weeks and would look me up then. I guess his plans were changed as he did not arrive and, frankly I forgot about him after that.

About a month later I decided to spend the night at the shack and after trying for an hour and having no luck because of very poor radio conditions, I decided to turn in and try it again early in the morning.

I had taken an old alarm clock with me, and unfortunately, dropped it as I was getting out of the car. I did get it working, I thought, and set it for 5:00 am and so after undressing, etc. turned in.

Before continuing with my story, I suppose I should go back just a little further and tell you something about the physical layout of the shack. First I have a large plastic globe, of the inflatable type, which is on a long arm and can be swung around in front of the transmitter or back in front of the bunk bed, when it gets in my way. Before turning in I turned the transmitter off but kept the receiver filaments lit, swung the globe around in front of the transmitter and then lit a small oil stove and set it in front of the bed. So much for that night.

Suddenly I heard a loud explosion, sat straight up in bed, and much to my consternation saw that the globe had gradually swung back in front of the bed, come in contact with the oil stove, and had blown a hole in the side. The alarm clock said 2 am but since it was daylight I looked at my wrist watch and saw it was shortly after seven. I found that the clock had stopped. I felt I had wasted a night, but, without bothering to dress went over to receiver and snapped the send/receive switch to receive and heard a voice saying "W3BCZ, are you listening this morning".

I quickly turned the transmitter on and after a very short warmup made a few hasty QRZ's. To my pleasant surprise the station came right back and announced that he was W3ZJU in Palmyra. Now my home town is Palmyra, Pennsylvania and I do have a few ham friends there but it didn't seem possible that the skip could be that short so I asked him if he was in Palmyra, Pennsylvania or in the South Pacific. He replied, don't you recognize me? This is John from Swoyersville and I'm on Palmyra Island, in the Pacific. We had a nice QSO and to me the night was then complete.

After signing off I started thinking; just why did the alarm clock stop, why did my receiver happen to be tuned exactly to the frequency John was transmitting on, why did the explosion occur at the exact moment John was calling me and why, oh why, did the hole in the globe appear right at the Palmyra Island????

Now are you starting to believe just a little in the supermatural; or is it just a case of pure mental telepathy?

Well, I told some of my friends about it and then forgot all about it but this morning when I suddenly awoke at exactly 5:00 am I knew that John was calling me from somewhere on the globe. What could I do? Well there was nothing to do but go back to sleep since I was 15 miles from my transmitter. But one of these mornings it wil happen again and this time I'll be prepared because I'm hastily setting up a small station at my home and I won't disappoint John again. ■

Beeper . . . . . A Keying Monitor

In the interest of generating clean signals, both novices and more experienced amateurs should include as a station necessity, some sort of monitor for checking the quality of keyed signals. Such is Beeper.

Wade Williams, K5ILG
2327 Wheeling Ave.
El Paso, Texas

Bernie Hirsch, K5ITB
9205 Mt. Olympus Rd.
El Paso, Texas

Since the mind and reflexes of the newcomer have not yet been indoctrinated to the complexities of operating his station, it is sometimes difficult to keep track of the various mechanical operations that are required.

I often wonder how many times we throw the transmit switch without first reducing the *rf* gain of the station receiver, the result being a deafening blast in the headphones. The classical solution is obvious; this being the simple action of muting the receiver when in the transmit position. This, however, leaves us with a far more serious problem; that of providing a means of monitoring the keyed signal with the receiver silenced.

The monitor described here serves the primary function of silencing the receiver to a tolerable level by reducing the gain to a point where monitoring is feasible, but blasting impossible.

After experimenting with several designs, we found that the "Beeper" was the simplest and most practical since no surgery to the transmitter is required for installation.

The chassis work is non-critical in nature. Any small aluminum 4″ x 6″ unit may be employed. The layout of the components is also non-critical. Any convenient arrangement will do.

Operation

The basic theory is simple. Some *rf* from the transmitter is sampled, rectified by the IN34 diode. The filter has a short time constant so the voltage fed to the audio oscillator ceases where the *rf* is cut. This voltage powers the oscillator. The oscillator output is then coupled to a single stage of audio amplification which drives a speaker. No *rf*-no output.

While the circuit is self-explanatory, there are a few notes that should be kept in mind. The transistor transformer is an Argonne AR-105, manufactured by Lafayette Radio Co. It has a primary of 20K and a 400 to 800 ohm secondary which serves as a combination oscillator transformer and interstage coupling transformer. An audio output transformer rated 5000 ohms to voice coil was found to be most satisfactory, however this will depend on the type of transistor selected and the impedance of the speaker used.

Physical placement of the pickup probe will depend on the availability of *rf*. Due to the extra high degree of sensitivity in this particular monitor, very little *rf* will be required for successful operation.

After you have constructed the "Beeper," you will find that the strength and tonal qualities are quite suitable for the average cw operator. ■

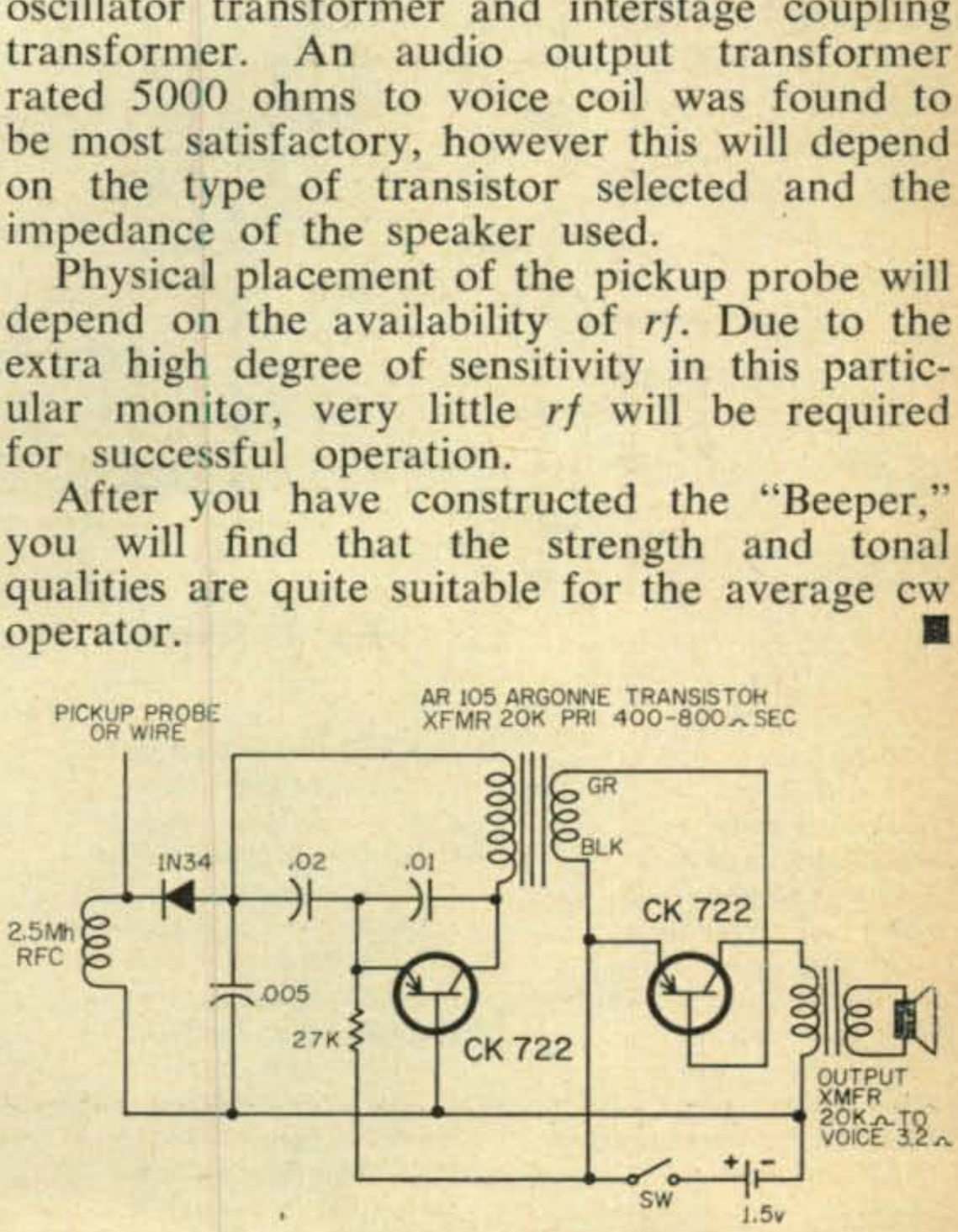
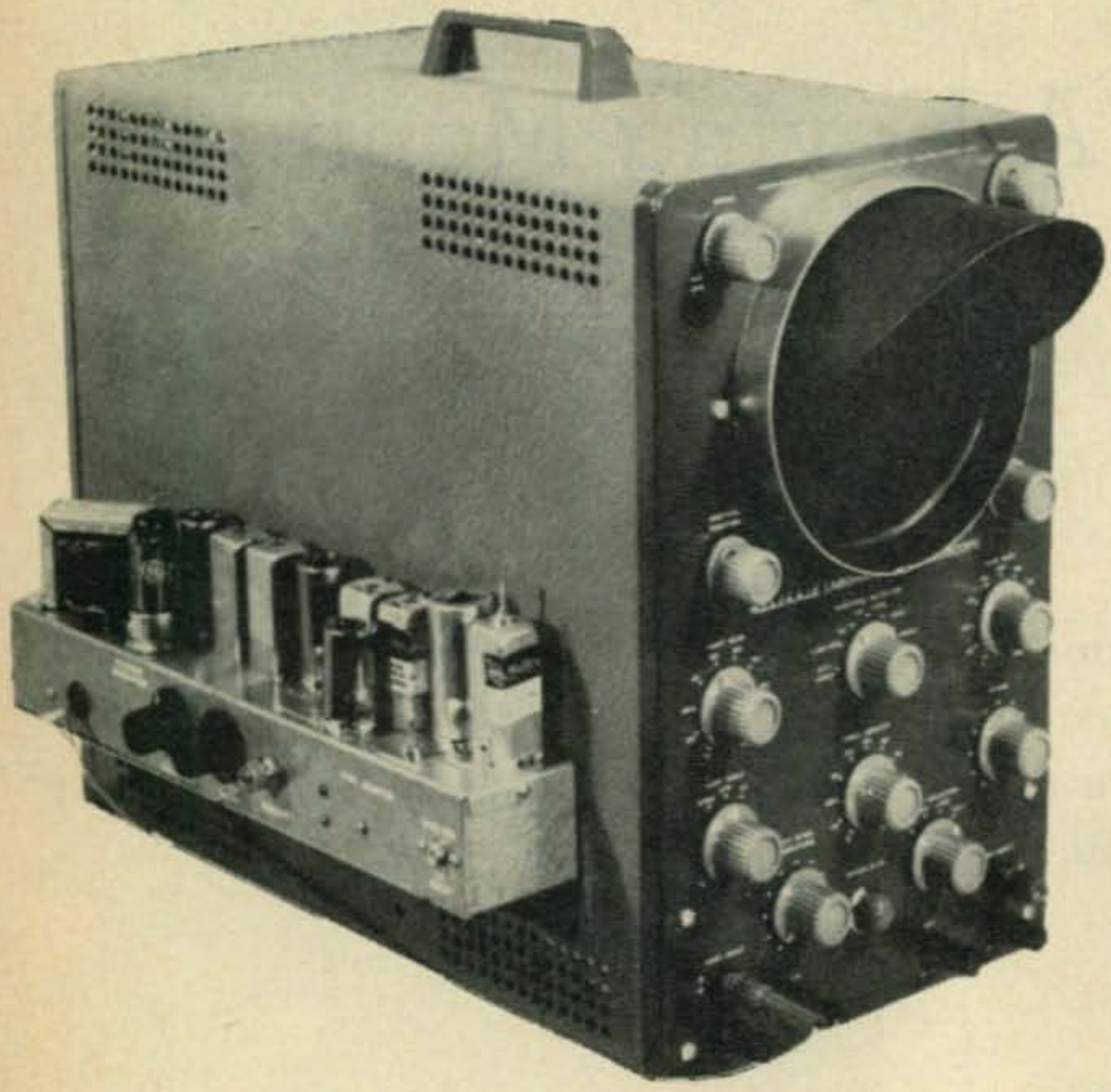


Fig. 1—Circuit of a simple keying monitor.

"The Pan-Scope"

Cheap and Easy Panoramic Reception

Louis I. Hutton, WØRF
2608 South Fern
Wichita 17, Kansas



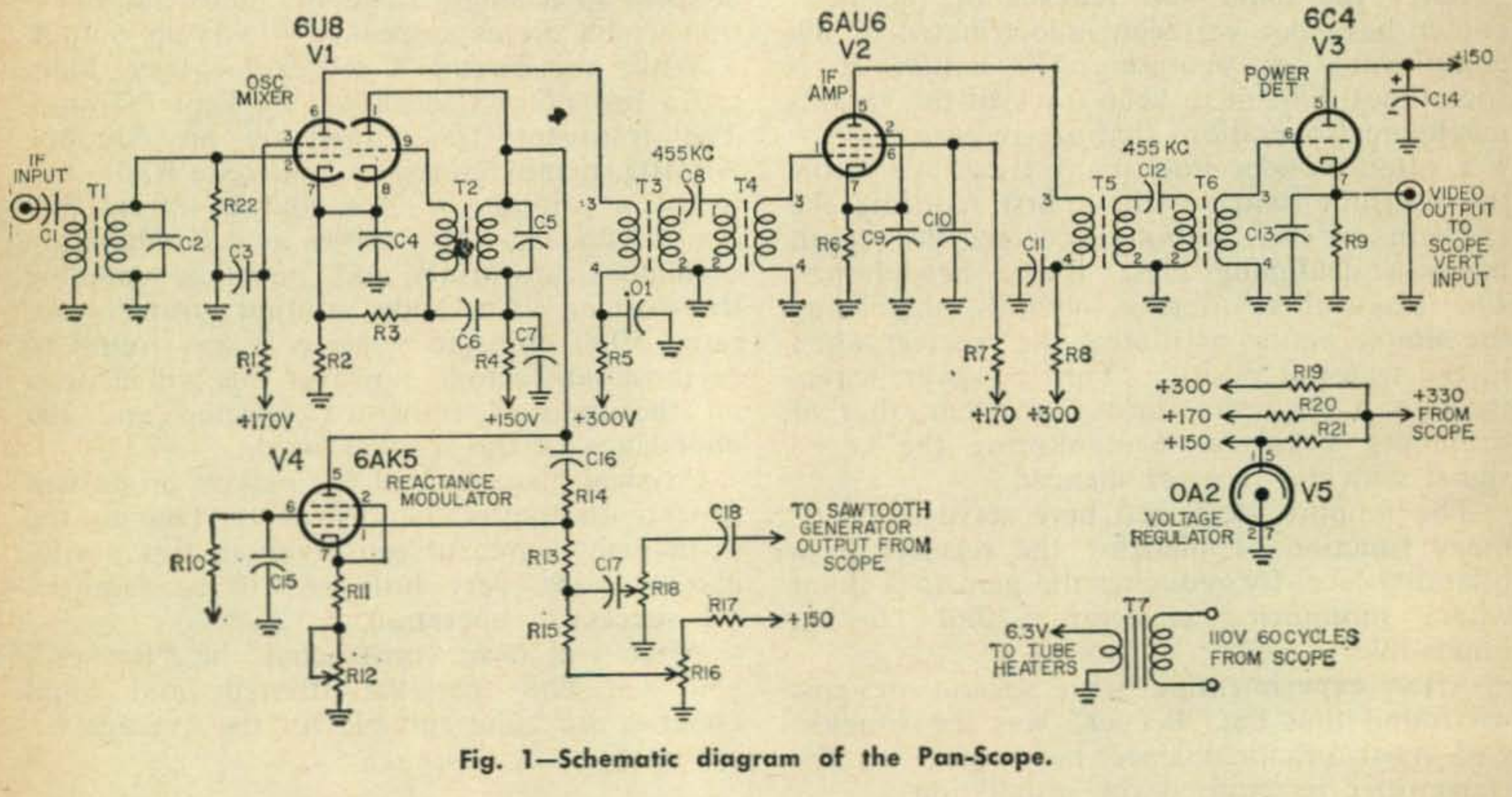


Fig. 1—Schematic diagram of the Pan-Scope.

Parts List

C1-10 uuf disc
C2-25 uuf disc
C3-.01 250v paper
C4-.05 250v paper
C5-56 uuf silver mica
C6-200 uuf silver mica
C7-680 uuf silver mica
C8-1 uuf tubular ceramic
C9-.01 250v paper
C10-.01 250v paper
C11-01 400v paper
C12-1 uuf tubular ceramic
C13-50 uuf disc
C14-8mf 350v electro.
C15-.01 250v paper
C16-100 uuf silver mica
C17-.1 mfd 200v paper
C18-.1 mfd 400v paper
C19-.01 mfd 250v paper
R1-33k ½w carbon
R2-680 ohms ½w carbon
R3-47k ½w carbon
R4-8.2k ½w carbon
R5-4.7k ½w carbon
R6-1.5k ½w carbon
R7-4.7k ½w carbon
R8-4.7k ½w carbon
R9-1 meg ½w carbon
R10-4.7k ½w carbon
R11-100 ohm ½w carbon
R12-10 k 2w potentiometer (linearity)
R13-270k ½w carbon
R14-3.3 k ½w carbon
R15-680 k ½w carbon
R16-50 k 2w potentiometer (center frequency)
R17-15 k ½w carbon
R18-500k 2w potentiometer (sweep width)
R19-4.7 k 2w carbon
R20-110 k 2w carbon
R21-15 k 2w carbon
R22-10 k ½w carbon

T-1 1600 *kc* ant. coil K-tran 13-WI
T-2 oscillator coil J. W. Miller 70-OSC
T3-455 *kc lf* Transformer K-tran 12-C2
T4-455 *kc lf* Transformer K-tran 12C2
T5-455 *kc lf* Transformer K-tran 12-C2
T-6-455 *kc lf* Transformer K-tran 12-C2
T-7 Filament Transformer 6.3v 2a Stancor P-6134

With the publication of Mr. Bishop's article on "The Snooper" in CQ of August and September 1952, the theory of panoramic reception became available to anyone interested in the subject. The question which arose in the writer's mind was how could this system be used with a commercial oscilloscope. The following is the results of the author's effort to build an inexpensive adaptor which will provide elementary panoramic display on a 5" scope when connected to a receiver with an *if* of from 950 kc to 2215 *kc*. The usefulness of the oscilloscope is not impaired in any way.

Circuit Description

The "Pan-Scope" adaptor circuit consists of a simple three-tube super heterodyne (see fig. 1) (V1, V2, V3) receiver whose local oscillator is caused to shift in frequency by a reactance modulator tube (V4) driven from a sawtooth signal. Supply voltages and the sawtooth signal are taken from the oscilloscope. Video output is sent to the vertical input of the oscilloscope. A filament transformer is provided to reduce current drain on the scope power supply. The voltage regulator (V5) is used to supply stabilized voltage. To improve the selectivity of the 455 *kc if* amplifier dual transformers with loose coupling were incorporated as shown in fig. 4.

Construction

The adaptor is constructed on a 2¼" x 2¼" x 12" chassis as shown in the photos and layout of fig. 2. An octal socket is mounted on the rear apron of the oscilloscope chassis to provide power and sweep voltages to the adaptor power cable. The output from the adaptor is connected to the scope vertical input through a shielded cable and bannana plug. Placement of internal parts during and after construction did not appear critical. The sawtooth signal is taken from the output of the scope sweep generator as shown in fig. 3. Control knobs are provided for the center frequency (R-16) and sweep width (R-18) potentiometers, as they are adjusted during operation of the unit. A screwdriver adjustment is provided for the linearity control (R-12). Decals were used to label the various major components and functions.

Installation and Adjustment

The alignment and adjustment of the unit is as follows: Connect a *vtvm* to the video output cable. Connect an *rf* signal generator to the *if* Input" jack. Set the center frequency control to mid-rotation point. Set the sweep width control to "Off" position. Set linearity control to mid-rotation position. Turn on scope and adjust so that trace is sweeping at approximately 60 *cps*. Set signal generator to 455 *kc* and adjust *if* transformers T3, T4, T5,

[*Continued on page 113*]

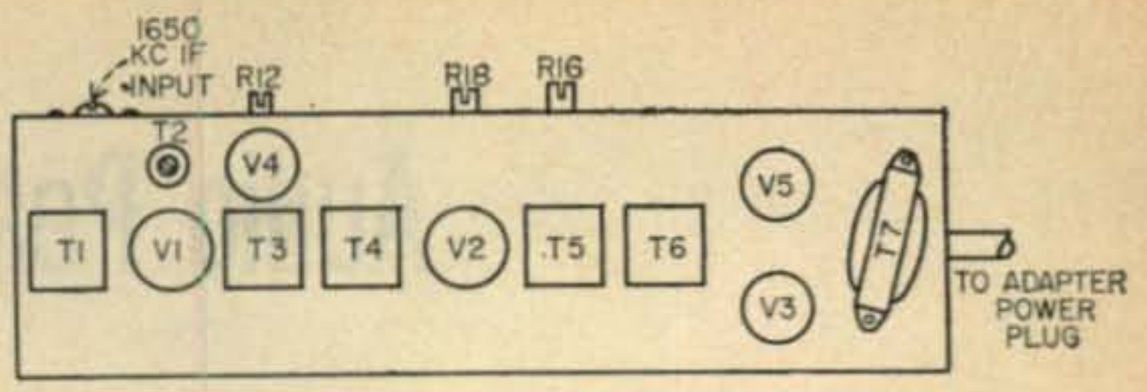


Fig. 2—Parts location; top view.

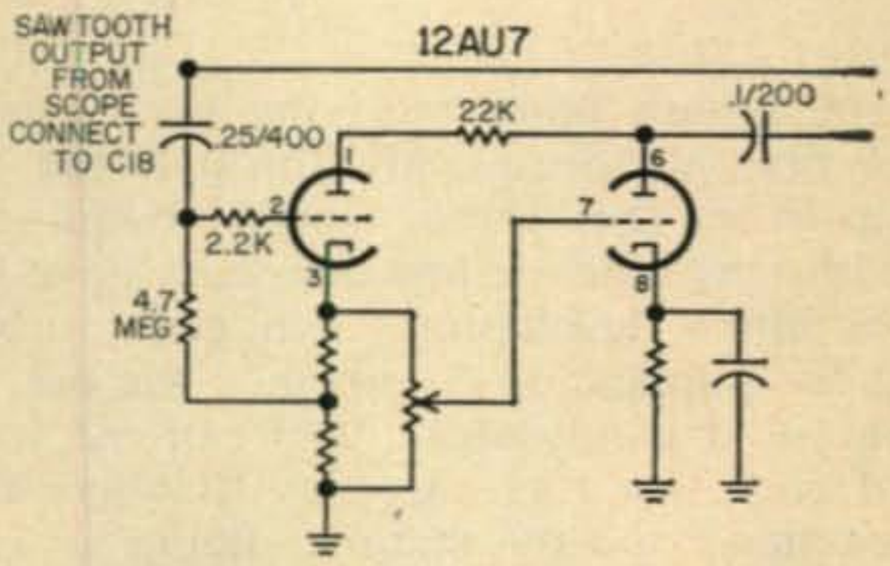


Fig. 3—Portion of the Heathkit O-12 oscilloscope showing the take off point for the sawtooth.

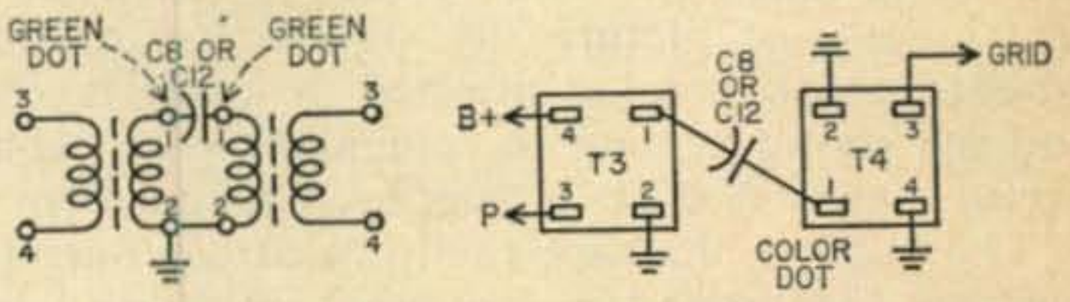


Fig. 4—IF transformer wiring.

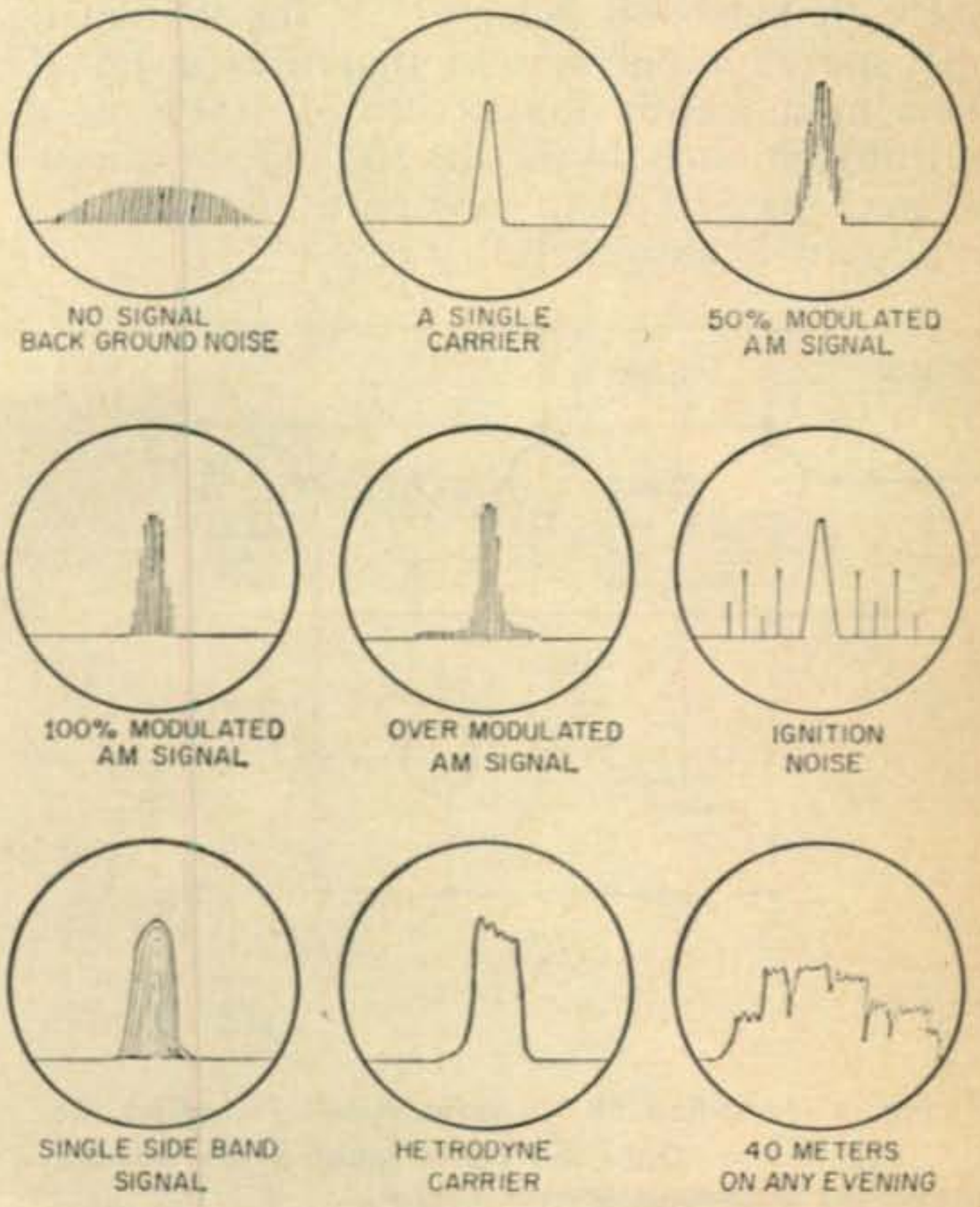


Fig. 5—Some typical Pan-Scope patterns.

Audio Peak Limiting

Howard S. Holzer, K6RAN
4221 Creed Ave.
Los Angeles 8, Calif.

Every month upon receiving my edition of CQ, I first glance quickly through the front portion to see the various worthy modifications and additions other fellow amateurs have spent endless hours developing, then generously offering for publication to advance the art. Like a child in a candy store, I dream of having one of each, for there are few that would not be beneficial to my station. Being a realist makes this an impossibility, so dreams slowly fade until the next month's edition of my CQ arrives.

One thing, however, that makes these very fine innovations not too appealing to me personally is that many are of the *outboard variety*. I can just picture my station full of unlabelled black crackle finished *do-good* boxes, and me trying in vain to remember what wonderful function each is supposed to perform.

The gadgets that are really most catching to me are circuit and/or component changes in existing kit or commercial equipment that the manufacturing engineers did not incorporate. This is my cue to offer a small but very useful gimmick for those fortunate enough to own a Heath Sideband Adapter, or for that matter any speech input system that uses a 12AX7. This modification makes use of 100% of the existing circuitry in the SB-10, and the addition of perhaps $10.00 in new parts, if the shack's cupboard is absolutely bare.

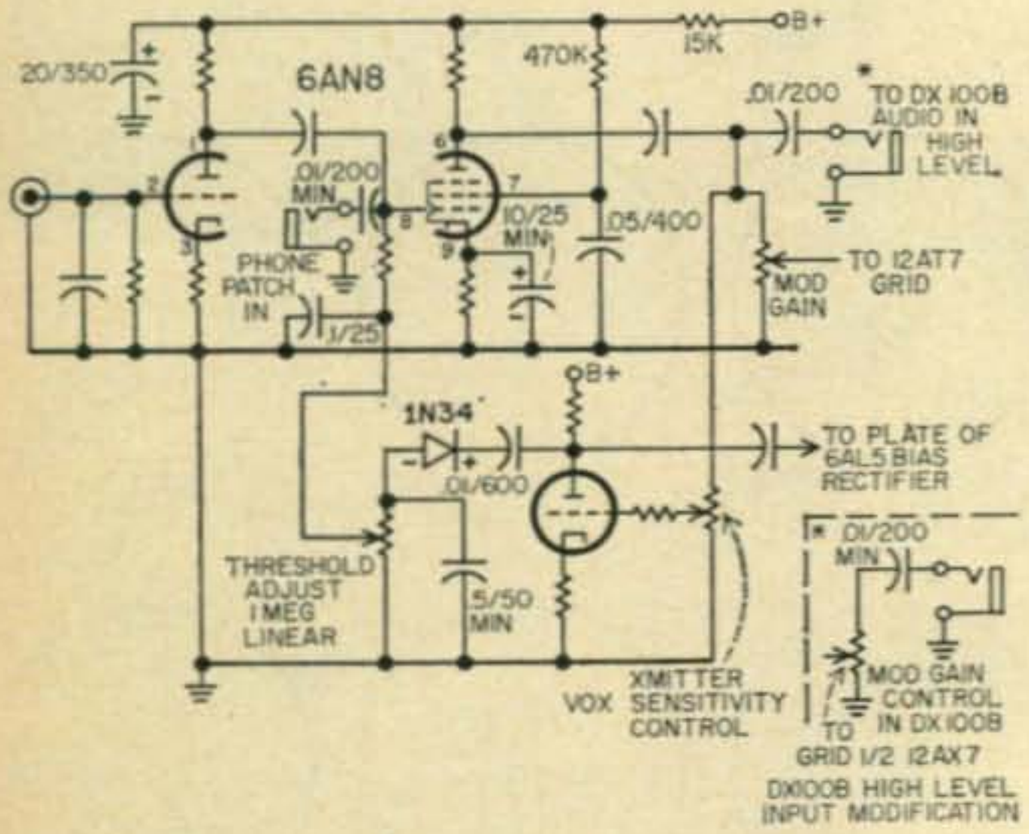


Fig. 1—Modified SB-10 input circuit including the peak limiter. Only the parts labeled are needed for the modification. Unlabeled parts are the same as those in the SB-10. The new parts should all be miniature.

Needless to say there have been more than ample articles published that extole the use of audio compression, peak limiting, clipping, or call it what you may. We all know the broadcast stations use audio limiting to prevent overmodulation and keep the apparent level of intelligence high. Being a recording engineer by trade, I can tell you from experience that those loud Rock & Roll records you undoubtedly have heard and cussed, could not be possible without the use of a good old *Altec Lansing A322C* limiter amp. or its equal. First of all, the cutting stylus would make excursions that would wipe out the adjacent groove, (if the cutting head didn't lost its armature winding after the first hot audio peak hit the poor thing). If you are a purist in the highest of Hi-Fi, I hate to shatter your dreams, but, even the best of those long hair recordings lose some of their dynamic range through a limiter amplifier, (and I have never seen a high quality recording studio that didn't have one of these brutes yet). Wait ! ! ! ! ! Before you lose your mind and heave the Hi Fi out with that expensive record library, let me explain. If the cutterhead driving amp was adjusted to put on maximum permissable recording level (without limiting) at the loudest crescendo of your favorite 120 piece symphonic group, the poor flutest, or other soloist, requested to play soft (whether by conductor or composer), would be buried down in the mud, rumble, hum, hiss, or what have you in your most elaborate system. Need I clarify more?

Upon the prodding of K6HXT (alias W6-KRM pre-war call) a dyed in the wool 160 meter DX fiend, I set out to come up with something that would approach the performance of the *Altec A322C*, but not quite as elaborate since the monster is at least as large as my humble DX-100B. Unlike some clipper circuits that create much harmonic distortion only to be filtered out with well shielded bulky

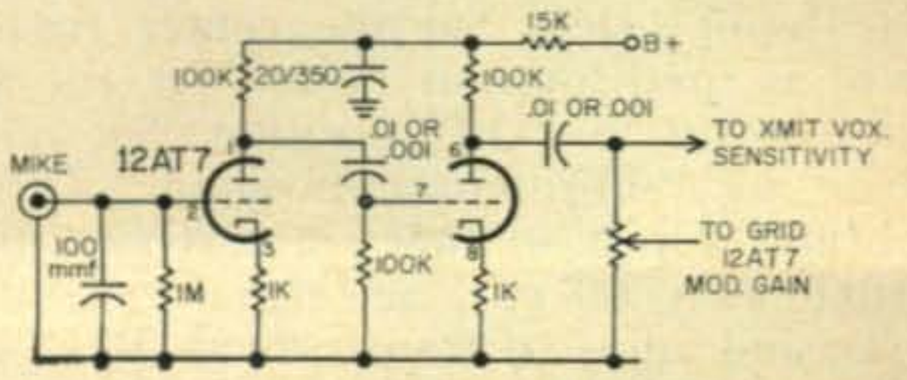


Fig. 2—Original SB-10 input circuit.

audio inductances, and associated components, this audio limiter, like the recording types, operates on the *avc* principle of your good receiver. It differs only in the fact that the threshold is continuously adjustable to suit the necessary operating conditions. (See fig. 1). As in *avc* circuitry, audio is rectified negatively, filtered, and fed back into a controllable pentode. I chose to use a 6AN8 primarily because the triode section had the same pin connections as the familiar 12AX7. The gain of the triode section in the 6AN8 is lower than that of one-half the 12AX7 used in the Heath SB-10, but with petode section added it makes up for and surpasses the cascaded 12AX7. (Fig. 2).

In the sideband adapter the 12AX7 cathode resistor, plate load, and grid return (input half) were untouched for the triode section of the 6AN8. It was necessary to change the filament connection, add a cathode by-pass capacitor, screen dropping resistor with associated by-pass condenser, and move the grounded end of the grid return resistor, (100K) already existing, to a tie point where it could pick up its *avc* voltage from the threshold pot. The *avc* voltage was picked off at the plate of the *vox* portion of the 6AL5 duo-diode through a blocking condenser. I used a 1N34 diode to rectify the audio and a 1 Meg *Linear Taper* pot for the load, filtered by a .5 mfd 50v miniature condenser. The *avc* voltage is always being developed, but that is where the pot comes in. By moving the arm from minimum to maximum, one can set the desired point where the developed bias overcomes the 6AN8 pentode's cathode derived bias, thereby reducing the gain of this stage. Different operators will need different threshold points, depending upon their mikes, voices, etc., so the variable threshold is necessary for versatility. In operation the time constant (attack time), though not as good as the professional limiter is more than adequate, and this is stated without exaggeration. Only if very near to maximum limiting is used will the speech system seem to swallow or punch holes in the modulation. I might add that this would occur only if total available limiting was used with the operator only one inch from the mike screaming CQ DX. In that case it is suggested that the person QSY to vocal power communication instead of using *rf*.

To set the device up properly, one should set the gain control to get proper *maximum modulation* by *talking softly* slightly further back from the mike than used in normal practice. Then, slowly increasing the level of voice and getting closer to the mike, adjust the threshold pot so as to prevent the louder peaks from raising the modulation indicator (meter or etc.) any higher. The user will be very pleased to find that over a wide range of amplitude his modulation will always be hitting what he has set up to be the maximum safe amount for the particular rig.

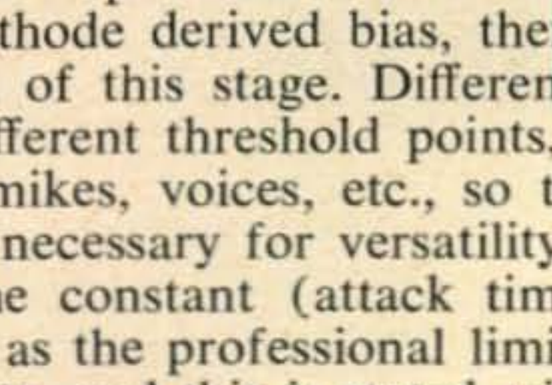


Fig. 3—Location of the components added to the front panel.

Looking at the SB-10 schematic at first glance it seems that the *vox* threshold pot would also affect the limiting threshold too since the bias for limiting is derived from one half of the 12AT7 that drves the relay portion of the same tube through a 6AL5 (one half) diode. All I can say to you sharp fellows is that if you have enough *af* to *vox* your machine, you have more than ample signal to rectify for the limiting bias. O.K.? Incidentally, that is one of the nice features about the gadget. In the SB-10, it does not require any additional stages of gain to get enough audio rectified for the *avc*.

In my lashup I have installed miniature jacks on the sideband adapter and the DX-100 so a small patchcord pipes audio from one to the other when changing from AM to SSB without moving the mike connector. (Fig. 3) Since the addition of the limiter in the SB adapter I always use the front end of it to supply audio to the DX-100.

On initial performance tests, K6HXT (whose QTH is in Calabasas, Cal., about 40 miles as the crow flies from mine) tied a standard broadcast VU meter across the audio output line and adjusted the *rf* Gain to receive my AM carrier to S9 on his trusty SX28 receiver. The audio gain was then set to obtain O VU from my loudest modulation peaks, (which were held to 100% modulation by constantly monitoring my Xmitter output with a scope). While I backed off from the mike, Phil (K6DVB) kept on raising the modulation gain control so as to maintain 100% modulation as my voice increasingly got softer with distance. He then adjusted the threshold so that no matter where I stood in the shack (a room about 8′ by 10′ in the basement) the peaks registered the same whether I spoke normally or shouted pretty dog-gone loud, and I mean *loud*. Roy, over in the hidden hills of Calabasas, then QSY'd down to the broadcast band monitoring some of the most potent AM stations in L.A. (50 *kw*) Without changing the audio gain, but, adjusting the *rf* sensitivity to S9 (same as my carrier strength), he noted that the BC stations rarely ever hit zero and most of the loudest passages of their program material hit −2 *db* below the 0 reference on the VU meter. He also noted that the dynamic range of my audio varied very little and the duration of words and phrases kept the decibel meter hovering around the 0 mark with very

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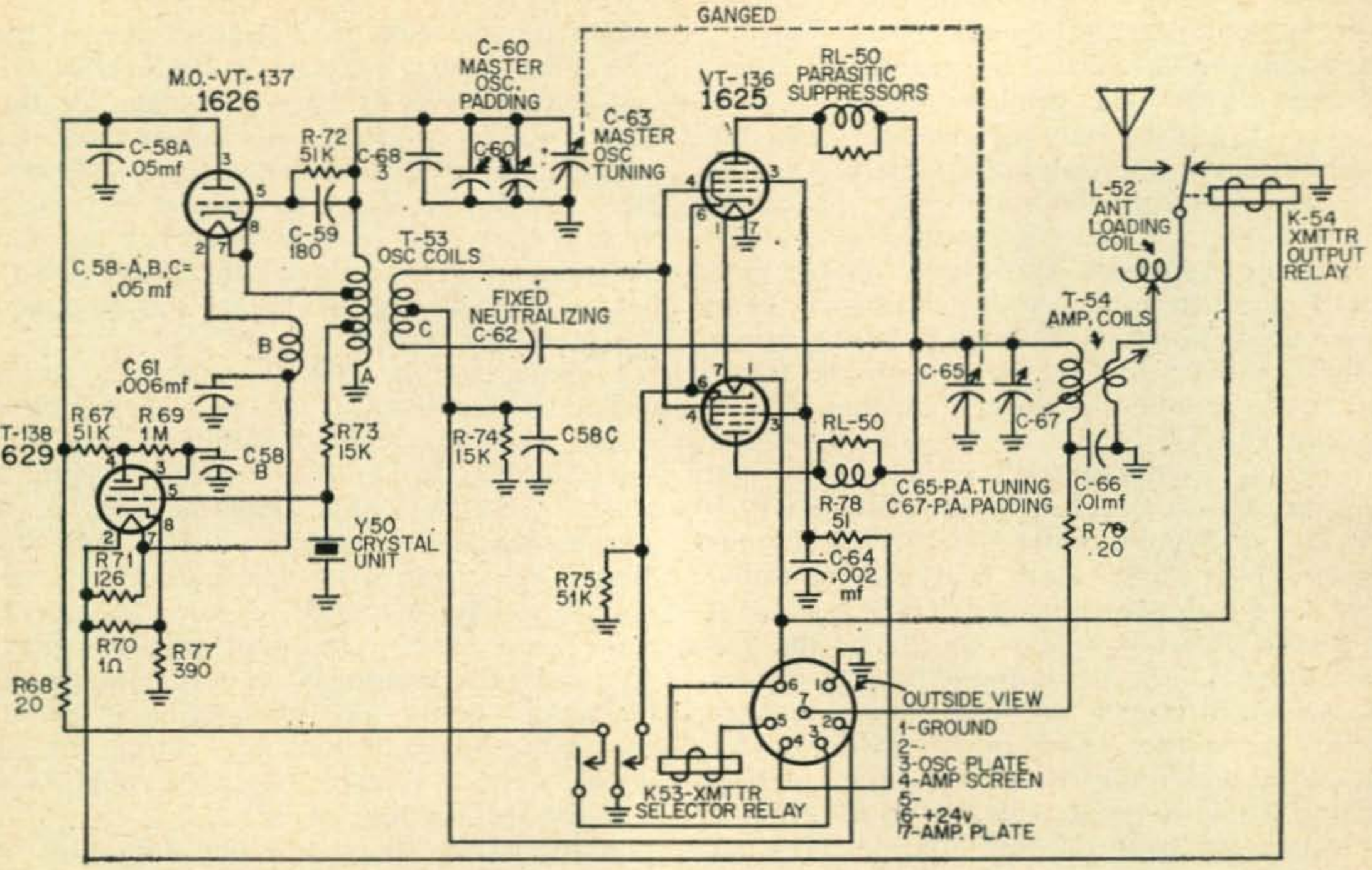
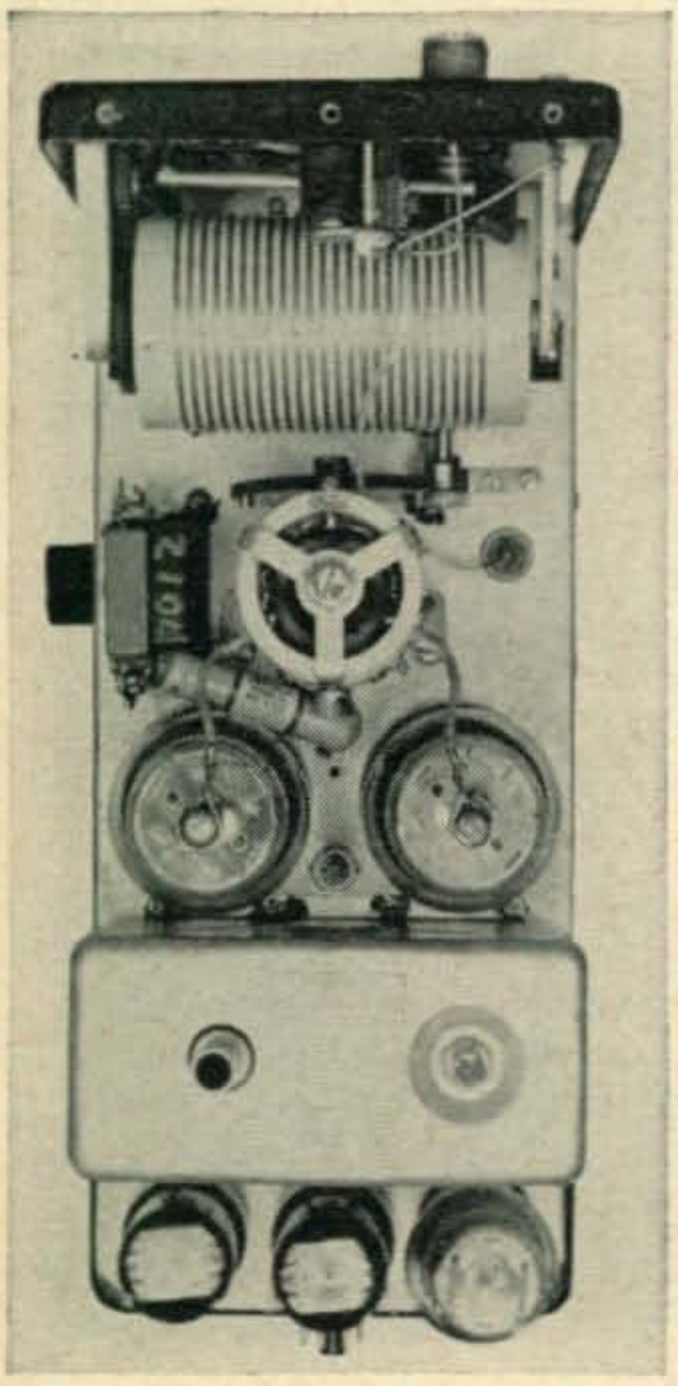
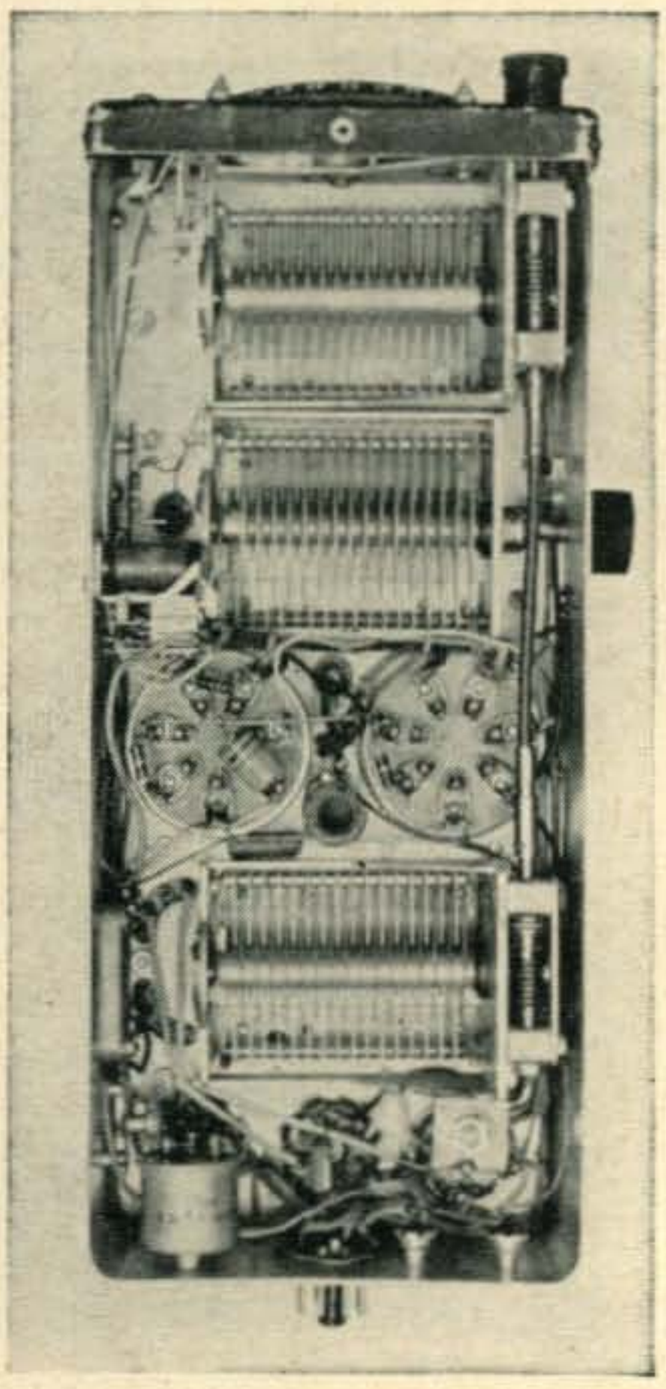


Fig. 1—Unmodified circuit of the BC 458A. (5.3 to 7 mc)

Another Approach To DSB Conversion Of Command Transmitters





Richard G. Fenner, W5AVI
1232 Dumont Drive
Richardson, Texas

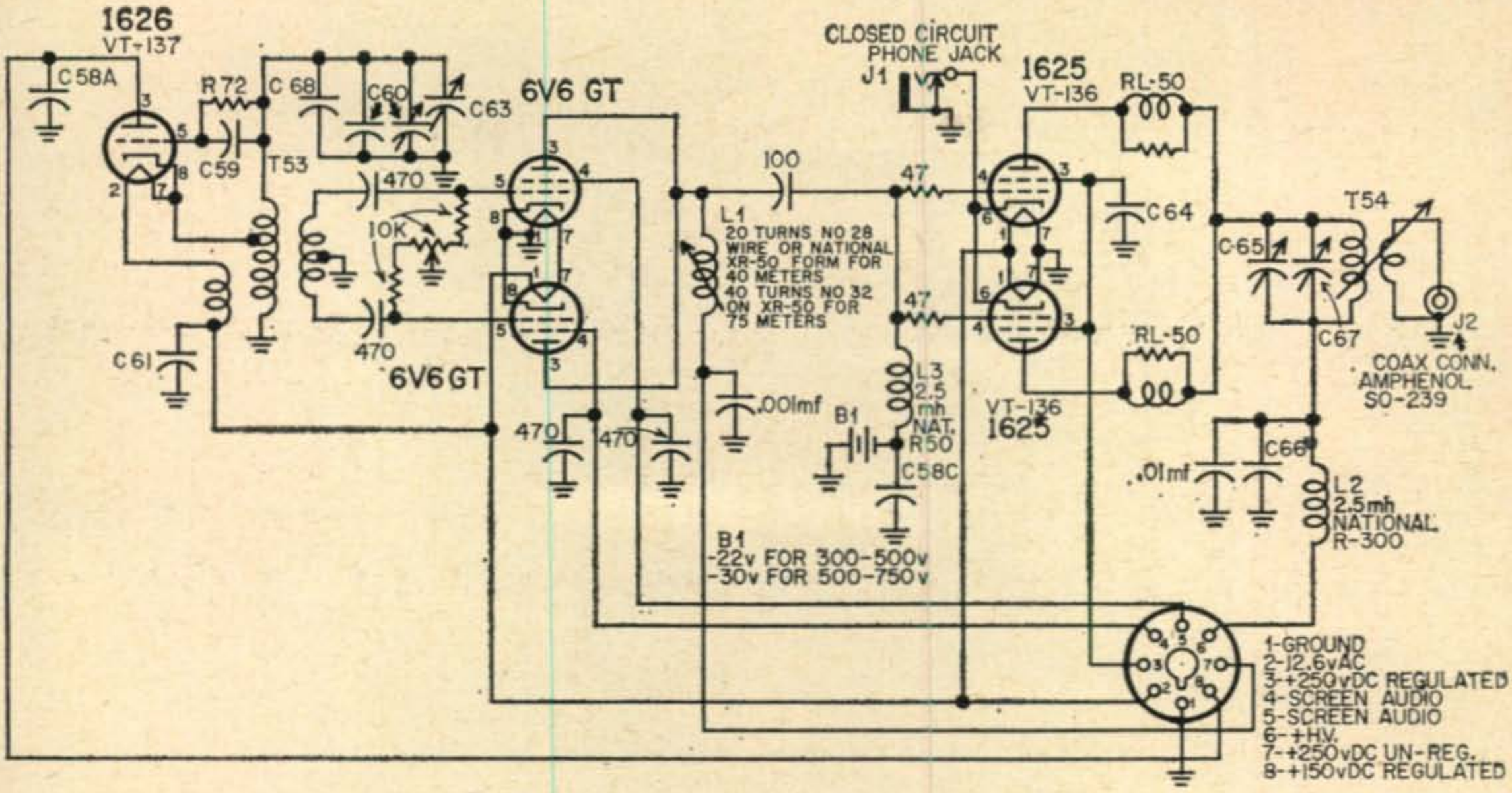


Fig. 2—Circuit of the command transmitter after modification.

Here is a different approach to double sideband conversion of Command Transmitters from those previously proposed. This method was used with good success on both the ARC-5 and BC series of transmitters after difficulty was encountered in trying to convert them to operate as high-level balanced modulators.

Modulators

Instead of connecting the 1625's as a balanced modulator, they were left connected in a normal fashion and operated as a linear amplifier. A low level balanced modulator using two 6V6 tubes was added on the back of the chassis in the sockets formally occupied by the tuning eye tube and crystal. The added modulator was then used to drive the linear amplifier. This method resulted in much improved operation since the low-level stage tended to act as a buffer stage between the oscillator and high-level stage. Previous attempts at trying to drive a high-level modulator with the existing oscillator in the transmitter had resulted in frequency modulation. Also the added tuned circuits of the linear amplifier gave increase harmonic reduction over the high-level modulator.

Conversion

The conversion is not too difficult and may be completed in a couple of evenings by the use of the before and after schematic diagrams. The 1625's and the 1626 filaments may be hooked in parallel and the 6V6's in series for 12-volt operation. The old plug on the back of the transmitter may be removed and an octal plug installed.

The two leads that formally ran to the grids of the 1625's and the neutralizing condenser should be re-routed to run to the sockets on the back. Pins 5 and 6 on each socket may be utilized to hold the 470 mmf blocking capacitors. The 10 k balancing pot may be mounted on the side or back of the chassis and the grid resistors run from pin 5 of the sockets to each side of the control. On the accompanying photographs, this pot is shown pointing out the bottom (since the author's arrangement utilized the standard rack for the transmitter).

Push-pull audio may be brought in the back plug and connected to the screens of the 6V6's. Each screen should be by-passed for *rf* with a 470 mmf condenser.

The plates of the 6V6's may be hooked in parallel and connected to the added tuned circuit. This coil may be added in the space between the 1625's and the oscillator tuning capacitor. The photos show the mounting detail of these components. On BC models of the Command Transmitters, it will be necessary to remount the final by-pass condenser on top of the chassis to make room for this coil. This coil should resonate in the center of the amateur band.

The grid circuit is changed slightly from the old Command Transmitter circuit to improve parasitic suppression. The old grid lead should be moved from pin 4 to pin 5 of each of the 1625's. The 47 ohm resistors may then be added between pins 4 and 5. The coupling capacitor may be hooked from the top of the tuned circuit to the bus wire. A small *rf* choke may be added from pin 2 of one of the 1625's to the bus wire to bring in grid bias. This completes the DSB conversion part of the transmitter. Relay and control circuits may be modified or added as needed.

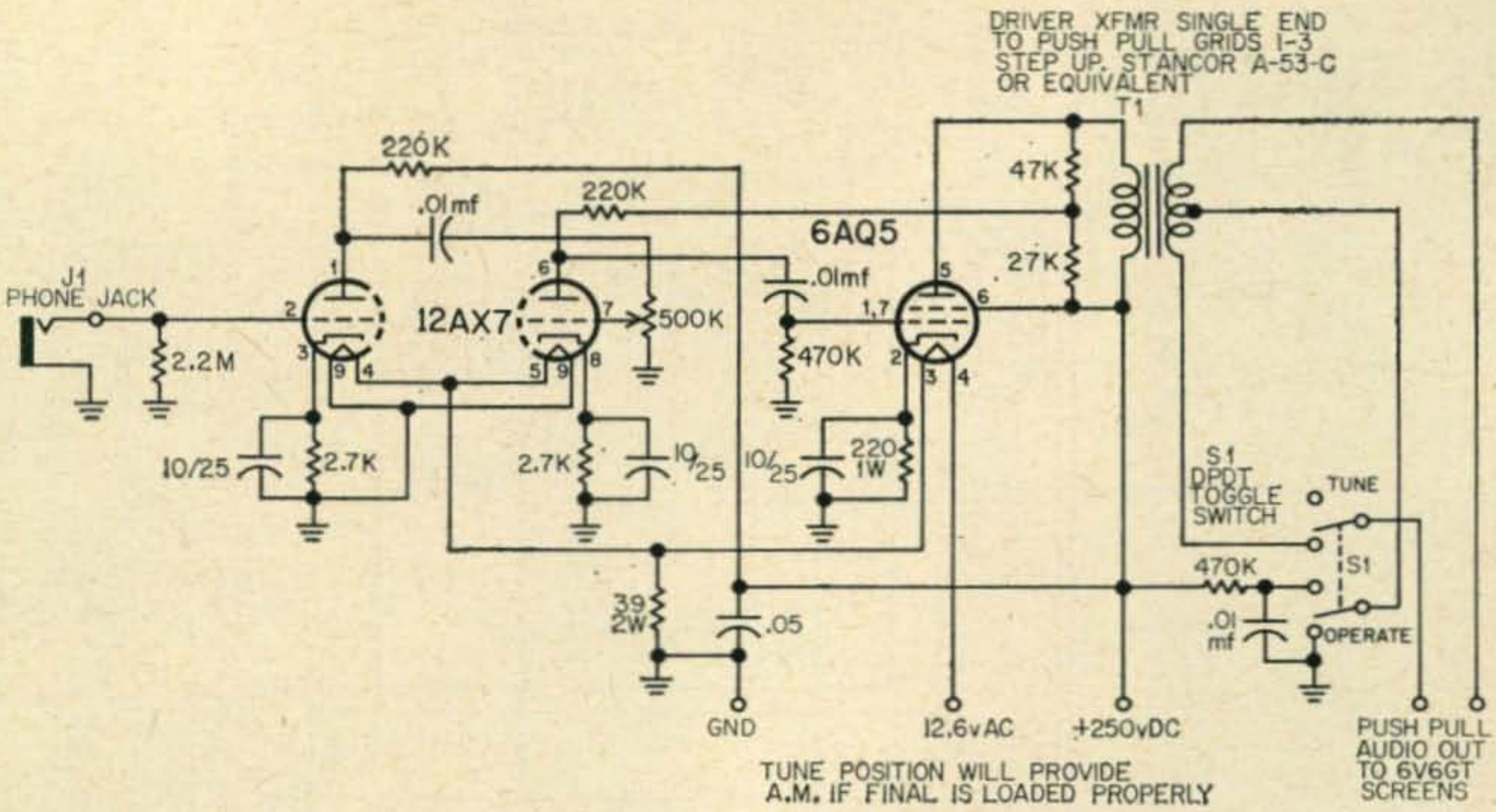


Fig. 3—Circuit of the speech amplifier and modulator.

A schematic diagram of the speech amplifier used is shown but no constructional details are given. If good construction practice is followed in building it, no difficulty should be encountered. A tune-operate switch is provided so that carrier might be inserted to tune the transmitter up. The "Tune" position of the tune-operate switch will also provide amplitude modulation.

Power Supplies

A word should be said here about power supplies. K9DBO's axiom in March 1959 CQ applies here also (quote) "Good signals require good power supplies." The voltage applied to the oscillator should be well regulated by the use of series VR tubes. For best results, separate regulator tubes should be used for the 1625 screens and the oscillator; although a common regulated source did provide a satisfactory operation. The plate voltage may be anything from 300 to 750 volts. The ARRL Handbook may be consulted for the correct bias voltage for linear operation of the 1625's.

Tune Up

Initial tune-up procedure is not too difficult but does require the use of a scope and preferably an audio oscillator. The scope should be connected to provide a two-tone test pattern. The transmitter should be loaded into a dummy load in the tune position and the added slug-tuned coil adjusted for maximum power output or cathode current. The tune-operate switch should be thrown to the operate position and a 400-1000 cycle audio note applied to the speech amplifier. The balance potentiometer should be adjusted until alternate lobes on the two-tone test pattern have equal amplitude. If an audio oscillator is not available, an alternate tune-up procedure is to couple the scope pickup loop tightly to the final tank. Turn the audio control to minimum and apply voltage to the transmitter. If the scope has good sensitivity, a small amount of carrier will appear as the balance control is rotated to either extreme. The balance control should be set for minimum carrier amplitude on the scope.

This completes the initial tune up. The transmitter should now be loaded into an antenna and the scope pattern watched as you speak into the microphone. Only the higher voice peaks should tend to be clipped or limited in the final. If heavy clipping is present, the drive to the final should be reduced by detuning the slug-tuned coil between the modulator and final (this might bother some of the purists, but it works). Heavy loading should be used on the final. If low-plate voltages (300-500 volts) are used, you might have to add another link to the final coil. This can consist of two or three turns of wire wrapped tightly around the bottom of the plate tank coil. If oscillations are present in the final, it might be necessary to add another .02 mmf by-pass condenser on the bottom of the plate tank. This condenser may be soldered in parallel with the remounted condenser that was originally in the transmitter. Additional screen by-passing may also be necessary. The parasitic and oscillation problem seems to vary from transmitter to transmitter.

You are now ready to get on the air and enjoy the advantages of sideband. True, most stations will receive you as a single sideband station and this gives you a 3 *db* disadvantage compared to a single sideband station of equal power. But, at least, you have gotten rid of the chief heterodyne cause, the carrier. Most of the sideband boys will not know you are transmitting both sidebands unless you tell them. Stations as far as 1200 miles away were worked with the converted transmitters running a peak power of only 35 watts. So if you have been looking for a cheap way to investigate this sideband business, here it is. ■

Modifying 1625's and 807's for Linear Amplifier Use

C. A. Morgan, W9LRM
810 South Burdette St.
Mishawaka, Ind.

Having recently received a rejuvenation of interest in Amateur Radio resulting from an introduction to single sideband techniques and modes of operation, the writer became particularly interested in "do it yourself" grounded grid linear amplifiers. This is due to the simplified circuitry involved and the comparative lack of some of the functional difficulties experienced before newly constructed apparatus can be made to operate properly.

Several amplifiers have been built and successfully operated using various types of tubes. From the standpoint of low cost, coupled with enough power output to give a good account of itself on the air (which I believe is still of interest to at least a few amateurs today), an amplifier was designed so as to be capable of using the type 837 and 1625 tubes in grounded grid. We will limit our coverage here to show how the tube modifications and interchangeability were worked out in a typical amplifier.

The amplifier was originally designed to use four type 837 tubes, a type having a 12.6 volt filament and requiring a 7 prong socket.

After the initial thrill of operation of the new amplifier wore off a little, it was decided to try the type 1625 tubes in this same socket. A few 1625 tubes of brands other than RCA were acquired. (RCA tubes cannot be modified since separating the cathode and beam forming plate leads in the tube base pins, still leaves them connected together in the envelope.) All other makes which happened to be available were satisfactory in this respect. The tubes were modified as has been suggested by cutting a rectangular slot in the side of the base, above the #5 and #6 pins. The two leads are then pulled out from the #6 pin, separated, and checked for an open circuit between them, with an ohmmeter. It may be necessary to untwist the leads to accomplish this on some tubes. It was found that some could not be electrically separated or although not showing continuity when the filament was cold, would regain it when the filament was heated. These tubes were reconnected as they were originally and set aside for other uses.

When continuity between the beam forming element and the cathode has been satisfactorily removed, current will flow only when the cathode lead is connected as in fig. 1. Once the leads are identified, the cathode lead is soldered into pin #6 and the beam forming plate lead into pin #5. A piece of tape is then wrapped around the base covering the rectangular slot. Tubes so modified are then directly interchangeable with 837's.

Having gone this far and also having accumulated a supply of 807 tubes of makes other than RCA (the same exception about separating the leads applies), it was decided to modify some of these for further interchangeability.

The modification is similar to that done on the 1625 tubes except that the slot is cut in the side of the base above the #3 and #4 pins and after separating and identifying the leads as previously outlined, the beam forming plate lead is soldered into the #3 pin, which is already

[*Continued on page 111*]

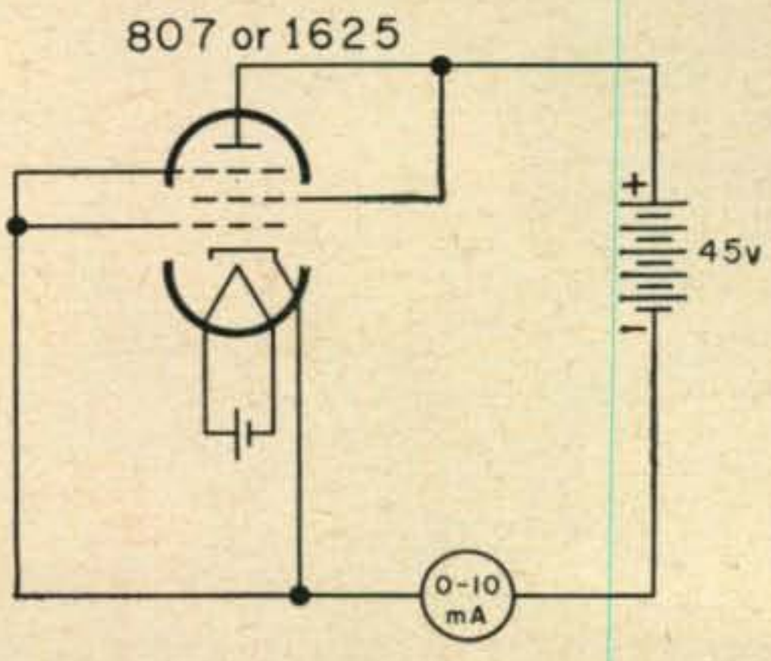


Fig. 1—Simple circuit used to test effectiveness of cathode and beam plate separation.

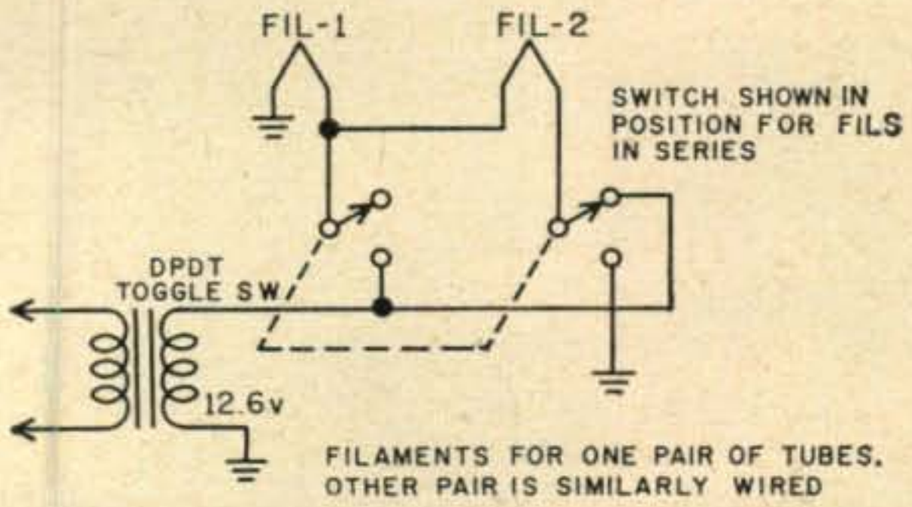


Fig. 2—Switching arrangement used to select circuit for 6 or 12 volt filaments.

"Little Nic"
Transistorized 6 Meter Transmitter

Just before press time Captain Sury notified us that he has replaced TR1, a 2N499, with an RCA 2N384. The result has been doubled power output without any modification.

Capt. John J. Sury, K8NIC/5
4325 South 6th Street
Abilene, Texas

Many of our Technicians and General Class license holders feel that a lot of power is needed to make contacts above 50 *mc.* within a 50 mile radius, especially when the band is not open. This is not necessarily so. Try this 40 milliwatt transmitter and find out for yourself.

Forty-six contacts have been made so far, of which only about 20% have been pre-arranged. A report of S-2 was given to the author on a 6 meter 5 element beam antenna. This was a modulated transmission at a distance of approximately 30 miles across a large city (Dayton, Ohio) and hilly terrain. With a ½ wave indoor halo antenna, contacts of 15 miles were experienced with signal reports of S-3 and audio read 100%. (The author lived in a wire meshed screen reinforced stucco apartment). In all contacts so far, a maximum of 50 milliwatts input was used. Several 6 mile contacts were made using only 15 milliwatts input with S-4 and S-5 signal reports using a matched gamma indoor antenna. All contacts mentioned were modulated except one which was cw.

The Cost

With the increase in production of *vhf-uhf* transistors, the prices have gradually dropped to within the reach of the ham. All of the components were purchased for approximately $24.00, including a 0-1 milliamp miniature meter. Some of the components were purchased from the local dealers while the remainder were purchased from the surplus market. The miniature variable capacitors used may be purchased for less than 70¢ surplus.

Prior to the writing of this article the author tested the Philco 2N588 MADT transistor in place of the 2N499, and it was found to be satisfactory, providing the bias adjustment pot was increased from 100K to 200K. The 2N588 sells for less than $3.00 while the 2N499 sells for more than $5.00. The characteristics are similar and they both are *vhf-uhf* Micro Alloy Diffused-base (MADT) transistors.

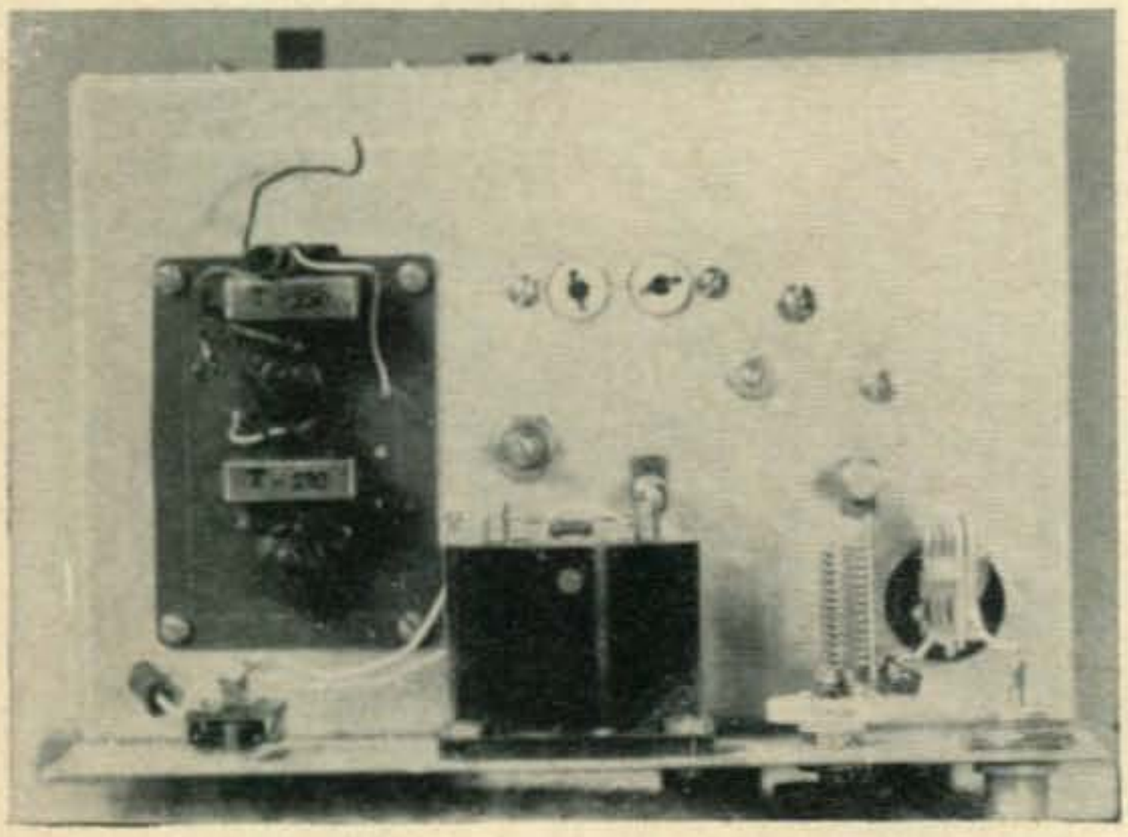
The crystal is a 50 *mc* 3rd overtone which sells for slightly more than $3.00. It is also possible that a 7158 *kc* surplus crystal could be operated on its 7th mode with a sacrifice of output.

Construction

Drill the chassis and panel. The first step is to lay out the holes to be drilled on the chassis. Next, lay out all holes to be drilled on the panel. The lower holes on the panel should be drilled with the panel clamped to the chassis. Drill chassis and panel as shown on the layout diagram. Remove all burrs from the holes. File the rectangular holes to fit the transistor sockets snugly.

Start mounting all of the components on the chassis, including the ½ inch standoff. The standoff makes a good mount for L1 by soldering one end to it. In order to keep from wiring the transistors backwards, which is dangerous, 3 pin sockets should be used for the modulator transistors (2N190) and the oscillator transistor (2N499 or 2N588). A four pin socket should be used for the power amplifier 2N384 transistor.

Mount the coil socket L2 by sliding the ring



down until it grips the socket and the chassis tightly. Pin four is mounted nearest to the panel.

Install the ground lug with 4-40 hardware. Install the ½ inch standoff. Use a ground lug between the standoff and the chassis.

Install panel and mount S1, J2, C1, C7, S2 and J3 as indicated. Do not install the meter until wiring is completed as rough handling may damage it. S3 on the rear of the chassis may be deleted from the circuit if you intend operating phone only. When operating cw, S3 cuts off the modulator, reducing power consumption.

Coils

L1 and L2 are made from a B & W miniductor 3007 (⅝ inch diameter, 16 turns to the inch). Cut off 6 turns each for L1 and L2. L3 is 2 turns of plastic covered #24 wire. Install L1 on the standoff (one end of the coil). Make up coil L2 on the 71-4S plug. Connect ends of coil to pins 1 and 3. L3 is wrapped over L2 leaving extra long leads. Lay L2, L3 aside for later use.

Wiring

The transmitter and modulator should be wired as shown in the schematic. Keep the wires as short as possible in the oscillator and power amplifier sections. A 15 volt battery may be used or ten 1½ volt flashlight batteries may be wired in series. The transmitter will operate on a lower voltage, but a better signal can be obtained with 15 volts.

After the wiring is completed, install the meter and wire it into the circuit.

Before inserting the transistors, make sure that the schematic, as far as wiring is concerned, was followed to the letter. After the circuit is checked carefully, the battery may be connected.

Testing

With S2 off, insert the transistors and crystal in their proper locations. Place S1 in the oscillator position and turn bias pot R2 in the direction for highest resistance. Install a dummy load on the antenna connection J3. Turn transmitter on and observe the oscillator current; adjust R2 to give approximately 3 *ma.*

Switch to the PA position and check for current. It may read anything between O and 4 *ma.* Adjust C1 to give the maximum reading. Adjust C5 for a dip.

Carefully increase C7 while readjusting C5 for a dip until the collector current reads the maximum. This should be approximately 3 to 4 *ma.*

Turn on a 6 meter receiver. Tune in the frequency of the transmitter. The signal from the transmitter should peg the S meter on the receiver. Plug in the microphone and talk into it normally to check the modulation

[*Continued on page 110*]

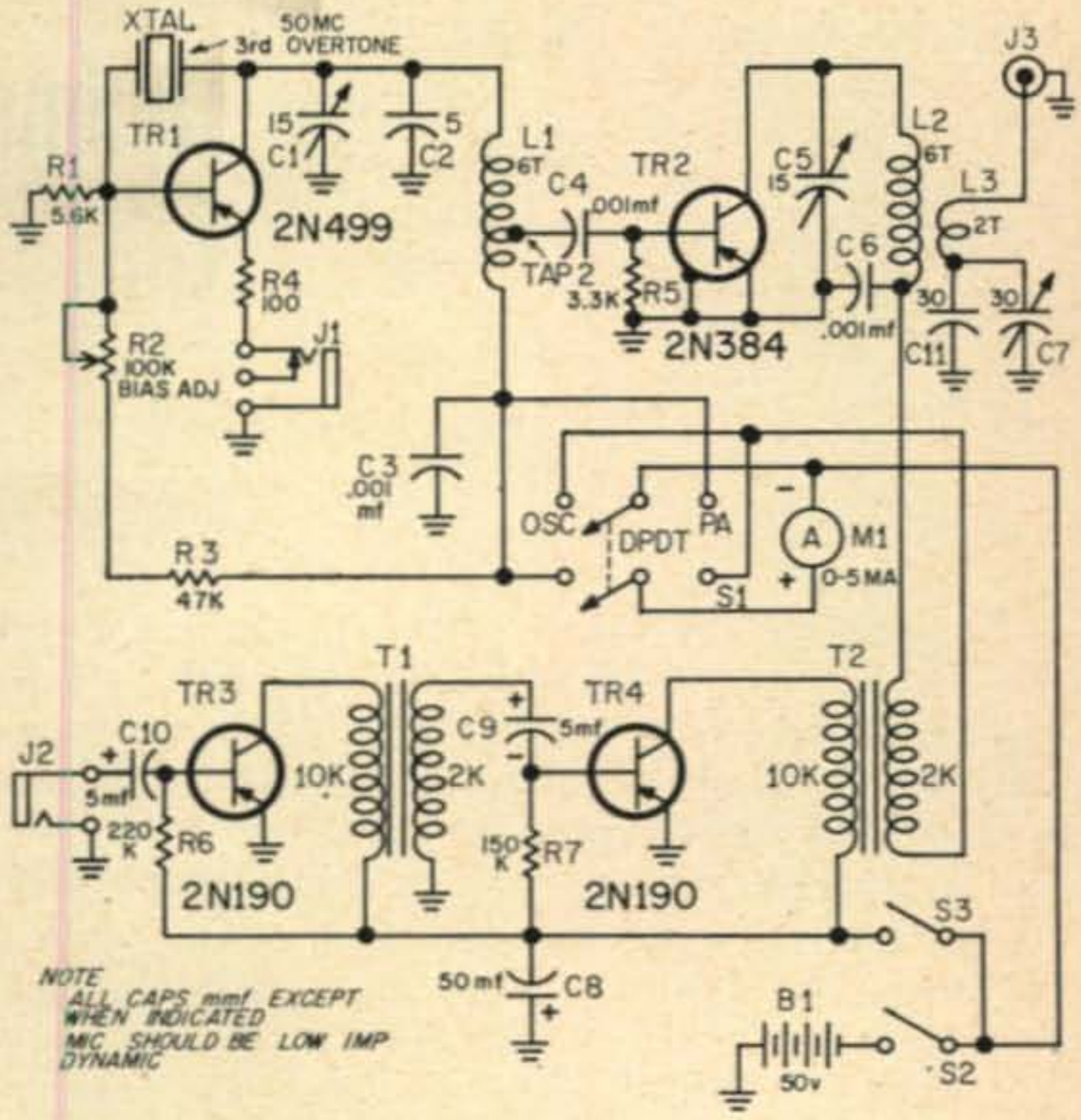


Fig. 1—Circuit of the 6 meter transistorized transceiver. It's good for phone or CW.

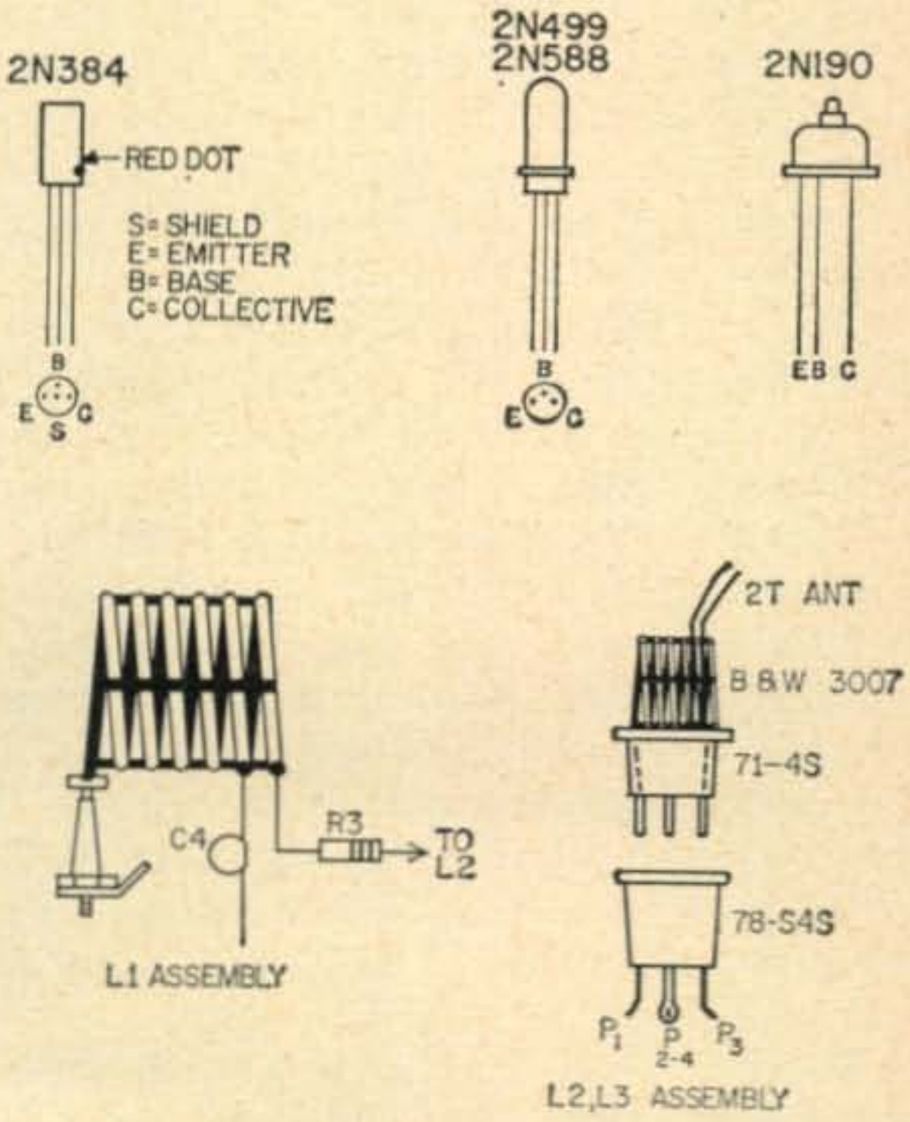


Fig. 2—Transistor basing and coil data.

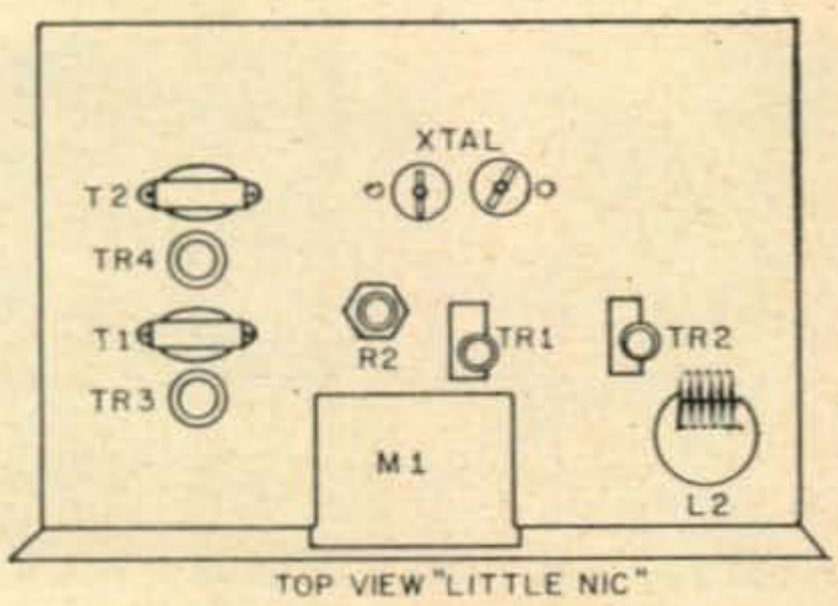


Fig. 3—Parts placement.

Phone Patch

George Postels, DDS, W9SA
1866 Sheridan Road
Highland Park, Ill.

In January '59 my son Bob graduated from the University of Illinois. Armed with a B.S. degree in geology, courage and confidence, he set out for Tucson, Arizona. It was his intention to work until September, and then enter the University of Arizona for graduate work. He couldn't let any of that GI Bill go to waste! However, he soon found that jobs were not as easy to come by in the great southwest as they had been in Illinois, and he and his parents put in a worrysome six weeks.

The phone bills were mounting. What to do?

Firing up the rig on ten meters I soon heard just what I was looking for. A rich southern accent on 29.3 *mc* was announcing, "This is W7CKV, the Tucson Monitor Station," and it's owner was arranging phone patches with military precision. I announced my presence and finally it got to be my turn. "What can I do for you?" was the businesslike question. I stated that I had a son who was living on a ranch outside Tucson, and could I get a patch to him? "Sure," was the cheerful reply. "Give me the phone number and I'll give him a buzz." Unfortunately, Bob wasn't in, but I enjoyed a most satisfactory conversation with the lady who owned the ranch, and whose hospitality I was later to enjoy. She assured me that both Bob and Dick (his room-mate and a jet pilot) were happy and well. She suggested that I call Sunday when she knew Bob would be there. The phone patch quality was excellent. W7CKV said, "When you call in Sunday refer to patch #68, and you won't have to give me the phone number and name again." Efficient?

On Sunday we talked to Bob with difficulty. The week-end QRM combined with the "Listeners in" on the rural line added up to problems. Harry, owner of W7CKV, suggested that Bob come to his home the following Wednesday afternoon, that being the day I lay down the instruments of my profession in favor of the mike. This time the contact was perfect and we talked ourselves dry—Harry meanwhile worrying about the several other stations awaiting their turns for patches. I'm afraid I was a bit inconsiderate in monopolizing things that day.

The following weeks saw many contacts completed with some interesting coincidences. Once, I just happened to hear Harry tell another Tucson station, "Bob is on the phone now, and wants to know if I've talked to his dad, I'll see if George is on." Needless to say George was on! Another time I came home from the office on Saturday noon and said to my wife, "I think I'll go down and see if Harry has heard from Bob." Turning on the receiver I heard Harry calling "W9SA." It seemed Bob was going to Nogales for the week-end to see a bull fight, and was anxious to talk to us before he took off. Mental telepathy or coincidence?

But I'm getting ahead of my story. Bob did get a job working for the U.S. Agriculture Department and we all breathed easier. Meantime, between phone patches, Harry and I would have some good old rag-chew, and I soon began to regard him as an old friend.

We had planned a trip to Arizona in early March, long before Bob had decided to seek his fortune there. So, on Feb. 28th we boarded a TWA plane for Las Vegas. After thirty-six hours there we still had enough money left to rent a car and make a leisurely trip to the Grand Canyon, Phoenix, and to the ranch that Bob called home. What a spot! Set right down in the Tucson Mountains, it presented a most beautiful vista. No wonder Bob was so in love with it.

The big highlight of our trip was the day Bob introduced me to my friend Harry. People who think hams are kinda peculiar, and wonder what we see in talking to perfect strangers, should be there when those "Strangers" meet personally the first time. After a hearty handshake the contest was on to see who could talk the fastest, Harry or I. On the way back to the ranch Bob announced that he thought the vocal contest was a draw. I did listen long enough to learn this:

Harry had lived in Virginia where he had

[*Continued on page 111*]

L to R—Bob, Harry-W7CKV, George-W9SA.

30 Minute Antenna For Two Meters

Antonio Gelineau
425 Falcon Ave.
Miami Springs, Fla.

Having worked out the design and construction details in my mind and having all materials needed at hand, the assembly to the final coupling to the Viking 6N2 transmitter was a matter of 30 minutes.

The antenna was designed primarily for indoor and portable use. The coaxial antenna design was chosen for its inherent characteristic of having the lowest angle of radiation of any of the vertical antennae. Physical design made it quite suitable for easy mounting and ease of portability.

The Viking 6N2 operates with an input of 75 watts on two meters. The results using this antenna have been very gratifying and power transfer losses from transmitter to antenna are nil due to direct coupling.

Losses occur, of course, from indoor locations and vary from one point to another. However, due to the low angle of radiation, from the antenna and nil power transfer loss, we compensate for location loss.

I cover the Greater Miami area on two meters and consistently receive reports that are better than I had when using an outdoor vertical with a 50 foot feed line. (No doubt line losses must have been high.)

For test purposes I ran a power extension out doors and set up the 6N2 transmitter, with this antenna, on a three foot box. This put the radiating portion of the antenna about six feet above ground surface.

The results were most gratifying. Reports far exceeded any expectations and indicated the antenna should be an excellent addition to a portable transmitter.

In the design I have used a right angle coax coupling to fit coax receptacle on back of the 6N2 transmitter. In transmitters where the coax receptacle is mounted on top of the case, a straight coupling can be used in antenna construction.

Photographs show parts and construction of the antenna while the sketch gives the dimensions. These dimensions can be altered slightly to suit the materials at hand.

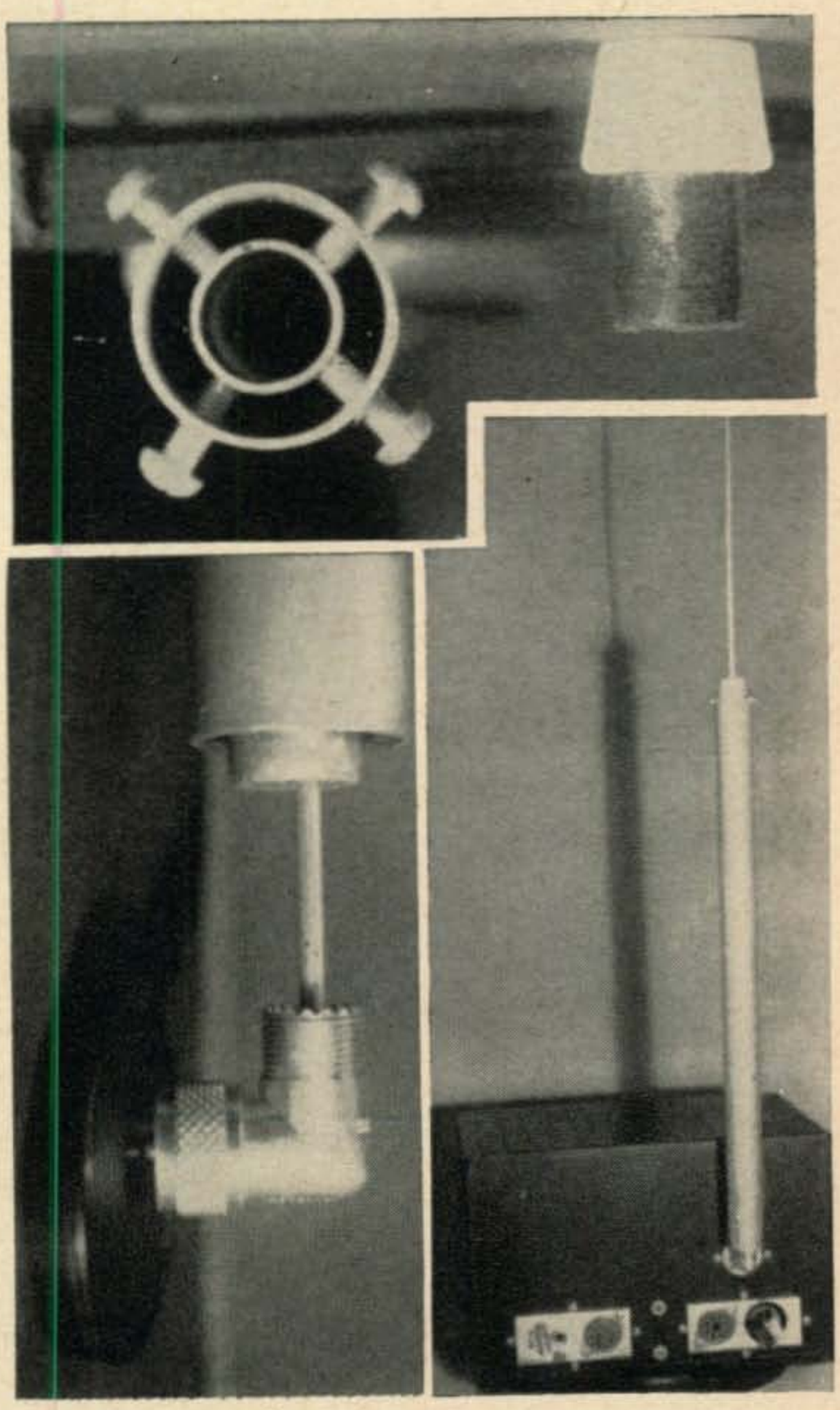


Fig. 1—Construction details and photos of the finished antenna for two meters.

Construction

1. The 5/8" I.D. piece of tubing is cut to a length of 19 inches. One end is slightly crimped inward so as to allow the coax coupling to be threaded inside tubing.

2. The insulating ring or grommet is then fitted over this end of the tubing acting as a spacer for the inner conductor. I used one half of a 1" diameter feed through insulator with a layer of tape to insure a snug fit. (See photo.) If the insulator is not available a cork or wood plug will also do. After insulator is fitted put it aside until step 5 is reached.

3. The coax coupling is then threaded into the tapered end of the tubing.

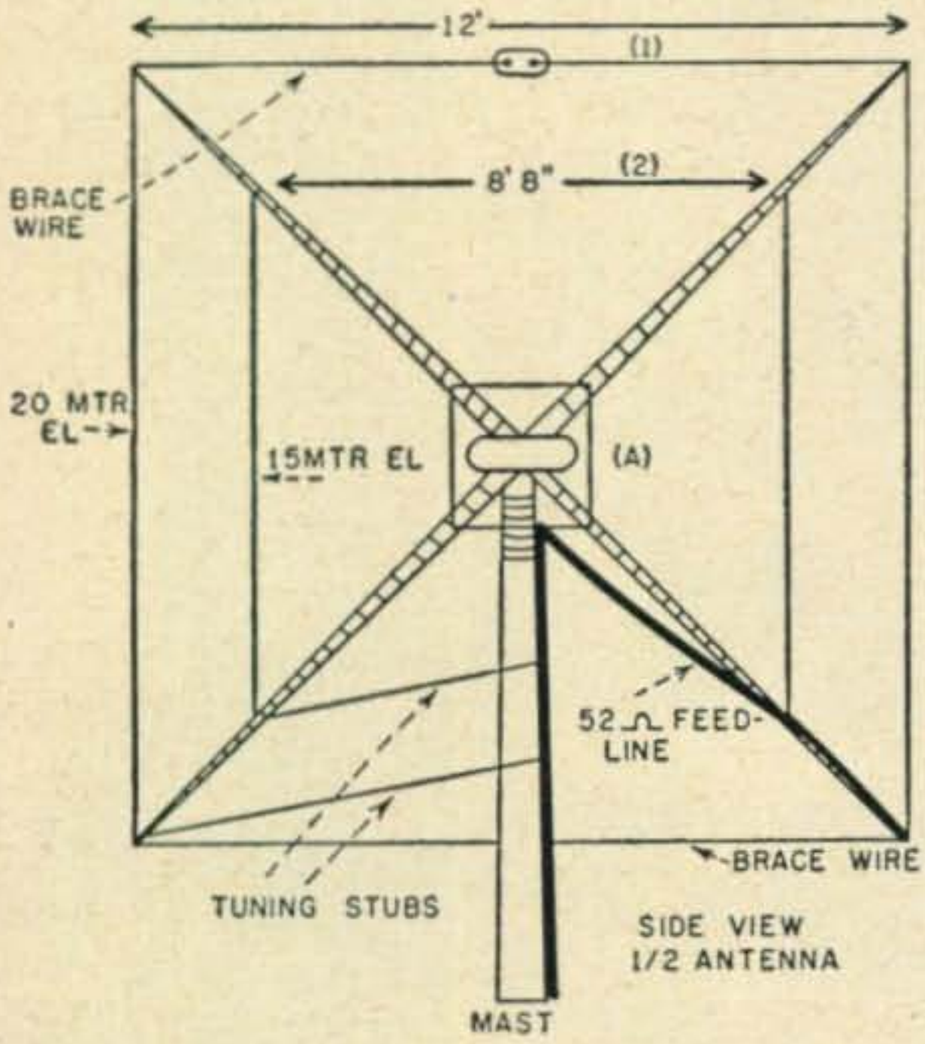
4. The 38½ inch length of aluminum

[*Continued on page 104*]

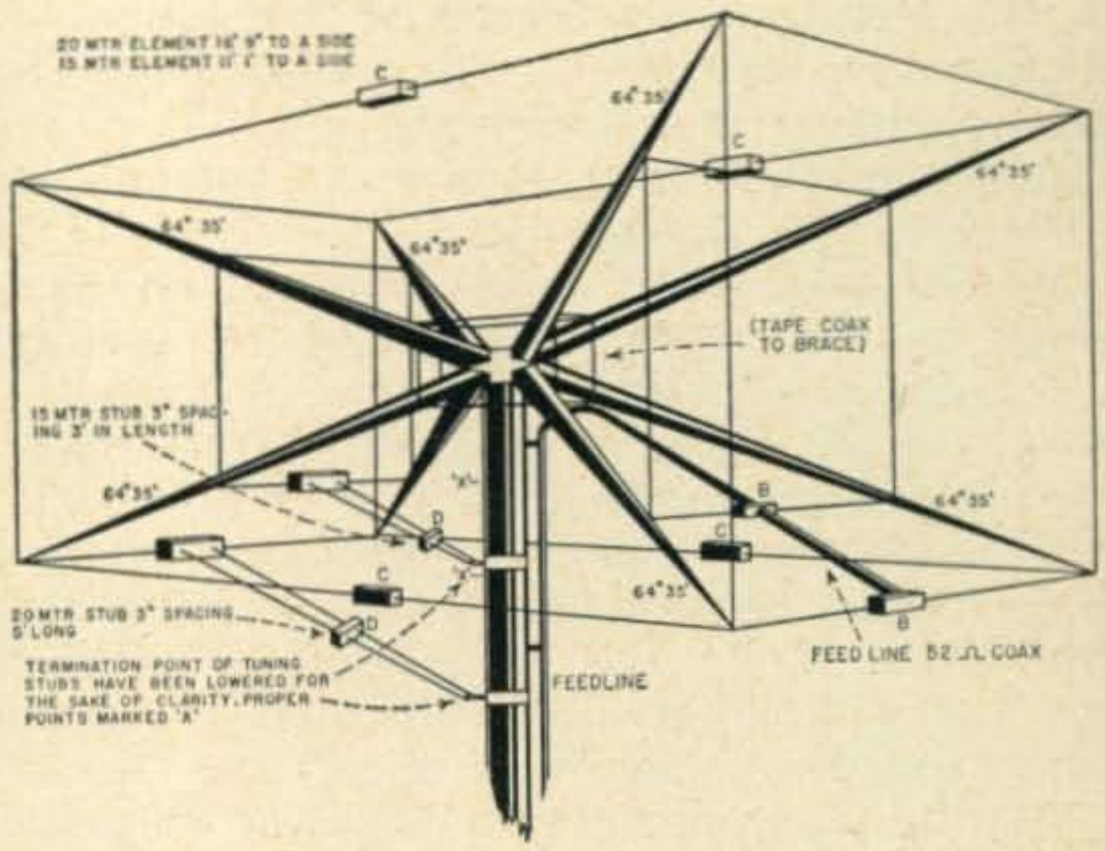
10-15-20 meter quad

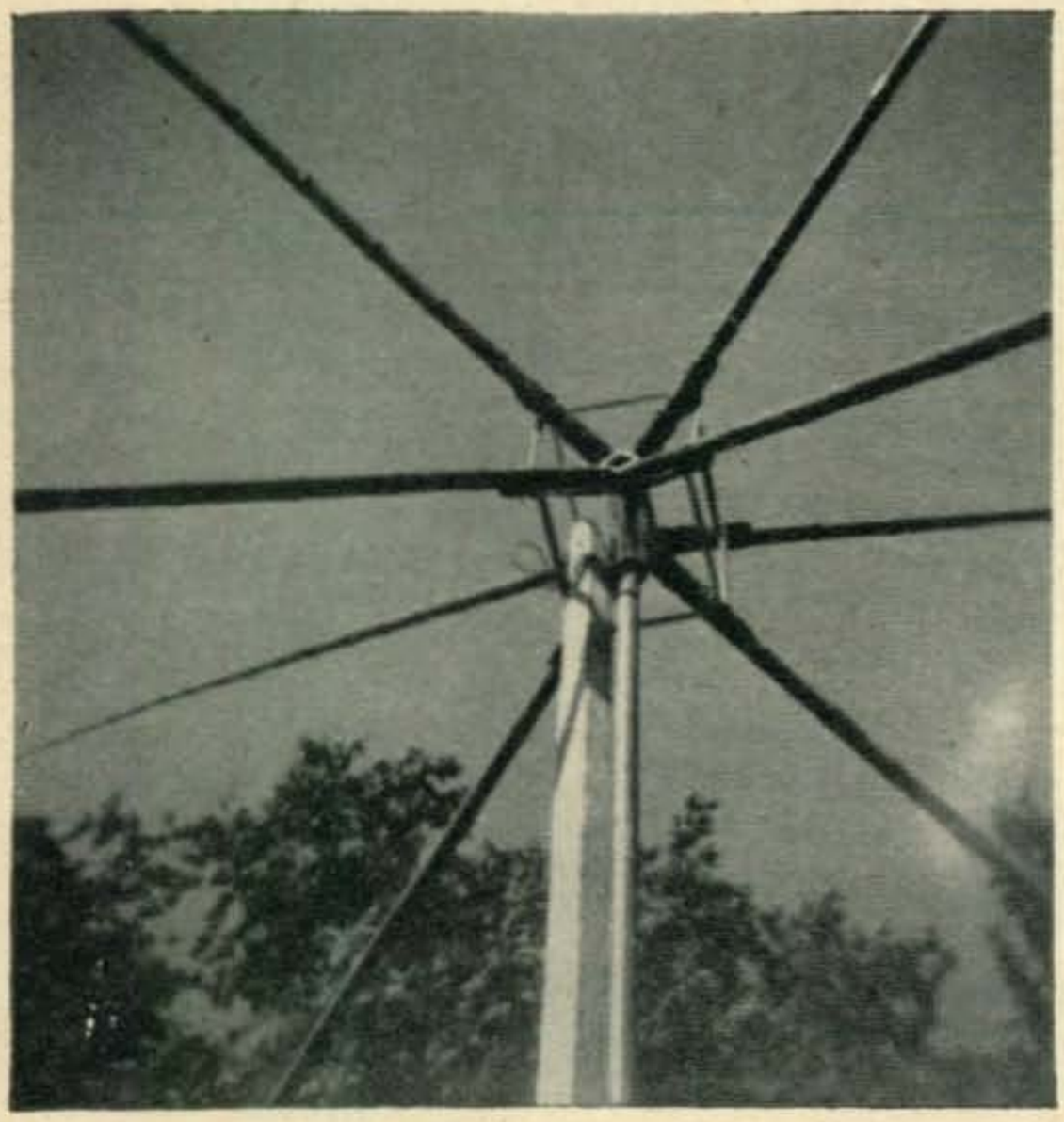
Devilcatcher

Don Powell, WØAIN
Lewellen, Nebraska



Side View.





The neighbors stare, of course. The idea of this gadget was to build a quad as simply as possible and still have something that would be there after a few of our gentle breezes had caressed it.

By running the bamboo supports out at an angle the usual boom has been eliminated and we end up with an antenna that weighs about fifteen pounds. Credit for the angled support idea goes to WØZAA, with WØPZH at the slide rule for the angles and dimensions, plus the fabrication of the center welded support.

Only one feedline is used since it connects into both the twenty and fifteen meter quads. On ten meters the twenty meter quad works fine, presenting two full waves instead of one full wave.

The guy wires probably should be Glassline (April '55 CQ, p. 24), but I used some #18 wire broken in the center with a small insulator. The elements were #18 Copperweld wire which helps make the whole structure very strong, yet adding little to the weight.

The Devilcatcher is mounted on a 35 foot mast and has withstood several heavy storms (50-60 mph winds). Lots of good DX has been worked (40 countries in the first few weeks) and I'm real happy with it. And, best of all, the whole works cost under $20! ■

Heath Kit VFO on 6 and 2— No Conversion

Don Gerken, W6NKN
122 E. Neece St.
Long Beach, Calif.

By tuning the 40-20-15-10 meter calibrating condenser to minimum capacity, switching the *vfo* to the 11 meter position and using the 11 meter calibrating condenser to calibrate the 40-20-15-10 meter dial reading, the heath can be used on 6 and 2.

With the *vfo* in the original 40-20-15-10 meter position the dial may now be calibrated for 6 and 2 meters by marking on the dial.

To avoid confusion remark the *vfo*. The 11 meter position is now the 40-20-15-10 meter position, and the original 40-20-15-10 meter position is now the 6 and 2 meter position.

Step By Step Screwdriver Adjustment

Assuming the *vfo* is in operating condition and was calibrated according to the original instructions these adjustments can be made without removing the *vfo* from the cabinet.

1. Turn the *vfo* on and allow it to warm up.
2. Set it on the low end of the 40-20-15-10 meter position, around 28,000, and listen for it on the 10 meter band. The other bands can be used but this has a wider spread on the dial.
3. Insert a screwdriver in the left front hole on top of the *vfo* until it is in place on the calibrating condenser.
4. Turn this condenser with the screwdriver slowly, a little at a time, and follow the *vfo* signal up the band in the receiver as far as it will go. (The condenser is now at minimum capacity.)
5. Switch the *vfo* to the 11 meter position.
6. Insert the screwdriver in the center front hole on the bottom of the *vfo* until it is in place on the calibrating condenser. (The *vfo* will have to be layed on its side.)
7. Turn this condenser with the screwdriver slowly and follow the *vfo* signal back down the band to the same spot on the receiver where it was at the start. (Around 28,000). If the receiver readings at the beginning and at the end of the adjustments of the *vfo* were the same, it should be as accurate as it was at the start. (However, the recalibration can be done as the Heath Kit manual explained, using the 11 meter position and calibrating condenser.
8. To stop confusion remark the *vfo*. The 11 meter position is now the 40-20-15-10 meter position, and the original 40-20-15-10 meter position is now the 6 and 2 meter position. This can be done with decals, paper and scotch tape or paint.
9. To calibrate the 6 meter position the dial itself will have to be marked. Use a pencil to start with. Turn on a 6 meter transmitter or its oscillator (with a known crystal frequency) and listen to it in the 6 meter receiver. Turn off the oscillator and turn on the *vfo* in the 6 meter position and turn the dial until its signal is heard in the same place on the receiver. Mark this place on the *vfo* dial, the same frequency as the crystal controlled transmitter on 6 meters. There are two places on the dial that can be marked and they are 180 degrees from each other. Mark them both as one may give more room than the other. Repeat this with other known crystal frequencies.
10. To calibrate for 2 meters mark the dial in the same way, this time using a 2 meter oscillator and receiver.

Note: This will work into an oscillator on 8 *mc* but may not into one doubling. ■

Cathode-Operated Relays

Richard F. Van Wickle, W6TKA
643 Aurora Avenue,
Santa Barbara, California

This idea was the result of a search for a resistor. The solution to the problem provided a single-switch station control system, answered the question of what to do with "war surplus" 24—28 volt *dc* relays, and made use of power that would have otherwise been wasted.

While building a 25-watt class AB1 modulator, it was discovered that we did not have a 250 ohm resistor of suitable wattage for use in the cathode circuit of the 807's. Thrashing around in the junk box, we came up with several 24-volt *dc* relays, and noticed that the coil resistance was in the neighborhood of 250 ohms. One of the relays was a double-pole, double-throw antenna switching relay with ceramic insulation. This, we decided, would be our cathode resistor.

Leads from the 807 cathodes (connected together at the tube bases) and the chassis ground were brought out to the octal connector on the rear of the modulator. From this connector, they would go to the relay, located away from the modulator. A 50 mf 50 volt capacitor was placed from the cathodes to ground, directly at one 807 tube base.

The relay was mounted in a small box and the box fitted with three coaxial panel-type connectors—one for antenna, one for receiver, and one for transmitter. Since we were going to use coax to feed our antenna, that left a set of contacts unused on this particular relay. A two connection terminal strip was also mounted on the box and, inside, connected to the normally-closed side of the otherwise unused contacts. These would now switch the receiver B+. The circuit for our system is shown in *fig. 1*.

Then came the big moment. We fired up the modulator, threw the B+ switch (it breaks the center tap of the high-voltage winding on the modulator power transformer) and the relay banged shut as cathode current from the 807s flowed through the coil. The antenna was switched from receive to transmit, and the receiver disabled. Turned off the modulator B+ and the relay opened. Pretty slick, huh?

The only problem encountered was that the relay did not let go until about three seconds after the modulator B+ had been turned off. Grounding the 807 cathodes as the B+ was switched off cleared this up. This was accomplished by replacing the SPST modulator B+ switch with a DPDT switch, and connecting one side to the cathodes in such a manner that when the B+ was switched off the cathodes would be grounded.

Flushed with success, we tried this with our ARC-4 two meter transmitter, to make use of the built-in crystal-switching relays. The relays, through the use of a suitable selector switch, were used in place of the 832A final amplifier cathode resistor. The 832A never seemed to know the difference, and we had a dandy means of switching crystals.

The current through the relay used with the modulator was checked and found to be around 80 *ma* with no signal applied to the input of the modulator. This is sufficient to keep the relay closed and the additional current with modulation seems to have no affect on it after it is closed. The voltage runs around 24

[*Continued on page 96*]

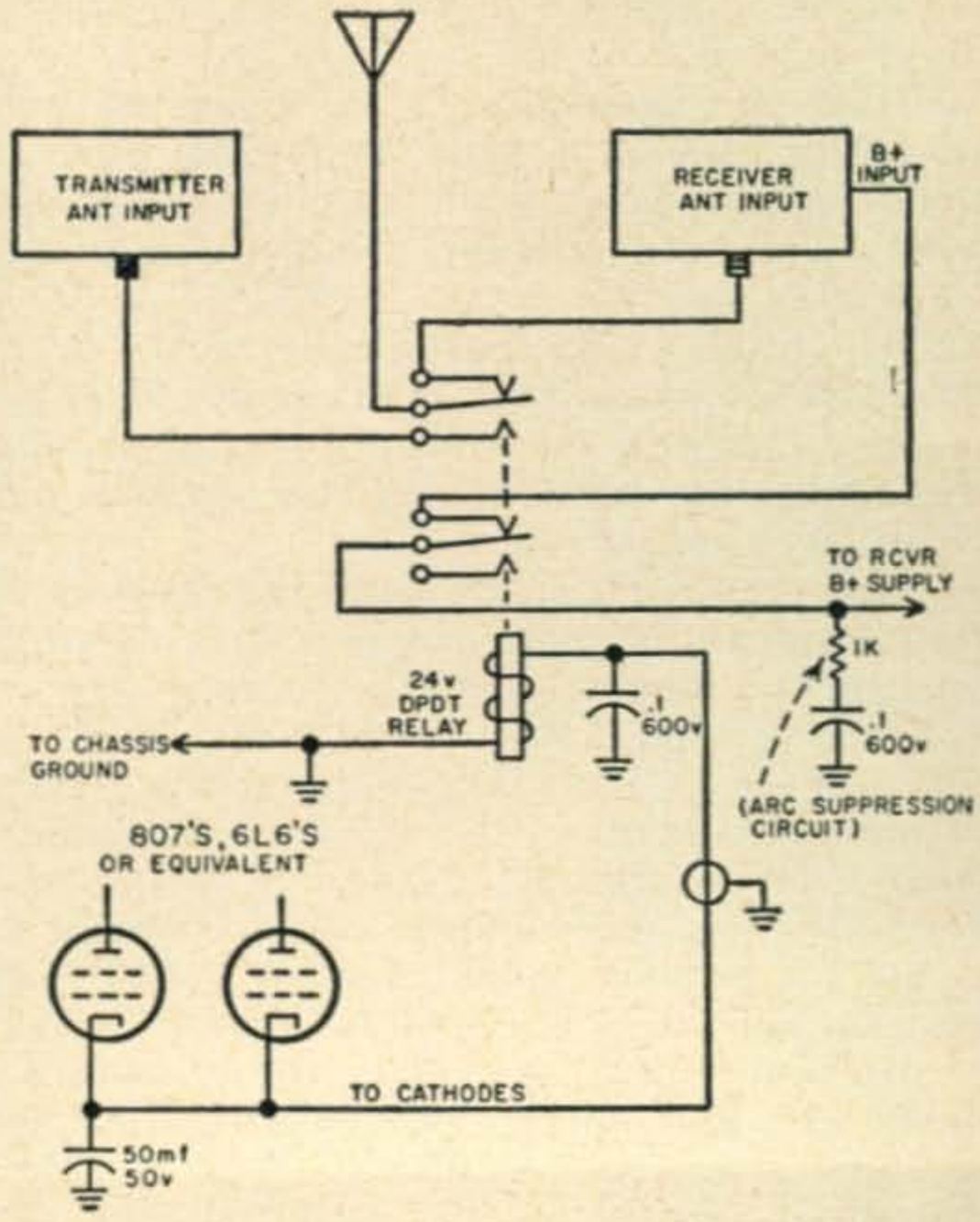
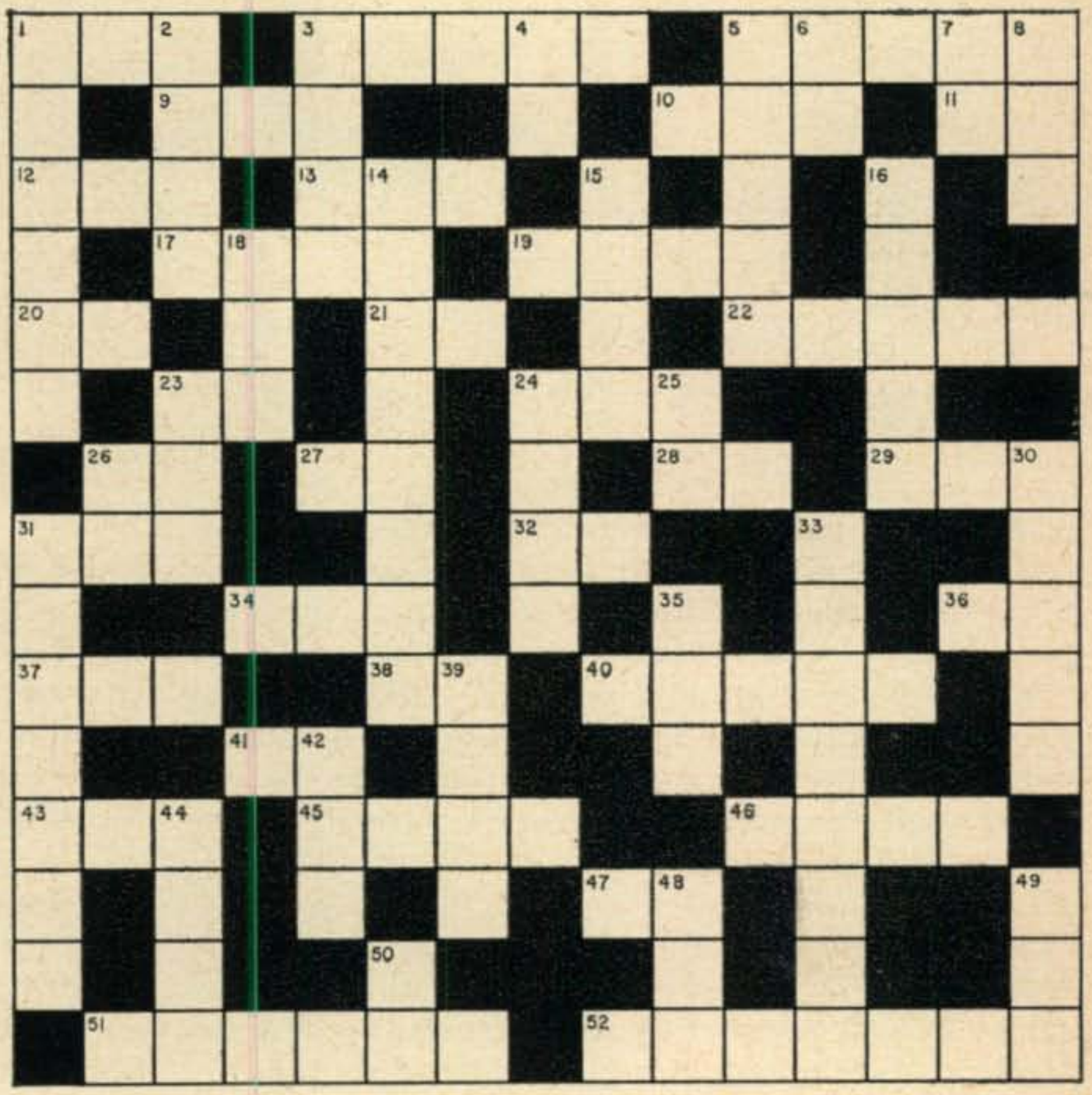


Fig.1 .—Simplified circuit of the cathode operated relay.

Ham Anagram



CQ, CQ, CQ. Attention all you puzzle-working hams! Got a leisure moment to spend between QSO's? Here is an anagram puzzle built around Q-Signals, ham lingo and electronic words and abbreviations, that you will have fun working. You had better watch out though, there are quite a few tricky clues designed to mislead you! For correct answers see page 96.

ACROSS

1. Complete amateur station.
3. A combination of antennas or antenna elements.
5. A jumper cord used to make connections to a telephone line.
9. When your rig is on the ....., you better watch your language!
10. Unit of transmission line impedance.
11. A unit of current flow.
12. Your rig should not cause this.
13. Choke coil used at radio frequencies (abbr.).
17. Zero.
19. An effect noticeable at high frequencies.
20. Resistance-capacitance (abbr.).
21. 73's to you, ...
22. Highest U. S. amateur license class.
23. The frequency band between 1 and 7.5 meters (abbr.).
24. How many ..... can you send, OM?
26. Master Oscillator (abbr.).
27. Not a gas tube (abbr.).
28. Calling all stations.
29. Something hams chew over the air.
31. A semi-automatic key.
32. Volume unit (abbr.).
34. Static interference.
36. Screen resistor (letters-symbol).
37. Oscillator (abbr.).
38. Glass tube (abbr.).
40. Undesirable pitch heard along with CW.
41. Radiotelegraphy.
43. A device pounded by many hams.
45. What's .....?
46. What you learn to send with a key.
47. A class of amplication.
51. The FCC gave you yours.
52. Complete path for current flow.

DOWN

1. A beam.
2. How much an amplifier can amplify a given signal.
3. An organization of hams.
4. Audio frequency (abbr.)
5. Short for radiotelephone.
6. The type of modulation spelt out by dit-dah, dah-dah.
7. Short wavelengths are expressed in this unit (abbr.).
8. What you are.
14. A free grid.
15. A ring shaped zone surrounding a transmitter, within which there is no reception.
16. Motor on a beam antenna.
18. The band between 400 and 3,000 mc. (abbr.).
23. A station's record book.
24. A meter often used to check wavelength.
25. A unit of frequency equal to one-million cycles (abbr.).
26. Amplification factor (letters-symbol).
30. A vacuum tube with a leak is said to be .....
31. A type of grid keying.
33. Ghost of a fundamental frequency.
35. The band of frequencies between 50 and 300 mc. (abbr.)
39. A type of oscillator (abbr.).
42. Call letters of the National Bureau of Standards, Washington, D.C.
44. A type of antenna named after its Japanese inventor.
48. Does your rig cause this in nearby radio receivers?
49. A number of stations connected by radio.
50. Neon (abbr.).

Tricks With The Collins 75A-2

Robert R. Renfro Jr. KP4AMU ex-W7ROM
Box 10365, Caparra Heights
San Juan, Puerto Rico

In many cases communication receivers are mis-used or not used to their full capabilities. Sometimes features built into the receivers are not utilized at all due to a misunderstanding on the part of the operator as to *how* to use them. Probably while attempting to use them at one time or another, they seemed to degrade the receiver performance. From then on they remain dormant. This is true of crystal filters, Q-multipliers etc.

It is the purpose of this paper to present information to aid the user of the Collins 75A-2 receiver. Of course, these instructions can be modified or expanded as desired for other equipment.

A serious drawback of the receiver is apparent splatter from an SSB signal when trying to copy a nearby (frequency wise) AM signal. This splatter is generated in the receiver due to a characteristic of the *agc* system. When the receiver is switched to the AM position, *agc* is automatically switched on. To avoid splatter, it is necessary to disable the *agc*. To do this, turn the AM-CW-FM switch to CW. Slowly turn the switch toward AM until the *bfo* stops working. Leave the switch in this position, halfway between CW and AM. You can now receive AM with no *agc* action. Of course, the *rf* gain must now be operated manually to prevent front end overload.

In cases of extreme pulse type noise such as power line leakage, this same position of the switch can be used for additional limiting afforded by the *cw* limiter. Merely advance the *cw* limiter control for the desired amount of limiting. The AM limiter is still operative.

Now let's set the receiver up for SSB reception. The instructions given here are somewhat different than the instructions given in the handbook and other similar sources. However, due to the characteristics of this receiver, these instructions should be followed.

First, it is necessary to align the *bfo* internally so the front panel *bfo* calibration can be relied on. To do this, set the receiver up for AM with the selectivity on "4". Tune in a calibration signal, preferably a 100 *kc* crystal calibrator. Tune for the sharp peak in the S-meter. Switch receiver to cw and reduce the *rf* gain to a suitable level. Turn the *bfo* pitch control to the center line. Open the lid on the receiver and locate the *bfo* coil. It is the can that the pitch control shaft runs to. Adjust the top slug for zero beat. Turn selectivity to "O". With the Zero set, move the fiducial (kilocycle hairline) to cover one of the kilocycle marks. Move *bfo* pitch control to "–1". Move the tuning knob higher in frequency until zero beat is obtained. See if the kilocycle dial scale has moved **exactly one kc.** If zero beat can not be obtained by tuning higher in frequency, loosen the *bfo* pitch knob and rotate it 180° on the shaft.

The *bfo* panel markings can now be relied on. When tuned to "–1", it means the *bfo* is operating one *kc* below the *if* of 455 *kc*, or 454 *kc*.

The position of the *bfo* pitch control to receive upper sideband will be in the vicinity of "–1". However to obtain the exact position proceed as follows.

Set selectivity to "1" or "2" depending on how much interference is present on the band. Tune in the calibration signal and peak it on the S-meter. Be sure the phasing control is on the center line. With the antenna trimmer, adjust for an S-meter reading of S-9. If this can not be obtained, try it on another band. Tune the receiver higher in frequency until the S-meter drops to S-6 or about 18 *db*. Switch the receiver to CW and adjust the *bfo* pitch for zero beat. It should be in the vicinity of "–1". This is the correct position of the pitch control for receiving upper sideband. Do all the tuning with the tuning control. The only time the pitch control should be moved is if the selectivity is changed. As the selectivity is increased, the *bfo* pitch moves closer to the center line. For lower sideband, tune the receiver lower in frequency in the above instructions.

For accurate frequency reading the SSB signal, it is necessary to offset the fiducial the same amount the *bfo* pitch is set away from the center line. This is a simple matter. After the receiver controls are set for SSB, tune in the calibration signal and adjust the tuning control until it is zero beat. Move the zero set until fiducial indicates the calibration signal frequen-

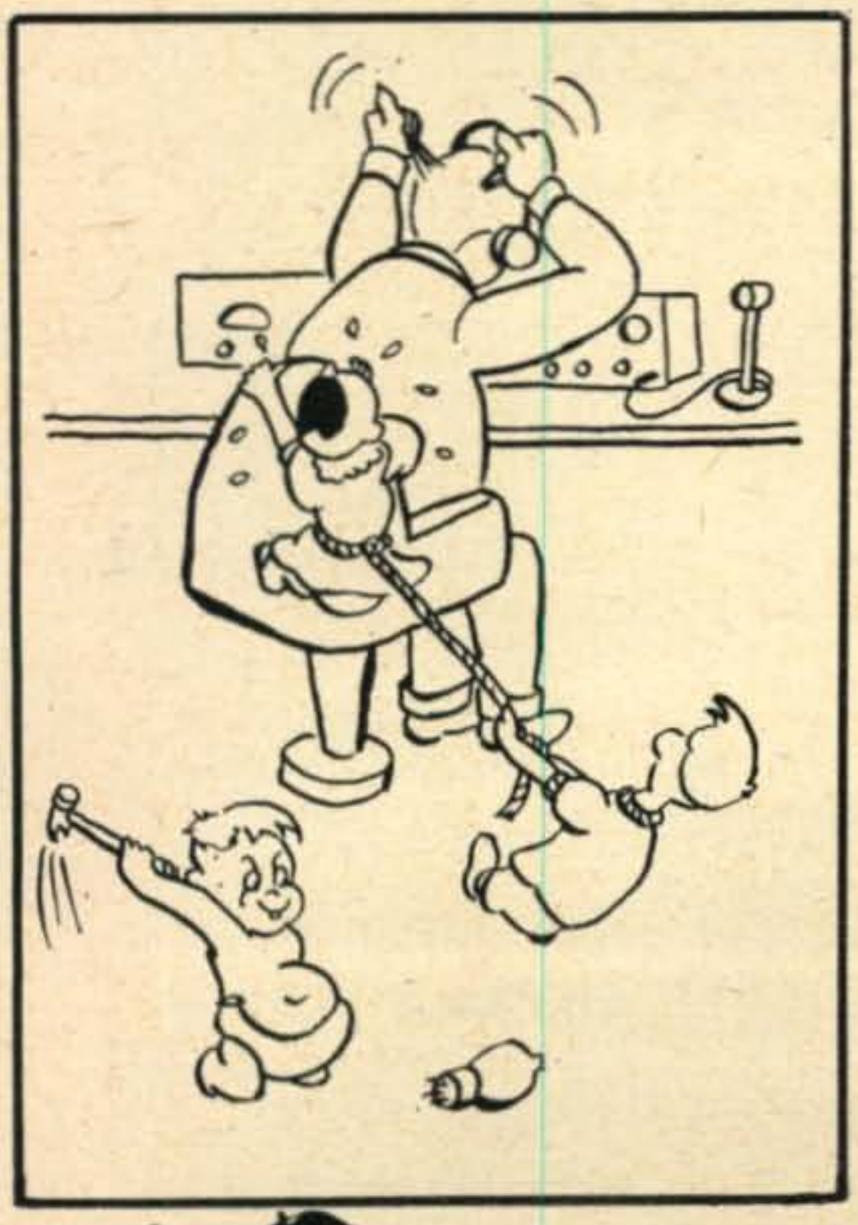
cy. The calibration frequency must be known to within a few hundred cps to make this adjustment worthwhile. Now, when an SSB signal is tuned in and sounds natural, the dial will indicate the SSB signal frequency. For upper sideband, the fiducial will be displaced about one *kc* to the right.

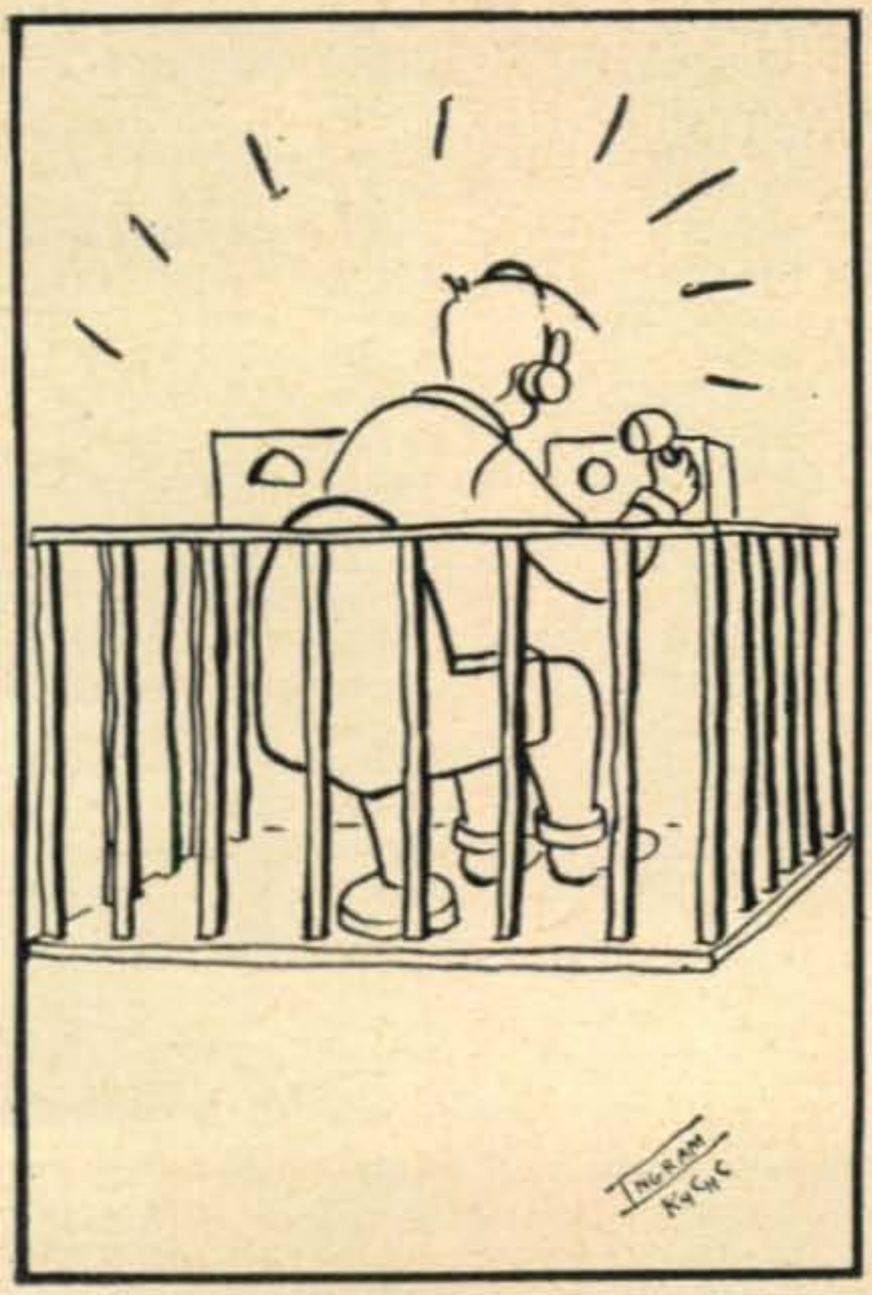
Now we will try our hand at exalted carrier reception. First, let's see what we can gain by using this method of reception. You have probably been in a QSO with a station running about S-9 on the meter. Very solid copy up until the time someone throws on a 20 *db* over S-9 signal. The voice you were listening to is no longer readable as it is crushed under this heavy signal. Switching to exalted carrier reception changes the situation. Instead of hearing one strong signal covering up a weak one, you can now hear two distinct voices, both of them readable. You just have to separate them with your mind; concentrate on the one you want to hear. Also, you have probably tried to pull in that DX station that was way down in the receiver noise level. By using exalted carrier reception, his voice now comes through quite readable.

You are probably wondering why I keep refering to voices. Well, the reason is because when we adjust the receiver for exalted carrier reception, that's all there is left of the incoming signal, just the voice. We have in a sense turned the AM signal into an SSB signal and then supplied a large QRM free carrier to demodulate it. In fact, it is difficult to distinguish AM from SSB when the receiver is set up properly.

Here's how to adjust the receiver. Tune in

[*Continued on page 104*]





Urban Le Jeune, Jr., W2DEC
416 North 15th St., Kenilworth, N. J.

DX DX DX DX DX DX DX DX

The following certificates were issued between November 15th and December 15th, 1959:

WAZ

1222	W7ABO	Francis A. Burnell
1223	W6GWW	Harry G. Loretz
1224	WØDMA	Alva A. Smith
1225	SP6FZ	Jan Ziembicki
1226	W2ESO	Eugene Black
1227	SM5YG	Tage V. Magnusson
1228	W5VIR	Sheldon C. Klock, Jr.
1229	W7MCT	C. E. Russell
1230	G6RC	R. P. Cole
1231	W8EYE	R. L. Davis
1232	SM5LN	Martin Höglund
1233	W3AYD	Michael Solomon
1234	VE7QL	Douglas G. Hall
1235	K6OWQ	Mary P. Schultz
1236	W3TMZ	Jack D. Colson
1237	W8TTN	Philip F. Frichbaum
1238	SM6VY	Karl A. Wallmark
1239	W2PCJ	Larry Amodeo
1240	W9GHK	W. B. "Bill" Bahr
1241	W2UTH	Henry A. Blodgett
1242	SM5BRO	Sigfrid Gahnberg
1243	VE7CQ	Doug Brabner
1244	K6SHJ	Frans J. Janson
1245	DL3WV	Hans Waitz
1246	W2ICO	James MacGeorge
1247	WØAIH/VE3	Rev. Paul E. Bittner
1248	VK3RP	Page E. Barrow
1249	CN8BP	M. Galland Remy
1250	OH2NB	Armas Valste
1251	W9WIO	James Zvolanek
1252	SM5AJR	GunnarJohansson
1253	WØCTW	R. H. Weihe
1254	VK3HL	Allen T. Butchings

CW WPX

83	W4IMI	K. A. Cole
84	W9YNB	Norman O. Merz
85	K2UKQ	Kay Gaynor
86	W8IBX	Kurt Meyers
87	W5BRR	George T. DeLaMatyr
88	DJ1VS	Dr. Edelmann
89	W8UMR	John M. Sulak
90	K9CLO	William H. Branche
91	W3AYD	Michael Solomon
92	W1HWH	Irving C. DeHart

All-Phone WAZ

47	DL7AB	Dr. Gerhard Baez

WPX Honor Roll

W2HMJ	553	KAPFC	330
W6KG	473	W6YY	330
W8KPL	453	WØSNL	327
W5KC	447	K9EAB	319
OK1MB	428	G3EYN	318
K6CQM	409	DJ1VS	316
W5AFX	407	VK6WT	316
W2EQS	401	W2GT	316
W1NLM	400	F9MS	315
W9UXO	390	K6SXA	315
W4OPM	387	PAØVO	315
W1EQ	377	SM5WI	312
W2PTD	374	SM5AHK	311
W9YSX	368	W2HO	311
W3BQA	367	W5BRR	311
W9DYG	367	W8RQ	311
W4AZK	365	PAØLY	310
VE3DIF	357	W9BPW	310
DL7CS	356	W3AYD	309
W5OLG	356	DJ3BB	308
W6WO	356	SM5BCE	308
W8LY	354	K2UKQ	307
W5AWT	353	W9YNB	307
WØPGI	353	DL1QT	306
W5DA	351	K5LIA	306
W2MUM	350	OK3DG	306
W8JIN	350	UA9DN	306
VK3KB	349	K4HXF	305
W1IJB	349	SM5AMJ	305
W9IU	344		

VE3BWY	305	W4IMI	301
W5AZB	305	W8IBX	301
W1BFT	304	W8TTN	301
W6RLP	304	WØGUV	301
OK1AEH	304	WØQYE	301
SM5CCE	304	K4JVE	300
W1FZ	304	K4KOY	300
W8UMR	303	KL7MF	300
W9VIn	303	PY4AO	300
K9CLO	302	W2FXA	300
W3DBX	302	W3BCY	300
W5LGG	302	W3LMA	300
WØDMA	302	W4GXB	300
JA2JW	301	EA4CR	299
K9AGB	301	W1HWH	299
LU5AQ	301	WØGUV	299
PY4OD	301		
SM5AJU	301	W3UXX	286
W2DGW	301	OK1BY	207
W4HYW	301	W4OMW	207

Phone WPX

W8WT	460	DL3TJ	305
CT1PK	409	F8PI	302
G3DO	400	PY1NC	302
PY2CK	354	W9UZC	302
W5ERY	315	VE1ADE	250
ZP5CF	306		

SSB WPX

TI2HP	231	WØCVU	155
K9EAB	204	W2OTZ	153
K2MGE	203	W2TP	153
W1GR	183	W5RHW	152
W6BAF	170	W8YBZ	152
W3MAC	165	WØFUH	151
VE3MR	164	W5DA	150
K2HEA	160	W6TNS	150
TG9AD	160	K2JFV	148
MP4BBW	158	W2VZV	147

As you all probably know by now, Don, W4KVX, our former DX editor and editor of the best DX publication in the world, experienced an unfortunate happening.

On the evening of November 28th (a Saturday night) the building in which Don publishes and prints the magazine DX, and also where he has his TV service business burned to the ground. Almost everything was lost including two TV service trucks, two color TV sets and all of the printing equipment for DX as well as all of Don's transmitting gear and test equipment for the service business. Out of the holocaust he managed to save 1 press camera, the slides of the KS4BB expedition, 1 typewriter (out of 5) and the shirt on his back and in Don's words, even it was scorched.

Fortunately out of the catastrophy, Don was able to save or rather salvage all of the addressograph plates for the mailing list for DX. These were made of metal except for the frames and the Ohio Valley Amateur Radio Association is restoring them and will send out a letter in approximately one week with all details of what happened.

Don was not insured so the loss is complete and total. The building was a three-story wooden structure built in 1910 as a barn on the farm near Burlington, Ky. It was 45 by 60 feet. Due to the fact that the nearest fire department was several miles away and was a volunteer department, Don was unable to get fire insurance. The fire started in the loft of the building and had a good start before it was detected. Don was on the ground floor off the shack, which was fairly well sound proofed and was not aware that anything was wrong until it was too late.

More equipment and other things may have been saved but Don was busy getting his house trailer moved while waiting for the Fire Dept. to arrive. The house trailer was on blocks alongside the barn and would have been consumed by the fire had it not been moved in time. He was fortunate enough to be able to save it so he does have a place to live. Water was available from the main house on the farm but by the time the fire department arrived the heat was too intense to get close enough to do anything. If I know Don, "DX" will probably be rolling off the press before you read this. I hope so. I've "lifted" many items from his publication in the past and I'd sure hate to stop now.

Mail

The following is a copy of a letter received by W7GBW from VU2SX.

"Dear George, OM:

First of all, many thanks for the QSO of yesterday, for which a QSL card is enclosed. Conditions were rather good, and then it was a real pleasure to get across to you all in W-land. Regarding your query, here is the dope, as far as I know. AC4AX, Shankar, is not active at the moment, but he is getting ready with a new Xmitter and a new Rhombic, which he will fire in the near future; he usually works CW at about 14050, and during weekends at about 0230 to 0430 GMT, which is mornings here. AC5PN, Chhawna, is also about during the same time and frequency. AC5SQ, Saja, formally AC3 and AC4SQ, will be on the air soon from Bhutan. Again, he works mostly weekends. All these people are Government Officers attached to the Indian diplomatic group in these countries, and have little time, except on weekends, to come on the air. We have received many inquiries about an AC3, AC4, AC5AA, and also about an 9N9AA. All these seem to come from one source which, of course, is a pirate. If you hear any such sigs, please get on to him and ask him for QTH and name, and pass the info to me. We are after him, and wish to put him out of business. 9N1AA is King Mahendra of Nepal, and reports say he is getting ready to start, but so far I haven't heard him."

Looks like there's still hope for AC3, 4 and 5. (Tnx WVDXC)

9N1 Nepal—The long anticipated activity from Nepal has finally started. 9N1GW has been putting a terrific signal into the states on 20 meter SSB. He is Glenn Ward. QSL to P. O. Box 9136, Washington, D. C. There will be about five 9N1's on very shortly.

DL4 Germany—W7QCK/4, the most recent

holder of DL4FE, received a package of QSL's that belong to the former holder of the call. Anyone knowing who this might be could drop a line to W7QCK/4 at L. G. Hegsted, 1252 Brookwood Drive, Winston-Salem, North Carolina.

EAØ Spanish Guinea–Masoko, EAØAF, has been off the air due to a heavy work schedule but will be very active now on Sundays and Mondays. (Tnx "DX")

KH6 Hawaii–Jerry of KA8KW fame is now KH6DMP. A color photo QSL is promised to all who work Jerry on the low end of 20. His now QTH is: Col. Jerry Branch, 623 Sperry Loop, APO 915, San Francisco, California.

KP6 Palmyra Island–KH6JEM is planning a DXpedition to Palmyra sometime in February. You will remember Harry for his SSB efforts as KH6JEM/KJ6.

ST2 Sudan–ST2AR would very much like a QSO with Nevada to complete his WAS. He will be on 14 and 21 *mc* SSB very soon. (Tnx WGDXC)

UAØ Tannu Tuva–UAØKYA is now on from this spot. CW and fone are used with fone on 14145 *kc*. Tannu Tuva was a separate country at one time. It is still Zone 23 for the benefit of WAZ hunters.

VK4 Willis Island–If you are fortunate to locate in your past logs—about May, 1955—an entry for Mick, VK4IC on 14 *mc* phone, you've got a brand new DXCC country, because Mick was operating from Willis Island at the time. (Tnx "DX")

VK4DS is also due on shortly using SSB. (Tnx WVDXC)

XW8 Laos–Panh, W8AL, says XW8AC is the only other currently active Laos station and he's presently working 10 meter phone. XW8AI is now en route to Guadeloupe and will become an FG7 about January 1st, he reports. (Tnx "DX")

ZM6 Western Samoa–A newcomer to ZM6 land is Noel, ZM6AB. He is active around 0500 GMT on 20 meter CW with a home-brew rig running 150 watts to a 4-125 final. His QTH is c/o Faleolo Airport, Private Bag, Western Samoa. (Tnx W6PHF/FO8AW)

One of the better-known Belgian DXer's, Bob, ON4QX. Bob is also a renown DXpeditioner, having been to such places as 3A2 and LX.

160 Meter DX

W6KIP/ZL3RB schedules on 160 were resumed on November 16th as reported by VE2AZI/G3GGN and W6KIP was heard by ZL3RB the first test. These famous schedules made propagation history in 1959 when W6KIP's signals were heard in ZL land every week proving that the N/S path was open during high sunspot activity while the E/W paths were closed. Alex/W6KIP is a little discouraged, however, with his QTH's high noise level, which makes it impossible to hear the real weak ones.

VE3BWY/ex G6WW and VE3AYE—make a good team and intend to give 160 good coverage this year. BWY is PASTOR H. A. Maxwell Whyte, using Valiant/200 Watts. He is F. O. C. EM/DX-BERTA-DXCC (twice) WAS (twice) WBC. Bob, AYE, says "It is a real pleasure to be active again on 160—there is something about the old 'Top-Band' which one doesn't find on the other bands" to which we say, aye!!!!

OD5LX—Willie, W8GDQ, reports that TED is "Ready, Willing and Able" with 450 watts and will be on the tests this year—Watch for him!!!! Lebanon will be a rare and nice one to add to your collection. (5A2CV also hopes to be on 160!!)

SWL/"Doug" Powell of GIBRALTAR—starts this season with two very fine SWL logs for November 1 and 15th reporting W1BB's signals heard 349/120/000 during three test periods each date. His reports are exceptionally factual and complete—last years were made use of in CQ's propogation study analysis. This year's reports promise to be equally fine. He reports a few Gs and DL1FF active thus far. Thanks "Doug". (Tnx W1BB)

This neat shack belongs to Ed, W4KWC. Ed, as you know, is the new QSL manager for FO8AC.

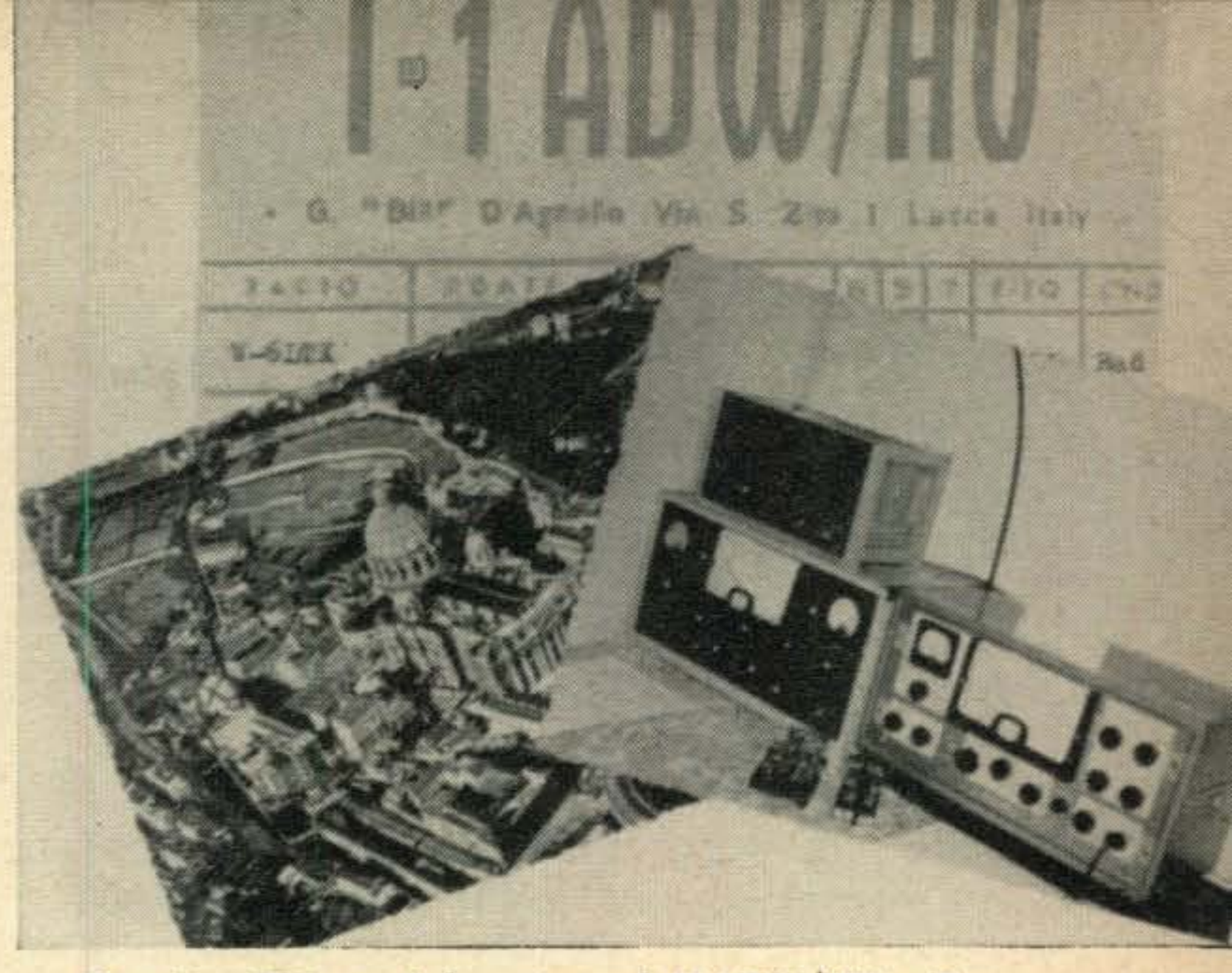
Certificates

The Radio Club of Haiti announced its new "HH-20" Award on August 15, 1959. A certificate will be mailed to any amateur who makes contacts with twenty Haitian stations on CW or Phone or any combination of both on any amateur bands. The certificate will be endorsed to show all A-1 or all A-3 contacts.

Applications for the certificate must be submitted to the President, Radio Club of Haiti,

P. O. Box 943, Port-au-Prince, Haiti, accompanied by a list of the twenty stations checked and certified by the secretary of the amateur's local radio club. QSL cards need not be submitted. Following verification of contacts by the Radio Club of Haiti, the certificate will be mailed. One dollar or its equivalent in an amateur's national money is asked to cover the charges of mailing.

President of the Radio Club d'Haiti, Lou Decatrel, HH2LD, says that a minimum readability of 338 for a CW contact and R-3 S-3 for phone is required. Operating ethics, fair play and good sportsmanship should be the goal of all amateurs working for the HH-20 awards.



The rig, QSL, and location of I1ADW/HV. (Tnx NCDXC)

Terry, VQ5FS, and his XYL. Terry has one of the better SSB signals from Africa. (Tnx WVDXC)

The California Award

The Northern California DX Club, Inc. issues this award, which consists of a beautiful certificate, to all licensed radio amateurs located outside the fifty states of the U. S. A. who have QSL's for QSO's with 220 different California stations as follows:

1. Confirmed contacts with any 200 different amateur radio stations located in California *and in addition* confirmed contacts with 20 different members of NCDXC.

2. All contacts must date since October, 1946, the date the NCDXC was founded as the first DX Club in the world. Any band and type emission may be used.

3. QSL's may be checked and certified to by officials of recognized amateur radio societies and clubs of the world. A list of the 220 stations will be submitted with all applications.

4. The award is free. Please include return postage if cards are sent NCDXC for checking.

5. Send all mail to: The Northern California DX Club, Inc., P. O. Box 75, Oakland, California, U. S. A.

Members of the NCDXC: W6AED, AHZ, ALQ, AM, ATO, BAX, BIP, BUY, BVM, BYB, BYH, CEI, CLS, CTL, DAC, DIX, DUB, EFR, EFV, EJA, GIZ, GPB, GQK, HNX, HOC, IPH, ITH, JHV, JK, KEK, KEV, KG, KYT, KXG, LDD, LMZ, LTX, LW, MEK, MHB, MFZ, MLY, NEQ, NHA, NRZ, NZ, NZS, ONZ, OWM, PB, PHF, PQJ, PYH, QDE, RBQ, RCC, RRG, RZS, SC, SXI, TI, TOT, TT, TXA, TXL, UF, UOV, UJ, UPV, UYX, VE, VJW, WB, YUS, ZUI, ZZ, ZZC, *K6AQP*, AUG, AYA, CWS, EDE, LZI, SSJ.

Contest

Cup winners in the recent Cr7 contest were DJ1BZ Europe, ZS4MG Africa, North America K8AEK, South America PY4KL and Oceania KH6 BXU. The ten highest scorers were CT1PK, K8AEK, K6SXA, DJ1BZ, I1ZCN, ZS4MG, CR6CS, K6DDO, CR6CI and CR6CJ; CR7's LU, BN, IT and FB were the home winners.

Conditions were fairly poor during the CW portion of the DX contest. Some of the better DX on during the contest included FE8AH, JZØHA, CR9AH, FB8XX, OHØ NC, UM8KAB, 7G1A, ST2AR, VS9OM, VK2FR and many more. Well over 100 countries were on. Bob, W3GHD, reports working 39 zones, missing only zone 23. A few fellows reported working JT1AB, so it looks as though all zones were represented.

Well, that's about it. CU agn next month.

73 es DX, Urb, W2DEC

QTH's

CE3LV—Jack Farrance, Casilla 13120, Santiago, Chile.
DU1AJ—Aleli Jose, 1018 Padre, Leoncio Street, Manila, Philippine Island.
HB9QP/CR8 via W4IYC only.
I1ADW/HV via W6AWT.
MP4QAD—Pradhan, Box 71, Doha, Qater, Near East, Asia.
MP4TAF—BFPO64 Sharjan, Trucial Oman.
OQ5JW—P. O. Box 27, Lupata, Belgian Congo.
VQ8BBB via VQ8AP.
ex VQ8AQ now G3NUF.
VU2ANI/5 via W8PQQ.
VU2NR via WØZSZ.
W7WQK/VO2—923 Sqd., A.P.O. 434, New York, New York.
XW8AC—Box 87, Vientiene, Laos.
XZ2BB—Saw Box 449, Rangoon, Burma.
ZD9AK—Charles/op Weather Station, Gough Island, c/o P. M. Capetown, S. Africa.
ZD2JM via K9EAB.

Thanks to W1ODW, K2QWN, W4KFC, HB9QP, NCDXC, SCDXC, WGDXC, WVDXC and the OVARA for the above.

ham clinic

CHARLES J. SCHAUERS, F7FE/W6QLV

CQ Magazine, 300 West 43rd St., New York 36, N. Y.

Transistor Technology

There are very few electronic circuits in which transistors cannot be used. Of course, you won't find any *vhf* or *uhf rf* power amplifier transistors capable of more than a few milliwatts output, but the day will come when semiconductor devices such as the tunnel diode will enable us to do more than we are able to do with power consuming vacuum tubes now—and with less components in the circuitry.

Transistors are used because they occupy little space and require little power. It is true that they are temperature sensitive and require a little more attention, voltage and current-wise, than the average radio tube, but if used properly they are economical and worth considering when designing ham equipment.

To the average ham however, the transistor is a difficult device and he is not inclined to go out of his way to learn more about it. (At least, this is what has been gathered from letters received.)

Unlike the vacuum tube, the transistor can stand a lot of mechanical abuse, but try operating the latter with a few more volts than its operating parameters call for and you'll run into trouble—spelled with a capital "T". On the other hand, you can "pour the juice" to the average vacuum tube and it will still perform well.

So why all this fuss about the transistor? Well, for one thing, unlike the radio tube its characteristics seldom, if ever, change with age. Now you consider the ordinary vacuum tube with its hot cathode, expanding metallic elements, etc., and you'll see that it can live only so long. Not so the transistor. If "fed" and cared for properly, the average transistor will operate on and on without the slightest sign of "giving up the ghost." (I'm sure you have heard about plans for silencing our solar powered satellite transistorized transmitters which could go on transmitting long after all who read this have been "silent keys" for a couple of hundred years!)

Today, transistors *are* practical; especially in many circuits used by the ham-experimenter. But one thing you cannot do (without a lot of hard work) is to substitute a transistor for a tube *without* major circuit changes!

With *Mesa* and *Drift* transistors, 100 *mc* is now considered a *low* frequency! Some tetrode transistors can be used in very simple circuitry to produce a very usable 10 meter receiver—AM or FM. And now with the low noise figures being obtained with many transistors, one can design and build a very effective *vhf* converter with few parts in a very small amount of space . . . which *can match* a good tube converter without half "trying."

The best way to become accustomed to using transistors is to obtain a few and make up a few simple circuits. *Raytheon, GE, CBS, Sylvania, TI, GT* and others are giving such complete information on their semiconductor products that the average ham should have little trouble learning how to use transistors and FAST!

My friend Don Stoner seems to be able to latch on to the latest technical info relative to available transistors, and when you read his column you will find that he manages to find the time to do some very serious experimenting that you can well profit by.

As time goes on you will certainly see that most transistor manufacturers are not standing still but endeavoring to improve transistor performance and reliability. Too, certain manufacturers of ham equipment such as *Hallicrafters* have turned to transistors in some applications with great success.

Yes, transistor technology is improving and ham radio will certainly benefit from it.

Observation

The purpose of any club is to create the *common* ground on which a worthwhile objective is pursued . . . by a *group* united by a *common* interest. (This is *my* definition and not Webster's.)

But how many times have you attended a radio club meeting and came away with a "sour taste in your mouth"! How many times have you wished you could throw a stick of dynamite at some character who gummed up the legislative machinery every time his ego sagged a little and he thought he needed a little special private attention!

Well, you're not alone!

The guy who tries to monopolize the floor and really says nothing drives more young ham aspirants away from club meetings than you can "shake a stick at." He is usually the guy who fails to see another's viewpoint and is the first to duck out of the meeting when committee appointment time rolls around. To those interested in making a go of club activity he is a "sorry mess" and reminds them of the agitators who get paid for such conduct.

What to do? Do as a friend of mine did while president of a thriving radio club—give

the guy the opportunity to produce or embarrass him right out of the club! How? By showing how ineffective he is. Drastic? Perhaps, but maybe necessary.

There will always be people around who just love to take the opposite point of view because it seems to bolster their ego and feed their inferiority complex; which they incidentally try to hide with loud talk or an awful lot of bragging.

Observed: radio clubs can be a lot of fun and much can be accomplished as long as *everyone* tries to do his best to make it worthwhile to belong to them. But if the character who wants to be "different" is allowed to spoil group effort, point your finger at your club chairman; it is up to him to put the guy *right* (privately) or *out* (publicly). Honest opinion and recommendation should be encouraged—with the good of the entire group in mind.

The Ham Scope Book

I wish to thank all of you who sent in names for my new scope book written exclusively for the ham radio operator. I did carefully consider all suggestions but did not find one (so far) that came near what I considered an appropriate title. Until publication time then, I'll still hold the $25.00 to pass on to *anyone* thinking up a *better* title than THE HAM SCOPE BOOK, which I shall use unless a *better* one is received. *How about helping me out?*

Questions

Feedback—"I recently constructed a transmitter from a kit and am experiencing *af* feedback on 10 meters. I can only advance my gain just past '1'. What can you suggest?"

Try the simple measures first. Mike connection good? Using shielded mike cable? First *af* amplifier tube shielded? Modulation transformer secondary leads? Good ground on transmitter proper?

Now then: Insert an *rf* choke (2½ mh) in series with mike input *right* at connector, bypass output side to ground with a .001 mf ceramic. If you still have feedback try a small (1 mh) *rf* choke right at the microphone (inside the case). If no luck, then make sure that your mike gain control leads are shielded (except the one going directly to ground). Check length of your mike cable, make sure it is not a ¼ wavelength long at 10 meters (coiling—reverse coiling one or two loops may help). How about your 110 volt line cord; how long? As a last measure (if no results) try a 68,000 ohm ¼ watt resistor in series with the first amplifier tube grid *right* at the grid. You can also try some resistance in series with modulator grids (around 20,000 ohms) and/or plates (around 100 ohms). If no better, try another shield around modulator transformer (aluminum). Above all, make sure you do have a very good low resistance ground. I can think of a few more things you could do, but I'm sure with this info you can clear up your trouble. Remember however, that so-called "*af* feedback" is sometimes *rf feedback* and *most* of the measures described above *are* anti-*rf*.

Scope Amplifier—"Why a push-pull amplifier (vertical) in preference to a well designed single-ended stage in an oscilloscope?"

Higher output voltage for driving the CRT; less hum; reduction of second harmonic distortion and better for frequency compensation (extension of high and low ranges).

6 Meter Beam—"I need a 6 meter beam and I have about $20.00 to spend. Can you steer me to one worth the money I spend for it?"

There are a number available. How about *Hy-gain's* 6M5E? Sells for $18.95; is wide-spaced; weighs 9 pounds and requires only a 9 foot boom. Most any TV rotator will turn it. Nine *db* forward gain is claimed for it.

Telrex's 6M-3D at $16.25 is also a real good buy. It requires a 6 foot boom, weighs only 7 pounds and has a claimed gain of 8.8 *db*.

Another is *Gotham's 4* element gamma matched beam at $16.95.

There is a wide choice and it will be up to you to look at them and choose the one which you feel will do the job for you. When equal gain is claimed the choice resolves itself when the mechanical simplicity is considered.

Note—*Everyone* knows "Bircher" should be *Birtcher*. Although this company concentrates on furnishing its fine tube heat shields to industry, hams *are* in the market for them too. Until their able sales manager told me where to get them, I was lost—in spite of handbook advertisement.

SX25 Improvement—"Where can I get information relative to improving the SX25's 10 meter performance?"

See CQ for February 1949.

PC Burnout—"What causes the parasitic choke in series with the plate of a final 4D32 to burn up? Transmitter is a 32V."

Improper final tuning on 10 meters and/or a high *VSWR*. Be sure you have sufficient grid drive and properly terminated antenna.

Dial Lights—"Is it true that GE makes a long-life low voltage pilot bulb?"

Yes, write them.

400 Cycle Transformer—"Any way to economically convert a surplus 400 cycle power transformer to 60 cycle service?"

Not that I know of.

Lightweight Receiver—"Can you suggest a receiver weighing less than 30 pounds with built-in power supply which will give me general coverage (BC, SW and Ham bands)? It must have more than 5 tubes."

Hallicrafter's S-107 and Gonset's G-43.

Neon I—"I installed a neon fixture in my shack for better light but it sure produces the

receiver noise? What now brown cow?"

Mooooooooo! Try an *Aerovox* type 1N106 interference filter. Costs $1.03 from *Allied Radio* . . . their stock #70B307, weight 6 oz. Install it right in the fixture—poof goes the noise! Mooooooooo! Incidentally, this can sometimes be used right at a radiating TV set with good results too.

Tube Removal—"Do you advocate removing the *af* tubes in the TX-1 when operating sideband?"

It all depends upon how long you operate SSB. When on SSB you don't need them; they are very easy to pull out and you do cut down on the heat when you do so. I always unplug the SB 10 when operating CW or AM.

50 Watt Rig—"What do you think of the 50 watt rig described in the ARRL handbook, page 177?"

I like it as a good approach to getting on the air quickly, but I don't like the idea of the 6146 being oscillator and amplifier. Drive it with a 6AG7 or 6CL6, etc., and you'll have a *better* rig.

Dipoler Angle—Any poles less than 30 feet will require an angle of less than 30°. For those of you who have poles higher than 60 feet, the 30° will work.

NC 300 Vernier—"Anyway to install a vernier on the NC 300 as is found on the NC303?"

Sure. To the lower left of the main tuning dial there is a plug type button which covers the bandswitch shaft removal hole. Remove the button and ream or drill the hole to ½" diameter.

A *National* S. B. bushing is cut down to about ⅜" and installed in place with the nut that comes with it.

Cut a neoprene washer to 15/16" in diameter with a ¼ inch hole drilled in the center. Bevel the outside edge of the washer. Cement the washer to a *National* HR knob which has had the small plastic dial locking tit filed off. Duco cement does a fine job.

Then cut a ¼" shaft 1¼" long and drill a small hole through its body close to one end for a cotter pin which will prevent the shaft from being pulled out inadvertently. Mount the knob on the shaft and pass the latter through the center hole of the bushing. Use a little oil for lubrication on the shaft.

You can now use the main dial for quick frequency excursions or with an insignificant amount of pressure on the HR knob, you can enjoy slow vernier tuning, say for SSB signals.

Still More on the SB10—"I followed your modification data okeh on the SB10 and it works fine according to on-the-air reports but I still seem to have a little difficult maintaing carrier null. Anything new?"

Yes. Insert a 10 watt 1500 ohm resistor in series with the B plus feeding the balanced modulators. This will help or completely eliminate your drift.

Explosion—"While mobiling through California I came upon a construction area near which a sign was posted reading: *'Do not operate mobile radio transmitting equipment in this area! Explosion danger!'* How about this?"

Electric blasting caps can bet set off by *rf* . . . especially in the higher frequency (10 meters up) bands. Another thing, do not operate your rig in or near a gasoline station or near a gasoline truck.

Transistor Modulation—"How can a transistor *rf* amplifier be modulated practically?"

By series transformer coupling in either the base, emitter or collector.

Book Reviews

"Microminiaturization of Electronic Assemblies" is a book published by the Hayden Book Co. Inc. and edited by Eleanor F. Horsey. It is organized into six sections which are titled, Techniques, Semiconductors, Components, Circuits, Missile Systems and Microelectronics in Industry. Actually, the book consists of a compilation of papers wihch have been presented before professional societies by experts in their particular fields.

For those seriously interested in what can be done to compress operational circuitry into real small space, this book is ideal. It is not recommended for the average ham who is usually content with something he can hold in both hands.

To me, chapter 2 is worth the price of the book alone. It covers "Two-Dimensional Transistor Packaging." This is interesting. Chapter 3 isn't anything to sneeze at either because it covers antenna miniaturization.

$11.00 will get you the book containing 278 pages.

Now another book, more to the liking of the amateur radio operator—"Basic Electronic Test Procedures" by our old friend, Rufus P. Turner. I still wonder how he does it! Goodness, can he write! This new one has 18 chapters covering everything from the use of meters to industrial electronic measurements. No hard to understand diagrams in this one! No sir, he obtained the services of an artist who can draw! All I can say in one breath on this one, it is G-r-e-a-t! His easy flowing style makes it all easy to understand. The book is $6.50 and worth every cent. The ham who wants to learn how to test electronically will find this is just what he has been looking for. It is published by Rinehart & Co. Inc.

To order either book mentioned here send, your check or money order to the *Radio Bookshop*, 1379 East 15th St., Brooklyn 30, N. Y.

Thirty

Thank you for reading the column.

73 and 75, Chuck

Novice

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

The WWV Story, Part 2

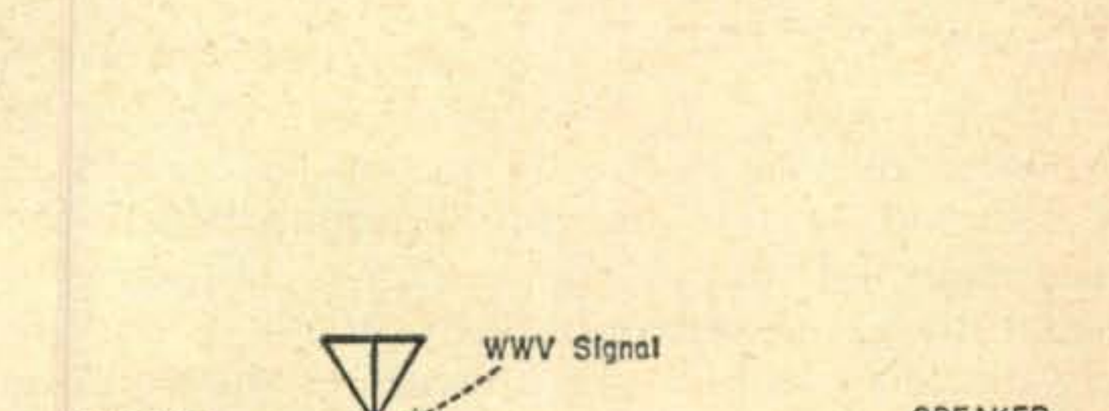
Last month we discussed radio stations WWV and WWVH and how they provided accurate frequencies, both audio and *rf*, for timing and calibrating equipment. Let's see how these signal sources can be used in the novice shack.

The simplest and most direct way of using these calibration signals is for check points to check the accuracy of your receiver dial. If WWV is received close to the 10 *mc* mark at the high end of the dial, but is off at the 5 *mc* point, your receiver is not tracking properly. There are enough WWV transmissions to check each band on an amateur communications receiver and they may be used for actual alignment of the "front end". Even though you may not be able to hear WWV on 20 or 25 *mc* you can beat a *vfo* or grid dipper against the 5 *mc* signal and then pick up the harmonics on your receiver. By the same token, you can beat the dipper with WWV on 10 *mc* using the 5th harmonic (the dipper frequency would be 2 *mc*) and obtain 2 *mc* check points over the entire range of the receiver.

Figure 1 illustrates a method of comparing the frequency of tunable signal sources such as signal generators, dippers, and *vfo*'s with the WWV standard. The same method is used when comparing crystals which are submultiples of WWV, such as 100 and 1000 *kc* calibration sources. The signal to be calibrated is loosely coupled by radiation or capacity coupling to the communications receiver, which is tuned to one of the WWV channels (see Jan. Novice Col.). The frequency of the source is then varied until a beat note between one of its harmonics and the WWV carrier is heard in the speaker. When the local signal is adjusted to produce exact zero beat, its frequencies is equal to that of WWV or is an exact submultiple of it. If you are not sure what submultiple you are on, tune the various harmonics on the receiver and find the lowest frequency where the signal source is heard. That's your fundamental frequency.

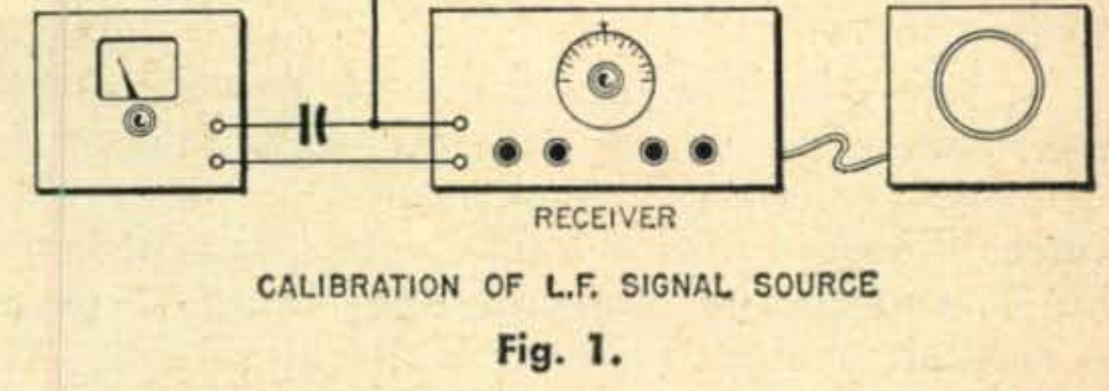
CALIBRATION OF L.F. SIGNAL SOURCE

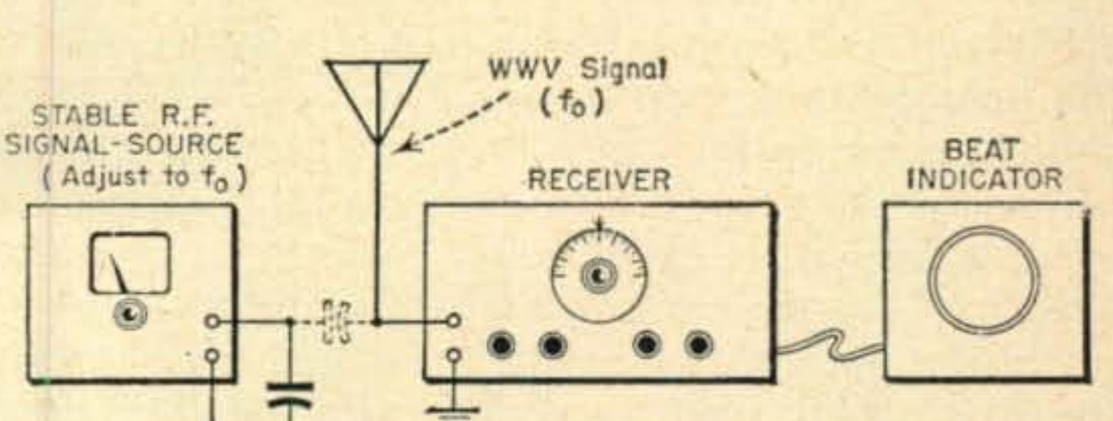
Fig. 1.



METHOD OF EXTRAPOLATING WWV STANDARDS

Fig. 2.





METHODS OF AUDIO COMPARISON

Fig. 3.

The system just described will check frequencies lower or equal to the WWV transmission. How would you like to calibrate your two meter receiver against WWV? You can do it with the test setup shown in fig. 2. In this case the stable signal source would be a high level (several volts) 1 *mc* crystal oscillator or signal generator. This unit is beat with WWV on any of its receivable frequencies, and then coupled tightly to the *vhf* equipment. You will then be able to receive 1 *mc* marker points across the entire band!

Audio equipment, as well as musical instruments may be referred to the 440 and 600 cycles tones broadcast by WWV using the layout shown in fig. 3. The output of the WWV receiver is coupled to the vertical amplifier on an oscilloscope, while the device to be calibrated is coupled to the horizontal input. When the frequency of the local source is adjusted to equal the audio transmitted by WWV, a stationary circle or elipse will appear on the cathode ray tube. Other multiples or submultiples may be identified by using Lissajou figures (see ARRL hbk.).

To calibrate the musical pitch produced by non-electronic sources, the equipment shown in drawing (b) of fig. 3 is required. Since the source does not produce an electrical audio output, a microphone and amplifier must be used to convert the audio into electrical signals. As before, a single pattern will indicate the two signals are the same frequency. However, since the source may not produce a sine wave, the oscilloscope pattern may not be a perfect circle, but may be considerably distorted. Using this system, musical instruments may be tuned exactly. If you have a "trained ear" you can replace the oscilloscope with your head! Listen to the instrument and the WWV tone at the same time. You will hear a zero beat occur when the two devices are on the same frequency. Again, thanks to the Aerovox "Research Worker" for supplying information for this article.

Red Face Dept.

Some time ago I mentioned that Novices were allowed to operate in Canada. Several readers, among them Jim Thorpe, VE7AIK, have corrected me. He quotes from the "Radio Amateur Licensing Handbook", by Jim Kitcein, Regional Supervising Radio Inspector for the Dept. of Transport, Vancouver, Canada. According to Jim "It is a requirement that the American visitor must hold a qualification equal to or higher than the minimum Canadian certification, and such being the case, the holders of American Novice and Technician qualifications are *not eligible* for permits to operate mobile stations while visiting Canada". Thanks for the correction Jim and Jim. My humble apologies if this "good" has inconvenienced anyone.

Trick of the Month

W. Murray Banks, VE1GA, Kingston, Nova Scotia, adds a trick of his own to my procedure for tuning a transmitter described in an earlier Novice Column. He suggests "before applying plate voltage to the *pa*, it is expected that you have your frequency spotted on the receiver—rotate the tune capacitor for maximum "S" meter reading on the receiver. If no meter is available, the ear will get you close enough. You can then apply plate voltage to the P.A. without making a mad dash for the tune capacitor as the *pa* tank will be in resonance, or nearly so." Try VE1GA's trick fellows, it really works. No excuse for those pinned plate current meters!

Who's DX?

How would you like to work DL4 land? PFC Mark E. Lawyer writes to say that the Armored Radio Sports Club listens very carefully on 40 and 15 meters for novices. Mark indicates that he would like to hear from novices and possibly arrange some skeds. If interested, drop Mark a line: PFC Mark E. Lawyer, Ra 13630115, Co. C 2nd Med Tk. Bn 13th Cav., APO 39, New York, N. Y.

From the other end of the world we hear from a KR6 novice. Tom forgot to include his last name or QTH, but did say his call was KR6ZT, and KR6Z stations are all novices. He has heard many K's and WV's but so far has been unable to contact any stateside novices, with his rocks on 21.108, .155, and .242, with .108 favored. Tom runs a homebrew 25 watts to a 5881 final, an SX-28, and a rooftop dipole. Tom would like skeds by airmail. I believe a letter addressed to KR6ZT, care of Okinawa Amateur Radio Club, P. O. Box 739, APO 331, San Francisco, Calif., will reach him okeh.

Mark Lawyer, mentioned earlier, reports hearing the following stations in DL4 land: KN3GCS, ILF, IWK, KN4BRX, WP4ARR, KN5RNO, VQR, KN8MXI, PTM, KN9PNV, KNØSFF, on 15 meters and WV6FCO, KN8OCL, and KN9RIY, on the 40 meter novice band. Thanks for the report, Mark.

The band was good during October for Tima Popovic, YU1-RS-357, Banat Novo Selo, Yugoslavia, and he reports hearing the following stations: Oct. 24, 1725—2035 GMT: KN1JIR, JUG, JXI, JYI, KBV, KCA, KDO, KML, KNQ, KVC, LBM, LLR, LVA, LWH, LXM, MJT, MKF, WV2CQU, DSE, EAQ, EHM, FBV, FBY, FHU, FMS, FYE, GFZ, GQW, GXM, HEI, HFT, HGL, HUI, HVQ, IAF, IJA, IKR, ITE, KN3HJK, HLB, ILF, IPB, JGL/3, JGU, JHG, JMP, JTP, KAU, KAW, SPB/3, WP4ARZ, KN4DGH, FTV, FWD, FWJ, HNR, IZO, JPV, JUK, JYP, KAU/4, KEU, KWQ, LHM, LRL, LXP, ORD, PFB, KN5WHW, WSJ, YAE, KN7JTJ, KN8NHC, OCK, ODK, OLU, QBW, QDT, QEX, QFA, RHK, KN9QJT, RMJ, ROD, RXR, RXV, SOZ, SRK, TUS, TZS, UCE, UFQ, KNØVMZ, VSK/1 Oct. 25, 1618—1920 GMT: KN1JAI, JGM, JJJ, KSG, LWX, LXB, WV2DRK, DTF, DXA, ELP, FJW, FPV, FTS, FWG, GRE, HJR, HRP, HVR, IGW, PQW,

KN3GYD, HLX, HPU, HTH, IWK, JGL, JGY, JIV, JLI, JTU, JZV, KN4EOS, FTC, FYN, HAO, HYN, ICH, ISV, KBZ, MOW, MPJ, OLK, ORJ, ORO, KN8NTE, OLB, OSS, PCH, POU, PWJ, KN9QJT, QMT, SMA/4, TPQ. Thanks once again, Tima, for your extensive list of calls heard.

Help Wanted

W6OZ, 255 Mantua Road, Pacific, Palisades, Calif., writes to say he generates code practice on 7199.5 at random times between 9 and 15 *wpm* for the primary benefit of novices. Dick also broadcasts ARRL bulletins on that frequency at slow speed, and usually has the rig going most of each weekend. Comments and signal strength reports will be appreciated.

The Panama City Amateur Radio Club of Panama City, Florida holds code classes and give code tests every Monday evening at 7:30 PM except on meeting nites, at which time it follows the 7:30 meeting. The club house is at 7th and Magnolia Ave. For more information call or write Don MacDonald, K4FQQ, 1912 Arthur Ave., Panama City, Fla.

The following persons have taken the time to write and ask for a helping hand on their examinations. Can you spare the time to help them out?

W1—Ralph McClintock (15), 44 Parkway Crescent, Milton 82, Mass. Phone CU 6-2575.

W5—Leighton Kelly, (13), 1207 Barshall Lane, Austin 3, Texas.

W9—Jim Breszke, 417 East Main, Sun Prairie, Wisconsin.

Bob Secor (left), WV6JCJ, 6242 Rockwell St., Oakland 18, Calif., introduces us to the other ham members of his family. In the middle is brother Terry (K6VSN), and on the right is Dad, K6VSO. The boys use a DX-100 and SX-101.

Letters

Jim Chandler, KN9TZN, 157 N. 6th St., Elkhart, Indiana, kicks things off this month with his letter. He has worked 37 states (conf) plus OK1, G5, WP4, VE6 and 7 with his DX-40 and SX-100 since Aug. 20th. Jim wishes to thank W9AKJ, his XYL, and W9MLE for their assistance with the novice license.

Jim, K5BNK, 701 W. Locust, Durant, Okla., writes to tell us about his ham family. Besides himself these are Jos, K5SLP, Fran, KN5TWB, and Tom, K5BAU. They all use a tri-bander and stick pretty close to the novice CW band. Jim will sked anyone needing Okla. for WAS.

Bud Lafferty, ex-KG1CK, got KNØVPP, Roger, on the air with his old Greenland equipment and reports that in three weeks he has worked 35 states, including Alaska. By the way, Bud is now in Adana, Turkey, and should be reporting on novices heard, soon.

Bob Hillman, VE7BBM, 2125 Bridgeman Ave., North Vancouver, B.C. Canada, writes to advise us he is on the lookout for novices and has 27 states confirmed with his DX-20 and Harvey Wells R9A receiver. Bob is 16 and in the 11th grade. He will sked for any reason. Bob's pet peeve is the novice who thinks his shack is surrounded by icebergs and such (well isn't it—Bob?).

Phil Coley, KN4MPE, 2006 Twain Rd., Greensboro, N. C. is racking up the dex, with VE's, WP's, TI2, YV5, KZ5, G3, DL1, DJ3, I1, OE1, OZ's, LU6 es SM7 under his dx belt, plus the rare one UP2KCD that got away. Phil would like skeds with Idaho, Vt., Del., Ariz., and KH6.

Dave Clark, KN8PJP, 502 Carroll St., Waverly, Ohio, would like to work Vt., N.H., Del., Alaska, Hawaii, and the 7's for his WAS. He runs a Knight Kit and SX-28 to a 40 meter dipole and will sked for any reason.

Harold Richard, KN7HOF, Box 416, Springerville, brings us up to date on Arizona happenings. He has been on for 5 months now, and has a WAS of 48/48 but needs Nev. and Vermont. Harold uses a Viking Adventurer, HQ129-X and 2 element beam.

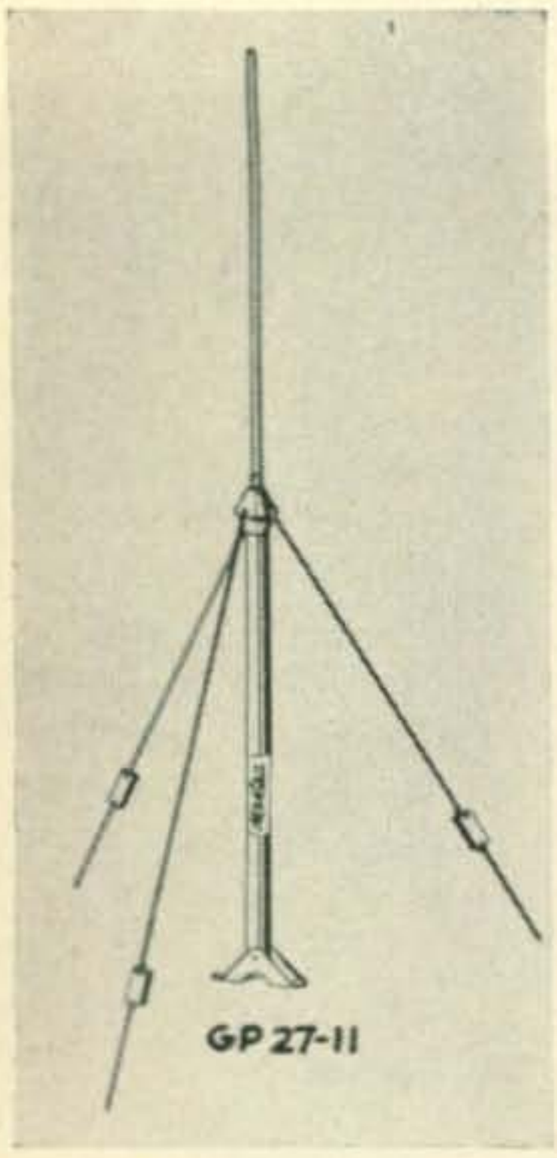
A similar writer, Sanford Hutson, K5QHS, Stuttgart, Ark., advises us that he finally made WAS and is well on the way to DXCC with 50 countries, and is still using the old gear with a TA-33 tri-bander. New DX includes KS4, UA1, UA4, and OQØ, with VP5 and SU1MS cards in the mail (we hope).

Herb Willcox, KN1LXA, 1200 Mass. Avenue, Cambridge, Mass. has a neat trick. He suggests that when trying to copy a cw station through phone QRM, turn off the bfo and let the two stations beat with each other. Says it reduces the racket greatly.

Merrill F. Green, KN3JDF, 7718 Wilson Ave., Parkville 14, Md., is an ole timer (38-HI) and is neck-and-neck with WAS but needs KH6 land and Vt. to get the wallpaper. He uses a Viking Ranger, SX-28A and dipoles on the

[*Continued on page 106*]

New Amateur Equipment



Master Mobile CB Ground Plane Antenna

For you lads on the Citizens Band (11 meters), Master Mobile has a nifty vertical ground plane called the model GP 27-11. This unit is constructed of heavy wall special alloy aluminum tubing for the whip and support pipe. It has a swivel-type antenna base mount to permit installation on either a flat or a peaked roof. The radials are constructed of heavy tinned copper braid. As to the specs, Master Mobile claims a VSWR of 1:5:1 at resonance. The GP 27-11 is furnished complete with all hardware, insulators, guy hooks, screws and 50 feet of RG 58/U cable terminated with a Motorola-Type auto radio connector. For a great preponderance of detailed information, we invite you to gnarl E on page 126. Get gnarling, please.

Hammarlund HQ-180

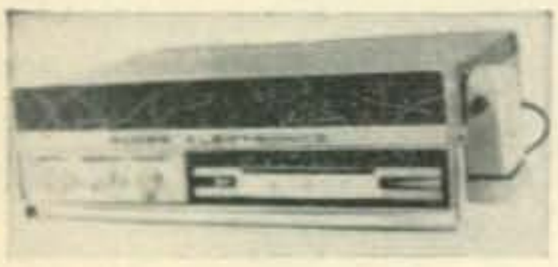
Hammarlund announces their latest amateur communications receiver, the HQ-180. Designed with the SSB operator in mind, the HQ-180 offers many features particularly desirable for this mode of operation. The new receiver is an 18-tube superheterodyne type which has triple conversion from 7.85 to 30.0 mc. Beside an effective noise limiter, the HQ-180 offers the operator a choice, or combination of Slot Filter, selectable sideband, tuned if, bandspread and a separate linear detector for tuning the desired SSB signal. A high-frequency crystal filter is employed at 3035 kc to improve selectivity and shape factor of the first if. The slot filter is adjustable plus/minus 5 kc over the passband for up to 60 db attenuation. Price for the cabinet model, $429.00. If it's more data you seek, merely obliterate D on page 126 and we'll see that you're in the know.

Heath FM Test Oscillator

The Model FMO-1 is Heath's latest development in the test equipment department. It provides all the test signals and sweep frequencies required for accurate alignment and troubleshooting of *rf*, *if* and detector sections for *fm* tuners and receivers. Convenient switch selection of fixed frequencies of 90, 100 and 107 *mc* are provided for tracking *rf* "Front Ends" and checking dial alignment. A 400 cycle tone is available to modulate the *rf* signal when desired. The 10.7 *mc* sweep oscillator in the FMO-1 features variable sweep width from 200 *kc* to well over 1 *mc* for *if* alignment. For more detailed dope, we suggest you gash B on page 126 and all the data is yours.

Vibro-Keyer

The Vibroplex Company has a real cool gadget for those amateurs that need the mechanical end of an electronic keyer. The Vibro-Keyer is constructed in line with the high-quality workmanship for which Vibroplex has long been famous. The unit has large, non-corroding contacts, heavy beige colored base, colorful red finger and thumb pieces, and smooth, easy operating trunion lever. It is, naturally, adjustable to suit any amateur's taste. The Price? Only $15.95. For more information, encircle C on page 126.



New GLOBE CB-100

Want to operate Citizens Band? Globe Electronics' new Model CB-100 Citizens Broadcaster is an ideal way to do the job painlessly and effectively. The CB-100 is a crystal controlled, 3 channel selectable transmitter and receiver weighing only 13 lbs. Two models are available. Both operate on 115 *vac;* one also operates on 6 *vdc;* the other on 12 *vdc*. See! It's ideal for mobile, too. Want more data? Merely synthesize A on page 126 and we'll get the info out to you Poste Haste.

RTTY

Byron H. Kretzman, KØWMR
108 W. Teresa Drive
West St. Paul, Minn.

This month's tidy tidbit of teleprinter technology reaches you through the courtesy of W6AEE, publisher of the RTTY bulletin of the RTTY Society of Southern California, Inc. It comes from the September issue of RTTY and from that most prolific of RTTYers who build, Phil Catona, W2JAV, designer of the W2JAV converter which was described in the April 1958 issue of *CQ*.

If you have a polar relay in the output of your terminal unit, or converter, you undoubtedly have had some difficulty with the noise generated by the arcing contacts in your local loop, particularly when you are digging way down for that weak ZL or VK. Well, you *could* use a vacuum tube keyer, but why not do it the easy way, the W2JAV way? Figure 1 shows the schematic of Phil's simple transistorized electronic keyer. With the polar relay plugged into J-1, only a small base current is keyed to make the *RCA* 2N270 collector current operate the Model 26. With 35-volts applied, the 1000 ohm pot is adjusted for the loop current that gives the best range. This should be in the order of 20 to 25 *ma* (Phil has gotten an 80-point range from his). The result: no contact noise to be picked up by your super-sniffer receiver. Neat, huh?

WØBP Memorial Station

Ever since the untimely passing of Boyd Phelps, WØBP, (*CQ*, Aug. '59, pg 54; *QST*, Sept. '59, pg 89) all of us have acutely felt the void on all RTTY frequencies, from 2 to 80 meters, left by this most active and liked RTTYer of all time. It therefore was unanimous among the Minneapolis-St. Paul club (RATS) that not just a memorial to BeeP should be erected, but an *active* memorial in the form of a club radio station would be established. This station, of course, would fling the call "WØBP" not just across the nation, but to the far corners of the earth, reminding all that copy of the man who gave RTTY life and purpose.

A special committee was appointed, consisting of Harold T'Kach WØLFI, Bruce Meyer WØHZR, Harry Nielson WØKKP, Bob Fincke KØAKG, Bob Wesslund WØAUS and Ed Johnson, BeeP's son-in-law. As Harold was in the Air Force Reserve it was natural that the investigation for a site began here. A happy set of circumstances; an unused old military radio station site complete with building and towers, and a most co-operative Base Commander, make the picture real bright.

So here we are: The WØBP Memorial Station will be a combined RATS-AF MARS

1959 Chicago RTTY Meeting.
The Candid Camera at the Evening Banquet.

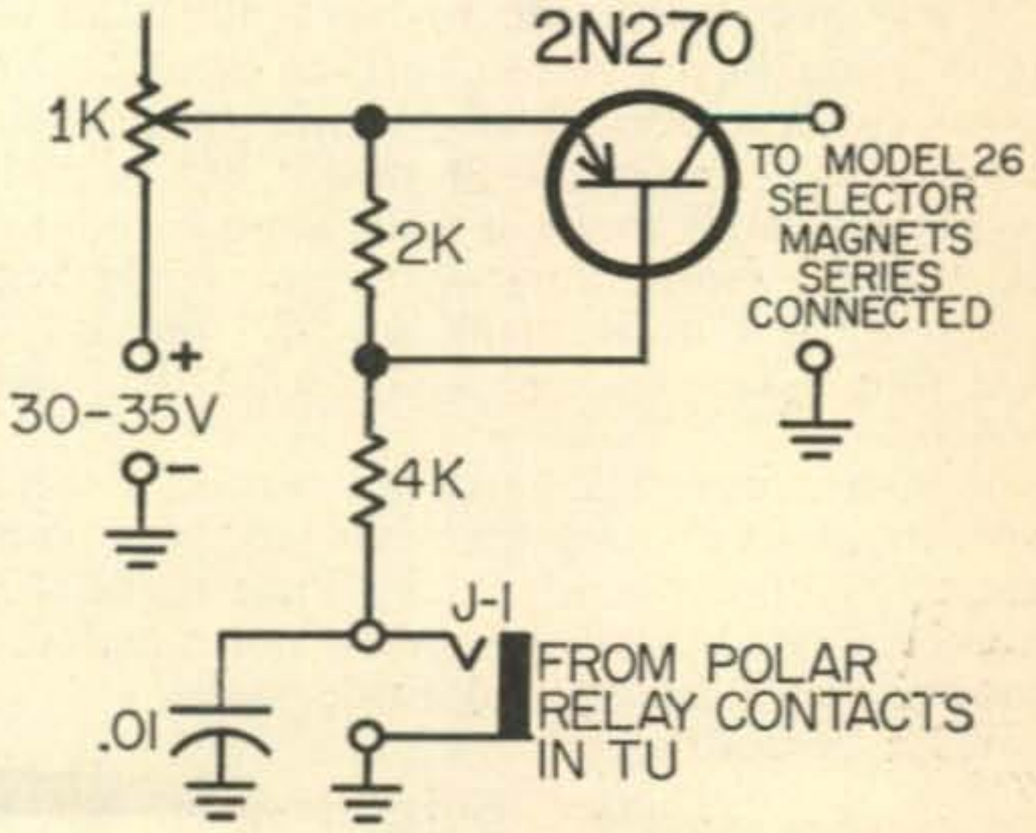


Fig. 1—W2JAV Transistorized Electronic Keyer for Model 26 Selector Magnets.

operation, located on Snelling Air Force Station just outside of Wold-Chamberlain (Minneapolis) International Airport. Five steel guyed towers will support all kinds of flat-top antennas and another tower, similar to a windmill tower, will support a multiband rotatable beam. There will be no lack of equipment. Besides equipment available through MARS, Mrs. Phelps has very kindly offered any or all of BeeP's collection of machines, receivers, and transmitters. The Base Commander, Col. Wood, is especially to be commended for his whole-hearted cooperation in providing such excellent facilities for the amateur radio activity.

Letters of Interest

W6VVF de XE1BI—"Thanks very much for your letter asking by your QSL confirming QSO between XEØBP and your station, W6-VVF. That morning—I was present when BeeP was pounding the machine; as BeeP all the time was operating RTTY very few places were left without an RTTY QSO: He made almost all calling zones: eight, Canada, Chile (for the first CE - XE in RTTY) and Mexico (for the first XE1 - XEØ) also he became the very first American tourist to operate RTTY in Mexico (first XEØ in RTTY).

That morning, I had prepared a tour around the city; first going to a place named Paso de Cortes (the pass that was used by the Spanish conquerors of Mexico). Adolph, WØITQ, and BeeP really enjoyed that trip and all the time this last fellow made jokes.

By the night, I took the log of BeeP and made the cards so BeeP could take the log with him back to the States. It was a Mexican log all written in Spanish so as to make more 'realistic' the operation of XEØBP. I have sent the cards, almost all, but I have a few: BeeP, checking the QSL's saw the addresses were not right in some of them (I had them from the RTTY and Call Books) so I have been doing is to write postal cards to each one asking for confirmation of addresses.

I was very fortunate to have the chance to have living in my house to that great two fellows, Adolph and BeeP. While they lived I enjoyed very much each new QSO of them; each time BeeP made a new State or country, he drinked (sometimes with me or my wife) a cup of a typical drink named 'tequila'; he said that it tasted good so he wanted to make WAS!

I have checked against the cards I have yet with me, and as long as I can see, you are the latest QSO in life, of BeeP. That night, I remember, conditions were very poor and don't know if BeeP could make one more.

With best 73's,

Eliezer Erosa Irabien, XE1BI"

Thank you, Nick, for passing along Erosa's letter.

Bill Brennan G3CQE—"I am writing to thank you for your fine gesture in donating the RTTY Handbooks to BARTG over here. They have been received by Doc G2UK and he asked me to thank you. Perhaps you can realize the great value these are to us—in your editorial you mention you fellas were in the same position there as we found ourselves here. All RTTY info is in extremely short supply. I have my own copy of the RTTY Handbook but since Jim VE7KX sent it over to me it has done several thousands of miles backwards and forwards along the country. It is now much thumbed but I wouldn't part with it for a three el beam! Funny, I could swear I know the book backwards but each time I let it outa my sight darn if I don't need to refer to it! Anyway Byron take it from me your copies are gonna be very busy for a long time to come. We did get some further copies (other than mine) but Doc had to loan em out with almost threats of violence if they weren't returned pronto for the next fellow!

I understand from a letter from Jim today that you would like some mags over here. Just let me know which ones and they are yours. He also says that you would like to be kept up to date with RTTY happenings over here. This I am willing to do if you would like me to. I don't mind a spot of typing now and then. I don't know how much you know of the past history of RTTY over here. BARTG was formed by Doc G2UK and myself (just the two) about May this year. Course it was all started by Jim VE7KX. I wonder if you know why? Personally I owe a great debt to both Jim and Merrill W6AEE for copies of the RTTY bulletin and now from Merrill a Model 26 is on the way. What a grand lot of boys. I know you have done a lot for RTTY through *CQ* Byron. Sorry to say that I just don't see *CQ* here. I have seen a few copies of it but it is rather expensive for us blokes—so is *QST*, mind! Our rate of dollar exchange is not favourable to us buying things from the USA as you probably know. What I have seen of *CQ* I do like very much. Particularly the constructional articles. When a few of my domestic commitments are clear I shall take *CQ*.

Now about RTTY over here. We have about 26 printers all of the Type 3 Creed range. I have sent the details over to both Jim and Merrill. There are keyboard differences but if you need the details write me again and I'll send you some more info. At the moment only Doc and myself are actually active on RTTY here. Doc is only on 3.5 *mc* though he could get *hf* if he chose to. I am active on 10-metres through 80. So far I have only worked Jim VE7KX on 21090. Have had a tryout with Eric VK3KF but as you know he is minus his beam and I was only able to print a few RYs from him. We keep trying. I have exchanged letters with ZL1WB and we are look-

ing for each other. Have not yet worked a W on either 15 or 20! There has been very low activity from you boys there recently. I heard W3CRO testing RTTY on 14340 a couple of weeks ago but he didn't have his receiver turned up I guess. I printed him fine, tho! On the 10th of October I heard several W's on 7140—tried calling 'em but nothing doing—though I had just been given 589 by two W's on 7030 (CW). Anyway, I heard K1MJZ calling RTTY and called him after each CQ praying that no one else would try to go back to him. They didn't and we made it! Still don't know if he believes it or not. Haven't heard from him yet. This last weekend I again listened and heard W1FGL working W4ZGR, both 57/89. Printed several yards of perfect (and I mean perfect) copy from them but they went QRT and didn't seem to hear me calling. Have written to W4ZGR. I had heard him the previous weekend too, this at around 0100-0300 GMT. WØFQY is a friend of mine and we hooked up on 15 meters the other day and he got some printing from me but he is only fixed up to transmit RTTY on the *lf* bands, hi. Have now had three RTTY QSO's with Jim up there though. Doc and I work each other very well on 3.5 *mc*. We only live 30 miles from each other and keep in constant touch. We are expecting to have several more of the G RTTY boys on the air in the next few weeks so there will be more to tell soon. So far Doc and I are pretty lonely! Have got ZC4SR interested in RTTY and he is going to try to borrow a printer if he can get the dope on FSK and a TU and that dope is now on its way out to him. Perhaps that will put a nice easy Asia on the RTTY map!! Sadly miss Old BeeP and proudly keep his printing of my AFSK RTTY (from mag tape in February this year) on the wall of the shack. Hope you will arrange the transmission of that bulletin on 15 too. I am really interested only in DX RTTY so here is hoping for more activity from you boys on *hf*. Would be delighted to keep skeds with anyone. Rig here is 140 watts and the antenna is a V-beam. Countries score has stuck at 233 for three months now—since I got going strong on RTTY building! See you on the air during the RTTY SS. Let me know pse if I can give you any more info. Thanks from all of us again Byron."

FB Bill! Thank you for all the dope. Hope to work you on 14,340 some time.

Bud Schultz W6CG—"Sure has been a long time since I traded any repartee with you. My hours on RTTY seem to be limited to the mornings and week ends. By the time I arrive home at night the RTTY gang has folded up. Don't let this little letter surprise you, OM. I will explain: Am in receipt of a long long letter from Bill G3CQE and from it I will make a quote which is self-explanatory. 'Jim asked me to let Byron know how things were going over here. I wrote to him this morning but this QSO with you folks made that letter out of date. Wonder if you will pass the info about this QSO on to him?' "

The QSO he refers to is our first, completed on October 20th. I heard rumors that ET2US was on RTTY around 21,015 so I was giving the band a look-see when I ran across some fine FSK signing G3CQE. At the time Bill was in QSO with VE7KX so I stood around and bided my time. When my turn came I turned on the FSK with my fingers crossed but Bill was able to make nice solid copy.

Since the 20th we have had a total of four good solid RTTY contacts with him from here.

Actually, we are not claiming anything but are just plain happy to finally have completed WAC on RTTY. I sent my WAC-RTTY cards to Budlong for consideration by the IARU; however, I understand they don't recognize RTTY for this award so I don't have any hopes.

On Saturday after the nice QQSO with G3CQE I managed to have nice solid F-1 contacts with KH6BSH, ZL1WB, and VK3KF so I firmly believe the 15-meter band is open for the season. hi. Eric suggests we rename the RTTY SS or dedicate some activity to the memory of the 'ole BeePer to keep his name alive. Think it is a swell idea, and told him I would pass the word around."

Thanks for the news, Bud. See you on 14,340 some time.

52.6 MC Comments

Last month we talked about the availability of commercial surplus FM mobile radio equipment. Our promotion, of course, was for a real good AFSK autostart RTTY network on 52.6 *mc*. Well, we now have one going in the Twin Cities, and perhaps you might be interested in some of our specific experiences.

First of all, I would like to say a very kind word for the gamma matched ground plane antenna of K4PRL, described on page 55 of the July '59 issue of *CQ*. I used a whip for the top part, as did Willie, and I measured a *vswr* of less than 1.25 to 1 without any trouble. The aluminum ground plane wires I pulled tight, at a 45-degree angle, with nylon lacing twine. These also serve as guys, as it gets pretty breezy in these parts.

We, too, have a Channel 2 TV station here, which causes a few problems. The gamma matched ground plane mentioned above helps, of course. A simple series tuned trap across the coax input I've found successful, and others have used the parallel tuned trap of W8INQ (pg 71, May '58 *CQ*). A real rough case requires the filter of WØHKF as described in the July 1956 issue of *CQ*.

See you all in two months.

73, Byron, W2JTP, KØWMR

SURPLUS

by KENNETH B. GRAYSON, W2HDM
Care of CQ 300 West 43rd Street, N. Y. C. 36, N. Y.

The column last month, covered the general area of what's available as well as desirable in surplus. We originally planned, and actually did, convert the RAO receiver, for this month, if you want to call it conversion. Like many receivers, the RAO is ready to go just as you buy it, since it operates on 115 volts 60 cycles. The RAO covers 540 to 30 *mc* and has a 455 *kc if,* being a superheterodyne. The original receiver, from which the RAO was copied was the NC-100 made by National. Like all of their equipment, this was a fine set. Only one problem, so we've been told, and that was oscillator radiation. This was overcome by adding an extra *rf* stage and good shielding. Oscillator radiation was quite a problem during war-time, since the U-boats used direction finders to home in on the unsuspecting ship using a poor receiver.

OK then, what's to convert? Actually, nothing, in this case. But there is a lot of things NOT to convert and this set is a good example. First, as with any surplus equipment, try to clean up the dirt which has probably accumulated. Start on the inside and blow or wipe dust and corrosion off, scraping if necessary. Q-tips (from the medicine chest) and pipe cleaners come in handy for close corners and between condenser plates. Wipe any wires down and if necessary remove wax from condensers with a screwdriver or knife and clean up with alcohol (rubbing alcohol is fine). This also applies to any excess rosin from solder. Now pull the tubes out, one at a time and dust them off, especially around the grid caps on top, if any. Switch contacts should not be spread apart for cleaning, but instead use a good contact cleaner, such as General Cement DE-OX-ID, available at your local dealer. For cleaning black crackle, we found out a long time ago, that a little Carbona Soapless Lather, and some carbon-tet, mixed half and half and brushed on with a paint brush works wonders. Work a small area at a time, and wipe dry after a couple of minutes with a soft rag or towel.

But now, what not to do to this type of set. Frankly, we'd never think of this approach if we hadn't gotten a couple of requests for help from people who made THE mistake. Like many sets of its day, the RAO makes use of double ended tubes such as the 6L7, 6K7 and 6J7. In these tubes the grid is brought out through the top, and the grid to plate capacity is very low. The sensitivity of these sets, when properly aligned (See Alignment Techniques CQ, May 59) is good, although it drops off somewhat at the high end of the range. In order to improve the gain, the temptation is to rewire the socket for single ended tubes, and then substitute a high transconductance pentode in place of the original tube. (Sometimes the change is to the seven or nine pin miniatures.) As a result, the set usually oscillates or overloads easily, and we get a nasty letter practically pleading for help with tears between each line.

Oscillations can occur in a circuit only when two conditions are met. They are, sufficient feedback from plate to grid so the tube can supply its own signal, and that the signal fed back is in phase with the signal which is at the grid. This can happen easily at certain frequencies in any amplifier. By rewiring the grid near the plate we could easily couple enough of a signal for this to occur. The solution is simple. Leave the original design alone.

Suppose we don't have oscillations. Why should the set overload (distort) on even weak signals. The solution to this is actually two-fold. First, the higher transconductance tubes usually cut off with less voltage on the grid,

and even a weak signal has been amplified quite a bit after it has passed through the *if* stages. Result, limiting, very similar to the FM limiter type *if*. The second reason is the *avc* system. Even a weak signal generates a couple of volts of *avc*. Sometimes even noise will develop enough *avc* to cut off a tube. It also happens that remote cut off tubes are replaced by high transconductance sharp cut-off types, which also give similar problems.

This info also applies to some models of the BC-312, 342 and 348, as well as many of the earlier ham receivers.

Keeping in mind the *if* of the receiver you have, quite a bit of improvement can be obtained by a Q-multiplier. We tried the Central Q-Multiplier in the RAO and it worked quite well, just following instructions.

Stopped over to see K2LGS the other night and he showed me the BC-603 he converted. One of the neatest and cleanest conversions we have ever seen. He used a commercially available power supply which replaces the dynamotor, but we pointed out the safety factor about transformerless supplies. Gus agreed to get a small isolation type 50 watt transformer which made us breathe a little easier, since guys as nice as Gus is what makes up the CQ surplus hounds, and we hate to lose them.

Oops Department

Our draftsman labeled the oscillator tube incorrectly in the BC-733 conversioning October 1959. The correct tube is a 6AU6 or 12AU6 (depending on the filament voltage you want). The drawing is OK, but the label is wrong.

Mail

Many requests are received each month regarding conversions and where to find them. Invariably we answer each and every reply. The exceptions are the few letters that arrive without return addresses. We may not be as prompt as we would like to be, but the letters do get answered, usually by post card. Many requests come in regarding conversions that are not always available. In cases like these we pass the word via the handbook requests and apparently have been very successful to date. This month Al Flitcraft, 41½ East Washington St., Chagrin Falls, Ohio is looking for the handbook for the R-156/ARR-16B. John Farnham of 4736 Violet Avenue, Sarasota, Florida and L. E. Etheridge, Box 254, Reprise, California are both looking for the BC-433 direction finder handbooks. Dick Sowler, W8FEM, P.O. Box 311, Mt. Vernon, Ohio needs the BC-778/SCR-718 manual and conversion. John Cooper in Petal, Mississippi needs the handbook for the BC-797. E. B. O'dell, Carmel, New York needs the BC-1066A instruction book. Harvey Rock, 1865 77 St., Brooklyn 14, N.Y. needs information on the BC-728.

Jonas R. Savage, Rt. 2, Box 900, Vacaville, California needs the ALA-10/ID-274 book. Mike Arnold, W3YDF, Rich Hill Road, RD-1, Cheswick, Pa. needs the BC-684 manual. In Roseboro, N. C., Bill Phillips, Box 42, needs the SCR-300 handi-talkie instruction book. H. W. Lingenfelter, 21352 Kenwood Avenue, Rocky River, Ohio needs the BC-669 book. From over in Sweden, N. O. Theve, SM5PY, Lidgaten 18, Solna, Sweden, needs any conversion information from anyone on the ART-13. C. T. Chadwick, 2450 Teller Street, Denver, Colorado has a couple of GP-7 aircraft transmitters and needs conversion information and handbooks.

Earl M. Coit, 1110 Norwood Street, Kent, Ohio wants the T-9/APQ-2 manual. From France, B. Cical, 8 rue A. Fournier, Chaville (S. et O.) France wants data on the BC-470D. Merle S. McBlain, 7622 Highway 128, Healdsburg, California is looking for the TS-34A and BC-779B manual. Another GP-7 manual is needed by Howard Magill, P.O. Box 506, Sutherlin, Oregon. William Border, 5883 Rhode Island Avenue, Cincinnati 37, Ohio wants handbooks covering the APR-4, TS-92, APX-6 and the BC-925. Thomas Mlynarski, 7610 Pierson Avenue, Detroit 28, Michigan wants the TS-35 instruction book. W. M. Gibson, 843 8th Street S.E., Paris, Texas wants a conversion on the BC-669A. J. D. Gavenda, Physics Building, Room 406, University of Texas, Austin 12, Texas wants the instruction book for the BC-1161. Gerald Martin, 59 Warren Street, Whippany, N.J. needs the TBS Navy Transmitter and Receiver manual, while Bill Rowley, Box 334 RT 4, Huntington, W. Va. wants the RDZ manual. Henderson Rogers, W5MFU wants alignment help for the BC-779 and a manual as well. His address is 6206 Grand Ave., Houston 21, Texas. William Parker, 118 E. Highland, Villa Park, Illinois is in need of an APA-38 handbook.

George T. Anderson, 17 Diane Drive, Vernon, Connecticut can supply many handbooks at a very nominal cost to cover handling and postage. Contact him for that elusive manual. 73, Ken,

W2HDM.

Cryptogram

. . . . . de W9ICF

Mack, like many phone men, seems to have mixed up some of his Morse characters and here is the message we received:

TFVZSO YR IAFTNQSO DON RBU VADTT ASDQ

D NM VFLODT TBUN DON ITSDQ BUZ BX ZAS EDON (DON DTT BCSQ FZ ZBB)

EUZ FZ FV JUVZ VBYS TFN IDTT-FOL IK!

IBQQSIZFBO: AFV SMDIZ HBQNV HSQS, "VUEVIQFES ZB IK."

. . . . . de W9ICF

sideband sideband sideband

SIDEBAND

By: Bob Adams, W3SW
Silver Springs, Md.
P. O. Box 625

WORKED 100 COUNTRY CLUB

Two-Way SSB

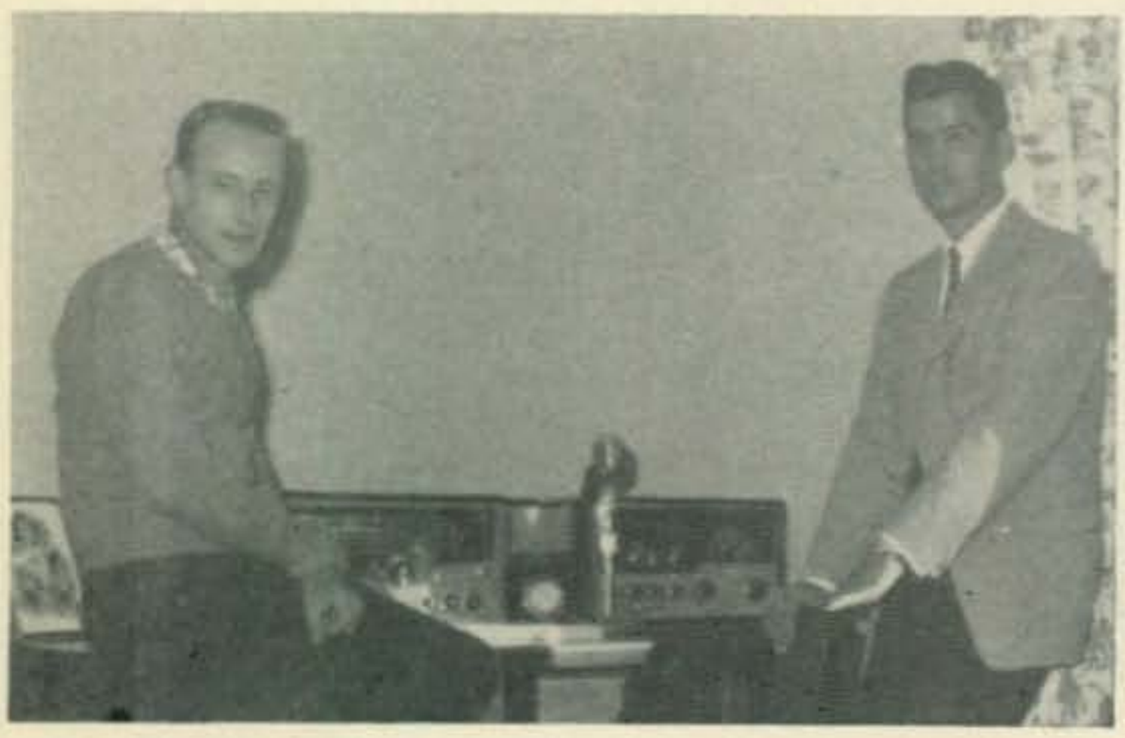
(In order of award)

W6UOU	K2JFV	W7IAA	K7GIE	W1WDD
W2JXH	W1ADM	VQ4ERR	W1LHZ	K6LGF
F7AF	T12RC	W8MPW	W2MA	W3VSU
K6GMA	W2CFT	W3MAC	W6BAY	W1OOS
W3SW	KØABH	W1GR	W5RHW	W9QNO
W4IYC	ZL3IA	W8JXM	K4HXF	ON4DM
T12HP	W6BAF	W1EQ	K2EWB	W2MAF
W8QNF	W2TP	W5FDZ	K2HUK	YV5ABD
W6ITH	W6RKP	W8JXY	VE3ES	4X4DK
VE3MR	PY2JU	W2OTZ	MP4BBW	VK3AHO
W8GCN	W6UPP	W5BGP	W1DCE	DL1VR
W8EAP	W6PXH	W6WNE	W2ATJ	K8EWK
W8YBZ	WØCVU	W6TNS	KZ5WZ	KØCTL
WØQVZ	W4INL	W4HIM	HB9IE	W4OPM
WØFUH	W8YIN	HB9TL	W6ZEN	W8DJP
W8PQQ	TG9AD	K2HEA	W5KFT	W8MXS
ZL3PJ	W3NKM	W7VEU	KØKWY/4	W9CYL
K2MGE	W6QFE	W4CDY	YV5FK	W1TYQ
W2OQO	W8MG	W6TOT	T12EV	W2HMJ
W2VZV	PY4TK	W9HP	W8DMD	
W61AL	K9EAB	W5DA	K2FW	

The Worked 100 Club's membership passed the century mark this month with W8MXS receiving the number 100 certificate. The six new qualifiers are W40PM, W8DJP, W8MXS, W9CYL, W1TYQ and W2HMJ. Congratulations! Incidently, W8DJP's membership makes four stations in one small town area to work more than 100 countries. The others are W8-YBZ, W8GCN and W8PQQ.

Barry, K2IEG tells me that UAØKYA will soon be on SSB in Zone 23. This should make WAZ-SSB possible. Get the certificates ready Urban.

Zone 17 is also on sideband with UJ8OJ making his appearance on 14,319. UF6DC can be found around 1900 GMT on 14,322. Other new sideband stations now active are ZK2AB, MP4TAE, MP4QAO, HA8WS, PZ1AX, VK-ØHA, LA3SG/P, VQ6LQ, GC3LXK, LU5ZL, 9M2DB, 9K2AZ, UI8AB and VU2MD. This very choice list has been worked by Bill, VE-7ZM who is the leading Canadian sidebander. Incidently Bill has a DXCC total of 284 which isn't bad hunting. Jeri and Pat of I5GN have their own SSB rig on the air now after returning W6UOU's "Argonaut." This rig will be next heard from FB8, Madagascar. Ted Henry has sent another SSB exciter to VR1B in the Gilberts. EA8BO will soon be active on SSB from the Canaries. AP2V promises to become more active, which is good news since AP2BP and AP2CR have long since gone QRT in Pakistan. We thank W7VEU and the Willamette Valley DX Club for some of this information.



John, SVØWB, (left) at DL4AS, Mark.

Ralph, 9N1CJ.

Probably the most publicized amateur radio activity to cause many long and frantic pileups is the SSB station in Nepal, 9N1GW. Signals from this exotic country have been expected hourly for more than six months. Many reported contacts with 9N1AC and 9N1AD and even with 9N1AA, which is the call assigned to the King of Nepal. All contacts with these stations definitely were not authentic. The bootleggers sure had a holiday for a long time. The first amteur to operate from Nepal was Glen Ward, using the call 9N1GW. The following information is furnished by Ralph Dennis, W1CJ who will soon be in Nepal with Glen, and expects to sign 9N1CJ. Ralph, whose picture is shown operating W1CJ/3 is an old timer in Ham radio. The station pictured is the Club station for the ACE Radio Club which has been especially constructed to contact the fellows in Nepal. When W1CJ leaves Washington for his long journey to 9N1-land early in January, the Club call will become K3KJF. All QSLs for the Nepal stations will be handled by the Club. Send self addressed, stamped envelopes to ACE Radio Club, Box 9136, Washington 23, D.C. Tapes with all pertinent log information are forwarded to K3KJF weekly.

Because of the intense interest in contacting 9N1GW, it is requested that those stations who have already QSOd him please refrain from attempting to make additional contacts. When Ralph gets on the air as 9N1CJ chances of QSOs will increase. These stations and possibly more will be operating in Nepal for two years or longer. The following is Ralph's report to me of the purpose of the activity and of his own personal plans:

"The Telecommunication Project for the Country of Nepal, which is a small country bordering between India and Tibet will take about 2 or 2½ years to complete. It consists of installation of single sideband radio telephone stations throughout the Country, linked to the home station at Kathmandu, which is the capital of Nepal. This will in turn be linked to the outside world through a similar circuit to New Delhi and Calcutta, India.

Power for all the equipment will not depend on local sources, but will have its own diesel generation units.

Transportation by road to the remote sites is an impossibility, and all material for a complete station will have to be carried by bearers over mountain trails. Distances in many cases is in excess of 200 miles. They are going to have to carry me too for I am not about to walk. This will also call for much camping out each night while on the trail as villages with hotels are non-existent. The problems which we expect to encounter in transporting 750 pound generator plants on human bearers' backs for 200 miles seems like an impossibility but will have to be solved by perseverance and ingenuity. Pack transmitters will be utilized on the trail for communication to base stations.

I expect my call will be 9N1CJ when I start operating there with a Pacemaker and Thunder Bolt combination and a GPR 90- GSB-1 receiver.

There is expected to be six families over there, three engineers on radio and three on telephone installations. My wife Marjorie will accompany me.

Amateur activity there is and will continue to be purely a recreational sideline as this is not an expedition. Amateurs throughout the world must realize time on the air over there is limited, sometimes through power failures and when business duties take precedence.

We have received some very discourteous and insulting letters from amateurs complaining about operation of 9N1GW. Glen cannot possibly answer all those who call him. It will take time as there are many on CW, AM Phone and those outside of the American Band who would like to make a contact. Operation on all amateur bands is anticipated. The load on Glen should be considerably lightened with two of us active soon. Your patience is requested as those of you who have never operated overseas as choice DX cannot imagine what it is like to be in such a spot."

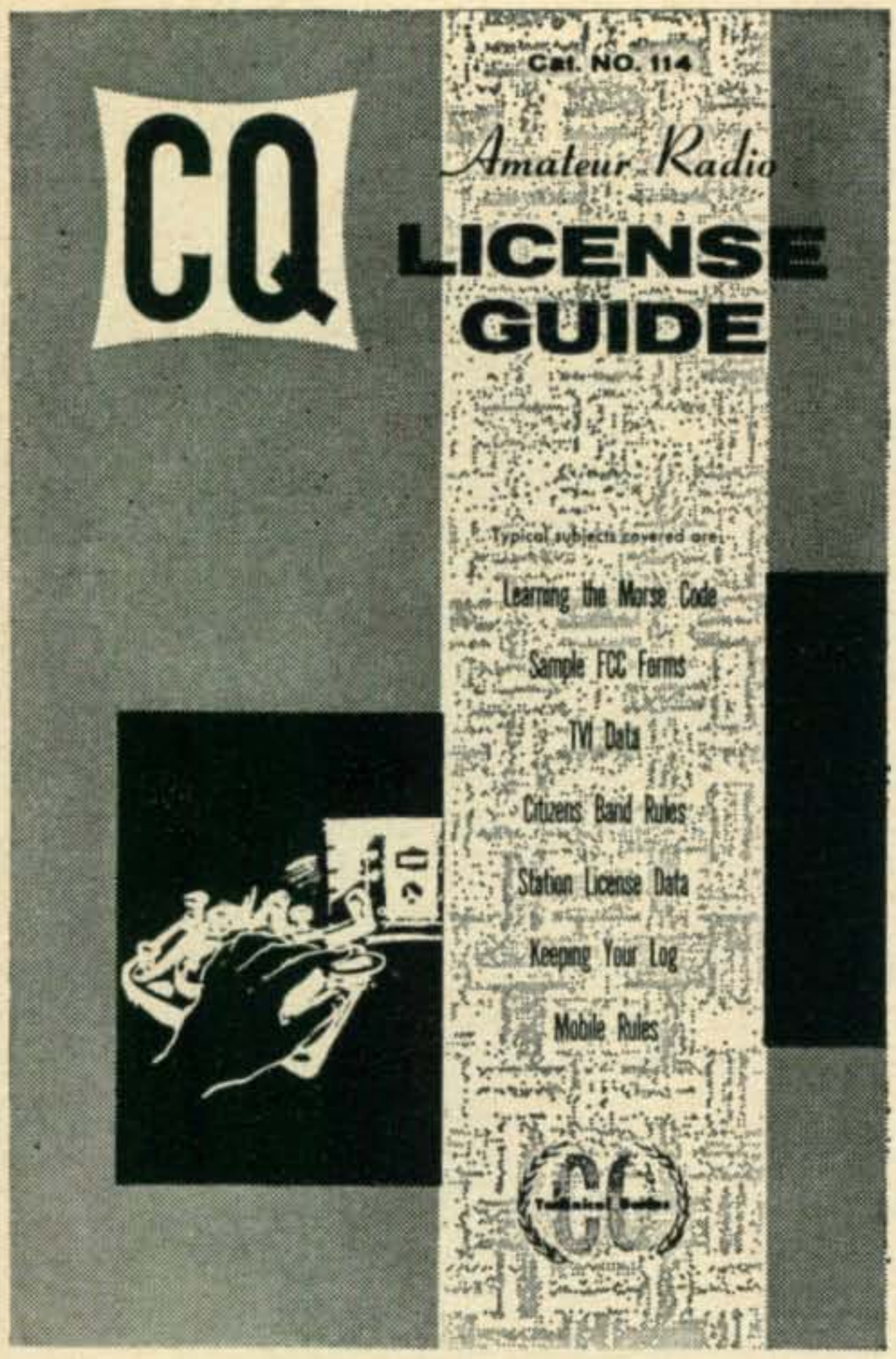
Ralph who is with Advanced Communications Engineering, the organization responsible for the installations is originally from Ashland, Wisconsin. He has enjoyed a very interesting career in all phases of radio, both with the US government and military and also in private industry. Most of his life has been spent in installations of transmitters. He has been contacting 9N1GW from W1CJ/3 nearly every morning and is very familar with the problems now existing in obtaining QSOs with Nepal. Good luck Ralph!

John, SVØWB told me that he will close down in January and reluctantly leave a wonderful QTH on Rhodes. SVØWV will continue side band activity from this spot. We show a picture taken by Mark, DL4AS during a visit to his shack. This is the only photo ever taken of John since becoming SVØWB.

I again repeat the necessity of enclosing return postage and fees for certifying or registering your cards and also fifty cents for cost of mailing the certificates. Most of the ones in the past have been sent in a heavy mailing tube by airmail at my personal expense. To ZL and VK etc this can be very costly. Don't forget to make a list of the QSLs furnished in order of the prefixes to be retained in my files. When applying for higher awards, you will not have to send the original cards.

We have received requests to expand the listings each month of Worked SSB Countries to show the latest confirmed totals similar to DXCC. If there is enough interest I may try to do this every four months with a complete total listing at the end of each year.

73, Bob, W3SW.



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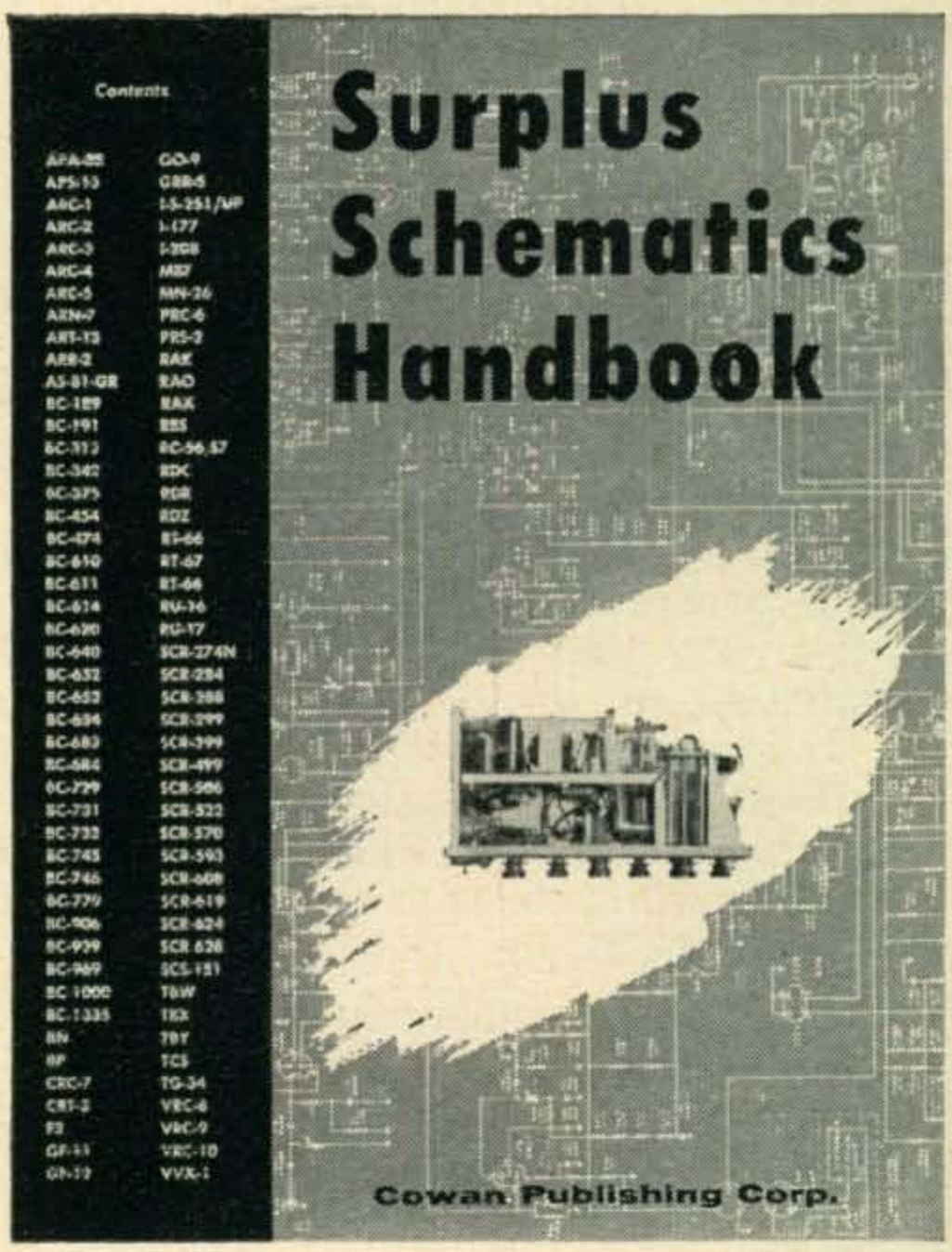

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Amateur Radio Legal Notes

Maurice J. Hindin, W6EUV
6505 Wilshire Boulevard
Los Angeles 48, Calif.

A lawsuit which had an important effect in establishing the law of radio, as it applied to amateur radio, was the case of *Grimes vs. Whitehurst*, 21 Fed (2) 787. The case arose in this way. The City of Wilmore, Kentucky, passed an ordinance requiring all persons, firms and corporations operating a radio broadcasting station, either commercial or amateur, to pay a license tax. The ordinance further provided for penalties for failure to pay such a tax. The tax was not levied on the property of the operator or the stations, as such, but was levied on the activity of radio operation. The Plaintiff Grimes was an amateur radio operator. The Defendant Whitehurst was the Chief of Police, of the City of Wilmore. The lawsuit was filed by the amateur against the Chief of Police to restrain him from enforcing this law. The amateur contended that this law was void as an unreasonable restraint on interstate commerce. The City, on the other hand, contended that it was a valid taxing ordinance and that they could legally tax any activity conducted within their town. The case was tried before the United States District Court.

The court held that the law was void and gave judgment in favor of the Plaintiff amateur radio operator. The Court, in its decision, noted that all radio communications are interstate in nature even though the transmitter is located within a particular state and even though the particular transmissions emanating from the station may not cross state lines. The court held that all radio transmissions of necessity affect interstate radio communications, and that, therefore, radio communications are a part of interstate commerce. The court further held in that case that the Congress of the United States has fully occupied the field of radio communication legislation, and that any local ordinance attempting to regulate the same is void.

It should be pointed out that the tax imposed by the City of Wilmore was not a property tax but was a tax on the activity of radio transmission. Other cases have held that radio equipment, including receiving sets and transmitting sets, is subject to general property taxes just as any other property is subject to those taxes; but this case is highly important in establishing the rule that a city (or for that matter even a state) may not impose a direct tax on radio transmissions.

Another case much later in time followed the law as was established in the *Grimes vs. Whitehurst* case. This other case was the case of *Tampa Times vs. Burnett*, 45 Fed. Supp. 166. In this case, the Plaintiff Tampa Times owned broadcast station WDAE and operated the station in Tampa, Florida. The State of Florida enacted a license tax law, under which it sought to collect taxes from radio broadcast stations. This was an action for an injunction to enjoin the collection of the tax and to enjoin enforcement of the state law. The United States District District Court, for the Southern District of Florida, in this case, followed the same reasoning that was announced in the case of *Grimes vs. Whitehurst*. The court in this case again enunciated the principle that Congress has exclusive jurisdiction over the regulation of radio broadcasting, and a state does not have the right to levy a license tax on the business of radio broadcasting which is being operated under a Federal license and under Federal laws. The court in this case again announced the rule that the Federal Government has exclusive jurisdiction in the field of radio communication, and any tax imposed on such activity constitute an unreasonable burden on interstate commerce. The court enjoined the State of Florida from enforcing this law.

As will be pointed out in other articles in this series, even these important cases did not deter cities and states from attempting, in one way or another, to regulate radio transmissions. Various other regulatory laws have been enacted from time to time by states and cities. How these regulations and laws have fared in the courts, will be discussed in other articles from time to time.

73, Maurice, W6EUV

PROPAGATION

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

Last Minute Forecast

Ionospheric storminess is generally quite prevalent during February. Storms of at least moderate intensity, with the likelihood of adverse affects upon shortwave propagation conditions, are forecast for February 2-4, 12-14 and 23-25.

General Conditions

During February the sun's ecliptic takes it into more northern skies, and closer to the earth than during the mid-winter months. As a result, somewhat less ultraviolet radiation sweeps across the ionosphere during the full daylight hours, causing somewhat lower values of daytime MUF's than occurred during the mid-winter months. On the other hand, because of the increased hours of daylight during February, the ionosphere is illuminated by the sun for a longer period of time, and early evening MUF's will be somewhat higher than during the past few months.

During February static levels remain generally low, but begin to rise from mid-winter levels. Ionospheric absorption also begins to increase during February.

Seasonal changes in propagation conditions during February are expected to affect the *hf* Amateur Bands in the following ways:

6 Meters: Daytime MUF's are decreasing. Very few, if any east-openings are forecast. North-south conditions are somewhat better, and the band is expected to open on several days to South America, and perhaps South Africa. South American openings have a tendency to occur a few hours after sunrise until noon-time, and again during the late evening hours.

10 Meters: Fair world-wide propagation conditions are expected during February from shortly after sunrise through the early evening hours.

15 Meters: Good conditions are forecast for this band for most of the period between sunrise and the early evening hours. Because of the seasonal increase in ionospheric absorption, signals may be weak, or fade entirely on many circuits, during the forenoon period.

20 Meters: With increased hours of daylight the band is expected to remain open somewhat longer into the evening hours than during the mid-winter months. Optimum conditions are expected during the late afternoon and early evening hours, and again shortly after sunrise, when openings should be possible to most areas of the world.

40 Meters: Fairly good propagation conditions during the evening hours are expected to continue on this band. Static levels are expected to remain relatively low during the early part of the month, but should increase in intensity towards the end of the month. Early morning openings to Australasia, peaking just before sunrise, are expected to improve considerably during the month.

80 Meters: No better than fair propagation conditions are expected during the month. The increase in static levels and absorption will be quite noticeable on this band. DX openings, with generally weak signals, should be possible to some areas of the world during the hours of darkness.

160 Meters: During February higher static levels are expected to result in poorer skywave propagation conditions on this band. Openings to about 1500 miles should be possible on several nights, and when static levels are lower than usual, the skip may extend out considerably further. Long distance propagation conditions usually peak on this band between an hour or so before sunrise and about a half hour after the sun his risen on the most eastern end of the circuit.

Charts

The *Propagation Charts* are on a well earned vacation this month. They'll return in next month's issue.

Contest Critique

Propagation information is now available from several ionospheric measuring stations giving a world-wide picture of propagation conditions existing during the recent *CQ DX Contest*. There appears to be unanimous agreement that good conditions were observed during the *Phone* period, from 0200 GMT October 24th through 0200 GMT October 26th. All stations for which information is available rated conditions between 6 and 8 on the international scale (between fair to good to very good). The *CQ* forecast for the Phone period called for "generally good" conditions. The good propagation conditions observed during the Phone

[*Continued on page 106*]

Citizens Radio

Lee Aurick, W2QEX

The comments in this column on the Heath CB-1 seem to have generated a storm of interest among hams and C/Bs. A demonstration before a local ham club may result in a club project to construct these flexible units on a mass production basis. As everyone suspected, this unit is going to be just as popular with hams as with C/Bs. The suggestion that six meters was a distinct possibility brought an immediate reply from WA2GJT. Jim had already made the successful conversion and recommends it for a *high-fun* power rig. Anyone care to try for 2?

Reg Info

Following up the comments on regulations, the mail bag turned up a very interesting document that was ordered recently from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. As many of you know, the Rules and Regulations of the FCC are contained in various parts. Part 12 and Part 19 cover the Amateur Radio Service and the Citizens Radio Service, respectively. Heretofore, these parts have been available separately. Now, under a system adopted last year, the FCC plans to group these parts into volumes and they will be available only in volume units. Volume VI, dated August 1959, covers both of the above services as well as the Disaster Communications Service. Since C/B rules require that applicants have in their possession, at time of application, a copy of Part 19, future applicants *must* obtain this publication. Again, it is available *only* from the above source. Price: $1.25.

The format of the new rules is the best we've seen. It is looseleaf and fits a standard 3-ring binder. Further, your $1.25 entitles you to all amendments; apparently for an indefinite time. These will be issued in page substitution form, so you won't have to bother crossing out lines and pasting in paragraphs.

Remember, this publication is a must for C/Bs, and hams will find it a new and easy way to keep up with amateur rules and also find out more about C/B operation.

Let's take a peak inside.

Subpart D

No changes under Station Operating Requirements, but perhaps we should take a fresh look at the first section, 19.61, *Permissible Communications*. Simply stated: *you may* communicate with other stations in the Citizens Radio Service; you *may not* communicate with stations operating in other services licensed by this country, and positively no contacts with foreign stations. Amateur stations in some foreign countries are permitted to use the 27 *mc* band, and with ionospheric conditions at another peak many are being heard here. Resist the temptation—it will likely cost you your license if you succumb.

Paragraph (C) specifies the limiting of communications to the minimum practicable transmission time. This of course means—no rag chewing and points up further the purpose of Citizens Radio . . . to provide for private short-distance radio communications. . . .

The paragraphs referred to above are really quite lenient, providing you're not attempting to thwart the regulations completely. We have reason to believe that some changes are proposed in this Subpart with the view to a more strict enforcement of their intent. There is little perhaps that can be done about this instance, but it is worthwhile to note that the FCC intends to adhere to its original plans for the establishment of the service.

Antenna Restriction Eased

No—you can't put that antenna above the 20 foot mark, but section 19.25 (c) no longer places a limitation on the distance that the transmitter may be placed from the center of the antenna. It was 25 feet. Actually, this change occurred a year ago, but the amendment was received only a few months ago and there have been too many other things to talk about since. With the new system, we believe that all future changes in the regs can appear in this column at about the time they become effective.

New Coaxial Antenna

For a month now we've been testing a new half-wave coaxial antenna made by HI-PAR Products Co., Fitchburg, Mass. The model CO-27 has proved to be a reliable performer, and what is just as important, it's designed to strain the pocketbook very little more than the raw materials would stand you. It is all aluminum and high grade seamless tubing. The center hub is a really rugged aluminum casting with a built-in, completely weatherproofed coax connector. Extremely light, this antenna is a cinch to mount. Regular 1¼ inch TV masting supports it and it may be mounted with chimney or sidewall brackets. Believe it or not; it weighs 2 lbs., 14 oz. RG59/U cable should be used, but little loss will be encountered with RG58/U. Assembly time: under ten minutes.

New Call Book

International Crystal Mfg. Co., advises that they'll have a new call book out this month listing calls issued up to January 1! They certainly deserve the thanks of all C/Bs for this valuable publication.

[*Continued on page 106*]

VHF

Sam Harris, W1FZJ
P. O. Box 334 Medfield, Mass.

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

Probably the only good thing a good VHFer can do this time of the year is to sit back and take stock of his accomplishments for the year. It always seems to me that I end up with a darn small amount to show for all the effort expended. To make matters worse there always seems to be twice as much to do as there was last stock taking time. Furthermore, the outdoor projects always come during the winter months, while we get our summer tan doing bench work on the indoor jobs. As a matter of fact the Rhododendron Swamp VHF Society members all agree that no antenna will perform satisfactorily unless it is ercted during a snow storm.

Speaking of the R.S.V.H.F.S. and taking stock, I wonder how many of you belong to VHF clubs. It is a real pleasure to receive news about VHF clubs and their activities. Particularly their method of keeping the membership interested. Many of these groups have been in existence since befor the last war. Some, like the Midwest VHF Society and the Mobileers, have rosters over the one hundred mark. Others have less than a dozen members. The important thing in any organization, regardless of size, is to have a purpose. The question is: Are you?

The R.S.V.H.F.S. (Rhododendron Swamp VHF Society) for instance has as its avowed purpose, the advancement of the state of the art as pertains to VHF/UHF communication. We are just a small club (12 members) and sometimes it seems like advancing the state of the art is an unattainable goal. Doesn't stop us from trying however. Prime target (outside of winning 80 meter DX contests) has always been *THE MOON*. We haven't had much luck yet, but we sure have put a lot of effort into it. We aren't making a secret of it. We welcome suggestions and help from all comers and are happy to give out all the information we have. We point out once again that we are not trying on two meters at this time. That doesn't mean we never will but results so far on six and two meters have not been successful. We have heard our own signals on occasion but not with sufficient reliability to permit communication. Prime problems arise from faraday polarization shift and too low E.R.P. The easiest way to beat both of these problems is to go higher in frequency. 220 mc isn't high enough. 420 mc has still got that stupid power limitation. That brings us to 1296. With old fashioned receivers this would have been a poor choice. With paramps it looks like the best possible choice. Sky temperatures are at a minimum. Faraday rotation is negligible. Antenna gain, and hence E.R.P. is possible with reasonable sized arrays. (For instance, an 18 foot parabolic dish can give 30 to 35 db gain.) If you go to the trouble of calculating your chances with a 100° receiver front end, an 18 foot, 35 db antenna, a 100 cps bandwidth and 300 watts output from the transmitter, you find that you will end up with a positive signal to noise ratio.

So there you have our latest project. We expect to be operating in February. You gonna help us???

Spiralrays and Towers

Get lots of inquiries about our Telrex 11 element, six meter spiralray. Well we are writing a report on it and I can tell you right now

that Helen really likes it. The only thing holding up the works is the so far impossible task of getting a picture of it. The best efforts so far might get me 1 libel suit from Mike. The darn thing looks good to the eye but the camera always makes it look like it just blew over in a high wind. We are still trying though, so don't give up.

Meanwhile, the tower business has been booming. The R.S.V.H.F.S. just completed a new 170 foot effort. Tower is one of Rohn's, number 40G. It costs a little more but boy that 18″ on a side baby gives you a real solid feel when you are way up there looking down. The big problem is: What do we put on top? Helen wants 64 elements for six. P. Day wants an 80 meter square corner. What do you think?

Dayton

Sound the trumpets! Shout from the housetops! First news of Spring 1960 "HAMVENTION" has come through.

Larry Brandenburg, W8TEK, is the new VHF sessions moderator, and after seeing Larry in action just "helping out" for the past few Hamventions, I shudder to think about the way he and the other poor Dayton VHFers are going to be running around for the next few months. Larry has the knack of "getting things done."

He has just one comment so far—"you said it couldn't be done again Sam, but we're going to do it and better—wait and see!"

Now is the time fellas! When you read this sit down and write Larry immediately for either reservations or information, Preferably reservations, as I expect to see every VHFer this side of the Missouri at Dayton in the Spring. Hope that many, many more of you make it too, 'cause you just "man't miss" on this one.

Susquehanna, Pennsylvania George Vacca, Sr., (K3HRF) sez: "Six meter work is going very strong here in Northeastern section of Pennsylvania. Three new stations will be on the air for a total of nine stations in Susquehanna County. Our local AREC control is K2ERQ in Binghamton, New York, with station K3HRF acting as Susquehanna County Net Control. Anywhere from forty-five to sixty stations are checking in every Friday night at 2100 at 50.4 to area Net Control H.Q."

"Two meter work is going very good and should find fifteen to twenty-five stations on two meters in this area in the next four to six weeks."

"No F-2 openings to speak of from this area but ground wave conditions of 100-275 miles are fairly good with a lot of the upstate New York stations (K2IXN, K2ZBU, K2QWD) doing very well in Eastern Pennsylvania."

"K2RRM/2 is doing by far the best local six meter work from the new portable location. Doc is covering four hundred to six hundred miles with no trouble; his location is over 2050 ft. above sea level and K2RRM/2 will be on two meters and 1¼ meters by contest time." *Very good to get this news from your area George, and continued good luck to all of you.*

Canoga Park, California Denny Williams, (K6UMM) comes through from Canoga Park with:

"Just a line to let you now what's happening on six meters in the Los Angeles area. To put it bluntly—nothing. The band has been just about dead."

"On November 17th at 0854 PST., I worked W4FT and at 0930 PST., worked K2TYW, both coming in about 4-6 copy. Nothing from the East coming in from that day until now."

"The 28th of November at 2040 PST, I talked with W5HOI, Mina, and her O.M., W5HOD, Gene, in Amarillo. Only other station which came through was Phil, W5SFW."

"I've added an HRO-50T receiver and a Tapetone converter to the shack. Both work real fine."

"Was heard in Argentina on November 5th around 1037 PST but heard nothing here." *Looks like it's about the same all over Denny, band is just about the same condition in this area.*

Lancaster, Pennsylvania Good ole George, (W3FEY) comes through with some 220 mc news:

"I am preparing a list of all stations on 220 mc and up that I can get information on. How about asking the boys active on the bands above 220 to send me dope on their stations, and usual operating hours? *All right fellows, consider yourselves asked, and send the information to George at 858 Eden Rd., Lancaster, Pa., at once.* Anybody that wants a copy of the resulting list should include a stamped self addressed envelope. Have patience, this project will probably take several months."

"I have 1296 mc gear built by W1WID ready to go on 24 hour notice. (Antenna is down at the moment.) *Well this is no weather to be gettin' it way Up thar!* I have worked W3ARW on 1296 and would like schedules with other stations within reasonable range. (150-200 miles)."

"Have been hearing Northern New Jersey stations regularly on 220 but haven't had any luck raising them in the past few weeks. I am on every night at 2130 EST for a schedule with K2CBA and I check NNE about 2145 each night. Frequencies, W3FEY-220.17, K2CBA-220.01. I also check 432 mc at 2200 EST whenever possible. My frequency is 432.17."

"W1IJD (KF1FN) will be on 50 mc from Fletcher's Ice Island during the month of February, probably with a KL7 call. (Ice islands move don't they?)" *Your guess is as good as mine George, and I imagine you're right. Thanks for the quantity and quality of your news. All most interesting to the VHF fraternity.*

W1TQZ inspecting the declination bearing. W1FRR, W1OOP, W1HIV and Larry Peavy give advice.

Frank Le Baron (W1TQZ) installs the declination bearing on the 1296 mc polar mount at the R.S.V.H.F.S. A complete run down on this antenna mount is in preparation. Design and construction was done by Frank.

Tucson, Arizona Finally came across a letter from "out that a way," and who should it be from but Jerry Walker (W7FGG).

"We are very glad to see your suggestions for SSB on VHF. We feel it is a very good idea and have just finished converting to high level mixers and SSB operation."

"We are now on SSB on 50, 144, and 220. (*Whew!*) The Pacemaker is the SSB generator on 14 mc or 28 mc with no noticeable difference."

"On 50 mc, a 6146 mixer drives a pair of 4.25A's. A 6U8 OSC and AMP runs on 36 mc. On 144 mc, two 6146's serve as a mixer to drive 4-125A's which loaf to drive a 5762 GG AMP. On 220, a 5894 operates as a mixer to drive a pair of 4X150A's, later to be followed by a pair of 4CX300 GG. Naturally cw is available as well as SSB, and by injecting carrier AM is available (*under duress?*) for non BFO stations."

"With the exception of the 220 rig which was built with a high level mixing deal in mind, all the other rigs originally went straight through and were converted. We get SSB into the screen with a non ind resistance serving as a load since very little SSB is needed, and most generators today would deliver far too much. This does away with any tuning necessary in the screen."

"Incidentally, we have a 64 element 8 of 8 ele tiltable antenna, but for some reason we don't get anything back on Moon Bounce on 144. The converter is 416B and power is full kw. The antenna shows by comparison about 22 db gain. Still no return. Would like to try skeds and are available nights and week ends. Have low frequency gear available for liaison and information exchange. All low bands are available SSB, CW, or AM. Open for skeds on 50, 144 and 220." *Very, very interesting Jerry! Shows how much time and effort you have put into your VHF. Keep up the good work and be sure to keep us informed.*

Dayton, Ohio From the home of the now famous "HAMVENTION," and from the boy that made the VHF part of it famous, Ev Taylor (W8NAF) comes forth with: "New officers for the 'Dayton Amateur Radio Association' voted in on December 4th, 1959, were—

Pres.
W8ZCV (50 mc-144 mc—220—420—TV)
V.P. W8ARC (50-144)
Secr. K8BPC (50-144)
Treas. W8INQ (50-144)
Direc. W8GFN (50-144)

"Attendance at the meeting was 180, a total of 139 votes were cast." *Hey, gang! Can your club make such a claim?*

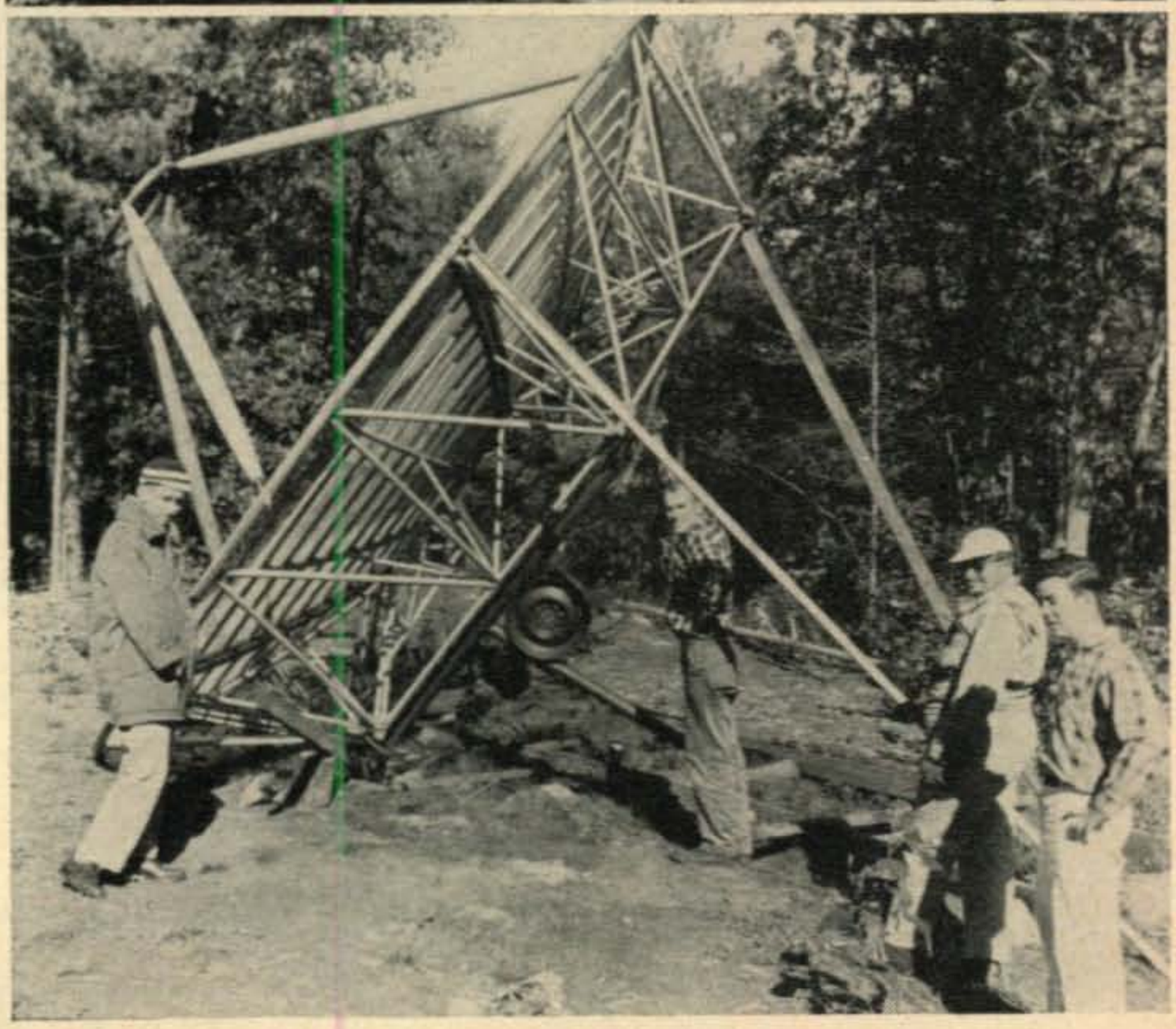
"Have been working on a new converter and it seems to be quite the thing. Watch for it!" *We will Ev, if it comes from Hamvention town, and VHF NAF, it's got to be good.*

73, Sam, WIFZS

Installing the Polar Mount for the 1296 mc dish at the R.S.V.H.F.S. Larry Peavy inspecting the polar bearing. Frank (W1TQZ), Fred (W1FRR), Henry (W1OOP), and Paul (W1PYM) in attendance.

The declination axis swinging into place. W1TQZ up. W1FRR, W1OOP, W1HIV, W1PYM and Larry holding the rope. 18 foot Kennedy dish ready to mount at lower right.

The Dish ready to be hoisted into place. Paul (W1PYM), Frank (W1TQZ), Henry (W1OOP) and Fred (W1FRR), looking pretty for the photographer.



YL

by Louisa B. Sando, W5RZJ
212 Sombric Drive, Santa Fe, N.M.

Calling All YLs

To the 2nd Annual California YL Convention, to be held at Sacramento, March 4-6, 1960. These also are the dates of the Camellia Festival. The convention will be held at the new El Mirador near downtown Sacramento. Plans include an open house party at the hotel Fri. night, the Camellia Show on Sat. A.M., YL luncheon at noon, and a dinner for YL's and OM's Sat. evening. Hostesses for the Convention will be members of the Camellia Capital Chirps with K6ENK, Wanda, chairman.

W6WRT—Silent Key

It is with a heavy heart we record here that Ruby Word, W6WRT, joined the Silent Keys on Oct. 12, 1959. Ruby became W9TAB in 1941, a year after OM Harl went on the air as W9HDK. A move to Calif. brought them the calls W6WRT-W6UTZ, and during WW II Ruby worked for Fletcher Aviation. They returned to Missouri in '46 and operated as WØTAB-WØHDK, but in '51 once again became W6WRT-W6UTZ. Ruby joined YLRL in '41, was a charter member and past secretary of L.A. YLRC and had served as custodian of the club's Lads 'n Lassies certificate. She held YLCC (400), WAC/YL, WAS/YL, DX-YL, WAYL (So. Africa), and many YL club certificates. Ruby and Harl have one jr. op, 14-yr. old Robert.

To this YL, as to all who knew her, W6WRT was a sincere, loyal friend—one who will ever be remembered.

W6WRT, Ruby Word

"Howdy Week" Contest

"Howdy Week," initiated in Sept. '59 by YLRL V.P., Gladys, W6DXI (now president), had as its main purpose the opportunity for YLs to get better acquainted. Those who participated felt there just weren't enough YLs on, but maybe more will get into the swing of it next year. Winner in the contest was W6QGX, Harryette, with 176 points. Next high scores: K5BNQ, 136; K4RNS, 131; K9QGR, 106.

WAS/YL, DX-YL Rules

W6DXI wishes to clarify the status of Hawaii in regard to the above awards. Since Hawaii officially became a State Aug. 21, 1959, WAS/YL will require 50 confirmations for the certificate as of that date. As of that date, also, Hawaii can no longer be counted as a DX contact for the DX-YL award.

Awards to K6IKF

For six nights out of seven, K6IKF, Gil George, runs phone patches between 10 and 12:30 p.m. PST. Regular skeds include Adak, Okinawa, Eniwetok, Parry Is., Midway and the South Pole. She also picks up patches from Greenland, Alaska, Guam, Hawaii, and ice cutters in the Arctic Ocean. In the last two years these patches have totaled about 3000. For her devotion to her task, Gil received four different citations this past summer. The last was brought to her by an operator from KX6BP, and is a framed photo of an atomic bomb explosion in the water. Hand painted in the lower corners are pictures of Gil and her OM, K6CHA, and it bears this inscription: *Gilberte George, K6IKF, has devoted extraordinary time and effort to provide us with excellent communications to our families and friends via Amateur Radio; has been diligent and faithful in meeting our schedules and has at all times shown patience and understanding. We award to Gil the ATOMIC GOLD MEDAL OF HONOR. With best wishes and sincere appreciation from the men of Holmes and Narver at the Eniwetok Proving Ground, Marshall Islands, July 1, 1959.*

All of K6IKF's work is done on 20m SSB, running about 500 watts to a 65 foot high beam. Licensed since 1955, Gil works during the day as secretary to the CD director of Pomona and she also is in RACES.

11th Annual YL-OM Contest

Phone: Starts Sat., Feb. 27, 1960, 1:00 p.m. EST. Ends Sun., Feb. 28, 1960, 12 midnight, EST.

CW: Starts Sat., March 12, 1960, 1:00 p.m. EST. Ends Sun., March 13, 1960, 12 midnight.

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

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

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

Exchange: QSO number, RS or RST report, name of State, U.S. Possession, VE district, or country.

Scoring:

a) Phone and CW contests will be scored as separate contests.

b) One point is earned for each station worked. YL to OM or OM to YL. A station may be contacted no more than once in each contest for credit.

c) Multiply the number of QSOs by the number of different States, U.S. Possessions, VE districts, and countries worked. (Maryland and the District of Columbia count as one State.)

d) Contestant running 150 watts input or less at all times may multiply the result of item (c) by 1.25 (low power multiplier).

Logs: Copies of all phone and cw logs, showing claimed score, must be postmarked not later than March 31, 1960, and be received not later than April 15, 1960, or they will be disqualified. Please file separate logs for each mode of operation. Send logs directly to YLRL vice-president Lillian E. Beebe, W5EGD/3, 923 Kent Ave., Baltimore 28, Maryland. Be sure to include Zone Number.

Awards:

YL First place PHONE — cup
First place CW — cup

OM First place PHONE — cup
First place CW — cup

The winner of the Phone cup is also eligible for the CW cup. Certificates will be awarded to high place Phone and CW winners in each district, U.S. Possession and country.

WRONE—3rd YLRL Convention

These days you can't speak of one without the other! Many WRONE members and guests enjoyed luncheon at the Towne Lyne House, Lynnfield, Mass. on Nov. 7, planned by committee members K1IZT, W1TUD and W1HOY. The WRONE certificate was presented and it is now ready for all who earn it (see Aug. CQ for rules). The custodian: K1EAV, Belle Bunney, 47 Pine St., No. Billerica, Mass. WRONE's Executive Committee for 1960 was announced: Chairman W1HOY, Helen; members, K1ADY, Mary; W1COL, Marie; K1GPE, June, and W1UKR, Eunice.

The forthcoming 3rd International YLRL Convention (June 17-19, 1960, Cambridge, Mass.) was main topic of the meeting and all committees reported great progress. On display was the hairpin lace afghan (convention prize) and the first three squares, embroidered by YL clubs, returned for the prize bedspread (Floridora, LARK, HAWK). (Tickets for the spread and afghan are 25¢ each and may be obtained from any YL club or from Chata Swenson, W1RLQ, Box 193, Morningdale, Mass.) Convention plans include special entertainment for the OM's, with this committee in charge: W1FZJ, K1GUU, K1HTK, W1RCJ.

New YL Club

Another brand new YL club to report. It is nameless at this writing (mid-Nov.), but its location is St. Louis, Mo. Club officers: Pres., WØMRJ, May; V.P. and Program Chm, KØMAS, Libby; secy, KØOSC, Polly; treas., Lora Euler. Aims for the club are to increase members understanding of radio and to give help to other women interested in becoming Hams. The gals extend an invitation to anyone in the St. Louis area interested in the club to obtain additional information from the secretary, KØOSC, at 2025 Maury Ave., St. Louis.

TYLRUN Party

The WHO club of Ft. Worth entertained members of TYLRUN on Nov. 7 for the net's

[*Continued on page 110*]

Gil George, K6IKF.

CONTEST CALENDAR

by Frank Anzalone, W1WY
14 Sherwood Road, Stamford, Conn.

Last Minute Report
REF CW starts 1300 GMT, Saturday, Feb. 27.
Ends 2100 GMT, Sunday, Feb. 28.

January	30-31	CQ WW SSB
February	5- 7	ARRL DX Phone
"	12-14	QCWA Party
"	19-21	ARRL DX CW
"	27-28	YL/OM Phone
March	4- 6	ARRL DX Phone
"	11-13	CQ 160 CW
"	12-13	YL/OM CW
"	18-20	ARRL DX CW

CQ WW SSB

Starts: 18.00 GMT Saturday, January 30th.
Ends: 18.00 GMT Sunday, January 31st.

Check Bob Adams, W3SW column for the past two months for all the details on this one. With the ever increasing SSB activity, this promises to be a real "humdinger."

ARRL DX

Phone

Starts: 24.00 GMT Friday, Februray 5th.
Ends: 24.00 GMT Sunday, February 7th.

CW

Starts: 24.00 GMT Friday, February 19th.
Ends: 24.00 GMT Sunday, February 21st.

The second half of each contest starts and ends at the same time shown above on their respective dates. March 4-6 for Phone and March 18-20 for CW.

This is the 26th year for this DX competition which just about makes it the granddaddy of them all.

It's the world working the United States and Canada, and for the first time Alaska and Hawaii too, now that they are states, making a total of 21 call areas that can be worked by the overseas boys.

So KL7s and KH6s take note. You can now concentrate and work DX only. W/VE contacts do not count. This should make a certain group of KL7s happy.

But enough—if you must have more information, write to the ARRL Comm. Dept. They will also be happy to supply you with log forms, for free too.

QCWA Party

Starts: 16.00 PST Friday, February 12th.
Ends: 16.00 PST Sunday, February 14th.

Once again the Northwest Chapter of the Quarter Century Wireless Association is sponsoring a party for the Ole Timers.

This is not a contest but a wonderful opportunity for the boys, who have been pounding brass for the past 25 years or more, to renew old acquaintances. Of course some of them have joined the "duck quackers" but in any event you will find them on the following frequencies.

BAND	CW	AM	SSB
75/80 M	3655 *kc*	3950 *kc*	3990 *kc* LSB
40 M	7125 *kc*	7210 *kc*	7205 *kc* LSB
20 M	14110 *kc*	14240 *kc*	14280 *kc* USB
15 M	21100 *kc*	21340 *kc*	21415 *kc* USB
10 M	28100 *kc*	28900 *kc*	28675 *kc* USB
6 M		50200 *kc*	

When contacting a fellow QCWAer, you can exchange contact number, signal report, QTH, your handle and National QCWA Nr. Of course your log should indicate the time, frequency and etc.

The Northwest Chapter does not solicit logs but they will be happy to receive your reports. No awards are planned but I bet if they receive enough logs, the "Top Banana" will get some kind of an award.

Send your logs to the Club Secretary, Dr. F. Clifford J. Spike, W7OS, 1015 Medical Arts Bldg., Tacoma 2, Wash.

YL/OM

Phone

Starts: 1.00 PM EST Saturday, February 27th.
Ends: 12.00 M. EST Sunday, February 28th.

CW

Starts: 1.00 PM EST Saturday, March 12th.
Ends: 12.00 M. EST Sunday, March 13th.

This is the 11th annual running of this contest. Louisa Sando, W5RZJ tells you all about it in her column this month.

CQ 160 CW

Starts: 9.00 PM EST Friday, March 11th.
Ends: 9.00 AM EST Sunday, March 13th.

The idea for this contest was suggested by VE3BWY in W1BB's 160 Meter Bulletin. Stew Perry, W1BB and Charlie O'Brien, W2EQS worked out the rules. Our Hon. Editor, W2NSD gave us the green light.

[*Continued on page 108*]

3 of the Finest AMATEUR TRANSMITTERS BUILT

SAYS LEO I. MEYERSON, WØGFQ, PRESIDENT OF

"the house the hams built!"

Here are three handsomely designed, commercially constructed, high 'watt per dollar' transmitters from Globe Electronics, . . . for the novice and the advanced ham. These are just a few of the great Globe Products carried in stock by World Radio, the "World's Largest Distributor of Amateur Radio Equipment". You'll always find at World late serial number equipment from the nation's leading manufacturers of all ham gear. The next time you buy, I invite you to check first the World Radio deal . . with high trade-in guaranteed on your present equipment.

GLOBE CHAMPION 350

A 10-160M single knob bandswitching Xmttr. for operating SB without sacrificing top AM performance, 350w CW, 275w AM, 450w SSB (PEP) with 10w external exciter. Filtered keying circuit virtually eliminates key clicks. Built-in, highly stable VFO with new dial drive, "smooth as glass" and non-slip. Adjustable bias control for SB operation. Extensively TVI-suppressed, filtered and by-passed. High level class B modulation without usual clipping distortion. Pi-Net output, 48-300 ohms. Push-to-talk, antenna changeover relay, etc.

$49.50 down
$22.28 per mo.
Or $495.00 net

GLOBE SCOUT DELUXE

A versatile 90w CW, 75w fone transmitter of smart modern design, packed with top performance features. Bandswitching 80-6 meters, straight through operation of final on ALL bands; high efficiency and output on ALL bands, panel adjustment of loading on ALL bands. Pi-net matches 50-300 ohms on 80-10, and 50-75 ohms link output on 6 meters. High level plate modulation using new husky 7027A modulator tube. Just plug in VFO or crystal. Dual Xmttr./VFO keying provisions for CW. More output on 6 meters than some exciter linear combinations. Extensively shielded and filtered with separate final RF shield and built in power supply and many other features.

$15.00 down
$8.70 per mo. $149.95 net

GLOBE CHIEF DELUXE

Also features the compact-modern design. 90 watts CW for the advanced CW enthusiast or novice (at 75w input). Choice of cathode or bias keying; — no rewiring to use external 755A VFO, UM-1 or SM-90 modulators . . . just plug in. Built-in power supply. Husky parallel 807 final for time-proven performance. New design Pi-Net for extra wide-range matching and standard coax output terminal, relay voltage and other features. Easy multi-color kit diagrams for simple assembly.

Wired: $79.95
$8.00 down $5.00 per mo.
Kit: $59.95
$6.00 down $5.00 per mo.

PAY ONLY 10% DOWN ON ALL EQUIPMENT

TOP RECONDITIONED EQPT. FOR THE ECONOMY MINDED

EASY TIME PAYMENTS

PROMPT SHIPMENTS

23 HAMS HERE TO SERVE YOU

FREE 1960 CATALOG 200 Pages of Ham Bargains

LEO: RUSH ME ☐ FREE CATALOG ☐ LATEST RECOND. EQPT. LISTS, AND COMPLETE INFO ON THE GLOBE ☐ **Champ** ☐ **Chief** ☐ **Scout**

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C-2

NAME: _____ CALL _____

ADDRESS: _____ CITY & STATE: _____

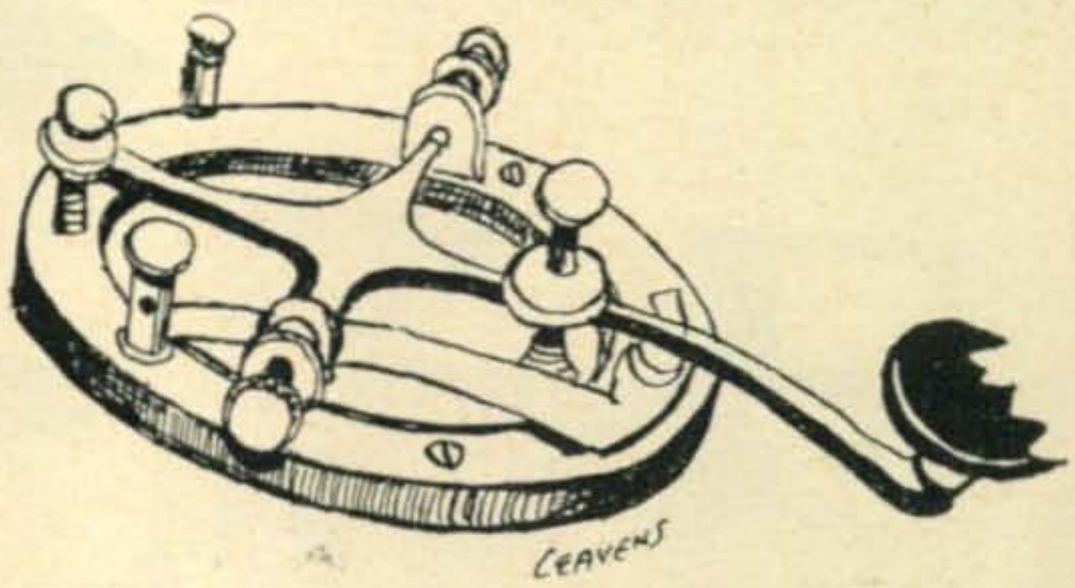
For further information, check number 24 on page 126.

CLUB BULL. [*from page 12*]

BCARC was given a wonderful demonstration of the new wonders of RTTY by Dick, W3CRO, Engineer, and Phil, W2JAV, President of the So. Jersey Radio Ass'n.—(The Xmitter), *Bucks County A.R.C.* Last meeting concerned a talk on T.V. Servicing by Tom, G3HGE. Next meeting will be judging the exhibition of home-constructed gear for grand prize.—(Lea Valley Reflector), *Enfield Group R.S.G.B., England.* Lt. Colvin and XYL will talk about "Travel, DX, and Amateur Radio". Colored movies of their Caribbean trip to be shown.—(Standing Wave News), *South County A.R.S.*

Hope this helps you, chaps.

73, Marv. VE3DQX



SCRATCHI [*from page 10*]

must agreeing I reely having loud dot on air, you not thinking?

Now, only trubble I having is that very difficult to have QSO. Oh, I trying, Hon. Ed. all rite. First I sending reel fast dash, then wateing one second, then sending dot, then wateing one second, and sending fast dash, then dot. In no time at all sending seek-you. Trubble is, nobuddies listening are thinking anybuddies sending that slow.

That's where needing your help. Wanting to organize all amchoors into SAPS. So, please, reel-quick-like, telling all reeders of your Hon. Mag. that here are how they can being SAPS.

First, increesing power so single dot being full kilowhat as read on plate meter. Next, get on air, and send one dot or dash per second. Be surely to wateing one full second, so input not going over one kilowhat. Hon. Ed., that's all there is to it!!

Now you seeing how SAPS solving all problums. If everybuddies wateing one second between dot or dash, there being lots more spectrum space. There even being time in the one second that you are wateing for some other amchoor to come on and transmit during that second, and be wateing during second you transmitting. So, saving spectrum space like fury.

Second, everybuddies can read see-w at that speed, on acct. one dot or dash every other second is six characters per minute which samelike one words per minute. This meening on amchoor bands that every QSO is copied 100 percent!!

you get Henry's DOUBLE DOUBLE Guarantee of SATISFACTION WHEN YOU TRADE UP TO Collins KWM-2 TRANSCEIVER

Guaranteed by Both HENRY and COLLINS

OTHER COLLINS MODELS—

MODEL		NET PRICE
KWM-2	SSB Transceiver	$1095.00
30S-1	Linear	1470.00
32S-1	Transmitter	590.00
516F-2	AC Power Supply	105.00
516E-1	12V DC Power Supply	262.00
75S-1	Receiver	495.00
312B-3	Speaker	27.50
312B-4	Speaker Console	185.00

Cash Price $1095.00
$109.50 DOWN
20 Monthly Payments of $54.75

HENRY gives you the finest terms and service.

Top Trade-Ins . . . We plan to top **all** offers! Your present equipment makes the down payment. Write for offer.

World's Best Terms . . . 90 days open account or 10% down—up to 20 months or longer. We finance. Payment within 90 days cancels all interest. Write for details.

Personal Service—Fast Delivery . . . Your inquiries and orders handled same day. Write, phone or wire.

Complete Stocks . . . Henry has everything in the amateur equipment field, new or used . . . transmitters, receivers, beam antennae, rotators, etc.

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"World's Largest Distributors of Short Wave Receivers."

For further information, check number 26 on page 126.

Thirdly, everybuddies can using reel high key-down power. Everybuddies having Arizona Kilowhat rig.

Don't wasting any time, Hon. Ed. Be surely everybuddies know about this, because Scratchi wanting to have his first QSO with other SAPS.

Respectively yours,
Hashafisti Scratchi

RELAYS [*from page 60*]

volts. Relays seem quite tolerant of voltage and current variations from the published ratings, so don't worry if the values you have available are somewhat different from what "the book" calls for. Even though the voltage measures low, if the relay closes and stays closed, you have no problem. You may, however, have to adjust the spring for proper operation. If you have a higher than required voltage, just check the relay coil to make sure it isn't overheating. And, of course, lower voltage relays could be used in circuits where only lower voltages are available.

Be careful to by pass the leads going to the relay to keep *rf* out of the modulator. In our circuit, the leads are bypassed at the modulator and again at the relay with .001 mf ceramic disc capacitors. Proper bypassing becomes even more important when this system is used in *rf* circuits, such as the final of a transmitter. In all cases, shielded cable should be used from the cathodes to the relay. The shield is grounded at the chassis and thus provides the ground return for the relay-cathode circuit.

All I can add, men, is that the scheme *relay* works! ■

Answers to Anagram
on Page 61

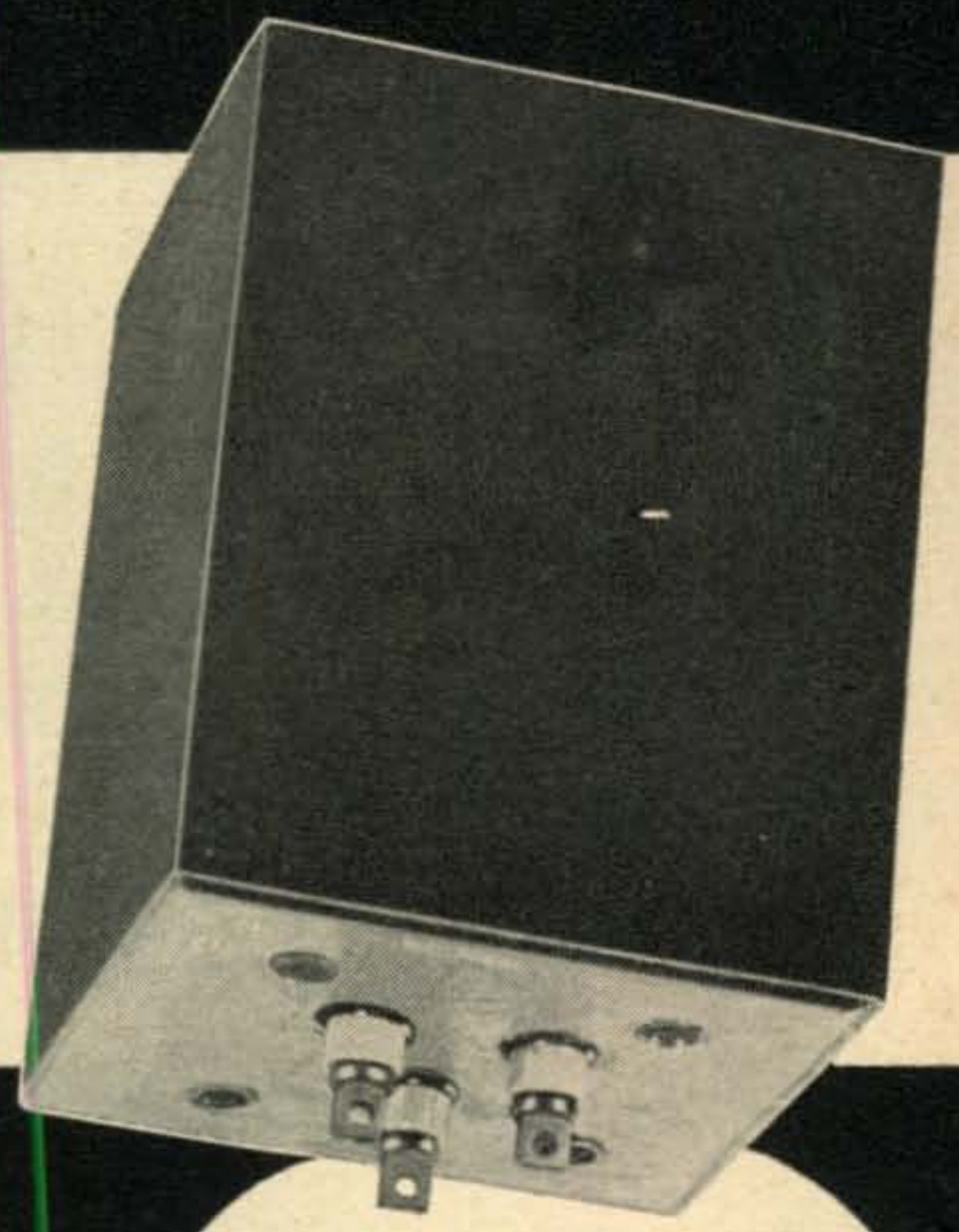
AGAIN AVAILABLE AT

HARVEY RADIO

TOROID
LOW PASS FILTER

Low pass audio filter that contains 5 Toroidal coils in an L/C network — Pass band 300 to 2,500 cps ± 3 DB — Extremely sharp cut off at 3,200 cycles — Impedance 600 ohm in and out . . .

Weighs 3.6 lbs.
Dimensions: 3⅜" x 3⅜" x 5"



- Handle up to 25 to 30 watts of audio
- No maintenance
- Better than a Speech Clipper

AN UNBEATBALE VALUE! WORTH TWICE THE PRICE

You can put it to use in so many ways—

- ★ In single side band applications
- ★ In 500 ohm line from speech driver to modulator
- ★ In 500 ohm receiver output
- ★ As a telephone line filter for broadcast stations

ONLY **$9.95** F.O.B. New York

Take advantage of this sensational *below manufacturer's cost* offer. It's the buy of a lifetime you can't afford to miss. Order by mail today.

Send check or money order Inclusive of shipping charges to

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103 West 43rd Street, New York 36, New York

For further information, check number 27 on page 126.

In Stock . . . for Immediate Delivery . . .

GLOBE'S VHF HI-BANDER 6 & 2

Here's a complete, band-switching transmitter for 6 and 2 meters, 60w CW, 55w AM fone. 52-72 ohm coaxial output matches all beams and most doublets. Has variable antenna loading control. Uses regulated screen supply. Four stage RF section, all metered, allows straight through operation. Harmonic and TVI-suppression. Reserve power for accessory operation from chassis rear socket (VFO, speech clipper, relay, etc.). Provisions for antenna changeover relay. Suitable for mobile use; provisions for plug-in power supply. New duo-band final tank circuit eliminates switching and increases efficiency.

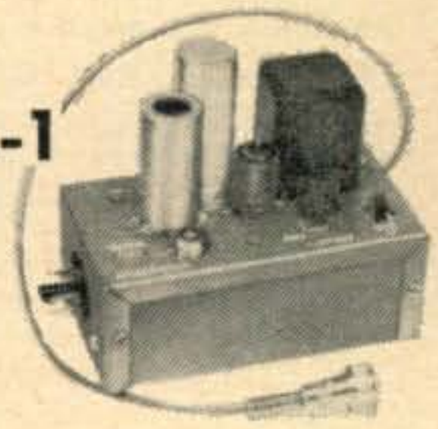
Kit: $119.95

Wired: $149.95

GLOBE'S VFO 6-2

Especially designed for driving the Hi-Bander and similar 6 & 2 transmitters. King size 7" tuning scale. Perfect zero beat with exclusive bandspread control . . . Built-in, well-filtered power supply with voltage regulation. Completely temperature compensated. Calibrate switch for zero beating signal frequency without turning on transmitter. Approx. 50V RF output. Plugs directly into Crystal socket of Xmttr. 13:1 tuning ratio. Wired: **$59.95.** In kit form: **$49.95.**

SPEECH BOOSTER FCL-1



Peak limiting audio preamplifier for use with the Hi-Bander, that clips and filters speech frequencies at pre-set amplitudes. 300-25000 cycle response. Harmonic suppression helps reduce distortion. Plugs directly into Hi-Bander. Aux. eqpt. socket for operation of VFO. Wired: **$24.95.** In kit form: **$15.95.**

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TRADE-IN ALLOWANCES

THE EXCITING NEW

GLOBE CHIEF DELUXE

Kit: $59.95

Wired: $79.95

The Globe Chief Deluxe is a top quality, self-contained transmitter for 90w CW use, band-switching 10-80M (75w meter indication for Novice use). Convert to phone by simple plug-in of UM-1 or SM-90. Provisions for antenna changeover relay. Choice of grid block keying or cathode keying with VFO. Built-in power supply. New wide range pi-net. Standard coax antenna fitting. Simplified 3-color diagrams for ease in kit construction.

THE EXCITING NEW

GLOBE SCOUT DELUXE

The Globe Scout Deluxe is a versatile 90w CW, 75w fone transmitter of smart modern design, packed with top performance features . . . Band-switching 80-6 meters, straight through operation of final on ALL bands; high efficiency and output on ALL bands, panel adjustment of loading on ALL bands. Pi-net matches 50-300 ohms on 80-10, and 50-75 ohms link output on 6 meters. High level plate modulation using new husky 7027A modulator tube. Just plug in VFO or crystal. Dual Xmttr./VFO keying provisions for CW. More output on 6 meters than some exciter linear combinations. Extensively shielded and filtered with separate final RF shield. Built-in power supply and many other features.

Wired Only: $149.95

For further information, check number 28 on page 126.

CITIZEN BAND
CLASS "D"
CRYSTALS
All 22 Frequencies in Stock

3rd overtone. .005% tolerance—to meet all F C C requirements. Hermetically sealed HC6/U holders. ½" pin spacing—.050 pins. (.093 pins available, add 15¢ per crystal). Add 5¢ per crystal for postage and handling.

$2.95 EACH

The following Class "D" Citizen Band frequencies in stock (frequencies listed in megacycles): 26.965, 26.975, 26.985 27.005, 27.015, 27.025, 27.035, 27.055, 27.065, 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175, 27.185, 27.205, 27.215, 27.225.

Matched crystal sets for Globe, Gonset, Citi-Fone and Hallicrafters Units . . . **$5.90** per set. Specify equipment make.

RADIO CONTROL CRYSTALS IN HC6/U HOLDERS

Specify frequency, ½" pin spacing . . . pin diameter .05 (.093 pin diameter, add 15c) ..... **$2.95 ea.**

FUNDAMENTAL FREQ. SEALED CRYSTALS

in HC6/U holders
From 1400 KC to 4000 KC .005% Tolerance ..... **$4.95 ea.**
From 4000 KC to 15,000 KC any frequency .005% Tolerance ..... **$3.50 ea.**

SEALED OVERTONE CRYSTALS

Supplied in metal HC6/U holders
Pin spacing .486, diameter .050
15 to 30 MC .005 Tolerance ..... **$3.85 ea.**
30 to 45 MC .005 Tolerance ..... **$4.10 ea.**
45 to 60 MC .005 Tolerance ..... **$4.50 ea.**

QUARTZ CRYSTALS FOR EVERY SERVICE

All crystals made from Grade "A" imported quartz—ground and etched to exact frequencies. Unconditionally guaranteed! Supplied in:

FT-243 holders
Pin spacing ½"
Pin diameter .093

MC-7 holders
Pin spacing ¾"
Pin diameter .125

DC-34 holders
Pin spacing ¾"
Pin diameter .156

FT-171 holders
Pin spacing ¾"
Banana pins

MADE TO ORDER CRYSTALS
1001 KC to 2600 KC:
.01% tolerance ..... **$2.00 ea.**
.005% tolerance ..... **$2.75 ea.**
2601 KC to 9000 KC:
.005% tolerance ..... **$2.50 ea.**
9001 KC to 11,000 KC:
.005% tolerance ..... **$3.00 ea.**
Specify holder wanted

Amateur, Novice, Technician Band Crystals

.01% Tolerance . . . **$1.50 ea.**—80 meters (3701-3749 KC). 40 meters (7152-7198 KC), 15 meters (7034-7082 KC), 6 meters (8335-8650 KC) within 1 KC
FT-241 Lattice Crystals in all frequencies from 370 KC to 540 KC (all except 455 KC and 500 KC) ..... **50¢ ea.**
Pin spacing ½" Pin diameter .093
Matched pairs ± 15 cycles **$2.50** per pair
200 KC Crystals, **$2.00 ea.**; 455 KC Crystals, **$1.50 ea.**; 500 KC Crystals, **$1.50 ea.**; 100 KC Frequency Standard Crystals in HC6/U holders **$4.50 ea.**; Socket for FT-243 crystal **15¢ ea.**; Dual socket for FT-243 crystals, **15¢** ea.; Sockets for MC-7 and FT-171 crystals **25¢ ea.**; Ceramic socket for HC6/U crystals **20¢ ea.**

(Add 5¢ per crystal for postage and handling)
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February is Cold

and we need the warmth of knowing you care. Here we've gone to a lot of trouble to work up a selection of books that you really ought to have and you go and put off sending for them month after month. Send cash, check or money order real quick and get your ham library in shape. Money back if you're not satisfied.

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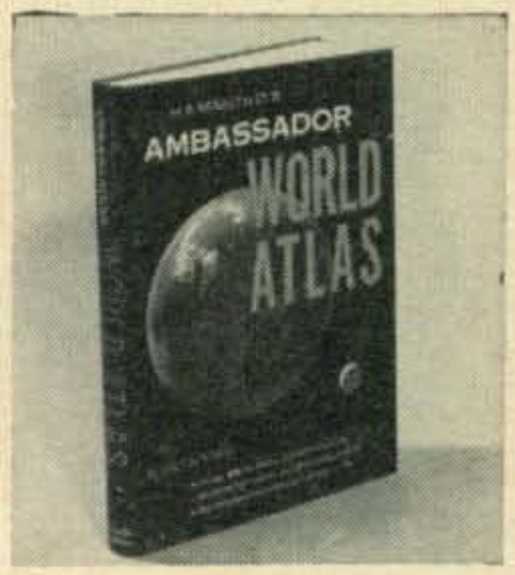

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This IS a collection of reprints, containing all of the available information on the conversion of the popular "Command" transmitters and receivers into good ham transmitters and receivers. Invaluable for Novice, Technician, General, Advanced and Extra class operators. 136 fabulous, amazing terrific pages for only $1.50 postpaid.

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Anyone who tries to go mobile without getting this book should register for a sanity hearing. Bill Orr, W6SAI has put everything you need to know in this book ...it is NOT a collection of reprints like some other mobile handbooks we could mention. Build-its by the dozen...solutions to ignition problems, keeping the battery charged, noise...only $2.95 postpaid.

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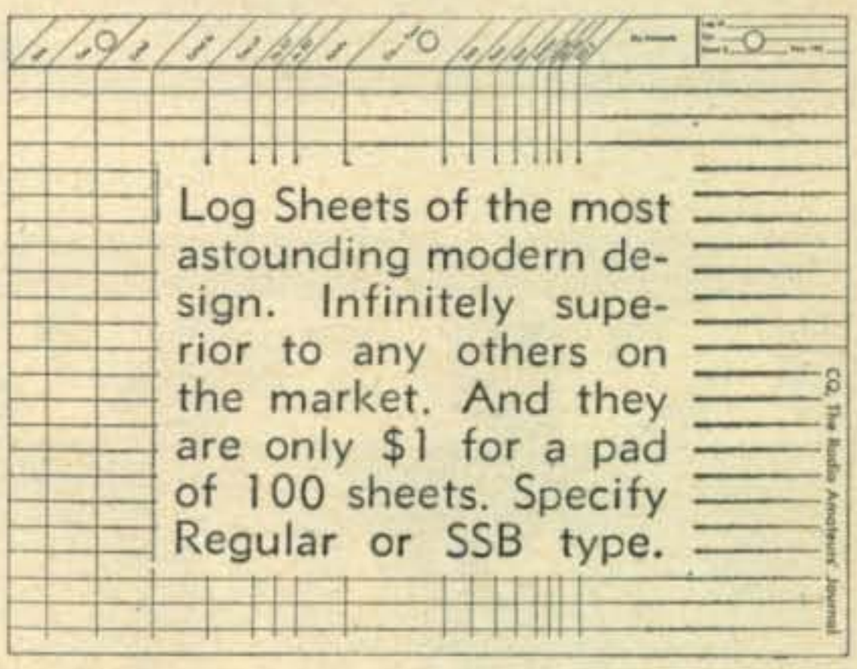

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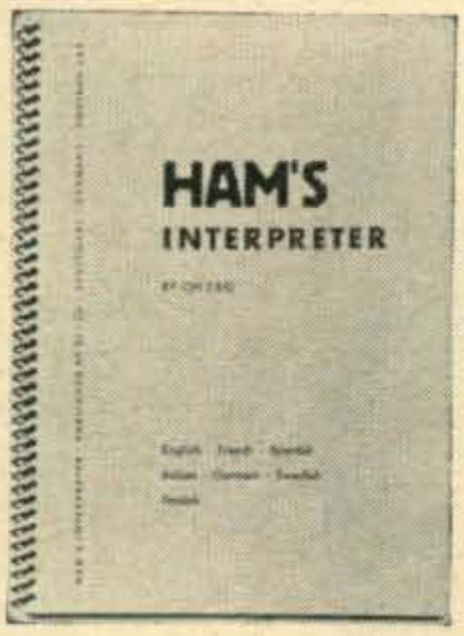

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WIDM's newly written TVI book (2nd edition) covers all aspects of curing TVI from both the Ham's viewpoint and that of the TV viewer or the TV serviceman. It includes 2- and 6-meter TVI as well as Citizen's Band, Industrial, Medical and Utility TVI. Profusely illustrated with diagrams, photos, charts, tables and FCC regulations pertaining to radio and television interference. Price $1.75 postpaid, USA, $2.00 Foreign.

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CQ ANTHOLOGY

Most amateurs do not have a good file of back issues of CQ. So we've looked back through the years 1945-52 and assembled all in one place the articles that have made a lasting stir. The issues containing most of these articles have long ago been sold out. The price is a paltry $2.00.

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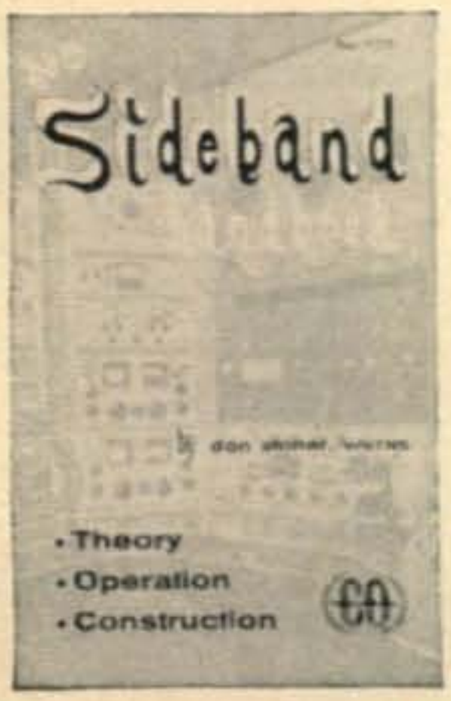

SIDEBAND HANDBOOK

Written by Don Stoner, W6TNS, was almost one full year in the preparation of this terrific volume. This is not a *technical* book. It explains sideband, showing you how to get along with it . . . how to keep your rig working right . . . how to know when it isn't . . . and lots of how to build-it stuff, gadgets, receiving adaptors, exciters, amplifiers. Price, only $3.00.

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2 M. ANT. [*from page 57*]

clothes line (wire) is then fitted into the coax coupling through center of ⅝" tubing. (The wire fits snugly in center of coupling.)

5. The insulator made in step 2 is now passed over the wire and fitted in the top of the ⅝" tubing.

6. The 1¼" I.D. x 19¼" length of tubing is drilled and tapped ¼" from one end to receive four 10/32 screws.

7. Insert the four 10/32 screws. These should be at least ½" long.

8. This tube is then slipped over the smaller tube assembly and the screws tightened. It will be necessary to sight center the two tubes so inner tube is close to exact center as shown in the photographs.

9. Mount the assembly on transmitter and you are in business. ■

75A-2 [*from page 63*]

the calibration signal as before in the AM position with the selectivity on "2". Switch to CW and turn the pitch control toward the "—1" position, about one third of the way. You should now be hearing a single audio tone of about 400 *cps*. Tune the receiver higher in frequency (which will make the audio tone go lower) past zero beat until you hear the same 400 *cps* pitch on the other side of zero beat. The kilocycle dial scale should have moved a little less than one *kc* during this operation. With the phasing control reject this 400 *cps* tone now coming from the speaker. Now the tricky part. Adjust the *bfo* pitch for zero beat. This is difficult because you have just eliminated the signal you are supposed to zero beat! However, you can bring it in for this last operation by moving the phasing control slightly. Be sure to put the phasing control back where it was after you finish zero beating. Now the receiver is set up. The *bfo* pitch control should be near the "—1" position and the phasing should be a little to the right of the center mark.

Try tuning in an AM signal now. Tune to zero beat the carrier. As the carrier approaches zero beat it falls into the rejection notch of the crystal filter and is eliminated. AM signals now tune like SSB signals. To make sure you have the phasing control in the right position, momentarily switch to AM after you have an AM signal tuned to zero beat. It should sound very distorted. If not, adjust the phasing control slightly until severe distortion results. Then when you switch the receiver to cw, it will sound normal. Slight readjustment of the *bfo* pitch may be necessary.

For frequency reading, follow the same procedure as with SSB. ■

NOVICE [*from page 73*]

novice bands. Merrill will sked anyone needing Md. for WAS.

Once again that brings us down to the bottom of the pile. Be sure to keep those letters and cards coming. If you would like help with your novice or general examination, don't hesitate to send your name in to the help wanted section. Last, but not least, how about some pictures of shacks, particularly those listed in the DX section.

73,. de Don, W6TNS

CB [*from page 85*]

Pocket Size FSM

The Quaker Electronic Co., Plymouth, Pa., let us try their new field strength meter. About the size of a king-size cigarette pack, it indicates, on a relative scale, power radiated by your antenna. No kit, it comes completely assembled. The unit is equipped with an SO-239 coax fitting so that it may be connected, through a length of coax cable, to a reference antenna for comparative measurements. It can't be beat for indicating the merit of new antennas, as well as for keeping a check on the output efficiency of your transmitter. It is available in all-band models or for specified frequencies. Oh yes, it has its own antenna also, which may be plugged directly into the coax fitting. A special model is available for citizen band users.

Transistor Rig For C/B

Though we've only seen a picture of it, we're just a little excited about a new rig by International Crystal. It looks like a printed circuit oscillator and amplifier. It would appear that all you need in addition would be a modulator. We'll try to get more info on this.

We've got so many things planned for next month, it's hard to see how it will fit in the column—another new rig and still another antenna are on the way.

Meanwhile, let's hear about any C/B problems you may have.

73, de Lee, W2QEX/2W2870

PROP [*from page 84*]

period are reflected in the initial scores received. It looks very much as if the record breaking scores of the past few years will be in for some keen competition again.

During the *CW* period, from 0200 GMT November 28th through 0200 GMT November 30th, world-wide propagation conditions appeared to have been somewhat unsettled. Con-

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BOARD OF THE MONTH

It's easier to add than multiply—"Frequency Adder" consists of Balanced mixer using new 7360 and crystal oscillator. Circuitry on 4½" x 5" board, with sockets ..... $3.00 Each

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"Power Supply"—4" x 7" Board provides circuitry for voltage doubler supply using diode rectifiers, provides 250 v. @ 60 Ma and 6.3 @ 2 amps.. $1.50 Each

Kit consists of etched board, tube or transistor sockets, diagram, parts list and assembly instructions . . . Mailed postpaid anywhere in U.S.A.

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CIR KITS

For further information, check number 36 on page 126.

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For further information, check number 37 on page 126.

ditions throughout most of the world seem to have been normal on November 29th, with ratings of 5 and 6 (fair to fair to good). On the 28th and 30th however, ratings ranged from 4 over the North Pacific, to 5 over the North Atlantic, to 6 in South America and South Africa. On a world-wide basis conditions were between poor to fair to fair to good. Conditions during the CW period were poorer than during the Phone period, and this seems to be reflected in the scores so far received. The *CQ* forecast called for "seasonally normal" conditions for the CW period.

Next Month

Next month's column will feature a discussion of the present course of the solar cycle, and the likely effects of the cycle upon propagation conditions during 1960.

73, George, W3ASK/HB9

CONTEST CAL [*from page 92*]

The only open date left would have been too late in the season for 160 meter activity so it was decided to share the YL/OM week-end in March. Being this is only a one band affair, no harm should result.

The contest is primarily planned for the United States and Canadian areas but foreign countries are invited to work VE and W stations if conditions permit.

Operation will be limited to CW only.

Rules

Points: 1 point for each QSO in the same call district; 2 points for QSOs with other call districts; 5 points for foreign QSOs. (exclusive of W/VE/VO.)

Multiplier: A multiplier of 1 for each state, Canadian province or foreign country worked.

Final Score: Total QSO points multiplied by the total multiplier points.

Sample QSO: Nr. 1 VE3BWY 579 Ont.

Your log should show the date, time, message sent and message received.

Awards: A certificate to the leading station in each state, Canadian province and foreign country.

Mail your logs to CQ Magazine, Att: 160 Contest, 300 West 43rd Street, New York 36, N.Y., no later than March 31st, 1960.

Ed Note

No word from the REF who usually hold one section of their contest late in February.

Regaring the CW section of our contest, conditions were pretty miserable on all bands. The overall scores are lower than last year's. However there was plenty of activity and some of the claimed scores being received are surprisingly high. In any event there is plenty of work for the Committee, so back to the salt mines.

73 for now, Frank, W1WY.

CONVENTION NEWS

(See page 9)

Sub Liminal Ad

There are all sorts of interesting (subscribe to CQ) things going on these days that you should know about (subscribe to CQ), like the attempts being made to change the (subscribe to CQ) Communications Act of 1934 to permit (subscribe to CQ) foreign amateurs to be licensed while in the U.S. (Subscribe to CQ) And there is the coming International Amateur Radio Convention (subscribe to CQ) to be held in New York City next August (fill out the blank below) which should turn out to be the biggest ham convention (fill out blank) ever held anywhere. You might be interested (fill it out) in getting all the inside info on it too. Tell you what, just fill out the blank below (fill it out right now) and you'll get all the news as it happens.

YL [*from page 95*]

5th annual Birthday Party. A hayride, good food, singing, prize drawing, and lots of gabbing filled the hours Fri. evening. At the Sat. luncheon 61 YL's were present. New TYLRUN officers elected for 1960 include: President and NCS, K5ALF, Mae; V.P. and ANC, W5FFH, Katherine; secy-treas., K5MJW, Betty; P/C, K5JXD, Marge. The ALAMO YL's have invited members of TYLRUN to San Antonio for the 1960 Party.

YL Nets

To the YL Nets listed on p. 82 of CQ for Oct. '59, add:

14,260 Wed. 1400 EST K5BJU SSB Net
29,130 Tues. 1300 EST K6JPY Hairpin
3950 Tues. 2000 EST K4BAL, Floridora
7215 Thurs. 0900 EST W3UUG, Friendly 40
7235 Fri. 0900 CST, ALAMO YLs
7260 Thurs. 0900 EST K4DNL, Ga. Peach
50.160 Thurs. 2000 EST K4PPX, Floridora

Corrections:

3750 Tues. 0930 CST W9MYC, LARK CW
29,000 Mon. 2200 CST W9BCA, LARK

"CQ YL"

It may be too late to put it under this year's Christmas tree, but it's never too late to read and enjoy your copy of "CQ YL!" The one and only book devoted to every aspect of YL participation in Ham radio—18 chapters, over 500 photos. Order from W5RZJ (QTH at head of column), $3, postpaid.

Happy Hamming, good DX, and all the best in 1960!

33, Louisa, W5RZJ

LITTLE NIC [*from page 55*]

through the receiver. You are now ready to put "LITTLE NIC" on the air. Before connecting it to the antenna, a good match is important for proper operation.

Tuning and Operation

Hook up to your favorite 6 meter antenna, preferably a 6 meter beam. The author used a beam as well as a ½ wave halo. The oscillator C1 is adjusted for maximum collector current on the power amplifier. The PA capacitor, C5, is always tuned to the minimum and the antenna trimmer is always tuned for the maximum. To use on CW just plug the key into J1 and open S3.

When the band is not open you should get about 30 miles on a 5 element beam, and 15 miles on a ½ wave halo (halo indoors). With a band opening it should get out with the rest of the transmitters. The auditor has never tried it during a band opening—they are few and far between in this part of the country. Good hunting; you will not burn up anyone's receiver, but you will have a lot of fun trying. Just think, no TVI. ■

PHONE PATCH [*from page 56*]

been in the contracting business with his brother. Becoming ill he went to Arizona in search of health. When he found it he decided to remain in Arizona, and his brother followed him there and now lives next door. Harry is "retired," he says, but while we were there his brother came in with an armful of blueprints and they briefly discussed some building project. Two years ago Harry took up amateur radio, "for its therapeutic effect," as he put it.

In Tucson, there is a school for asthmatic children, who come from all over the country. Now these youngsters being otherwise normal, like your children and mine, just don't write to their parents. And that is the reason "The Tucson Monitor Station" was born. Here was a chance to render a real service, and Harry saw and grasped it. He began patching these youngsters to their parents, and many a mother and dad has slept easier because of these contacts.

Arizona has several air bases and when some of the units go far afield for a few weeks or months, Harry keeps the fly-boys in touch with their wives and families at the home base. Sometimes, of course, they don't live in Tucson and then a long distance call is involved. W7CKV averages 250 phone patches per month, about one third of which require a long distance call on one or both ends. Phone Company please take note.

Harry monitors 29300 from 10 am until 5 pm MST, except when working on MARS frequencies.

Like all things, good and bad, our visit had to end, and we boarded a plane for home. So, here we are back in Illinois, resuming our QSO's with W7CKV.

Fellows, won't you please move off of 29300 *kc* just a little ways and give Harry a chance to continue his fine unselfish service. The ten meter band is a big one, and Harry has chosen the less popular end of it to operate. Please give him a break, and besides, I might be trying to talk to Bob. ■

1625-807 [*from page 111*]

occupied by the #1 grid lead. The cathode lead is soldered into pin #4.

In order to compensate for the different base used by the 807 tube, adapters were assembled, using a 7 prong plug or an old 837 or 1625 tube base, sawed off, and connected to an 807 tube socket with heavy leads.

The filaments of the four tubes used were wired in pairs which can be changed, by means of DPDT toggle switches, to either a series or parallel filament circuit for each pair of tubes. It is therefore possible to use four 12 volt tubes, four 6 volt tubes, or a combination of two 6 volt and two 12 volt tubes. The switching

arrangement used is shown in fig. 2.

Operation of this linear amplifier, driven by one of the popular commercial SSB exciters and coupled to a beam antenna at the author's station, has been satisfactory enough on 20 meter SSB that a higher power amplifier capable of running a so called "dc kilowatt," is hardly ever used.

Although no detailed characteristic measurements were made as a basis for comparison of the three tube types used, relative forward power with the same amount of cathode drive, as indicated by a reflected power and swr bridge, showed no appreciable difference between the 807 and 1625 types, as would be expected. The 837 appeared somewhat less efficient although more rugged, and reflected its inherently larger interelectrode capacities and lower maximum frequency rating. More driving power was required.

It is hoped that others may find the tube modification and interchangability feature of interest and make some use of the information provided. ■

PEAK LIMITER [*from page 49*]

little deviation. A tough guy to please, with audio, Roy also stated that the quality of the speech suffered absolutely nothing in comparison with the unlimited audio which is as good as any well built DX 100 using a fair crystal mike can be. On the test bench, using a Heath Audio Analyzer and Audio Generator I found the limiter could perform its function well over a 25 *db* range before it showed any signs of overloading or distortion. Upon further investigation it turned out to be that I was overloading the input triode section of the 6AN8. This might lead to the question as to why I wasn't conventional and put the controllable pentode in front of the rig and prevent overload at the source. I had good reason for my madness. First of all, I doubt if there are any communication low level mikes (except the Telefunken, AKG, and etc. Hi Hi) that will put out enough to make the first triode draw grid current with the present 1K resistor in its cathode circuit. (Under critical measurement the front end will take as high as −25 *dbm* before going to pot.) An average high output crystal and dynamic mikes will supply a 1 meg load with about −40, with a lot of sound pressure. Second, I wanted to be able to limit my hybrid phone patch which is fed into the grid of the controlled stage. We all know that the incoming phone line audio is always lower than the level we develop from our own F1 units. . . . Make sense yet???? Again, set the modulation gain and limiter threshold for 100% modulation on the incoming signal and when you modulate that rig through your own telephone transmitter you will still have continuity in the fuses for that 2 *kw pep* outfit.

To sum it up, as AM can use *Audio Peak Limiting,* SSB needs it even more if we are to realize the full benefits from it. If you want to keep those grid mils down and intelligence high, look into audio peak limiting. ■

PAN SCOPE [*from page 47*]

and T6 for maximum output. Set generator to 1650 *kc* (first *if* frequency of the receiver used with this equipment) and adjust oscillator transformer T2 and *rf* input transformer T1 for maximum output. Disconnect *vtvm* and plug video output into vertical input of oscilloscope. Adjust center frequency and sweep width controls to center 1650 *kc* pip on scope tube. Move pip across scope screen by varying signal generator input frequency. Adjust linearity control so that movement of pip is linear with frequency change. Due to the extreme simplicity of the sweep circuit there will be some interaction between the linearity, sweep width, and center frequency controls. With the sweep width at maximum sweep approximately 60 *kc* of the spectrum will be seen.

Signals for the pan-scope are taken from the plate circuit of the receivers first conversion *if* amplifier. A coaxial line (RG-58/U) is connected to the plate through a 3-*mmf* tubular ceramic capacitor. The other end of the line is connected to a phone jack mounted on the rear apron of the receiver chassis. The shield of the coax line is grounded only at one end.

Performance

Fig. 5 shows some examples of what may be interpreted from the signals seen on the oscilloscope tube. ■

½ GALLON [*from page 43*]

connected to the bases of the transistors. Each consists of eight turns of #20 wire wound on a 47 ohm 1 watt resistor. Eight resistors are connected to the transistor emitters. Each is constructed by winding 14 turns of #14 enamel wire on a ⅜ inch form. They are self-supporting solenoid wound. The low ohmage resistors in the emitters help equalize currents; the suppressors in the bases help equalize gains.

Adjustment

When wiring has been completed, the supply should be checked and adjusted. Be sure to connect the supply to the battery with the correct polarity or the transistors will be destroyed. Temporarily short the high voltage terminals of condenser C1 to ground. Adjust bias resistors R1 and R2 to read 1 and 50 ohms respectively. Connect an ammeter in the lead from the battery to power supply. Adjust R2 very slowly

For further information, check number 44 on page 126.

until the ammeter reads about 4 amps. Remove the short and ammeter. Connect two 4000 ohm 200 watt resistors in series from the high voltage output to ground. Actuate K2. If the circuit does not oscillate reverse the leads going to the transistor base. (Green) ■

WAVE METER [*from page 41*]

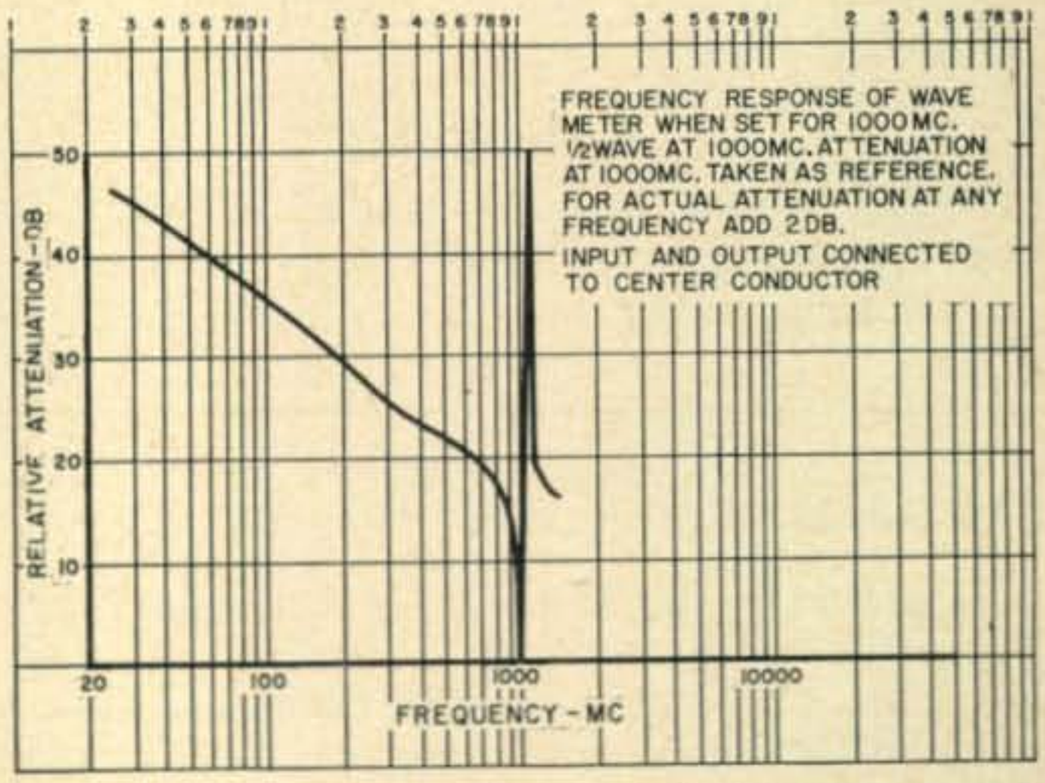
fed with a 50 ohm signal generator through 50 ohm cable. A detector with a 50 ohm input impedance was used.

The table below gives the performance of the loop coupled model.

Input frequency	Frequency calculated from wavemeter	Bandwidth 3 *db* points	Insertion loss
300 *mc*	303 *mc*	1. *mc*	27 *db*
350	374	1.5	23
400	431	1.5	19
450	475	2.	16
1000	975	2	10
1500	1527	2	8
2000	2010	3	4

The following data is for the model in which the connections are made directly to the center conductor of the wavemeter.

Input frequency	Frequency calculated from wavemeter	Bandwidth 3 *db* points	Insertion loss
250 *mc*	254 *mc*	1 *mc*	17 *db*
300	315	2	14
400	423	3	8



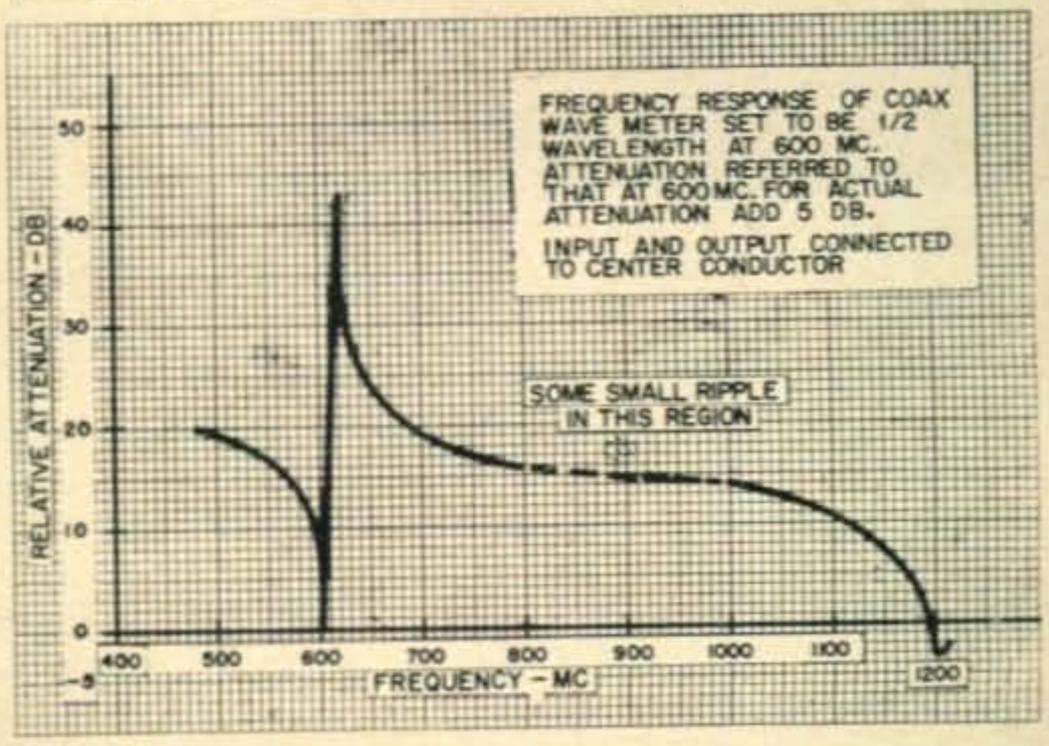


Fig. 4

500	499	4	7
600	595	4	5
700	700	6	5
800	795	8	3
900	890	9	3
1000	990	12	2
1300	1280	30	1
1500	1450	>30	<1
1750	1740	>30	<1
2000	1920	>30	<1

The bandwidth was not measured very accurately but the values obtained at least indicate the approximate value to be expected. It seems that the accuracy of the wavemeter is poorer below 500 *mc*. This might be due to the wavemeter being made up of two unlike sections of coax in this range.

From the data it would seem that it might be better to use the wavemeter with connection made to the center conductor at the lower frequencies where the loop coupled model has a rather high insertion loss. The lower insertion loss might make it easier to secure a usable indication from the detector.

For the benefit of the curious and for those who might have other uses in mind for the wavemeter the graphs in fig. 4 are included. These show the frequency response of the wavemeter over a wide frequency range. ■

IF AMP [*from page 36*]

on the bottom of the printed circuit board for the filament, B+ and ground leads, as well as the input, output and gain control. Connect wires to these various points on the board, from the underside of the board. The two points marked, "GAIN," are connected to the gain control, R5. The "IN" point on the board connects to the input jack on the rear of the chassis. Likewise, the "OUT" jack on the rear of the chassis connects to the "OUT" point on the printed circuit board.

The cable from the output jack of your converter, is plugged into the input jack on the *if* amplifier and the amplifier output jack connects to your receiver antenna terminals. Use a short piece of RG-58/U or some other coax shielded cable for this lead.

If your receiver picks up signals other than those from the *if* amplifier, you may eliminate most of this feed through by mounting a jack on the rear of your receiver chassis, close to the antenna terminals. Disconnect the receivers lead which connects to this antenna terminal and connect it to the jack which you installed on the receiver chassis. This will shield the lead from the *if* amplifier completely and to a large extent, eliminate feed-through at the *if* frequency.

Be sure that the chassis is at "floating ground" if you are using an *ac/dc* receiver,

[*Continued on page 123*]

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WANTED

WANTED: Military and Commercial laboratory test and measuring equipment. Electronicraft, Box 399, Mount Kisco, N. Y.

WANTED TRADES NEW AND USED: KWS-1 $1250.00, 32S-1 $590.00, 75S1 $495.00, 32V2 $350.00, HQ100 $149.50, HQ110 $209.00 HQ129 $129.00, HQ145 $269.00. HQ160 $379.00, HQ170 $359.00, Johnson Mobile $75.00, Thunderbolt $589.50, Valiant $439.50, Johnson Citizen Messenter $139.75, Courier $289.50, Hallicrafters 101 Mark III $395.00, HT33 new $495.00, SX99 $119.00, SX100 $295.00, HT32A $695.00, S107 $94.95, NC125 $139.00, NC183D $319.50, NC173 $139.50, NC57 $69.00, SW54 $35.00, CB100 Citizen $125.95, Globe King 500A $425 90 Chief $49.50, 90A $54.95, 680 $94.95, 680A $97.95, DSB100 $129.95, VFO755 $42.95, NC300 $299.95, NC2400 $169.50, CE20A $195.00, 10B $139.50, CE Slicer $37.50, WQ Multiplier $59.95, Heath DX35 $54.95, AT-1 $23.50, DX20 $34.50. Easy terms, Ken-Els Radio Supply, 4208 Central Avenue, Fort Dodge, Iowa, or 128 31st Street NE, Cedar Rapids, Iowa.

WANTED: TELETYPE TG-7 and Model 15 and parts, printers and reperforators, etc.; COMM'NS REC'V'RS AND XMTRS, e.g. BC-610-E, –I, BC-399A, Collins 51J, 17L3, –4; R-388 and R-390/URR; 18S-2, –3; ARN-14 and –30; APR-9, –10, ARC-21, 27, etc.; APS-31, –33; and TEST EQP'T, with TS– or 1– prefix. We pay freight. AMBER INDUSTRIAL CORP., 75 Varick St., N. Y. 13, N. Y.

WANTED: Model engines, any make or condition. State price. K8AOJ, Arthur Ryan, 31770 Junction, Farmington, Michigan.

WANTED: Meter for LR-1 frequency meter. Somebody somewhere must have one of these. White Wayne Green, CQ Magazine, 300 West 43 Street, N. Y. 36.

WANTED: Collins 32V3, factory built, no modifications from earlier models. Must be in A-1 condt. State lowest cash price. Bill Garrett, 1021 E. Scottwood Ave., Flint 7, Mich.

WANT: Smallest sized generator possible about 500 watts. Similar to Bendix. 110 volts a.c. 60 cycles. Want to mount it in Volkswagen. Will answer all letters. Frank Smith, W8HMT RFD #3 Paw Paw, Michigan.

GUNS wanted. Trade my ham gear for them. W2LJU.

WANTED TO BUY: Scott Philharmonic Radio or any similar model Scott all-wave radio; McMurdo silver masterpiece IV or V. State mechanical and electrical condition, model, price. Incomplete radios or lacking cabinets considered. Jack Rhodes, 1880 Juniper St., Prince George, B. C., Canada.

WANTED: Driver Transformer PP6L6 to PP 8IIA, Modulation Transformer PP8IIA to 4-250A Black Widow 6 or 2 meter or Gonset Modulator splatter choke. Prefer In-Person deal all letters answered. John Jackman, Devonshire Road, Milford, Conn.

WANTED: Used heavy duty antenna rotor. Send price; full details air mail. Edgar Cole, American Schools, APO 331, San Francisco, Calif.

WANTED: Transmitting Tubes, 4-1000A, 4-400A, PL-172A 450th, 750th, 1000T, Transformers, 4000 volts each side or above at 500 MA CCS or better, 220 or 110 Volt single Phase Primaries. Also want Vacuum variables, 575A tubes, sockets, variacs, 220V 20 amps or more. State price and whether or not you will ship. Pick up within 40 miles of NYC. Box BB, CQ, 300 West 43 Street, N. Y. 36, N. Y.

For further information, check number 49 on page 126.

WANTED (Cont'd.)

WANTED: All types of receivers transmitters, test equipment & teletype, in trade for NEW Hallicrafters, Hammarlund, Johnson, National, Central Electronics, etc. Colilns 51J2 $495., 75A-1 $239., 75A-4 $595., Hallicrafters SX-101 $225., SX-101 Mk 111A $295., SX-99, $109. SX-71 $169. National NC-60 $45. NC-188 $109. NC-109 $139., Eldico SSB 100F $495. Teletype converters, printers, etc. Write Tom W1AFN, Alltronics-Howard Co. Box 19, Boston 1, Mass. (RIchmond 2-0048). Store: 60 Spring St., Newport, R. I.

SWAP OR SELL

BOUGHT Aug., '59 $500.00 Model Radio Control commercial equipment-6-3-channel rcvr's servo's, mitter, etc. Long list—Want good ham rcvr NC-303, etc. Class or any good offer's—No junk. Sam Faziani-W8JXN, 1140 Maple Blvd. Monroe, Mich. PH-CH-1-4342.

QSL

CHEAPY's. "Fill 'em in yourself." 100-$1.00, 200-$1.75, 500-$4.00, 1000-$7.75 Postpaid. Free sample. QSL Coop, Box 5938, Kansas City 11, Missouri.

QSLS??? LARGEST variety samples 25¢ (refundable). CALLBOOKS $5.00. Religious QSL samples 10¢. Sackers, W8DED, Holland, Michigan.

QSLS-SWLS: 100 two color glossy $3.00; QSO file cards $1.00 per 100; Samples 10¢. Rusprint, Box 7507, Kansas City 16, Missouri.

QSL's—2 and 3 colors. Kromekote, Attractive, Distinctive, Different, 48-Hour service. Sample 10¢ K2VOB Press, 62 Midland Boulevard, Maplewood, New Jersey.

GLOSSY 3-color QSL cards 100—$4.50. Free sampler. Rutgers Vari-Typing Service, 7 Fairfield Road, New Brunswick, N. J.

QSL's? Samples 25¢ (refundable). W6CMN, 6707 Beck Ave., North Hollywood, Calif.

QSL-SWL: $1.00 per 100. Samples dime. Riesland, W6HTN, Del Mar, Calif.

CREATIVE QSL CARDS. Personal attention given. Free samples and catalogue. Bob Wilkins, Jr., Box 1064-2, Atascadero, California.

QSL's-SWL's. Sample free. W4BKT Press, McKenzie, Tennessee.

QSL's, SWL's, XYL-OM's. (Sample assortment approximately 9¾¢.) Covering designing, planning, printing, arranging, mailing, eye-catching, comic sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards, (Wow!) Rogers KØAAB, 737 Lincoln Avenue, St. Paul 5, Minnesota.

QSL's, SWL's, REASONABLE. PAYE, W4ZKK. 824 AVANDALE. COCOA, FLORIDA.

QSLs. Samples Free. Phillips, W7HRG, 1708 Bridge Street, The Dalles, Oregon.

QSL's—"Brownie" W3CJI, 3110 Lehigh, Allentown, Pa. Samples, 10¢, with catalogue, 25¢.

QSL-SWL. Samples free. Bolles. W5OWC, 7701 Tisdale, Austin, Texas.

QSL's: Samples, dime. Print Shop, Corwith, Iowa.

QSL's-SWL's: That are different, colored, embossed card stock, and "Kromekote." Samples 10¢. K8AIA, Box 953, Hamilton, Ohio.

QSL's-SWL's, samples 10¢. Malgo Press, 1937 Glendale Avenue, Toledo 14, Ohio.

QSL's. Samples 15¢. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

MISCELLANEOUS

FOURTH STUPENDOUS YEAR — Broward Amateur Radio Club's Get-Together and Auction. Doors open 9 A.M. Lunch at noon, auctioning 1 P.M. Armory, S. W. 24th St. and 4th Ave., Ft. Lauderdale, Fla., Saturday, Feb. 13.

PRESERVE YOUR HAM TICKET. Social Security Card, small photo, passes and anything else of value that is wallet-size. We will laminate it in clear plastic, guaranteed for life. Lamination will prevent it from getting torn, soiled or frayed. Send your ticket or anything of value with $1 in stamps or cash for each item that you want preserved. 24-hour service. Send to Dept. HW, CQ Magazine, 300 West 43rd St., New York 36, N. Y.

TWO-COLOR CERTIFICATE. Attests to tongue-in-cheek ownership of one acre of the moon. Ideal gift or for wall of club, shack, bar or room. Name and call inscribed free. $1.00 each, 6 for $5.00. Box G, 1738 201 St. Bayside 60, N. Y. Check or M. O. only.

HAMS: Learn Calculus or algebra. Powerful modern mathematics. Easy practical lessons, first four $1. Mathco, 4256-5 Minmor, Cincinnati 17, Ohio.

"WYOMING SUMMER JOB for man with General Ticket. . . . Teacher, graduate student or college upper classman. Single man. Assist with radio club at Teton Valley Ranch. Good technician. Keep contact between ranches and pack trips. Contact: W. S. Wilson, 2619 Oak Knoll Ave., San Marino,' California."

ANNOUNCE [*from page 22*]

Send checks for reservations to SSBARA, care of Mike Le Vine, WA2BLH, 33 Allen Road, Rockville Centre, L. I., N. Y.

East Coast VHF Dinner

The East Coast VHF Society Inc. announces it's 2nd annual Dinner and Ham-fest in the grand ballroom of the Hotel Alexander Hamilton, Paterson, New Jersey, Sunday evening, February 21, 1960. It will feature guest speakers on your favorite topic, more prizes than you have ever seen, more scuttle butt than you have ever heard, more food than you can eat and more friends than you ever thought you had. The dinner starts at 8 P.M. promptly with live music throughout dinner. All this for only $5.00. Make your reservations now because tickets will not be sold at the door! Deadline February 14, 1960. Tickets are available from any of our members or write to: Nick Franetovich, W2SWI, 100 Surrey Lane, River Edge, N. J.

Rotarian Hams

Now hear this!!! All hams who are Rotarians please contact:

Byron C. Sharpe, W9JKC
634 Vernon Avenue
Gencoe, Illinois

Byron is trying to compile a complete listing of all Rotarian hams.

Santa Fe Ry. Amateur Radio

The Santa Fe Railway Employees Amateur Radio Club, organized on December 3, 1958 in San Bernardino, has grown to a total of 117 members in twelve states, and are still growing.

Shown is a sample certificate which will be issued to any amateur who works with five members and who has the contacts confirmed by QSL cards.

QSL cards confirming the five contacts should be mailed to Secretary-Treasurer, W. E. Courtney, 1169 Crestview

Ave., San Bernardino, Calif., whose call is WA6BGI, together with a stamped self-addressed envelope for return of the cards, and four 3¢ stamps for handling the certificate.

Crowley, La.

The Acadia Amateur Radio Club, Crowley, Louisiana, was officially organized on September 2, 1959. Operating frequency for club net use, tentatively adopted, is 3975 *kc* each Sunday morning 0900-1000 CST. It is planned to establish an alternate frequency on 40 meters.

The officers of said club are as follows:
K5ANN, John Webb, President.
K5JRK, Kenneth Holloway, Vice President.
W5BMN, Dr. J. D. Hains, Treasurer.
W5ARZ, J. A. Soto, Secretary.
W5VDG, Ralph Gonthier, Activities Manager.
Also Emergency Coordinator for this area, as appointed by ARRL.

Apple City Certificate

The Apple City Radio Club of Wenatchee, Washington, "The Apple Capital of the World," offers a certificate attesting to an associate membership in the "Apple Net." Five contacts are required with member stations on the ten meter band. The certificate is also available for ten ACRC contacts on 3980 kcs. Send log extracts to Al Freeman, W7ETO, 1031 Lindy Street, Wenatchee, Washington.

Presently active on ten are—W7's DLI, EQJ, ETO, HQO, OVE, ZGH, and K7's ABH, ABI, ABJ, and APJ.

LETTERS [*from page 20*]

A foreigner can come to the U.S. and get a license to carry a gun, and to operate that most lethal machine—the automobile. Operating a ham radio station *could* be another step in our national program of fostering international friendship and understanding.

Let us hope that you too will continue to actively advocate reciprocal licensing and operation.

73, Clement R. Coggin, W4MXU

Phone Patches

Dear Wayne,

I've been running a kw on SSB, 10 through 80, specializing in 15 & 75. I like to run phone patches, but have been running into trouble with RF feedback. Not much, but enough. And, as a side consequence, when I am transmitting others in the house hear me on the phone. So I took my life in my hands and called the phone company.

To make a most interesting story real short, you cannot at present run 100% successful phone patches with no trace of *rf* using the new modern type 500 telephone. They pick up *rf* and rectify it in the new type of equalizer circuit built into them. The other type, model 300, in use since WWII, does not do this. As a result, if you have any 500 type phones you can expect difficulties.

They tried all sorts of filters, by-pass condensers, etc., etc. We built the project into practically a national emergency with the result that there is now an official inquiry regarding the 500 phones for the research headquarters in Camden, N. J. to mull over and a possibility that tariffs may be set up for these devices, which will, once and for all, legalize them beyond any question.

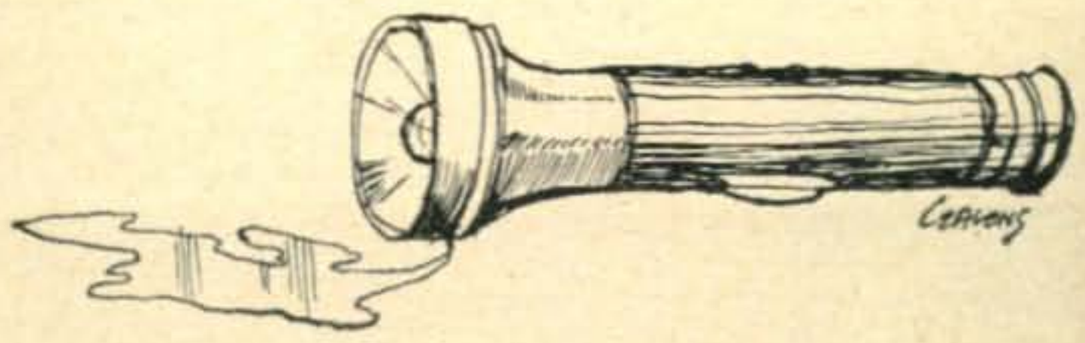
Irvin M. Hoff, K8DKC
Ann Arbor, Michigan

Dear Wayne,

A couple of us hams here in Dallas would like to start an Inter-state Texas net. All the novice hams here in Texas are welcome to join. We'd prefer they run at least 50 watts. We thought this would be a good idea because so many hams want to get traffic in to Texas. I'd appreciate it very much if you would publish this because we do need a little help. We're gonna call ourselves the "Hotwines." All the information is below. I'd be much obliged es Tnx 73,

Time: 5:00 pm CST
Band, Freq = 40m 7.170 mc—7.173 mc
Power = 50 watts at least.
Write to Jerry Chouinard, 6631 American Way, Dallas, Tex. for information on joining and handling of traffic.

Jerry Chouinard



IF AMP [*from page 115*]

otherwise one side of the receiver chassis will be hot, and thus the *if* amplifier and the converter chassis will be also. Almost all inexpensive *ac/dc* receivers have the chassis floating, but it may pay you to check the diagram and make sure.

Alignment

Aligning the *if* amplifier is very easy. After you have connected the various units together, tune your receiver to the middle of the band which your converter covers. Then adjust the slug in the amplifiers output coil for maximum indication on your "S" meter. If your receiver does not have an "S" meter tune the slug for maximum noise as heard in the speaker. The adjustment is very broad and you may not notice a large difference as you vary the slug in and out.

In some way, the *if* amplifier is of greater help in *vhf* work than is an *rf* amplifier ahead of the converter. This is due to the tube noise and other factors found at the higher frequencies. Some *rf* amplifiers have as much increase in noise in their outputs as they do signal. This is particularly true of the 50 *mc*, 6 meter band. After the frequency has been converted from *vhf* down to the frequency tuned by your receiver, it is easier to get signal amplification without a high noise level.

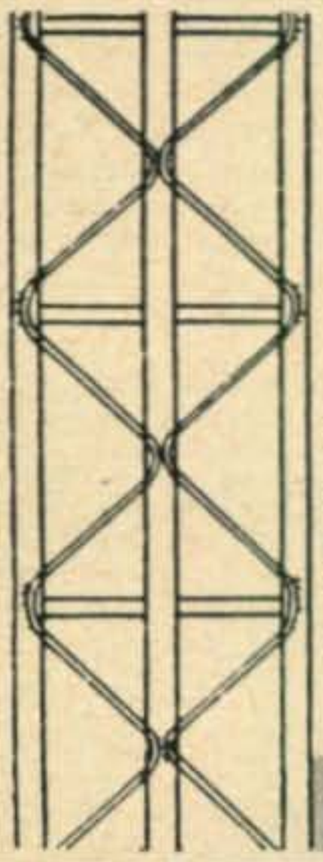
In tests run on the *if* amplifier shown, which was built to operate between a 6 meter converter and a Hallicrafter SX-99 receiver, the signal was increase 12 *db* (average) while the noise increased only 6 *db!* When the amplifier was used with less sensitive receivers, the increase was even greater. Adding this unit to your *vhf* equipment will help you "dig down in the noise" and get those weak signals. ■

HAM SHACKLES [*from page 35*]

When the necessity of a household move arises, average people will have to take the following viewpoints into consideration: Is the place comfortable? Is the house in a nice neighborhood? Is it close to shopping areas and schools? Is the kitchen practical? Are the rooms sunny? etc.

Not the ham family. When we move, only two things count: Is there space enough for a hamshack? Where can we put the doublet antenna and the three element wide-spread rotary beam?

Or look at the poor, unfortunate women whose husbands have hobbies which take them away from home and family, thereby endangering the spirit of togetherness! We XYLs don't have to worry about that. Our husbands are always home, at least physically. Why, if it weren't for an occasional ham fest or con-



vention, we'd never get the guy out of the house.

But lastly, let us not forget the most important factor, the added safety a ham radio station gives to the home. Just picture this:

The night is dark. You are alone. (Never mind why, just suppose!) The TV program is suddenly interrupted with this urgent message: "There has been a prison break at Upper State. Dangerous criminals are at large."

Upper State Prison is only about 250 miles from your house—they may be heading your way! First you shrug off the possibility; but then you hear a strange noise outside. You're frightened. You rush to the telephone. Horrors! The line is dead—someone cut it!

But ah! This is where ham radio will save you. Just turn the transmitter on (of *course* he showed you how) and call "Mayday! Mayday!"

And what will happen?

You'll probably blow a fuse. ■

VIKING—SB-10 [*from page 34*]

on, but a word of caution. Beg, borrow or buy, a scope, if you don't already have one, at least until you get oriented on how to run this beast. If it is run properly, it will do a creditable job, while on the other hand, it will put out some atrocious sounds if not properly adjusted. On our unit, with a number of mikes, we found that the gain control could not be advanced beyond 9 o'clock when it was set for off at 7 o'clock.

If you have the meter on the SB-10 set for 60 maximum drive, it will seldom be necessary to talk it up over 35 to 40, in fact it will definitely not be desirable to get it up over that level. A scope is the best indication of what is going on, and one cannot be recommended highly enough.

Make the interconnections to the receiver, antenna, and antenna switching circuit, if any, and you are in business. Adjust the voice control adjustments so they work satisfactorily and enjoy something new in amateur radio.

SB-10 Modifications

We found it desirable to make some changes in the audio section of the SB-10 also. These changes are listed as follows and shown in fig. 6.

1—At the mike connector, install a 47,000 ohm ½ watt resistor inside the connector between it and the wire that normally went into the connector.

2—At the plate (pin 1) of the 12AX7 audio amplifier, install a .01 disc ceramic in parallel with the one already there (.001).

3—At the other plate (pin 6), same tube, install a .01 disc ceramic condenser in parallel with the .001 already there.

4—At the audio gain control, remove the

wire from the center terminal and install a 47,000 ohm ½ watt resistor between the wire and the center terminal.

5—At pin 2 of the audio driver (12AT7) install a 330 mmf disc ceramic to ground.

6—At the plate of the audio driver (12AT7) (pin 1) Install a .005 disc ceramic to ground.

The reasons for these changes are as follows: The 47,000 ohm resistor at the mike connector, along with the 100 mmf condenser at the tube grid, plus the shunt capacity of the associated circuit form a low pass filter which reduces the possibility of *rf* feedback and rectification in the first audio. The .01 condensers will improve the low frequency response, possibly more than you wish, but we liked the results. The 47,000 ohm resistor at the audio gain control, along with the 330 mmf shunt condenser will somewhat reduce the high frequency response, as will the .005 condenser at the plate of the audio driver stage. With these changes the audio response was about equal at 200 and 5000 and nearly flat from 400 to 3000 cycles.

These changes were made before we received the modification notice from Heath with regard to the same problem. Their changes were not tried. I had an opportunity to check the audio quality of the SB-10 against my 10A and local reports were to the effect that the SB-10 sounded more natural, indicating a wider frequency response. ■

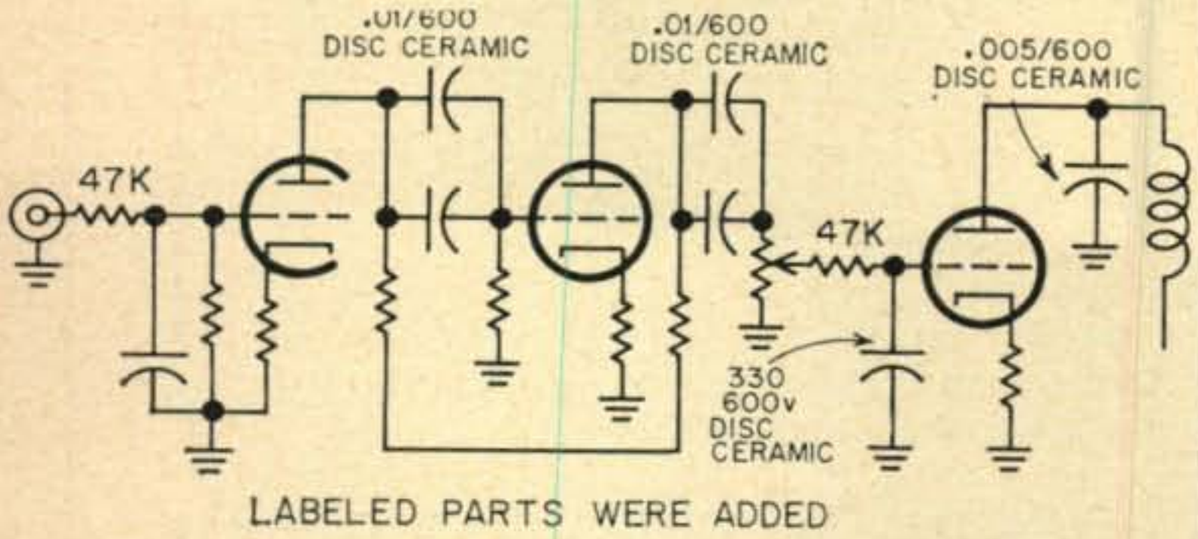


Fig. 6—SB-10 modifications.

Parts List

2—125 mf 450 volt electrolytics. Sprague TVL 1760.
1—40-40 mfd 450 volt electrolytic tubular.
2—100,000 ohm 2 w carbon.
1—2700 ohm 2 w carbon (R-17).
1—1800 ohm 2 w carbon (R-16).
1—3300 ohm 2 w carbon (R-15).
1—200 mmf 600 volt mica.
1—330 mmf 600 volt disc ceramic.
1—.005 mf 600 volt disc ceramic.
2—.01 mf 600 volt disc ceramic.
2—47,000 ohm ½ watt carbon.
1—2.5 *mh* 125 *ma rfc*.
1—octal plug chassis mounting type for *vfo* power adapter, if needed.
2—octal sockets chassis mounting type for *vfo* power adapter, if needed.

Parts list for those who do not use the Heath Conversion Kit MK-1.

Advertising Index

READER SERVICE

CQ Magazine, Dept. RS

300 WEST 43rd STREET
New York 36, N. Y.

Coupon B
Void after
Feb. 25, 1960

Please send me information on your ads in the February 1960 CQ keyed as follows:

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54

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Call _____ Engineer ☐

Type of work (specify) _____

ADDRESS _____

CITY _____

ZONE _____ STATE _____

"TAB" THAT'S A BUY

"TABSTAT" CONVERTER TRANSISTORIZED DC to DC POWER 450V DC HI-EFFICIENCY KIT or BUILT!

Output 450 & TAP 250VDC at up to 150 MA/Up to **70 Watts** 80% efficiency: ripple 0.2%; low idle current one amp silicon rectifiers, oil condensers, toroid transf. fused & short circuit proof. Regulation 5% at 20 to 100% load!! **Small in size! Quiet! Light wgt! Lo-priced gtd** "TABSTAT" TR1245CB built $38. **Pre-Assembled U-Build** kit TR1245CK **Only $33.** Six V Inpt. TR645CB **$38 or Kit** TR645CK **$33.** "TABSTAT" 250VDC @ 100MA/12V in TR1225CB **$30. Kit** TR1225CK **$27.** 6V inpt TR625CB **$30. Kit** TR625CK **$27.**

SELENIUM F.W. BRIDGE RECTIFIERS

	DC AMP	18VAC 14VDC	36VAC 28VDC	72VAC 54VDC	130VAC 100VDC
One Year Gtd!	½	$1.00	$1.90	$3.85	$5.00
	1	1.30	2.00	4.90	8.15
	2	2.15	3.00	6.25	11.10
	3	2.90	4.00	8.60	13.45
	6	4.15	8.00	18.75	31.90
	10	6.10	12.15	26.30	41.60
	12	7.75	14.90	30.95	43.45
	20	12.85	24.60		
	24	15.00	29.45		

New "TABTRAN" Rectifier Xfmrs

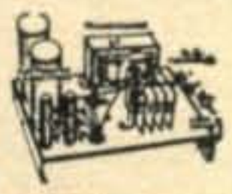
Sec'd Volts (DUAL†) 0-9-15-18-&-0-9-15-18. Series Sec'ds 0-3-6-9-12-15-18-21-24-27-30-33-36 Volts.

Write for Rectifier Catalog

TR4001 @ 1 Amp† ea/sec/winding $5.15
TR4002 @ 2 Amp† ea/sec/winding $7.15
TR4003 @ 5 Amp† ea/sec/winding..9.90
†Wndgs in Series at Ratings shown: Parallel 2X Current. Voltage output. 0-9-15-18

DC POWER SUPPLIES for TRANSISTORS!

New low-cost filtered 0.5% Ripple Power Supply. Same as specified in Transistor Manual **G.E.** Ideal for Powering transistor circuits, small in size!



12VDC at 150Ma-
T12V150M ..... $ 8
25VDC at 150Ma-
T25V150M $10
40VDC at 1 Amp-
T40V1A $19

"TAB"—THAT'S A BUY!—BARGAINS!!

IRISH/MYLAR Tape 2400 ft..... 3/$12
CONDSR Oil/W.E. 2mfd@600WVDC 6/$1
SNOOPERSCOPE TUBE 2"..... $5@ 2/$9
MINI-FAN 6 or 12VAC/60Cys $2@, 3/$5
NEW PRINT CKT-PANEL, 11x12x.062" $2
IRISH TAPE 1200' HiQlty, ...3 for $5
BANDPASS 60 or 90 or 150 Cys **each $2**
1N34A 45¢@, 15/$5; 1N35 $1; IN38 70¢@;
XTAL OVEN—115V&Thermostat $2
Blower 24VDC/100CFM $3.98
Blower AC/Miniature 6&12VAC $1.00

Xmitting Mica's .006 @ 2500V, 5 for $1.00
Miller 2.5MH/2.5&5Mtr Chokes ....8/$1.00
Vibrators 6 or 12VDC $1.49@; 4/ $5.00
New Variacs/or equiv 0-135V/7.5A $15.30
New Variacs/or equiv 0-135V/3 Amp $10.65
New Variacs/or equiv 0-132V/1.25A $7.25
RF-MTR GE/475 Ma & 5 Amp $4@, 2/$7
DC-METER Dejur 800 Ma/3½" $3@, 2/$5
DC-METER One Ma/4" Rd. $5@, 2/$8
RF-MTR Weston 750Ma/TC....$4@, 2/$6
DC MTR 100Ma/2½"..... $3@, 2/$5

BC696/3 to 4 mc's good condition $5.95
AN-ARR2/RCVR less tubes A-1 cndtn $1.95
RDZ/USN 200-400 Mcs Rcvrs As Is $25
RAX/MPN rcvr covers 4 bands 1.5 to 9 mc's 8 tubes has BFO Vernier $24.00
G.E./YRS-1 Side Band Selector $45
829B Socket 85¢, 2/$1.50, 813 Socket $1
4x150 Ceramic/LOKTAL ..... 2 for $1.00
W.E. 416B Higain—HiMu $4

NEW BATTERY CHARGER ! ! !
FOR 2V OR 4V OR 6V OR 12 VOLT BATTERIES, TRICKLE & FULL CHARGE up to 4 AMP

Charges 2-4-6 & 12 volt batteries.

Built BCK-1 ..... $13.50

*"TAB" GUARANTEED XTALS!

HAM BAND 80 or 40Mtrs ..... $1@
NOVICE BAND ..... $1@
CITIZENS BAND ..... $3@
Include 1st, 2nd, 3rd & 4th choice! On XTALS!
**Postpaid 48 States XTALS Only*

Send 25¢ for Catalog

Wanted 304TL Tubes & ALL TYPES!!!

"TAB" Tubes Tested, Inspected, Boxed

Six Months Guaranteed! No Rejects!

GOVT & MFGRS Surplus! New & Used

0A2	.70	6BZ7	1.25	*We Buy & Sell*	
0A3	.80	6C4	.45	43	.75
0B2	.65	6C5	.69	45	.49
0C3	.70	6C6	1.08	50L6	.69
0D3	.50	6C8	1.08	RK59	1.39
0Z4	.60	*We Trade!*		RK60	1.17
1A7	.90	6CB6	.89	HY69	2.20
1B3	.78	6CD6	1.49	75	.81
1L4	.82	6CF6	.85	HY75	5.00
1R4	5/$1	6CL6	1.40	83	.95

We Swap Tubes! What Do/U Have?

1R5	.78	6CB6	.89	4PR60A	37.50
1S4	.78	6CG8	1.12	4-125A	27.50
1S5	.68	6CM6	.79	4X150G	15.00
1T4	.85	6CS6	.70	4X250B	41.00
1T5	.95	6CU6	1.29	4-400A	41.75
1U4	6/$1	6D6	.99	4E27A	39.00
1U5	.75	6E5	.79	250TL	19.45
1X2	.99	6F4	2.49	307A	2/$1
2C39A	9.00	6F5	.63	316A	5/$1
2C40	5.50	6F6	.99	VR92	5/$1

Send 25¢ for Catalog!

2C43	6.50	6F7	.99	388A	3/$1
2C51	2.00	6F8	1.39	350A	2.45
2D21	.65	6H6	.59	350B	1.75
2E22	1.75	6J4	1.72	371B	.95
2E24	1.90	6J5	.59	5146	3.90
2E25	2.50	6J6	.59	416B	16.00
2E26	2.75	6J7	.99	450TH	43.00
2E30	1.70	6J8	1.39	450TL	43.00
2E35	1.60	6K6	.59	460	11.50
2K25	9.75	6K7	.79		

All Tubes Stocked at Low Prices!

2K26	34.00	6K8	.99	703A	2.00
2K28	30.00	6L6	1.19	707B	3.50
2V3	2/$1	6SN7	.72	715C	10.00
2X2	.48	6T8	.98	717A	5/$1
3A4	.70	6V6GT	.90	723AB	5.00
3A5	1.00	6X5	.49	725A	2.75
3API	5.95	12AT6	.59	803	3.50
3BPI	3.99	12AT7	.89	804	8.85
3C24	3.50	12AU6	.63	805	6.00
3D23	3.95	12AU7	.69		

We Buy! / *We Sell!* / *We Trade!*

3E29	6.00	12AX7	.79	807	1.10
3Q4	.68	12AY7	1.29	5/$5, 10/$12	
3Q5	.86	12B4	.95		
4-65A	13.50	12BA6	.65	811	3.45
4-125A	27.50	12BA7	.99	811A	4.41
4-250A	34.00	12BD6	.59	812	3.30
4X150A	7.00	12BE6	.59	813	8.00
4X250	36.00	12BH6	.79	815	3.15
4X500	37.00	12BH7	.99	826	.59
5API	2.95	12BY7	1.00		

Wanted Test Sets and Equipment

5BPI	5.02	12BZ7	.99	828	9.00
5BP4	5.00	12H6	.75	829B	8.00
5CPI	4.99	12J5	.69	832A	6.00
5CP7	9.00	12J7	.69	833A	36.00
5R4	1.00	12J8	1.35	837	2/$2
5T4	.90	12K8	.89	866A	2.45
5U4	.75	12SA7	.69	954	10/$1
5V4	.89	12SC7	.89	955	3/$1
5Y3	.60	12SF5	.69	957	3/$1
5Z3	.89	12SG7	.89	958A	2/$1

Send 25¢ for Catalog!

15GP22	89.00	12SH7	.89	991	5/$1
6A7	1.00	12SJ7	.75	1614	2.75
6A8	.99	12SK7	.75	1619	5/$1
6AB4	.59	12SL7	.79	1620	2.00
6AC7	.72	12SN7	.69	1625	5/$1
6AG5	.65	12SQ7	.69	1626	5/$1
6AG7	.75	12SR7	.69	1629	4/$1
6AK5	.69	15E	1.19	2050	1.25
6AL5	.59	15R	4/$1	5517	1.25
6AQ5	.66	FG17	3.49	5608	3.95

Top $$$ Paid for 304TL tubes

6AR6	1.95	19T8	1.16	5618	3.25
6AS7	3.49	24G	3.50	5651	1.35
6AT6	2/$1	25A6	1.19	5654	1.20
6AU6	.79	25A7	2.19	5656	4.25
6B8	1.35	25C5	.81	5663	1.15
6BA6	.59	25L6	.72	5670	.90
6BE6	.59	25T	4.00	5686	1.75
6BG6	1.49	25Z5	.72	5687	1.15
6BH6	.79	25Z6	.75	5691	4.70
6BJ6	.72	26A7	3.69	5725	1.95

Top $$$ Paid for XMTTR Tubes!

6BK7	.99	FG27	8.28	5732	2.00
6BL7	1.35	HV27	19.39	5736	85.00
6BN4	.69	28D7	.89	5749	1.95
6BN6	1.08	FG33	15.00	5750	2.75
6BN7	1.99	EL34	3.49	5751	1.25
6BQ6	1.19	35A5	.69	5814	1.20
6BQ7	.99	35L6	.59	5879	1.20
6BX7	1.11	35T	4.49	5894	$12.00
6BY5	1.19	35Z5	.89		
6BZ6	.91	RK39	2.99	No See—Write!	

"TAB" TERMS: Min Order $3—25% with order F.O.B. New York. Ten day guarantee, price of mdse. only. Our 15th year.

Prices shown are subject to change.

111CD Liberty St., N. Y., 6, N. Y. RE 2-6245

Leece Neville Charger Systems "SILTAB" Silicon Rectifier Replacement Non-Aging Hermetically Sealed

FOR 6 or 12VDC @ 100A, Type YJ9 $24

*New Silicon 500Ma Rectifiers, Working Range RMS-ACV Input!

rms/piv	rms/piv	rms/piv	rms/piv
35/50	70/100	140/200	210/300
30¢	45¢	50¢	65¢
rms/piv	rms/piv	rms/piv	rms/piv
280/400	350/500	420/600	490/700
78¢	$1.00	$1.26	$1.50
rms/piv	rms/piv	rms/piv	rms/piv
	630/900	700/1000	770/1100
$1.59	$1.89	$2.58	$3.12

Use in Bridge or C.T. up to 750ma dc

GENERAL PURPOSE & REPLACEMENT

*Silicon 400PIV. at 250 Ma Rectifiers Hi-Temp 106°C at 252V/RMS. Special 2 for $1; 25 for $10.

Tophat's Postpaid 48 states orders $10.

Silicon 866A Tube Replacement Rectifier Rated 3000 Ma at 4500V-RMS or 6400PIV. Operates —65 to + 165°C. Max 12.5 VDC Drop 300Ma "VACDAC" ST866. **Each $16.**

5u4 or Equiv. 1600PIV/1100 Rms at 750Ma. ST5u4 ..... $9

RECTIFIERS 130V/RMS HALF-WAVE

75Ma 49c, 5 for $2; 100Ma 59c, 6 for $3 150Ma 70c, 8 for $5; 250Ma 79c, 6 for $4 300Ma 88c, 5 for $4; 350Ma $1.00, 8 for $7 400Ma $1.10, 5 for $5; 500Ma $1.35, 5 for $5

This Item P.Pd. 48 states orders $10.

*"TAB" for NEW TRANSISTORS!

2N38	$.98	2N442	$5.00	2N441	$3.00
2N155	3.25	2N256	1.45	2N234A	1.36
2N156	4.45	2N277	4.50	2N422	5.00
2N174	12.00	2N278	5.50	CK722	.95

**Postpaid 48 States Orders $10*

"TAB" FOR THE BEST KITS!

KITS! *Each "TAB" Kit Contains The Finest Selection!!!!*

Kit 5 Mycalex Glass/HF Strips
Kit 35 Precision Resistors
Kit 10 Switches
Kit 75 Resistors ½/1/2W
Kit 150 Carbon Resistors
Kit 25 Panel Lamps
Kit 12 Electrolytic Cond's
Kit 15 Volume Controls
Kit 56 Tube Sockets
Kit 65 Tubular Condensers
Kit 500 Lugs & Eyelets
Kit 10 Bathtub Oil Cond's
Kit 5 lbs. Surprise Package
Kit 10 Transmit Mica Cond's
Kit Glyptal & Cement
Kit 3 Phone/Patch Xfmrs
Kit 3 Searchlights
Kit 4 AN/Reflector Lites
Kit 6 Inslid Tuning Tools

Kit 6 AN Plugs & cnnctrs
Kit 5 Sub-Min Tubes
Kit 40 Standoff Insulators
Kit 35 Power Resistors
Kit 75 Mica Condensers
Kit 5 Crystal Diodes
Kit 200ft Hook Up Wire, 4 Rolls, 50ft/ea. Asstd. Color
Kit 100 Fuses, assorted types
Kit 100 Ceramic Condensers
Kit 5 FT243 Xtal Holders
Kit 5 Microswitches
Kit 10 Wheat Lamps
Kit 3 Transistor Xtmrs
Kit 8 Xtal Osc-Blanks
Kit 4 Asstd Rectifiers
Kit 12 Alligator Clips Asstd
Kit 5 UG/Connectors
Kit 100 Self/Tap Screws

Kit Adj Wire Striper & Cut
Kit 2 Bakelite Panels 6x12"
Kit 5 pcs Wrench Set
Kit 8 pcs Nut Driver Set
Kit Hi Gain Xtal Mike
Kit 6 ea Phonoplugs & Jacks
Kit 25 ft Lo-Cap Mike Cable
Kit 18' Lo-Cap 2 Cond M-Cable
Kit 20 ft RG59U Coax Cable
Kit 15 ft RG11U Coax Cable
Kit 2 pair SO239 & PL59
Kit 12 Binding Posts Asstd
Kit 5 Phone Jacks Asstd
Kit 3 Phone Plugs Asstd
Kit Long Nose Plier
Kit Side Cutter Plier
Kit 2 Xmttr Variables
Kit 5 of 2mfd @ 600wvdc/oil

Order Ten Kits We Ship Eleven!!! *ONE EACH ABOVE KIT ONLY* **99c**

If U Don't See It Write!

WE BUY! SELL & TRADE
Send 25¢ for Bonus Catalog!

NEW FROM NATIONAL

NC-400

The Most Versatile Communications Receiver Ever Designed

National

NATIONAL RADIO CO., INC.

MELROSE 76, MASS.

A wholly owned subsidiary of National Company, Inc.

Export: AD AURIEMA, INC., 85 Broad St., N. Y., N. Y., U.S.A.
In Canada: CANADIAN MARCONI CO., Toronto 17

For further information, check number 2 on page 126.

The NC-400 is a modern, multiple purpose, general coverage receiver. Tuning range is 540 kc to 31 mc in 7 bands, with dual conversion on all frequencies above 7 mc. Its unique design provides maximum flexibility of operation to satisfy a wide variety of communications requirements.

The NC-400 may be used as a self-contained unit, either manually tuned or crystal controlled on pre-selected frequencies. In addition, external master oscillator provisions make possible use of modern synthesizer techniques for applications where extreme frequency stability is required. It may be operated in space or frequency diversity applications. Provisions are made for interconnection of any required outputs or for feed to external loads or combiners. All frequency determining circuits may be internally or externally controlled. The NC-400 also provides optimum versatility of bandwidth, either through the use of internal IF circuits or the use of optional mechanical filters.

FREQUENCY RANGE:	GENERAL COVERAGE
Band 1	.54– 1.1 MC
Band 2	1.1 – 2.1 MC
Band 3	2.1 – 4.1 MC
Band 4	4.1 – 7.0 MC
Band 5	6.9 –12.2 MC
Band 6	11.8 –20.4 MC
Band 7	19.6 –31.0 MC

NOTE: Bandspread dial provided with 0-100 logging scale and calibrated for 80, 40, 20, 15 and 10 meter amateur bands.

FREQUENCY STABILITY: Long term stability after warm-up –.002%

SENSITIVITY: 1 microvolt for 10 db signal/noise ratio

SELECTIVITY: 4, 8 and 16 kc positions provided with 6 tuned circuits. 3.5 kc wide upper and lower sideband positions provided with 14 tuned circuits. 3.5 kc sharp position activates plug-in crystal filter providing 5 additional degrees of selectivity below 3 kc plus phasing notch. Plug-in accessory available which will provide front panel selection of three mechanical filters without modification of receiver. Proper choice of filters will enable selection of bandwidths from 500 cycles to 16 kc, or will enable filter type of sideband selection from front panel.

SSB PROVISIONS: Separate SSB heterodyne detector uses pentagrid converter and separate beat oscillator. Beat oscillator may be crystal controlled. Special "fast-attack-slow release" AGC circuit. Sideband selection accomplished by exclusive, new National passband switching techniques. In the event of commercial-type SSB reception, single sideband mechanical filters may be installed and switched from front panel.

FIXED CHANNEL OPERATION: HF oscillator has 5 crystal sockets for use in fixed channel operation. Channels may be selected by front panel switch. In addition, HF oscillator may be controlled from external master oscillator selected by front panel switch. "S" meter "Tune" position permits rapid tuning of receiver to crystal controlled channel.

DIVERSITY PROVISIONS: Basic receiver may be operated from master oscillator as noted above. An accessory Diversity Modification Kit (NC-400 DMK) allows choice of internal or external control of all oscillators. Rear panel selector provisions make possible use of any receiver either as master control, or slave fed from other oscillator sources. IF, detector and AGC outputs available for feed to external loads or combiners.

POWER REQUIREMENTS: 110-220 volts, 50-60 cycles AC

MANUFACTURER'S SUGGESTED LIST PRICE: $895.

OPTIONAL ACCESSORIES:

1. XCU-400 crystal calibrator. Output frequencies of 100 kc. and 1 mc.
2. NTS-2 matching speaker
3. NC-400 DMK diversity modification kit
4. NC-400 FH mechanical filter housing

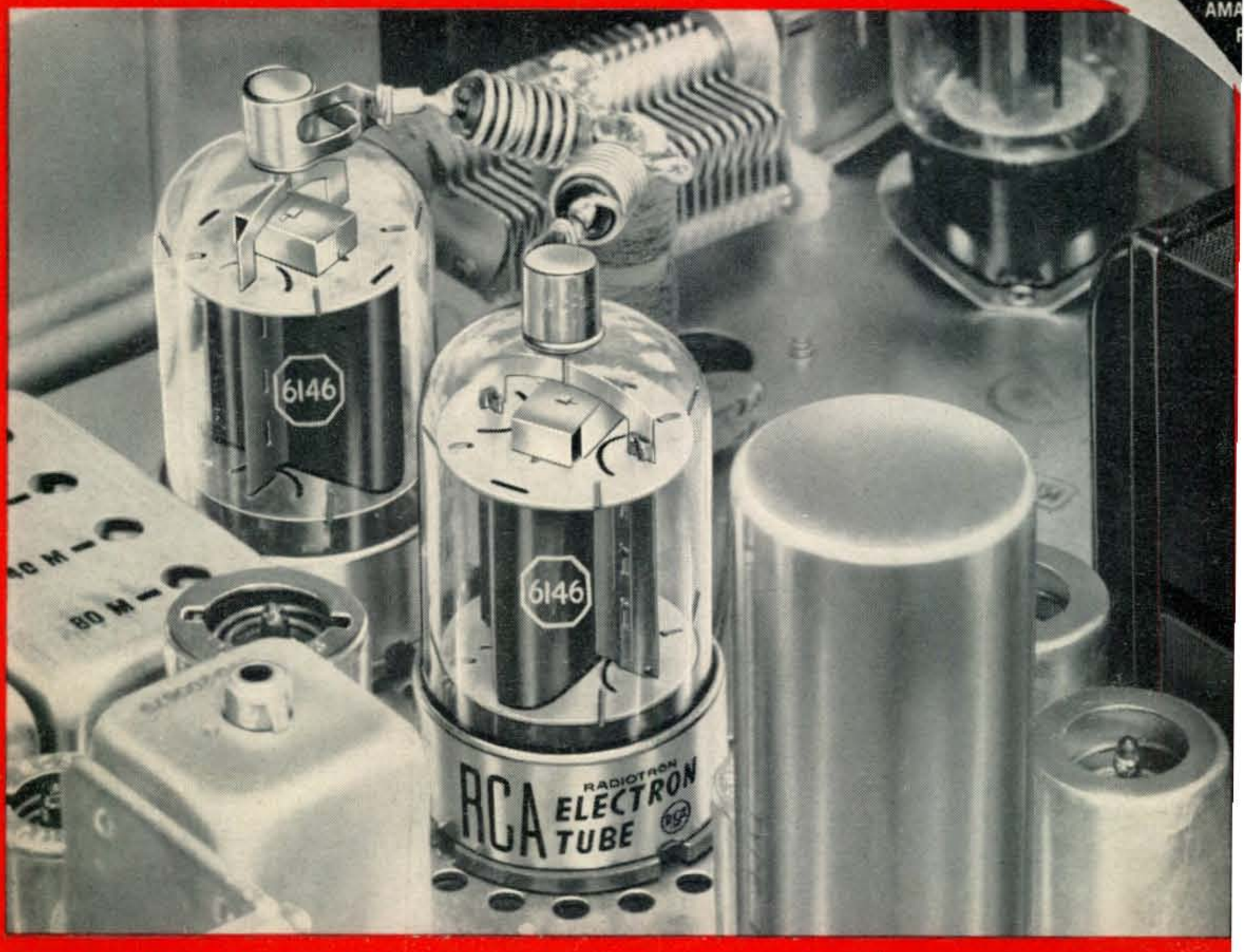
*Manufacturer's suggested list price. Sold only by National Co. Franchised Distributors

In Canada by Canadian Marconi Inc., 830 Bayview Ave., Toronto, Ontario

Export by Ad Auriema, Inc., 80 Broad St., New York City.

NEW HALLICRAFTER HT-37 TRANSMITTER

ANOTHER
RCA SE
AMA
P



Inside view of the HT-37, showing the two RCA-6146's in parallel in the linear final.

Every Tube is RCA...

from VFO to the 6146 Final

RCA-6146
90 watts CW inp
to 60 Mc; 67.5
on phone.

Pictured here is one of the newest, most modern SSB-AM-CW transmitters in amateur radio. It's the medium-power 10-to-80 meter HT-37. RCA is proud that Hallicrafter designers specified an RCA tube for every stage in this outstanding 18-tube rig—including the linear final!

Operating today in hundreds of thousands of communications equipment throughout the world, RCA tubes have earned a reputation for high reliability *right in the circuit!* Emission capability is second to none—even after long periods of demanding operation. High uniformity of tube characteristics during life does away with circuit "touch-up", while high uniformity of characteristics from tube to tube enables you to replace tubes without major tune-up. And conservative ratings pay off in more operating hours for your tube dollar.

Whether you design or whether you retube, you'll do better every time—with "RCA's" in the sockets! Your RCA Industrial Tube Distributor handles all RCA types used in the amateur station.

RADIO CORPORATION OF AMERICA

Electron Tube Division **Harrison, N. J.**