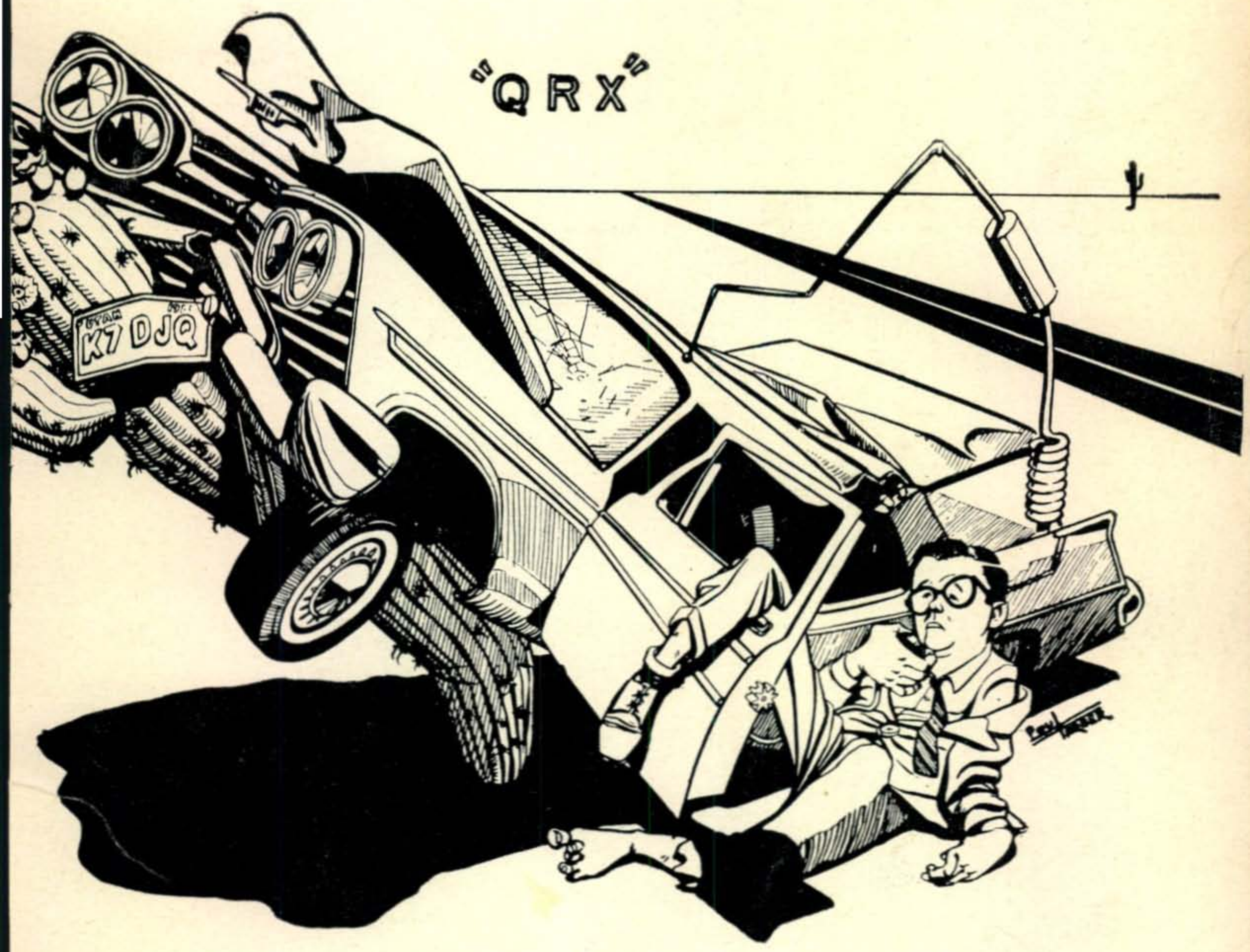
CQ

October 1959
50¢

Winner of
October QSL Contest K7DJQ



The Radio Amateur's Journal

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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Fifth overtone; for operating directly in 6-meter band; hermetically sealed; calibrated 50 to 54 Mc., ±15 Kc.; .050" pins. **$6.95 Net**

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

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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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Channels 2 thru 13.... **$6.45 Net**
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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%..... **$2.95 Net**

TYPE Z-9R RECEIVER CRYSTALS FOR CITIZENS BAND CLASS "D"—Specify I.F. frequency, also whether I.F. is above or below transmitter frequency. Calibrated to .005%. **$2.95 Net**

TYPE Z-9R RADIO CONTROL CLASS "C"
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Type Z-6A, Frequency Standard
To determine band edge. To keep the VFO and receiver properly calibrated.
100 Kc. .. **$6.95 Net**

Z-6A

Silver Anniversary Year 1934-1959

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For further information, check number 3 on page 126.

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

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

CQ CERTIFICATES:

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

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

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 to 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 go wrong we hasten to point out that everything is experimental and we guarantee nothing.

◀For further information, check number 4 on page 120

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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

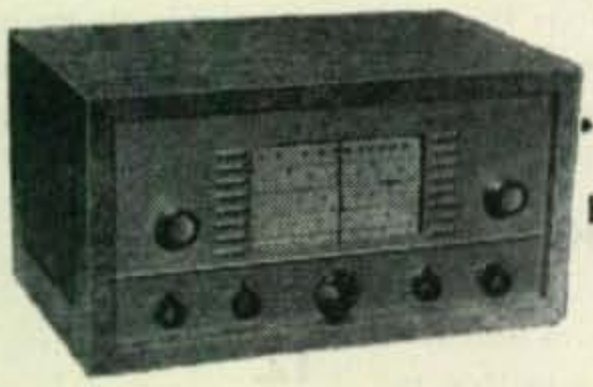
The many features and modern styling of the "Apache" will provide you with just about everything you could ask for in transmitting facilities. Emphasizing high quality the "Apache" operates with a 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, built-in switch selected 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

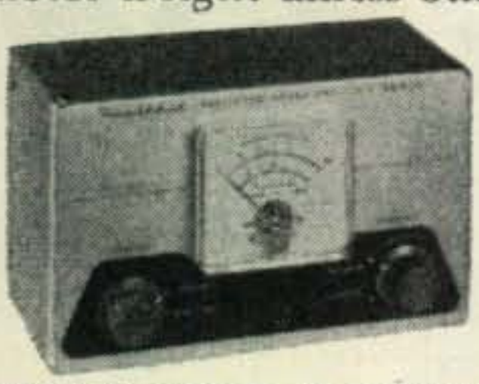
Handsomely designed and color styled to match the "Mohawk" receiver this heavy duty 8" speaker with 4.7 ounce magnet provides excellent tone quality. Housed in attractive 3/8" plywood cabinet with perforated metal grille. Speaker impedance is 8 ohms. Shpg. Wt. 7 lbs.

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.



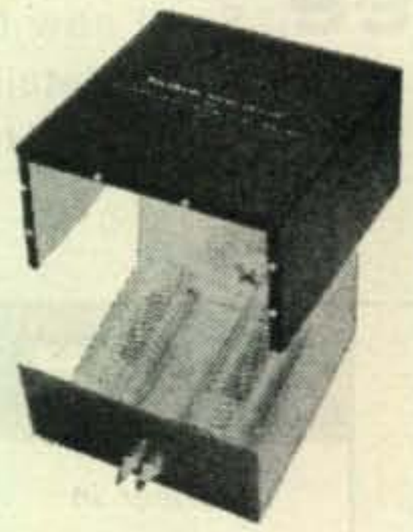
HEATHKIT AM-2
$15.95

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**

HEATHKIT DX-40 **$64.95**

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.

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.

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HEATH COMPANY BENTON HARBOR 12, MICH.

pioneer in do-it-yourself electronics

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QUANTITY	KIT NAME	MODEL NO.	PRICE

For further information, check number 5 on page 126.

. . . de W2NSD

never say die

Maximum Power

Barry and I got to talking about some of the recent FCC citations for overpower. From there the conversation drifted to the ease of building a kilowatt transmitter today. I dug back into my memory and compared the problems of putting a kilowatt on the air today with the obstacles a ham faced twenty years ago. Barry dates back to about 1950 in the hobby, a newcomer to those of us left over from pre-war deuce, so I had to try to suggest an analogous situation.

Back in the Thirties a kilowatt was a big deal. A few fellows ran a full gallon on the high end of Seventy-five and would only talk to other of the Gentry. A few more thundered forth on Twenty and worked all the DX there was to work. But the problems of building a kilowatt were formidable and the expenses enormous and to most of us a rig like that was only a far off unattainable dream. The difficulties and costs were about what we would expect if we were to try to build a ten kilowatt rig today.

Nothing is available at amateur prices that will run ten kilowatts, you have to build your own. No matter which end you start to plan, you run into wallet thinning miseries. You will probably want to run 5000 volts at 2 amps to the final amplifier. Price a transformer for this; new. Let's not dig into surplus for there wasn't any then. And don't forget a second transformer for the modulator for only 5 *kw*. The final tubes will run several hundred dollars . . . even the filament transformers will be expensive and hard to find. In all probability you will be forced either to make all of your own components or else buy stuff made for commercial broadcast transmitters at sky high commercial prices. Price a 5 kw modulation transformer some time.

When you consider this comparison you can understand why the National 600 transmitter made such an impression when it came out in the late thirties and provided a 600 watt rig for all bands which would run 600 watts input for only $1200. This price, adjusted for inflation and increased taxes corresponds to about $4000 today! This was quite a bargain and a lot of the rigs were sold. Today we can own a kilowatt transmitter for a few dollars a year by trading in our old model every couple of years for a new one.

Fear

The other day, while tuning through the Novice band, I ran across several signals that were pumping out CQ's by the dozens, with only a rare pause for a call sign. On reflecting about this phenomenon I began to wonder, for here I had found four operators who were practicing an age old vice of our hobby . . . four operators who undoubtedly had read time and time again about the correct way to send a CQ. Why were they sitting there grinding out 15 minute long CQ's? For that matter, why have beginners in ham radio been practicing this extremely frustrating habit steadily right on down through the entire history of our hobby? Why has the technique persisted in spite of all attempts at education or embarrassment?

Perhaps the root of the problem does not lie in education at all. In mulling this over I went back to some of my early days on the air, particularly on CW, and recaptured some of the emotions that I experienced. Fear! I'm sure that every one of you can remember the petrification of your first unaided QSO. This fear is so strong that many Novices have never conquered it and have let their licenses lapse rather than go on the air. Most of us get over our fears gradually, easing the early pangs by stereotyped contacts which require practically no thinking and allow us to procede through the trauma as painlessly as possible.

Applying this thought to long winded CQ's I can remember the thrill of being on the air, the excitement of pressing the key and knowing that *I* was sending a signal out by radio. And there was the fear of not being able to copy what the other chap might send back to me once I got into a QSO. Or I might not be able to think of anything to say myself and be caught there in a panic at the key with this other fellow waiting impatiently for me to say something of interest. If anything ever made me send long CQs, it was those fears . . . for, while sending CQ I was on the air, but with no responsibilities.

The cure? Well, experience is a good one . . . but this is a bit rough on some of the other fellows trying to use the band with you while you are indulging in ego release through blind transmitting. Perhaps there would be a little less fear if you would sit down and spend a few minutes planning out something to say in your QSO before you go on the air.

Feenix, Ariz.

Deer Hon, Ed:

Boy oh boys, the mirakel are finely happening. Hot Diggity and like that there, Hon. Ed., Scratchi are going to be 1/c milyunair. Are you gonna see the bux spent!

You thinking it being better to having one kilowhat mobile rig in Hon. Cattelac or should I going hole hoggy and getting Rolls Roice? On second thought, maybe should reely going 1/c and getting Grayhound Bus and running Arizona Kilowhat on all bands.

Howcomes I suddenly going to being in the bux? Some relative leeving me there forchun? No indeedy, Scratchi getting this money with his Hon. Branes. What making it so slicky is that all this are possible on acct. of F.C.C.

Letting me starting at beginning. Some time ago F.C.C. making legal what they calling Class D citizens band radio. This way anybuddys 18 years or older can getting on air in what used to being amchoor eleven meter band.

Okey you saying, so what's new—everybuddys knowing all this. Rite chew are, but keeping listening. It now many months since this being legal, and poor old F.C.C. are being snowed under with applicayshuns. In fackly, so many peoples getting class D license that there are over eleventeen thousand peeples now on air.

So how this making Scratchi milyunair? Easy. Keep listening and paying atenshun. If you listening on class D band any nite when skip are open, you heering all sorts things.

For examples, you heering feller in Buffalo talking to feller in Dallas. Know what, Hon. Ed? That not legal. No indeedy, that are against the law. Class D only good for short distance use.

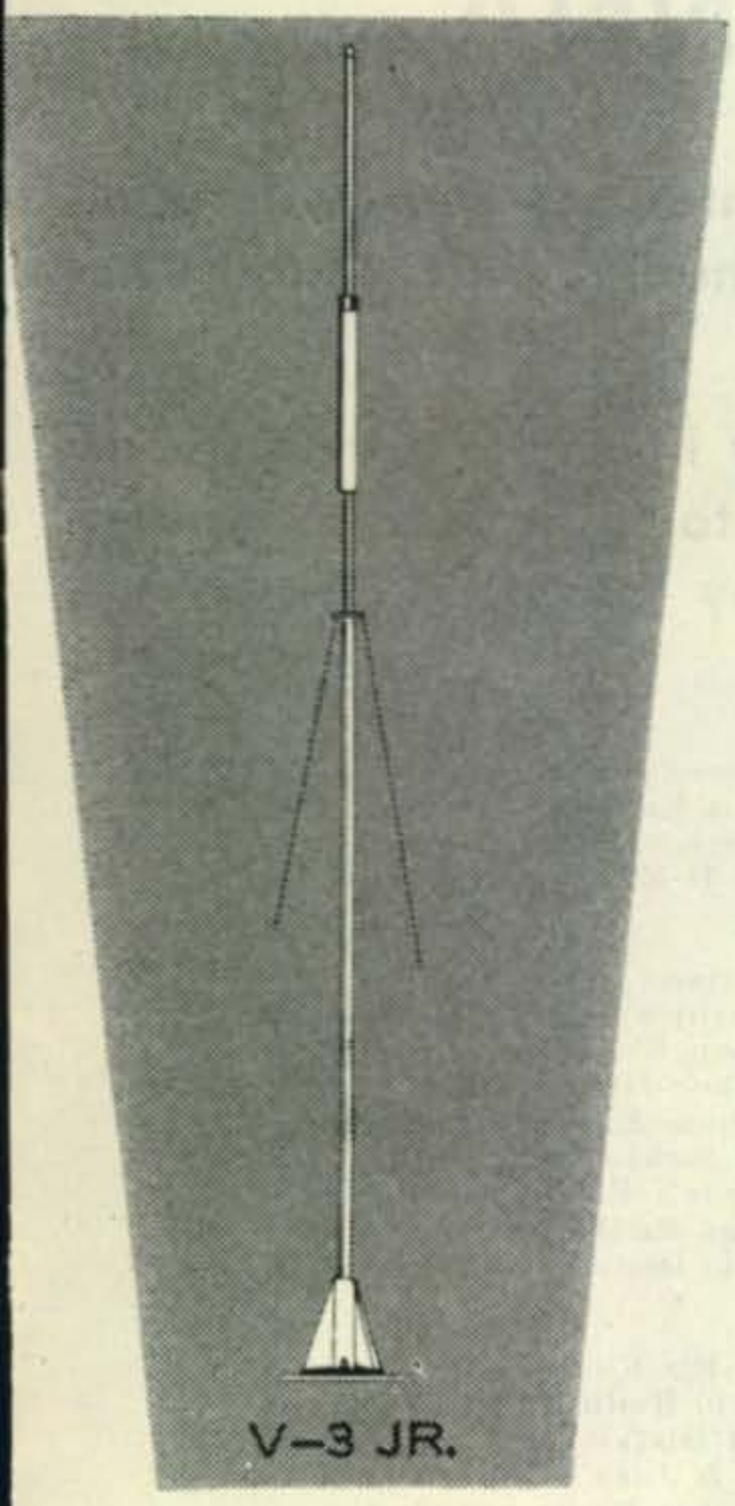
Listening reel carefooly and you heering something else. Heering fellers off freakwency. Everybuddy know that are against the law. Yes indeedy, having to have 0.005% freakwency stability.

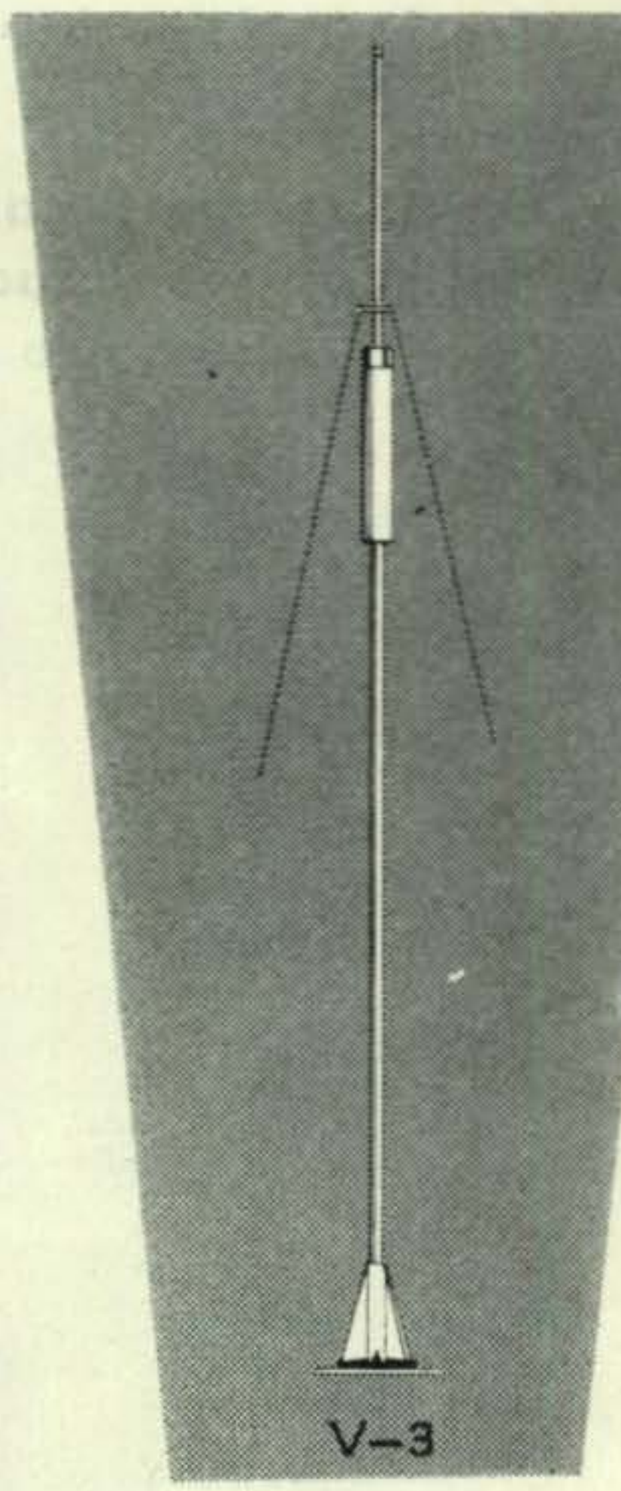
Also heering cupple fellers suddenly finding they can talking to one another, so they starting QSO. Aren't legal. F.C.C. saying can't having random contacks.

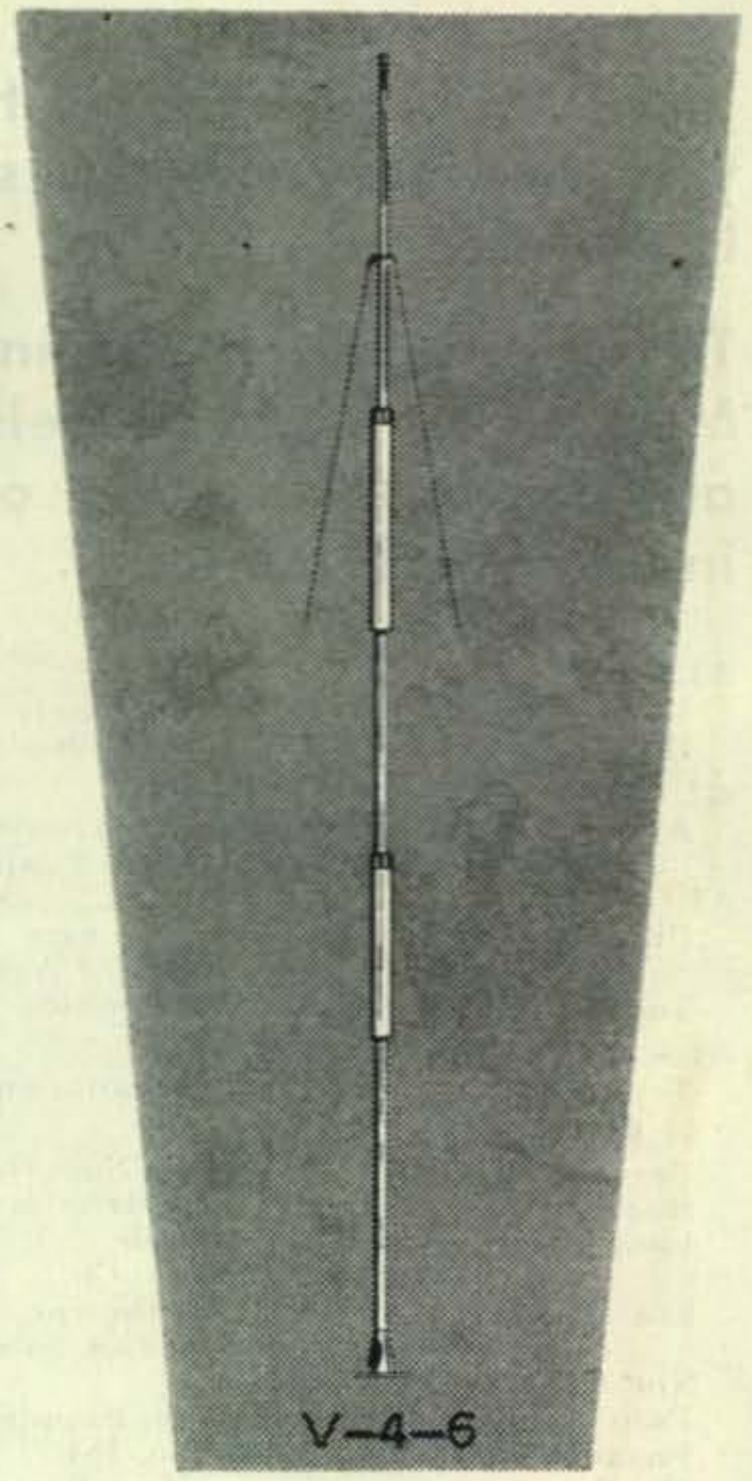
[*Continued on page* 86]

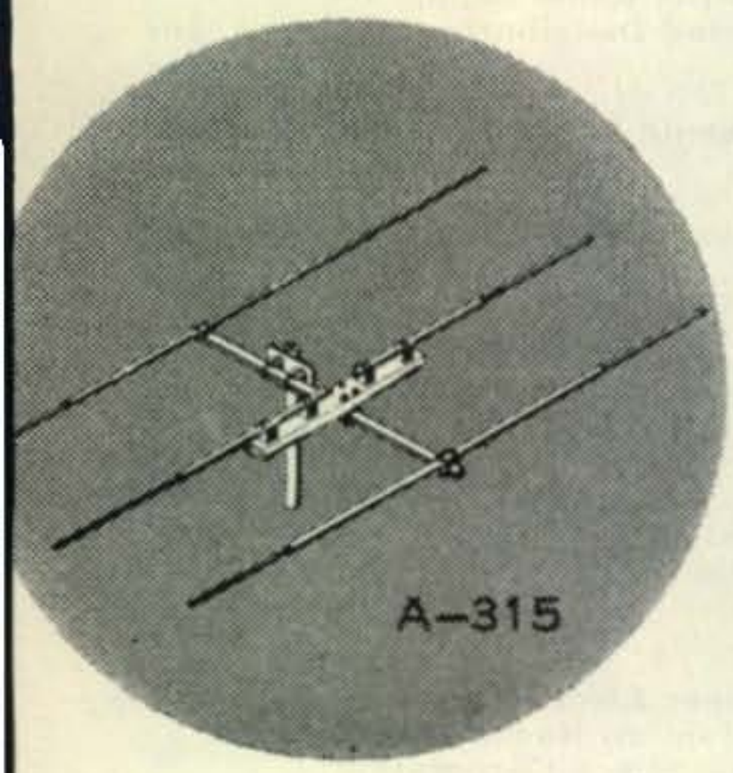
on this page you will find . . .

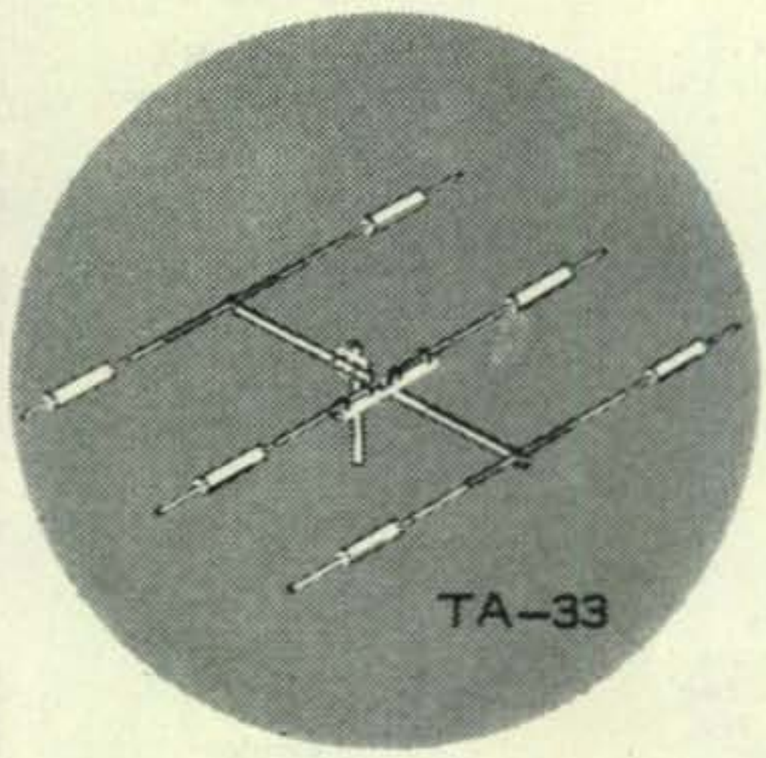
Your Antenna

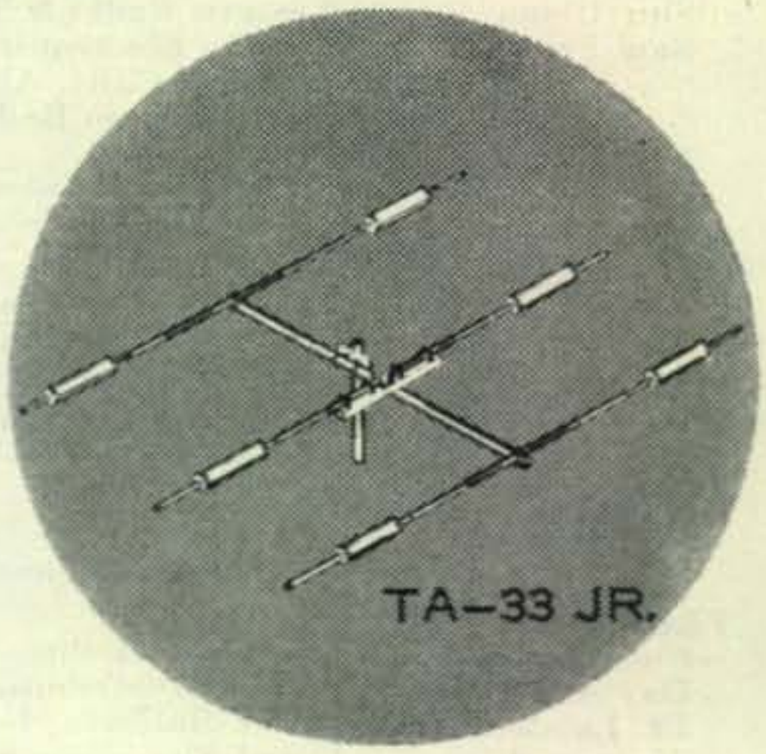

V–3 JR.


V–3


V–4–6


A–315


TA–33


TA–33 JR.

There is a MOSLEY Antenna to suit every Amateur's need! Whether you choose a beam or a vertical; whether you're a DX'er, a Net Operator, a "rag-chewer" or a VHF fan – join the thousands of Hams all over the world who are *glad* they chose MOSLEY!

You hear it on the bands . . . *"A MOSLEY Antenna can't be beat!"*

Turn the page to find listed a Distributor within driving distance who can supply *from stock* the MOSLEY Antenna of your choice.

Mosley Electronics Inc.

St. Louis 14, Missouri

For further information, check number 6 on page 126.

WHERE TO BUY YOUR MOSLEY ANTENNA

The Distributors shown here are STOCKING Mosley Antennas and will give you prompt, courteous service. Drive in today—drive home with your MOSLEY Antenna!

To qualify for this listing, each Distributor must carry in stock a variety of MOSLEY Antenna models. Every effort has been made to compile a complete and accurate list. We offer our sincere apology to any qualified Distributor inadvertently omitted.

ALABAMA	
Birmingham	Ack Radio Supply Co.
Huntsville	Curle Radio Supply Co.
ALASKA	
Anchorage	Alaskan Electronics Supply, Inc.
	Yukon Radio Supply Inc.
ARIZONA	
Phoenix	Acme Electronics
	Radio Parts of Arizona
Tucson	Elliot Electronics
ARKANSAS	
Texarkana	Lavender Radio and TV Supply, Inc.
CALIFORNIA	
Berkeley	Electronics Suppliers
Burbank	Valley Electronics Supply Co.
Long Beach	Larry Lynde
	Scott Radio Co.
Los Angeles	Henry Radio, Inc.
	Radio Product Sales, Inc.
North Hollywood	Woody's
Palo Alto	Zack Radio Supply
Pasadena	Dow Radio, Inc.
Riverside	Mission Ham Supplies
San Diego	Western Radio & TV Supply Co.
San Francisco	Fortune Electronics, Inc.
	Northern Calif. Amateur Supply
	San Francisco Radio Supply
San Jose	Quement Inc.
Vallejo	Electronics Wholesale, Co.
Van Nuys	Valley Electronic Supply Co.
COLORADO	
Denver	Radio Products Sales Co.
	Rogers Radio Company
CONNECTICUT	
Hartford	Hatry of Hartford, Inc.
New Haven	Radio Shack of Connecticut
DISTRICT OF COLUMBIA	
Washington	Electronic Wholesalers, Inc.
FLORIDA	
Cocoa	Thurow Distributors
Daytona Beach	Thurow Distributors
Ft. Lauderdale	Vance Baldwin, Inc.
Jacksonville	Peard Electronic Supply
Miami	Walder Radio & Appliance Co.
Pensacola	Grice Radio Electronics Inc.
Tampa	Kinkade Radio Supply, Inc.
GEORGIA	
Albany	Specialty Distributing Co.
Atlanta	Ack Radio Supply Co.
	Specialty Distributing Co.
Augusta	Specialty Distributing Co.
Columbus	Specialty Distributing Co.
Macon	Specialty Distributing Co.
Savannah	Specialty Distributing Co.
Valdosta	Specialty Distributing Co.
HAWAII	
Honolulu	Kaimuki Radio Co.
	Precision Radio, Ltd.
	Radio Wholesale & Supply Co.
IDAHO	
Idaho Falls	Moore Radio Supply, Inc.
	Schwendiman Distributing Co.
ILLINOIS	
Alton	Ebinger Radio, Inc.
Chicago	Allied Radio Corp.
	Green Mill Radio Supply
	Newark Electronic Co.
Moline	Lofgren Distributing Co.
Peoria	Klaus Radio and Electric Co.
	Selectronic Supplies, Inc.
Rockford	H & H Electronic Supply, Inc.
INDIANA	
Angola	Lakeland Radio Supply
Evansville	Castrup's Radio Supplies
Fort Wayne	Brown Electronics, Inc.
Gary	Walker-Jimieson, Inc.
Indianapolis	Graham Electronics Supply, Inc.
	Van Sickle Radio Supply Co.
Kokomo	George's Electronic Supplies
Portland	Bucks Radio and TV Supplies
South Bend	Radio Distributing Co., Inc.
IOWA	
Cedar Rapids	Ken-Els Radio Supply
Council Bluffs	World Radio Laboratories, Inc.
Davenport	TCR Distributors
Des Moines	Bob & Jack's Store for Hams
Fort Dodge	Ken-Els Radio Supply Co.
Sioux City	Molstad Distributing Company, Inc.
KANSAS	
Wichita	Amateur Radio Equipment Co., Inc.
KENTUCKY	
Louisville	Universal Radio Supply Co.
LOUISIANA	
Baton Rouge	Davis Electronic Supply Co., Inc.
Lafayette	Butcher Dist. Corp.
Lake Charles	Wholesale Radio Equipment
New Orleans	Radio Parts, Inc.
MARYLAND	
Baltimore	Amateur Radio Center
Silver Spring	Uncle George's Radio Ham Shack
MASSACHUSETTS	
Boston	Cramer Electronics, Inc.
	DeMambro Radio Supply
	Radio Shack Corporation
Lawrence	Alco Electronics
MICHICAN	
Ann Arbor	Purchase Radio Supply
Detroit	M. N. Duffy & Co., Inc.
Ferndale	Erickson's Electronic Wholesale, Inc.
Flint	Radio Tube Merchandising Co.
Grand Rapids	Radio Parts, Inc.
Jackson	Matteson Electronics, Inc.
Kalamazoo	Warren Radio Company
Laurim	Northwest Radio of Michigan
Marquette	Northwest Radio of Michigan
MINNESOTA	
Duluth	Northwest Radio
Minneapolis	Electronic Center, Inc.
	Lew Bonn Company
Rochester	Elliot and Hanson Co.
St. Paul	Gopher Electronics Co.
	Hall Electric Company
MISSISSIPPI	
Jackson	Swan Distributing Co., Inc.
MISSOURI	
Butler	Henry Radio Company
Kansas City	Associated Electronics Supply Co.
St. Louis	Walter Ashe Radio Co.
Springfield	X-Ray Electronic Supply, Inc.

WHERE TO BUY YOUR MOSLEY ANTENNA *(Continued)*

MONTANA	
Billings	Electronic Supply Company
Great Falls	Modern Equipment Company
NEBRASKA	
Omaha	Ladd Electronics Company
NEW HAMPSHIRE	
Concord	Evans Radio, Inc.
NEW JERSEY	
Bloomfield	Variety Electronics Corp.
Mountainside	Federated Purchaser, Inc.
Newark	Hudson Radio & TV Corp.
Passaic	Nidisco-Passaic
Ridgefield Park	N.R.M. Wholesale Radio, Inc.
NEW MEXICO	
Albuquerque	Electronic Parts Co., Inc.
Santa Fe	A-1 Communications Supply Co.
NEW YORK	
Albany	Fort Orange Radio Dist. Co., Inc.
Brooklyn	National Radio Parts Distg. Co.
Buffalo	Genesee Radio & Parts Co., Inc.
	Radio Equipment Corp.
Elmira	Chemung Electronics
Hempstead	Standard Parts Corp.
Jamaica	Harrison Radio Corp.
Long Island City	Lafayette Radio
	Spera Electronic Supply
Mineola	Arrow Electronics, Inc.
New York City	Arrow Electronics, Inc.
	Harrison Radio Corp.
	Harvey Radio Company, Inc.
	Hudson Radio & TV Corp.
	Midway Radio & TV Corp.
	Milo Electronics Corp.
	Terminal Radio Corp.
Rochester	Rochester Radio Supply Co., Inc.
Syracuse	Morris Distributing Co., Inc.
Utica	Associated Electronics Supply
	Grapac Electronics Co.
White Plains	Melville Radio Corp.
NO. CAROLINA	
Asheville	Freck Radio Supply Co.
Charlotte	Dixie Radio Supply Co., Inc.
NORTH DAKOTA	
Fargo	Fargo Radio Service Co.
OHIO	
Akron	Warren Radio Company
Canton	Burroughs Radio Co., Inc.
Cincinnati	Steinberg's Inc.
Cleveland	Pioneer Electronics Supply Corp.
	Radio and Electronic Parts Corp.
Columbus	Universal Service
Dayton	Custom Electronics, Inc.
Toledo	H & W Auto Accessories
	Selectronics Supplies, Inc.
Warren	D and J Electronics Supply Co., Inc.
Youngstown	Armies Electronics
OREGON	
Albany	Oregon Ham Sales
Portland	Portland Radio Supply
	United Radio Supply
PENNSYLVANIA	
Allentown	A. A. Peters, Inc.
Bristol	Powell Electronic Sales Co.
Elkins Park	AG Radio Parts Co.
Erie	Erie Electronic Supply Co.
Harrisburg	Radio Distributing Company
Philadelphia	Almo Radio Company
	Consolidated Radio Co.
	Radio Electric Service Co.
Pittsburgh	Cameradio Company
Reading	George D. Barbey Co., Inc.
Wilkes-Barre	Shelborne Electronics, Inc.
RHODE ISLAND	
Newport	N. F. Andrews Elect. Supply Corp.
Providence	DeMambro Radio Supply
SOUTH DAKOTA	
Rapid City	Burghardt Radio Supply, Inc.
Watertown	Burghardt Radio Supply, Inc.
TENNESSEE	
Chattanooga	Curle Radio Supply Co.
	Specialty Distributing Co.
Memphis	Bluff City Distributing Co.
	W & W Distributing Co.
Nashville	Electra Distributing Co.
TEXAS	
Dallas	Central Electronics
	Crabtree's Whsle Radio & TV
Fort Worth	Bill Sutton's Whsle Electronics
Houston	Busacker Electronics Equipmt Co., Inc.
UTAH	
Salt Lake City	Manwill Supply Company
	Standard Supply Company
VIRGINIA	
Arlington	Key Electronics
Norfolk	Priest Electronics, Inc.
WASHINGTON	
Everett	Pringle Radio Whsle Co.
Seattle	Amateur Radio Supply, Inc.
	Pacific Electronic Sales
	Seattle Radio Supply
Spokane	Northwest Electronics, Inc.
	Tel-Electric Distributing, Inc.
Tacoma	C & G Radio Supply
WEST VIRGINIA	
Bluefield	Meyers Electronics Inc.
Charleston	Hicks Radio Supply
WISCONSIN	
Appleton	Valley Radio Distributors
Fond Du Lac	Harris Radio Corp.
Kenosha	Chester Electronic Supply Co.
Madison	Satterfield Electronics, Inc.
Milwaukee	Amateur Electronic Supply
CANADA	
ALBERTA	
Calgary	Sacker Electronics Co., Ltd.
	Smalley's Radio, Ltd.
Edmonton	Canadian Electronics, Ltd.
	Taylor, Pearson & Carson, Ltd.
BRITISH COLUMBIA	
Vancouver	Taylor, Pearson and Carson, Ltd.
	The Ham Shack
	Hygrade Radio, Ltd.
	Western Agencies, Ltd.
Victoria	Ellison Queale Radio Supply, Ltd.
	Western Agencies, Ltd.
MANITOBA	
Winnipeg	Cam Gard Supply, Ltd.
	Sparling Sales, Ltd.
	Western Sound Services, Ltd.
NEW BRUNSWICK	
St. John	Eastern Distributors, Ltd.
NEWFOUNDLAND	
St. Johns	Electronic Centre, Ltd.
ONTARIO	
Brantford	Brant Electronics, Ltd.
Downsview	Alpha-Aracon
Fort William	Inter-Com Supply
Hamilton	Crawford Radio
London	C. M. Peterson Co., Ltd.
Ottawa	George A. Lafleur Radio Co.
Toronto	Electro-Sonic Supply Co., Ltd.
Windsor	Adams Electronics-Windsor, Ltd.
QUEBEC	
Montreal	Payette Radio, Ltd.
SASKATCHEWAN	
Regina	Radio Supply and Service, Ltd.
Saskatoon	A. A. Murphy and Sons, Ltd.
	Radio Supply Co., Ltd.

OVERSEAS AMATEURS—MOSLEY Antennas are stocked by many Distributors throughout the world. For name of nearest supplier, write: MOSLEY ELECTRONICS, Inc., International Division, 15 Moore St., New York 4, N.Y. or MOSLEY ELECTRONICS LTD., 15 Reepham Rd., Norwich, Norfolk, England.

MOSLEY ELECTRONICS INC.

Saint Louis 14, Missouri

For further information, check number 7 on page 126.

CLUB BULLETINS

Marvin D. Lipton,

311 Rosemary Road, Toronto 10, Ontario, Canada.

Attention Radio Clubs

In recognition of the prominent role being played by the hundreds of amateur radio clubs on the ham scene today, *CQ* takes pleasure in announcing the creation of the **Club Activities Department** in the *Radio Amateurs' Journal*. Previously written under the heading of **Club Bulletins,** the new department will deal with all amateur radio club matters rather than just club papers as was the case before the change.

CQ NEWS, our monthly new digest, continues to be produced from the best contents of the nation's club journals, but whereas it was mailed mainly to clubs with bulletins, now it's sent to all clubs who desire free copies. Among the many clubs that will be granted associated membership in the news service, are those that registered with *CQ* last January and those who register at the above address in the future. The *CQ* bulletin no longer is duplicated but is now offset printed in newspaper-style. This enables us to include photos and simple schematics; something that previously was impossible.

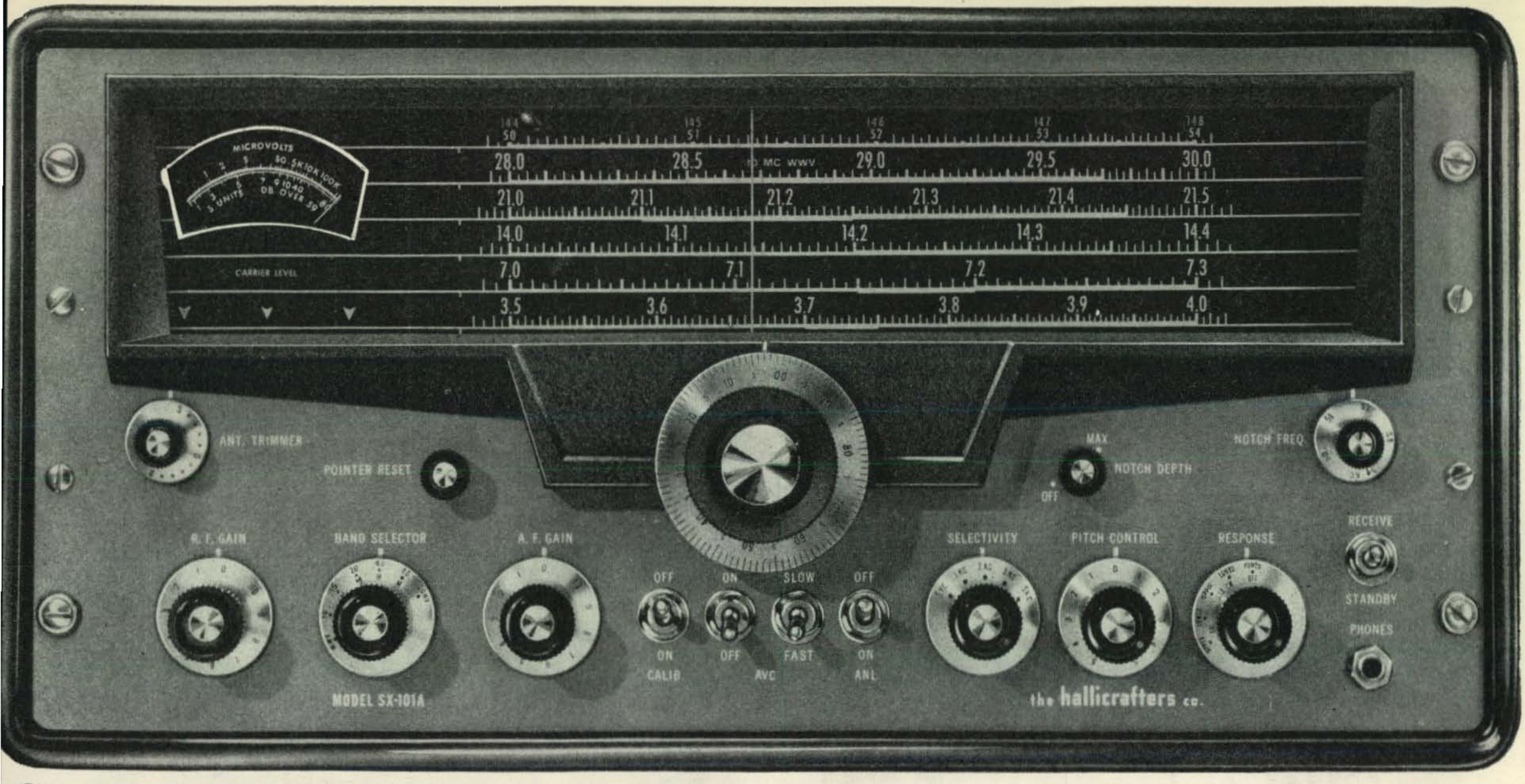
In this space we intend to print news of all club activities. We would like you to feel free to contribute generously to this colume with the understanding that these pages are reserved for the exclusive use of your club and other radio clubs of the world.

Taped Programs

The Capital VHF Society of Washington, D.C., hit upon a ten carat idea that came to me through the pages of **QSO,** the six meter publication of the hams of Rahway, N.J. The VHF group would swap tapes of special club programs with other clubs throughout the country. In this manner a club could have a standby program should the scheduled speaker fail to show, a projector break, etc. We'd be happy to print in *CQ NEWS*, a catalogue of available tapes each month if we get a volunteer to act as librarian.

Help Wanted

Bob McNichols, K2TWN, and his friends in Manhattan are attempting to start a VHF club. They seek advice and guidance regarding the formation and operation of such an organization and if you are able to offer a few ideas from personal experience, contact Bob at 222 East 87th Street, New York 28, N.Y.



When great ideas are born . . . leadership is earned. This is a leader. This is the SX-101A, newest and finest expression of unqualified authority in precision receivers. Its predecessor models earned their position overnight with *ideas*. Like the Tee-notch filter . . . upper-lower sideband selection . . . unprecedented sensitivity and stability. But leadership demands progress—still more ideas, more features. You'll find them in the 101A: A new type of product detector . . . two-position AVC . . . full bandspread on 10 . . . band-to-band gain equalization . . . many more. The leader belongs in your shack. **SX-101A by hallicrafters**

QSL contest

Winner

This month the grand prize goes to Bill Parker, K7DJQ for his novel cartoon card depicting the perils of inattentiveness while mobiling—Well done, William. (See the front cover.)

W8EDE, SM2AVU and LU9ABI tried hard but Bill scooped 'em!—Anyway, they win gallons of applause and a free copy of "CQ."

Fellas—Keep those cards coming—We still have lots of subscriptions to give away!

CLUB BULLETINS [*from page* 16]

New Members

Word of *CQ NEWS* seems to have spread abroad and we now have quite a representation in foreign countries. The latest club publications to become affiliated with us are: **The Malayan Radio Amateur,** Kuala Lumpur, Malaya, **H.A.R.T.S. Newsletter,** Hong Kong A.R.T. Soc., **RTA Magazine,** Radio & TV Assoc. of Santa Clara, Calif., and **Ragchew,** Capetown Branch, South African Radio League.

73,
Marv VE3DQX.

Choice of the careful buyer

GSB-100, SINGLE-SIDEBAND, AM, PM, CW TRANSMITTER/EXCITER

GSB-100 is a welcome exception in today's market . . . returns full value for each of your hard-earned equipment dollars. It is truly the choice of the careful buyer—and there are many—as the number of GSB-100's on any band will clearly show.

GSB-100 performs . . . does what it is designed to do . . . with ease. Non-marginal, non-critical, stable. You set up on any band . . . 80-40-20-15 or 10 meters . . . on any mode, SSB with selectable sidebands, AM, PM, CW . . . in seconds. Exciter circuits are ganged for single control. Pi network output setup is simplified by output indicating instrument. You change sidebands at the flip of a switch . . . a quartz crystal "notcher" keeps carrier nulled perfectly without adjustment. The voice-operated-relay (VOX) adjusts precisely to your own voice characteristics . . . gives you "at ease" operating enjoyment. "Peek" control allows you to zero-in without turning on amplifier. CW men all agree that keying of this unit when on CW is exceptionally good.

Power . . . 100 watts P.E.P.—is sufficient for "barefoot" use as a transmitter . . . more than enough to drive the Gonset GSB-101 Linear Amplifier when you want a ten-fold increase in power.

GSB-100 . . . choice of the careful buyer

479.50

Watch for the new Gonset Mobile SSB!

For further information, check number 11 on page 126.

GONSET **GONSET** *Division of Young Spring & Wire Corporation*

801 SOUTH MAIN ST., BURBANK, CALIFORNIA

EXPORT SALES: WESTREX CORP., 111 EIGHTH AVE., NEW YORK 11, N.Y.

Letters . . . . . to the Editor

Free Ham Press

Dear Wayne:

As one of the *readers* of CQ, I would like to comment on that on pages 15 and 16 of the August issue of CQ . . . . this, speaking as an individual amateur.

Truthfully, on reading what I did, I took a "fast roll' and began the slow process of "burning up."

Let's stop this "anti-ARRL" business once and for all with a few facts.

First off, criticism in a FREE SOCIETY is the impetus for better performance. A *free ham press* is essential if we are to maintain some semblance of organization; a stifled press is similar to milking a cow from only one spigot!

The Voice of CQ is a powerful one (over 90,000 readers) who draw their own conclusions as to the competency of an organization and its governing individuals. To me, a letter as you reproduced in the August issue is a *challenge* to FREEDOM. If CQ did nothing for the ham or did not contribute to the welfare of the ham; blatantly criticised our only American ham organization, the ARRL, WITHOUT offering constructive suggestions—then the horse surely would be of a different color!

"Anti-ARRL"? My eye! If it *were*, there would be no reference to the ARRL, its publications, or suggesting that CQ readers consider ARRL membership (look at some of my past HAM CLINIC COLUMNS). I have yet to have you tell me WHAT to put in my column. CQ Free? You dern betcha it is!!

Mr. Budlong, *we the members* of the ARRL have the right to criticise. (Incidentally, we are waiting with bated breath a *report* on your activities at the conference in Geneva—and wish you GOD SPEED.) We also would like to see the expense ledger for that $25,000.00 that has been appropriated too.

Of course, the Publicity Committee has the prerogative of accepting or rejecting proffered advertising and requests for booth space . . . at any convention. But is it a wise thing to turn down a ham publication—that many ARRL members read? Is it wise to *show* that we in America sometimes disregard a *part* of our freedoms by "putting the thumb" on a publication that is about as FREE as any publication can be. Yes, you're "dern tootin'" I'm waving the flag! (I fought in *two* wars for it!)

Maybe the ARRL and those connected with its activities (both at Hqrs. and throughout the country) will wake up to the realization that CQ IS NOT "anti-ARRL" but only wishes to see that the *job* they have *assumed* will be done well and that the amateur will be taken care of properly—whether he is ARRL or not. If he is, fine!

But regardless of whether you are for or against ARRL, CQ I'm sure will always remain the independent powerful voice that it is and stick up for ALL HAMS.

72 73 75

Chas. Schauers W6QLV/F7FE

QSL

Dear Wayne,

You, perhaps, can be of greater assistance concerning this subject than anyone; or if not, you can no doubt offer a very good reference in the form of an amateur who has been successful in this field of endeavor.

Here is the problem. As the ten meter band was opening late this past summer, I worked most of the South and Central American countries on phone (do they know the code there?). When the band started opening to Africa and Europe, the mike was dropped and serious DX operating initiated. As a result 62 new countries (new to me) were worked in a two month period. My total worked column stands at about 75 countries with most all of the 75 worked 3 to 5 times. This was accomplished with 60 watts input.

200 or more QSL cards were sent direct air mail and

From the engineering team that developed the incomparable HT-32A comes a transmitter that brings SSB within reach of all...

HT-37

The price: $450.00. Here, for the first time, is a moderately priced SSB transmitter that retains the essential performance characteristics which made its big brother the most wanted single sideband transmitter of all.

Same power. Same rugged VFO construction. Identical VOX. And a smooth, distinctive speech quality that insures excellent on-the-air reports.

You can judge — and own — the HT-37 now. Your distributor will soon have it on featured display.

Technical Details

VFO employs double reduction disc drive, fixed T.C. **Sideband suppression** 40 db. at 1000 CPS. **Power rating:** 70-100 watts P.E.P. output CW or SSB. 17-25 watts carrier on AM phone. Two 6146's in the final. 3rd and 5th order distortion products down 30 db. **Carrier suppression:** 40 db. or better. **CAL System:** Instant CW CAL signal from any transmission mode. **Cooling:** convection with final operated at low dissipation in standby. **Size:** 9½" high, 18¼" wide, 16¾ "deep.

the new ideas in communications are born at . . .

hallicrafters

Chicago 24, Illinois

Export Sales: International Division
Raytheon Mfg. Co., Waltham, Mass.

For further information, check number 13 on page 126.

the others direct regular mail. Out of about 300 QSL's sent, about 30 were received representing 25 countries. This figure includes those cards received through the bureau. Naturally all the pleading phrases were included on the cards. Stations not listed in the call book, CQ, or the radio rag were sent via the proper bureaus. All DX stations are QSLed.

To improve the return ratio, IRC's are now being sent with self addressed envelopes and second QSL card. It seems rather foolhardy to send this packet to bureaus, consequently this is not being done. Are the procedures of this paragraph sound?

None of the countries worked are particularly rare but a fella has to start somewhere. If it is difficult to obtain QSL's from non-rare stations it must be "real bad" trying to get cards from the rare ones. If a fella has to work the same countries over and over to get a QSL, he cannot spend as much time listening for other countries and QRM gets bad and all that garbage.

Now then, on bended knee I ask, "Please divulge to me the complete scoop on this QSL business", and I will remember you in my will (One arc 5 modulator to W2NSD). What is the most effective system and where have I erred?

R. H. ("Hess") Garlough, II, W8EFG/9
Angola, Indiana

An unusual QSL card usually brings pretty good results. You might try that. Maybe the readers will have some handy hints for you too.

DX

Dear Wayne:

A few days ago I was looking over some back issues of my favorite magazine, CQ. In one of these issues I found a story by Ol' Joe, "Are You a O!!%c?." As the days passed and the sun spots got better I tried my hand at 20 cw, and the following story might be passed on.

ARE YOU A O!!%c—**#$ K6?

War has long been waged between the midwest and south between the K6's and W6's. Maybe not a total war, but a cool disagreement on who is a gentleman on the ham bands. Ol' Ed—that's me—has long leaned toward DX when he can. Not 100%, mind you, but when classes are not in session. Everywhere you hear CQ DX, until at last you turn your receiver off and then you hear CQ de K6XXX. I oppose such actions on behalf of the Six's and take it to Congress.

Here's why. I had two whole days off from work and no classes, so I settled down for a lot of happy, relaxed DX'ing.

Like the cart and buggy, 20 cw ain't what it is cracked up to be ,and I'm fed up to the top of my 6146 of all these sun spot guys saying the band will be open in the Central U.S.A.

In the first place, I enjoy a little DX, and when I hook a DX station three consecutive times and a "knot head" from K6 land comes on calling CQ CQ CQ de K6XXX, I blow my fuse. Just a few moments before I has received a 589 and a 599 from the "smog" ridden country side. How does a lead like that ever obtain a General ticket I'll never know. Wonder if he got someone else to fill out FCC form 610 when he applied.

I slowed down for a while and sweated it out, hoping against hope they would all go to bed, but that never happened.

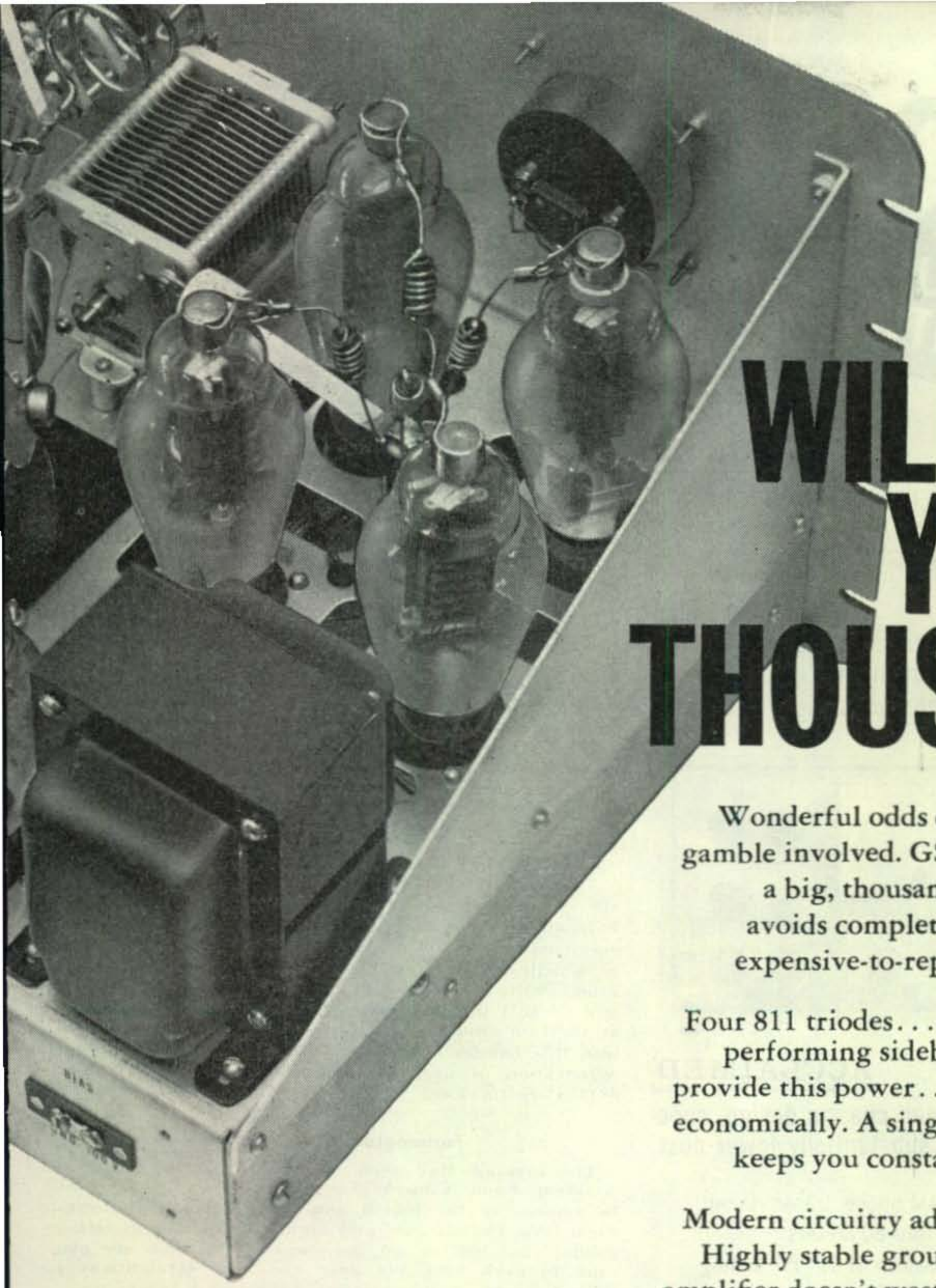
Many words have been exchanged about this breed who must own a crystal set when they listen before sending. I counted 10 QSO's about the subject in just one night. Of course, that is no record.

I've saved the most horrible example for the last. I finally hooked a VK and who do you suppose broke in, right in the middle of the QSO—you guessed it; a K*6*, calling the VK like mad. Here's a little advice to those eager-beavers—remember, those boys across the big pond can work whom they please, and whom ever they please CAN abide by the "Amateur Code."

I've got a name for a guy like that, but CQ wouldn't print it. If this hits home, and you don't want to be an unprintable, act like the amateur whom you are suppose to represent it.

73, Eddy Shell, W5ZBC/5

[*Continued on page 123*]



FOUR WILL GET YOU A THOUSAND!

Wonderful odds certainly. But no gamble involved. GSB-101 gives you a big, thousand watts P.E.P.— avoids completely, any need for expensive-to-replace large tubes.

Four 811 triodes. . . well-proved, top performing sideband veterans. . . provide this power. . . conservatively, economically. A single low-cost spare keeps you constantly in business.

Modern circuitry adds further value. Highly stable grounded-grid linear amplifier doesn't waste drive power in swamping, lets it appear as useful talk power in amplifier output circuit. (Drive requirement, 60-70 watts, ideally supplied by Gonset GSB-100.)

Operation on 80-40-20-15-10 meters. . . full bandswitching of course. Heavy-duty power supply with 2-866A's and bias supply built-in. Operating conveniences include, quiet, DC-operated antenna relay, indicator for constant check on output.

GSB-101 LINEAR AMPLIFIER.

Unquestionably, your biggest power-for-dollar value!

439.50

Watch for the new Gonset Mobile SSB!

For further information, check number 15 on page 126.

GONSET *Division of Young Spring & Wire Corporation*
801 SOUTH MAIN ST., BURBANK, CALIFORNIA

EXPORT SALES: WESTREX CORP., 111 EIGHTH AVE. NEW YORK 11, N.Y.

Announcements

Auburn, Alabama

The Auburn, Opelika, and Valley (Ala.) Amateur Radio Clubs will hold their 1959 Ham Picnic on Sunday, October fourth at Chewacla State Park south of Auburn off of U. S. 29. Bring your own picnic lunch. Drinks will be furnished. Prize tickets will be $1.00. Main prize will be a mobile transmitter. There will be no registration fee. For further information contact Ed Bailey, W4EVU, Route 2, Box 130, Auburn, Alabama.

Cleveland, Ohio

The Cleveland Area Council of Amateur Radio Clubs announces that the 2nd Annual Amateuradio Convention will be held at the Manger Hotel in Cleveland, October 16th and 17th. This will include Buffalo to Detroit and south to Dayton and Pittsburgh.

A very attractive program has been planned for the expected 2000 in attendance of all ages, novice to sideband. Pre-registration and a number of hospitality parties on Friday night will attract many visitors before the big day. Saturday will bring forth talks, demonstrations, movies on antennas, singleside band, linear amplifier design, microphones, television interference, and DX. In the evening a banquet with an estimated 750 in attendance will hear the Mayor of Cleveland proclaim Amateur Radio Week, and several other speakers of local and state importance.

Dallas, Texas

The Dallas Texas Amateur Radio Club is holding its 8th annual Hamfest, Sunday, October 11th at the State Fair of Texas. Activities begin at 8 A.M., with prizes every half hour. Pre-registration prizes and the grand prize will be drawn at the conclusion of the main program which begins at 3 P.M. Rain or shine, the Hamfest will be held in the air-conditioned Margo Jones Theater at the fair grounds. Monitoring frequencies, to zero you into this hamfest, will be 3.995 and 50.55 mc. For pre-registration of only $1, contact Bob Norris, W5KAS, 6815 Cornelia Lane, Dallas 14, Texas.

Farmington, New Mexico

This coming Halloween, October 31, 1959, the Totah Amateur Radio Club of Farmington, New Mexico, will be sponsoring the fourth annual 5Ø7 Totah Halloween Field Day. On that day and night, in addition to (other) goblins that will be out, members of this club are planning to pack field day gear and head straightway to Four Corners.

Four Corners is in a very sparsely-settled area—primitive at present, yet possibly destined to become increasingly better known in days ahead due to the fact that it will be only about seven mies from Navajo Highway No. 1.

Shreveport, Louisiana

The ARK-LA-TEX Amateur Radio Club and amateurs of this area are holding a ham-fest in conjunction with the Louisiana State Fair conducted during the week 25 through 31 October 1959 in Shreveport, Louisiana.

Space has been allocated to encompass an elaborate display of oldest and latest amateur radio equipment. In addition, an amateur radio station will be placed in operation and operate on all bands during the active hours of the fair.

The last day of the fair will be called "Ham-Day," at which time we will sponsor guest speakers and conduct the "Royal" drawing for prizes.

Syracuse, New York

VHF ROUNDUP. Oct. 10 is the day you'll find the DX men and the boys you want to meet at the VHF Roundup. You'll have a full day of never-to-be-forgotten ham fun and take home prizes as well. Contact W2OQY, 106 Hyland Drive, North Syracuse, N. Y.

[*Continued on page* 26]

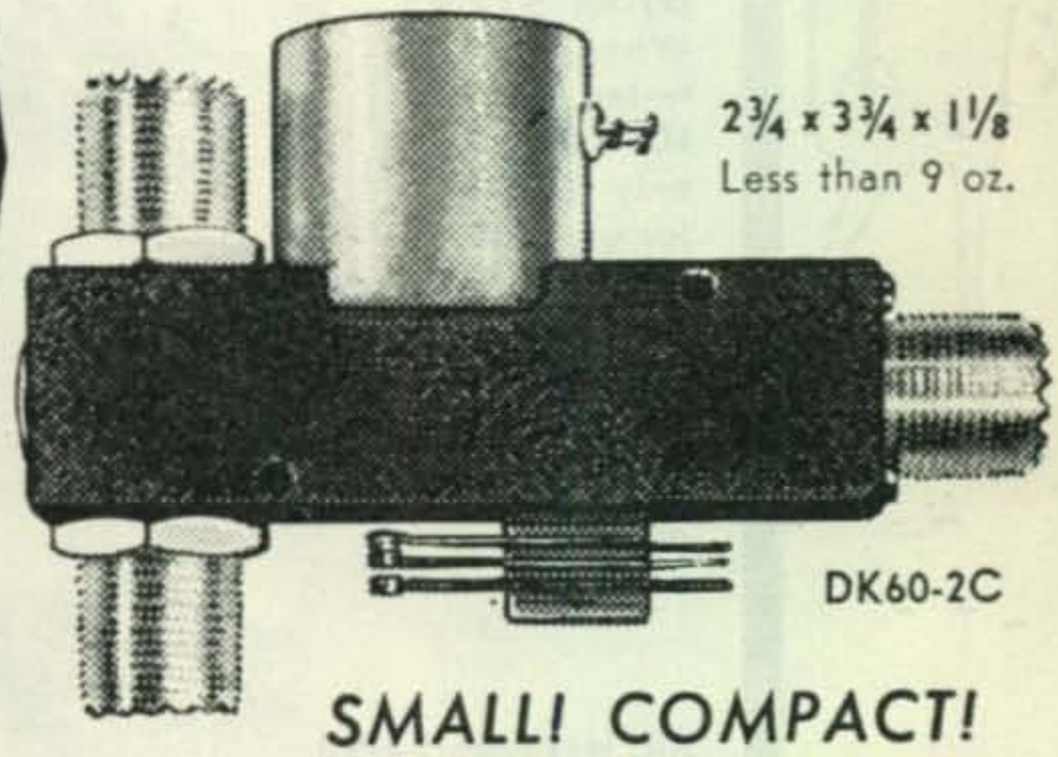
For further information, check number 17 on page 126.

CELEBRATING DOW-KEY CO.'S
10 YEARS OF PROGRESS

AND ANNOUNCING THE . . .

NEW

DK60 SERIES
COAXIAL RELAYS
in 4 different models, A.C. or D.C.



SMALL! COMPACT!

r.f. SPECIFICATIONS

- Low VSWR, less than 1.10:0 from 0 to 400 mc.
- Low Losses: Fine silver plated parts used in crucial positions, contacts pure silver.
- Low Cross-Talk in DK60-G and DK60-G2C through use of patented receiver protection connector which provides shield between receiver and transmitter line greater than 100 db. isolation, 0 to 500 mc.
- High Power Rating — to one kilowatt in transmit position when connected to matched line.
- Single Pole Double Throw r.f. contacts.

MECHANICAL SPECIFICATIONS

- High Contact Pressures.
- Long Life Expectancy—greater than one million operations.
- Continuous Duty.
- New Coil Terminal Design — Teflon feed-throughs used to provide connection ease.
- Small Size — new compact design, only 2¾"x3¾"x1⅛"
- Light Weight — less than nine ounces.
- Newly designed Dow UHF (standard) or type N (at slight additional cost) r.f. connectors available. Specify if type N connector required.

ELECTRICAL SPECIFICATIONS

- Wide variety of coil voltages — D.C. volts at 6,12,24,32, 48,110 (5,000 ohm), 220 (10,000 ohm) at 3 watts or 6,12, 24,110,220 A.C. at 6 volt-amps. 50-60 cps. (Special voltages available on request.)
- Auxiliary contacts available for power control — DPDT @ 5a. 110 vac. on DK60-2C and DK60-G2C.

Guaranteed free from Hum or Chatter.

DK60 — DK60-G — DK60-2C — DK60-G2C, A.C. or D.C. ..... 10.90 to 14.20

SEE YOUR ELECTRONIC DEALER for these and other Dow-Key Quality Products!

TESTED! PROVEN!

THE DKC-TRP
COAXIAL ELECTRONIC TR SWITCH
with
BUILT-IN POWER SUPPLY!

Designed to operate in the 1.8 to 30 mc range requiring NO EXTERNAL D.C. POWER SUPPLY! Has a BUILT-IN POWER SUPPLY which may be operated from a regular 120 volt A.C. circuit. About 15 watts of power is required.

DKC-TRP features include: Rated maximum legal amateur power. Low VSWR. Aluminum casting construction makes DKC-TRP TVI proof. Switch allows break-in operation with a single antenna system. Type N connectors available at slight additional cost.

DKC-TRP, each $27.75

DOW-KEY GUARANTEE:
All Dow products fully backed by traditional factory warranty for unit replacements.

DOW-KEY COMPANY • THIEF RIVER FALLS MINNESOTA

For further information, check number 18 on page 126.

You Asked For It . . . Here It Is!

COSMOPHONE "1000"

▲ A Self-contained 1 KW Transmitter-Receiver
▲ A True Table-top Station with NO Sacrifice of Performance

SPECIFICATIONS

TRANSMITTER

INPUT: Full 1 kw on Voice Peaks (Meters Read 2500 V at 400 ma) into a pair of 4 x 300 A's
UNWANTED SIDEBAND: 42 db down
DISTORTION (SSB): Third order products approx. 32 db down
FREQUENCY STABILITY: Drift less than 100 cycles.

CALIBRATION: Built-in 100 kc marker
AUDIO CHARACTERISTICS: 200-3100 cps

MIKE INPUT: High impedance
VOX: Built-in
LEVEL: Automatic level control
METERING: Screen, plate, and grid current, plus RF output
RF OUTPUT: 52 ohms
VFO's: Dual VFO's permit transmitting on the receive or any other frequency
CONTROLS: Vox, Qt, ALC, Grid Tuning, Plate Tuning, Antenna Loading, Audio Gain, Band Switch, Meter Switch

RECEIVER

SENSITIVITY: 1 microvolt for 6 db S/N
SELECTIVITY: 3.1 kc mechanical filter plus a T-notch filter
STABILITY: Drift less than 100 cycles from a cold start at room ambient
TUNING KNOBS: Coarse gear ratio of 20:1, fine gear ratio of 100:1 gives a 1 kc dial reading per division
CALIBRATION: Built-in 100 kc marker
IMAGE AND IF REJECTION: Better than 50 db
AUDIO DETECTOR: Balanced detector for SSB and CW, diode detector for AM
MODE SWITCH: Selects up or low SSB, or up low AM, or CW
DUAL RECEPTION: Two VFO's permit reception of any two frequencies on one band with the flick of a switch
BFO: Crystal controlled
METERING: S-meter
CONTROLS: T-notch filter, audio gain, RF gain, antenna trimming, tune selector, phone jack, tune A and B

"The **COSMOPHONE 1000**"—a complete Station, Receiver, and Transmitter.
Dimensions: 17 inches wide, 12 inches high, and 15 inches deep.
Power Supplies packaged separately, can be placed under operating desk.
Price: "The **COSMOPHONE 1000**" with Power Supplies...**$1,550.00.**

A Product of

For additional information and dealer nearest you, write Dept. CQ10

COSMOS INDUSTRIES, INC.

31-28 QUEENS BOULEVARD
Long Island City, N. Y.

For further information, check number 19 on page 126.

For further information, check number 20 on page 126.

Worked All El Paso Contest

The contest will be held October 17-18 and October 24-25, starting at 4 P.M. MST on Saturday to 4 P.M. MST on Sunday each weekend. A WAE certificate can be earned by contacting 15 El Paso Hams. This certificate can be won anytime during the year but once a year the El Paso Hams hold a contest on two weekends in October to see who can contact the most hams outside El Paso; so anyone desiring a WAE certificate should get on the air those two weekends. They would then be sure of getting their 15 contacts in the shortest possible time. It is not necessary to send the QSLs to be eligible for the certificate. Just list the 15 hams contacted and the time contacted. Write to Milly Aldrich, W5OHV, 1501 Golden Hill Terrace, El Paso, Texas.

U.S., Mexico OK Ham Radio Pact

Official talks held by Mexico's Secretary of Foreign Relations Manuel Tello and U. S. Ambassador Robert C. Hill climaxed in a Mexico-U. S. agreement permitting ham radio stations to transmit third-party communications between the two nations.

However, the agreement specifies such services must be rendered free of charge and limited to technical or personal conversations or messages which because of their scant importance do not justify use of public telecommunications service.

Communications will also be permissible when public service installations are not within easy reach to expedite handling of messages directly related with the safety of life and property.

Radio "Hams" Honor Late "Dean"

A two-part memorial to the late Henry P. Broughton of Schenectady, known throughout the world for many years as the "Dean of Amateur Radio," has now been formally established by the Schenectady Amateur Radio Association, it was revealed today by Irving B. Mickey of this city, Association President.

Prompting today's announcement, Mr. Mickey said, was the assignment to S.A.R.A. by the Federal Communications Commission of the amateur call, K2AE, formerly held by Mr. Broughton. This will henceforth be the call of the "Broughton Memorial Station," under which designation the Association will carry out its future radio operations. A major occasion for its use will be the annual Field Day operations, conducted each June under the auspices of the American Radio Relay League. Serving as Trustee of the station will be Samuel E. Johnson, Jr., of Schenectady, a former President of the organization.

Comprising the other half of S.A.R.A.'s Broughton Memorial is an invested fund, the interest from which will be used to finance a periodic achievement award for community service or for outstanding contributions to amateur radio on the part of a local amateur. Numerous gifts have already been made to the fund by S.A.R.A. members and by other friends and associates of Mr. Broughton.

Mr. Broughton, who died on May 26th of this year at the age of ninety-three, played a significant role in the early development of radio. One of his greatest contributions was made in 1893 when he and the noted scientist, Nikola Tesla, gave the first public demonstration of wireless in St. Louis. Though not the first to hold an amateur license in this country, he was one of the hobby's early devotees and at the time of his death was believed to be the world's oldest active amateur operator. A long-time member of S.A.R.A., he held one of the only two honorary life memberships ever awarded by the organization.

Cooperating closely with S.A.R.A. in the establishment of the Broughton Memorial was Mr. Broughton's son and sole survivor, William G. Broughton of 1048 Parkwood Boulevard, Schenectady. Licensed for many years under the call letters W2IR, the latter is also one of the nation's senior "ham" operators. He and his father formed the only father-son combination to hold membership in the Old Old Timers Club, a nation-wide organization of amateurs licensed for forty years or longer.

For further information, check number 21 on page 126.

SSB

satisfactions and challenges at

REL

If you are a graduate engineer or amateur with equivalent experience specializing in the design, development, and construction of communications gear, the outstanding Single Sideband design team being built by REL's Eldico division may have a place for you.

Exceptional potential in this rapidly-expanding sector of communications is combined at REL with especially desirable working and living conditions. At this communications pioneer, engineers enjoy their association with those who have made and are making outstanding contributions. Engineers here are not confined to a single, narrow slot, but are encouraged in well-rounded diversification of activities within their area of interest.

The new plant, with its air-conditioned offices, is in Long Island City—only three miles from the Empire State Building, with all the cultural, educational, and recreational opportunities of the Capital City of the World. Whether you prefer an apartment or secluded private house, it can be yours on celebrated Long Island.

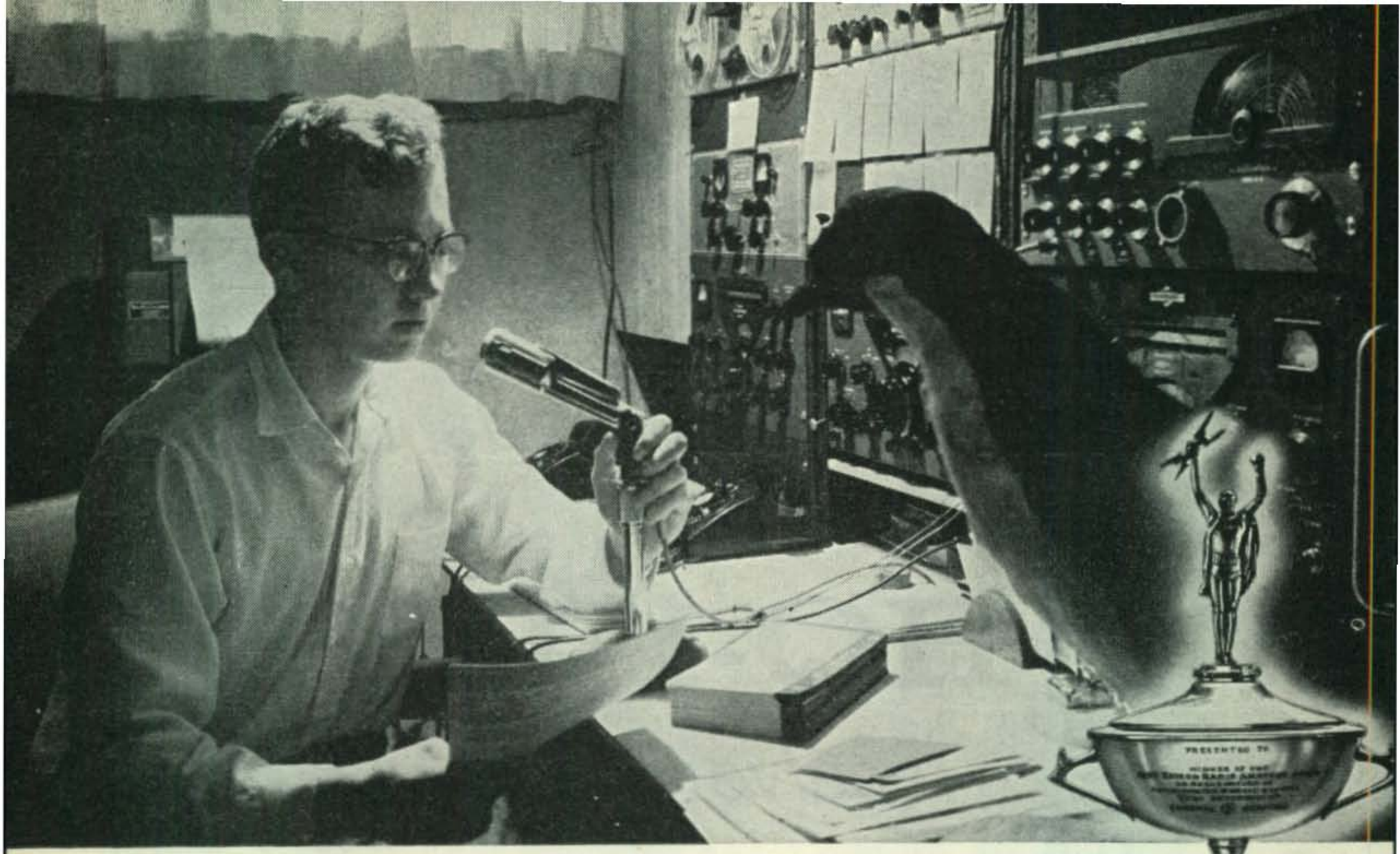
Please address your resumé to *S. E. Piller, W2KPQ, Group Supervisor, Eldico Electronics Division.*

ELDICO

Radio Engineering Laboratories·Inc

Dept. C · 29-01 Borden Ave · Long Island City 1, NY

For further information, check number 23 on page 126.



1958 AWARD WINNER Julius M. J. Madey, K2KGJ, has handled more than 12,000 messages to and from persons at isolated U.S. Arctic, Antarctic, and South Pacific bases. The 18-year-old New Jersey amateur devotes an average of 90 hours weekly to this service. Several times he has sent or received official Navy and Coast Guard messages, and the Navy has publicly commended Madey for his work. Nominated by Mayor Jay A. Stemmer of Clark Township, New Jersey.

1959 Edison Award Nominations Now Open

The Edison Radio Amateur Award for 1959 will be your eighth opportunity to share in honoring an amateur who—like K2KGJ above—has rendered public service that reflects credit both on himself and his fellow hams.

The Award winner, as before, will be chosen by a committee of distinguished, impartial judges. They will make their selection only from names you and others have submitted by letter.

Your part, therefore, is vital. By nominating a suitable amateur, you will help make sure that the judges overlook no worthy candidate. See rules at right for help with your nominating letter! Mail it to *Edison Award Committee, General Electric Company, Electronic Components Div., Owensboro, Ky.*

RULES OF THE AWARD

WHO IS ELIGIBLE. Any man or woman holding a radio amateur's license issued by the F.C.C., Washington, D.C., who in 1959 performed a meritorious public service in behalf of an individual or group. The service must have been performed while the candidate was pursuing his hobby as an amateur within the limits of the United States.

WINNER OF THE AWARD will receive the Edison trophy in a public ceremony in Washington, D.C. Expenses of his trip to that city will be paid.

$500 GIFT. Winner will be presented with a check for this amount in recognition of the public service he has rendered as a radio amateur.

WHO CAN NOMINATE. Any individual, club, or association familiar with the public service performed.

HOW TO NOMINATE. Include in a letter a full description of the service performed, as well as the candidate's name, address, and call letters. Your letter of nomination must be postmarked not later than January 4, 1960.

BASIS FOR JUDGING. All entries will be reviewed by a group of distinguished and impartial judges. Their decisions will be based on (1) the greatest benefit to an individual or group, (2) the amount of ingenuity and sacrifice displayed in performing the service. The judges will be:

E. ROLAND HARRIMAN, Chairman, The American National Red Cross.

ROSEL H. HYDE, Commissioner, Federal Communications Commission.

GOODWIN L. DOSLAND, President, American Radio Relay League.

Winner of the Award will be announced on or before Thomas A. Edison's birthday, February 11, 1960.

Employees of the General Electric Company may nominate candidates for the Edison Radio Amateur Award, but are not permitted to receive the Award.

GENERAL ELECTRIC

8-524-401

Last Month – the Exciting New Globe Chief Deluxe

NOW the NEW Globe Scout Deluxe

FINAL AMPLIFIER WORKS STRAIGHT THROUGH ON ALL BANDS • HIGH LEVEL PLATE MODULATION • PI-NET OUTPUT ON 10-80 METERS; HIGHLY EFFICIENT TUNED LINK COUPLED OUTPUT ON 6 METERS, MATCHING INTO LOW IMPEDANCE BEAMS • THREE-GANG (1300 MMFD) LOADING CAPACITOR FOR CONTINUOUS ADJUSTMENT 10-80 METERS PLUS HARMONIC AND TVI-SUPPRESSION • SEPARATE CAPACITOR GANGED TO LOADING CAPACITOR TUNES OUTPUT LINK FOR 6 METERS • LINK TUNED FROM FRONT PANEL • BUILT-IN POWER SUPPLY • HIGH QUALITY CHOKE INPUT FOR BEST REGULATION • NOVEL 3-COLOR DIAGRAMS SIMPLIFY KIT CONSTRUCTION

Styling

MODERN NEW "LOW LOOK" CABINETRY
ROLLED EDGES • ROTARY SWITCHING

Operation

90 WATTS CW; 75 WATTS PHONE
BANDSWITCHING 6-80 METERS

IN WIRED FORM $149.95 QUALITY

A new concept in transmitter design, the Globe Scout Deluxe incorporates a host of features to make it the most outstanding and exciting low cost AM transmitter available. The newly designed cabinet features the modern "low look" which is so popular today. The attractive panel is etched aluminum, trimmed with black. Styling and appearance blend with any surroundings, making the unit at home in livingroom, den or office. New RF circuitry provides greater output and efficiency. Six meter output greater than that of any comparable transmitter on the market today. Extensive TVI precautions have been taken, including separate shielding of final amplifier and meter. Convenient rotary switches used throughout; no unsightly toggle or slide switches to mar appearance. Functional design of the meter face extends the length of scale for easier reading. Kit contains all parts, tubes, pre-punched chassis and detailed construction manual with three-color diagrams. Compact cabinet: 15¼x6¼x11¼". Shipping weight: 35 lbs.

Available

AFTER NOVEMBER 1, 1959

See Your Nearest Dealer

GLOBE electronics
3417 W. BROADWAY
COUNCIL BLUFFS, IOWA

For further information, check number 25 on page 126.

NEW!
NEW!
NEW!

"6N2"

Thunderbolt Power Amplifier

1200 watts P.E.P.* input SSB and DSB,
1000 watts CW, 700 watts AM linear!
Bandswitching 6 and 2 meters!

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

It's new! The Viking "6N2 Thunderbolt" Power Amplifier!

Rated at 1200 watts P.E.P. input SSB and DSB, Class AB_1; 1000 watts CW input, Class C; and 700 watts input AM linear, Class AB_1. Continuous bandswitched coverage on 6 and 2 meters – effectively TVI suppressed and filtered – wide range pi network output. Efficiency is outstanding – losses on 2 meters are held to approximately 5%, instead of common 25% losses experienced in some other 2 meter circuitry! This is possible due to the unique silver-plated Hi-Q coaxial line; silver-plated anode and other external metal portions of the 7034 tubes; silver-plated inductors; capacitors; and switch!

Drive requirements are approximately 5 watts in Class AB_1 linear, or 6 watts Class C continuous wave.

Cat. No. 240-362-1 Viking "6N2 Thunderbolt" Kit.....**Amateur Net** **$524.50**

Cat. No. 240-362-2 Viking "6N2 Thunderbolt", Wired and Tested.....**Amateur Net $589.50**

"6N2" CONVERTER

This compact Viking "6N2" Converter provides instant front panel switching from normal receiver operation to either 6 or 2 meters. Maximum sensitivity and low noise figure . . . offers excellent image and I.F. rejection. With tubes. Available kit or wired in either 26 to 30 mcs., 28 to 30 mcs., 14 to 18 mcs., or 30.5 to 24.5 mcs. ranges. Specify range desired.

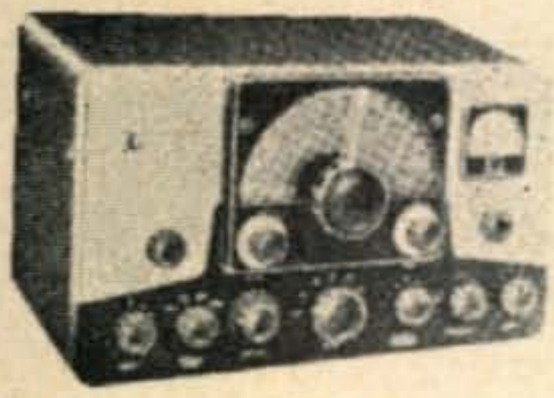
Kits .....**Amateur Net $59.95**
Wired Models .....**Amateur Net $89.95**

For detailed specifications on the new 6N2 Thunderbolt, write for Data Sheet 714

E. F. JOHNSON COMPANY

2849 SECOND AVENUE S.W. • WASECA, MINNESOTA

you'll get more with a *Viking*



"RANGER" — 75 watts CW and 65 watts phone input. Bandswitching 160 through 10. Built-in VFO. With tubes.

Cat. No.		Amateur Net
240-161-1	Kit	$229.50
240-161-2	Wired	$329.50

"FIVE HUNDRED" – 600 watts CW input, 500 phone and SSB (P.E.P. with auxiliary SSB exciter.) Bandswitching 80 through 10 meters. Built-in VFO. With tubes.

Cat. No.		Amateur Net
240-500-1	Kit	$749.50
240-500-2	Wired	$949.50

"VALIANT"—Instant bandswitching 160 through 10. 275 watts input CW and SSB (P.E.P. with aux. exciter) 200 watts phone. With tubes.

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

3 feature-packed amplifiers!

"COURIER" AMPLIFIER—Class "B" linear rated 500 watts P.E.P. input with aux. SSB exciter—500 watts CW and 200 watts AM! Continuous coverage 3.5 to 30 mcs. Drive requirements: 5 to 35 watts. With tubes.

Cat. No.		Amateur Net
240-352-1	Kit	$244.50
240-352-2	Wired	$289.50

"THUNDERBOLT" AMPLIFIER—Rated 2000 watts P.E.P.* input SSB; 1000 watts CW; 800 watts AM linear! Continuous coverage 3.5 to 30 mcs. May be driven by "Ranger", or other unit of comparable output. With tubes.

Cat. No.		Amateur Net
240-353-1	Kit	$524.50
240-353-2	Wired	$589.50

"KILOWATT" AMPLIFIER—This exciting unit is the only power amplifier available which will deliver full 2000 watts SSB* input and 1000 watts CW and AM! Continuous coverage 3.5 to 30 mcs. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

Cat. No.		Amateur Net
240-1000	Wired and tested	$1595.00
251-101-1	Matching desk top, back and 3 drawer pedestal..FOB Corry, Pa.	$132.00

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

New Catalog

Yes, dollar-for-dollar and feature-for-feature you'll get more of everything in a Viking transmitter . . . that's why Viking transmitters outsell all others! Write for your free Viking Amateur Catalog and you'll soon see why your best transmitter buy is a Viking!

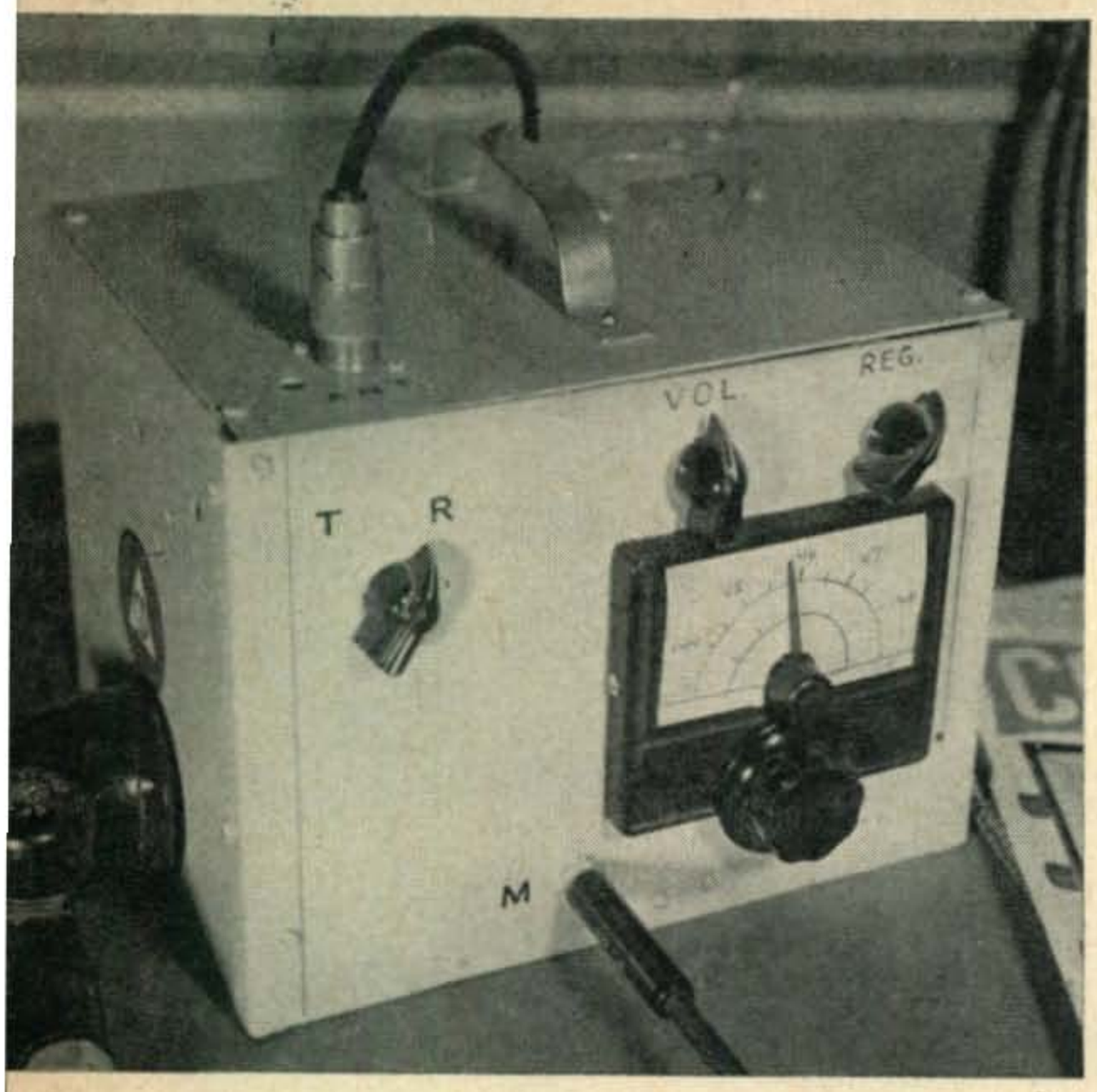
E. F. JOHNSON CO.

2916 SECOND AVENUE S. E. • WASECA, MINNESOTA

Viking

FIRST CHOICE AMONG THE NATION'S AMATEURS

For further information, check number 26, on page 126.



Joseph B. Shinal, K2HMY
23 Shamrock Ave.
Seneca Falls, New York

Two Meter Ham Transceiver

An old teacher once told us to always "Do your best, with what you have, where you are—today." The advent of Civil Defense and two meter activities prompted the construction of this set. Articles on the subject were reviewed, together with studies of tailor made jobs costing several hundred dollars. I was looking for something which offered portability, versatility and economy. With the above quotation for inspiration a review of our material (junk box) and financial assets was made so that the project could get under way.

To digress for a moment, I suspect that I am no different from most other hams. Whenever I see a circuit I would like to build, I usually find it contains some high priced ultra-modern parts or tubes which are beyond my means. In the end I usually find, right under my nose, parts or tubes that will perform just as satisfactorily as some of the newer models. Substitution of tubes, non critical parts, etc., can easily be made on this equipment without jeopardizing its usefulness.

I wanted a set which operated from 8 *mc* crystals, could be used at home or in the car, would operate straight through in the final and still not put a strain on the pocketbook. I am very pleased with the results.

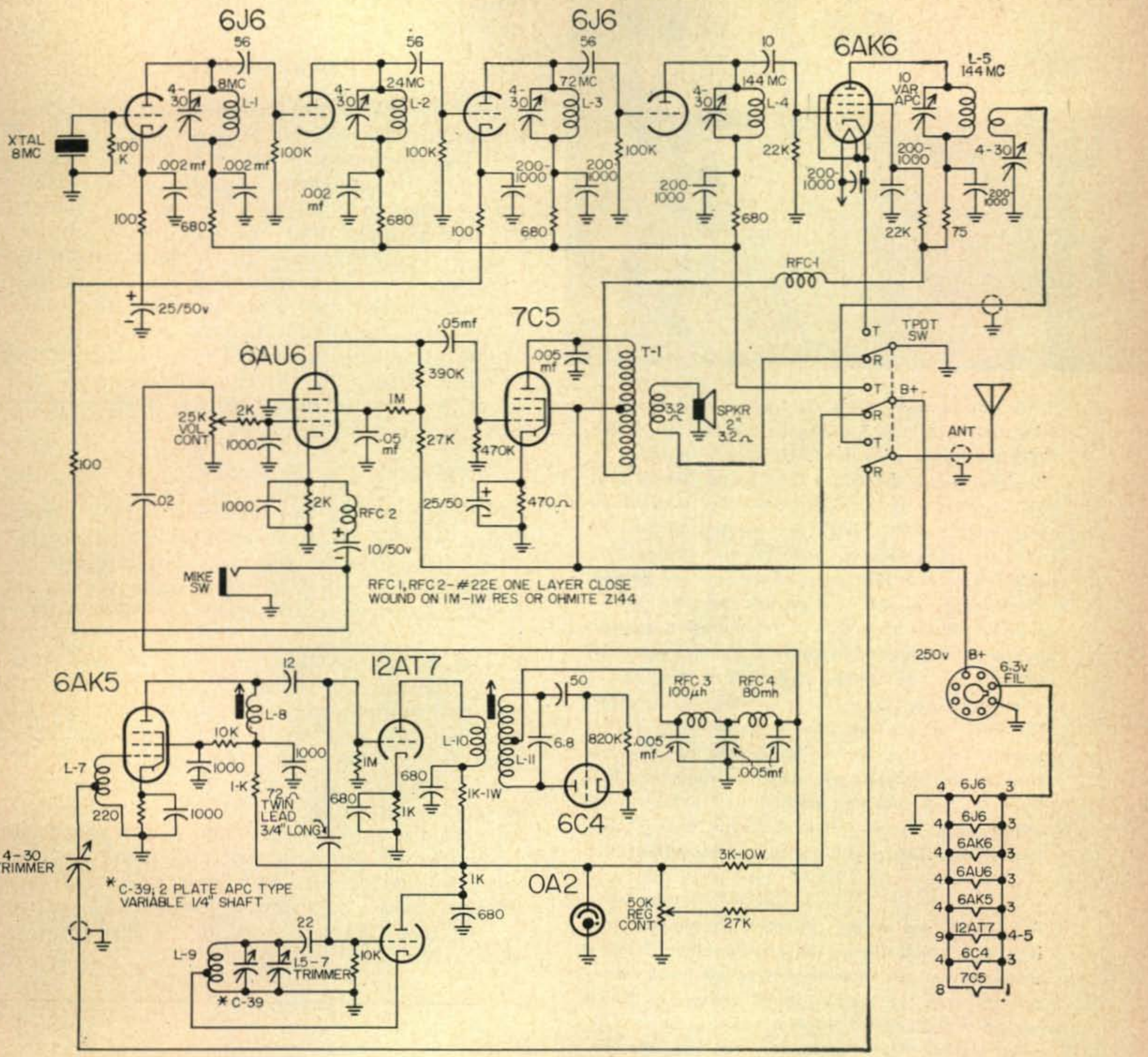
For mobile work I use a 19" whip suction cup mounted on the roof of the car. At home I erected a four element beam with which I can consistently work in a 50 mile radius.

The entire package weighs 10 pounds and is housed in a 7" x 7" x 9" home made aluminum box, as can be seen in the photograph.

Receiver

The receiver is a superregenerative superhet. The front end consists of an untuned-grid tuned-plate *rf* amplifier using a 3—30 mmf trimmer for the antenna. This stage feeds into a 12AT7 mxier-oscillator. The oscillator is tuned from 126 to 130 *mc* and beats against the mixer to produce an 18 *mc if* which is coupled to a 6C4 superregenerative detector. Excellent sensitivity, amplification and *avc* characteristics are offered through the superregenerative circuit plus the reception of *cw* signals, all by adjustment of the regeneration control. This detected signal is fed into 6AU6 and 7C5 audio amplifiers whose output is coupled to a 2" speaker. The 6AU6 and 7C5 audio stages are also used for modulating the transmitter final. A carbon microphone is cathode fed into the 6AU6. A push pull 6V6 plates to voice coil output transformer is used where one half serves the speaker for receiving and the other half supplies modulation to the 6AK6 final.

The receiver was built first. Outside of the usual short lead precautions and copper shield across the 6AK5 *rf* amplifier socket between the input and output stages, no particular difficulties were encountered. Coupling between the mixer-oscillator stages, 12AT7, is through a 72 ohm twin lead, C33, clipped to a ¾" length which provides ample signal injection.



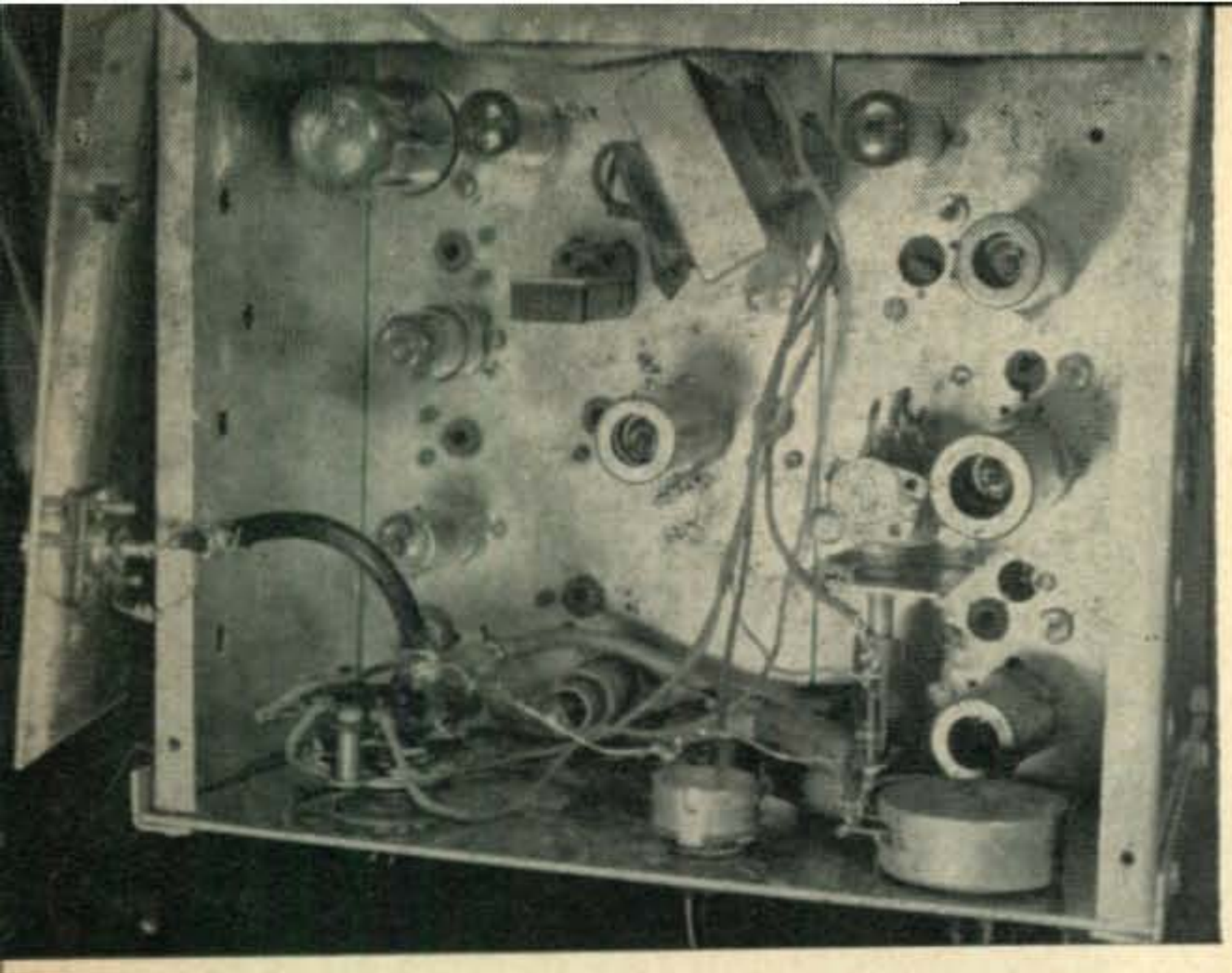
Coil Data

L1—54T #26E ½" dia. ⅞" long (8 MC)
L2—17T #16E ½" dia. 1" long (24 MC)
L3—8T #16E ⅜" dia. ⅞" long (72 MC)
L4, L5—3T #16E ⅜" dia. ¾" long (144 MC)
L6—2T #16E ⅜" dia. ½" long
L7—4T #16E ⅜" dia. ¾" long (144 MC)
L8—3T #30E ¼" dia. (Brass slug form) ½" long (144 MC)
L9—3T #16E ⅜" dia. ¾" long tapped 1 t from ground
L10—10T #28E close wound over cold end of L11
L11—22T #28E close wound (center tapped) on ¼" iron slug form (18 MC)
T1—PP 6V6 plates to v.c., 32 ohms

Fig. 1—Complete schematic of the two meter transceiver. (Note the following correction: Volume control in grid circuit of the 6AU6 speech amplifier is 250 K rather than 25 K.).

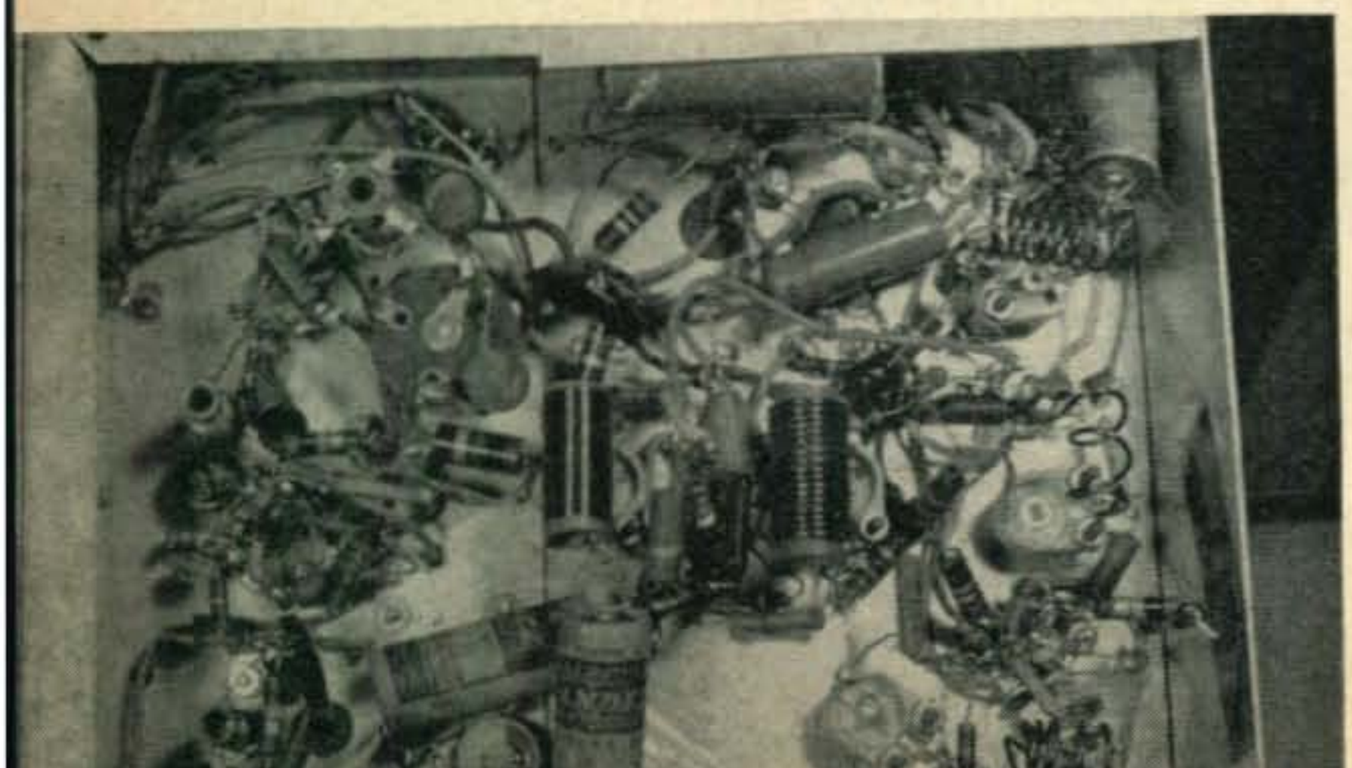
Transmitter

An 8 *mc* crystal oscillator (½ 6J6) is coupled to a 24 *mc* tripler in the other half of the same tube. A second 6J6 is used where one half serves as a tripler to 72 *mc* and the other half as a doubler to 144 *mc* to drive the final. A 6AK6 final operates straight through on 144 *mc*. I haven't tried it but feel confident that a 5763 could be substituted for the 6AK6. Once again I used what was available: the 6AK6. Our most important tools, once the parts were mounted and wired, were a grid dip oscillator and NE51 neon lamp. The lamp also served as a modulation indicator by being held against the final and watching it glow during transmissions. Most all coils and chokes were hand wound and



This photograph, with the top removed shows the tube locations. Starting at the top left is the 7C5 modulator with the 6AU6 speech amplifier to its right. Below the 7C5 is the 72 and 144 mc 6J6. Below the 6J6 is the 6AK6 final. The modulation transformer and crystal are located above the 6J6 crystal oscillator and 24 mc. tripler (the shielded tube in the center of the chassis.) Behind the front panel, left to right are the send receive switch, volume control and regeneration control. Below the regeneration control, going from front to back, is the 6AK5 rf Amplifier, the 12AT7 mixer-oscillator and 6C4 regenerative detector. The OA2 voltage regulator is to the right of the transformer. The rubber grommets on the left side of the chassis are used for adjusting tool slots for the trimmer condensers in the transmitter tank circuits. The oscillator tuning condenser and coil can be seen to the left of the 12AT7.

A bottom view of the chassis is shown. Actually it is two small chassis spliced together. K2HMY unit construction HI! In the lower left hand corner can be seen the copper shield across the 6AK5 socket. A 3-30 mmfd trimmer next to the two 25 mfd. electrolytics is used for trimming the antenna. This condenser can be reached through a hole in the bottom plate. The rest of the parts are fairly plainly visible. There is no use trying to explain any more of the wiring as can be seen from this photo. We just kept going along and this is the result. To those who believe in this mess—no explanation is necessary, to those who don't believe—no explanation is possible. We know we are all thumbs—we are satisfied—and we know it works!



checked with the grid dip oscillator prior to installation.

Power Supplies

For mobile work I converted a PE101C dynamotor as per the August 1952 issue of CQ and mounted it on a separate chassis. This set up is quite portable. Two heavy (#10) leads are clipped to the car battery and are plugged into the dynamotor chassis. I set this power supply on the floor, place the transceiver on the seat, mount the suction cup antenna on the roof and am ready to go.

At home I use a full wave rectified power supply built from an old TV set power transformer. Using the 4 element beam I can equal the pleasures of many higher priced jobs.

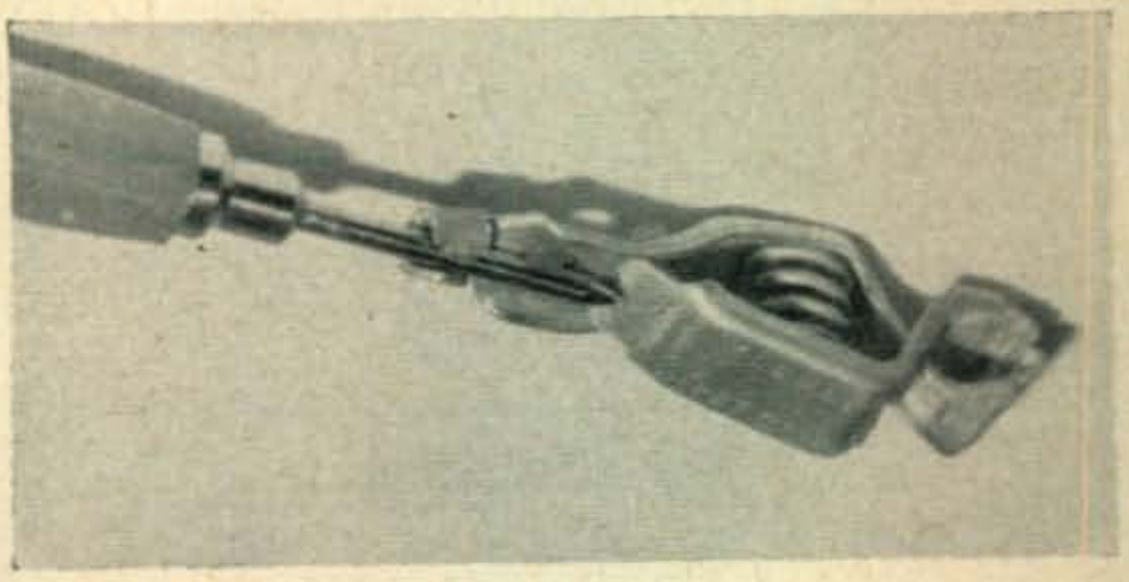
General

The wiring will not take any beauty prizes; I just wanted to make it work satisfactorily. There have been no component failures so far, but if they occur I won't hesitate to dig in; for all fears were dispelled during construction.

The 8 *mc* crystals are plentiful and relatively inexpensive, other *if* frequencies could be used within reason. I aimed for 14 mc and got 18 *mc*, so I varied the oscillator accordingly. The tube filaments can be rewired for 12 volt cars by using series—parallel wiring, this would necessitate using a 12AU6. Of course other tube substitutions can be made without imparing the results.

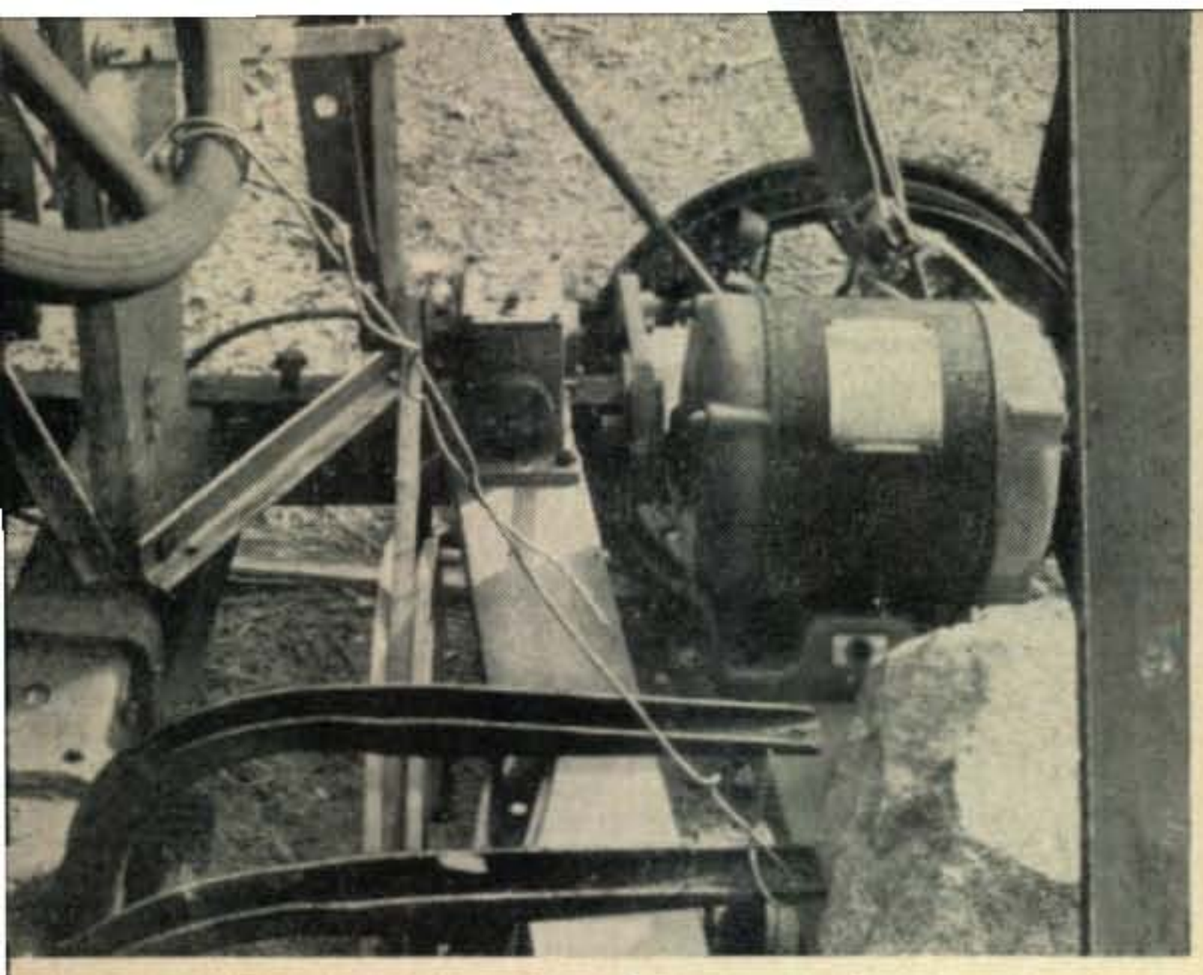
I am no expert and this was my first attempt at a construction job of this nature. As in true 'Ham" tradition, "The Joy is in the Striving." ■

Shop Hints



Clip Adapter

When you want to clip a test prod to a wire or terminal but do not have a pair of prods equipped with test clips, take a clip like the one shown and remove the screw and bend the wire supports over so your prod's tip will fit snugly inside. This lets the clip accept phone tip plugs or pointed test prods.



Motor drive assembly on truck.

Overall view of complete installation.

oseup of truck tower pporting outboard end.

Truck on guide rails.

End view of complete system.

Ingenuity

What sort of budget would you figure for setting up a VHF antenna system for moon-bounce? I doubt if any commercial company or government agency would even imagine that it might be done for less than $10,000. Some hams might even come close to that figure if they were interested and had the money.

Now lets take a look at a ham installation set up to do a man sized job on practically no budget at all. The finished product is completely remote controlled for both direction and tilt of a 128 element tow meter beam. The brains and brawn behind this monster is none other than the CQ VHF man himself: Sam Harris W1FZJ. How did he do it?

Well, first of all he started with a 128 element beam and mounted this on a section of tower. One end of this is secured to the middle of a wheel fastened to the top of a sturdy tree. The other is supported by another tower section which is mounted on an old truck (or something). The truck is arranged so it can run around the center tree on some home made tracks to turn the antenna. An electric motor, remotely controlled from the shack, drives the truck on the track. A second motor adjusts the angle of tilt of the array. The only trouble with the system is that a couple of times the truck motor got left on and the truck ran around the track and off the end and started off across the field on its own.

The results? Sam hears his own signals reflecting back from moon quite well and wishes someone else within moonshot would set up something similar so they could break all the DX records.

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A Sneak Preview Of The FPM-200

One of the big items of interest at the recent San Jose ARRL Convention was the new Hallicrafters FPM-200 transistorized transceiver. The new transceiver represents a great stride foward, not only for transistors, but for SSB. Interest in this device is at an all time high.

By distracting the local "rep" with a curvaceous blonde, I was able to inspect the "innards" and shoot some interesting photographs (none of the blonde—sorry). Most of this material is reproduced from memory, some of it is "educated guessing," and there may be a few minor technical errors.

The FPM-200 covers all amateur bands between 75 and 10 meters. Two *vfo's* provide independent tuning, or either *vfo* can be used to control the receiver and transmitter simultaneously. Only three tubes are used in the design (12BY7 driver, parallel connected 6146's in the final), the rest of the circuits are completely taken over by transistors. The over all design of the transceiver is shown in the accompanying block diagram. You will note that identical *rf* and *if* systems are used in the receiver and exciter sections. This is not the least expensive way to do it, but it is the best way. It avoids making some transistors do "double duty" and greatly simplifies the switching problems.

Let's start at the receiver antenna connection and work back towards the speaker. The antenna feeds a two stage common base *rf* amplifier using two RCA "drift" transistors, type 2N370. The mixer, a type 2N372, combines the signal from either of two identical *vfo's* (depending on *vfo* switch setting) which have a tuning range of 8.0-8.5 *mc*. The *vfo* frequency is not changed regardless of what amateur band is being received. Such a system necessitates a different 1st *if* for each band and has been given the name "step *if*". As an example, if the *vfo* mixes with signals between 14.0 and 14.5 *mc*, a 22.5 *mc* 1st *if* would be used, For 15 meters, a 29.5 *mc if* would be used, and so on. The step *if* includes a second mixer which combines the first *if* and the crystal controlled local oscillator energy. The oscillator is on the proper frequency to heterodyne the step *if* down to 2.2 *mc* for each band. Thus on 20 meters, a 20.3 *mc* crystal would be used to convert the step *if* to the 2nd *if*. Additional "drift" transistors are used in the 2nd *if* amplifier and SSB selectivity is obtained with crystal filters. Individual filters are employed for the selection of upper or lower sideband. Again, this is more expensive than a single symmetrical filter, but it is better than switching the carrier insertion frequency. This would require that the conversion oscillator or variable oscillator frequency be changed also. This would be difficult with a crystal and if it was done in the *vfo*, the tracking problems would be terrific. A beat frequency oscillator and detector are used to demodulate the sideband signal. The detector output drives an audio amplifier which winds up in a class A stage delivering 5 watts of audio power.

The transmitter section operates like the receiver, but it works the "other way around". The *bfo* is also used as the carrier generator, and it drives the balanced modulator. This produces a double sideband suppressed carrier signal when audio is applied from the speech amplifier. The two sidebands are passed through the appropriate filter (bilateral circuitry) and the unwanted sideband is rejected. The output of the filter drives an *if* system that is identical to the receiver *if*. The amplified 2.2 *mc* SSB signal drives another step *if*. This circuit also includes a mixer to convert the first exciter *if* up to the 2nd exciter *if* (22.5 *mc* for 20 meters). This signal is mixed with the 8.0 *mc vfo* to produce a sideband on the operating frequency. If a common *vfo* is used, the transmitter will be on the same frequency as the receiver is tuned to. This low level signal on the operating frequency is amplified in another two stage common base *rf* amplifier to a level that will provide adequate drive for the 12BY7. The parallel connected 6146's insure that the signal will be strong enough to "cut the mustard".

The *vfo* switching circuit allows any one of four possible combinations. "A" can tune the receiver, while "B" tunes the transmitter, or they can be interchanged. In a third position *vfo* "A" can be used to control both the receiver

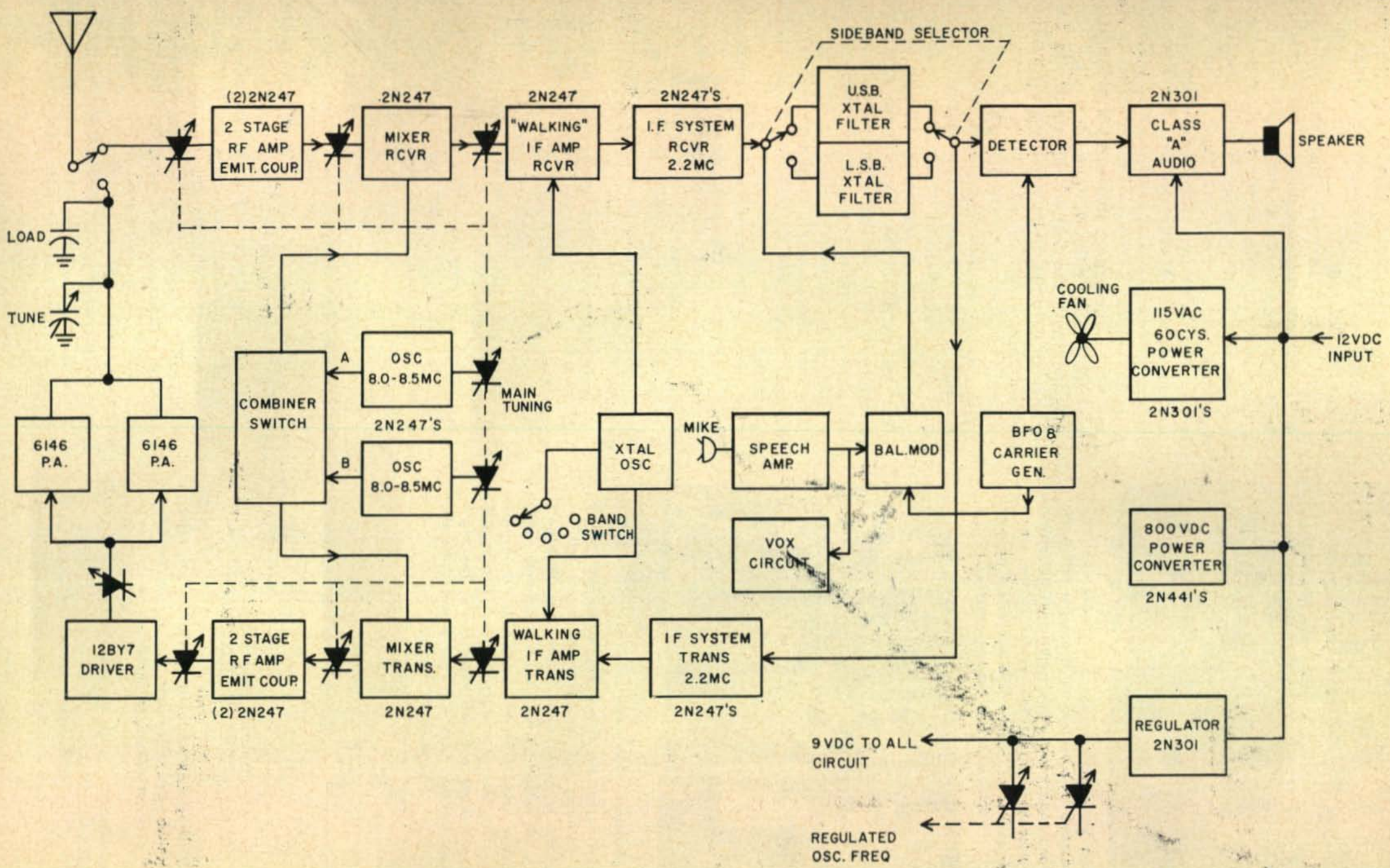
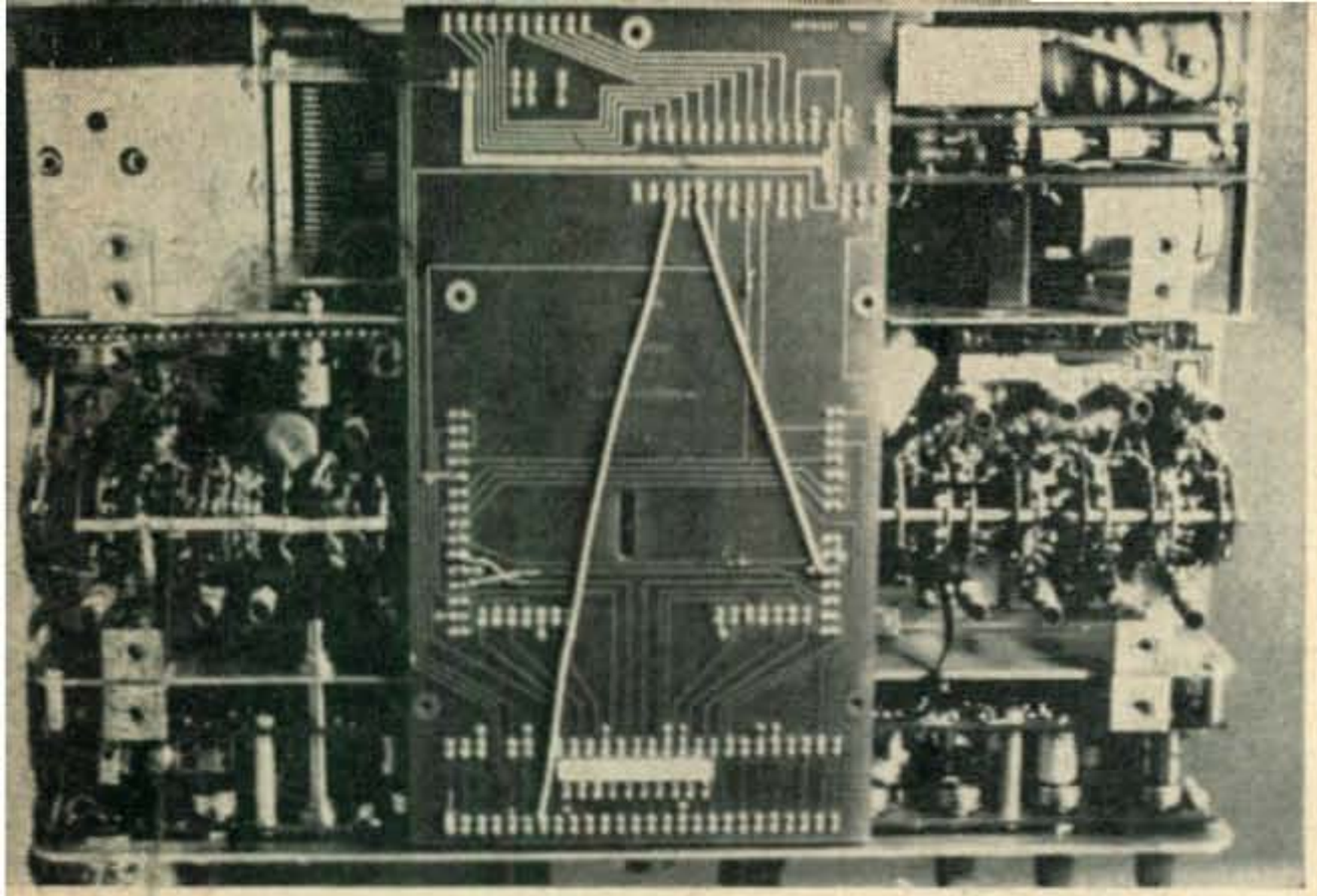
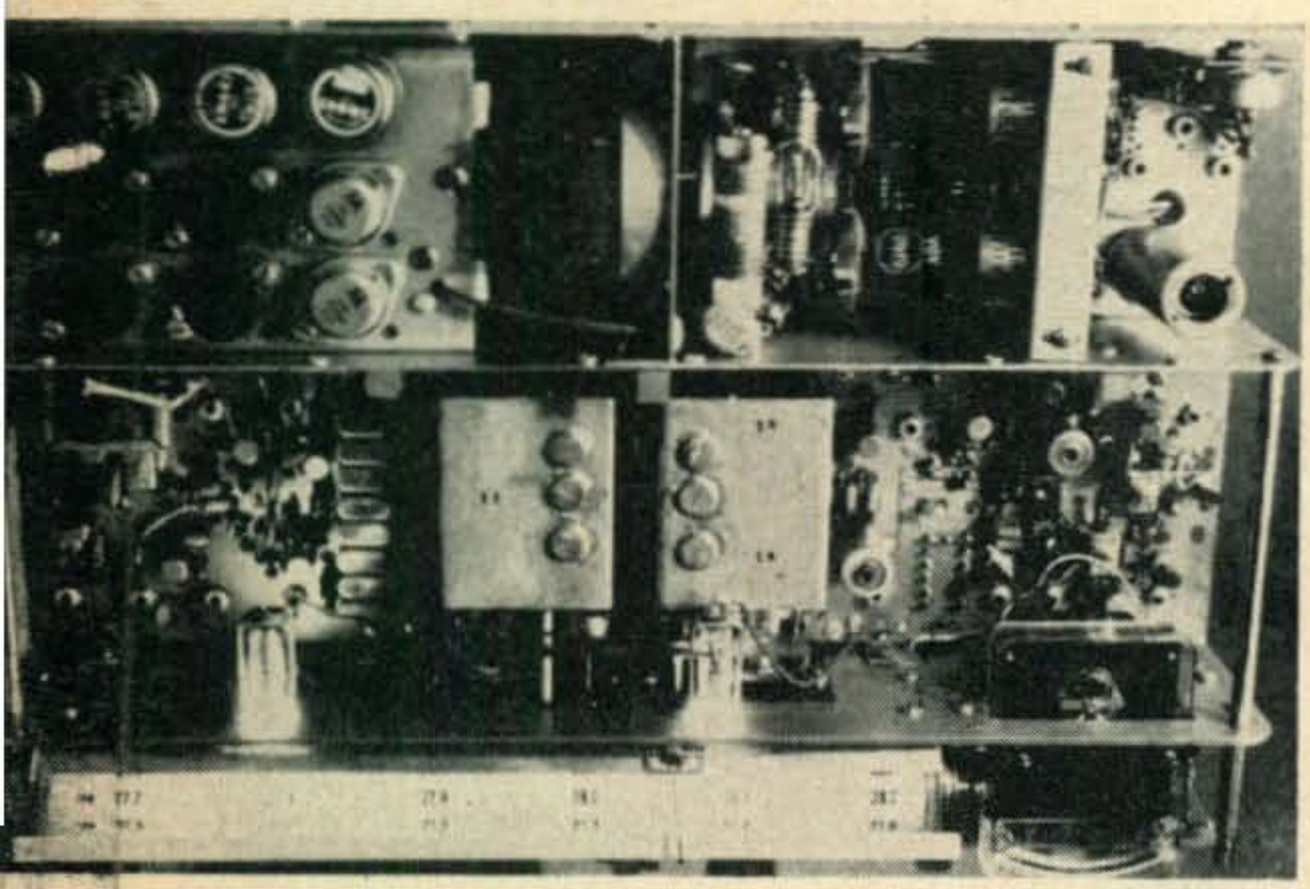


Fig. 1—Block diagram of the new Hallicrafter Transistor Transceiver, Model FPM-200.



Bottom view showing the E.C. board that the sub-assemblies plug into. At the upper left is the exciter compartment, upper right transistor power converter section. At left center is the transmitter exciter r.f. circuits. The equivalent receiver r.f. circuits are opposite right.



Transistors for the power converter, fan driver, and regulator are shown at the upper left. In the center is the fan, and to the right the 6146's which are driven by the 12BY7 at extreme right. The two varicap tuned oscillators are in the center. Transmitter and receiver r.f. circuits are at center right and left respectively. The eight crystals for the "step i.f." are mounted on the receiver EC board.

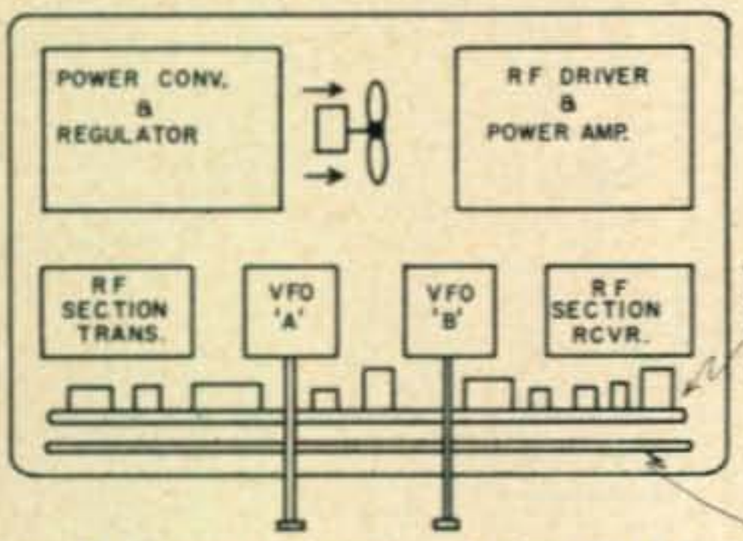


Fig. 2—Layout sketch of the FPM-200 Transistor Transceiver. Space between the plug-in sections is exaggerated to show positions.

and transmitter, and in the last position *vfo* "B" tunes the two.

Quite a few drift transistors are used in the FPM-200 because they are very dependable and quantity purchase lowers the unit cost. The RCA "shortwave series" (2N370-2) are used in the front ends and the factory tests the transistors for best performance in this high frequency application.

It may have occurred to the reader that the step *if* system requires more tuned circuits which must be tracked to the tuning dial. The duplication of circuits in the receiver and exciter requires twice as many circuits also. You might also wonder how all these circuits are tracked. No slug tuned coils or variable capacitors are used for tuning! Rather, the resonant frequency of each circuit is tuned with a Pacific Semiconductors "Varicap" variable capacity silicon diode. The tuning dial turns a potentiometer which adjusts the voltage on each "Varicap", including the *vfo* tuning diode. In this manner all variable tuned circuits are "ganged" to the tuning potentiometer.

Stability of the *vfo* is extremly good. Not only is the famous Hallicrafters temperature compensation system used, but additional "Varicaps" are connected to the collector voltage source. Any voltage variations (which would affect the oscillator frequency) are cancelled out. The *vfo's* will not drift more than 25 cycles with an input voltage variation between 10 to 14 volts, it is claimed.

For the most part, TR switching is electronic and gate diodes are sprinkled throughout the transceiver.

To increase the overall stability, the device uses an electronic regulator system to smooth out the fluctuations due to changing battery voltage. The nominal 12 volts is leveled off at 9 volts with a Zener diode regulated supply, and this delivers voltage to the rest of the circuits.

A transistor power converter is used to supply power to the driver and high voltage plus bias to the final amplifier.

A real design problem cropped up when it was discovered that the heat from the tubes disturbed the transistor circuits. The obvious solution was to employ a fan and get the heat out of the box. But inexpensive *dc* types created too much electrical interference and shielded motors were far too expensive. The problem was resolved by including a second power converter to supply 117 volts, 60 cycles for a synchronous fan motor. The overall cost was less, and the results far superior. The latest models have incorporated the supply switching transformer in the fan motor winding!

The accompanying photographs show the layout of the various sections in the transceiver. All the transistor circuits are mounted on high quality fiber glass etched circuit boards, which plug into printed circuit connectors. Behind the front panel is a sub-panel which holds the switches, pots, and so on. Behind this is another vertical etch circuit board upon which the *if's* filters, speech amplifier, balanced modulator, carrier generator, audio, vox, and components are mounted.

[*Continued on page* 123]

Radar Speed Traps Defeated

Glynn N. Murphy, K2UAW
171 Toronto Avenue
Massapequa, L. I. N. Y.

Every mobile ham should carry this article in his car.

I think most amateurs and a lot of other mobile transmitter operators will be most interested in the following story of a radar speed trap and subsequent events relating to it.

On July 22, 1958, at about 6:20 am K2UUH (Arvi) and I were in QSO as per our regular morning schedule. I was on the air at the time and was traveling at about 40 *mph* on the right lane of one of the Long Island parkways, where the speed limit is 40 *mph*.

On passing over a little rise in the parkway, I ran smack into a radar speed trap. Since these are no novelty around New York City and environs I paid little heed, remarking only to Arvi that it was there.

Several hundred feet later I was stopped by the 2nd man of the team, and accused of speeding at 56 *mph*.

I protested my innocence and explained that I was on the air when I went by the trap. He, with that sarcastic tone only a cop can put over, said, "Oh, a wise guy huh? You saw us here and picked up the mike for an alibi."

The result of it all was a summons returnable on August 22.

The next day I noticed that the summons had been dated (and presumably the offense committed on) Aug. 22. This may have been an "out" for me as technically I would be in court on that date, but I chose not to take advantage of the technicality. Instead my choice was whether to plead guilty and pay a $10 fine, or plead not guilty at a cost of at least two days pay and legal fees.

I chose the latter, but immediately decided a lawyer would be of little help, since lawyers with an electronic background are hard come by. Some judges will allow a defendant to conduct his own case and others won't. I was hoping that mine would.

The trial was set for Thursday September 25th. About the middle of September I received a notice from the court postponing the trial to November 20th, 10 *am*. This I thought was for the purpose of giving the state time to prepare expert testimony and to assemble the necessary technical consultants.

At 10 *am* on the trial date I was assigned, as were all radar cases, to a special court presided over by judge Katherine Kane.

If this was going to be a task explaining harmonics, fundamental overload, etc., to a man judge, what, I pondered, would it be like to try to explain nonlinear detectors, *rf* leakage, etc., to a woman judge?

The court room for these cases is a small room just large enough to accommodate the necessary people for one trial at a time. Consequently we had to wait out in the hall until called.

While waiting outside, along with several others, some with lawyers, some without, the District Attorney walked through, and seeing a legal acquaintance, asked him if he had intention of fighting a radar case. On receiving an affirmative answer he laughed and said you may as well throw in the sponge as we haven't lost one yet.

This news cheered me no end; Woman judge, radar, and a state's attorney who hadn't lost a case yet.

Finally it came my time and in I went, armed with an armful of legal looking documents. After the usual preliminaries of testimony on how a radar set is calibrated and tested, and when and how this particular set was conditioned, I was formally accused of exceeding the speed limit. A radar graph was submitted as evidence. The officer who issued the summons then deliberately perjured himself and stated that I had admitted speeding and that I would beat the rap by hook or by crook.

The ball was then tossed to me. After asking for and obtaining permission to conduct my own defense I first established myself as an expert witness. This was done with several documents I had brought with me and with statements as to my length of time and capacities in the electronic field.

I then asked the arresting officers if they as operators of the radar unit were electronic experts. On receiving a negative answer I asked the District Attorney if they were considered experts by the state. He replied that they were, but only in their capacities as operators.

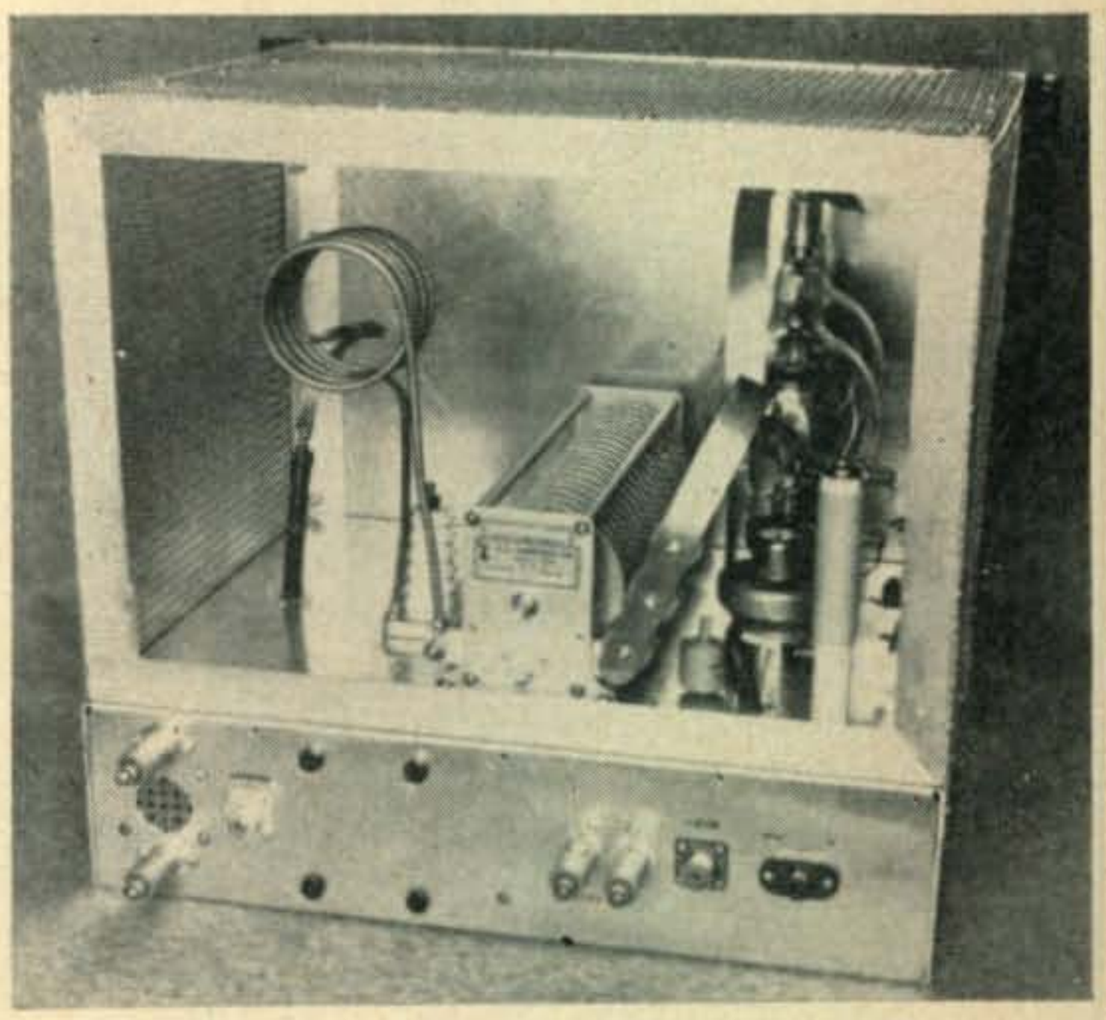
I then asked each of them in turn if they had ever experienced interference on their TV set at home, such as auto ignition, X-Ray, diathermy, etc. Positive answers were received from both. The same question was then put to the D. A., and with the usual legal skill he was able to sidestep an answer.

I then submitted photostatic copies of Arvi's log dated August 22nd, showing the early morning QSO. Of course that was the wrong date, as I had forgotten that the date on the summons was wrong. The judge noticed the mistake and with the help of the District Attorney informed me that even if it were the

[*Continued on page 122*]

250TH'S In Grounded Grid

Norman R. McLaughlin, W3LNT/W4
3404 Lenox Court
Greensboro, N. C.



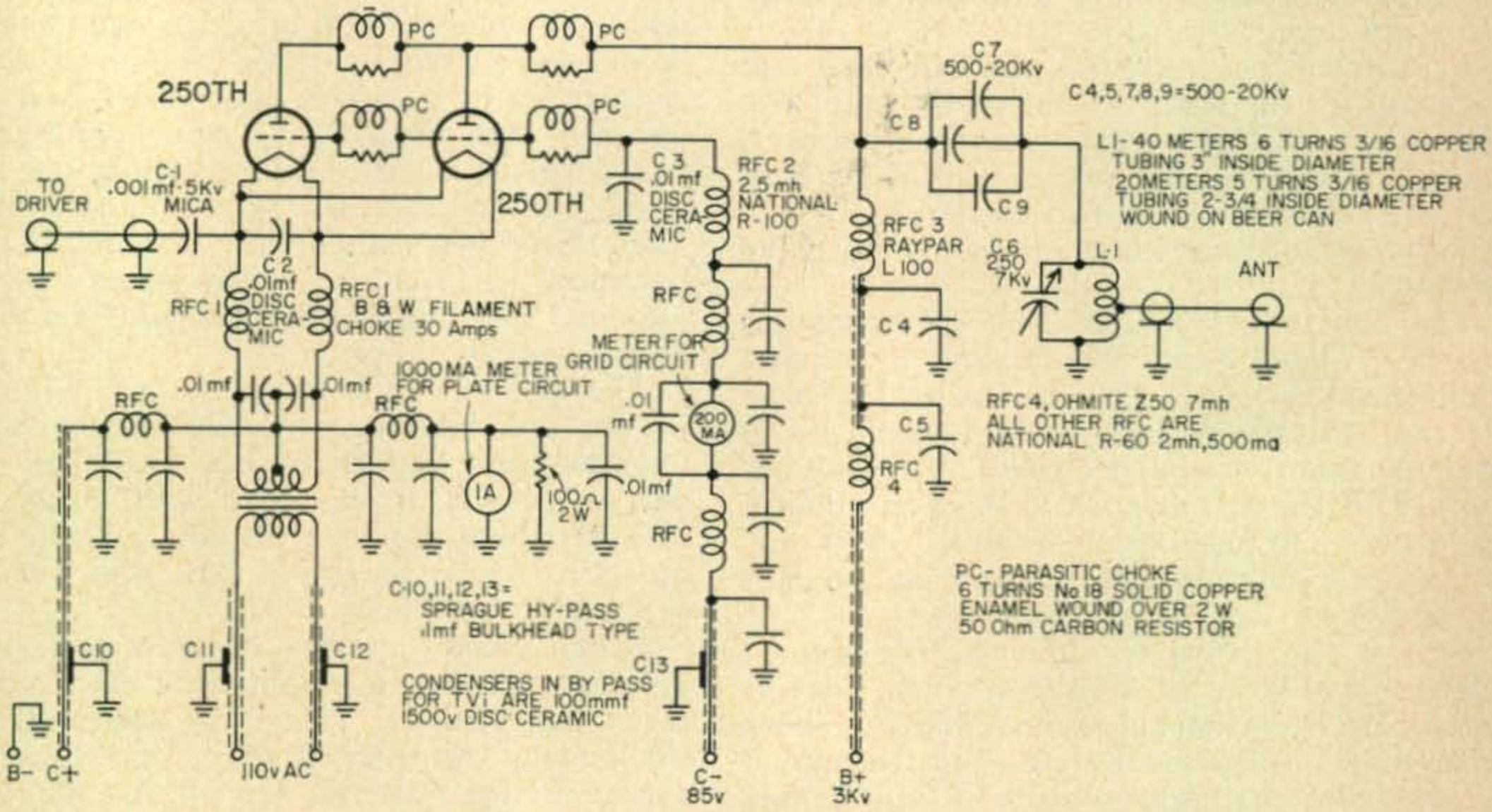


Fig. 1—The schematic is simplicity in itself. B&W Filament chokes are the only expense item. Everything else is straightforward hardware.

So much has been written about pentodes and tetrodes in grounded grid, many may have concluded that these were the only types for this mode of operation. This thought has been further encouraged by articles describing triodes in grounded grid and telling of the wholly impractical drive requirements.

No doubt Quent Johnson, WØPXH, of Glendale Missouri didn't read the latter. Or perhaps it was because he was from the "Show Me" state that he designed a kilowatt final using a pair of 250TH's in grounded grid. Like the Bumblebee who knew nothing of aerodynamics and just flew anyway, Quent drives this final to all the law allows with a mere, loafing KWM-1.

As the pictures indicate, Quent spends most of his time on 20 meters. However, if less than 100 watts will drive the 250TH's to a kilowatt input on 20 meters, 40 and 75 meter output should be no problem at all.

The final portrayed is the second Quent

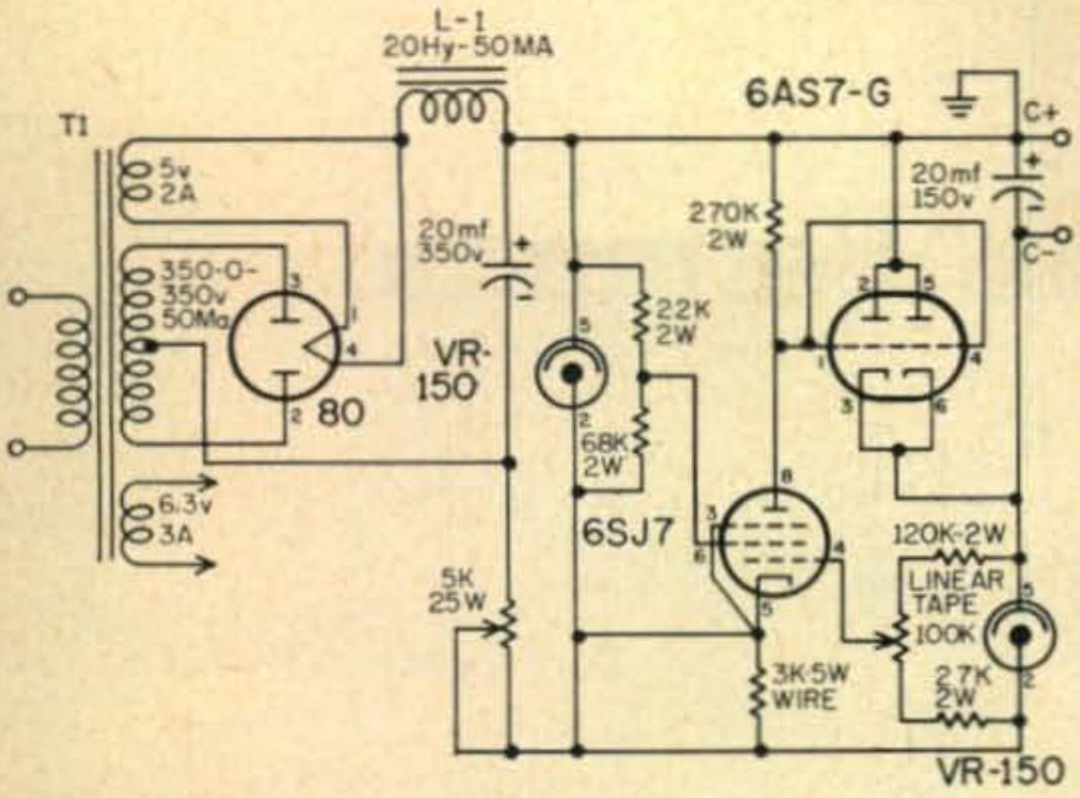
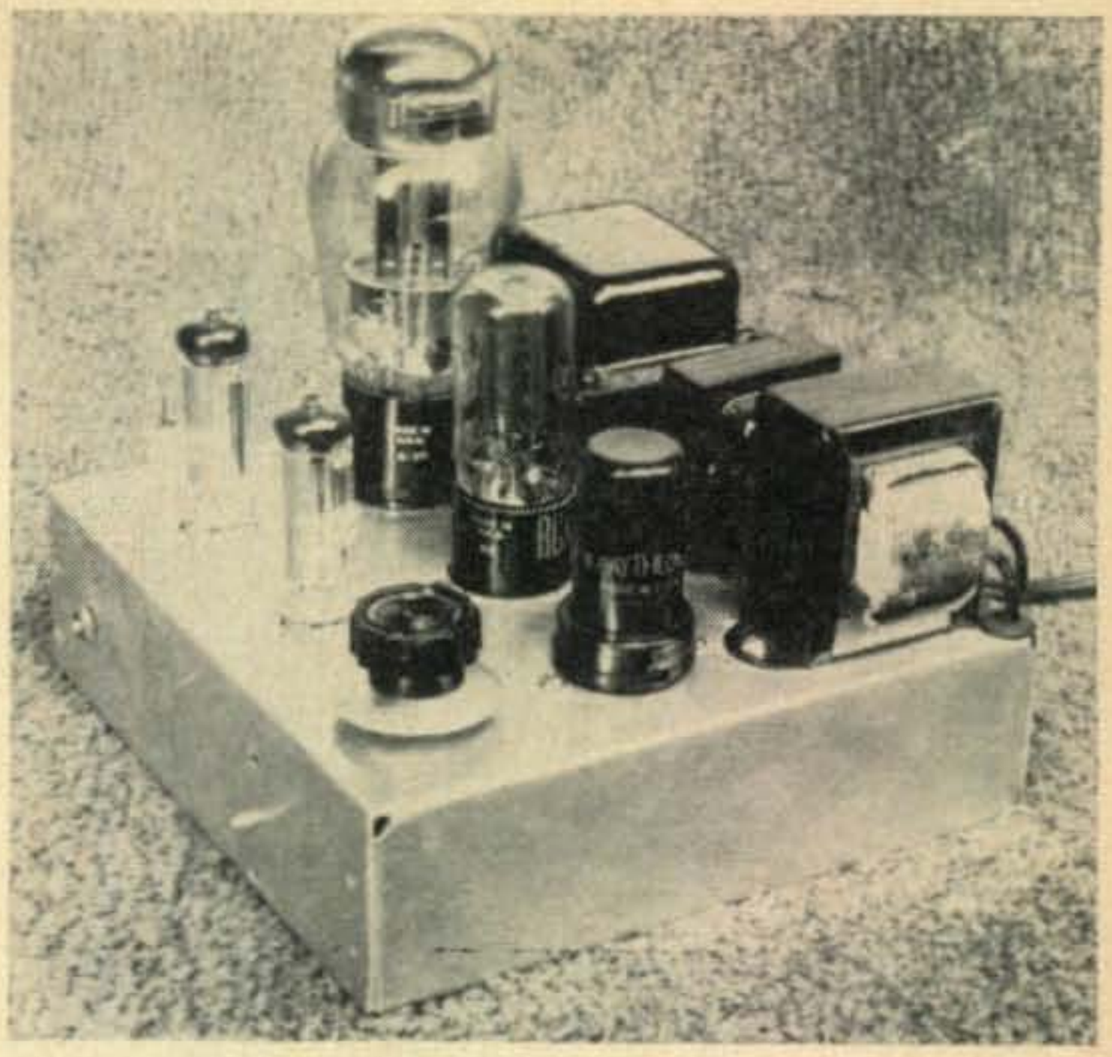


Fig. 2—Even if you don't need a stiff bias supply, this little dandy is handy to have around the work bench. Its regulation is excellent under substantial loads. In the WØPXH final it holds grid voltage right on —85 volts despite 60 mils of grid current.



built. The first was along the same lines but less shielding. When asked what the results of the TVI precautions were, he replied;

"Peace of mind to me, but nothing else. I also feel safer not having high voltage terminals such as the tube plate caps so exposed."

Circuit

The schematic (fig. 1) is quite straight forward. Drive is applied to the filaments through a .001 condenser. The filaments are kept above ground by the B&W Model FC-30 Filament Chokes and the output is taken from a simplified tank circuit. The turns data for 40 and 20 meters appears in the parts list.

Three thousand volts are applied to the plates. Grid bias is from a bias pack, fig. 4, and is set at—85 volts. This brings static plate current to 60 mils. Under modulation peaks, the plate current hits 330 mils, while grid current ranges between 55 and 60 mils.

Amplifiers of this type require stiff bias supplies to handle the 60 mils of grid current. The regulated supply shown in the photo and fig. 2, is ideal for such a job. Not only is its regulation such that the 60 mils won't make its output voltage budge, but that output voltage is variable, from —23 to —85 volts, under Quent's arrangement, although even wider voltage range is possible through adjustment of R1 towards minimum value.

There's also a Viking II at WØPXH that was used as an AM driver on 40 meters. Quent dropped plate voltage to 2,500 for the AM linear operation and the final seemed to work best with the following:

Plate voltage, 2500
Plate current 300 *ma* (steady under peaks)
No signal grid current 25 *ma*
Peak signal grid current 45 *ma*

In describing this operation WØPXH wrote: *"The tubes ran hot, plenty red. Under modulation the plate efficiency goes up and the tubes actually got a bit of rest while modulating.*

"Compared to the 800 watts of AM I had been alternating with this set up, the results were good. The linear amplifier gave just a bit less signal at the receivers of my regular 40 meter buddies. About down one S Unit."

All of which is about par for the course. 250TH's don't look healthy unless they are at least orange. It's when they turn whitish one should start worrying. Regretfully the 750 watts input to the AM linear resolves itself down to an effective 250 watts or so. This should be about 3 *db* down from a 60% efficient high level modulated final. Likewise, it should be about 3 *db* above the normal output of the Viking II by itself.

As was pointed out some time ago[1] linear amplifiers hold little charm for all but phone men on using flea power or SSB. Surprisingly, judging from the fan mail, that point was missed and most replies had to try to dissuade readers from hanging a pair of 803's in grounded grid onto their Vikings, 32V's etc and running a full kw input! It is hoped that most of the flea power men were so happy with their 10 time power increase, so easily obtained, that they didn't have time to write.

Trying to anticipate the flood of queries which always follow such an opus as this, Quent was asked the following questions to which he replied:

How about parasitics?

"There were none until I reached a plate voltage of 2,500. Then parasitics developed but I gave them the usual cure by adding parasitic chokes in both plate and grid leads" (See fig. 1 for choke data).

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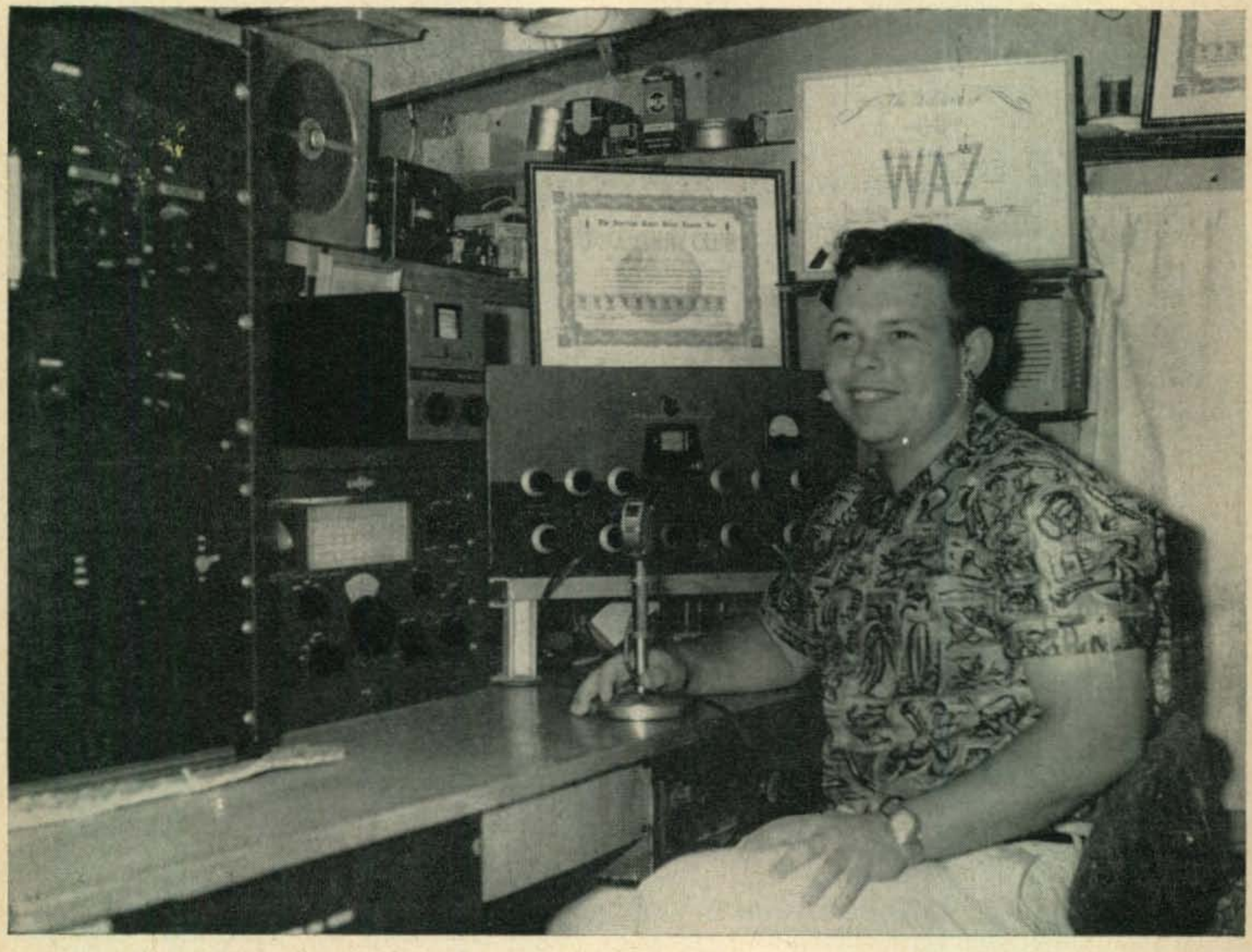
1. McLaughlin, QRO[10] . . . ., CQ, February 1956, p. 26.

[*Continued on page 112*]

K6EVR Wins Bermuda Contest

Tom Lynch, VP9EN



BERMUDA WINNER—Ray Camp, K6EVR, flashes smile on learning he's won Bermuda's 350th Anniversary Contest for W/K and VE stations.

Ray, K6EVR, has won an expense-free Bermuda vacation for two as top point man in Bermuda's 350th Anniversary Contest.

The Los Angeles, Calif., amateur racked up a total of 4,710 points in the competition for W/K and VE stations held during the weekends of April 24-26 and May 8-10.

Runner-up to Ray in the combined 10, 15, 20 and 40 meter bands contest was W5KC with a total of 4,536 points. Third place was taken by WØAIH/VE3, whose points aggregate was 4,071.

More than 8,500 U.S. and Canadian contacts were logged by a hardworking nucleus of 25 VP9ers. It was their contribution to the year-long public celebration of Bermuda's 350th Anniversary as a British colony.

Local winner in the contest organized and sponsored by the Radio Society of Bermuda was noted Dxer Cy, VP9L, who posted a grand total of 140,195 points.

Cy, by the way, had a commanding spread

of nearly 47,000 points over runner-up John VP9DL. However, the latter's performance was remarkable by itself in that he built such a high score with only a DX-35 and a Mosely TA-33 Junior.

Also deserving of full praise from this end was ATHOL, VP9CX, who placed fifth in the standings with 43,953 points—the entire score made on 20 meter CW.

Generally speaking, 10 meter openings to the western U.S. determined the outcome of the competition. Yet, this contention can be challenged by the fact that not a single W7 thought enough of his "worked Bermuda" performance to submit a log.

However, there is no doubt about the fact that skip conditions heavily favored West Coast competitors over their Eastern counterparts. This is borne out conclusively when a simple comparison is made of winner Ray's score (4,710) as compared with that of the W2 area leader, Tom, W2YTH (3102).

The story in a nutshell was that conditions were truly poor throughout the entire period of the contest, sun spot activity being largely to blame.

It should be pointed out, too, that many of the first-weekend leaders were unable to participate in the finale—the popular Dayton, Ohio Hamvention having drawn them away on the second weekend.

Still another determining factor was the distinct lack of 40 meter activity on the part of Bermuda amaeurs, which naturally worked to the disadvantage of East Coast stations.

The reasons for Bermuda's relative inactivity on 40 meters were threefold: first, the generally bad conditions; second, the inclination to use much more phone than CW; and, third, the fact that most Bermuda stations were without antennas specifically tuned for 40 meter operations.

But in spite of drawbacks, countless numbers of W/K and VE stations either verbally or in writing expressed both praise and appreciation to Bermuda amateurs for the staging and running of the contest. Among the many who made known their kind feelings were W2YTH, W2DEW, VE3BSJ, W9FVU, WØAIH/VEE—and, of course, winner K6EVR.

Incidentally, many of the contestants who submitted logs were found to have worked all nine Bermuda parishes, and thus automatically became eligible for the "Worked All Bermuda" certificate.

In addition to the grand prize, the top point scorers in all U.S. and Canadian call areas will be awarded a handsome vellum paper certificate. It is a reproduction of an early Bermuda map, circa 1616, and will carry the individual's call as well as the signature of the Governor of Bermuda, Sir John Woodall.

It should also be mentioned that every VP9 who took part has been given the means to QSL the contest 100%. All were issued special cards by the Bermuda Trade Development Board so as to completely cover their contacts.

All contests do, of course, have their lighter moments and the Bermuda event was no exception. Reggie, VP9AX, Radio Society president, burned up his final tank coil trying to get on 40 meters during the final weekend.

Al, VP9DC, arrived back home from a Canadian business trip only a half hour before the start of the contest. And he played fast and loose, they say, with Bermuda's 20 mph speed limit to make it from airport to rig in time for the opening.

And Bill, VP9BN, who has long treated his key like so much poison, did a fine bit of brass-pounding in order to give U.S. and Canadian chaps the contacts to keep them going when fone conditions were out.

"All in all, it was a wonderful contest from Bermuda's point of view," said Reggie, VP9AX. The Society president added: "We are grateful to the local fellows and gratified that so many Americans and Canadians entered into the spirit of our competition."

Plans already are underway to work out a similar competition next year, according to Mr. W. James Williams, director of the Bermuda Trade Development Board.

"Since the radio amateur's event was such an obvious success," he said, "we are indeed thinking seriously about making it a traditional affair."

So in all probability another W/K or VE will next year be following in the vacation footsteps of Ray, K6EVR, who will be flown here by Eagle Airways later this year with a friend of his choice.

Together, they will be treated to a full week of vacation fun in the mid-Atlantic resort. And it's a good bet you'll be hearing Ray on from VP9land during his stay.

The results (call area leaders):

W1JYN	819	WOBTD	1596
W2YTH	3102	VE1AR	1530
W3GHS	2520	VE2AYY	540
K4RXQ	1998	WOAIH/VE3	4071
W5KC	4536	VE4	no entry
K6EVR	4710	VE5	no entry
W7	no entry	VE6	576
W8TQY	3432	VE7	no entry
W9FVU	2508		

(Bermuda)

VP9L	140,195	VP9AK	21,012
VP9DL	93,688	VP9DU	18,564
VP9CR	65,274	VP9DC	18,270
VP9BN	61,620	VP9ES	15,825
VP9CX	43,953	VP9AX	12,069
VP9EN	36,952	VP9H	8,505
VP9DK	29,739	VP9D	4,752
VP9BO	29,274	VP9DV	6,120
VP9EP	24,418	VP9DH	1,236
VP9WB	24,300		

In The Beginning

F. D. Whitmore, W2AAA
223 W. Holly Ave.
Pitman, N. J.

Part VII

World War I

The war in Europe quickly affected amateur radio. At the start of World War I, the Rear-Admiral of the 12th U.S. Naval Inspection Department refused to permit six-district amateurs to operate. This ruling silenced hams in California, Utah, Nevada, Arizona, and Hawaii in 1914—two years before the United States entered the War. The reason for this was our government's fear of a breach of neutrality considering California's long coast line.

Between the start of World War I and the United States' entry, amateur radio swept forward. Especially prosperous for them was 1916. But with progress came numerous problems. Extended range of rigs brought increased interference. The more sensitive an audion receiver, the more distant signals it picked up. For instance, Chicago alone had five hundred amateur stations. As interference increased, the need for better receiver selectivity became evident.

Summer static still killed reception for many. Everywhere arose the cry for invention of a static eliminator. This though remained a wistful hope.

Coordination of amateur activity through the American Radio Relay League caused radio clubs to spring up all over the country. Membership in the ARRL swelled by leaps and bounds. Even rival organizations appeared and tried to compete with the ARRL.

Dependable relaying still remained a great problem. Regular operating hours seemed to hold the best solution for its success. However, many ham rigs failed to get out as they should have. Most of the trouble lay with haywire connections. Periodicals contained many articles advising the hams to shorten all connections especially those in the oscillatory circuit.

Others suffered backyard confinement due to poor rotary design. Their rotaries didn't get out as well as their original fixed gaps and induction coils. Generally, the rotary speed was at fault. Too high motor speed rotated them too fast to allow the oscillatory condenser to receive an adequate charge.

Finally the curtain closed upon amateur activity. On April 7, 1917 the United States entered the War. Immediate instructions ordered hams to dismantle their stations. Dismantling meant disconnecting all pieces of apparatus and the antenna. To satisfy the Government order, apparatus was packed up, sealed and stored. Law enforcing groups made prompt inspections to see that the order had been carried out.

World War I found Walt a 2nd lieutenant in the infantry with the overseas forces in France. Hal served during the war as a wireless operator confined to a government listening station located on the Million Dollar pier at Atlantic City.

Big "Doings" After The War

When the Government lifted the amateurs' restrictions on October 1, 1919, hams attacked radio with a vengeance seeking to make up for lost time. The amateurs, now reinforced many times by war-trained radiomen, concentrated their attention on vacuum tubes and the short waves.

Immediately after the War, amateurs persevered with wartime bootleg tubes. But early in 1921, they received a big break—transmitting vacuum tubes appeared on the amateur market. Ready accessibility of these tubes set the radio stage for unheard of achievements establishing record after record for long distance communication.

From the designs submitted by many amateurs, the American Radio Relay League settled on its famous emblem and forthwith set its sights for transatlantic reception.

In December 1921 the ARRL woke up the whole radio world. For some time the League believed American signals could be heard across the Atlantic Ocean. To prove their convictions, they sent America's most expert receiver experimenter, Paul Godley, to Scotland to listen during a special transatlantic test. The results: Thirty hams bridged the Atlantic on 200 meters; Godley heard 18 cw stations and 9 sparks, and European amateurs too heard a few of the American signals.

Distance melted fast after this accomplishment. Early in 1922 a successful two-way QSO occurred between a California ham and Hawaii. At the next trans-Atlantic tests held in December, over 300 American hams spanned the "big pond." In addition, a number of U.S. hams heard several British and French amateurs. By November 1923, these feats stretched to a two-way communication between a New England ham and a French amateur.

Walt using his 3ARP call also discovered the merits of vacuum tubes over sparks. He tickled a 201A receiving tube with 400 volts and worked Chicago. However, it was a QSO for the fast boys—a short dash turned the plate red; a long dash melted it.

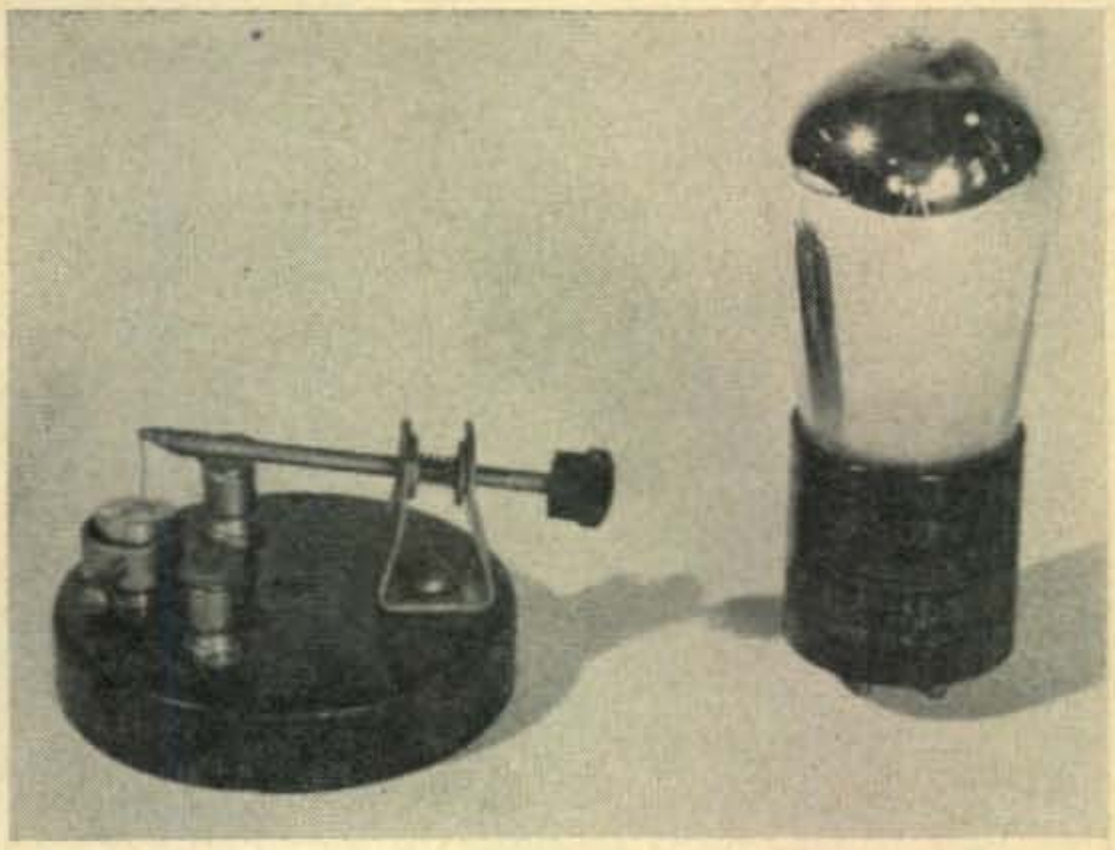
After this, expanding commercial broadcasting captured Walt's interest. With two other enthusiasts, he barnstormed southern New Jersey with a homemade superheterodyne receiver. They arranged with community organizations in numerous towns to hold demonstrations. Their big attraction to audiences was the announcement, "There's music in the air. Have you heard it?" For fifty cents admission, listeners heard portions of broadcasts from several stations intermingled with squeals and squawks.

At this stage of the radio art, Walt entered college. With a professional radio career in view, he ceased all activities in amateur radio. His brother, Hal, had similar ideas. Neither ever again participated in ham activities; both, however, became deeply enmeshed professionally and worked for the same large eastern radio company until their recent retirement.

July 1924 is a historical date in amateur radio—the constant efforts of the ARRL finally wrung from our Government, short waves below 200 meters. For the first time hams received fixed bands in the higher frequencies. With but slight adjustments, they became the bands you have today. Now things really happened! On 20 meters Connecticut worked California in daylight. Again, Connecticut worked New Zealand—9000 miles—only to lose the DX record within a month when England QSOed first New Zealand then Australia.

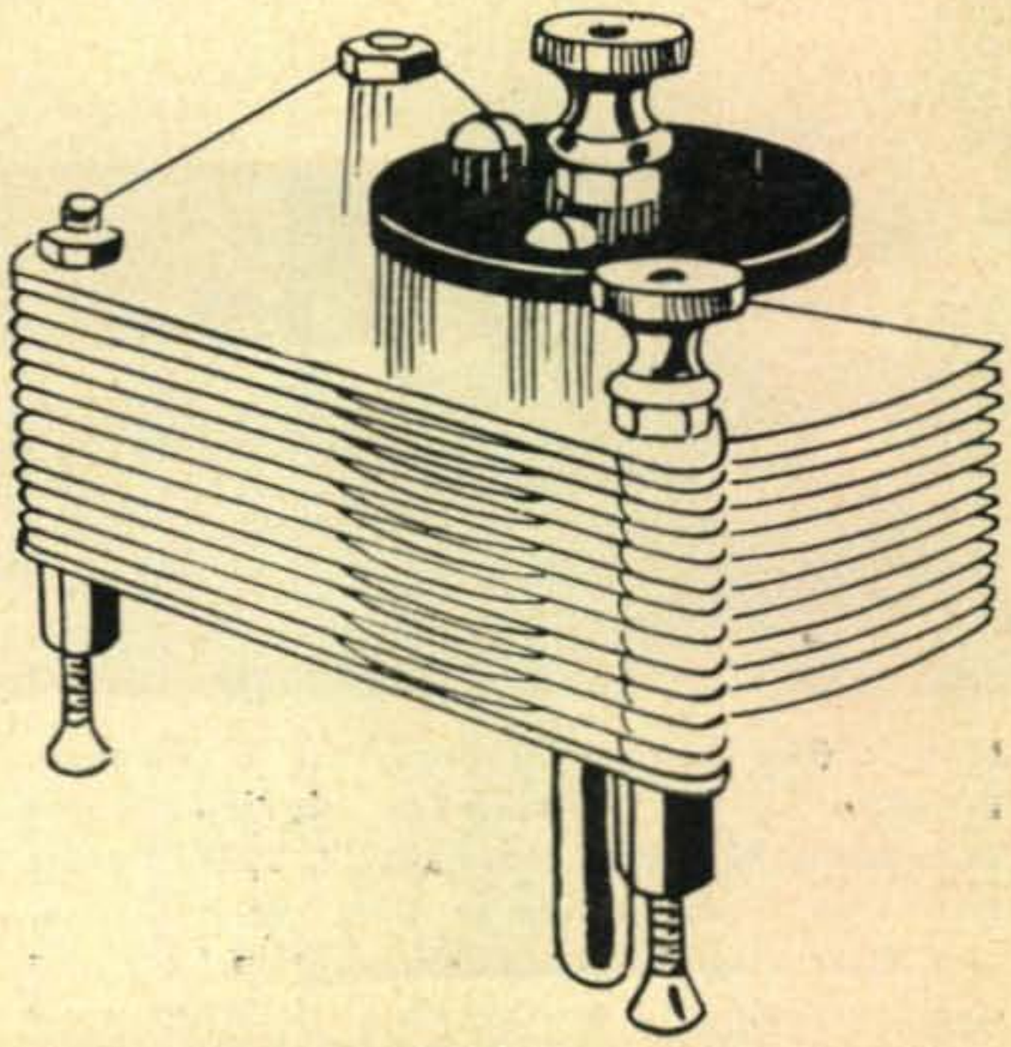
In the face of such records, sparks and their general interference died. But in their place regenerative receivers introduced squealing in ham receivers and those of the broadcast listener. The disturbance to the latter group created great public feeling against the amateurs and resulted in silent evening hours for the hams. Assignment of harmonically related bands to the hams eliminated most of this difficulty; but where it didn't, silent hours for the hams prevailed.

By the latter "twenties" the five watt and fifty watt oscillators gave way to crystal controlled oscillator amplifiers. New receiver circuits constantly filled the pages of radio periodicals. The superheterodyne steadily displayed its superiority. And the economical UX-210 transmitting tube was a favorite fixture in most



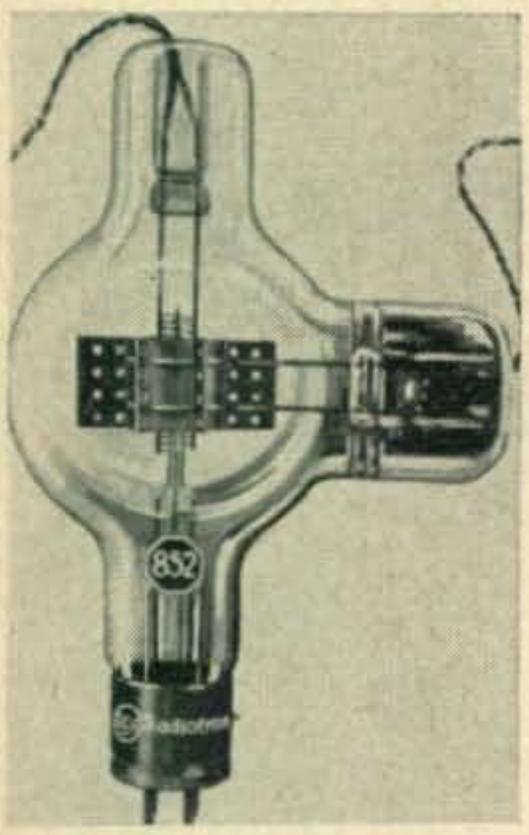
Comparison of a UV-201A receiver amplifying tube with a crystal detector.

UV-200 detector tube. Similar in size to the 201As, these tubes were 50% more sensitive than crystal detectors.



Early design of variable condenser.

UX-210. Very popular low power transmitting tube.



UX-852. High power transmitting tube.

any shack. Higher power advocates liked the RCA UX-852—a three ended 50 watt tube announced in 1927.

Finally, amateur calls over the world got changed. In 1927 the International Radiotelegraph Conference met in Washington. They decided on prefixes for amateur calls in all countries making the effective date January 1, 1929. United States amateurs got prefixes suggested to the Conference by the ARRL—W for the mainland and K for possessions and territories. For United States hams, October 1, 1928, became the effective date for using the prefixes.

Amateur Versus Broadcast-listener

Hamming before World War I and hamming afterwards were not the same. However, it started out the same. The "old gang" mainly opened up with their pre-war sparks. A few followed the trend of new hams trained during the war and acquired war-vintage transmitting tubes to pursue the greater distances possible via CW.

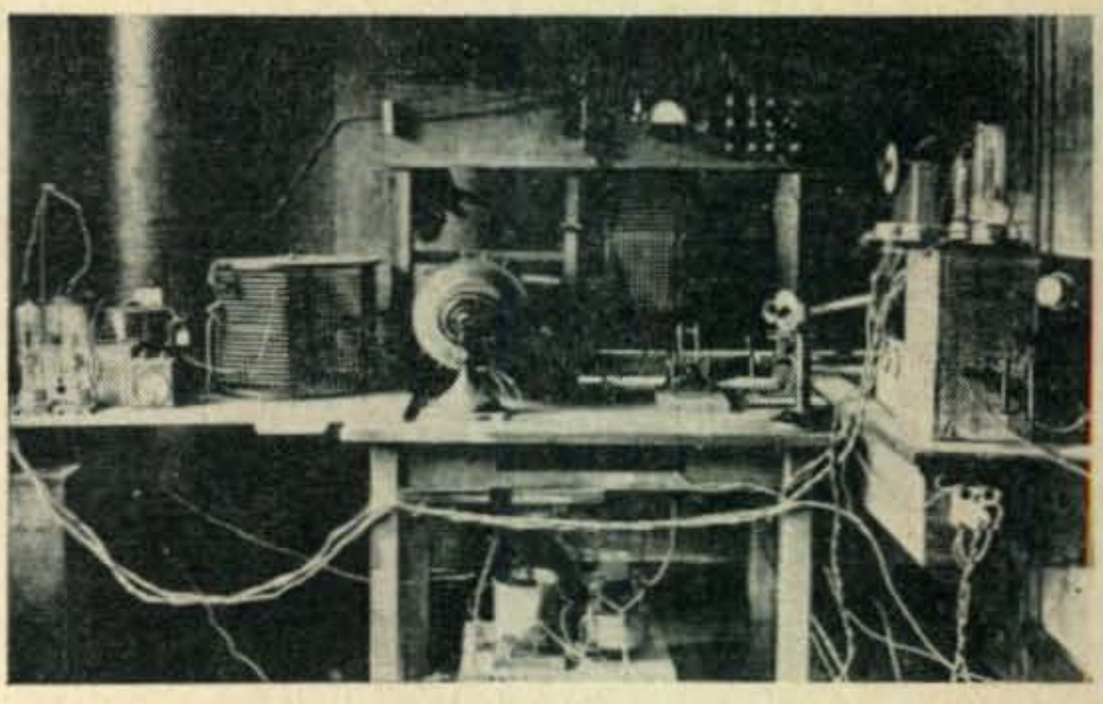
All went well until late 1920. On October 27, 1920, the Department of Congress assigned the Westinghouse Electric and Manufacturing Company of Pittsburgh, Pennsylvania the historic call letters KDKA.

This first radio station of scheduled broadcasts opened on November 2, 1920 broadcasting the Harding-Cox presidential election returns. Though only using two 50-watt oscillators and four 50-watt modulators, this demonstration of wireless telephony created a sensation in the American press and started in motion a movement that eventually encircled the globe. This rise of radio broadcasting brought many problems to the amateurs and also a few breaks.

Within just about one year, four American stations received goverment licenses and were in operation. KDKA, Pittsburgh, Pa.; WBZ, Springfield, Mass.; and WJZ, Newark, N.J.; were Westinghouse stations. WDY, Roselle Park, N.J. belonged to the Radio Corporation of America. KDKA started operating in November 1920; WBZ in September 1921; WJZ, in October 1921; and WDY, in December 1921.

From then on the mushrooming craze for stations swamped the U.S. Department of Commerce with an avalanche of orders. Bulletins from the Department showed:

Radio's first commercial broadcast in America. Broadcasting the Harding-Cox election returns over KDKA Pittsburgh November 2, 1920. Besides Pittsburgh, many towns in Ohio, Pennsylvania, and West Virginia heard the program loud and clear according to a November 15, 1920 press release. Courtesy of Westinghouse Mfg. Co.



Experimental transmitting station 8XK of Pittsburgh. Its owner, Dr. Frank Conrad, then assistant chief engineer at Westinghouse, conducted experiments over it during the four years prior to KDKA. Courtesy Westinghouse Mfg. Co.

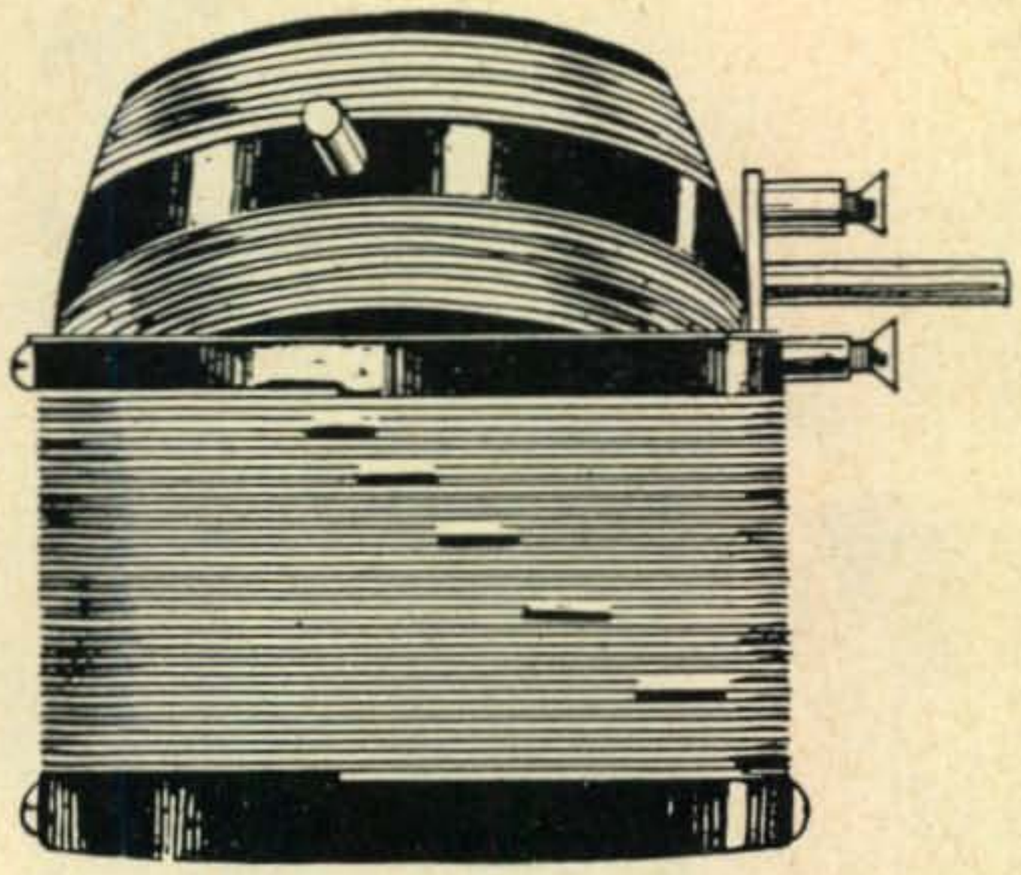
Date	New Stations
August 1921	2
September 1921	9
October 1921	12
November 1921	6
December 1921	3
January 1922	26
February 1922	14
March 1922	27
April 1922	88
May 1922	99

Until scheduled radio broadcasting occurred, amateurs had the air to themselves. Now, with entertainment filling the air every evening, hams experienced severe interference. Likewise, the radio listeners also suffered; their interference originated from amateur sparks and radiating regenerative receivers, ship wireless stations, and heterodyning from overlapping broadcasting stations.

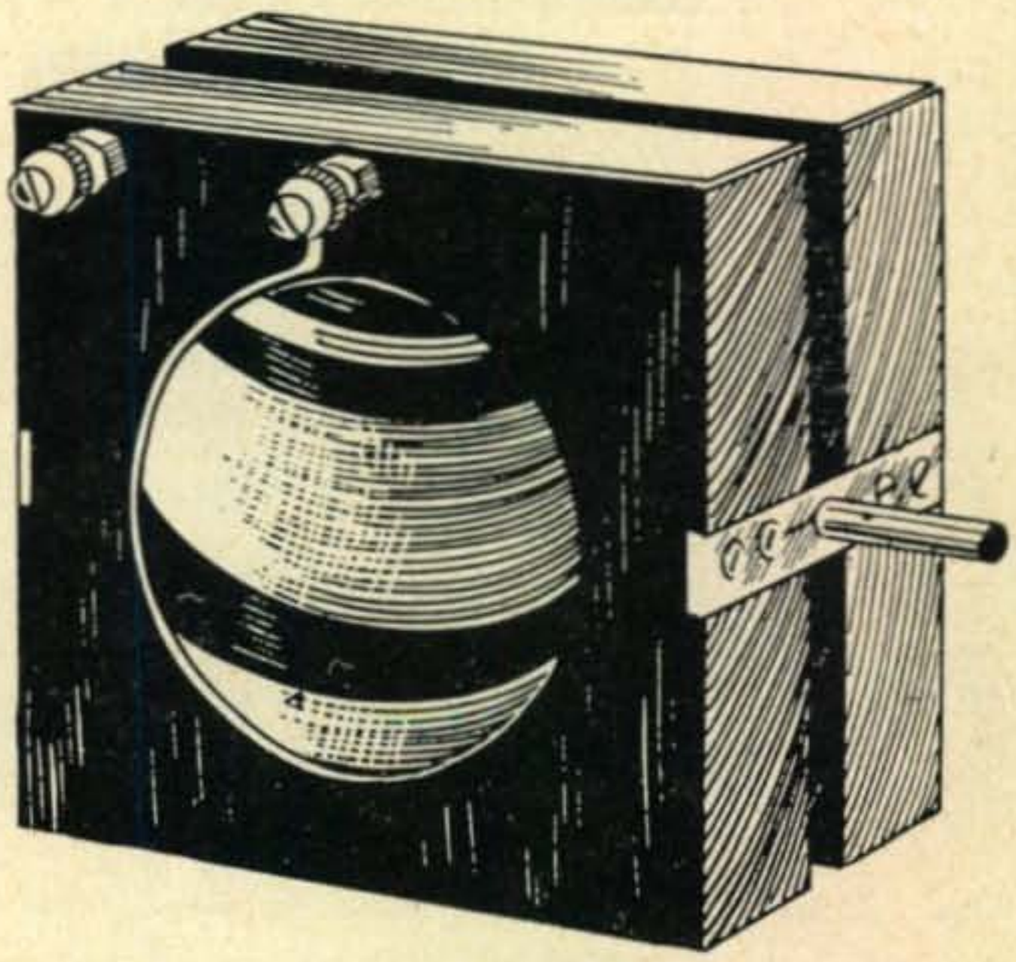
The main causes of both groups' trouble were the non-selective receivers. However, the broadcast listener interference from unscrupulous competitive stations needed frequency assignment by the Government to eliminate it. Regardless, a virtual feud speedily developed between hams and radio listeners.

Considering the average radio listener inexperienced in radio, manufacturers flooded the market with broad-tuning single circuit receivers. Having only one dial to turn, they concluded that the public couldn't possibly have trouble tuning them. And this passe style of circuit adequately met broadcast receiving conditions because transmitters emitted sharp carriers.

Used in amateur CW work, the single circuit set radiated strong waves causing heterodyne whistles in the broadcast receivers as well as their own. But, by the end of 1922, amateurs were swinging to the three circuit tuner. This design placed the stationary primary of a variocoupler in series with the antenna variable condenser; the rotor of the variocoupler varied selectivity through secondary coupling and was tuned by a parallel variable capacitor (sometimes a variometer in series with the grid tuned the secondary). A variometer in the plate circuit adjusted the regeneration feedback.



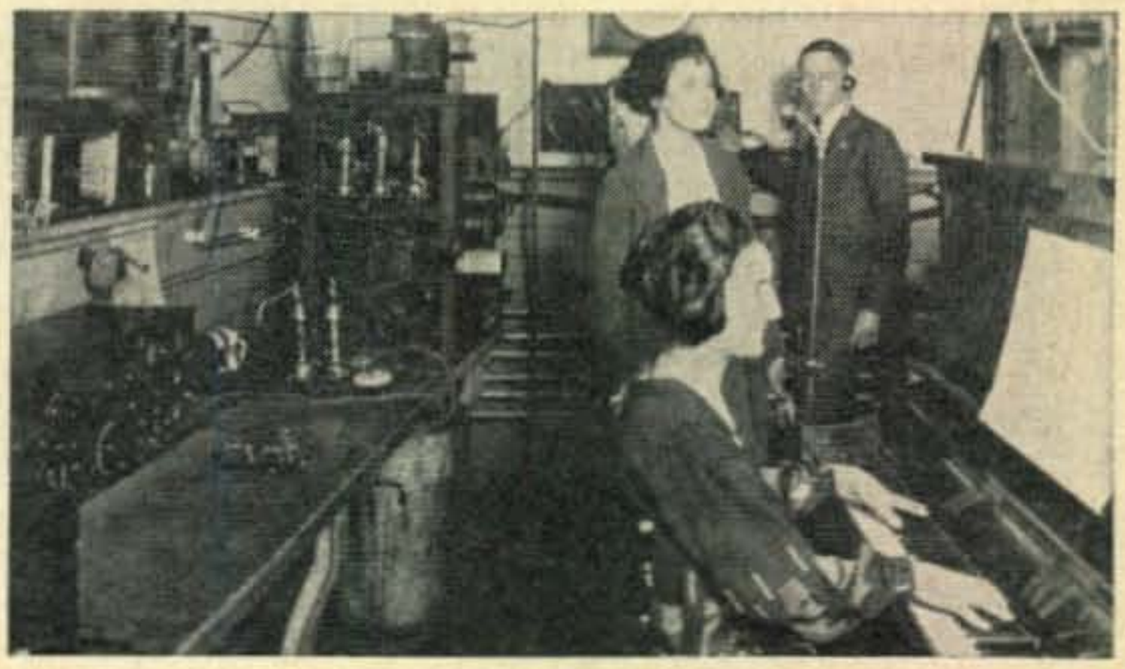
Variocoupler, used to tune primary and vary secondary coupling.



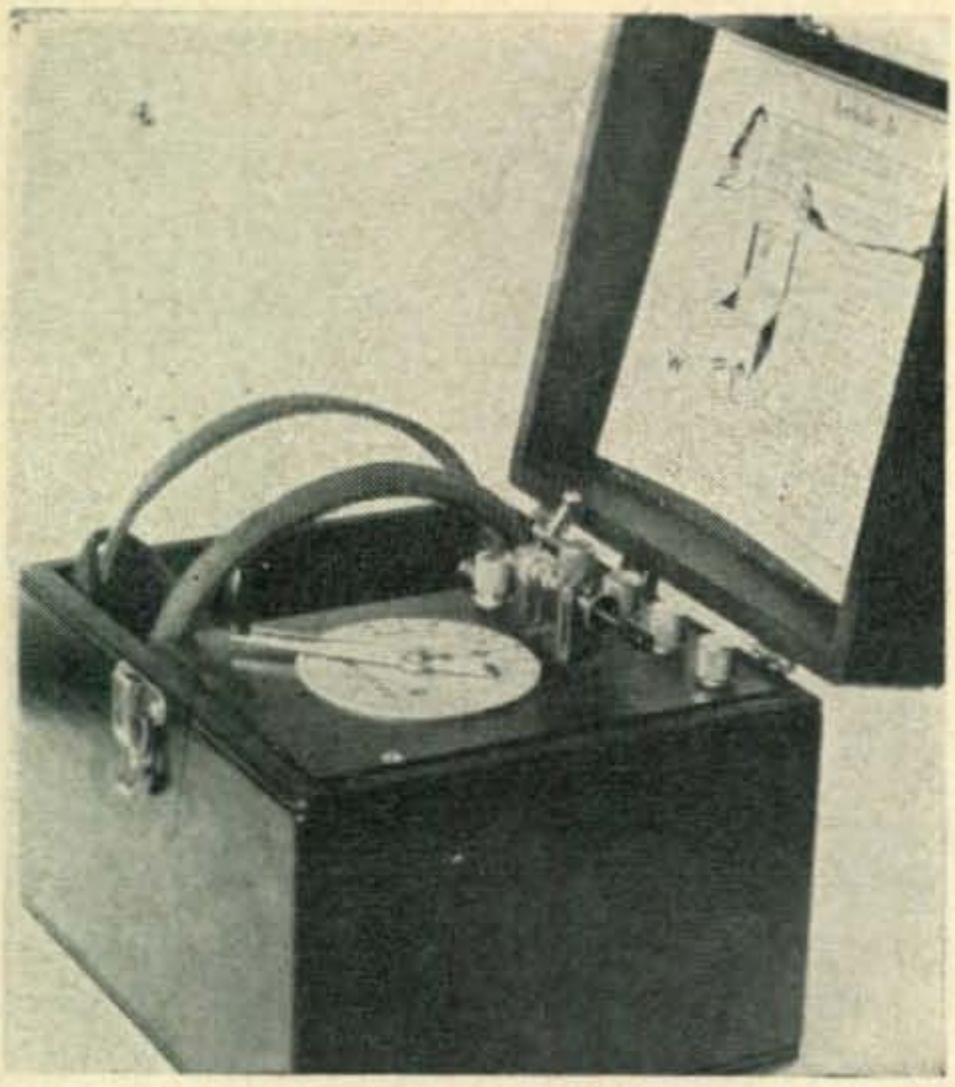
Varimeter, used to control feedback in regenerative circuits.

Enthusiasm for broadcasting spread like wildfire among the public. Manufacturers couldn't satisfy the rush of orders. Buyers waited months for deliveries. As more and more receivers went into operation, a great cry arose from the multitude of radio listeners—they discovered that besides receiving the interesting radio programs, their sets also picked up various kinds of interference. This they weren't going to tolerate.

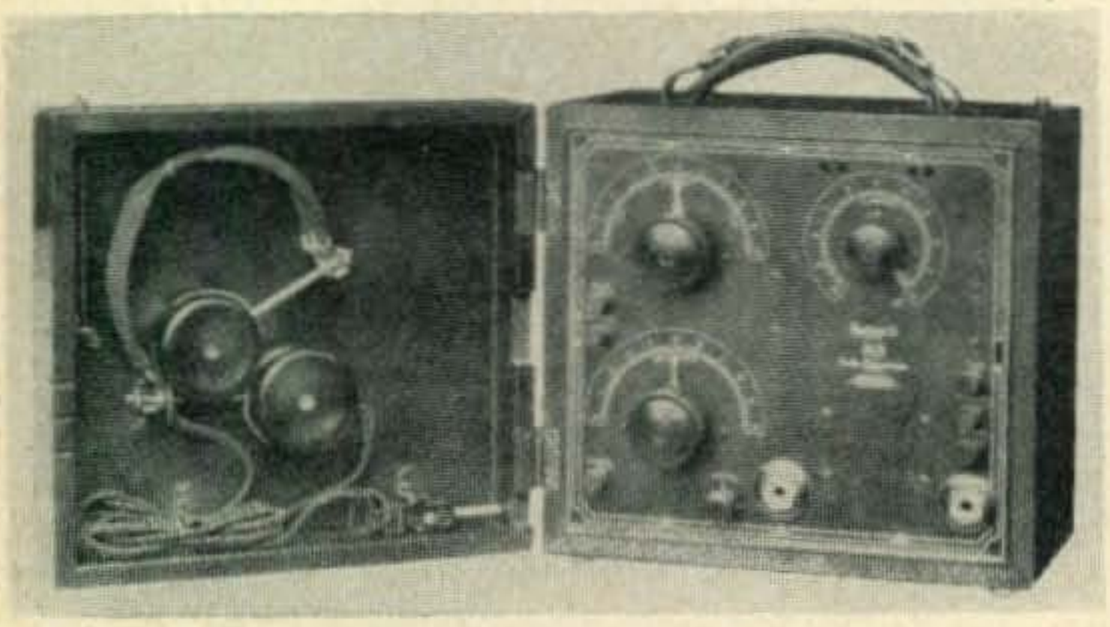
Performers before big special microphone used by broadcast station WJZ in 1923. Courtesy Westinghouse Mfg. Co.



Original studio and operating room, Station WBZ, Springfield, Mass., in 1921.



Single circuit crystal set. First popular-priced home radio receiver, the Westinghouse Aeriola, Jr. Courtesy of Westinghouse Mfg. Co.



The "Radiola II"—an RCA early receiver marketed in 1920.

Regardless of the type of interference, the "listeners" soon blamed the hams for everything.

In the meantime, broadcasters made their programs extremely appealing to the listening public. They out-did themselves trying to better their competitors. Every type listener found something to please him. From record programs, agendas spread to band concerts, church services, political talks, boxing events, baseball bulletins, opera, and recitals by prominent artists.

By autumn of 1922, five hundred licensed broadcast stations existed in the United States. Broadcasting congregated on 360 meters. In large cities where a number of stations operated, mutual time-sharing arrangements developed to keep down interference. However, conflicts soon arose for the choice evening hours, and a babble resulted when some station violated its time-sharing agreement.

Loud voices clamored for Government intervention and laws to straighten out the mess. Up to this point in the radio art, transmitters weren't readily tunable (they used fixed condensers and varied tap connections on pancake coils) and receivers lacked sharpness to tune-out interfering stations. The White Radio Bill, containing the solution for correcting this bedlam, lay dormant in Congress. Frequency assignment, therefore, continued to be a hot political item. Strong factions existed on both sides depending upon how their personal interests lay.

To prove the value of separate frequencies for broadcast stations, two of the stations conducted experiments to determine the feasibility of separate wave-lengths. Operating simultaneously—one on 360 meters, the other on 400—they quickly proved the value of specific station frequencies. However, they also proved the inadequacy of most of the broad-tuning receivers possessed by the public.

Finally, in 1923, Herbert Hoover, then Secretary of Commerce, tired of waiting for passage of the White Radio Bill, and took it upon himself to assign separate frequencies to the broadcast stations. This eliminated program interference but didn't solve interference due to poor receivers. Further interference elimination came after the Third Radio Conference met in Washington in October 1924. Out of that meeting amateurs received their harmonically related shortwave bands and ship wavelengths went up beyond the broadcast zone.

What a break this was for the hams! Now they possessed a group of harmonically related bands where their squealing receivers would only annoy themselves. And with these allocations, the Government eliminated the silent hours imposed on hams to stop amateur interference with broadcast reception. Hams were now free to operate during those choice evening hours from 8:00 to 10:30 and on Sunday mornings during local church time.

The pioneering stage of radio broadcasting ended by January 1, 1926. No new stations entered the field because a full broadcast spectrum prevented the Department of Congress from issuing more licenses. Network broadcast-

[*Continued on page 111*]

The "Radiola 17"—first a-c radio receiver.

Simple Condenser Checker

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New Orleans 18, Louisiana

Knowing how useful a small, cheap but efficient condenser checker is in trouble-shooting, I would like to pass on the following modification of one I saw in a local TV shop. It is especially efficient in that it applies *dc* to the condenser in question and indicates any breakdown under approximate operating voltage.

Construction

The case is a small (2″ x 4″ x 4″) aluminum box with the neon bulb and switch mounted on one panel. The positive and negative leads come out through grommets in one end—the *ac* line goes in the other. The box used can be wood with a bakelite panel in which case the tie strips are not needed. If the metal box is used they are necessary to keep above ground. If desired, an on-off switch (Sw2) may be installed. For the test leads I have used regular red and black multi-meter leads. I used part of a DPDT switch for Sw1—this is what my junk box produced—a SPST is all that is needed however.

Operation

The checker works as follows — to test tubular condensers it is not necessary to observe polarity. Sw1 is in "off" position. Attach the positive and negative leads to the condenser. If good, the neon bulb will flash briefly and go out. If leaking, the bulb keeps flashing slowly or rapidly depending on the amount of leakage. A steady glow indicates a shorted condenser. Keep in mind the smaller the condenser value the faster and weaker the flash. Also since we are applying from 50 to 125 volts of *dc* to the condenser—any having a lower voltage rating may short and possibly be ruined.

To test filter condensers Sw1 is placed in the "on" position. A filter in good condition causes the light to glow brightly at first, then dim and go out as it becomes fully charged. If the light stays bright the condenser is shorted. Caution—always discharge the filters after testing! **Observe polarity** when testing electrolytic condensers. The precautions about voltage ratings still apply also.

The checker is reliable except on very small value condensers—where it will detect shorts or leakage but not opens. ■

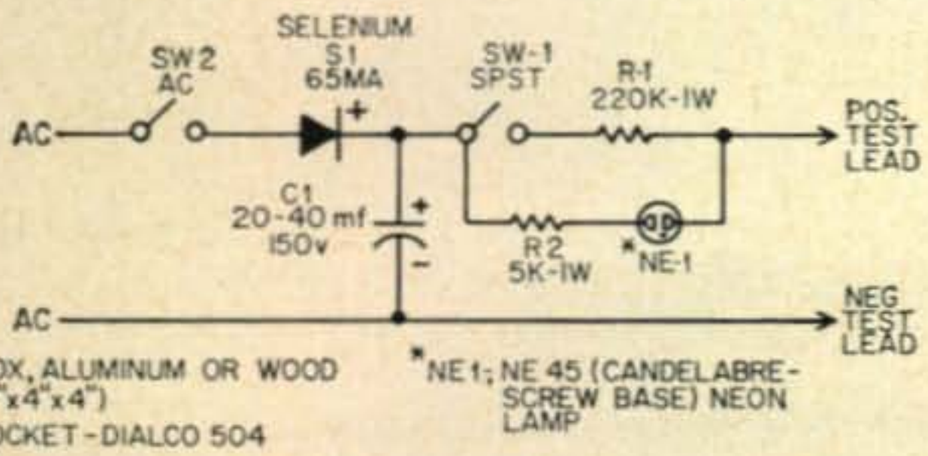
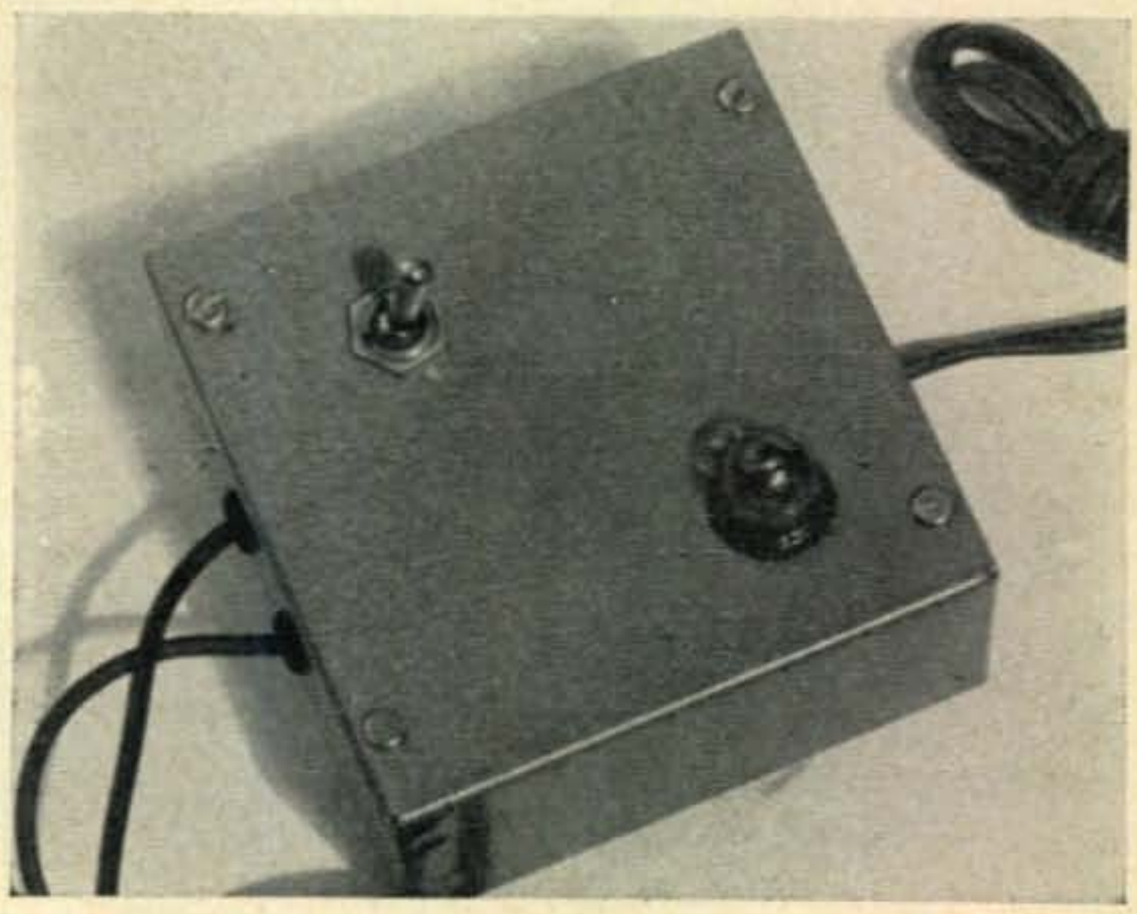
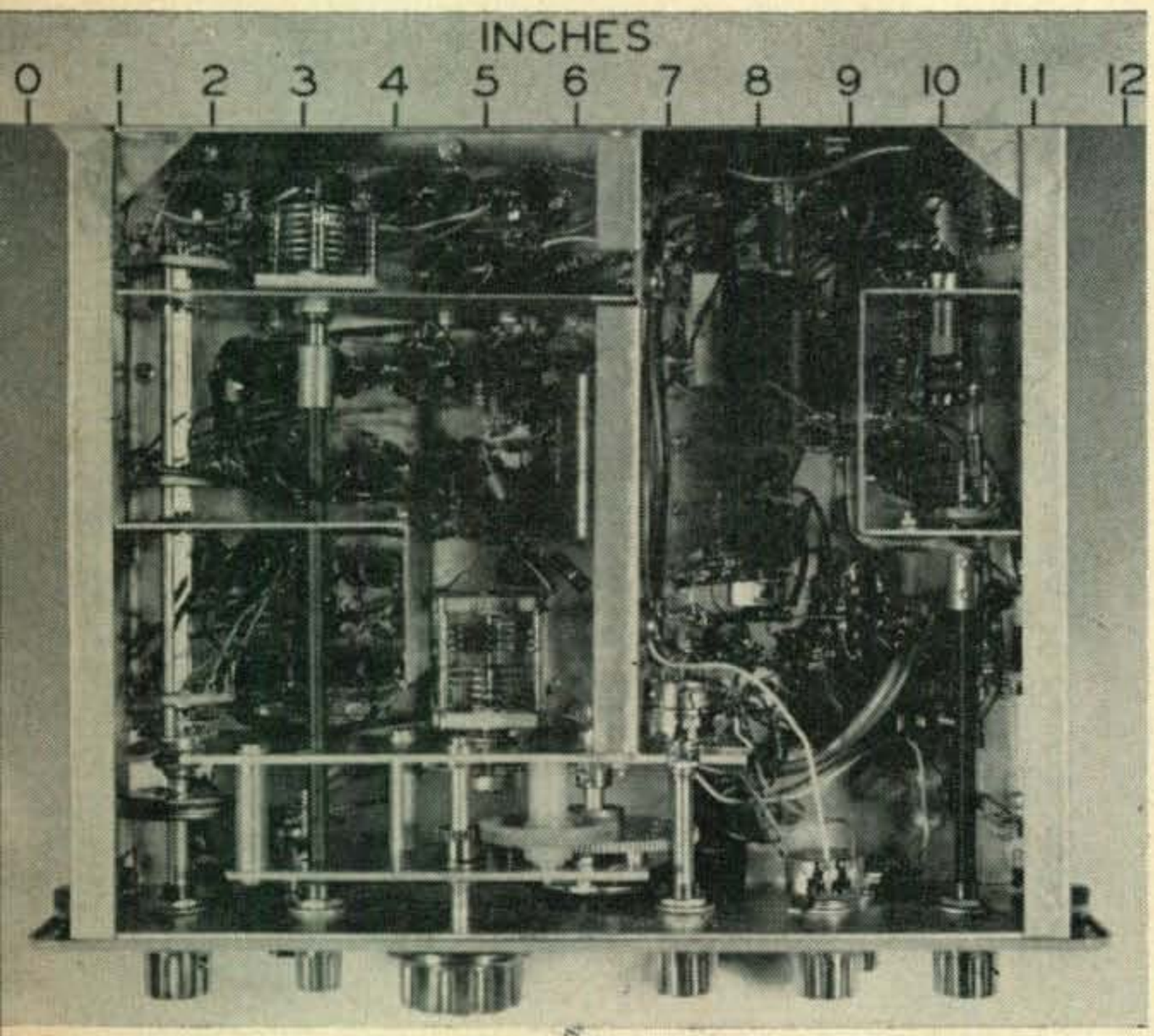


Fig. 1—Circuit of simple condenser checker.

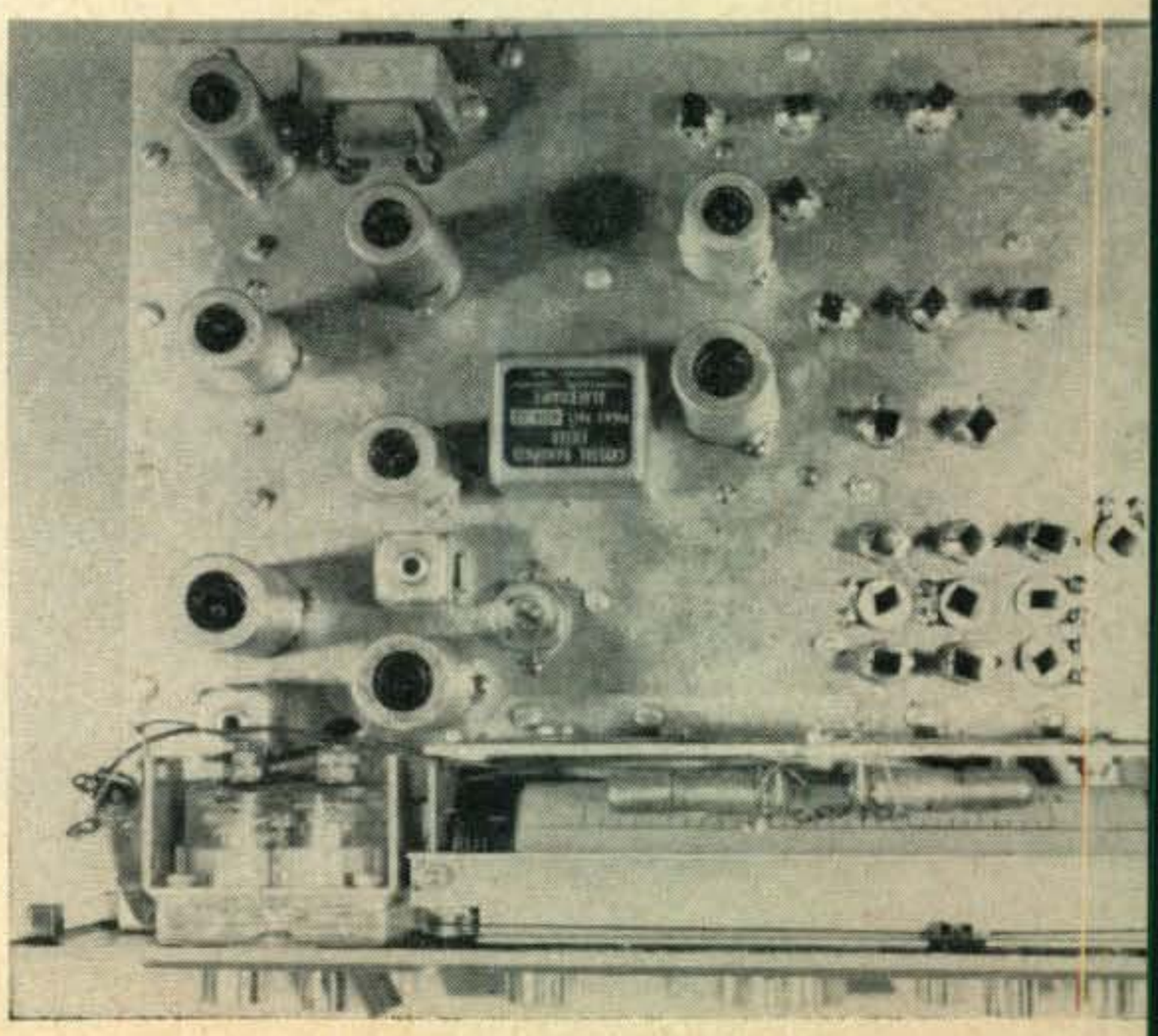


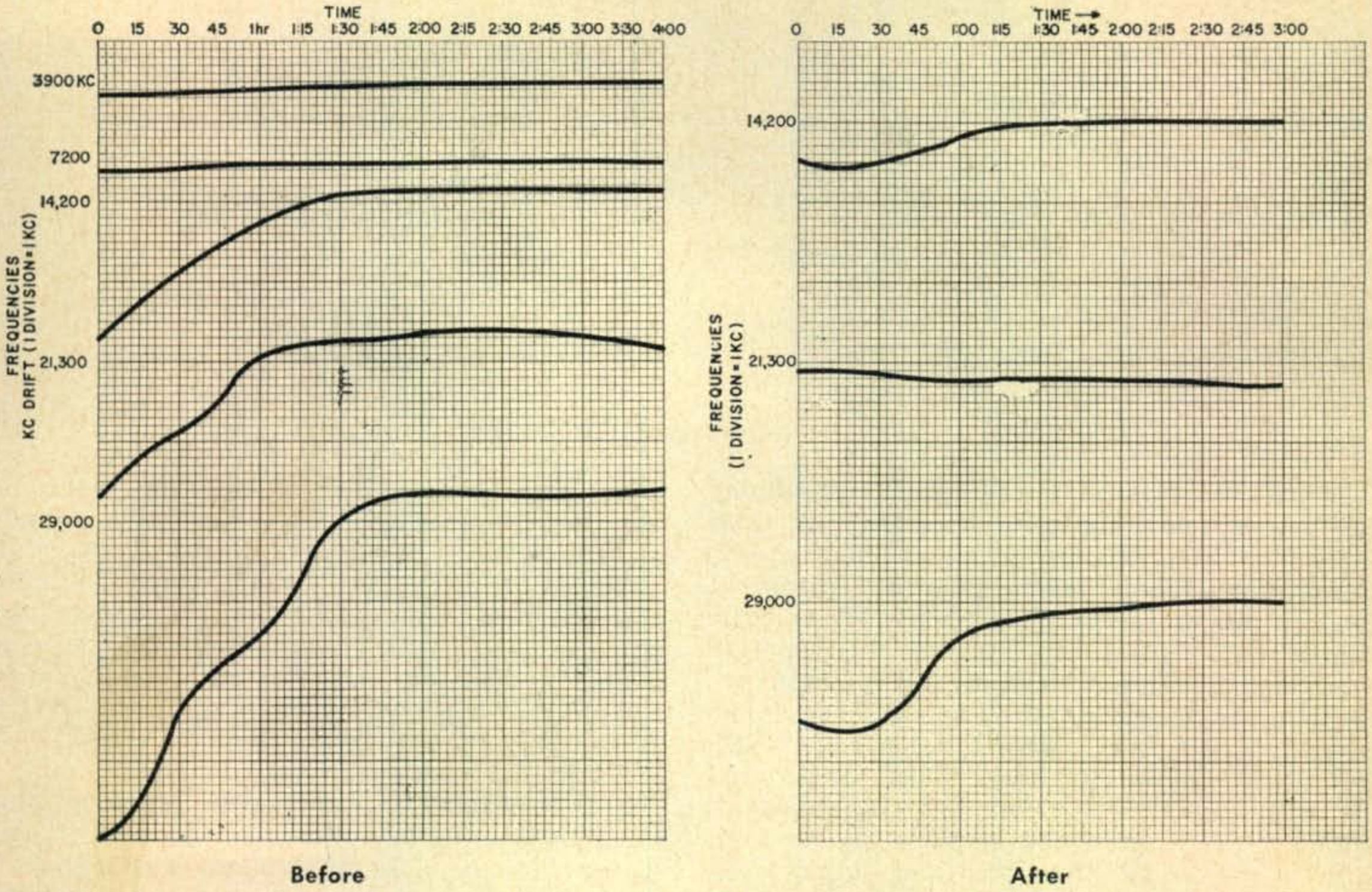
Building The Heathkit "Comanche" Mobile Receiver

James N. Brink, K5SVJ
1721 River Oaks Drive
New Orleans 14, Louisiana



Needless to say, the recent introduction into hamdom by the Heath Company of what appeared to be a very interesting set of mobile/fixed gear was greeted with deep interest. Every Heath advertisement and circular was thoroughly gleaned for all bits of knowledge concerning this new equipment. Finally, upon deciding the only way to get complete information would be in the kits themselves, a complete set was ordered on 8 March 1959. The "Comanche" MR-1 mobile receiver, the "Cheyenne" MT-1 mobile transmitter, the transistor power supply MP-1, mobile speaker kit AK-7, and mobile mounting rack AF-6 were ordered. Then the usual vigil of watching for the mailman started. On 15 March, the MR-1, MP-1, AK-7 and AK-6 arrived via parcel post. The MT-1 had been backordered, but my fears of waiting an unendurable 2 or 3 weeks were allayed by a letter from the Heath Company saying the tentatively scheduled release date would be the 20 March 1959. I had carefully calculated estimated delays, shipping times, etc. and had applied for twenty-one days leave in order to devote full time to the building process. Naturally, the first box to be opened was the box containing the "Comanche" and the construction manual was thoroughly scanned from cover to cover to determine its capabilities and details. I was





Before — After

Improvement in stability on 20, 15, and 10 after a Heath modification.

very pleasantly relieved of all the anxieties I had accumulated during the waiting period. The "Comanche" was far more of a receiver than I had dared imagine for such a low price.

At that time, a decision was made to follow the instructions exactly as outlined. A thorough item by item inventory was conducted, and to my pleasant surprise the kit was complete and undamaged.

The authors of the assembly manual are to be congratulated. The written instructions and detailed drawings are exceptionally easy to understand and follow. During the course of construction, I was very pleased to observe that all parts, lead lengths, etc would fit exactly as the manual indicated. This has not always been my experience in the past, considering kits of various manufacture. Anyone who has had the experience of following the instructions to the letter and then ending up with a lead that "just won't quite reach" can well appreciate the value of accurate instructions.

There were no major errors in the manual; however, the following suggestions may be of benefit to others:

1. Assembly of main tuning mechanism—smoothness of operation can be improved by insuring the portions of the shafts of pointer drive pulley shaft assembly (100-202) and the pinion gear shaft assembly (100-201) that are bearing surfaces are completely free from nicks, burrs, etc. and all oxidation is removed prior to assembly. This can be accomplished with a power buffer and/or crocus cloth (not sandpaper!!). Be extremely careful not to decrease the size to the extent of causing a loose fit.

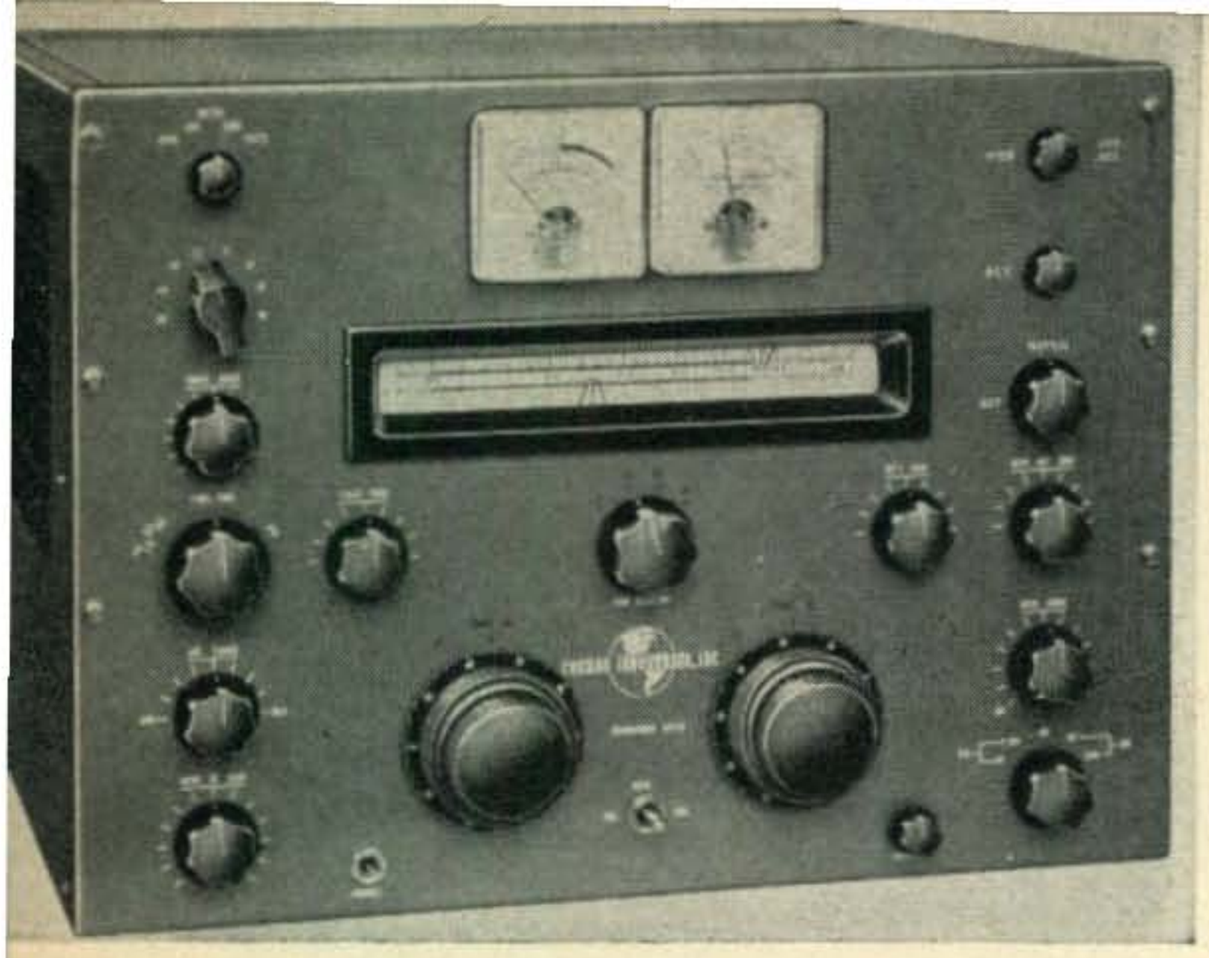
2. The same smoothing treatment should also be accomplished on that portion of the pointer bracket (204-M215) on which the dial drum pointer (463-15) rides. This is very important because the pointer bracket is subject to receiving nicks and burrs during handling and these nicks and burrs can be a source of continual irritation. Dial pointer may be glued to dial cord with model airplane cement provided the cement used does not soften the dial cord. On page 53 in the note, change, "at holes GE, GU and GT" to read "at holes GV, GU and GT."

If the filament wiring is to be changed from 6v to 12v or vice versa at a later date, I recommend the builder position the wires on terminal strip Q in such a manner as to provide an easy change, inasmuch as this location is fairly inaccessible after the chassis is assembled.

The remainder of construction items are very well stated and easy to follow.

Assembly of major components, chassis base assembly (100-M189) chassis top plate (205-M132) and all other assemblies is easily accomplished. The greatest praise is due Heath

[*Continued on page* 109]



CQ Reviews the:

Cosmophone "1000"

When we first reviewed the Cosmophone "35", we were impressed by the size and versatility of this little 35 watt bilateral ssb transceiver. The most praiseworthy feature of the unit was that it contained two independently controlled VFO's functioning as two separate receivers and transmitters or two transceivers.

I had the good fortune to spend a few hours with the boys up at Cosmos Industries last week. They escorted me into the lab and confronted me with, what to all appearances, was a Cosmophone "35". It contained all the usual features with a major modification. The single 6146 power amplifier had been replaced with a pair of Eimac 4CX-300A's, providing a plate input of up to 1.2 kw instead of the usual 35 watts. The only apparent change in the appearance of the unit was the addition of a second meter to the front panel.

Receiver Section

To begin with, lets review some facts about the receiver section of the "1000". Actually, there have been only minor changes in the unit as far as it's reception capabilities. The "Q" Multiplier found in the original "35" has been replaced with an effective "T"-Notch Slot Filter. This gives the operator the ability to sweep across the 3.1 *kc* bandpass of the *if* and notch out any interfering signals that may be present. The notch depth is quite deep; being in excess of 40 *db*. I was able to tune in a 40 *db* over 9 AM carrier, apply the notch, and watch the "S"-Meter drop from plus 40 to about S-1. Then by merely retuning slightly, I was able to return the signal to its original strength as read on the meter. This demonstrated, to my way of thinking, the ability of the "T"-Notch to reduce even the strongest undesirable signals present in the *if* bandpass.

Sensitivity-wise, the "1000" is right in there with the best of them, showing 1 microvolt for a 6 *db* S/N ratio. The mechanical filter employed in both the ssb generating section and the receiver *if*, provides for a bandwidth of 3.1 *kc*, with extremely sharp skirts.

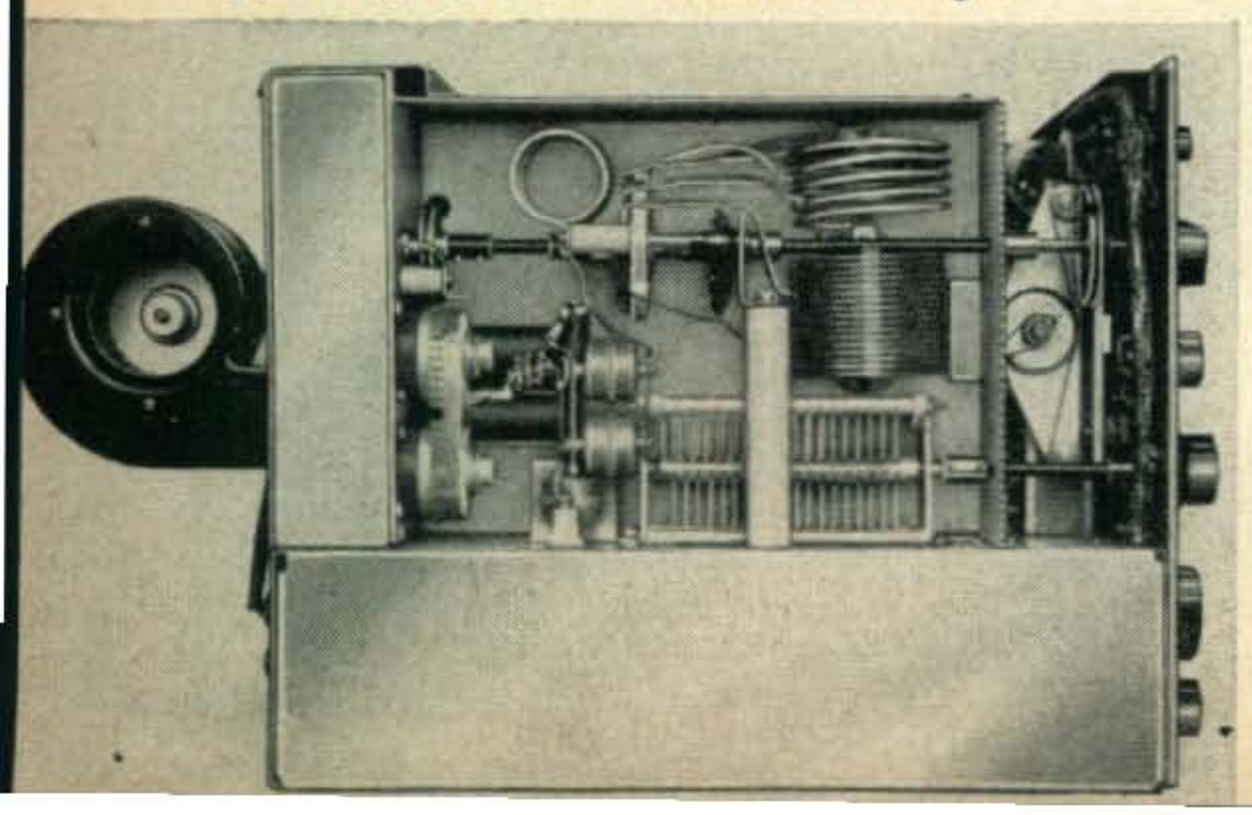
I had the opportunity to watch a stability test on a production unit. By coupling the output of the *vfo*'s to a Berkeley Counter, I was shown that the drift of the unit was less than 100 cycles from a cold start—this at ambient room temperature. The solid construction and packaging of the unit makes for a high degree of mechanical stability as well.

The tuning system has a reduction knob with two speed output. The operator can select either 20:1 for rapid tuning across a large range or 100:1 for smooth, vernier bandspread tuning. Skirts are included on each knob, which enable one to determine frequency to 1 *kc*. These are resettable. By using the built in 100 *kc* calibrator, holding the knob, and setting the skirt to coincide with the calibrator, a high degree of readability can be obtained.

By using a carefully designed balanced detector for ssb reception, The Cosmophone "1000" delivers a high quality received signal even on the strongest 9 plus powerhouses. The operator can use the unit with the *rf* gain at maximum with good results, as the *avc* system is such that there is little distortion and no pumping.

Let's not forget one other major point. The *bfo* in the "1000" is crystal controlled, with the crystals matched to the mechanical filter to provide just the right reception of ssb signals. This adds stability to the receiver as well.

Side view of blower cooled final cage.



Transmitter Section

The sideband generating section of the Cosmophone has seen little modification. The block diagram shows the tube lineup and basic scheme behind the transmitter. The same mechanical filter is used to generate sideband. By carefully selecting the crystals for the carrier oscillator, Cosmos has been able to achieve some outstand-

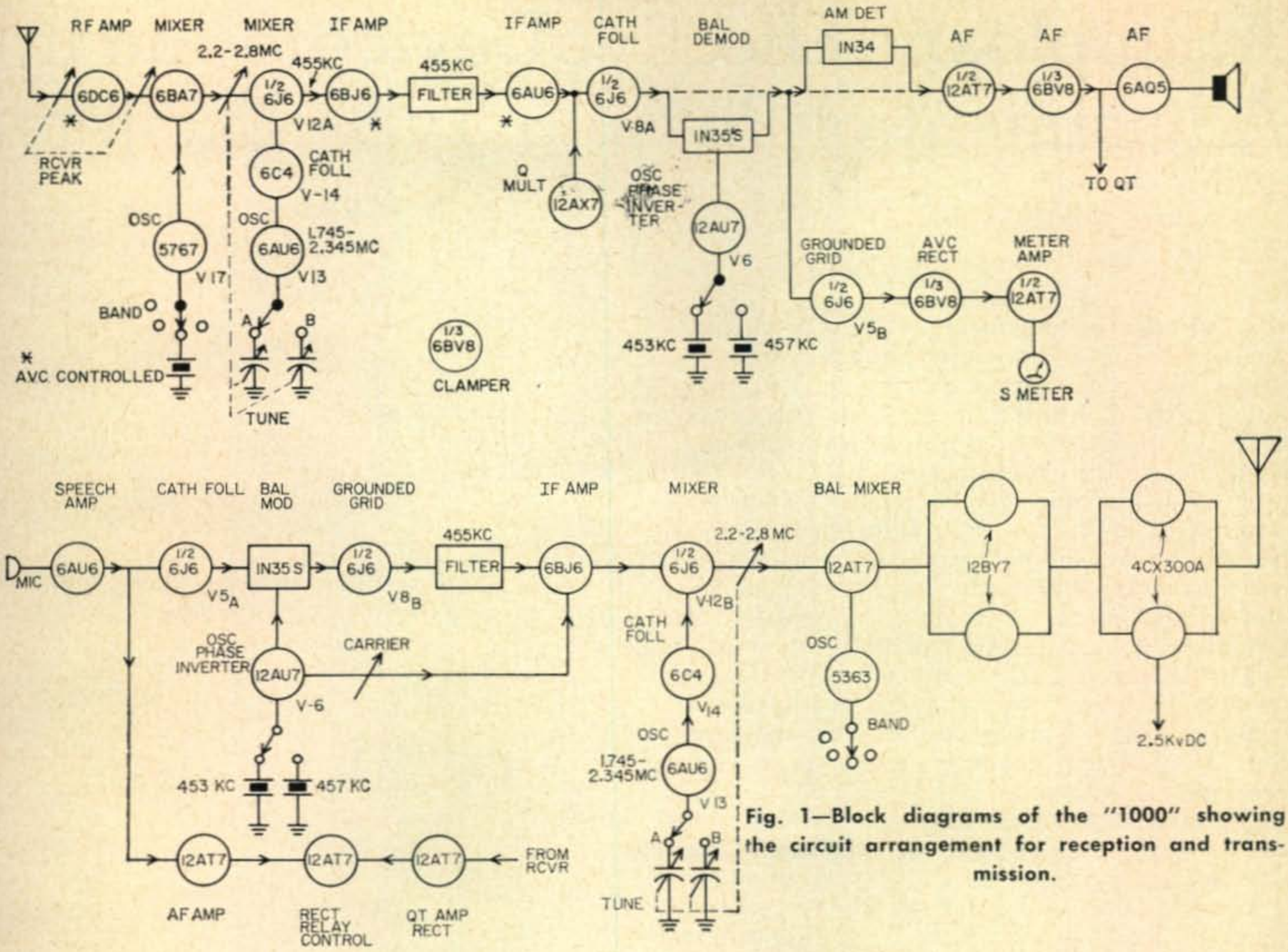


Fig. 1—Block diagrams of the "1000" showing the circuit arrangement for reception and transmission.

ing results as far as quality of transmitted signal is concerned.

Unwanted second order distortion products are better than 32 *db* down. Unwanted sideband suppression is 42 *db* down or better. Since the same *vfo*'s control both receiver and transmitter, the drift factor is the same for the transmitter as receiver.

Final Amplifier

As already stated, the 6146 in the "35" has been replaced by a pair of Eimac 4CX-300A's in the "1000". These tubes are extremely small, rugged, ceramic versions of the 4X-250B. Using two of these in linear amplifier service gives one a total plate dissipation of 600 watts with a maximum plate power input on the order of 1.2 *kw* in the space normally required for a pair of 6146's. The boy's at Cosmos' Lab demonstrated an output of 725 watts from the amplifier in the new "1000"; This with a plate potential of about 2500 volts under a full 1.2 *kw* load, and a plate current of around 420 *ma*. Mind you, this measurement was taken with carrier injected, and is true *dc* input; not peak envelope power.

The Plate network in the new Cosmophone "1000" is a conventional Pi-Network with an average "Q" of 10 on all bands. A 250 mmf plate tuning capacitor, silver plated coils, extremely heavy duty ceramic bandswitch, and a 1500 mmf loading capacitor make a compact *LC* section with an output impedance between 45 and 80 ohms; this is, of course, adequate to effect a proper match to either the 52 or 72 ohm coaxial feed systems currently popular.

I haven't said very much that would describe the TVI precautions that have been taken in the design of the Cosmophone "1000". Besides the normal shielding and filtering, Cosmos has supplied a specially designed *rf* choke for the power amplifier which is series resonant at 50 *mc*. This has proven to do quite a bit in reducing channel 2 interference. The entire unit is built in a series of partitioned compartments to eliminate any possibility of *rf* feedback and resultant oscillation. Amplifier design is such that lead lengths are minimized, components properly and strategically located etc. All these factors fit together in making the new "1000" highly TVI supressed.

The final amplifier section in the unit is a separate compartment. Cooling of the 4CX-300A tetrodes is accomplished by a blower mounted on the rear of the cabinet. The air from the blower passes through the air system sockets and out the side of the cabinet by means of a special louvre opening. No hot air can leak through to effect any frequency sensitive components in the main unit. Should the blower not be plugged into the socket provided on the rear apron, no high voltage can be applied to

[*Continued on page* 88]

A Simple and Effective Device to Aid in Adjustment of Phasing Type Exciters

S. W. Richards, G3CWB
10 Greenhill Flats
Perrins Ct., Hampstead
London NW 3, England

Using the arrangement of fig. 1, obviates the need for an oscilloscope when adjusting for sideband suppression in phasing type exciters. I find it quicker and more precise. The carrier is first carefully balanced out, then the link, L1, is coupled to the exciter output. Feeding a 1 *kc* tone into the microphone input socket will now result in a 2 *kc* tone being heard in the headphones. (This being the beat between upper and lower sidebands.) The audio balance and *rf* phasing controls are then adjusted for minimum 2 *kc* tone. That is all.

The circuit L2-C1 forms a rejector to attenuate 1 *kc* as during the above adjustments some carrier unbalance occurs and the input tone of 1 *kc* will become audible. If it is too pronounced it will make it difficult to distinguish the 2 *kc* beat. This rejector should be preset in the first instance by inserting carrier and adjusting the value of C1 for minimum 1 *kc* tone only. If desired the device could be made in the same box as the 1 *kc* tone generator of fig. 2, thus forming a complete instrument for sideband suppression adjustments. ■

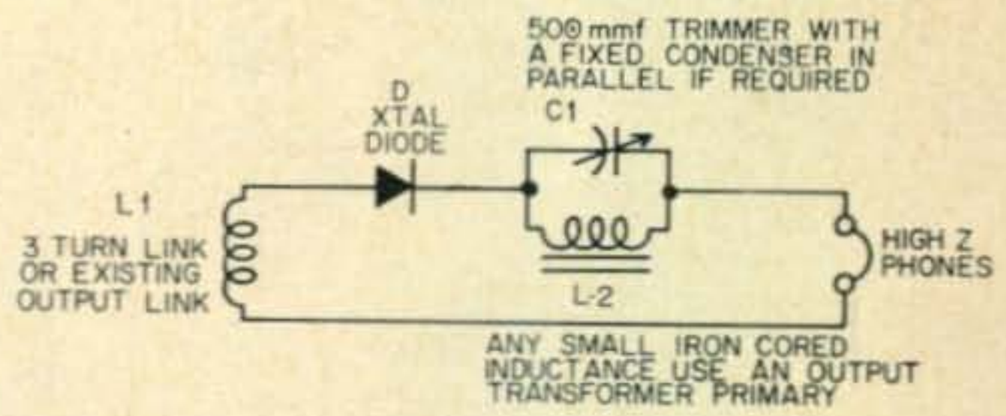


Fig. 1—Simple circuit for detection of the 2000 cycle beat. C1-L2 is a 1 kc filter.

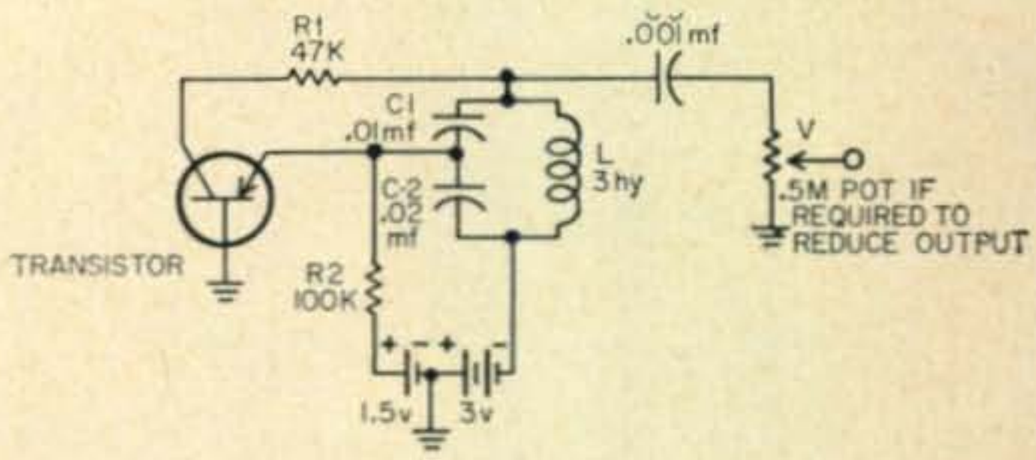


Fig. 2—Two kc oscillator to modulate transmitter. Circuit is taken from CQ Sideband Handbook.

Sideband May Be Older Than You Think!

Bob McFall, WØBZZ

An early operator from G-Land (whose initials have come down as indicative of a good report) must have been an early Sideband Op. We quote Francis Bacon: (The New Atlantis)

We represent small sounds as great and deep, likewise great sounds, extenuate and sharp; we make divers tremblings and warblings of sounds, which in their original are entire. (Here he must be referring to parasitics, harmonics, 40 meters on a Field Day, or good old SSB).

We represent and imitate all articulate sounds and letters, and the voices and notes of beasts and birds. (How many hours he must have spent listening to the whistles and moose-calls of our brethren tuning up and checking modulation!)

We have certain helps, which set to the ear further the hearing greatly; (a good set of cans?) *we have also divers strange and artificial echoes, reflecting the voice many times, and as it were tossing it; and some that give back the voice louder than it came, some shriller and some deeper; yea, some rendering the voice, differing in the letters or articulate sound, from what they receive.* (Here he has experienced everything from narrow-band audio, AC-DC Lo-Fi, QSB, QRM, QRN, to SSB or DSB without a BFO!)

We have all means to convey sounds in trunks (records or tape?) *and pipes* (waveguide, beaded co-ax?) *in strange lines and distances* (an obvious reference to skip, aurora, meteor trails, moon-bounce, and the long way around).

His remarks anent these things points up his close acquaintance with inverted speech, doppler effect, and overmodulated California Gallons. Perhaps if we listen carefully, we can still hear his rig churning the ether, and add another country to our lists! ■

sideband sideband sideband

SIDEBAND

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

WORKED 100 COUNTRIES
Two-Way SSB
(In order of award)

W6UOU	W6IAL	PY4TK	W6TOT
W2JXH	K2JFV	K9EAB	W9HB
F7AF	W1ADM	W7IAA	W5DA
K6GMA	TI2RC	VQ4ERR	W7GIE
W3SW	W2CFT	W8MPW	W1LHZ
W4IYC	KØABH	W3MAC	W2MA
TI2HP	ZL3IA	W1GR	W6BAY
W8QNF	W6BAF	W8JXM	W5RHW
W6ITH	W2TP	W1EQ	K4HXF
VE3MR	W6RKP	W5FDZ	K2EWB
W8GCN	PY2JU	W8JXY	K2HUK
W8EAP	W6UPP	W2OTZ	VE3ES
W8YBZ	W6PXH	W5BGP	MP4BBW
WØQVZ	WØCVU	W6WNE	W1DCE
WØFUH	W4INL	W6TNS	W2ATJ
W8PQQ	W8YIN	W4HIM	KZ5WZ
ZL3PJ	TG9AD	HB9TL	HB9IE
K2MGE	W3NKM	K2HEA	
W2OQO	W6QFE	W7VEU	
W2VZV	W8MG	W4CDY	

The "WORKED 100 CLUB" is rapidly gaining international status with the addition this month of VE3ES, MP4BBW, KZ5WZ and HB9IE. Just to prove that it can be accomplished with low power, By, W2ATJ qualified with a rig running under 100 watts. We also welcome K2HUK and W1DCE.

The first award for "Worked 175" went to Humberto, TI2HP and it is fitting that we have an excellent photo of this handsome gentleman and his fine station. It couldn't have happened to a finer fellow as Humberto really works hard at Ham radio. TI2HP was the first SSB Station to win the WPX award. Several are right on his heels, and are just awaiting the necessary cards. TI2RC, W4IYC, W8GCN, W8YBZ, W8PQQ, W3SW and some others have worked over 175 countries two way SSB.

We are very pleased to learn that the very efficient dx/pedition of Juan, EA2CA to Ifni as EA9DE and to Andorra as PX1DE has been declared official. There were some rumors last month that the Radio Club of Spain was protesting Juan did not have official approval to operate in Ifni. A photostat of the authorization was sent to DX Magazine who published it. We also understand that ARRL will accept Juan's QSLs and we at CQ will do the same. The photo of EA2CA shown was taken in Ifni. There is a possibility of another dx/pedition to Ifni and Andorra in November by EA2CA.

Some of the most colorful QSL cards are starting to arrive from I5GN in Italian Somalia. This very rare and much sought after station is operated by Jere and Pat Nudson, and is the "Little Argonaut" transmitter of Ted Henry's which has been all around the World. (The QTH is P.O. Box 16, Mogadiscio, Somalia.)

Another new country made its appearance via SSB when Mac of PY7SC on Fernando de Noronha "opened for business" this month. With Art, PY4TK acting as master of ceremonies, PY7SC called in order, a list of prearranged sideband stations. Your Editor was number five on the list and snared country number 180 since moving to Maryland. The usual pile-up occurred and only the failure of Mac's power supply prevented a repetition of the mess on twenty caused by EA9DE. PY4TK did a wonderful job of keeping things under control, and he will also handle the PY7SC

[*Continued on page* 90]

Humberto, TI2HP, first to get "WORKED 175" on SSB.

Juan, EA2CA, in Ifni as EA9DE.

URBAN Le JEUNE Jr., W2DEC
416 North 15 St., Kenilworth, N.J.

DX DX DX DX DX DX DX DX

The following certificates were issued betweeen July 15th and August 15th, 1959:

WAZ

1115	W8CWY	John E. Hoffer
1116	W7FLD	Matt Karatmatic
1117	W7DAA	Bill Sanders
1118	W1IJB	Albert A. Bellerose
1119	OK1KKJ	Podebrady Radio Club
1120	W1AJG	Walter F. Reynolds
1121	SP6RT	Hubert Trzaska
1122	I1ER	Dr. Mario Santangeli
1123	W2BAC	Steven Jeffrey Baker
1124	K2OLS	J. L. Follett
1125	VK7LZ	Collis P. Wright
1126	VE6JR	R. J. Heppell
1127	W6QDE	A. V. Wright
1128	W8JRB	Jay K. Seyler
1129	W1ODW	Richard G. Rowe
1130	W4YGZ	C. F. Bonbright
1131	OK1PD	Josef Plzak
1132	OK2UD	Frantisek Dvorak Gottwaldov
1133	W4COC	Tom Boone
1134	G2GM	Frank Donald Cawley
1135	W7CKY/KL7	Victor Marconi
1136	UC2AA	
1137	UA9CR	Gleb Osmushin
1138	UA9CL	
1139	UC2CB	Leonid Yeveyev
1140	VQ2GW	George A. Wafer
1141	K6GMA	Walter A. Knight
1142	G3CSL	W. W. Jones
1143	W9VZP	L. B. Boles
1144	DL6DE	Karl Metzger
1145	W7NRB	F. J. King
1146	K6CYO	William G. Christie

ALL PHONE WAZ

41	ZL4BO	V. Roy Jackson
42	G3BYM	Don Bushe

SSB WPX

9	W1GR	Alfred W. Hyde

WPX HONOR ROLL

CW WPX

W2HMJ	531	SM5CCE	304	T12HP	231	W2TP	153
W6KG	473	W1FZ	304	K9EAB	180	W1GR	152
W8KPL	436	W5AWT	303	VE3MR	164	W8YBZ	152
OK1MB	424	W9VIN	303	K2MGE	158	WØFUH	151
W5KC	405	VK3KB	302	WØCVU	155		
W2EQS	373	W3DBX	302				
W9DYG	367	W5LGG	302				
W9UXO	362	JA2JW	301				
VE3DIF	357	LU5AQ	301				
W6WO	356	PY4OD	301				
W8LY	354	W2DGW	301				
W3BQA	352	W4HYW	301				
W5DA	351	WØPGI	301				
W1NLM	350	WØQYE	301				
W2MUM	350	K2PFC	300				
W8JIN	350	K4JVE	300				
W9IE	344	K4KOY	300				
DL7CS	330	KL7MF	300				
W6YY	330	W2FXA	300				
W4OPM	323	W3BCY	300				
K9EAB	319	W3LMA	300				
G3EYN	318	W4GXB	300				
W9YSX	317	EA4CR	299				
VK6WT	316	F9MS	299				
PAØVO	315	W1HWH	299				
SM5AHK	311	WØGUV	299				
W2PTD	311	W3UXX	280				
W8RQ	311	OK1BY	207				
PAØLY	310	W4OMW	207				
W9BPW	310	W1EQ	307				
DJ3BB	308	DL1QT	306				
SM5BCE	308	K5LIA	306				
W5AFX	308	OK3DG	306				
VE3BWY	305	UA9DN	306				
W1BFT	304	K4HXF	305				
W6RLP	304	K6SXA	305				
OK1AEH	304	W5OLG	305				

PHONE WPX

W8WT	446	W5ERY	311
G3DO	395	ZP5CF	306
PY2CK	354	W9UZC	302
CT1PK	350	VE1ADE	250

SSB WPX

DXpeditions

MP4QAO, who is good DX even when he stays at home, had the following to say in a letter to W2KUW.

"I have written to MP4BBW with a view to borrowing his sideband rig from time to time to get Qatar on sideband.

I have got the call of MP4TAD for operation from Tarif in Trucial Oman and MP4MAB for operation from Muscat. I will operate from these places using the aircraft HF gear and the crystals when I receive them. This will mean that I can come on during the night when we are nightstopping away from the shack at Umm-Said in MP4Q land.

MP4M is Muscat and is a separate country from Trucial Oman as far as the British Government is concerned. (That is why I have obtained the license.)

Old friend Andy MP4DAA has got the call MP4MAA and intends to operate from Muscat in September.

As a point of interest, Muscat is separate

from the Sultanate of Oman (VS9O and VS9OM) as well as from Trucial Oman, so I think it deserves country status.

Bryan has been very active on 21 *mc* of late.

Speaking of Ian, MP4BBW, he had to cancel his MP4QAN/TAD trips for various reasons, primarily his holidays not fitting in with plane schedules. He will go to both places either this fall or next spring when he has two weeks leave due. Ian will be putting a pair of 4X250B's and a three-element beat on shortly."

A very interesting letter was received by Ben, W2BXA, from YA1PB, which reads, in part, as follows:

"We (YA1PB and YA1IW) plan on being done here (YAIand) sometime in September and we are planning our DXpedition at that time.

At this time we are awaiting official permission for the Ministry of Communications in India to operate from VU4 and VU5 land. Permission to operate is almost a certainty as we have an Indian station who is more or less vouching for us.

We are also hopeful that the contact we have in the Indian Ministry of Communication will be able to use his influence in aiding us to obtain permission to operate from AC5 land.

As for equipment needed and equipment available, we have the supplies for camping, a generator, transportation and food. All we need is transmitter, receiver, and antenna to be in business."

W2KUW will lend the boys his KWM-1 if they can make the necessary arrangements for operation.

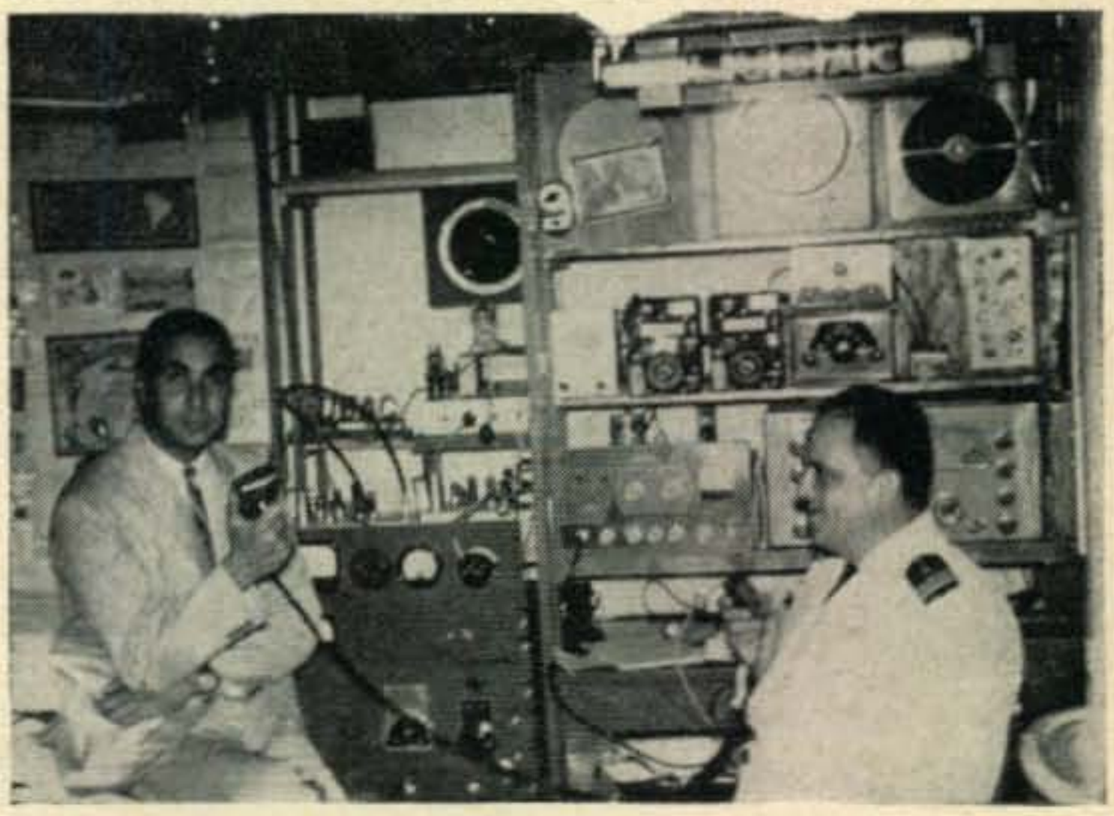
Paul closes the letter with this word of advice.

"Pass the word to the boys that I have a very poor receiver (BC348) and when they call at once when I'm in QSO they only defeating themselves, as I can't copy anybody under those conditions."

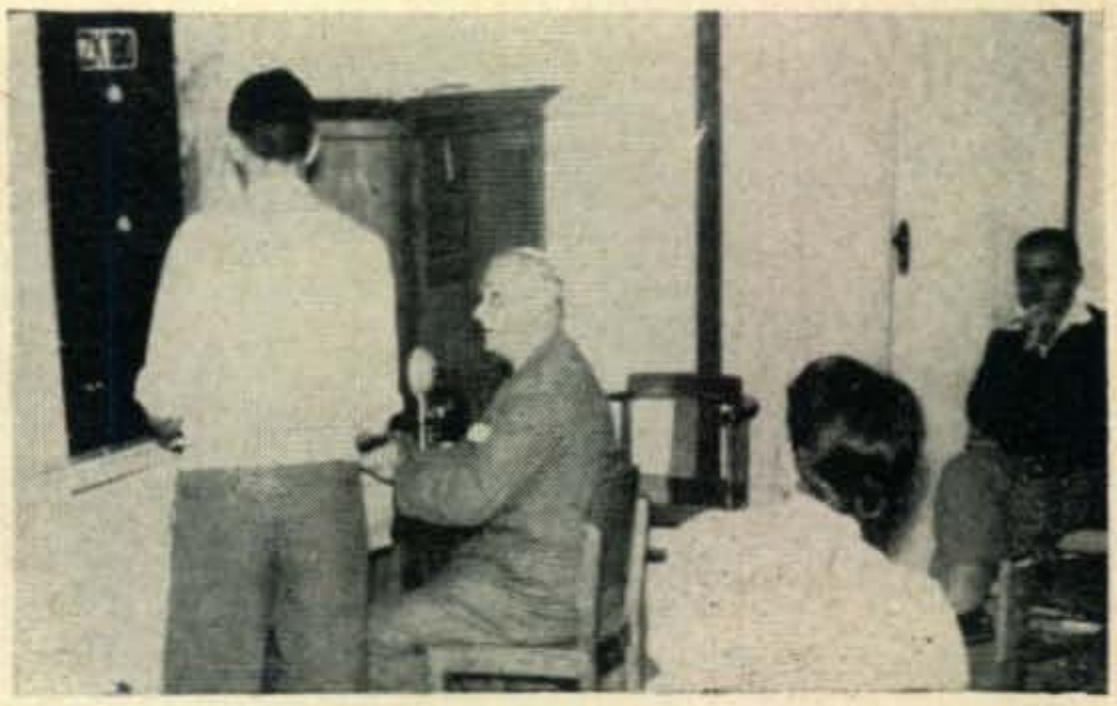
BVI FORMOSA —- the following from BV1USE should help clear up some of the questions that have been asked about this station.

"The Chinese gave approval to install and operate an amateur radio station under the call BV1USE in the Hsinchu area as a MARS

Mohammed, 9K2AM ex MP4KAM, at his new mobil installation. Anyone for a road trip to Yemen? (Tnx W6QLV)



J.C., LUØDAB, and Ruben, LUØAC, operate LUØAC/MM aboard the S.S. Rio Jachal heading for New York harbor. J.C. recently spent his vacation meeting his many 10 meter friends in the states. (Tnx W2HTI)



The official opening of ZK1BO, the club station of the Rarotanga Radio Club. In the picture at left Petuera Kora and Tuatai Tupou operate the rig. In the picture at right Mr. G. Nevill, the Resident Commissioner of the Cook Islands, calls CQ. All members of this club are Islanders with very small incomes. Donations of any unwanted gear by readers will be welcome. This includes old handbooks, callbooks and radio magazines. All correspondence with the club will be answered by the Secretary, ZK1BO, c/o Social Development Dept., Rarotanga, Cook Islands. Tnx ZK1BG)

station. Since I am the only operator at present and no third party traffic is allowed, I used my own equipment which is homebuilt for the most part.

The equipment lineup is a homebuilt phasing exciter driving a 250TH about 600 watts, a cubical quad with a homebuilt receiver utilizing a HRO chassis which was built in the early 30's. Grounded grid triode RF amplifiers in the front end and a triode mixer seems to do real well.

I will QSL 100% on a card received card sent basis. The address was changed recently, (right after I got my cards from the printer) but either the old or the new will reach me OK for a while. The new address follows:

MSgt Donald E. Merideth
Hsinchu ABAT (Weipu)
AF Sec/MAAG APO63
San Francisco, Calif.

Operating times are any time the band is open and all operation has been on 20 meters SSB as of now. No other type is contemplated in the near future. I operate outside the US phone band on SSB (14200 to 14250 on AM) and my operating habits dictate a preference for calls below 14290 and Kilowatt alley. We will gladly sked anyone needing us consistent with my duty hours at work.

73's
Don"

LA/P JAN MAYEN—The much anticipated operation of a regular Jan Mayen station has started. Two stations have started operation, LA1NG/P and LA3SG/P. Boh stations are VFO but LA1NG/P prefers 14052 and LA3SG/P prefers 14057. They have a 20A for SSB but at the time of this writing have been uncopiable in the states.

VS9 MALDIVES—the DX35 at VS9MB popped two electrolytics, a switch, 5U4GB and power transformer. If you have any of the above items and would like to see them get a good home, drop a line to K2QXG as Mac is trying to get the boys squared away. Don Trammer, ex 4S7DT, VS9MA, is now G3NJT. (Tnx K2QXG)

Bill, ZK1BS, and his XYL Mavis starting their journey to the USA. Bill is Superintendent of the Rarotonga Radio Station. (Tnx ZK1BG)

9N1 NEPAL—The following letter was received from K4KMX and should clear up the Nepal situation:

"I received my August CQ Magazine today and was surprised to read in your column that W2DOD, W2DKS and KV4AA had worked 9N1AA.

I think it would be well to get the situation clear to all the DX boys. The facts are that the calls have not been officially approved by the Nepalese Government; however, approval is expected any day. Since my company, Advanced Communications Engineering, a division of Cook Electric Co., has the responsibility of installing all the communication equipment, including the ham gear, in Nepal, we will be advised when the calls are approved.

For your information, 9N1AA will be assigned to King Mahendra Bir Bicram Shaha Deva. 9N1AB, AC and AD have not, as yet, been assigned.

I expect to leave for Nepal about 15 August 1959 and will be on the air on SSB, AM and CW as soon as possible.

The equipment will be a Johnson Pacemaker and Thunderbolt and a GPR-90 receiver with the GSB-1 sideband adapter for SSB and CW, and a Viking II driving a kilowatt and amplifier. The antennas will be a Telerex tri-band beam and a 20 meter 3 element HyLite.

Certificates

The "ASSOCIACAO PARAIBANA DE RADIO AMADORES" (Association of Radio Amateurs of Paraiba) will be pleased to issue a diploma called "CABO BRANCO" to any Radio Amateur in any part of the world who may have an Official License. The following regulations are to be strictly observed:

1. **OVERSEAS AMATEURS:** They are requested to confirm the simultaneous communications they have had with any station in Paraiba, registered with APRA, so that the points won may never be less than 10 (ten), but preferably more.

2. Each communication made with any Radio Amateur Station in Paraiba is 1 (one) point worth.

3. Any station may be contacted more than once by the candidate applying for the Diploma, provided that the communications are made over different wave bands.

4. All Radio Amateur wave bands may be used, but every communication made on 50 mcs or over will be worth 2 (two) points.

5. The communications will be considered valid for the "DIPLOMA CABO BRANCO" only if they are made in August of each year, coinciding with the celebration of the foundation of the capital city of Paraiba.

6. Comunications will also be considered valid if they were made after September, 1957, month in which the "Association of Radio Amateurs of Paraiba" was organized.

7. In order to have valid communications, the minimum simultaneous reports has to be in R S T 4.4.7. for C. W. and R. S. 4.5. for phone.

8. Acknowledgements of radio receptions, as QSL, or any testimony, Log Book, as well, are kindly requested to be sent to ASSOCIACAO PARAIBANA DE RADIO AMADORES, P. O. Box 285, Joao Pessoa, Paraiba, Brazil. 5 (five) coupon responses are to be enclosed to any acknowledgement made by the candidate in order to cover the mail expenses of the "DIPLOMA CABO BRANCO." (Tnx Northern California DX Club)

QTH's

W1EQ has not received any logs from VP6RG since January and will have to give up as his QSL manager unless they are forthcoming. George is still handling the cards for YN1CK. His new QTH is George Caron, W1EQ, 749 Court St., Auburn, Maine.

At latest count, W2CTN is handling the following: VK9BW, OX3RH, 9G1BQ, KW6CU, JZØHA, VK9NT, FK8AT, VK2FR, VR2DA, VQ3CF, VR2DK, VQ4AQ, TI2WD, VK9GK, ZS7M, OQ5IG, VQ2EW, VQ3HH, ZB2I, VP6PJ, VK2AYY/LH, JZØDA, KW6CP, CR4AH, CR4AX, and FM7WU. WHEW!

EL2AB, EL2AD and EL8C via Bob Moncrieff, W6ZRK.

Box 29
Mojave, Calif.

KA2RJ ex KA4AS Ronald Finger, HQ NSAPAC, APO 343, c/o PM, San Francisco, Calif.
KC4USK operator Don via D. H. Edman, Elect. Eng., **USAFE** (EPC), APO 633, c/o PM, New York, New York.
W5YQO/VE8 Bob Simon, 920th Sqdn., Frobisher Bay, N. W. T., Canada, via Montreal.
ZC4BE via W8DPF/4, P.O. Box 13154, Tampa, Florida.
FB8BD via G3LMD.
VKØCC via Adrian Fallert SWL, 121 N. "C" St., Hamilton, Ohio.
FY7YE via W5JLU.
VE8TH (ex VE2AGW/VE8), c/o 926 Squadron, Frobish Bay, Baffin Island, Canada.
HC1XJ via K8CZJ.
5A5TO, P.O. Box 638, Tripoli, Libya.

Zone Prefixes

I have had several requests recently to run a list of prefixes in each zone, so here it is. For more detailed information on Zones 17, 18 and 19, see the June 1959 DX column.

Zone 1—KL7, VE8 (Yukon Territory only)
Zone 2—VO (Labrador only) VE8 Northwest Territory only
Zone 3—VE7, W6, W7 (Wash., Ore., Idaho, Utah, Nev., Ariz.)
Zone 4—VE3/4/5/6 W4 (Ky., Tenn., Ala.) W5, W8 (except W. Va.) W9, WØ.
Zone 5—FP8, VE1/2, VP9, W1/2/3, W4 (Fla., Ga., S.C., N.C., Va.) W8 (W.Va.)
Zone 6—XE, XE4.
Zone 7—FO8 (Clipperton Is.) Hp, HR, KS4, KZ5, TI, TI9, VP1, TG, YN, YS
Zone 8—CO/CM, FG7, FM7, HH, HI, KP4, KV4, PJ2 (St. Martins), VP2, VP5, VP6, VP7
Zone 9—FY7, HK, PJ2, PZ, VP3, PV4, YV.
Zone 10—CP, HC, HC8, OA
Zone 11—PY, ZP
Zone 12—CE, CEØ
Zone 13—Antarctica, CX, LU, VP8 (all)
Zone 14—CT1, CT2, DL/DJ/DM, EA6, EI, F, G, GC, GD, GI, GM, GW, HE, HB, LA, LX, ON, OY, OZ, PA/PI, PX, SM, ZB2, 3A2
Zone 15—HA, I, IS, IT, FC, M1, OE, OH, OK, SP, UP, UQ, UR, YU, ZA, ZB1.
Zone 16—UA1/2/3/6, UB, UC, UN, UO
Zone 17—UA9 (some) UH, UI, UJ, UL, UM.
Z ne 18—UA9/Ø (Eastern Siberia)
Zone 19—UAØ (Western Siberia)
Zone 20—JY, LZ, OD5, SV, TA, YK, YO, ZC4, 4X4
Zone 21—AP (West), EP, HZ, MP4, VS9 (Aden and Oman) YA, YI, 4W1, 9K2
Zone 22—AP (East), AC3, AC5, CR8, VS9 (Maldive Is.) VU, 4S7, 9N1.
Zone 23—AC4, C8, JT1, UAØ (Tannu Tuva only)
Zone 24—BV1, C, CR9, VS6
Zone 25—HL, JA/KA, KR6
Zone 26—HS. HZ, 3W8, XW8
Zone 27—DU, KAØ, KC6, KG6
Zone 28—CR10, PK (all), VR4, VK9 (Papua & New Guinea), VS4, VS5, ZC5, VS1, 9M2
Zone 29—VK6, VK9 (Cocos Is.), ZC3
Zone 30—VK2/3/4/5/6/7, VKØ (Macquarie Is.)
Zone 31—KB6, KH6, KJ6, KM6, KP6, KW6, KX6, VR1, VR3
Zone 32—FK8, FO8, FU8/YJ, KS6, VK9 Norfolk Is.) VR2, VR6, ZK1, ZK2, ZL, ZM6
Zone 33—CN2, CN8, CT3, EA8, EA9 (all), FA
Zone 34—SU, ST, 5A1/2/3/4/5
Zone 35—CR4, CR5, EL, FD8, FF8, ZD1/2/3, 7G1, 9G1
Zone 36—CR6, FE8, FQ8, EAØ, OQ5/Ø,

[*Continued on page* 94]

Cav, KC6JC, Humberto, TI2HP, and Wil ex PK6XZ, PAØ MOT at a recent meeting of the North Jersey DX Association. The fellow in the background trying to worm his way into the picture is none other than W2DEC.

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

semiconductors

It would appear that the amazing *tunnel diode* will be as important to microwave transmission as the parametric amplifier is to reception. The first report on this device was presented last year by Leo Esaki, a Japanese scientist (L. Esaki, New Phenomenon in Narrow Germanium p-n-p Junctions, Physics Review, Vol. 109, p. 6031, 1958).

A *tunnel diode* is an alloy-junction device made of heavily doped germanium. It has a negative resistance characteristic over a low forward voltage range. The effect is due to tunneling of the majority carriers through the junction barrier. It results in a voltage controlled negative resistance diode which shows great promise as an *rf* oscillator and amplifier in the microwave region.

The *tunnel diode* can also be used as a negative resistance linear amplifier. In operation it is connected to a tank circuit and loaded with a series resistance sufficient to suppress self sustained oscillations. Oscillations in the input circuit are prevented by a low resistance in parallel with the diode.

It has been shown that the diode offers several advantages over the transistor, particularly in high frequency performance. The *tunnel diode* is 10 to 100 times faster than the transistor. Electrons, which travel at slow speeds in semiconductors, tunnel across this new diode at the speed of light, resulting in the ultimate in high frequency devices. It has been used at 2,000 *mc* and frequencies around 10 *kmc* are expected soon. And, unlike the transistor, it is insensitive to temperature changes.

The device is as simple to make as a high quality semiconductor diode and it has a gain-bandwidth product far superior to vacuum tubes. General Electric is expected to be sampling the new diode about the time you read this. The original devices will be laboratory samples, and may be priced around $75.00. Production lines (and much lower cost) are expected in approximately 18 months.

Zener Diode Circuits

Clever circuits, this month, were found in a Motorola advertisement which appeared in *Electronic Design* recently. It describes many uses for Zener diodes. Several of the more useful circuits are shown in Fig. 1. Do you need to regulate an odd or higher than normal voltage? Simply connect zeners in series as shown in (A). How about an odd voltage that is lower than the usual zener rating? The circuit (B) shows how two zeners may be used. Their rating is 1.5 volts difference and this voltage (which is not normally available with a zener) is regulated at the output. Circuit (C) shows how the same trick may be used to obtain a variable voltage, with a range between the two zener ratings. What to do when the load current is beyond the zener dissipation? Simply use the zener diode as a reference in a transistor regulator circuit (D). Only a small base current flows through the zener. Of course, the transistor must be able to handle the load current. A zener diode can be used to replace an electrolytic filter capacitor as shown in (E). A typical waveform for the power supply is shown in (F). The zener diode is selected to regulate just below the ripple level. Ripple that rises above the zener voltage will be effectively shorted out. According to Motorola, the diode will be as effective as a 6,000 mfd filter capacitor! A zener diode can also be used as a "coupling capacitor" as diagrammed in (G). The zener diode is operated in the avalanche region and the leakage provides bias for the following stage. Changes in collector voltage of the driver transistor will cause more or less diode current, changing the bias on the output transistor. If you think about this circuit a little,

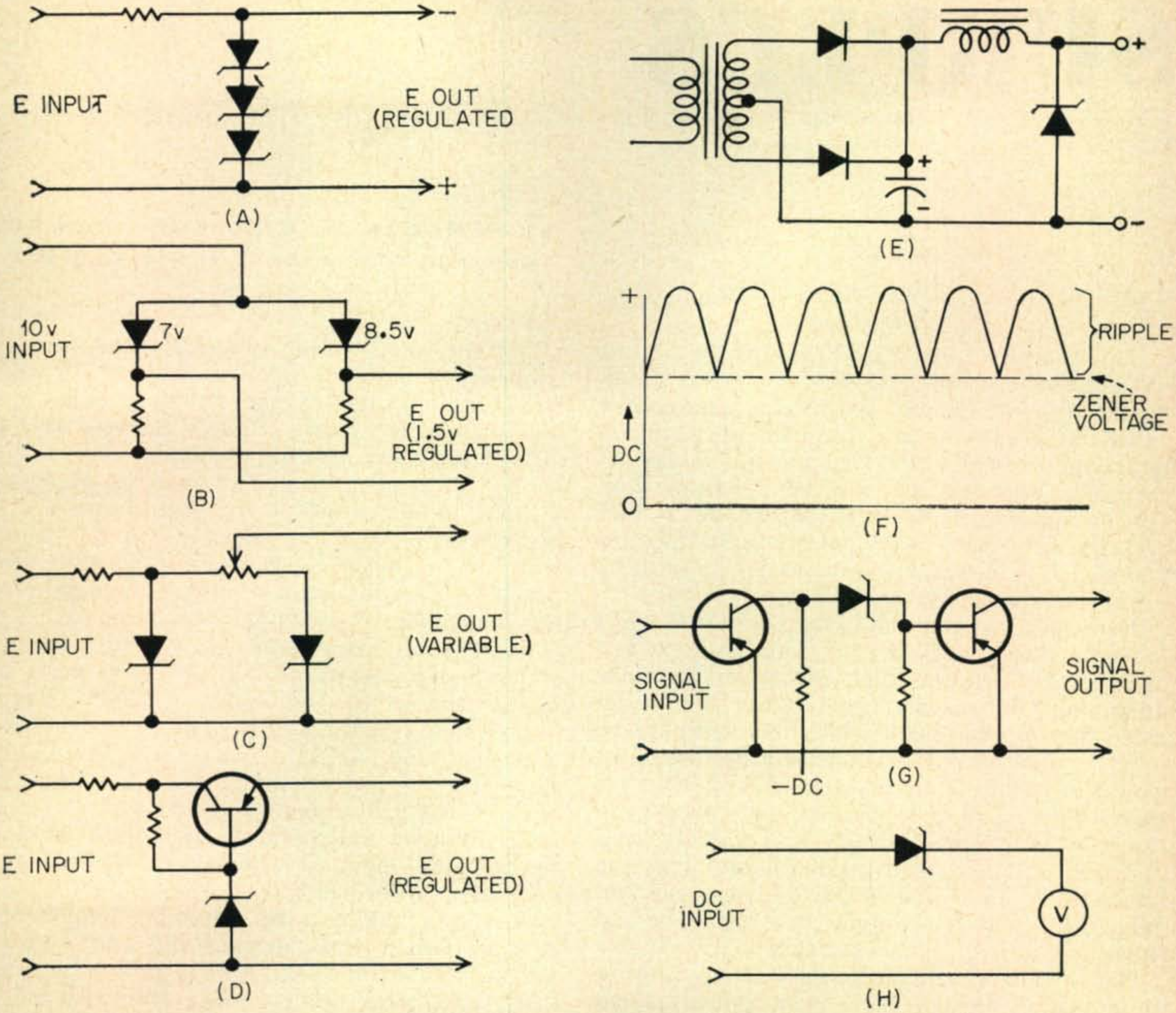


Fig. 1—Zener diode applications. See text for details.

you will see that it can be used as a dc amplifier without complicated power supply circuitry. The zener diode is also useful as a meter scale expander, as in (H). Let's say you want to accurately read 10 volts *dc*. Select a zener diode with a 9.5 volt rating and use a 0-1 volt meter. There will be no meter indication until the applied voltage exceeds 9.5 volts. At .5 volts indicated, the applied voltage would be exactly 10 volts.

Semiconductor News

CBS Electronics (formerly CBS-Hytron), a pioneer in the transistor field has done it again. Recently announced is their new line of complimentary NPN-PNP power transistors. These transistors can be used in class A or B push-pull amplifier that employ no transformers. A technical bulletin is available by asking for E-355 from CBS-E Information Services, 100 Endicott St., Danvers, Mass.

The slickest terminal mounting boards to come down the pike are being marketed by Erie Resistor Corp., Erie, Pa., and are available in 10, 15, 20, 25, and 30 stations of clips (see photo).

Having trouble finding mica for your transistor insulation? Drop a card to Ford Radio & Mica Corp., 536 63rd St., Brooklyn 20, N. Y., and request bulletin 2965. They have all shapes, sizes and descriptions.

General Electric has announced new tetrodes for *rf* and *if* service, types 3N36 and 3N37,

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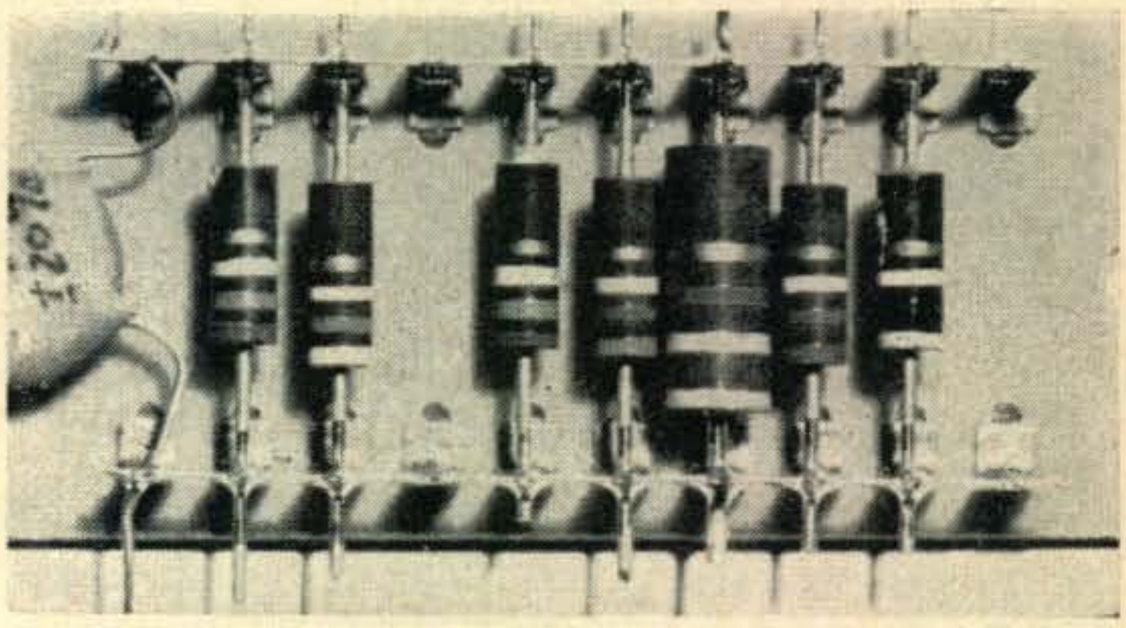

Erie's new terminal strips can be used to make your new project look commercial.

SURPLUS

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

This month's conversion concerns an aircraft navigational receiver, the BC-733 and its modification to either two or six meters. Also known as the RC-103-A, it is a localizer operating in the range of 108.3 to 110.3 *mc* on six crystal controlled channels. The receiver is a single conversion superhet with an IF of 6.9 *mc*. It uses crystals in the 5 *mc* band and multiplies these to the operating frequency of the local oscillator by a multiplication factor of 18 times.

Because the rf is broad tuned and relays select the proper frequency crystal, some thought had to be given to the method of conversion since no tuning controls are used. It was finally decided that a separate local oscillator would be used in place of the crystals, and the oscillator would be tuned. This decision was made after much hashing of the possible conversion with the boys at Rex Radio in N.Y. Their idea was to use a separate local oscillator and that the rig could be hidden in the trunk of a car and only the oscillator-control box need be up front.

The localizer is a receiver used by a pilot to determine his alignment on a runway when making a landing approach. In operation two transmitters are used, one left of the runway, one on the right of the runway. When in the middle, or on the runway approach, each transmitter will be received with equal strength. If each transmitter is modulated differently, in this case 90 cps for one and 150 cps for the other, the transmitters can be identified. Filters within the receiver can pick out each modulation frequency, and a meter can be used to tell which signal is stronger. In this case, the signal strength is presented to the pilot as positioning information.

In the BC-733 the filters are heavy cans marked 83 and 84. They operate too low for our use and are not used in the conversion. In fact, just adding the oscillator should be enough, since there is already an audio channel in the receiver just for emergency communications. Unfortunately, like most aircraft equipment, the audio level is fine for headset operation, but woefully inadequate for loudspeaker operation.

The actual 733 is designed to operate on 12 or 24 volts dc. The 12 volt dynamotor is labeled DM-53-AZ, while the 24 volt dynamotor is labeled DM-53-A. Filament switching is accomplished by the plugging in of the appropriate dynamotor. Conversions to six volts would require the change of many tubes and a few filament wiring changes as well. If the 12 volt dynamotor is not available, almost any supply of about 200 to 250 volts dc at about 80 *ma* should work nicely. For home use a power supply of about the same B-plus ratings would be needed, as well as about two amperes of 12 volt filament power. One side of the filaments are grounded as is B-minus.

The actual conversion begins by deciding which band you want. Let's say you want to modify the set for two meter operation. Begin by removing both covers. This exposes both the tubes and wiring. Position the chassis so the wiring is in view and locate the three rf coils. These are probably labeled 61, 62-1 and 62-2. Remove the shield from around 61 and remove the input rf connector. Replace the connector with a coaxial type, SO-239, and proceed to remove the coupling loop from coil 61 which went around the coil and to the rf connector. This should now make all three coils look alike. Now, from all three coils remove three turns from the top of the coils, leaving three turns still on the coils. Solder the coil leads carefully making sure that you don't break the ceramic coil forms. On coil 61 wrap a single turn of standard insulated hook-up wire from the connector, around the coil, and to ground as close to the coil as is possible. Make sure that the coil is just around the lowest turn of the coil, solder the connections. Replace the shield where it was before and tighten the screws so as to get a good ground connection without breaking the heads off. The rf coils are now converted to two meters.

To convert the rf coils to six meters, it is only necessary to solder a 30 mmf mica capacitor across each of the rf coils, and change the input rf connector to a coaxial type, as before. The coupling link on the input rf coil should also be modified by removing it entirely and adding in its place a one and one half turn link of hook-up wire (as before) and soldering one end to ground and the other to the coaxial connector. All of the other changes are in the audio circuits and in the oscillator compartment.

Open the oscillator compartment and locate

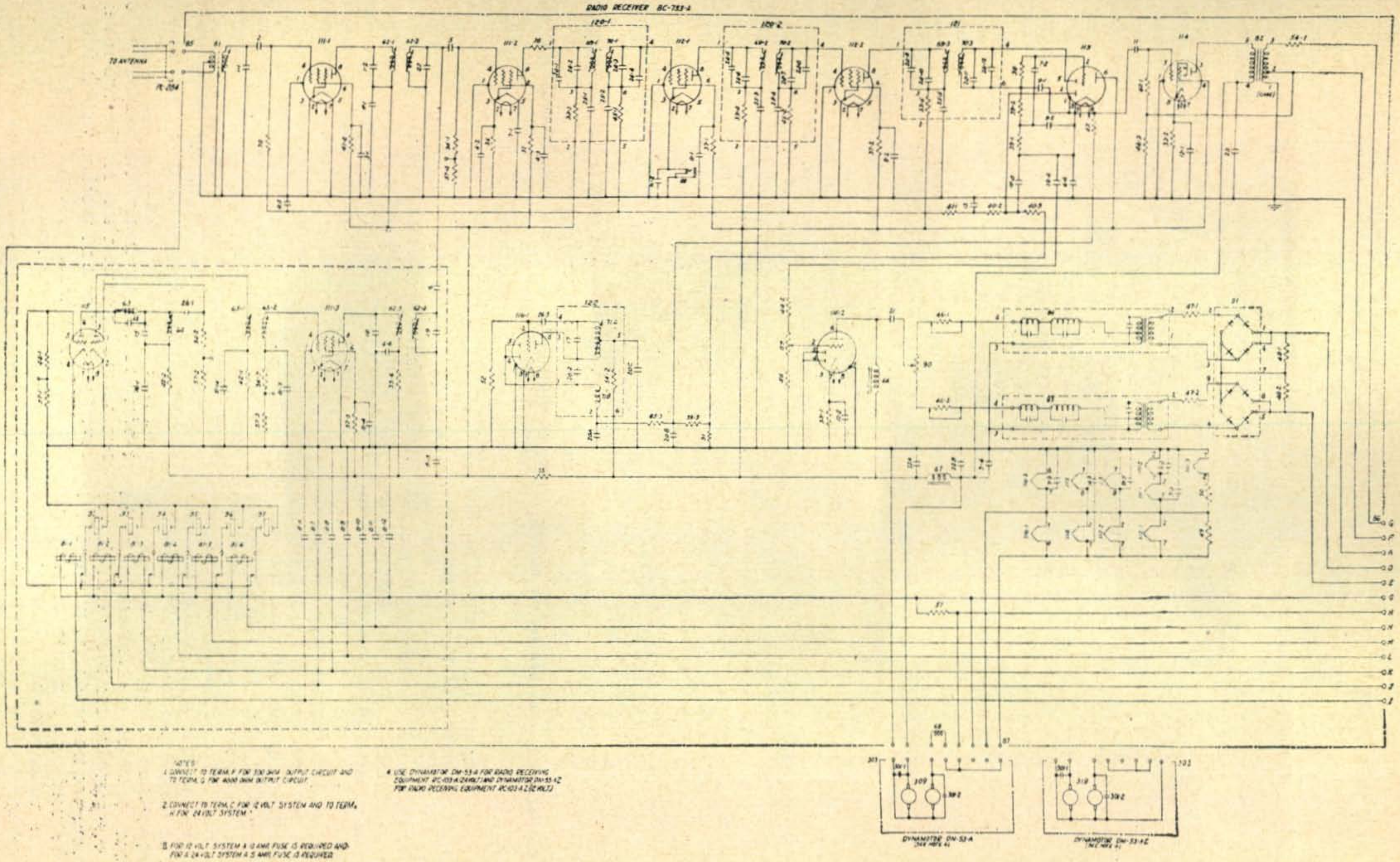

Fig. 1—Circuit of the BC-733 receiver. The control and junction box that tie in on the right hand terminals are shown on next page.

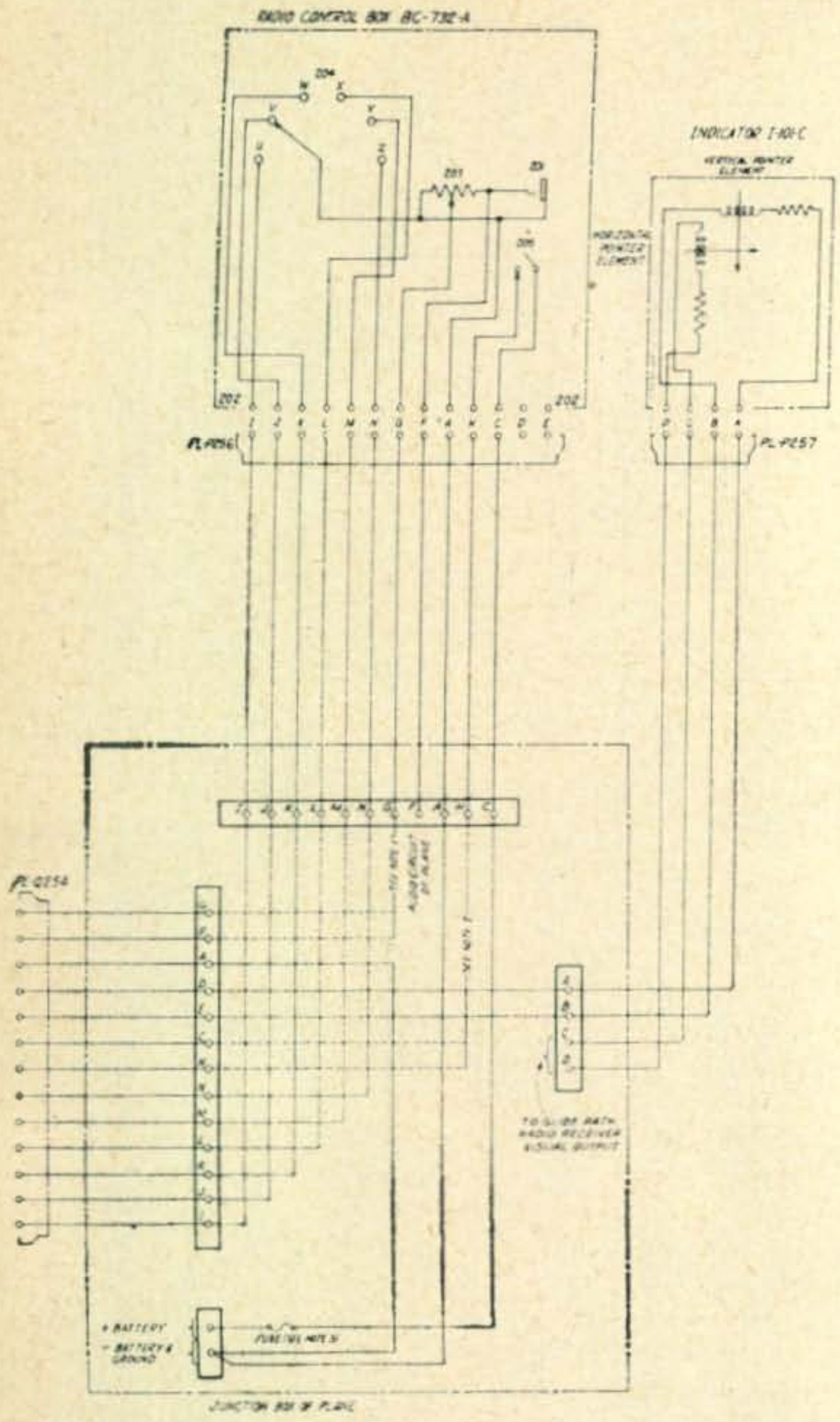

Fig. 2—Control and junction box for the BC-733.

the two coils which are located closest to the rf coils on the other side of the compartment. These are labeled 62-3 and 62-4. For the two meter conversion it will be necessary to remove three turns from each coil as was done for the rf coils. The other coils in this compartment will require no additional changes. Now, connect a piece of thin coaxial cable (RG-58 or RG-59) so that the inner conductor goes to grid pin number 5 of tube 115, and the shield goes to ground at tube 115. The wire going from this pin (number 5) to the relays should be cut, so that only the resistor and the coax are connected to the grid. Shake the coax cable out of the compartment and provide for its later connection to the VFO we will construct. That is all of the conversion in the oscillator compartment for two meters. If you want to convert to six meters, the tube at 111-3 will not be used. As a matter of fact, this tube can be pulled out of its socket if the filament voltage is going to be 12 volts. The one mmf. capacitor going to the feed-through from the oscillator compartment to the mixer should be changed to about 5 mmf and should go from the plate of the multiplier tube, pin 6 of tube 115. It will be necessary to connect the coax cable as before. Our oscillator changes are now complete except for alignment of the coils.

The audio circuits come next. Since we have no need for meter circuits, the meter amplifier will be used for an audio amplifier. Remove capacitor 11. This is the 0.002 mfd mica found at the rear of the small terminal board near the 12A6. To remove, merely heat the terminal as the leads are held in only by solder. Now locate the lead going from capacitor 21 to the center arm of the potentiometer. Disconnect this lead and reconnect it to pin 5 of the 12A6 (tube 114). Remove resistor 33-2 which is a 1000 ohm resistor located third from the rear end of the large terminal board, and replace it with a 270 ohm 2 watt carbon resistor. Tube 116-1 is a bias oscillator and supplies the necessary negative voltages to the various tubes.

For loudspeaker operation it will be necessary to replace the output transformer. To do this, remove the transformer and connect the primary where the primary of the old transformer was. This is identified by pins 4 and 5 of the output transformer. Ground one lead of the secondary and connect the other lead to the loudspeaker which of course should also have one lead connected to ground. The lead going to pin 2 of the old output transformer is for feedback and is not needed, so should be cut out and removed. This lead starts at pin 2 and goes to the junction of the 560 k resistor and the 3.3 k resistor on the rear of the large terminal board.

A more advanced conversion would be to remove all of the wires not needed and the filters used for the navigational part of the receiver. Since this really isn't necessary it is mentioned only for those who are interested.

The variable oscillator is a Clapp or series tuned Colpitts oscillator of rather good stability. It uses a 12AU6 and is electron coupled. The output is about 70 volts which is more than enough to operate the oscillator. The plate voltage is about 150 and is obtained from a voltage regulator. The tuning range is approximately 7.2 to 7.9 *mc* for the six meter band and about 7.6 to 7.8 *mc* for the two meter band. The same oscillator will actually serve for both bands, except that the two meter band could be better spread out on the dial. With the capacitor used for tuning (Hammarlund type HFA-15) you can get the necessary bandspread for six meter, but may have to remove two or three plates for the two meter coverage. We found no problem with drift and the BC-733 is broad enough to take care of any that should crop up.

The oscillator should be made as rugged as is possible. All parts should be mounted with stand-off insulators. All rf leads should be of

decent size wire so that they won't sag or bend too easily. In general all of the precautions that are necessary in a transmitter VFO should be incorporated in the oscillator.

The four holes in the oscillator box that normally hold the back cover plate on should be enlarged with a number 27 drill, if you intend to mount the oscillator on the front panel as we did. Using the box as a template, locate where you want to position it. We found that we didn't need the handle and plugs and removed them in order to get the box low on the panel. Power was brought in from the dynamotor pins and all unused pins on the power plug can be taped for insulation.

We found that in order to remove the power plug, unscrew the four screws holding it onto the front panel and pull the wires through so you can get to the back of the connector. There is a small wire ring much like a split washer which can be pried loose so that the connector shell can be pulled free and the insulator and pins pushed back into the receiver. With the connector removed you can also remove the cover plate for the two potentiometers, the one marked SENS will become the volume control. If the oscillator box covers this control, it may be removed for use elsewhere on the set.

Alignment

Aligning the set isn't difficult. If you have a grid dipper you can preset most of the coils to about midway in the band. If no dipper is handy, tune the oscillator to a point where it can be heard on a receiver. Find the frequency at each end and make any adjustments to the trimmer that are necessary to bring it so that it covers the band you need. Then, with the oscillator connected to the set, turn on power to make sure all tubes light and if possible, use an audio oscillator to make sure the audio is operating by connecting it from grid of the 12A6 to ground and feeding in a signal, say about 1000 cps. If no oscillator is handy, touch a screwdriver to the grid (make sure it's the grid) and see if you get a hum through the speaker. Do the same to the grid of the previous tube to make sure the audio is operating. Since no changes have been made to the detector we can only hope that the circuit is operating properly, unless you have a signal generator. If you do have a sig-gen, tune it to 6.9 *mc* and feed this to the grid of the if tubes, one at a time. You should be able to get a signal right through from the if to the audio.

The sig-gen would be helpful in aligning the rf section, and in case it doesn't reach the two or six meter band you could use harmonics of 24 *mc* for two and of 25 for six meters. In case you only have a grid-dipper, just plug in the coils for the band you are testing for and you are all set. Couple the signal in with the aid of a small loop of wire around the dipper coil with one end going to ground and the other to the center lead of the coax connector. In some cases you would merely bring the dipper near the set and there will be enough pick-up. Without either a sig-gen or a dipper you can still line up the set using a strong signal picked up on the antenna. The various coils should be tuned to maximum audio output by means of the screwdriver adjustments on the tube side of the set. First adjust the rf coils, then the oscillator. The oscillator should be pretty well aligned since there are not too many changes in the frequency range of each coil except in the case of the last multiplier on the two meter band. If you have a frequency meter or a grid dipper you can use this to check the frequency of the multiplier coils. The first is tuned to the second harmonic of the signal. The output of the second multiplier is three times the input. On six meters the circuit stops here, but on two we go an additional multiplier of three. If you look closely at the diagram you will find that various test points are shown on the diagram. These are in the mixer circuit (tube 111-2) and in the oscillator-multiplier circuits. Using a high resistance voltmeter, or a *VTVM* you should be able to get a small voltage representing the grid current. The appropriate coil should be tuned for maximum voltage at this point.

That completes our BC-733 conversion.

Correction of Sorts Department

We received a couple of letters in regard to the ARR-2 conversion which shed some light on the equipment that we had not had the opportunity to find out. One of the reasons that we didn't get the word is that we never were able to locate the ARR-2 handbook. KP4ARF passed the word and it goes like this. The ARR-2 was a simple UHF receiver that received a signal modulated at 540 to 1050 *kc*. The set is actually a TRF, which explains the lack of an oscillator. Every story that we have heard was that the signal came from some other equipment. That's where the error was. The ARR-2 was a simple TRF . . . until the sub-carrier was

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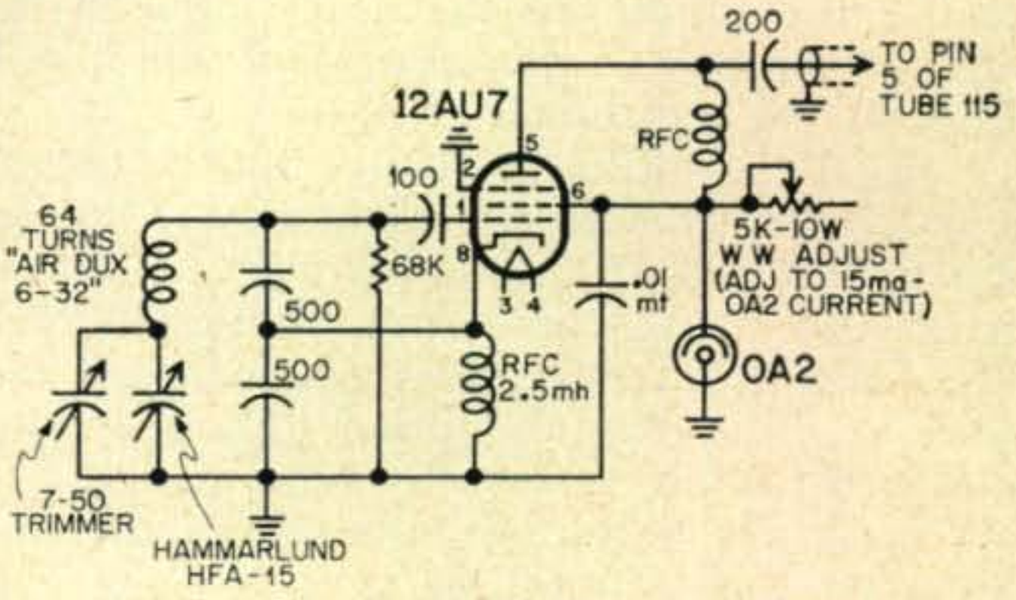
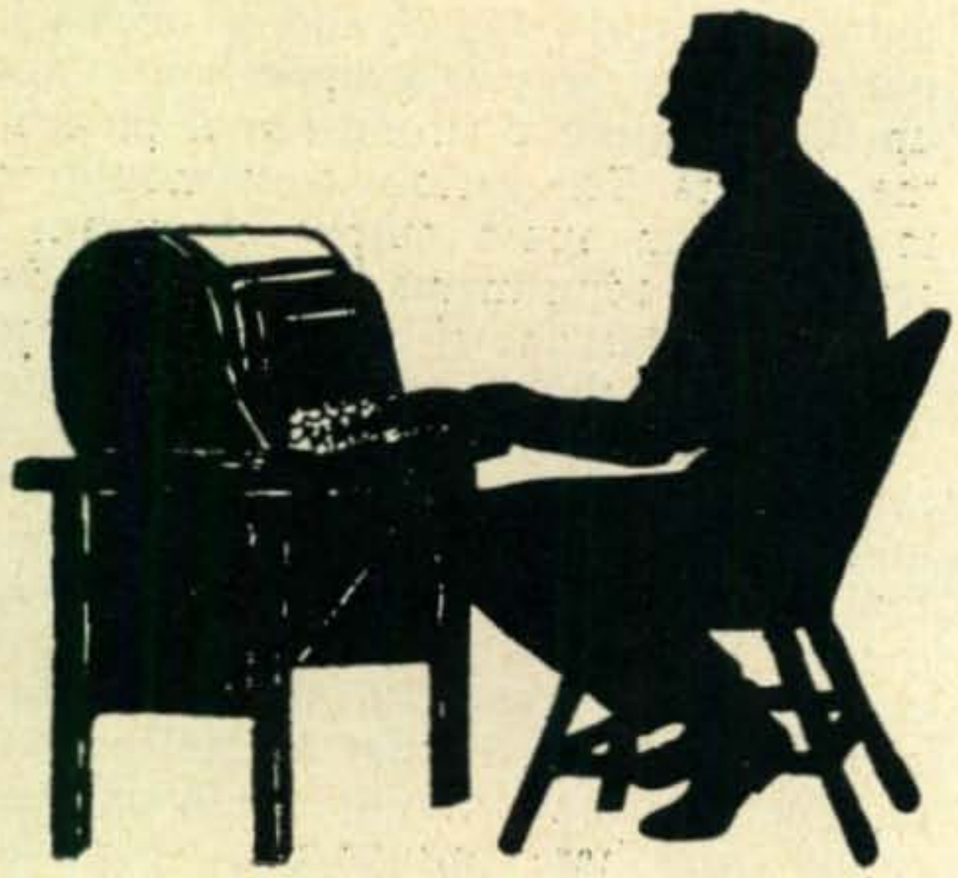


Fig. 3—A VFO circuit for use with the BC-733.



RTTY

Byron H. Kretzman, W2JTP/Ø
2260 Matilda Street
St. Paul 18, Minnesota

"Dual identification is an unnecessary evil!," as WØBP said so many times in his bulletins. Originally, these rules were thought to make it easy for FCC monitors. A look at part 12.107 of the Rules shows that the technical standards for teleprinter operation are so carefully laid down that it is very easy for anyone, especially the FCC monitors, to copy our RTTY. But, dual identify we must, in spite of vain attempts to get the ARRL to request the elimination of this requirement for RTTY.

Many an RTTYer has made a transmission, after identifying on CW, with his key open, making beautiful local copy—from his VFO! Well, it ain't necessary. Nothing in the Rules say we must use CW for this purpose, and many of us identify on FSK, using the full 850-cycle shift. Both of these procedures are unsatisfactory because the fellow on the receiving end must shut off his printer motor or lock out his TU while this silly business goes on.

Well, the solution is really simple: identify on narrow shift with the hand key. 'Ole BeeP used to threaten to use 2/3-cycle shift for this "evil," but I've been using about 40-cycles. This, being within the band-pass of most *mark* filters in TU's lets the other fellow's printer stand still while we waste time banging the idiot-stick, as required. International Morse code with this amount of shift is quite copyable, or should be, by any ham who has ever passed a code test. And, no switches need be thrown to go from one mode to the other.

FSK Details

Technically, narrow shift for code identification is not difficult. *Fig. 1* shows the very widely used FSK circuit, developed by W6ZH and originally published by W6AEE, as modified for narrow shift code identification. If you will compare it with the original circuit shown on page 81 of the *RTTY Handbook*, another potentiometer is merely connected in series with the shift-adjust pot. The pot added can be almost anything out of the junk box that is around 2500 to 10,000 ohms. Try both ends for the most desirable and smoothest taper.

Adjustment is fairly simple. With the IDENT-SHIFT pot turned for *minimum* resistance, adjust the SHIFT-ADJUST pot to give you just under the standard 850-cycle shift. Now open the IDENT-SHIFT pot to give you some value between 25 and 50 cycles as you hand-key with something plugged into *J-2*. (The exact amount of this narrow shift is not important.) Then, recheck your 850-cycle shift and readjust to put it right on the nose. That's all there is to it. Easy, huh?

Model 26

There are undoubtedly more Model 26's in ham hands than any other type of page printer, thanks mostly to the RTTY Society of Southern California, Inc. A good many received were set up for fractions in the upper case instead of

punctuation marks. Most all of them have the feature of unshifting automatically when a space signal is received.

Lately, mostly because of the increasing availability of the newer (and more expensive) Model 15's, the Model 26's are again changing hands, this time to the newcomer to RTTY for the greater part. It therefore is in order at this time to review some of the things that make the Model 26 such a nice machine to use that characters like W2JTP/Ø wouldn't swap his for a nice new shiny Model 15.

First of all, to find out what makes your machine tick, look up W2VLL's article, "The Model 26 and How it Works," on page 88 of the November 1957 issue of *CQ*. Secondly, if your machine still has the fractions, you can easily replace those slugs in the type wheel and the key-tops with the standard ones at a very nominal cost. They can be obtained from W2ZKV and W9GRW. . . . What is more, you can get a very special "Ø" slug for the zero character from W9GRW.

Thirdly, and last but not least, is the automatic carriage return and line feed attachment dreamed up by Ben Woodruff, W9UE. (This was pictured in the RTTY column in September 1958.) After using it 5 minutes I wondered how in the world I ever got along without it. No more black squares at the end of the line! Ben's *AUTO-MATE 26* conversion kit costs only $15 and it takes just a few minutes to install —without drilling a hole. W9UE is not in the amateur supply business so he hasn't too many left, so drop him a line at 6140 N. Harding Avenue, Chicago 45, Illinois.

Chicago

Speaking of Chicago, the CATS will hold their annual National CHI-RTTY Meeting October 11th. The attendance award will be a *Model 28!!!* For the fine details, contact Ray Morrison, W9GRW, 8029 Keeler Avenue, Skokie, Illinois; or, George Boyd, W9SPT, 3540 N. Seeley, Chicago 18, Illinois.

Across the Nation

W2BVE, Maywood, New Jersey, is using a Model 26, a VF-1 to drive a DX-35 (!), a 75A2, and a W2PAT TU. W3MUA of Damascus, Maryland, is FSKing a Ranger. W3CRO, Springfield, Pa., has a source of AN/URA-7 TU's. (These work from a 50-kc *if*). W8DTY is /4 in Huntsville, Alabama, with a new Model 26. K5OLU in El Paso, Texas has acquired a TG-7-B. W5GAD, 225 Aurora Ave., Metairie, La., has a Model 15 with table for sale.

W6JOX, Santa Rosa, Calif., uses an SX-101 and a W2JAV TU to work his Model 19. W6LFT in La Crescenta, Calif., uses an HT-32 and an SX-101 with his Model 12. W6CQK, 710 Madison, Redwood City, Calif., has available those 88-mhy loading coil toroids for $1 each, postpaid. W7TCT in Cave Junction, Oregon, uses a Model 26, a GPR-90, and an FRA *if* type of TU. W8FMJ in Toledo, Ohio, is 16 years old. *Any younger RTTYers?* K8ALA of Holland, Mich., has a DX-100 and Model 15 combination. W8HYG, Shaker Heights, Ohio, is looking for a 51J-( ) receiver. WØAEB of Waterloo, Iowa, has built a W2JTP fork standard. (*RTTY Handbook*, page 56.) WØOKH of Phillipsburg, Kansas, has an AN/FGC-1 but needs a manual, both on this and on a CHZ-60170 fsk monitor. KØBFY of Littleton, Colorado, acquired both a 15 and a 26.

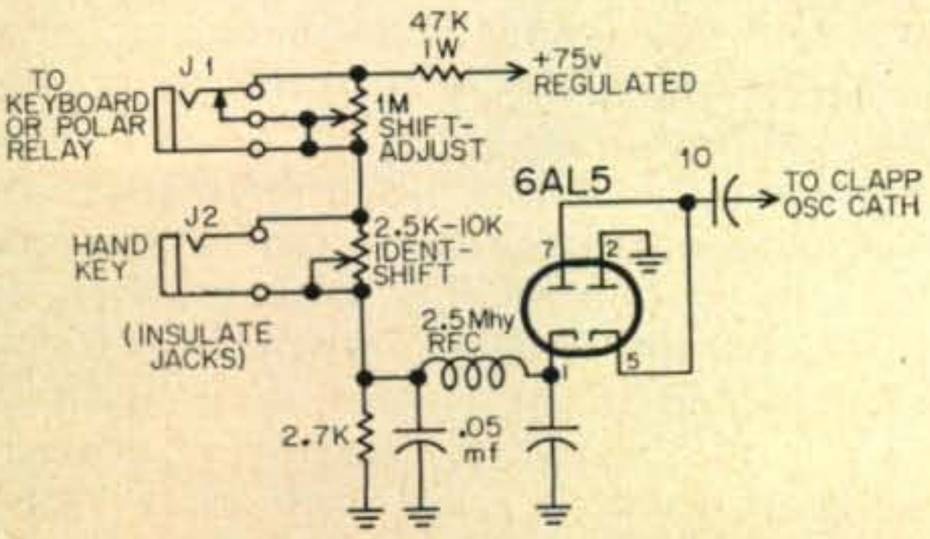


Fig. 1—FSK with Narrow Shift Code Identification

Information

A very good source of information is the RTTY Bulletin published by the RTTY Society of Southern California, Inc. This may be subscribed to for $2.75 a year and it is well worth it. Also published is an RTTY Callbook for $1. Contact W6AEE, 372 West Warren Way, Arcadia, California.

The RTTY Handbook is available for $3, postpaid, via W2JTP/Ø, 2260 Matilda Street, St. Paul 18, Minnesota. This is the first and only handbook devoted entirely to RTTY. If you haven't gotten yours, shoot off a check or money order today, made out to "RTTY Handbook."

73, Byron

WØRTE Minneapolis, Minnesota

Operator:	**M. A. Simonich**
Machine:	**Model 26**
Transmitter:	**Viking 1 and VFO**
Receiver:	**75A-1**
Converter:	**W2PAT**

ham clinic

by CHARLES J. SCHAUERS, F7FE/W6QLV

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

HAM CLINIC has received so many letters requesting identification, buying and modification information on surplus electronic equipment, that I thought I had better make this the "lead-off" subject for the month. (With apologies to Ken Grayson, our able Surplus Editor.)

This is a typical question received: "I bought some surplus that looks like some kind of a transformer. It has 6 terminals on top, weighs about 10 pounds—how about some information on this unmarked wonder?"

(I wonder too!)

Another: "I've picked up what looks like a fine RCA choke surplus, for $2.50. The letters and numbers stamped on it are CH-1001. What current will it handle and what is its value?"

(The guy is lucky because I just happen to have such a choke. It will handle 150 mils and has a value of 10 henries.)

And still another: "I bought a surplus 1D169/APN 12 scope indicator. How about complete conversions? Is it worth the 14 bucks I paid for it?"

(*No* to the first part—and *yes*, to the second. But had he checked with *R&W Electronics*—a CQ advertiser—the set would have cost him only $9.95 WITH modification information.)

When you buy *some* surplus item(s) you're buying a "pig in a poke"—a "bargain" is not a bargain if it cannot be used—regardless of how little it costs!

Converting any surplus item for ham use requires more than just a passive knowledge of circuit analysis—as Ken Grayson can tell you. It takes time and experimentation as well as some mechanical ingenuity.

Those who have taken the time and trouble to convert a piece of surplus equipment and write up the results for CQ will tell you that the job is not easy. But it's easy for you because all you need do is to follow the instructions . . . and this is what you should do if you do not have enough technical know-how to dig into a piece of surplus gear and make your own modifications.

But to buy *any* piece of surplus equipment with which you are not acquainted (or on which no modification information exists) is a waste of money.

Most reputable surplus houses *do* have technical information on the equipment they sell—for, if they do not, they sell less.

The *Dave Rumph Company*, PO Box 7167, Ft. Worth, Texas can supply most surplus equipment schematics for $1.00. When you write to us asking for them—this is where we usually obtain or tell you to obtain them.

So please do not request schematics on surplus (or commercial ham gear) equipment—those we have are used for trouble-shooting and we do not yet have complete files. I'm sure Ken feels the same way.

If you request information on the identification of a part we will *try* to help but cannot guarantee that we will come up with what you are looking for.

Then the question is asked: "well, is surplus worth having IF it CAN be used?"

The answer is an emphatic YES! Many hams have nothing in their shacks but surplus equipment and they can compete on the airways with some of the most expensive gear.

After all, do remember that some surplus items are "gems." *We* taxpayers shelled out many dollars for some fine engineering and top precision equipment—now we can get them for as little as ½¢ on the dollar or less.

For example, that old reliable workhorse, the AN/ART 13 transmitter can be purchased from the G&G Radio Supply Co., 53 Vesey St., New York for only $48.50. This set cost Uncle Sam (us) $1800.00. Plenty of conversion information on this unit is available.

Now for surplus tubes. This is a "sore" subject with me. Getting information on *some* surplus special purpose (one-shot design) tubes is nearly *impossible*. Then to add insult to injury, some guy comes along and asks for the design of *complete* sets (which we are not in a position to do) using these tubes.

If the tube is not listed in the ARRL Handbook's tube section, tube manufacturer's handbooks or military specification sheets (new and old), you can bet it was a prototype or one-shot special. Why some hams will insist on using them when they have no counterparts or are not directly replaceable—is not understood.

To sum up this surplus situation then, if you do not know an item, or know that information is available on it for purposes of modification, don't buy it. I'm still wondering what *one* ham is going to do with a complete radar set—and

I'll bet his XYL does too—the backyard is *full* of it!

Observation

Using SSB and contacting European SSB stations has disclosed (at least to me) the high technical ability of the European ham. Getting home-made SSB rigs on the air is not as easy in Europe as it is at home in the USA. In the first place, parts are hard to come by and are expensive.

One Yugoslavian ham (with outside material help) actually copied one of *Collins'* receivers! (This would be difficult for any ham, anywhere; even if all the original parts were available.)

A British ham took a little *Lakeshore* phasing rig (donated by a generous American ham), modified it carefully and came up with a real fine sounding rig which I would put up against the MOST expensive obtainable.

The other evening I worked a Russian ham on SSB who described his rig to me as a "quadruple crystal—single phasing rig." Maybe so—and his SSB sounded a bit "muffled"—but he was getting out real good. He did emphasize his "1000 watts PEP" however! No lack of technology there.

Observed (generally): the merits of SSB are not only recognized in the United States but also in the rest of the world. The day will come when the greater majority of stations in the ham bands will undoubtedly be using SSB or even DSB (SC). But this time will be slow in arriving if SSB equipment as well as SSB components—especially filters—prices do not drop!

Too, if *all* hams are not sold on the efficiency of SSB, and it is pointed out to them how much *better* it ACTUALLY is than AM—total SSB operation on the ham bands will be slow in coming.

Another thing: you SSB boys listen for these AM enthusiasts and contact them. Point out the merits of SSB and don't "plunk" yourselves in one part of a band and only contact other SSB stations. This isn't the way to "sell" SSB. No one who is a good ham has the "right" to look down his nose at anyone using any other mode of operation—but some SSB operators do.

But the PROOF in the pudding is the eating! When I flip my receiver dial and can hear SSB signals and *NO* AM stations; who's trying to kid whom?

SSB is here to stay, but I'm afraid I cannot say the same for AM. Some of the practical things gained from SSB will be *no* annoying heterodynes, more frequency space for more stations, fast break-in operation and better overall communication.

Questions

PEP Measurement

"Can the PEP of a transmitter be measured without a scope? How?"

Yes, the PEP of any SSB transmitter can be measured by using an *RMS calibrated* VTVM for a close approximation. The VTVM is connected directly across the SSB final load (resistance that is non-inductive.) The formula $\frac{E_L}{R_L} = PEP$—where E_L is the voltage across the load and R_L is the resistance across the load, is used.

SB 10 Line-up

Many letters continue to be received relative to the SB 10 as well as the Apache by *Heath.* As long as so much interest in these two new pieces of gear continues, HAM CLINIC will bring you all available information relative to operation, modification and trouble-shooting.

Inadequate carrier suppression in the SB 10 *may* be do to one of these: 1. over *rf* driving the unit; defective balance pots—HINT:—if you must continually readjust the carrier null controls replace them with 1000-ohm wirewound pots—this will clear up the trouble; bad phase-shift network (most unlikely) and improper *af* balance and *af* phase adjustments. Check *all* of these. Also check and (try to match) the balanced modulator tubes.

I have found that the SB 10 is easily *overdriven.* I do not tune driver circuits for maximum output indication (100 or over). For better quality signals, *don't* peak over 65 (on voice peaks) on the SB 10 output indicator. If your final contains 2-6146s in Class *AB1* with about *55 mils* standing current—for a "whistle load" of *200 mils*—65 on the output indicator is FB.

Next month—full modification data on the SB 10 for better signals.

Valiant & 20A

"I have a Viking Valiant driven by a CE-20A and I experienced instability (final taking off) on the higher frequencies. After trying nearly everything I tried separate grounds to each unit. Zoop! My trouble disappeared."

Thanks for the tip E. K., sorry you don't want column credit!

Receiver Muting

"What's the best way to mute any receiver while transmitting?"

There are a number of ways. My "pet" is lifting the power supply center tap with an extra set of relay contacts on the antenna relay. Depending upon the receiver, you may have "voltage hangover" and "bloop" with this system (due to slow current "diedown"). Diodes can be used in supply circuits to eliminate this. Another system is the *af* shorting system and consists simply of shorting out the audio of the receiver on transmit.

TVI By-pass

"Must one always use disc ceramic by-pass condensers when TV'ing a transmitter?"

No, but they are small; have little self-inductance and can be obtained in a wide variety of sizes (physical) and voltage ranges (operating). I replaced a ceramic screen by-pass one time with a good mica type and I noticed some TVI (which I did not have before). Switching back to ceramic, it disappeared.

Tech-Twist

Searching for a dial take up spring one day, I found that I had none in the junk-box; then I thought of the spring in my ball-point pen! It works. (Incidentally, a large number of manufacturers make a replacement point package which also contains an *extra* spring.)

ALCO Meter

The TS-55A volt-ohm meter was tested by the writer. Imported by *Alco Electronics Mfg. Co.* of 3 Wolcott Ave., Lawrence, Mass., this little meter is just the thing for the ham starting out. For only $9.95 you get 10 a-c and d-c voltage ranges; 1 to 500 milliamperes; 0-100,000 ohms and 2 decibel ranges. Its accuracy is close to that claimed by the manufacturer. I'm glad I bought one. Along with five others of various manufacturer I shouldn't have any trouble measuring anything!

On the Dipoler

I'd like to thank those who wrote directly to me expressing their satisfaction with my Dipoler antenna described in the July issue of CQ. To clear up a few points: the spacing (I found) of the separate dipole antenna sections is *not* critical—within INCHES. It is true that dipoles parallel connected *and* fanned out any way will work (depending upon location and height). I "stumbled" on to the spacing combination which WORKED *better* for me on a number of different receivers—some owned—some borrowed. Yes, this antenna *is* "harmonic-prone" but need not be with a good transmitter final (especially with a pi-L or pi-Z network). If you will simply invert the antenna in your "mind's eye," you can readily see that it DOES "look" like a "horizontal beam." I'm experimenting with others now and will let you know how I make out.

Inversion

In my friend Don Stoner's **SSB Handbook,** there was a "slip" between the typewriter and the printing press. In the section relating to setting up a phasing exciter—"the setting for best suppression on the favored sideband" is a little in error. It should be "the best compromise between upper and lower SB or the frequency of alignment is favored."

Info on Hi-Fi—I

J. D. Wells (W4TJU) of Dunedin, Florida ("75"), says that he suggests shielding speaker leads really helps cure *rf* pickup and resultant rectification (via a feedback loop). If over 50 watts is used, he suggests an *rf* choke in the speaker lead. Sounds good to me!

Another idea from him: he suggests, a resistor in series with neon bulbs across fuses in 110 volt *ac* circuits.

Thank you so much J. D.

Public Service Advertising

Because HAM CLINIC is interested in assisting hams with their technical problems, it must be concerned with obtaining all the technical information it possibly can; especially that which is not too easily found in books.

When an advertiser of electronic components describes his products in an ad, and at the same time passes on some good solid technical information (that one doesn't have to "dig" for); he is, in reality, performing a fine public service.

Among CQ's readers are engineers as well as some very fine technically capable hams. They are interested in the unusual and not merely "ohms law type" information and can often be counted on to make some real concrete contributions to the nation's technical progress.

From time to time, HAM CLINIC will endeavor to bring you extract technical information gleaned from the public service type ads; not only because of its inherent technical value and interest, but because it is hoped that other technical advertisers will realize the real worth of this kind of advertising and follow suit.

Starting off this month, permission has been granted by W. W. Taylor, Asst. to the Marketing Manager of *Sangamo Electric Co.* of Springfield, Illinois to make a copy of their "Folio *59-5" Sangamo* Reference Data File which has appeared in some industrial technical journals. Most of us hams have at one time or another used some of *Sangamo's* products, especially condensers, and know how fine they are.

IMPORTANT FACTORS IN SPECIFYING TOROIDAL INDUCTORS

The powered molybdenum permalloy toroidal inductor is finding increasing use in today's complex electronic equipment. Excellent magnetic stability, superior temperature stability, high Q values, and small physical size are but a few of the outstanding features which explain the popularity of molybdenum permalloy toroids. To fully realize the advantages of these inductors, the components application engineer must accurately specify those parameters which are of critical importance in a given application. "Un-

der-specification" may result in a component which fails to give adequate performance in the circuit. "Over-specification," on the other hand, may result in a component of extremely high cost. An understanding of the factors involved in the design and manufacture of toroidal inductors at Sangamo will enable the components application engineer to effectively judge the consequences of his specification in relation to the cost and performance of the final product.

THE EQUIVALENT CIRCUIT of a toroidal inductor is illustrated in figure 1.

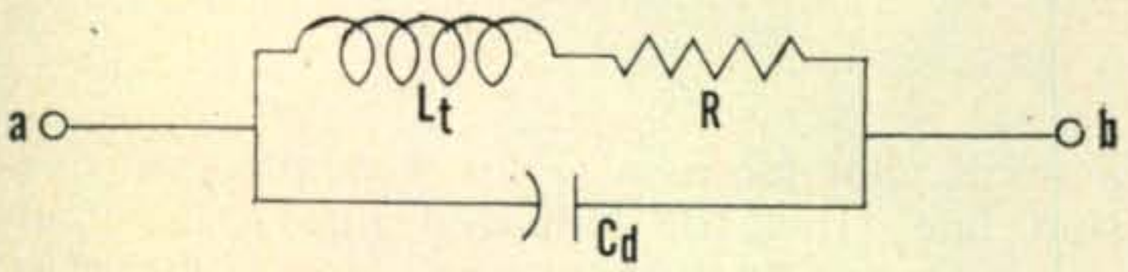


Figure 1

L_t is the so-called "true inductance" of the toroid and is assumed to be constant at all frequencies. R represents the sum of copper losses and core losses which increase with frequency. C_d, the distributed capacitance, approximates the capacitance between turns of the winding and between the winding and core. Due to the fact that the dielectric constant of the insulation on the windings and the core itself is not constant with frequency, the distributed capacity will also vary with frequency. This variation, however, is usually small and may be neglected in the following discussion.

THE APPARENT INDUCTANCE (L_a) is the equivalent inductance between terminals (a) and (b). As might be expected, the apparent inductance varies with frequency. If R is neglected the expression for L_a becomes:

$$L_a = \frac{L_t}{1 - \omega^2 C_d L_t}$$

Inductors for single frequency or resonant circuit applications are usually specified in terms of apparent inductance. The standard tolerance on L_a is 1% or one turn whichever is greater.

THE Q FACTOR is usually specified in lieu of R since most applications are concerned with the ratio of inductive reactance to equivalent resistance. The accepted method of specifying Q is to set a limit on minimum Q at the operating frequency or over a range of frequencies. Normally, the Q of a given design at a given frequency will vary some 20% between units. Where direct current flows through the inductor it may sometimes be desirable to set a limit on the d-c resistance as well as on Q. Analysis of the equivalent circuit, assuming constant R, shows that:

$$Q_{equiv} = \frac{\omega L_t}{R} - \omega R C_d - \frac{\omega^3 L_t^2 C_d}{R}$$

From the above equation one may deduce that anything which increases the distributed capacitance must necessarily reduce the Q.

DISTRIBUTED CAPACITY becomes most important in wide band or multiple frequency applications, since C_d will determine the variation of L_a with frequency. The majority of users do not find it necessary to specify C_d. Where C_d must be specified, the accepted method is to to set a limit on the maximum allowable distributed capacitance. An alternative method of specifying C_d is to set a tolerance on the apparent inductance to be measured at two different frequencies (usually corresponding to the upper and lower frequencies encountered in a given application). The design engineer controls the C_d by varying the method of winding the inductor. In decreasing order of capacity he may choose 1) random continuous windings; 2) progressive winding, or segmented winding. Unfortunately, winding costs increase as distributed capacity decreases. Wax or varnish impregnation will increase the distributed capacity. In applications where it is necessary to insure that L_a be reasonably constant over a wide frequency range, it is also usually desirable that L_a be reasonably constant with temperature and with time. These features are best achieved using a stabilized core, a low capacity winding, and an unfilled hermetically sealed enclosure. In this way, the undesirable effects of impregnation may be avoided.

REQUIREMENTS FOR STABILITY OF INDUCTANCE with temperature, with a-c voltage level, and with direct current are additional factors which will influence the cost and the size of a given inductor. Temperature stabilized cores are available only in certain core sizes and are, of course, more expensive than the standard unstabilized cores. High values of a-c voltage and direct current will lead to larger cores and increased cost.

So thanks Mr. Taylor and *Sangamo* for reprint permission on "Important Factors in Specifying Toroidal Inductors."

On Scope Information

The fly-sheets I prepared on scope operation are all gone. I hope soon to finish a practical book for the practical amateur on the scope.

Many manufacturers in the USA and Europe who specialize in scope manufacture are cooperating with my effort by furnishing me with some very fine information.

Written *exclusively* for the radio ham, the book will contain selected articles (including three construction articles by the writer)—one of which will contain info on how to put together a completely self-powered, transistorized scope which I believe, will be the *smallest one* in the world!

In the meantime, if you have something on scopes to contribute to the book, send the in-

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Novice

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

A primary consideration in any hamshack is getting the *rf* up the transmission line, into the antenna, and radiated into the ether. There are many ways to check on the antenna's ability to suck power from the transmitter. If you use an open wire feed-line, about the simplest method is to place a neon bulb or fluorescent tube near the line. The *rf* field will ionize the gasses and cause the bulb to light. The more power generated by the transmitter, the more brilliant the bulb.

Checking the antenna current is an excellent indication of antenna performance. You can do this by connecting an *rf* ammeter in series with the transmission line. Balanced line (such as 300 ohm ribbon) should show the same current in each wire and it is not necessary to use two meters. For unbalanced line (like 52 ohm coax), connect the meter in series with the center conductor. Here is how you use an *rf* ammeter:

First, calculate the transmitter power input. Let's say it is 50 watts. Also, to make the math easier, we'll call the efficiency 60% (although it may be slightly higher). Under these conditions you should have 30 watts of power output. We also know the transmission line impedance (which should be the same as the antenna impedance) is 50 ohms (for an example). The power formula, when R and I are known is: $P = I^2 \times R$. By substituting the known numbers in the formula we find:

$$P = I^2 \times R$$
$$30 = I^2 \times 50$$
$$I^2 = 0.6$$
$$I = 0.774 \text{ amperes}$$

Thus we find the antenna current should be about three-quarters of an ampere. If the meter read something quite different from this, something is wrong (either your transmitter, or my math!). If the meter reads high it means the transmitter is more efficient than you assumed or the antenna impedance is lower than it should be. If, however, the meter reads low it could be the transmitter is not working properly or the antenna impedance is higher than it should be.

Rf ammeters are expensive little beasts. You can build a "Chinese ammeter" by connecting a small pilot lamp in series with the transmission line (two for balanced line), and connecting a two or three turn coil across the bulb. The antenna current will flow through the bulb and cause it to light. You cannot tell how many amperes are flowing, but it *will* tell you when current is flowing and when it increases or decreases.

Another relative device for checking the antenna radiation is a *field strength meter*. This is usually a detector (a crystal), a pickup wire, and an indicator such as a sensitive meter. In use, you tune your transmitter and/or antenna coupler for maximum meter reading. This tells you that your adjustments are peaked up for maximum power output.

Although the Heath PM-1 is intended for mobile operation, it can be used in the fixed station ham-shack also. It can be used in conjunction with any amateur transmitter between 100 *kc* to over 250 *mc*. No batteries are used in the unit. About 0.3 volts *rf* RMS at the antenna terminal will produce full scale deflection on the 200 microampere meter.

Who's DX?

A very nice letter was received from Allan Herridge, G31DG, 95 Ramsden Road, London, S. W. 12, England, with a request. Allen has worked several Novices but has never received QSL cards from them. If the following Novices (and ex-Novices) will send him a card, he will QSL direct: KN1EIJ-Sep. 10, 58, KN2QQZ-Oct. 13, 56, KN2RAL Oct. 20, 56, WN2RFS-Sep. 8, 57, KN2TYK-Feb. 23, 59, KN4DTO, May 3, 59, KN4VUR-Mar. 7, 59, and KN4-YWZ-Feb. 23, 59. Allen uses a 138′ long wire with a modified HRO-MX and has received the following stations in London since Feb. 17, 1959: KN1IMD, IVT, JIU, JRA, WV2ARM, BLX, BPU, CZN, DEF, DFV, KN3HGN, KN4AEQ, AWM, DCI, DLJ, FII, HPN, VYD, YYL, ZVS, KN5SSI, UKN, USB, USE, KN8-KWB, MAU, KN9PES, RWC, KNØQEF, and WP4APP. Allen requests that you do not write for skeds because he has varying working hours, however, he will be listening for Novices on 15 meters.

At this writing the 15 meter band is a "gone goose" and there is no other DX news to report.

Net News

The Springfield, Mo. Teenage Slow Speed Net would like more Mo. operators to check in. NCS operates on 7.164 *mc* (± 5 kc.) at 1300 CST, and is Larry Wilson, KNØRWL. Thanks to Pat, KNØTNH for the info.

The Novice Hurricane Net, in addition to its regular meeting on Sunday at 0730 EST on 3725 *kc*, will also have a 40 meter session on Wednesday at 0630 on 7190 *kc*, with K4BHL (Dale) as NCS. Write to W4UHF, Roy Scott, at 5512 N. Armenia Ave., Tampa, Fla. for details regarding net procedure. All hams are invited to check in.

Helping Ham

The following persons have indicated a desire to obtain their Novice licenses. Can you give them a helping hand?

W2—Barry Ford, 7 Pearl St., Penns Grove, N.J.

W4—John Hettish Jr., 932 Nancy Dr., Murfreesboro, Tenn.

W7—Charles Boyles, 1683 N.E. Vine St., Roseburg, Ore. Phone OR 2-4533.

WØ—Tom Vars, 1804 Stanford, St. Paul 5, Minn. Phone MI 8-5343.

Larry Savage, 5995 Everett St., Arvada, Colorado. Phone HA 2-0345.

Letters

As Perry Como says "We get Letters." Unlike Perry, the file marked "Letters" is rather thin this month. Must be the back to school blues!

Glen Zook, KN9STH, 1006 W. 16th St., La Prote, Indiana kicks things off this month by telling us about his gear which includes a WRL Chief, a 60 watt home brew 807 rig, a Hallicrafters S-107 and Silvertone four-band battery receiver. Glen uses dipoles on 15 and 40 with the latter his favorite. His WAS stands at 23/14 and would like skeds with 1st and 7th areas.

Carl Haywood, K7EAB, sent along a picture of himself and Dwayne operating 40 and 15 meters from his fathers casket works yard (no, I'm not kidding!). The picture may be too dark to reproduce though—dog-gone-it.

Jim Johnson, WV6EUT, 12314 Hesby St., N. Hollywood, Calif. made one of the ZL special antennas out of bamboo poles and guy wires. Jim says the total cost was less than a dollar. He pumps a DX-20 and HQ-100 into it with good results.

Richard Harmon, KN9RGG, 1009 Third Ave., Mendota, Ill., has had his ticket since Mar. 11 and has snagged 45 states plus KH6. He says his DX isn't much, but it includes KG4, ZL1, VQ3, CE1, CX1, KM6, KL7, VP4, GM3, G3, DL3, HA5 (gasp) and a VP9. My not much list could use some of your not much's, Rick!

Edward Radlo, KN1LDK, 10 Edgemere Rd., Pawtucket, R.I., has only been on a few days and has 5 states plus VE2. His exhaled is a Globe Chief and the inhaler is an SX-101. He will sked anyone needing R.I. or wanting a rag chew.

Lee Winde, 805 Princeton Rd., Wilmington 6, Del., is 16 and has been on the air since April. In June he dropped the N and holds call K3ICP. Lee uses an SX-101 along with a home brew 75 watter, a Viking Adventurer, Riking Ranger, and New Viking 5ØØ. Lee will be glad to sked anyone needing Delaware.

Dan Dolan, 2913 Adams N.E., Albuquerque, N.M. forgot his call, but wants to represent New Mexico in the novice column. Dan will sked anyone needing N.M. on 15 meters. He operates with an NC-100 and homebrew 807 rig.

F. D. Howe, KN9SMQ, 421 Oak St., Quincy, Illinois is also a 59 year old grandpa who enjoys ham radio. He uses a Knight 50 watter, and a 17 year old SX-24. OM Howe has 20/19 on the way to WAS and would like skeds with 1st, 2nd, 3rd, and 7th districts on 15 or 40.

Daral Kent, Box 622, Lockney, Texas writes to thank us for the Help Wanted plug. It must have worked, for Daral got 100 on the test and is expecting (hi). He will be using a DX-40 with an NC-60 receiver, into a long wire.

Phil Coley, KN4???, 2006 Twain Rd., Greensboro, N.C. will be on in Sept. running an S-85 and Knight 50 watter. He has over 10 "pen pals" via the Novice section, and would like many more. He also would like to hear from hams with NC-300's.

Ted A. Schmitz, WV6GPH, 842 N. Orange St., Orange, California uses a BC-348 for receiving and a Meissner Sig. Shifter for a transmitter. Ted wonders how to obtain his WAS certificate. Well, when you have all 49 (or is it 50) cards together, send them to the ARRL,

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Carl Haywood's DXpedition to "Gonesville." Carl, K7EAB, and Dwayne, KN7IJZ, are operating from his burial vault plant located in their back yard. The boys worked 40 and 15 until the rains came. Real Cool, man!

Citizens Radio

Lee Aurick, W2QEX

The manufacturer of the equipment we're going to talk about this month is widely known for his compact, high-performance, and ubiquitous amateur gear. The same know-how that has made the Gonset Communicator so popular has been incorporated in the new Gonset Citizens' Communicator, Model G-11.

Last month we said it was just about the smallest radio station you could buy. This would certainly appear to be so.

It measures approximately 5½ inches high by 6¾ inches wide by 6¾ inches deep.

The G-11 contains eight tubes not including the rectifier and tuning-eye, and four of these are dual purpose tubes.

Part of the extreme compactness of this equipment is obtained by limiting each unit to one power supply. As a result, there are four models available, each identical except for the power supply. Model 3303 operates from 115-volts *ac*, and models 3304, 3305, and 3306 operate from 12, 6, and 24 volts *dc*, respectively. An individual unit may not be operated from voltages other than the one for which it was designed.

Both transmitter and receiver are crystal controlled on one of the 23 citizen channels. Though some may feel that this restricts the use to which the units may be put, there is no mistaking the advantage of knowing that the receiver dial hasn't been moved accidentally from the desired channel. This can be particularly helpful in mobile operation.

Aside from the push-to-talk button on the microphone, there are only two simple controls. The VOLUME control incorporates the OFF-ON switch, and the SQUELCH control is adjusted for a predetermined signal level below which the receiver will not operate.

In operation, the VOLUME control is advanced to a comfortable level while listening to a signal from another station. The SQUELCH control should be full clockwise at this time.

Following this, the SQUELCH may be adjusted when no station is transmitting. The control is turned slowly counter-clockwise until the hiss just disappears. When a station transmits on the receiver channel now, the SQUELCH will be automatically disabled and the receiver will "come to life".

To transmit, it is only necessary to press the push-to-talk button on the microphone. A 6E5M tuning-eye indicator makes the G-11 very simple to tune-up and also serves as a modulation indicator.

The units are shipped with crystals for operation on either 27.085 *mc* or 27.115 *mc*, and other crystals may be ordered from Wright Electronics, 2537 Grand Avenue, Kansas City, Missouri by channel number. Gonset has a clever way of numbering channels for the citizens band, and your conductor would like to suggest that all C/Bs standardize on this simple method. More on this in a moment.

The actual transmitter crystal frequency is ½ of the operating frequency. The oscillator doubles to the desired output frequency.

The receiver crystal oscillates at a frequency 1.65 *mc* higher than the channel frequency.

Tune-up instructions are simple and to the point, and no technical experience is required to obtain satisfactory performance.

The Gonset G-11 is a quality piece of equipment in every respect, and should give a reliable account of itself in a host of citizen applications.

Tests conducted over a distance of 2 miles using the simple wire doublet antenna which comes with the station resulted in excellent communications. This antenna has no lead-in and the two wires are led away from the station in opposite directions, either vertically or horizontally. More elaborate antennas are certain to produce increased range.

Channel Designation

C/Bs seem to be a gregarious lot who like to do some crystal changing, particularly when interference mounts and the going gets rough. This has produced some interesting results and some grand confusion when channel data was garbled or misunderstood. When one station goes by channel number (1 through 23) and the other station by frequency, it's a wonder that successful moves in frequency are ever accomplished.

The system suggested by Gonset, and the one that appeals to your conductor, provides a channel designation that also indicates the operating frequency. All frequencies end in 5 and this is ignored in the channel numbering system. The channel number is the first 2 *kilocycle*

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PROPAGATION

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

CQ DX Contest Special

The 1959 CQ World Wide DX Contest will be held as follows:

Phone Section 0200 GMT October 24 to 0200 GMT October 26.
CW Section, 0200 GMT November 28 to 0200 GMT November 30.

Following the practice of the past nine years, this month's Propagation Column is devoted to a special analysis for the phone section of the contest. Included in this months' forecast is a study of more than *three-hundred* circuits centered on *eight* major geographical areas of the United States. There's a forecast almost custom made for your QTH.

Forecast

As the following table shows, since 1954 there has been an almost direct relationship between the highest total all-band scores for the CQ DX Contests and the rise in solar activity during this period of time.

Year	Sunspot Number	High Score Phone	High Score CW
1954	8	275,110	597,065
1955	64	341,214	517,030
1956	156	532,620	752,346
1957	200	436,974	821,763
1958	181	585,120	973,912

This correlation is, of course, not unexpected since solar activity is one of the most important influences governing the characteristics of the ionosphere, upon which shortwave propagation depends. Although solar activity is now slowly declining, the present level is still exceptionally intense, and generally good shortwave propagation conditions are forecast for the 1959 Contest periods. A smoothed sunspot number of 138 is predicted for October, 1959. Barring any sudden radio storms, world-wide DX conditions forecast for the Phone Section can be summarized as follows:

10-Meters: Exceptionally good worldwide during the daylight hours.
15-Meters: Exceptionally good during the daylight hours, with the band remaining open to some areas of the world during the early evening hours.
20-Meters: Exceptionally good during the late afternoon and early evening hours, remaining open to many areas of the world through the hours of darkness, and until shortly after sunrise.
40-Meters: Fairly good from the early evening hours, through the hours of darkness, and until shortly after sunrise.
80-Meters: No better than fair to some areas of the world during the hours of darkness.

For a more detailed forecast please refer to the *Propagation Charts* on the following pages.

This month's special forecast is based upon a double-sideband AM signal with an effective radiated power (ERP) of 500 watts at low radiation angles (less than 15 degrees). The ERP is equivalent to the *power output* of your transmitter *multiplied* by the *power gain* of your antenna over that of a free space dipole. For example, a transmitter with a power output of 125 watts being used with an antenna having 6 db gain (a power gain of 4) at low radiation angles has an ERP of 500 watts. In this example, the ERP is that value for which the *Charts* have been calculated. To use the *Charts* for other values of ERP, add 1 to the symbols indicating 'the number of days band expected to open" for each 6 db of ERP greater than 500 watts, subtract 1 for each 6 db less than 500 watts.

The forecasts shown in the *Charts* are based upon normal propagation conditions expected for October during the present level of solar activity. In the event that a *radio storm* should develop during the Contest, circuits passing

OCTOBER, 1959

ALL TIMES IN E.S.T.

NORTHEAST USA TO:

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

ALL TIMES IN E.S.T.

Southeast USA To:

	10 Meters	15 Meters	20 Meters	40/80* Meters
Europe & North Africa	6A-8A (3) 8A-1P (4) 1P-5P (2)	6A-8A (3) 8A-12N (2) 12N-4P (4) 4P-9P (2)	6A-12N (1) 12N-3P (2) 3P-8P (4) 8P-11P (3) 11P-6A (2)	5P-7P (2) 7P-10P (3) 10P-2A (2) 7P-12M (1)*
Central & South Africa	7A-12N (1) 12N-2P (3) 2P-5P (4) 5P-7P (2) 7P-9P (1)	5A-8A (2) 8A-12N (1) 12N-3P (2) 3P-6P (4) 6P-8P (3) 8P-11P (2)	1P-5P (2) 5P-10P (3) 10P-2A (2) 2A-7A (1) 7A-9A (2)	5P-7P (1) 7P-12M (2) 8P-11P (1)*
Australasia	8A-12N (1) 3P-5P (2) 5P-7P (3) 7P-9P (2) 9P-11P (1)	7A-9A (2) 9A-4P (1) 4P-6P (2) 6P-10P (3) 10P-12M (2)	6A-9A (3) 9A-11A (2) 11A-6P (1) 6P-10P (2) 10P-3A (3) 3A-6A (2)	2A-4A (1) 4A-6A (2) 6A-8A (1) 4A-7A (1)*

Malaya & South East Asia: 7A-10A (2), 3P-7P (2) | 7A-10A (2), 2P-6P (1), 6P-9P (2) | 6A-9A (2), 4P-9P (1), 9P-2A (2) | NIL

SOUTHEAST USA TO:

	10 Meters	15 Meters	20 Meters	40/80* Meters
Far East	3P-5P (2) 5P-7P (3) 7P-9P (1)	6A-9A (2) 9A-3P (1) 3P-6P (2) 6P-9P (3) 9P-12M (1)	6A-8A (3) 8A-4P (1) 4P-9P (2) 9P-2A (1)	NIL
South America	6A-3P (3) 3P-6P (4) 6P-10P (3) 10P-12M (1)	6A-9A (3) 9A-3P (2) 3P-9P (4) 9P-3A (3)	6A-8A (4) 8A-3P (2) 3P-5P (3) 5P-4A (4) 4A-6A (2)	6P-8P (2) 8P-2A (3) 2A-5A (2) 8P-2A (2)*
Antarctica	9A-2P (1) 2P-4P (2) 4P-6P (3) 6P-9P (2)	7A-10A (2) 10A-3P (1) 3P-7P (2) 7P-10P (3) 10P-1A (2)	4P-6P (1) 6P-8P (2) 8P-11P (3) 11P-2A (2) 2A-6A (1)	6P-9P (1) 9P-2A (2) 2A-6A (1) 9P-1A (1)*

ALL TIMES IN C.S.T.

CENTRAL USA TO:

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

Last Minute Forecast

A moderate to severe radio storm is forecast for October 8-12. Generally good propagation conditions are expected to occur during the Contest period October 24-26.

ALL TIMES IN C. S. T.

SOUTH-CENTRAL USA TO:

	10 Meters	15 Meters	20 Meters	40/80* Meters
Europe & North Africa	6A-8A (2) 8A-12N (3) 12N-2P (2) 2P-4P (1)	6A-11A (2) 11A-2P (4) 2P-5P (3) 5P-9P (2)	6A-2P (1) 2P-12M (2) 12M-6A (3) 6A-2P (1)	6P-11P (2) 8P-11P (1)*
Central & South Africa	7A-12N (2) 12N-3P (3) 3P-5P (4) 5P-7P (2)	8A-12N (1) 12N-3P (2) 3P-5P (3) 5P-7P (4) 7P-11P (2)	3P-5P (1) 5P-7P (2) 7P-11P (3) 11P-2A (2) 2A-9A (1)	7P-12M (2) 8P-11P (1)*
Australasia	7A-11A (2) 11A-2P (1) 2P-4P (3) 4P-7P (4) 7P-10P (2)	7A-10A (2) 10A-3P (1) 3P-5P (2) 5P-9P (3) 9P-2A (2)	2A-6A (2) 6A-9A (3) 9A-11A (2) 11A-6P (1) 6P-11P (3) 11P-3A (4)	1A-7A (3) 2A-6A (2)*
Malaya & South East Asia	8A-10A (2) 10A-3P (1) 3P-7P (2) 7P-9P (1)	7A-11A (2) 11A-4P (1) 4P-8P (2) 8P-10P (1)	6A-9A (2) 4P-8P (1) 8P-1A (2)	NIL
Far East	2P-4P (2) 4P-7P (3) 7P-9P (2)	6A-9A (2) 9A-2P (1) 2P-4P (2) 4P-8P (3) 8P-12M (2)	6A-9A (3) 9A-11A (2) 11A-3P (1) 3P-7P (2) 7P-11P (3) 11P-2A (2)	12M-6A (1)
South America	6A-12N (3) 12N-6P (4) 6P-9P (3) 9P-11P (2)	5A-8A (3) 8A-2P (2) 2P-6P (3) 6P-9P (4) 9P-5A (2)	3P-7P (3) 7P-2A (5) 2A-9A (3) 9A-3P (2)	7P-7A (4) 8P-6A (2)*

ALL TIMES IN C. S. T.

NORTH CENTRAL USA TO:

	10 Meters	15 Meters	20 Meters	40/80* Meters
Europe & North Africa	7A-10A (2) 10A-12N (3) 12N-2P (2) 2P-4P (1)	7A-11A (1) 11A-2P (3) 2P-5P (2) 5P-7P (1)	6A-12N (1) 12N-3P (2) 3P-6P (3) 6P-2A (2)	5P-12M (2) 7P-11P (1)*
Central & South Africa	7A-10A (1) 10A-1P (3) 1P-5P (4) 5P-7P (2)	8A-12N (1) 12N-4P (2) 4P-6P (4) 6P-10P (2)	2P-4P (1) 4P-6P (2) 6P-9P (3) 9P-2A (2) 2A-6A (1) ~~6A-9A (2)~~	7P-12M (2) 8P-11P (1)*
Australasia	7A-9A (1) 1P-3P (1) 3P-7P (4) 7P-10P (2)	7A-9A (2) 9A-2P (1) 2P-6P (2) 6P-9P (3) 9P-2A (2)	6A-8A (3) 8A-11A (2) 11A-8P (1) 8P-11P (2) 11P-3A (4) 3A-6A (2)	1A-7A (3) 2A-6A (2)*
Malaya & South-east Asia	8A-10A (1) 1P-3P (1) 3P-7P (2) 7P-9P (1)	7A-11A (2) 11A-4P (1) 4P-7P (2) 7P-9P (1)	6A-9A (2) 4P-8P (1) 8P-10P (2) 10P-12M (1)	NIL
Far East	2P-4P (2) 4P-6P (3) 6P-8P (2)	6A-9A (2) 9A-2P (1) 2P-6P (2) 6P-8P (3) 8P-10P (2)	6A-9A (3) 9A-11A (2) 11A-2P (1) 2P-8P (2) 8P-10P (3) 10P-2A (2)	1A-7A (2) 4A-6A (1)*
South America	7A-9A (2) 9A-2P (3) 2P-6P (4) 6P-10P (2)	7A-9A (3) 9A-1P (2) 1P-5P (3) 5P-9P (4) 9P-2A (2)	4A-6A (3) 6A-8A (2) 8A-4P (1) 4P-6P (3) 6P-1A (4) 1A-4A (2)	6P-8P (2) 8P-2A (3) 2A-5A (2) 9P-2A (2)*

ALL TIMES IN M. S. T.

WEST-CENTRAL USA TO:

	10 Meters	15 Meters	20 Meters	40/80* Meters
Europe & North Africa	6A-8A (2) 8A-12N (3) 12N-2P (2)	6A-10A (2) 10A-2P (3) 2P-5P (2)	7A-1P (1) 1P-3P (2) 3P-8P (3) 8P-12M (2)	6P-11P (2) 7P-10P (1)*
Central & South Africa	6A-8A (1) 8A-12N (2) 12N-3P (3) 3P-6P (2) 6P-9P (1)	6A-11A (1) 11A-2P (2) 2P-6P (3) 6P-8P (2) 8P-10P (1)	6A-9A (2) 9A-12N (1) 12N-4P (2) 4P-10P (3) 10P-2A (2) 2A-6A (1)	6P-11P (2) 7P-10P (1)*
Australasia	6A-9A (1) 9A-1P (2) 1P-5P (3) 5P-7P (4) 7P-10P (2)	6A-9A (3) 9A-3P (1) 3P-9P (3) 9P-2A (2)	1A-6A (2) 6A-8A (3) 8A-11A (2) 11A-7P (1) 7P-10P (2) 10P-1A (4)	11P-4A (3) 4A-7A (2) 1A-4A (2)* 4A-6A (1)*
Malaya & South East Asia	7A-1P (2) 4P-8P (3)	7A-9A (2) 9A-4P (1) 4P-7P (2) 7P-10P (1)	6A-9A (2) 4P-8P (1) 8P-1A (2)	3A-6A (1)
Far East	1P-3P (2) 3P-6P (4) 6P-9P (2)	7A-9A (2) 9A-1P (1) 1P-5P (2) 5P-8P (3) 8P-11P (2)	7A-9A (3) 9A-12N (2) 12N-2P (1) 2P-7P (2) 7P-10P (3) 10P-2A (2) 2A-7A (1)	11P-7A (2) 12M-6A (1)*
South America	5A-7A (3) 7A-1P (2) 1P-3P (3) 3P-5P (4) 5P-9P (2)	5A-8A (3) 8A-1P (2) 1P-6P (4) 6P-2A (3) 2A-5A (1)	4A-6A (3) 6A-9A (2) 9A-3P (1) 3P-5P (3) 5P-11P (5) 11P-4A (2)	6P-8P (2) 8P-12M (3) 12M-5A (2) 9P-1A (2)*

ALL TIMES IN P. S. T.

SOUTHWEST USA TO:

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

ALL TIMES IN P. S. T.

SOUTHWEST USA TO:

	10 Meters	15 Meters	20 Meters	40/80* Meters
Siberia	1P-3P (3) 3P-6P (4) 6P-8P (2)	9A-12N (1) 12N-6P (2) 6P-8P (4) 8P-10P (2) 10P-12M (1)	6P-9P (2) 9P-12M (4) 12M-4A (3) 4A-12N (2)	10P-6A (3) 11P-5A (2)*

ALL TIMES IN P. S. T.

NORTHWEST USA TO:

	10 Meters	15 Meters	20 Meters	40/80* Meters
Europe & North Africa	7A-9A (1) 9A-12N (2) 12N-2P (1)	6A-10A (1) 10A-2P (2) 2P-4P (1)	7A-10A (1) 10A-2P (2) 2P-6P (3) 6P-8P (2) 8P-12M (1)	7P-11P (1) 8P-10P (1)*
Central & South Africa	7A-11A (1) 11A-1P (2) 1P-3P (3) 3P-5P (2) 5P-7P (1)	11A-2P (1) 2P-6P (2) 6P-9P (1)	6A-8P (1) 8P-11P (2) 11P-6A (1)	5P-9P (1)
Australasia	9A-12N (1) 12N-5P (2) 5P-7P (4) 7P-9P (2)	6A-9A (3) 9A-2P (2) 2P-7P (1) 7P-10P (3) 10P-12M (1)	7A-9A (3) 9A-12N (2) 12N-6P (1) 6P-8P (2) 8P-10P (4) 10P-7A (2)	9P-4A (3) 4A-7A (2) 11P-4A (2)* 4A-6A (1)*
Malaya & Southeast Asia	8A-11A (2) 11A-2P (1) 2P-4P (2) 4P-6P (3) 6P-8P (2)	7A-9A (3) 9A-3P (2) 3P-8P (3) 8P-10P (2)	7A-9A (2) 9A-5P (1) 5P-11P (2) 11P-7A (1)	3A-6A (2) 4A-6A (1)*
Far East	12N-2P (2) 2P-5P (4) 5P-8P (2)	7A-12N (1) 12N-4P (3) 4P-7P (4) 7P-10P (2)	2A-6A (1) 6A-1P (3) 1P-6P (2) 6P-9P (4) 9P-2A (2)	10P-8A (3) 11P-6A (2)*
South America	6A-9A (2) 9A-1P (3) 1P-4P (4) 4P-6P (3) 6P-8P (2) 8P-10P (1)	6A-11A (2) 11A-3P (3) 3P-6P (4) 6P-9P (3) 9P-12M (2)	1P-3P (2) 3P-6P (3) 6P-12M (4) 12M-4A (3) 7A-9A (2) 9A-1P (1)	6P-8P (2) 8P-11P (3) 11P-5A (2) 9P-1A (2)*

SYMBOLS INDICATING NUMBER OF DAYS CIRCUIT IS FORECAST TO OPEN

DURING OCTOBER, 1959

(1) 1-4 days (2) 5-11 days (3) 12-18 days (4) 19-26 days (5) over 26 days

* Indicates time of possible eighty-meter openings.

The 160-meter band is likely to open approximately 10% of the nights during October during those times for which 80-meter openings are shown in the Charts with a symbol of (3) or higher.

The six-meter band is likely to open on approximately 10% of the days during October during those times for which ten-meter openings are rated with a symbol of (4) or higher.

This month's Phone Contest special propagation forecast is based upon basic radio propagation data published by the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado. The forecast is valid through November 15, 1959. Refer to the text for a discussion of the radiated power parameters used for this month's special forecast.

through or near the auroral zones will become weak, fade considerably, or may even blackout entirely, depending upon the severity of the storm. On the other hand, often during such storms, conditions on north-south circuits improve. If a radio storm should develop during the Contest concentrate on working east-west paths during the daylight hours, and north-south paths during the morning and evening hours. The east-west paths appearing in the *Charts* with a rating of (3) or better are expected to hold up during all but the most severe type radio storm. A "last minute forecast" for the Phone Section, made at press time, appears elsewhere in this column. Up to the minute propagation forecasts during the Contest period can be obtained from WWV broadcasts on 2.5, 5, 10, 15, 20 and 25 *mc.*, at 19½ and 49½ minutes past each hour. WWV forecasts are intended primarily for north-Atlantic circuits, with a similar forecast for north-Pacific circuits broadcast from WWVH, Hawaii, on 5, 10, and 15 *mc* at 9 and 39 minutes past each hour. The WWV and WWVH forecast consist of a letter-number combination transmitted in slow Morse Code. The letter "N" indicates that conditions at the time of the broadcast are normal; the letter "U" that conditions are presently unsettled or erratic, and the letter "W" that conditions are disturbed and a radio storm is in progress. The number indicates the average quality of propagation conditions forecast for the next few hours as follows:

1—useless
2—very poor
3—poor
4—poor to fair
5—fair
6—fair to good
7—good
8—very good
9—excellent

A comprehensive propagation forecast will also be made on the Voice Of America Amateur Radio Program on the Sunday preceeding each Contest Period. This English-language broadcast of the VOA is beamed around the world every Sunday, and latest schedules can be obtained from:

The Voice of America
IBS/EF
Washington 25, D.C.

Post Mortem

The CQ World-Wide DX Contests, because of the large amount of world-wide activity they generate on the various amateur bands, offer an excellent opportunity to check the accuracy of the propagation prediction methods used in this column. As a result of information compiled during previous Contests it has often been possible to improve the accuracy of these forecasts, especially during the present period of intense solar activity. Any comments or observations that readers of this column should care to make concerning the accuracy of this special Contest propagation forecast will, therefore, be appreciated.

Six-Meters

Although the six-meter band is not included in the Contest, a few DX openings are likely to occur during October, becoming more and more numerous as winter nears. Conditions favor openings to South America around noontime, with the possibility of some other openings from the eastern part of the USA to Europe and Africa. Since solar activity is decreasing, this may be the last year for extensive DX openings on six-meters.

Next month, a special forecast for the CW Contest Period.

73, George, W3ASØ

YL

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

These new officers of the L.A. YLRC pictured at the club's installation luncheon meeting. L. to r., WA6AOE, Maxine, corres. secy.; K6MQS, Virginia, record. secy.; K6BUS, Midge, pres.; K6ANG, Billie, V.P.; K6OAI, Anita, treas. Photo by W6CEE, Vada.

The lucky 13—these YLs got together for eyeball QSOs at the Denver Hamfest July 19, 1959, after many contacts as members of the Loaded Clothes Line YL Net. L. to r., front: KØHFB, Irma; WØMMT, Marie; KØEVG, Pat; KØEDH, Lee; WØZWL, Martha, net V.P.; KØGAS, Connie. Back: K5ECP, Helen, net secy.-treas. and ANCS; KØBTV, Kay; KØKFX, Loni; KØADB, Maylo; KØEPE, Marti; KØBCQ, Carolyn; KØMNI, Linna, president and NCS. Photo by W5DWX.

20th YLRL Anniversary Party

Listed elsewhere in this column are the rules for YLRL's 20th Anniversary Party. Note the dates: Nov. 11-12 for the phone section; Nov. 18-19 for cw. Changes of interest: Any 30 consecutive hours may be worked in each of the two sections; ARRL sections will be used in scoring U.S.A. contacts; The Corcoran Award will be awarded to the YLRL member earning the highest combined phone and cw score. All YLs everywhere, whether or not members of YLRL, are invited to participate in this contest. So come on, gals—make it a date!

WRONE Fall Luncheon

The Fall meeting and luncheon of WRONE will be held Nov. 7, 1959 at the Towne Lyne House, Rte. 1, Lynnfield, Mass. (just around the corner from Rte. 128). General get-together from 11:30 a.m. and luncheon at 12 noon, which committee members K1IZT, Blanche; W1TUD, Alice, and W1HOY, Helen, promise will be a fine one at $3 per person. Plans for the 3rd International YLRL Convention (to be held June 17-19, 1960 at the Hotel Commander, Cambridge, Mass.) will take a prominent place in the afternoon discussions. General chairmen for the coming convention, W1ZEN and W1SVN, invite you to bring any ideas you may have on the convention and to pass them along to the many committees for consideration.

TYLRUN 5th Birthday Party

Members of WHO are busy with plans for the Texas YL Round-Up Net's 5th Birthday Party to be held in Ft. Worth Nov. 7. The *all western* party will be held at the Shangri-La. Members are requested not to dress up for the luncheon, but to come in western apparel. Entire cost for the party will be $7.50 which will include lodging, midnight snack, breakfast and the luncheon. If you can attend the luncheon only the price is $2. Activities will start at 4 p.m. Fri. and will include square dancing, prize drawing, and a hayride.

With the Clubs

YLRL's WAC/YL Award custodian, KØLYV, Barbie Houston, has moved with

YL NETS
Phone

Freq.	Day	Time (ST)	NCS	Name
3880	Th	0800 C	K5BWM/5	Tex. YL Round-Up
3890	M	1500 P	W7HHH	Monday YL
3900	T	0830 E	WK4CZP	Blue Ridge
3900	W	0830 E	W1TRE, W1UKR Alt.	Yankee Lassies
3900	T	0900 E	W8ATB	Welcome
3915	W	0900 P	K6HHD	Ironing Board
3915	Th	2000 P	K6HHD	Chirps
7225	M	0900 E	K4IFF	Floridora
7235	M	0900 M	KØMNI, K5ECP Alt.	Loaded Clothes Line
7220	Last W	1100 H		Rotates
7235	Th	1000 C	K5BWM/5	Tex. YL Round-Up
7250	F	0900 P	W6QGX	Fri. Round-table
7260	Th	0900 E	K4CYV	Georgia Peach YL
14240	Th	1300 E	W4SGD	Tangle
21390	W	1300 E	KZ5VR	Cross Country
28800	M	2000 E	K1DGZ	WRONE
29100	F	2200 C	W9BCA	LARK

CW

3750	M	1300 C	W9MYC	LARK
7104	Th	0900 E	K4CZP	
7150	W	0930 C	KØEDH	
7185	F	1330 E	KN4ANR	Floridora Novice

If any YL net currently operating is not listed here, or if there are any errors in this listing, please let's hear from you. Also, we'd like to receive a complete list of the VHF YL nets for future publication.

YLRL 20th Anniversary Party Rules

Phone: Start Nov. 11, 1959 at 12 noon EST. End Nov. 12, 1959 at midnight EST.

CW: Start Nov. 18, 1959 at 12 noon EST. End Nov. 19, 1959 at midnight EST.

Time: Any 30 consecutive hours may be worked in each of the two sections. All contacts must be made during the contest times indicated above.

Eligibility: All licensed YL and XYL operators throughout the world are invited to participate. YLRL members are eligible for the cup awards, non-members will receive certificates. Only YLRL members are eligible for the Corcoran Award. Contacts with OMs will not count. The next YL/OM contest will be held in the spring of 1960.

Operation: All bands may be used. Cross-band operation is not permitted. Only one contact with each station will be counted in each contest.

Procedure: Call "CQ YL."

Exchange: Station worked, QSO number, RS or RST report, ARRL section, U.S. possession, VE district, or country.

Scoring:
(a) Phone and cw sections will be scored as separate contests.
(b) Multiply number of contacts by the total number of ARRL sections, U.S. possessions, VE districts and countries worked.
(c) Contestants running 150 watts input or less at all times may multiply the results of (b) by 1.25 (low power multiplier).

Awards:
Highest phone score—gold cup.
Highest cw score—gold cup.
Highest phone and cw score in each district, U.S. possession, VE district and country will receive a certificate.
Highest combined phone and cw score, YLRL member — Corcoran Award. (For details of this Award see YL column, p. 80, CQ, March, 1959.)

Logs: Copies of all logs must show claimed score and be postmarked not later than Nov. 30, 1959, and received by the Vice President not later than Dec. 15, 1959, or they will be disqualified. Send logs directly to Gladys Eastman, W6DXI, 735 Glen Ave., Glendale 6, Calif.

her family to a new QTH at Richardson, Tex. Send applications for WAC/YL to her c/o General Delivery.

The WHOOTs of Dallas participated in the 4th annual Dallas Civitan Open Golf Tournament for women for the benefit of the mentally retarded and deaf children of the Dallas area, maintaining communications between the scoreboards. . . . The WHOOTs also took part in a 13-week contest for clubs sponsored by a local b.c. station. They were three times weekly winners and were second in grand prize winners. From reports via K5IMD they had a fine time gathering cold drink bottle caps, pkgs, cartons and grocery labels!

These new officers of the San Diego YLRC were elected in June: Pres., K6UTO, Betty; V/P., K6VRH, Ellie; secy., K6YGJ, Marcia; treas., WV6BNS, Meta. Betty reports there are over 70 YLs living in the San Diego area; she cordially invites any or all of these YLs to attend a club meeting—contact K6UTO for information.

On Oct. 31 members of BAYLARC will hold their annual family get-together with a pot-luck dinner and an evening of Halloween fun. . . . WV6HDE, Shirley, and W6BDE, Esther, of BAYLARC helped clear traffic at Electronics Post 800 of the Explorer Scouts (believed to be the only one of its kind in the U.S.) at the San Mateo County Fair and Floral Fiesta during the first week in August.

To earn the LARK certificate, W9MYC furnishes this list of current LARK members: W9AYX, GJB, IWP, KFC, LDK, LOY, MYC, QXI, RTH, RUJ, RXY, SJR, SPI, SYX, TDC, UON, YWH, ZXZ; K9BUS, BWJ, CCO, CZQ, EMP, EMS, IDR, IWR, IXD, KXO, OQW; W4DEV, ZMV; W5ZUD; W6PCA; W8ATB, MBI; K8EBY. Contacts with former members may be counted toward a certificate if made before Mar. 3, 1959.

The July issue of PARKA HI-LITES carries this list of PARKA officers for '59-60: Pres., KL7ZR, Rose; V.P., KL7CHV, Evelyn; secy., KL7DAA, Barbara; treas., KL7YG, Marjorie. Continuing as "Lucky Seven" certificate custodian and HI-LITES editor is KL7ALZ, Geraldine.

In addition to the officers pictured elsewhere in this column, the Los Angeles YLRC has these chairmen: P/C, K6TFN, Tommy; auditor, W6CEE, Vada; parliamentarian, W6UHA, Maxine; raffle, K6KLN, Ruth; hospitality,

[*Continued on page* 106]

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GENERAL ELECTRIC

CONTEST CALENDAR

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

CQ WORLD WIDE DX CONTEST

	Phone		C W
GMT	02:00 Saturday, October 24th to 02:00 Monday, October 26th.	GMT	02:00 Saturday, November 28th to 02:00 Monday, November 30th.
EST	9:00 PM Friday, October 23rd to 9:00 PM Sunday, October 25th.	EST	9:00 PM Friday, November 27th to 9:00 PM Sunday, November 29th.

September	26-27	SAC Phone
September	26-27	MARC VE/W
October	3-4	VK/ZL Phone
October	10-11	VK/ZL CW
October	10-11	TOPS 3.5 CW
October	24-26	CQ WW DX Phone
November	7-8	ARRL SS
November	11-12	YLRL Phone
November	14-15	ARRL SS
November	18-19	YLRL CW
November	21-22	RSGB 21/28 Phone
November	28-30	CQ WW DX CW

S A C
Phone

Starts: 15:00 GMT Saturday, September 26th
Ends: 18:00 GMT Sunday, September 27th

The CW section is already past history. The July Calendar had all the information. Don't waste time getting your logs to the SARL, P.O. Box 306, Helsinki, Finland.

Marc VE/W

Starts: 18:00 EST Saturday, September 26th
Ends: 24:00 EST Sunday, September 27th

Boys on this side of the border will work as many VEs in as many districts as possible. The Canucks will try to work as many W/Ks in as many ARRL sections as possible. Last month's Calendar gave all the other details you will require. Send your logs to Gordon H. Webster, VE2BB, 69 Pine Beach Blvd., Dorval, Quebec, Canada, no later than October 12th.

VK/ZL
Phone

Starts: 10:00 GMT Saturday, October 3rd
Ends: 10:00 GMT Sunday, October 4th

CW

Starts: 10:00 GMT Saturday, October 10th
Ends: 10:00 GMT Sunday, October 11th

This popular contest by the boys "Down Under" is sponsored by the WIA this year. Last month's Calendar gave a complete run down on the rules. Mail your logs no later than October 31st to the W.I.A., Federal Contest Committee, Box 2611W, G.P.O. Melbourne C.1., Victoria, Australia.

Tops 3.5 CW

Starts: 12:00 GMT Saturday, October 10th.
Ends: 12:00 GMT Sunday, October 11th.

This is a contest to promote activity on the 3.5 mc band. One section has already taken place but notice was received too late for last month's Calendar, and this section interferes with the VK/ZL contest.

1. Exchange—RST report plus a progressive three figure serial number starting with 001.

2. Scoring—One point for contacts in the same continent, three points for other continents, N. America and S. America counting as separate continents. However contacts in your own country or call area do not have a point value.

3. Final score—Total QSO points X total countries and call areas worked. Call areas in the following countries will count as separate multipliers; W/K, VE, VK, ZL, ZS, PY and JA. An extra 10 points can be added to the total for each WAC completed. In this instant NA and SA counts as one continent.

4. Reporting—Log must show date, time in GMT, station worked, number sent and received, country/call area and points. Compute your score and sign the usual declaration.

5. Awards—Certificates to winners as entries warrant. In addition call books will be issued to the leader in each continent and the highest scorer in the British commonwealth.

Logs may be sent to John Lubinski, W2-DGW, 2375 Sixth Ave., Troy, N. Y. or J. Browne, G4XC, 245 Yarborough Road, Grimsby, Lincolnshire, England. The deadline is November 30, 1959.

W W DX

Copies of the rules as published in the August issue have been distributed to all known amateur radio organizations, plus many individual stations. Indications are that they will be published by all the better known amateur radio publications in the world. That is, practically all. There is still one barrier we have not been able to penetrate. And we thought the "Iron Curtain" was difficult.

If you haven't already sent in your request for logs and report forms, time is running out on you. It's too late for overseas stations, altho you might try aid mail. Five sheets go for one o nce.

[*Continued on page 86*]

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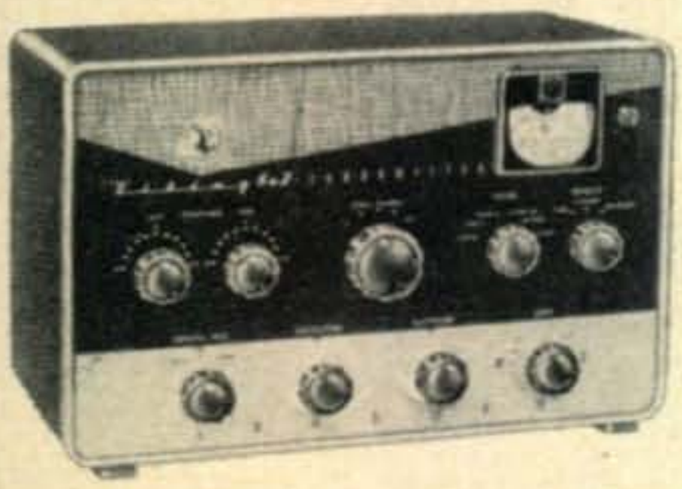

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TRANSMITTER

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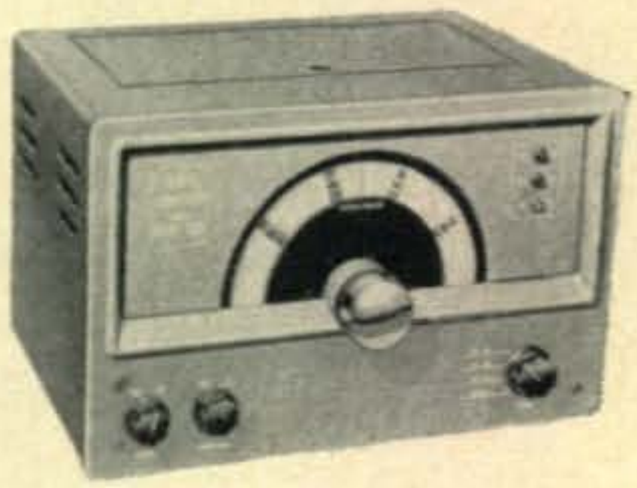
CONVERTERS



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6, 2, 1¼ Meters.....**$239.00**

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For further information, check number 27 on page 126.

CONTEST CAL. [*from page 84*]

ARRL SS

Well, what more do you want from us, we gave you the dates didn't we?

YLRL

Phone

Starts: 12:00 EST Wed., November 11th.
Ends: 24:00 EST Thurs., November 12th.

CW

Starts: 12:00 EST Wed., November 18th.
Ends: 24:00 EST Thurs., November 19th.

This one of course is for YLs only and Louisa Sando, W5RZJ will fill you in on the details. A smart move on the YL's part, to hold their Anniversary Party during the week and avoid the SS "rat race."

RSGB 21/28

Starts: 07:00 GMT Sat., November 21st.
Ends: 19:00 GMT Sun., November 22nd.

It's the world working the British Isles on Phone in this one. Rules are the same as previous years, with the addition of a 50 point bonus for each additional ten G3 stations worked, irrespective of band.

1. Exchange — RS report plus a progressive three figure serial number starting with 001. Only one contact on each band with a specific station, whether it's fixed, portable or mobile. Crossband contacts are not allowed.

2. Scoring—For Overseas Stations: Each com-

[*Continued on page 88*]

SCRATCHI [*from page 10*]

F.C.C. also saying Class D fellers should not having any lengthy discusshuns. Hah! Double hah!! They all sounding like bucking for Hon. Rag Chewers Club.

And, Hon. Ed., another thing are being no legal on acct. F.C.C. saying so. Can't callin Seek-You. Triple hah! Hole band soundin like week-old amchoors trying to having firs QSO. I'm telling you, Hon. Ed., there ar forchun to be made here.

Still can't figyouring how I making lots bux? That easy part. All I doing is getting lis of everybuddy what having Class D licens and I riting them, telling them that they operat ing illegally, and if they sending back five bux I telling them how to being legal.

Don't have to yewsing reel name. Can hav ing fancy stayshunary printed, with WORM on top of page, meening Western Observay shun Radio Monitoring Sistem. Making sounding reel offishal, so they sending me ther bux like crazy. Can even having slogan, sum thing like: "Don't being early bird or you ge ting the WORMS."

Hon. Ed., it can't missing. I don't even hav to heering peeple on air to knowing they no being legal. Scratchi can just sending letter t everybuddys what having license. I just know ing they almost all being illegal.

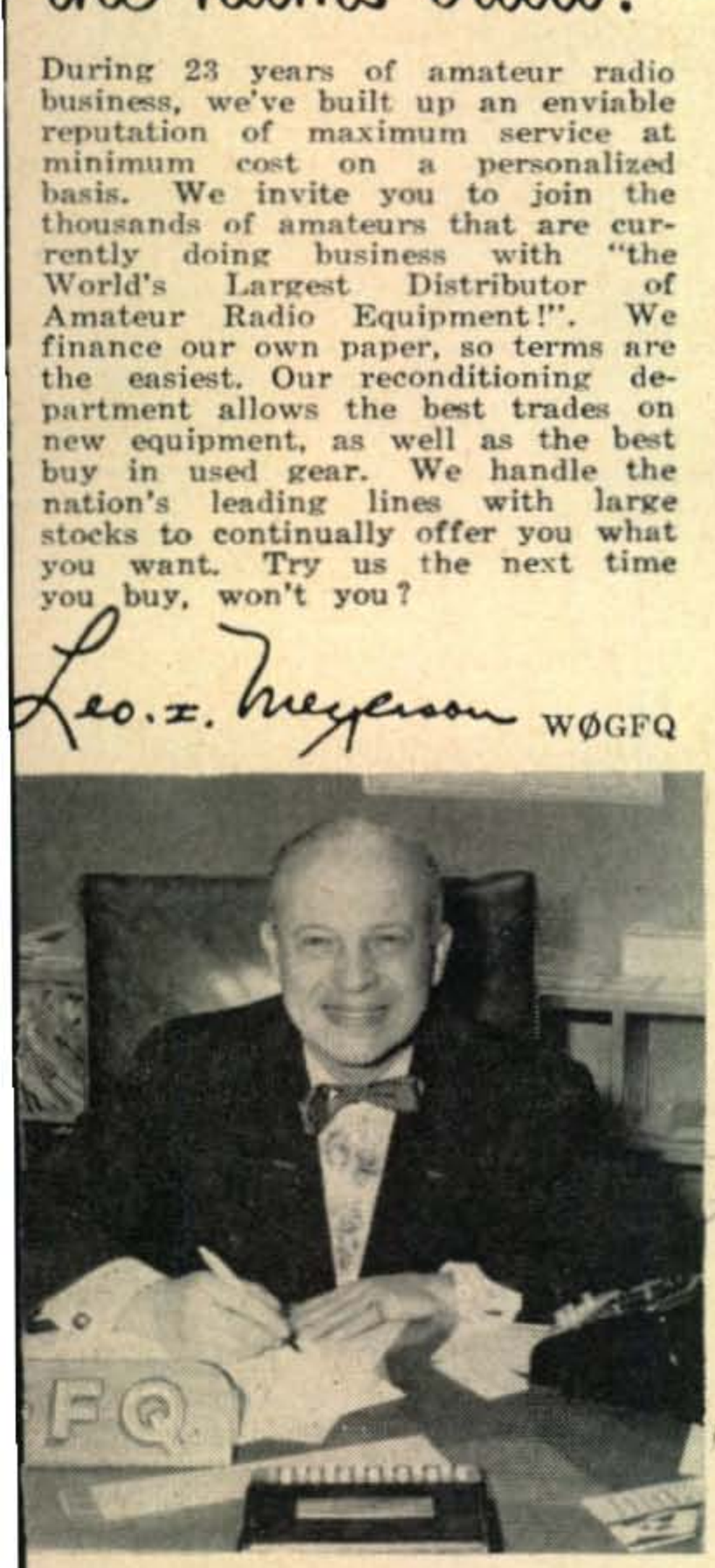
Howcomes?? I not menshuning one last thin that F.C.C. insisking on. To being legal an being on Citizen Class D you having to hav Conelrad monitor. Now, Hon. Ed., you know ing anybuddys on Class D that having one?

Respectively yours,
Hashafisti Scratch

"the house the hams built!"

During 23 years of amateur radio business, we've built up an enviable reputation of maximum service at minimum cost on a personalized basis. We invite you to join the thousands of amateurs that are currently doing business with "the World's Largest Distributor of Amateur Radio Equipment!". We finance our own paper, so terms are the easiest. Our reconditioning department allows the best trades on new equipment, as well as the best buy in used gear. We handle the nation's leading lines with large stocks to continually offer you what you want. Try us the next time you buy, won't you?

Leo. E. Meyerson WØGFQ



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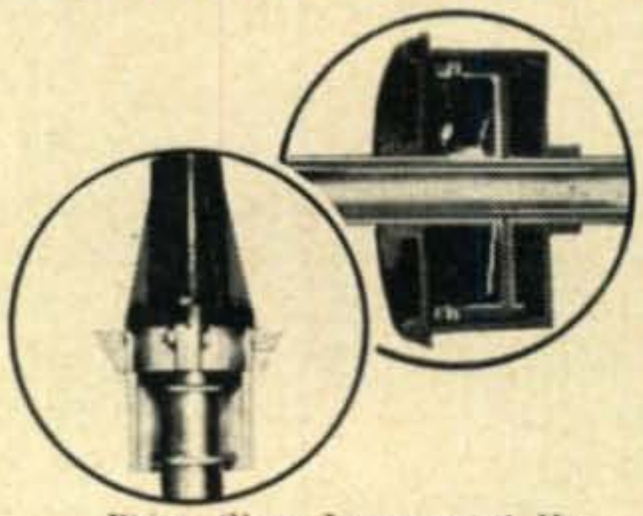

Fiber Glass Impregnated Nylon Base Assembly makes possible self support. Heavy cast aluminum mounting bracket is adjustable for various sizes of mast. Weatherproof internal coaxial fitting supplied.

The Hy-Gain Insu-Trap acts as an insulator at resonant frequencies, but allows radio energies of other frequencies to pass, making the Insu-Trap an automatic electronic switch which isolates various sections of the verticals to make them the proper length for each band. Exclusive adjustable capacitor plates are used, individually factory resonated for efficiency in high degree. Traps are completely weatherproof and airtight. Carbon activated polyethylene cover and cap. Traps rated to take full maximum legal input power. Just 2x3", trap's weight only 8 oz.

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for 10, 15 and 20 meters; only 13.5' high, wt.: 12 lbs. Self suporting.

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14-AV Vertical

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ELECTRONIC HEADQUARTERS

3415 W. BROADWAY COUNCIL BLUFFS, IOWA

For further information, check number 28 on page 126.

pleted contact with a British Isles station will score 5 points. In addition, a bonus of 50 points may be claimed for the first contact with each British Isles country—numeral prefix, i.e. G2, G3, G4, G5, G6, G8, GB, GC2, GC3, GC4, GC5, GC6, GC8, GD2, GD3, GD4, GD5, GD6, GD8, GI2, GI3, GI4, GI5, GI6, GI8, GM2, GM3, GM4, GM5, GM6, GM8, GW2, GW3, GW4, GW5, GW6 and GW8. A further 50 points will be scored for each additional ten G3 stations worked irrespective of band.

3. Final Score—Final score therefore will be total points claimed on both bands, plus bonus points on both bands, plus the special bonus.

4. Reporting—Logs must be clearly written or typed on one side of paper only. Show in this order: Date, time in GMT, station worked, serial nr. sent, nr. received, band, bonus points and contact points.

5. Declaration—Sign a declaration that you were operating within the limits of your license and that your log is correct and true.

6. Awards—Certificates will be awarded to the leading station in each country and each call area in the following countries; VE, VK, W/K, ZL, and ZS. Besides certificates there is the Whitworth Trophy for the leading station in the British Isles.

Address your logs to: The R.S.G.B., Contest Committee, New Ruskin House, Little Russell St., London, W.C.1, England. They must

[*Continued on page 105*]

COSMO. [*from page 55*]

the final amplifier tubes. The blower motor can be activated with either the application of filament or high voltage power, depending upon the hookup. The addition of the high power linear to the Cosmophone does not mean an extra bandswitch has been added. By selecting the band, all stages in both the transmitter and receiver are switched simultaneously.

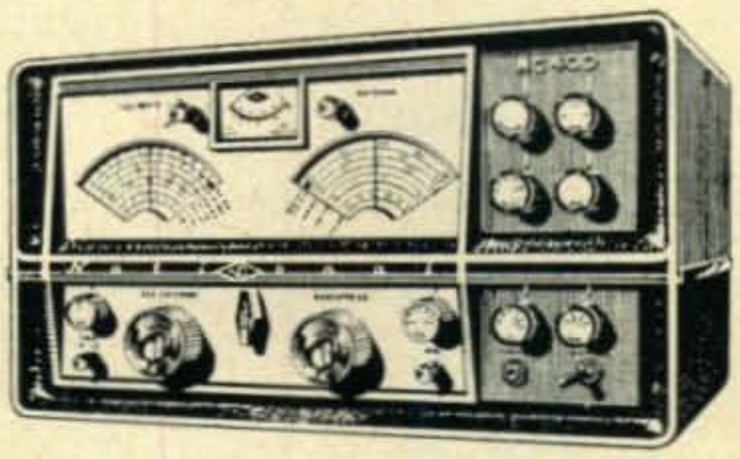
ALC has also been included as a feature of the new "1000". By setting the level of the *ALC* to correspond with proper amplifier operation, it is difficult, if not impossible, to drive the final to the point where severe flat topping occurs. This *ALC* is adjustable by means of a front panel control.

Separate High Voltage Supply

Aside from the usual PS-35 power supply, there is a compact high voltage unit. Both these can be placed under or behind the operating position, well out of sight, and full control is available at the front panel of the Cosmophone. This supply is conservatively rated at 2800 VDC at 450 *ma*, more than enough power to drive the final to maximum ratings, and still retain a large safety factor in the equipment. Aside from the high voltage, both regulated

IT'S NATIONAL NEWS

the New National NC-400



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Dream Receiver: front panel DSB, SSB selector for instant sideband choice. Q multiplier. 5-position IF selector for DSB, SSB, CW, Fone, Fone Net and VHF. Hi-speed 40-1 tuning dial with logging scale. Image rejection 50-80db all bands. Dozens of other top features.

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screen and bias voltages are supplied on the same chassis. Regulation is accomplished by the use of 6 voltage regulator tubes.

Summary

After checking out the new Cosmophone "1000," we can only report that we find the unit to be a successful "first" in the way of a one package tabletop kw station for ssb.

Barry Briskman, K2IEG

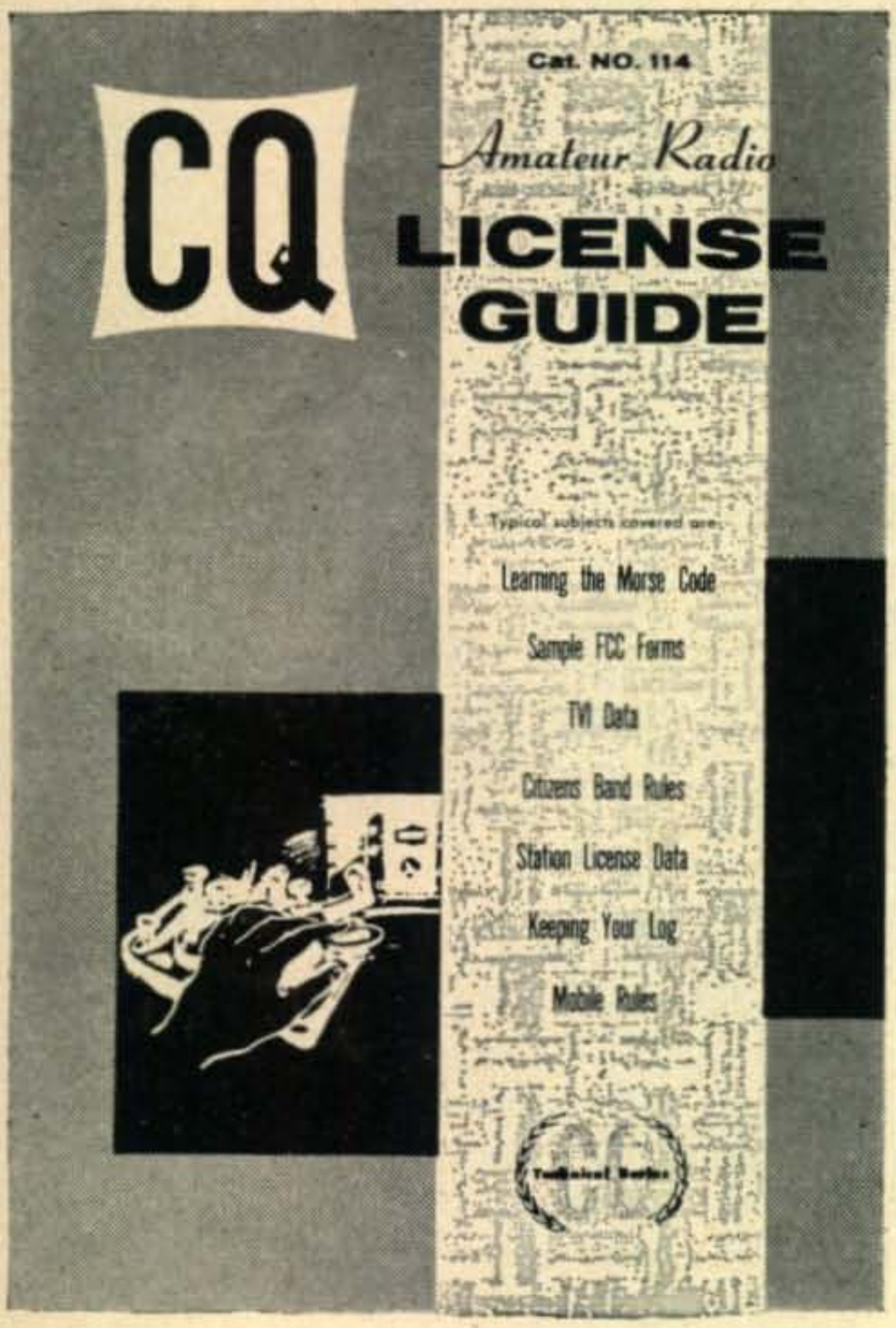
SIDEBAND [*from page 57*]

QSL chores. Address Art Cattoni, P.O. Box 43, Bello Horizonte, Brazil.

Recently I read somewhere about the necessity for rules and regulations to overcome the chaos which occurs when a new country makes its appearance. For the benefit of the initiated, may I say that such a problem and the answer to it would tax the ability of Solomon. Who actually wants it solved? Where would the fun and the excitement of shooting big game in Africa be if you were able to travel in a plate glass enclosure? What an empty feeling would exist if we were able to snare a rare one without having to fight for it. . . . Even with a "California Kilowatt" and a six element beam eighty feet in the air! Nothing can touch the thrill and exhilaration one feels when the far off station acknowledges your call, when there are still ten or twelve others calling on the rare one's frequency. Then when you are sure that your call is safely etched in the other fellow's log and you shut off the big switch to catch a breath of air and try to relax, isn't it nice to listen for hours to all the other "cut-throats" trying for a contact? Sure you are enraged when lots of the gang try to get a contact by using CW on the DX'ers frequency. When he pleads "please give the W-8 a chance fellows, you will all get your turn" do you wait patiently? Like —— you do! You turn up the audio gain and "tail end" like all those eager beavers you have been cussing. That night after you have tried for hours to fall asleep, because you are still unconsciously calling the rare one, and at the same time promising yourself 'never again', what is the first thing you do in the morning? You go to the mail box hoping the latest DX bulletin is there with news of another rare DX/pedition. So again I say, "should we try to do something about these pile-ups?" The truthful answer is "Yes, let's have more pile-ups." Would Humberto have number one "Worked 175" hanging in his shack if he disliked pile-ups? Think about it fellows.

George of UA1DZ has added a final amplifier to exciter and has been putting a big signal into the Eastern USA around 2200 EST. Ian MP4BBW who qualified for his "Worked 100" with a barefoot KWM-1 is also building a new final.

Advertisers Take Note:



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There have been several reports lately of contacts with 9N1AC in Nepal. According to W1CJ/3 who is scheduled to leave for that country shortly, there is definitely a "phoney" at work. Cook Electric Company has received a contract to install a modern communication and power system in Nepal, and some of the engineers scheduled to do the installation are licensed amateurs. The King of Nepal who is personally interested in Ham radio has granted authority to these operators to install amateur stations. Calls assigned are 9N1AA, 9N1AB and 9N1AC. The King will use 9N1AA. There are several SSB transmitters made by G.P.E. already in Nepal with power capability of one kilowatt, awaiting official word to commence operation. According to W1CJ/3 that word has not come as of August 17.

A very interesting letter was received from Bryan, MP4QAO in Qatar on the Persian Gulf. In the letter Bryan, who is an AM operator, states: "I have *never* heard a USA *AM* Station in six month's of listening here, although the 14 and 21 megacycle bands are full of SSB stations with S9 plus levels." Need I say more?

SSB operation from Austria, OE1 may be expected in the near future. Your Editor has sent an exciter to that country in response to a sincere request and the station will be in operation in several months. More information will appear in this column next month.

Dorothy, K2MGE and her OM Irv, K2HEA have taken over the duties of editing the Sideband er, the official publication of the SSB Amateur Radio Association and are doing a splendid job. Every sideband er should be a member of this organization which is dedicated to the furtherance of SSB. There are now over 400 members in all parts of the World. Send your check in the amount of Five Dollars to Mort, W2KR.

We were surprised to learn that Cliff, W8GCN who is number 11 on the Worked-100 Club, will soon be signing an HZ1 call in Saudi Arabia. We all wish Cliff good luck in his new QTH. Hugh, DL4WX has returned Stateside.

XE4B cards have all been sent out as have those from EA9DE and PX1DE. Martin, VE3MR advises that QSLs for his latest dx/pedition to PZ1MR, FY7YF, VP3RO and PJ5AC are in the process of being mailed. With these cards mailed, it is anticipated that there will be an increase to one hundred members of the "Worked 100 Club". Don't forget when applying for this award to send your QSL cards via registered mail in substantial packing, and to include return postage plus fifty cents for the cost of mailing the certificate etc.

Of the more than 240 certificates mailed so far and all of the batches of QSLs checked and returned, yours truly has been stuck for nearly half of the costs. As of today I have ceased to be a good samaritan, even though I may need your QSL desperately.

It's getting time to set the dates for the next

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SSB WAS and DX Conests. Watch this column for the announcement.

Errors

Last month's photo captions were accidentally switched by the printer. The handsome chap in the upper right corner of page 83 is Bill, ZK1BS. Peter is the good looking fellow operating his rig, clearly marked HB9IE.

73, Bob, W3SW

DX [*from page 61*]

VQ2, ZD7, ZD8

Zone 37—ET2, ET3, FL8, CR7, I5, VQ3/4/5/6, VQ1, ZD6

Zone 38—ZS1 through 9, ZE, ZD9

Zone 39—FB8 (all), FR7, VQ8 (all), VQ9

Zone 40—LA (Jan Mayen), LA (Spitzbergen) TF, OX/KG1, UA (Franz Josef Land)

CU AGN NEXT MONTH

73 es DX
Urb, W2DEC

SEMICONDUCTORS [*from page 63*]

rated to 100 and 300 *mc* respectively. Bulletins ECG-309 and ECG-314 are available.

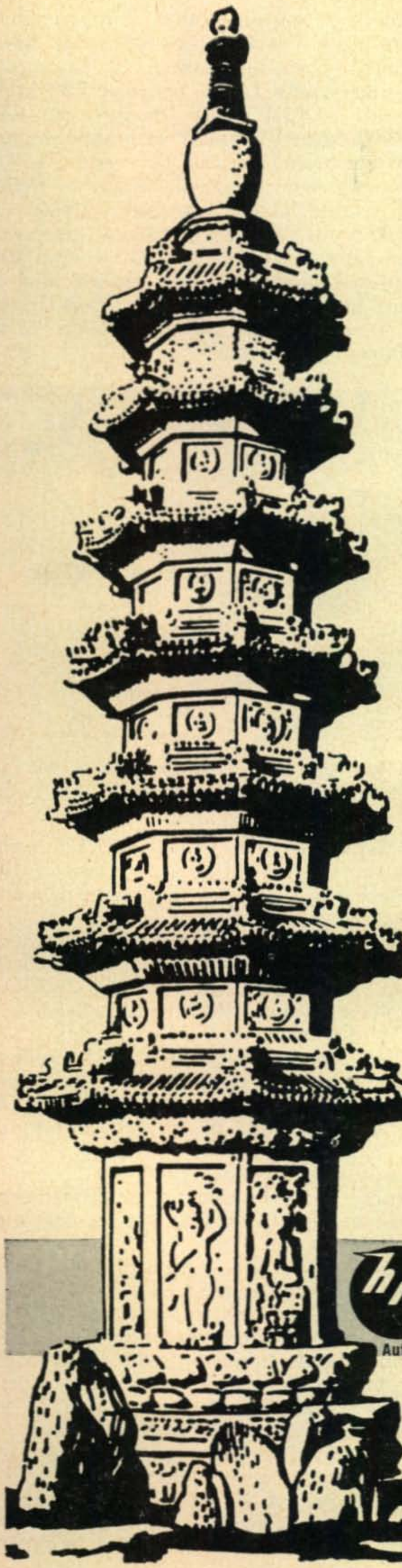
A new series of GE stud-mount rectifiers are described in bulletin ECG-404. This series is rated between 3 and 30 amperes, with PIV's to 800 volts, and they are specifically designed to eliminate thermal fatigue.

Also new from General Electric is a series of medium current silicon rectifier stacks, series 4JA3511. These units are described in bulletin ECG-409. All the GE bulletins may be obtained by writing the Semiconductor Dept. of GE, Electronics Park, Syracuse 1, N.Y.

International Rectifier Corp., 1521 E. Grand Ave., El Segundo, Calif. has a new series of silicon readout photocells for computer and data handling systems. Typically they generate 300 μ amperes for 0.01 sq. in. of area, at 1,000 footcandles illumination. Described in bulletin SR-277, they are available in multiple or single cell construction.

International has also announced a new 10

General Electrics new tetrode transistors are designed for use in rf, if osc. and mixer circuits.



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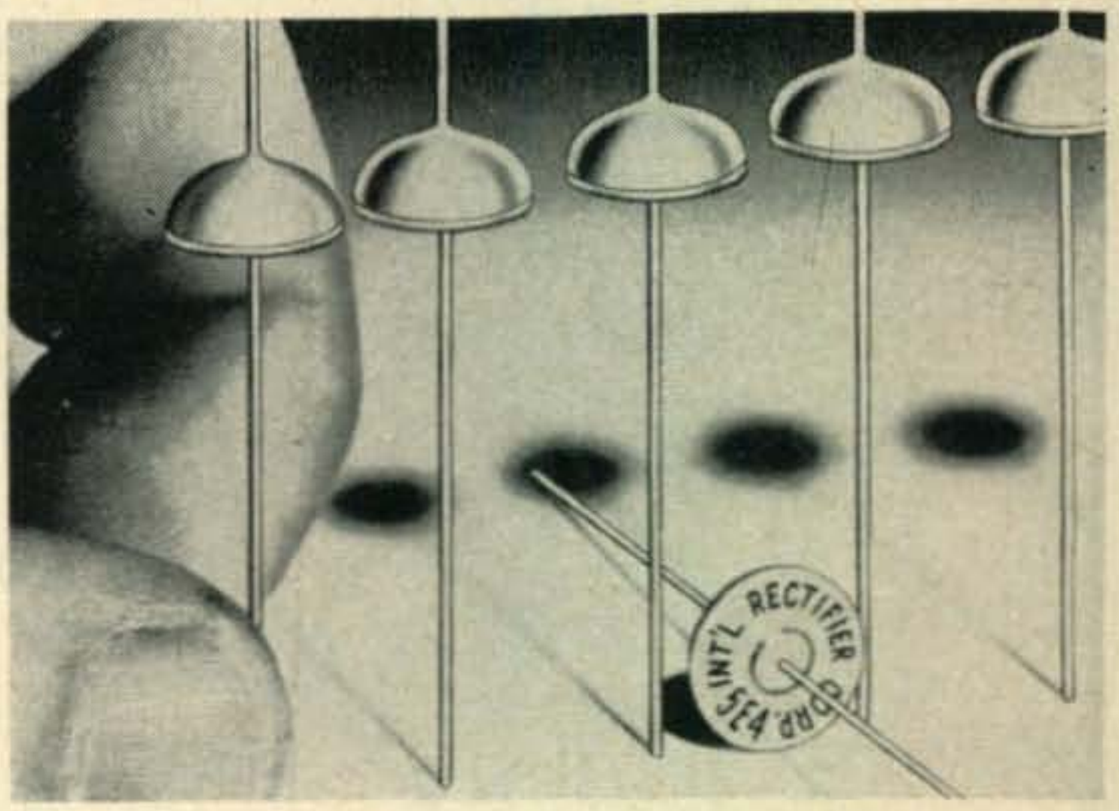
For further information, check number 35 on page 126.

watt Zener diode substitution box, to complement their present 1 watt box. Another new development is their recent series of low cost silicon rectifiers with rating between 200 and 400 ma, and 400 PIV. These new devices, 2E4 and 5E4, will be very popular with experimenters—they are priced between 84c and $1.35!

Recent news from Motorola describes their new high voltage power transistor, 2N297A, rated to 60 volts V_{cb}, their general purpose audio transistors 2N1191-2N1193, a new series of diffused junction silicon diodes, and a tremendous line of Zener diodes. Information can be obtained from Motorola, 5005 McDowell, Phoenix, Arizona.



For the first time, silicon rectifiers with a 400 volt PIV rating, at less than one dollar each.

Pacific Semiconductors, 10451 W. Jefferson Blvd., Culver City, Calif., have a new VHF silicon power transistor. It is capable of *delivering* five watts at 30 *mc!*

Although RCA's new MESA transistors are designed for computer work, they should find application in rf equipment. The new 2N1300 and 1301 have gain-bandwidth products of 40 and 60 *mc* respectively.

Texas Instruments have announced another new MESA transistor, type 2N705, for use in computer high speed logic applications. It is about ⅛ inch high! and has a alpha cutoff of 300 *mc.*

TI's new low cost silicon rectifiers 1N2069-3071 will interest cost conscious experimenters. They have ratings of 200-600 PIV at 750 *ma* average current.

Tung-Sol Electric Inc., One Summer Ave., Newark 4, N. J. have announced a 2N313 PNP germanium alloy junction transistor employing a thermal bond type of construction. The junction tab is securely bonded to the unit's base plate for increased heat dissipation.

As this is written, plans are being made to attend the WESCON show in San Francisco. This meeting is always a tremendous source of information on the semiconductor field, particularly with regard to future developments. I'll tell you all about it next month. For now—

73, Don, W6TNS

For further information, check number 37 on page 126.

SURPLUS [*from page* 67]

received. Then it basically became a superhet. According to KP4ARF, the rf section is very much like the ZB equipment which was used with the RU receiver. He mentioned too that some of the ARR-2 sets were called ZBX receivers.

Next Month

Next month is the Annual, Gigantic, Colossal, Tremendous, BIG issue. So much room is being taken up with articles that there just isn't room enough for the surplus column. BUT . . . we will be back on the stand with the same quality (we hope) conversions beginning with the BC-603 (again) converted to the 30 to 40 *mc* FM band for the many police and firemen that have written in. Believe it or not but about a quarter of all mail received here is requesting this one conversion.

Convention

By now you may have gotten wind of the convention to be held in New York next year. The CQ Surplus Department will be actively engaged in the problem of keeping people interested and we are asking your help. Anyone having a real out of this world type of conversion should look out for the contest to begin in January. The prize will be a chance to show off the gear to the many thousands of hams, and a chance at some recognition. Full details will be given in the January issue of CQ.

A letter from K5RXO requests manuals and conversions on the AMA, which apparently is an Australian communications receiver, and a BC-654A. K7GHC wants a handbook for the Navy TDT transmitter. Martin Ewing, K5MXF wants a handbook on the ARC-27 equipment, while W4YPW is searching for a conversion of some type for the BC-652 receiver. Like many others, George Borkowski, 903 Miller Street, Marinette, Wisconsin, is looking for a conversion of the BC-611 hand-talkie to citizens band. The Rev. Anthony E. Cahill, O.S.B., Physics Department, Belmont Abbey College, Belmont, North Carolina, is looking for diagrams or handbooks on the Navy MAR equipment, the BC-604 transmitter, Navy model RAZ-1 receiver, the R-89/ARN-5A receiver and the ARR-2 receiver. Rodger C. Legg Jr., 384 Broadway, Paterson, N.J. is looking for conversion information on the BC-696A. Charles Falk. 283 DelMar Court, San Luis Obispo, Calif. is trying to find conversion info on the BC-433F part of the SCR 269. K6YFL wants the manual and conversion on the ADX indicator which is part of the Mark 3 and 4 fire control radar. K5OGP asks for an ASB-7 indicator book.

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 the Geneva Conference 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.

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Pan-America and all other foreign: 1 yr. $6; 2 yrs. $11; 3 yrs. $16.

Mr. R. Idiens, 77 Amersham Road, High Wycombe, Bucks, United Kingdom needs info on the R-28/ARC-5 vhf receiver . . . K4PRT wants the APN-1 manual. Tom Kneitel, 97-10 62nd Drive, Rego Park 74, N.Y. is looking for the RBL-2 manual.

K4LLB has the manual for the BC-610 he is converting, but would like to get any information on improvements of this gear. W8UYL would like to get hold of, even on loan, an HRO-1 manual and a conversion of the BC-929 scope. While not surplus, the DuMont type 224-A handbook is desperately needed by K3BJA. W4ZZU wants the complete handbook for the ART-13 transmitter. K1IWB needs the RBH-2 books. W4ZMK is looking for a source of the PE-157 and the BC-366. W3GZL is in need of the books and info on the Navy TDF as well as a source of these units. K9JIH wants the ARW-2 conversion and manual for a CD conversion.

W. J. Bainbridge, 309 Bennet Dr., Weirton, W. Va. wants an instruction book for the RAK-7 and has an RBZ and SCR 609/610 manual for anyone that might need them. Wm. Gartner, 6129 N. 8th St., Phila. 20, Pa. wants a conversion of the ASB-5 equipment. WØTTG wants anything on the BC-611. K9DQP would like to hear from anyone with a conversion or info on the BC-1004. KØEIC would like to use a BC-728A for 12 volts and would like to get a conversion of this. W9AZA wants a TBS manual. W9HYV is trying to locate a set of coils for the ARC-5 receiver covering 1.5-3.0 *mc.* K2DFP needs the MAR and RDR Navy manuals. W7ZJB needs a conversion for the APN-4 Loran to a scope or panadapter.

A/2c George R. Harrop, KN9QEY, 791 AC&W Squadron, Hanna City, Ill. needs a conversion and schematic for the AVT-15A aircraft transmitter made by RCA. Dick Shafer, 3621 E-138, Cleveland 20, Ohio needs a conversion for a TA-12 for ten meters. K1BJZ needs conversion information on the BC-624 and the T-19/ARC-5, and WA6BPE wants the full story on the RT-34/APS-13. George Vance, P.O. Box 1742, San Diego 12, Calif. needs the handbooks for the DBM-1, RDP, RDJ and TS-182/UP.

Charles Logan, Box 505, Sudan, Texas wants the maintenance manual for the BC-653-A. Bob Forman, W9RJH/K9TNX needs the ARR-7 manual.

73, W2HDM, Ken

HAM CLINIC [*from page 73*]

scopes to contribute to the book, send the information to me.

I will send my personal check for $25.00 to the ham who can suggest a good title for this practical ham-scope book. No submissions can be acknowledged or returned—except the winner's. No duplicate awards—first one received,

first chosen first paid!

"72" and "75" (or *all* is *not* technical!)

To everyone (at least in the ham radio world), "73" means "best regards" and "88s" mean "love and kisses." Now I come along with two others that I have been using and will continue to use—"72" and "75." I hope they'll catch on and you'll use them too.

"72" means "PEACE AND FRIENDSHIP" . . . and I respectfully dedicate it to our Vice President of the United States, Richard M. Nixon.

"72" connotes *our* American desire for peace and our will to retain our freedoms. It is a salutation, a prayer and a greeting—wishing only the best for EVERYONE.

"75" needs no explanation. With our ham radio voices penetrating every "nook and cranny" of the world, I can think of no better way to sign off a QSO than by saying a sincere heartfelt "MAY GOD BLESS YOU AND YOURS!" This is the meaning I have assigned to "75."

I have *no* intention of injecting either religion or international politics into ham radio operational practices; but I think it is high time that we *American hams* let the WORLD know in no uncertain terms that we do desire peace and that *most* of us are God Fearing, and not as materialistic as some of our "friends" paint us to be.

We have needed these two new number signals for a long time . . . and they are easy to say. Word will get around on them!

Along these lines, I respectfully suggest to Mr. Paul Segal, the General Counsel for the ARRL that the words "UNDER GOD" be the first words in the 6th Part of the American Amateur's Code which appears in the ARRL Handbook. They're now in our pledge to the flag (as changed by Congress). To add these words to section Six of the code requires no act of Congress!

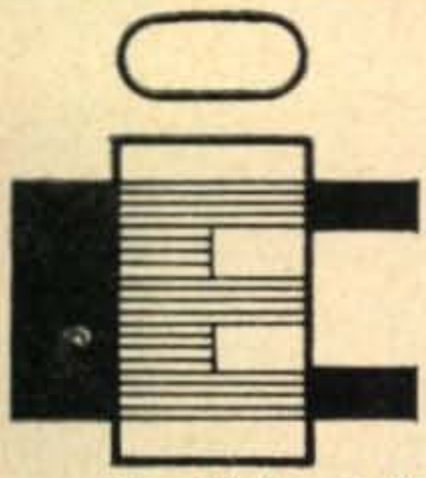
Thirty

I continue to receive some very fine letters from the readers of HAM CLINIC, and I want you to know that I appreciate each and every one of them! Personal answers are given (when addresses are included!).

We're not "world-beating" experts by a long-shot, but we do sincerely trv to help out other hams with their problems. There's a lot of satisfaction in this even though we do not and cannot please everyone 100% of the time.

Because the statements and opinions expressed herein are my own and do not necessarily have the indorsement of the publisher, any group or agency, governmental or civilian, I can occasionally stick my neck out. As long as I can help ham radio I'll continue.

72, 73 and 75, Chuck W6QLV/F7FE



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NOVICE [*from page* 75]

West Hartford, Conn. They will review the cards and if they are valid, you will receive the cards and a certificate 30 days or so later. There is no handling charge. The same goes for WAC (Worked all Continents).

Also from Calif., Tom Dixon, WV6EGL, 1626 Delford, Duarte, Calif. is 14 and runs a Viking Adventurer with a NC-57 for the hearing aid, on 40 meters. His WAS is 14/13 and he would like skeds with anyone outside the state.

It happens every month! That's the bottom of the stack. BCNU AGN.

73,—Don, W6TNS

CITIZENS RADIO [*from page* 76]

digits of the operating frequency. Hence, 27.085 *mc* is designated channel 8, and 27.165 *mc* is designated channel 16. In this way, the channels below 27.000 *mc* are similarly identified. A complete listing of the suggested channel numbers and their identifying frequencies follows:

Channel	Frequency (mc)	Channel	Frequency (mc)
96	26.965	11	27.115
97	26.975	12	27.125
98	26.985	13	27.135
100	27.005	15	27.155
1	27.015	16	27.165
2	27.025	17	27.175
3	27.035	18	27.185
5	27.055	20	27.205
6	27.065	21	27.215
7	27.075	22	27.225
8	27.085	25	27.255
10	27.105		

Why not give this system a try and talk it over with other C/Bs? In any event, your thoughts on this and other C/B items of interest will be aired here. Let's have them.

C/B Reflections

Why don't all manufacturers include a large, well drawn schematic diagram of their units with the equipment? Gonset includes a print 22″ x 17″ that's a real beauty.

C/B Notes

W8PSV inaugurates this part of the column with a query on C/B regulations. He raised the point that Par. 19.71 (c) of the rules would seem to prohibit a C/B, not holding at least a Second Class Radiotelephone license, from tuning or adjusting his transmitter in any way.

This point had previously occurred to your

CONTEST CAL. [*from page* 88]

be postmarked no later than December 7th 1959.

That should do it for this month fellows. Following are some of the results of contests that took place last winter and spring.

73, Frank W1WY

Certificate winners and leaders in their respective countries and call areas.

WAEDC—January 1958

Europe		No. America		Africa	
DL1KB	120,960	W2EQS	43,425	CR6AI	27,320
G2DC	69,992	W4KFC	43,043	ST2AR	16,965
OE1RZ	36,127	W6YMD	27,258	5A3TQ	12,160
UR2BU	36,000	W8RQ	21,450	CN8LC	5,134
IT1TAI	35,868	K3AXH	18,655	ZD2GUP	4,350
UC2AA	33,615	W5KC	9,102	FA9VJ	2,816
SM5CCE	32,838	W9ZTD	8,692	ET2HM	2,080
PAØVB	31,010	WØYCR	7,626	CR7BN	1,426
OK1KKR	29,450	W1WY	7,525	FF8BJ	624
HB9MO	21,658	W7PQE	5,400	ZE1JV	396
F8TM	16,240	VO2NA	5,495	VQ4KPB	162
SP9EU	13,200	KP4KD	3,660	**Asia**	
OH5QN	13,065	VE1EK	1,800	4X4KK	62,328
UB5TV	11,373	VE7ZM	1,678	YK1AT	23,352
LA1K	9,920	VE2WA	1,587	OD5LX	14,637
YU3OV	9,815	VE3EAM	1,558	JA1VX	13,818
EA1AB	8,126	VE4MJ	216	UF6FB	9,798
ON4AU	3,871	W2ZRX/vol	38	JA3AA	1,170
I1ALU	2,418	VE6VO	8	HS1C	976
OZ3GW	636	**So. America**		JA7AD	576
TF3AB	492	PY7AFK	10,360	JA5AF	416
EI6D	322	LU7AS	10,290	JA2BL	114
LZ1AB	275	PY4OD	3,024	**Oceania**	
UO5AA	144	PY1ANR	2,574	KH6IJ	10,450
oy7ML	90	CX2AM	230	ZL3OB	390
CT2BO	72	CE3AX	12	VK2APK	279

Helvetia—22 April 1959

HB9QR/TG	482,144	HB9KO/BE	187,340
HB9UB/ZH	380,386	HB9BX/SH	74,088
HB1TL/GR	349,600	HB9EQ/VD	68,508
HB9DT/FR	273,424	HB9SJ/BS	66,528
HB1VL/AR	268,494	HB9EU/ZG	40,581
HB1VL/AR	216,270	HB9BE/NE	7,200
HB1TI/SZ	207,466	HB9TP/SO	4,023

Other Europeans		I1CWX	1,035	K6CQM	1,020
G3IQE	10,164	TF3AB	969	VE3CIO	864
DL7CW	8,610	F2NZ	495	VE7ZM	810
OH2AA	8,190	EA2CR	429	FM7MU	756
OK1AWJ	5,967	ON4IB	48	W9WIO	624
YU2HO	5,472	OE6ST	27	ZL1HY	363
SM7EH	5,406	**Other Countries**		LU7AS	324
UC2AR	4,002	W1JYK	8,640	W7DIS	168
PAØVO	3,999	K3AXH	7,812	W4KAC	90
SP8HR	2,553	W2HTI	7,011	VE6QV	75
OZ7EX	2,178	WØYCR	3,193	VE4YZ	75
LA3UF	2,142	W8AJW	2,688	CR7BN	45
GW3BNQ	1,674	VE1EK	1,386	VE2IL	27
UB5TV	1,386	K5LZO	1,254	OA4FU	12

The Committee apologizes for the lack of activity in some of the rare Cantons. They promise more activity from these rare spots next year.

PACC April 1959

PAØVO	97,644—CW Winner
PAØHBO	10,537—Phone Winner

European Winners		HA5KDQ	1,428		
SM5AHJ	7,128	UC2AA	1,236	W2EQS	3,111
OH5RO	6,468	UP2AW	1,188	K38XH	2,703
OK1MG	5,972	YU1SF	1,110	W8JIN	2,360
SP9EU	5,006	OZ4FF	988	WØYCR	552
LA1K	4,347	GW3LAD	864	VE3XK	432
HB9QH	3,843	UB5CI	783	JZØHA	370
G3IQE	3,842	EA7CA	729	W5KC	270
DL1GN	3,021	UR2KAE	45	K9EAB	252
F3ZU	2,160	**Other Countries**		KL7CDF	165
IT1AGA	1,683	W1JYH	4,032	VK2CX	30

The above are CW winners. There was very little activity in the Phone section.

MARS BULLETINS

The Long Island Section of the Institute of Radio Engineers began an experiment in co-operation with local high schools in 1956, in making available to them the experience of members of local industry. Through its Student Affairs Committee, a group of 19 lecturers has been made available to math and science classes, clubs and other organized groups. Arrangements are normally made through the activities of a wide spread group, called High School Representatives, who serve as points of contact with the nearly 30 schools presently served in Nassau and Suffolk counties.

This fall, the experiment will take on a new character. The Military Affiliate Radio System (MARS) Eastern Technical Net, which is estimated to reach 14,000 students, technicians, engineers, educators and military reservists in the area east of the Mississippi, will present a series of eight radio talks on successive Sunday afternoons during October and November. The objective of the series is to reach youths who are technically inclined but who may not yet have decided upon a career; introduce them to the many facets of modern technology, and perhaps stimulate some of them to undertake careers in engineering, science or as technicians.

Presently scheduled are:

October 6—Engineering—A Career of Opportunity—G. W. Karlsruher, Engineer-in-Charge—Mechanical Engineering Services, Sylvania Electric Products.

October 13—Careers in Technical Writing—S. Miles, Vice President, Miles-Sammelson, Inc.

October 20—Automation in Industry—T. Dosch—Senior Project Engineer—Reeves Instrument Co.

October 27—Basic Comparisons of Microwaves, Optics and Infrared—Bruce A. Woodward—Engineer, Airborne Instruments Laboratory.

In November, the series will include such topics as: Elements of Radar, Guided Missiles and Propulsion Systems, Elementary Particles, Applications of the Atom, and Semi-Conductors.

These MARS broadcasts can be heard from 2 to 4 PM prevailing New York time, on 7540 *kc* and 13,715 *kc*.

Since suggestions and volunteers are always welcome, those interested may contact J. Kearney, Chairman of the Student Affairs Committee, G. Krayer, Chairman of the High School Lectures Subcommittee, at Airborne Instruments Laboratory, Melville, New York, or J. H. McCoy, Director of the USAF Eastern Technical Net, c/o Office of the Chief, MARS, U. S. Air Force, Tempo T Building, 6th Street and Adams Drive, Washington 25, D. C. ■

TRADING POST

ARE YOU MOVING?

If you expect to move, and IF you know your new address now, and IF you don't want to miss any issue of CQ here are three things you can do right now!

1. Tear your name and address label off the wrapper of this issue and paste it in this box right over these words, or make a complete and accurate copy of your old address label.
2. Print your name and NEW post office address in the lines below:

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(City) (Zone) (State)

3. Cut out this whole box and mail it to: CQ Magazine, 300 W. 43 St., New York 36, N. Y.

conductor who recognized in it the possibility of some highly restrictive language. OM Stewart's letter provided the necessary inertia to get the answer directly from the FCC. Happily, they interpret this paragraph to relate only to on-the-air tests, and advise that any adjustments made with a "dummy load" are of no interest to them. However, they most definitely will be interested in adjustments made by unauthorized persons while the rig is connected to an antenna. Let this word suffice and make any transmitter adjustments with a small lamp across the output.

Follow-Up

Considerably more experience has now been realized with the International Crystal Company Citizen Bander. The unit performed perfectly all the way to the ARRL convention in Galveston and back home. Mobile range, with a three-element beam at home, is now reliably 12-miles and from minor vantage points 15-to-20 miles. From atop Bear Mountain in New York, the mobile unit has been heard at home in New Jersey more than 40-air miles away. A very high noise level atop the mountain prevented 2-way contact with the home station.

Next month we're going to take up the subject of antennas. At present, a ground-plane and a three-element beam grace the roof at home and provide near maximum coverage and versatility. Then too, you'll be interested in a project just completed—the Heathkit CB-1. It works fine on ten meters also. It may prove to be the least expensive mobile station you've ever seen.

73, Lee, W2QEX

YL [*from page 82*]

K6JCL, Jenny; delegates to L.A. Council of RC, K6VAP, Margaret; WV6EAF, Marty, and W6AVF, Mary; Lads 'n' Lassies certificate custodian, W6WRT, Ruby; DX YLs, W6UHA, Maxine. . . . Many of the L.A. club YLs attended the Southwestern Div. Convention at Pasadena July 24-26. W6JZA, Elsa, did a bang-up job on the YL luncheon. This was followed by a meeting of YL ops with W6QGX, Harryette, presiding. She presented W6DXI, Gladys, VP and president-elect of YLRL; K6EXQ, Connie, secy; W6MWU, Mary D/C, and W6CEE, Vada, past president of YLRL. . . . Pleasant surprise for all was the wedding announcement of L.A. club member W6PJU, Mildred. Her OM, Don Maxon, also a Ham, worked with her 14 years ago for FCC at the Santa Ana Monitoring Station. They both still work for FCC and she planned to join him in D.C.

Several new officers for GAYLARK (due to change in QTH for former ones): Pres., K5PFF, Audrey; V.P. and certificate custodian,

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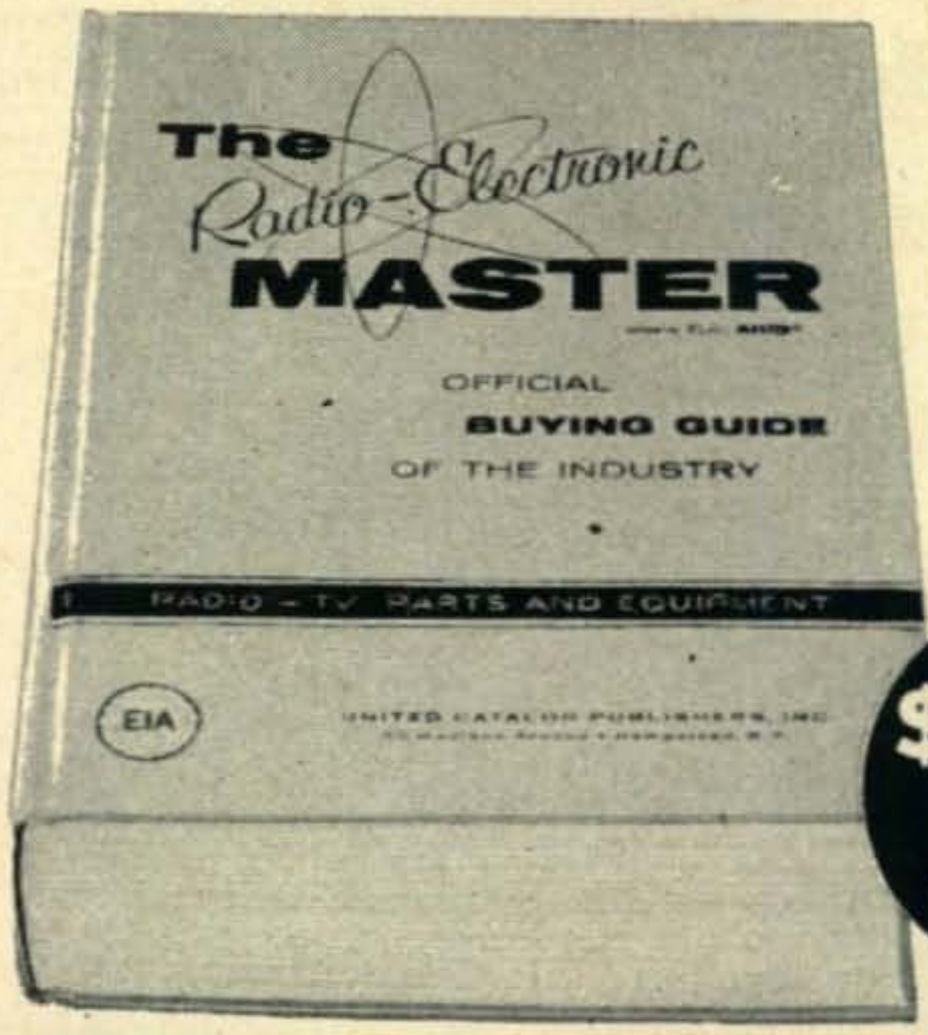

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W5ERH, Betty; secy.-treas., K5BJU, Harriett.

From Air WAC to Ham

GAYLARK's new president, K5PFF, has an interesting background in radio, one that started long before she became a Ham. Audrey went to radio school in 1942 at Glenwood, Minn. and then worked for Northwest Airlines. In Nov. 1943 she joined the WAC (Air WAC) with basic training at Ft. Des Moines, radio school at Godman Field, Ky., then on to Chanute Field, Ill. for procedure school. From there she went to work at Maxwell Field, Ala., with the Army Airways Communication System. Her next transfer was to Atlanta, Ga., AACS Hq. From there she went overseas—England, France, Germany, and finally home in 1946. (She met her OM in Paris but waited till they returned home to marry.) She was on the *Athos II* that was ship-wrecked off the coast of Newfoundland, towed back to the Azores and finally came home on the aircraft

An Air WAC, Audrey Beyer served in the AACS in the U.S. and overseas in WW II, but didn't become a Ham until 1958. Now K5PFF is president of GAYLARK at Houston.

carrier *Enterprise*. It was not until Harriett, K5BJU, found after many years that Audrey might be interested in amateur radio that with a little coaxing she got her ticket. She passed her Novice in Jan. 1958 and became a charter member of GAYLARK.

An OM Says . . .

"Carmen, KN4CPZ, the XYL, and I are enjoying 'her' copy of 'CQ YL' very much. I'll have to admit I wanted it, too. It gives me something to do when she won't let me run her off our rig—hi!" W4TNE, Carroll

Now how about it, OMs? We've been directing our appeal to the YLs and XYLs to get their copy of "CQ YL" to see and read about hundreds of other YLs in this wonderful hobby. But maybe we should tell all of you OMs to get a copy (for you both, of course) so you can see their pix and read about the YLs you *might* be working if only you could get at that rig!

Anyway, it's the one and only book about the YLs, 169 pages, over 500 photos, only $3 per copy, autographed and postpaid. Order from author/publisher W5RZJ (QTH at head of this column).

Ye Editor says no YL column in November issue—see you in December CQ.

33, Louisa, W5RZJ

COMANCHE [*from page 53*]

for the remarkable close mechanical tolerances of the hardware components. Screw holes, etc are located where they're supposed to be!! There was no occasion that called for reaming or refitting.

Final Calibration And Adjustment

Final calibration was first accomplished using a Paco G-30 RF Signal Generator which was beat into a Collins 51-J receiver to obtain a reasonable degree of accuracy. Alignment, though time consuming, proceded according to the manual. A very important lesson was learned during the alignment procedure. Although I had taken the precaution to write the proper designation beside each oscillator coil and each trimming capacitor the inevitable happened—I turned the wrong capacitor, well brother, you get smart in a hurry when you see two-hours work go down the drain. That possibility was practically eliminated by cutting ¼" square of plastic tape and sticking on the screw slots of all oscillator, mixer and antenna coils and oscillator trimmer capacitors except the particular ones that were being worked on at that time. It's pretty easy to make a mistake without some kind of reminder because there are a total fifteen coils and five trimmers, all located fairly close to each other. Another lesson was learned about calibration. The manual says to let the frequency standard and receiver warm up at least a half hour before beginning calibration. That's the minimum if everything stabilizes within that time—better allow 2-3 hours and be on the safe side.

The day following the initial calibration, a frequency stability check was run on all bands with excellent results on 80 and 40 meters but rather bad drift on 20, 15 and 10. A letter was written to the Heath Company and, about a week later, a special notice bulletin arrived, together with the necessary temperature compensating capacitors to correct the drift. Also, instructions and parts for increasing audio output on 10 and 15 meters. This had not been noted previously as a shortcoming; however, the audio changes were accomplished along with the temperature compensating capacitors. Inasmuch as drift correction involved removing the oscillator coils for 10-15 and 20 meters to do a neat job—it was put off for a couple of days until enough courage was gathered to tackle the very intricate unsoldering and de-crimping job that exists after everything is in place. Actually, it was necessary to bend the soldering gun tip in various L-shapes to get to the parts. It took about four hours hard work. You can see from the ac-

companying graphs of frequency drift that the corrective measures were quite effective on 20 and 15 meters and a great help on 10 meters.

This "Special Notice" Model MR-1 was not identified other than named as above and dated 3-19-59 which makes it difficult to identify for reference.

Performance

Everyone who has heard the little "Comanche," including an ardent CW man (SX101), an ardent AM Man (NC-303), and an ardent SSB man (KWM-1) plus yours truly (51-J), have all been amazed at the fine degree of sensitivity and selectivity that this little, low cost, do-it-yourself unit possesses. It's truly amazing—CW and single sideband being outstanding. CW signals were followed one by one thru the novice portion of 40 meters in the evening—comparing selectivity and sensitivity simultaneously with the 51-J. The little "Comanche" is right in there with the big ones. SSB signals on all bands are exceptionally easy to tune and the quality leaves little to be desired. Occasionally, a very strong nearby, commercial teletype station will get through on 20 meters but it did not interfere with reception of any but the weakest signals.

Yours truly suffered a few agonizing moments wondering what was wrong when switching bands and not getting any signals—it turned out that the antenna trimmer on the "Comanche" is much more selective and critical than any I had been accustomed to using and had failed to peak it properly. Once this was learned, everything became rosy again.

Power Supply

Power requirements are adequately stated in the manual, requiring 300 *vdc* at 125 *ma* (unit drew 80 *ma*) and 6 or 12v *ac* or *dc*. Performance dropped off noticeably when these figures were reduced, so by all means insure that the required power is available *under load!!* The "Comanche" was operated on a homebuilt power supply at 6*vac* and 12*vac* and *dc* filament power. No noticeable difference could be detected with these changes.

The overall time spent in building and aligning was 40 hours of which 30 hours were for construction alone. Everything considered, the little "Comanche" is by far one of the finest pieces of equipment to come onto the market. It is low in cost, size and weight. It has versatility, being both a mobile and fixed a bands receiver with outstanding SSB reception. This makes it a worthy addition to an existing shack or a fine long term investment for the beginner who will not have to trade it in later for a "big" one. In fact, unless I miss my guess, there will be quite a few "big" ones traded in for the "Comanche."

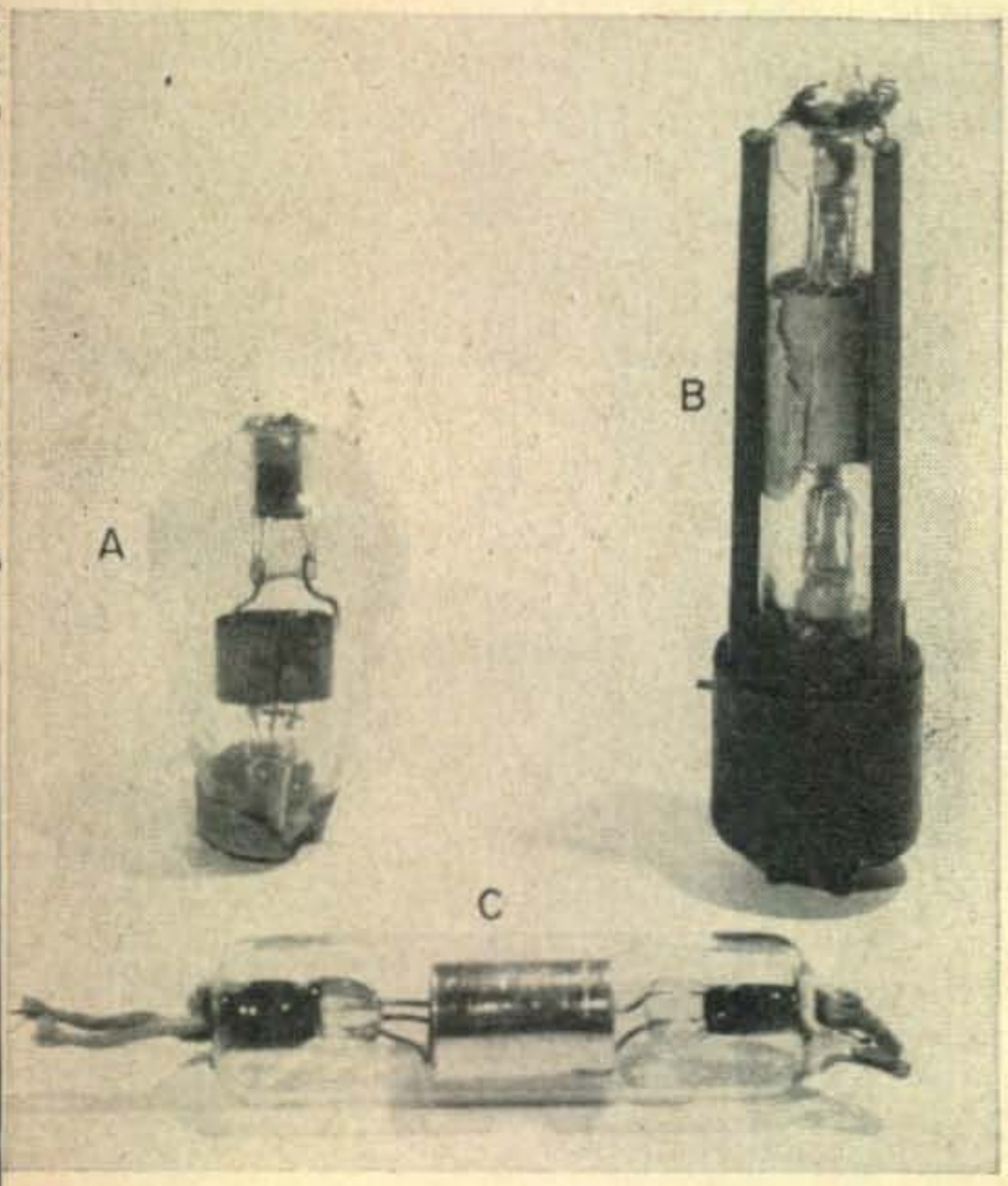
General

It was noted that the variance in initial drift on different bands was somewhat different; however, once warmed up to operating temperature, stability was excellent. Be sure to allow at least 2-3 hours warm up prior to calibration.

Due to the width of the dial indicator and dial spacing, accurate frequency determination is impossible; however, by eye-balling the well lighted panel, one can easily judge within one or two *kc*'s on all bands except on 10 meters where about 3-5 *kc* would be a good guess. The companion speaker (AK-7) is simplicity at its best. It is well constructed, sturdy and has fine tone qualities. It takes about 30 minutes or less to assemble.

All factors considered, the Comanche is well worth the effort and money and if you're just half as pleased with it as yours truly, you'll be mighty pleased. ■

IN THE BEGINNING [*from page* 50]



Very early radio receiving tubes.
A—DeForest audion with plate surrounding the filament (Earlier models contained a plate on one side of filament).
B—Audiotron of "teen" years featuring twin filaments for longer service.
C—Audiotron mounted in an early type socket.

ng of programs created nationwide audiences or sponsors, and let all the nation hear special vents simultaneously. Problems still existed of ourse; but radio was too much of a permanent ixture in everyone's home to tolerate detrimental changes.

(*To be continued*)

What are the drive requirements for a KW input?

"For driving on 20 meters, the KWM-1 has ample drive to give 60 ma of grid drive on voice peaks. There is six feet of RG58U from the KWM-1 to the final. B&W suggests no more than 5 feet when driving the filaments the way I do, but the extra foot seems to do no harm."

What kind of bias supply worked best?

"I had several bias supplies to work with. The one that was best provides a variable output and is very well regulated. It uses a 6AS7G, a 6SJ7, two VR-150's and an old 80 rectifier (see fig. 2). I can't even see my voltmeter needle move under modulation peaks. I might mention that this good regulation is available through the first 85% open of R7. Beyond that, regulation is not too good."

What kind of quality reports do you get?

"Lots of people can tell I'm using the KWM-1 for a driver as the M-1 quality goes right on through with so little distortion that it is not even a factor. I have yet to get a report of poor quality or broad signal."

How come old fashioned copper tubing coils?

"I built this amplifier for 20 and 40 meters only. I don't swish between bands so it is no inconvenience to use copper tubing coils. They are sure cheap to make. About 40¢ of copper in each coil plus a heavy terminal lug, and there you have it."

Conclusions

In conclusion, it should be stated that, commercially, triodes are preferred for grounded grid amplifiers. The Western Electric LD-T2 3KW SSB transmitter uses a 3X2500 in its output stage . . . and works down to 10 meters, too! Likewise, the new Westinghouse MS Amplifier, for which the LD-T2 is the driver uses several king sized triodes to get 30KW output. It too, will work down to 10 meters which ought to pacify the minds of a lot of people who worry about internal shunt capacities of tubes versus high frequency operation.

It is hoped that what Quent has done will kindle a spark of interest in some faithful 250TH's which may be gathering dust on shelves all over the world, simply because they were thought to be old fashioned. There's many a good CW final and AM phone job too, that could be easily converted into excellent linear amplifiers simply by (1) adding BW Filament Chokes to the filament circuits, (2) removing the grid circuits and grounding the grids and (3) setting bias for static plate current WØPXH recommends.

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Breeze	W5DVP
Blow	W4OMO
Gust	W9WRH
Gale	W1BD
Tempest	G3GSZ
Cloud	W2VVP
Damp	W4ADQ
Sprinkle	WØAXW
Showers	K5BBQ
Rain	W1TOY
Storm	W9DPK
Hail	W5BBB
Flood	W4AOD
Frost	W3DEY
Freeze	W7BOP
Ice	W7BKX
Snow	K6CMT
Blizzard	W6LBS

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Clock	WØFCF
Dawn	KN4EPR
Early	W1QC
Morning	K9AMP
Noon	K2LRN
Monday	G3LM
Calendar	WØVWS
Day*	W5IGW
Date	K4BBY
Daily	W9EWL
Weeks	WØDGO
March	WØPSW
May	W9CXO
June	W2POS
August	K2GMA

Lotsa Knights, but no Night.

Suggestion of night:	
Moon	W7APH

Beam directions:	
North	W2HP
East	W5GYU
South	W3ADD
West	W6OAN

Countries:	
Denmark	W2MBZ
England	W4AMW
France	W7AJN
Germany	W5RQD
Greenland	G4HD
Holland	W3AF
Ireland	W1QG
Israel	W8PK
Lichtenstein	W2NEA
Monaco	K6PMH
Poland	KØAGT
Scotland	VE3ADP
Spain	W6EUG
Wales and Mars!	W1AFK WØTYK

States (US):	
Kansas	VE4RT
Maine	W2CCT
Washington	W6VGT

Nationalities:	
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English	WØRSH
French	W5FXS
German	W3IMN
Irish	W1BLS
Scotch	K6IRH
Swiss	W2IUW
Welsh	W9ESQ

Cities:	
Algiers	W9DTE
Belgrade	KØDXI
Berlin	W2LDW
Brisbane	K4GYX
Bristol	W8UBA
Bombay	K2JMF
Canton	K4HFV
Colon	W4SHB
Fairbanks	W6AIN
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For further information, check number 56 on page 126.

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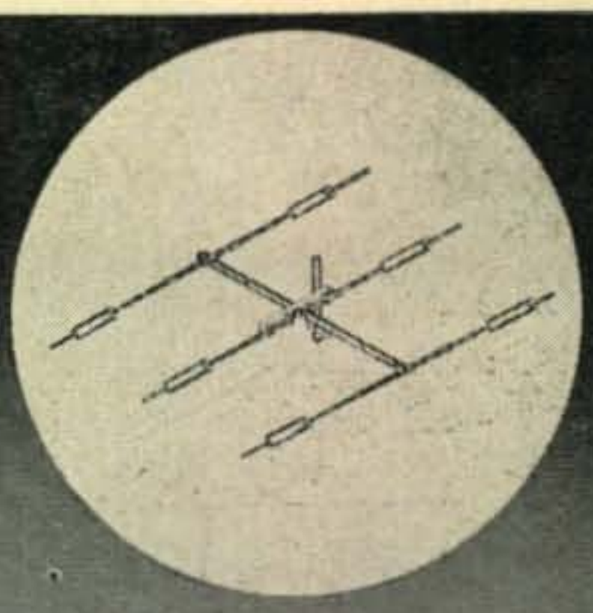

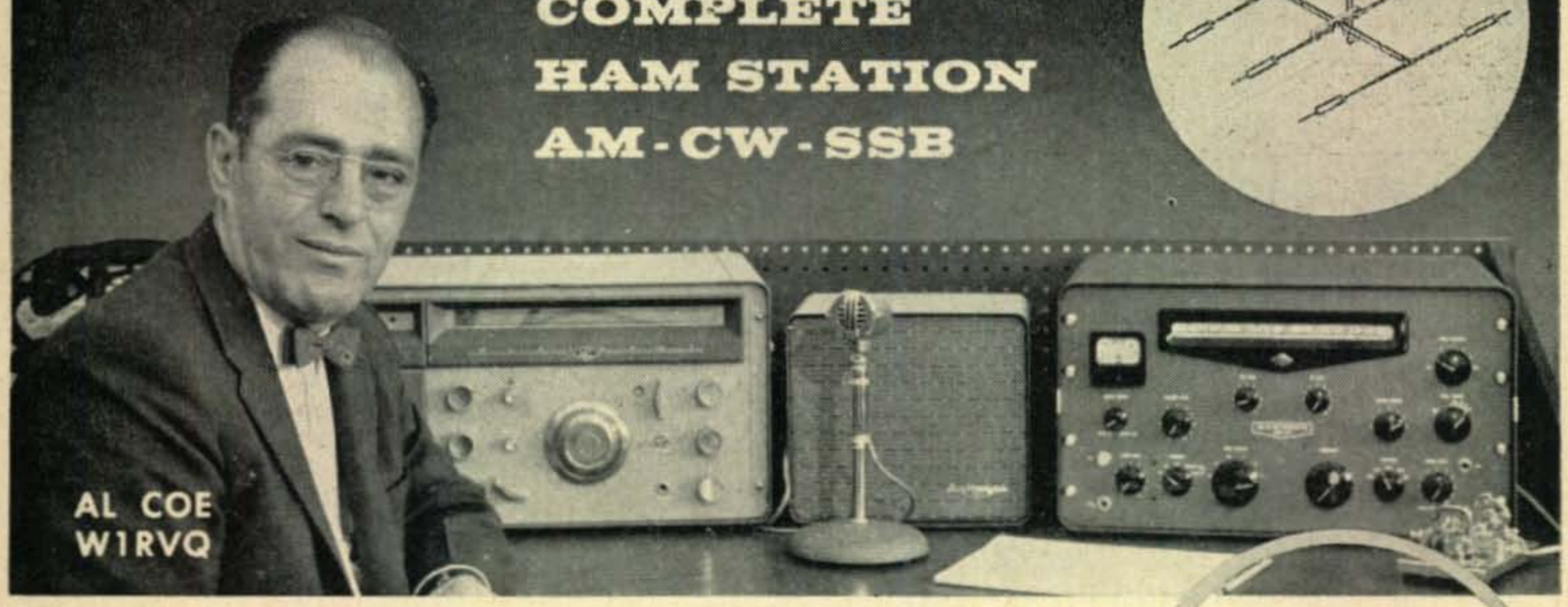

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For further information, check number 56 on page 126.

BC 603—20 to 27 MC FM RECEIVER. See Sept. and Oct. 1958 issues of "CQ" for conversion to 20-50 MC and AM
UNUSED ..... ea. **$12.95**

BC 604—TRANSMITTER—20-27 MC FM **$7.95**
UNUSED .....

Set of 80 crystals for the above ..... per set **$5.95**

F.T.—237 Mount for above XMTR and Receiver **$4.95**
NEW ..... each

AN/ART-13 100 WATT TRANSMITTER

(Removed from Aircraft)

Designed to provide radio communication by voice, (MCW) or CW telegraphy. Class "B" audio modulator system capable of modulating the carrier at least 90% on voice or MCW. Incorporates automatic tuning mechanism which may be used to select any one of 11 frequencies, range 2000 KC to 18,100 KC. Frequencies 200 KC to 1500 KC range is provided by addition of oscillator O-16/ART-13A. **$39.50**
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RADAR SYNCHRONIZER UNIT with 7 ea. 717 A's only, 12-SO239 Coax. Chassis, Connectors, Relays, Switches, etc. ..... ea. **$2.49**
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T-17 CARBON HAND MIKE —200 ohm. Press-to-Talk Switch. **$5.95**
BRAND NEW .....

ID 169/APN-12. SCOPE INDICATOR. Complete with tubes and conversion instructions for 110V 60 cyc AC. BRAND NEW **$9.95**

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2430 S. Michigan Ave., Dept. CQ, Chicago 16, Ill.

Phone: CAlumet 5-1281

For further information, check number 59 on page 126.

EASY TO LEARN CODE

It is easy and pleasant to learn or increase speed the modern way — with an Instructograph Code Teacher. Excellent for the beginner or advanced student. A quick, practical and dependable method. Available tapes from beginner's alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready, no QRM, beats having someone send to you.

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357 West Manchester Ave., Los Angeles 3, Calif.

FOR SALE (Cont'd)

MORROW MBR-5 receiver with RVP-250 6/12VDC supply instruction manual, $150. GONSET 6M Converter $30. Both excellent condition. Lt. Messinger, K6QMI/1, Box N150, 509BW, Pease AFB, New Hampshire.

NC 183-D-Excellent-$210. W5FHU, 2509 Terrace Ave., Midland, Texas.

FOR SALE: Scott Receiver Model SLR-12-B $35.00. PE103 Motor Generator 6-12V in, 500 V out $8.00. Bud Xtal calibrator $12.00. 6 meter Tecraft Converter Broadcast I.F. $18.00. Power Supply 110 V to 7V 7A $10.00. Send for list. Chris Williams, WA2CGL, Clinton Road, Hewitt, New Jersey.

TECH MANUAL: TM-11-601 covering BC-923-A receiver, BC-924-A transmitter. New. $2.20 POSTPAID. PAM Electronics, 2129-A E. Holt Ave., Milwaukee 7, Wis.

RECEIVERS: EXCELLENT CONDITION MILITARY HALLICRAFTER SX-28, 540kc-43MC $145, BC-348's $75, BC-342 $75, BC-779 $125. COMMAND SETS, all tubes, BC-453 $12, BC-455 $8, Tuning knobs 65c New 12V command receiver dynamotors $8.50. Command transmitter 3-4, 5.3-7 $6.50. Also, mounts, controls, and all kinds of plugs. Send needs. MD-7/ARC-5 modulators $5.50. BC-442 antenna changeover box $1.75. 85KC I.F.'s $1.25. FL-8 filters $2, BC-229 command receivers $12. URC-4 VHF-UHF walkie talkie $37.50, less battery. New Army TG-34 code machine, Tapes $27.50. Complete BC-221 frequency meter $65. COD's OK., all guaranteed. Bill Slep Company, Box 178A, Ellenton, Florida.

WANTED

WANTED: All types of communications receivers, transmitters, test equipment, teletype equipment, factory built amateur gear. Cash or trade for NEW HT-32, Valiant, Thunderbolt, SX-101, NC-303, Fisher HI-FI, etc. Write Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. (RIchmond 2-0048) Store: 60 Spring St., Newport, R. I. (VIking 7-3435, Fred W1JFF)

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-939A, 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: USED commercial broadcast transmitters in the 500 watt to 5000 watt range. Frequency ranges 1 mc to 150 mcs acceptable. Units By Collins and Gates particularly desirable. Commercial Power Amplifiers and power supplies also wanted. Write Box BB, CQ, 300 West 43rd Street, New York 36, N. Y.

WANTED: Military and Commercial laboratory test and measuring equipment. Electronicraft, Box 399, Mount Kisco, N. Y.

WANTED: Echophon Model EC-1A, EC-1. Fred Haines, Rual Ave., Lewisburg, Penna.

WANTED: 11 meter citizens band equipment. Bob Hartman, Dakota, Illinois.

WANTED: Tubes—special purpose and receiving. Top prices for Klystrons, Power Tubes, Thyratons, T. V. and Receiving Tubes. Tubes must be unused. Also communication equipment—aircraft and ground, Omnireceivers, Loran, VHF, Marker Beacon, Transceivers, Lab grade Test Equipment, Signal Generators, Oscillographs, Recorders or what have you. Box Sanett, W6REX, V&H Radio & Electronics, 2053 Venice Boulevard, Los Angeles 6, California.

INSTRUCTOGRAPHS WANTED: used, A.C. models, complete with tapes. For use in Amateur Radio class. State age, condition, and price. G. E. Taylor, VE3EDG, 2835 Isabella St., Ft. William, Ont., Canada.

WANTED: Gonset two or six meter communicator. Cash. Graham Company, Reading, Mass.

QSL

QSL's Samples 15¢. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSL's, SWL's, VHF's, XYL-OM's. (Sample assortment approx. 9¾¢.) Covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fatabulous, DX-attracting, prototypal, snazzy, unparagoned, cards. Rogers KØAAB 737 Lincoln Ave., St. Paul 5, Minn. Also glamorous, pulsating, super-passionate. (Wow!)

CREATIVE QSL CARDS. Personal attention given. Free samples and catalog. Bob Wilkins, Jr. Box 1064-2, Atascadero, California.

QSL's: Samples, dime. Print Shop, Corwith, Iowa.

GLOSSY 3 color QSL cards 100—$4.50. Free sampler. Rutgers Vari-Typing Service, 7 Fairfield Road, New Brunswick, N. J.

QSL-SWL: $1.00 per 100. Samples dime. Riesland W6HTN, Del Mar, Calif.

QSL's-SWL's, samples 10¢. Malgo Press, 1937 Glendale Avenue, Toledo 14, Ohio.

QSL's—"Brownie" W3CJI, 3110 Lehigh, Allentown, Pa. Samples, 10¢, with catalogue, 25¢.

QSL's-SWL's: High quality, reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams Street, Rutland, Vermont.

QSL's-SWL's: That are different, colored, embossed card stock, and "Kromekote." Samples 10c.. K8AIA, Box 953, Hamilton, Ohio.

QSL's-SWL's; $2.75 per 100, QSO file cards $1.00 per 100, Samples 10c. Rusprint, Box 7507, Kansas City 16, Missouri.

QSL's ??? LARGEST variety samples 25c (refundable). CALLBOOKS (fall) $5.00. Religious QSL samples 10¢. "Rus" Sackers, W8DED, Holland, Michigan.

QSL's, SWL's. Samples 10¢. Onondaga Press, Onondaga, Michigan.

QSL's, SWL's Samples 05¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix, Ariz.

QSL's SWL's Citizen Band. Paye, W4ZKK, 824 Avondale, Cocoa, Florida.

QSL's? Samples 25¢ (refundable). W6CMN, 6707 Beck Ave., North Hollywood, Calif.

QSL Card: Original designs by CREATIVE Artists. Send requests to: Acme Engraving Co., P. O. Box 2237, San Antonio 6, Texas.

QSL-SWL: 100 4-color $3.50. Others less. Glossy cards. Nice selection. Dick, W8VXK, 1018 Arthur, Mt. Pleasant, Michigan.

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QSL's: 500 cards $7.00. 100 special quality novice cards $3.00. Samples 25¢ (refundable). All orders plus tax postage. Gary Grant, K6QXZ, 3461 Angelus Ave., Glendale, Calif.

QSL's: Samples Free. Phillips, W7HRG, 1708 Bridge Street, The Dallas, Oregon.

SWAP or SELL

RADIO MAGAZINES. Buy, sell, trade. Bob Farmer, Plainview, Texas.

SWAP OR SELL: 400W Mobile SS Station, includes alternator, 3Ø supply, sideband rcvr, filter exciter, AB14X150-A's FS Meter, harness, ant, mike. R. Arcuri, W2KSV, 8 Linden Ave., Pelham, N. Y.

MISCELLANEOUS

HAMS: Learn Calculus or algebra. Powerful modern mathematics. Easy practical lessons, first four $1. Mathco, 4256-5 Minmor, Cincinnati 17, Ohio.

HAM Licenses, resident courses, Novice and General Classes 3 evenings weekly. Delehanty Institute, 117 East 11th St., New York City 3, N.Y. Tel. GR 3-6900.

MISCELLANEOUS (contd.)

SPEED TRAP [*from page* 41]

correct date, it would not be admsisible as evidence since it was hearsay. I would have to have Arvi in court in person. Since that would mean still another day's pay, I decided to decline, with thanks, the judge's offer to postpone the case to enable me to furnish direct proof that I was on the air at the time in question. Some impulse made me remark, "I have already won my case anyhow." The judge and the D. A. looked a little startled at that. (I think the motive must have been to needle the 100% D. A.)

I continued with my defense by explaining that the radar transmitter was a very weak broadcasting station and that the radar receiver was designed to receive signals bounced off the moving car, and that the time interval was a measure of distance and therefore speed.

I explained that the transmitter in my car was many times more powerful than the radar transmitter (I use an AF-67) and that therefore the radar receiver could have "read" the signals from my transmitter rather than from the radar transmitter.

At this point the D. A., seeing his fingers slip a little on his 100% record, required me to produce evidence that I was a radar expert as opposed to an electronic expert. For this I cited my work done on US Navy and Maritime vessels, supervising the installation and maintenance of shipboard radar units. He conceded the point.

He then asked (his voice rising higher and higher), "Do you mean to tell me that the Navy has to shut down all its radios when it is using radar?"

I replied, "Of course not, but then rarely does the Navy turn its radar on its own transmitting antennas."

His fingers loosened a bit more on his record. He then asked if I knew of any other method by which a radar could be made inaccurate due to outside influences. I cited Jamming as an example.

He shrugged his shoulders and sat down.

I then asked the court to dismiss on the grounds that the people had not produced prima facie evidence that the radar receiver had "read" the correct signal. The court dismissed on the grounds of reasonable doubt. ■

FPM-200 [*from page* 40]

As you can see, from this peek, the new FPM-200 uses some very new and startling innovations—particularly in the application of diodes and transistors. Judging from the interest that this unit has created, I believe it will be an exremely popular piece of equipment. ■

LETTERS [*from page* 22]

Hya Wayne:

Here are some photos that may be of interest to the gang. #1 is Rundy XV5A, who is not allowed on the air right now, but is still trying to get back on from Viet Nam. #2 Myself, Col. Hudson KR6QM and Maj. Mahler KR6OT on Okinawa. QM is the president of the Okinawa Amateur Radio Club and commanding officer of the Quartermaster Corps, OT is an old fishing buddy of mine. #3 Stopped off at Cocos Island just in time to meet VK9LE who was about to return to Perth. I picked up a QSL card for my SSB QSO with Lionel in December. Well Wayne, am going on a 20 day safari. Will stop at Durban, Pt. Elizabeth, Nairobi, Livingstone, etc.

73,
Dave Marks, W2APF

New Amateur Equipment

Portacab

Bud Radio, Inc., has a stylish, new cabinet dubbed the "Portacab." A new, lightweight, contoured cabinet, the Portacab is built to house any unit where highly stylized appearance is desirable. There is plenty of room inside, a large panel area and louvered sides for cooling where required. For more facts, gash A on page 126.

Hi-Power 5 Band Antenna

The General Crystal Company, Inc., HA-5F antenna is designed to handle the output of a 1KW SSB transmitter on 80,40,20,15 and 10 meters with a VSWR of better than 1.2:1 at the center frequency of each band. The VSWR is better than 2:1 within 100kc of resonance in any well erected installation. This antenna has an overall length, including insulators, of 111 feet. The feedline is 88 feet of Amphenol 14-023 72 ohm twinlead which is also rated at 1 KW. This antenna includes Hi-Power traps, feedline, copper wire and insulators, completely wired and ready for installation. It does not require tuning except in unusual locations or when one end of the antenna must be higher off the ground than the other. For more glorious details, obliterate B on page 126.

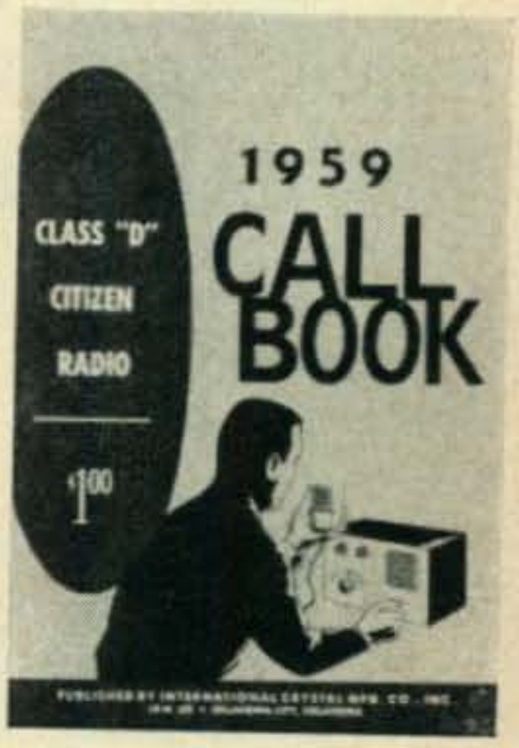
Trap

Heliwhip Dipole Antenna

Mark Mobile, Inc., has a new item to add to their line of heliwhip antennas for fixed and mobile applications. The Model HWD Heliwhip Dipole antennas are fiberglass molded dipoles with helical wound end loading sections. These units are available for 80 thru 10 meters, as well as the 11 meter citizens band. The new principle embodied in this series, utilizes helical wound sections so proportioned as to result in a current distribution on the shortened dipole, which is essentially uniform and which produces a 50 ohm match at the resonant frequency. For more dope, we advise that you gore C on page 126.

Citizens Band Callbook

International Crystal Mfg. Co., Inc., of Oklahoma City have a new callbook for the Class D boys. The listings in the book are in order of call letters (sequenced) much the same as the amateur callbook and give names and addresses in all 24 zones as well as some miscellaneous data including a list of citizens channels, districts map, antenna dope, message and radio codes and a copy of the FCC regulations. For further information, circle D on page 126.



Modulator for the Adventurer

Johnson has a small plug-in speech amplifier and modulator for the Viking Adventurer which nets for only $12.25. Installation is quite simple, plugs into the rear socket on the Adventurer. For more dope, digest E on page 126.

THE HAM SHOP

COMMAND SETS ♯106

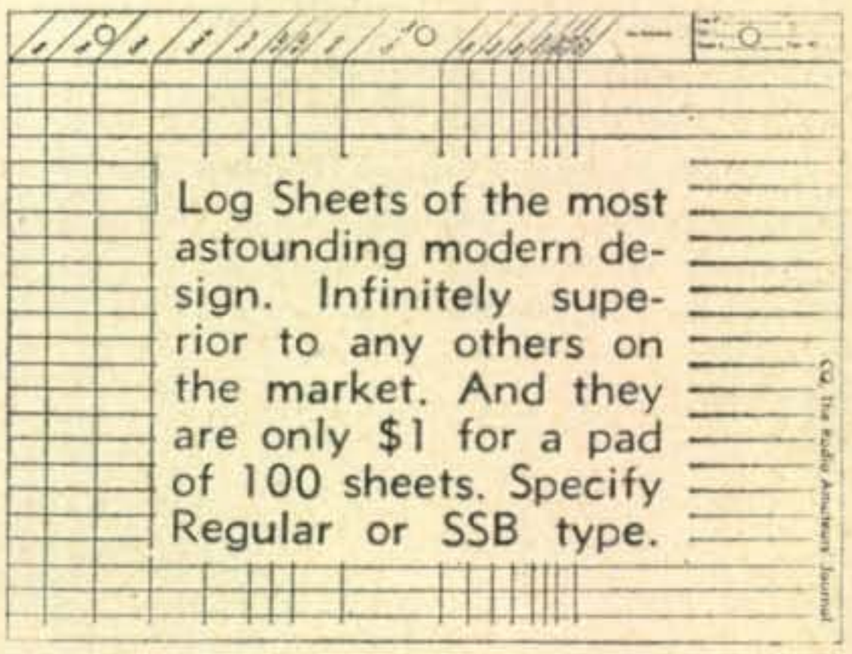
This IS a collection of reprints, containing all of the available information on the conversion of the popular "Command" transmitters and receivers into good ham transmitters and receivers. Invaluable for Novice, Technician, General, Advanced and Extra class operators. 136 fabulous amazing terrific pages for only $1.50 PPD.

MOBILE HANDBOOK ♯105

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.

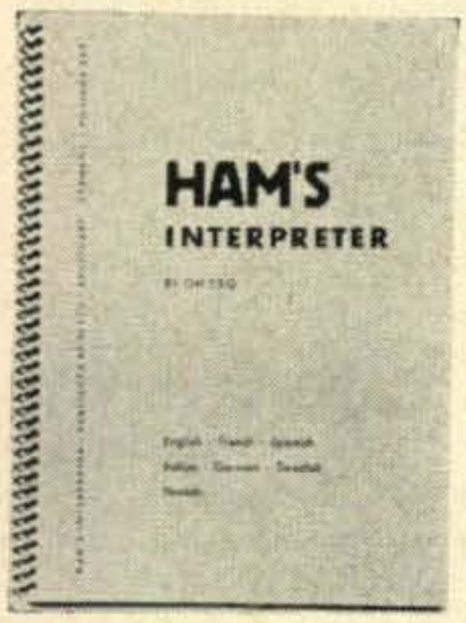
CODE RECORD ♯110

Learning code is a snap with this record. Speeds from 3 to 16 WPM, depending upon turntable speed. This 12" LP record has on it all you need to learn the code for both the Novice and General license. $3.50 each. ♯112 ➤



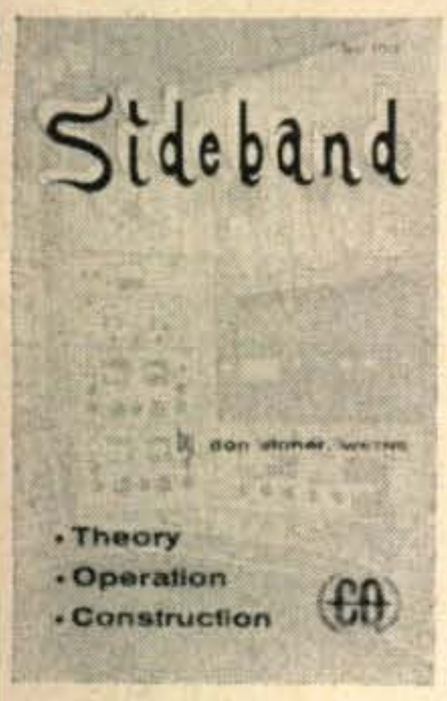
HAM'S INTERPRETER ♯109

Now you can talk in broken French, Spanish, Italian, German, Swedish and Finnish. This handy little book gives all the popular ham conversation in seven languages, including letters and numbers. Only $1.50 postpaid.



CQ ANTHOLOGY ♯102-1

We've looked back through the years 1945-1952 and assembled all in one piace the articles that have made a lasting stir. The issues containing most of these articles have long ago been sold out and are unavailable. The price is a paltry $2.00.



SIDEBAND HANDBOOK ♯103

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.

TVI HANDBOOK ♯99

W1DBM's newly written TVI book (no reprints) 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 Industrial, Medical and Utility TVI. $1.75 ppd. U.S.A., $2.00 foreign.

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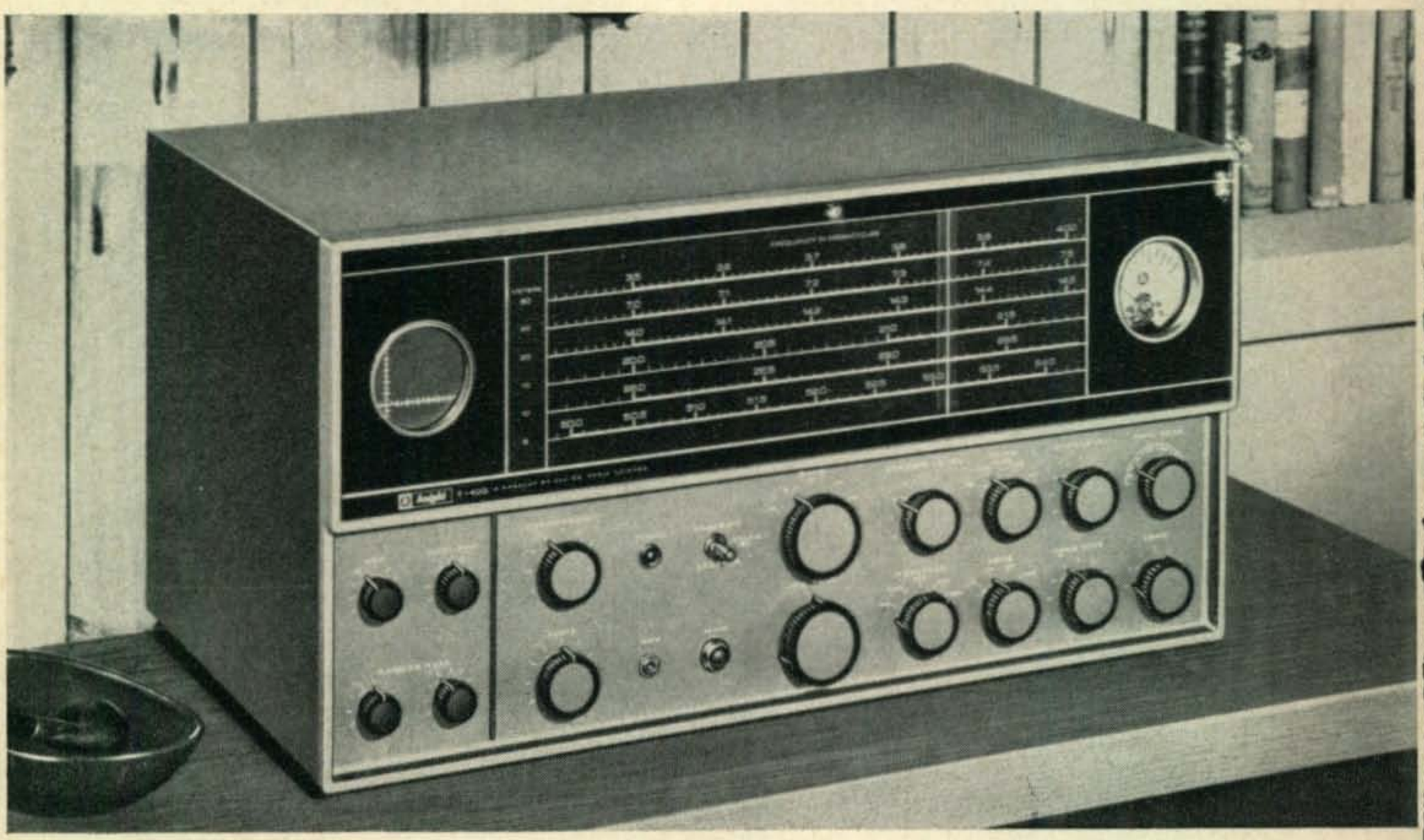
T-400 Deluxe Amateur 400-Watt Transmitter Kit



the world's finest build-your-own transmitter

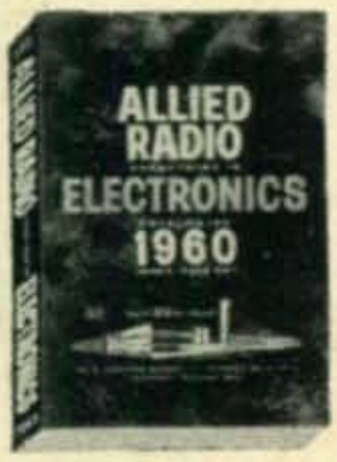
GREATEST VALUE EVER... *IT HAS EVERYTHING*

No other transmitter can give you so much for your money! Truly the answer to any Ham's dream, the new T-400 has what it takes to punch out a QRM-busting SSB, AM, or CW signal. 600 watts P.E.P. input on SSB...400 watts on AM and CW. It's the only rig of its kind that offers so much power and so much versatility in a single cabinet. Covers 80, 40, 20, 10, and 15 or 6 meter bands. Start with the basic CW kit...you can add the AM and SSB accessory units and other "add-ins" whenever you wish. The T-400's built-in VFO is of the heterodyne type...your assurance of a signal that "stays put". The tremendous 14-inch dial is precision-calibrated for all bands from 80 through 6 meters. Phone features include front-panel controls for VOX and anti-trip as well as adjustable speech compression. Smooth, chirpless screen-clamp keying, plus VFO keying for complete CW break-in. There's plenty of drive on all bands. The 7034/4X150A final coasts along at well within its CCS ratings...the silicon rectifier power supply runs "cool as a breeze" under the most grueling operating conditions. A superb transmitter in a class by itself!

400-WATT CW TRANSMITTER KIT ONLY.....**$395.00...*only $10.00 down***

"Add-In" Accessories: SSB Generator Kit, $69.95 ... AM Modulator Kit, $24.95 ... Speech Amplifier Kit, $9.95... Monitor Scope Kit, $37.95...6-Meter Conversion Kit, $7.50.

Available February, 1960...reserve your T-400 now!



For a detailed description of this superb Knight-Kit Transmitter, see your 1960 Allied Catalog. If you haven't a copy, write for it today.

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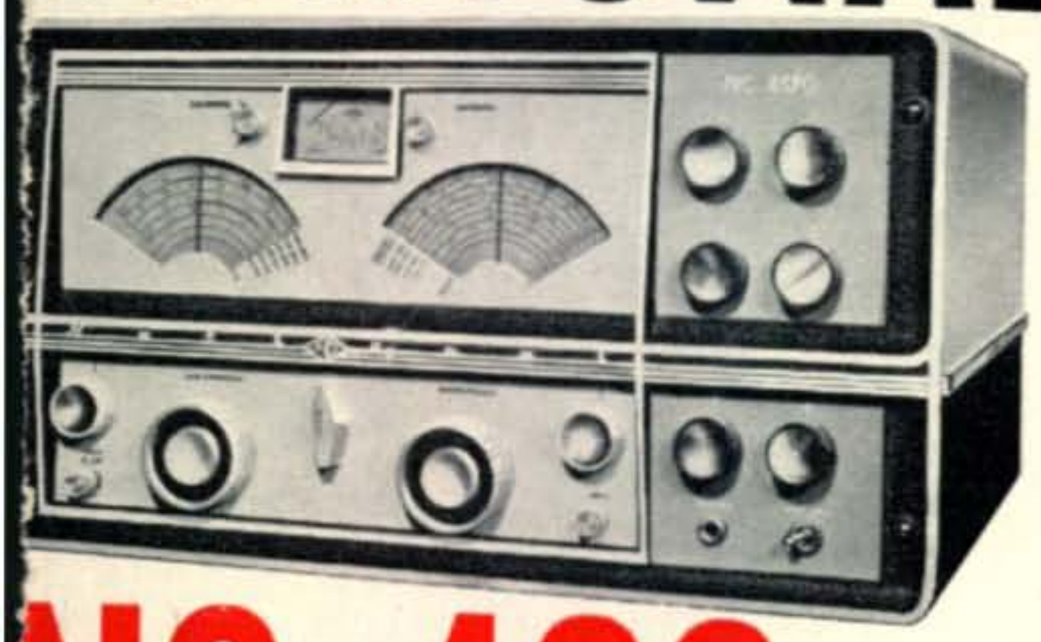
100 N. Western Ave., Chicago 80, Ill.

For further information, check number 62 on page 126.

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.

For further information, check number 2 on page 126.

BURTON BROWNE/New York

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.

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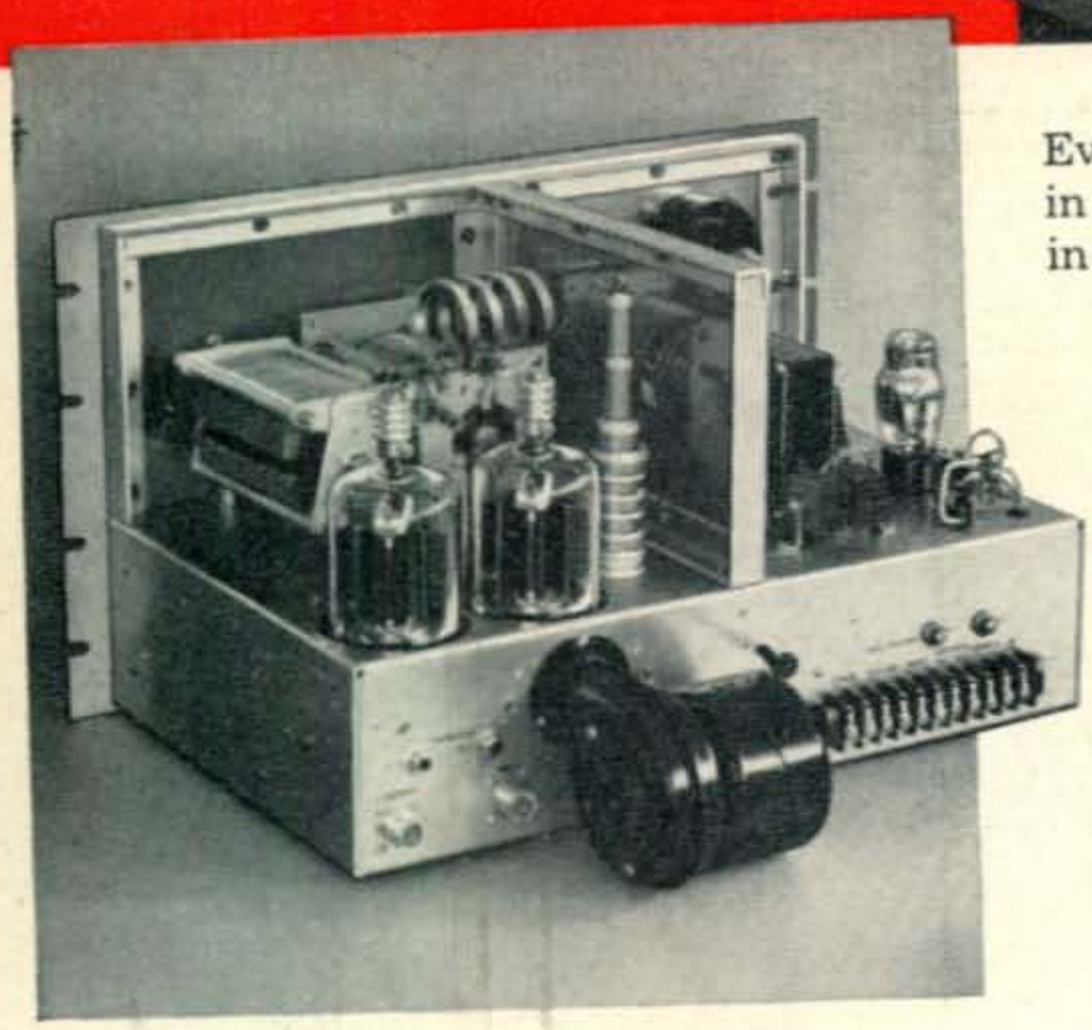
The compact RCA-7094 High-Perveance Beam Power Tube. Plate Input: 500 watts, CW; 400 watts, SSB; 335 watts, AM-phone.

W8GRY's High-Power Linear in QS

...uses RCA-7094 Beam Power Tubes in Parallel

Edward S. Noel, W8GRY, author of the QST article "An 800-watt P.E.P. Input Linear."



Everywhere you turn these days you see more and more RCA- in high-power equipment. Says W8GRY about his 800-watt lin in QST, July 1959:

"Here is an 800-watt linear amplifier that takes advantage o new RCA-7094 beam power tubes. It is about as simple as two-tube, high-power amplifier can be, since there is no tu input circuit, and no neutralization."

And QST adds this:

"Because of its low driving-voltage requirements, the 709- lends itself well to resistive broad-band circuits. As a resul stability can be obtained with circuit simplicity."

Capable of putting more watts into the load for a given pla supply voltage than any beam power tube of equivalent po rating, RCA-7094 will handle up to 500 watts on CW—*with plate voltage of only 1500 volts.* An RCA-5763 drives it to f power output easily.

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