September 1958 50c

CQ

K2KGJ's Telrex Antenna Forest

The Radio Amateur's Journal

Collins

KWM-1

mobile/fixed SSB transceiver for

MAXIMUM VERSATILITY

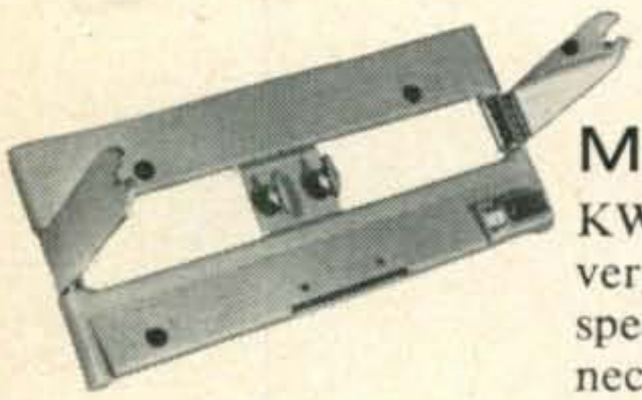
Power
The KWM-1 is the most versatile rig available with 175 watts PEP input on SSB and 160 watts on CW.

Mobile
The most compact unit available for mobile operation with anywhere near the power — the only one available for SSB.

Fixed Operation
Takes very little space — includes receiver and transmitter — costs less than two separate, comparable units.

Novice
Plug-in adapter available to operate the KWM-1 as a crystal-controlled Novice rig. When your General Class license arrives, just slide in the normal crystal box and you're set for regular VFO operation.

Operational Features
Receiver and transmitter tuned to same frequency always — no need for zeroing in. Switch deck on Exciter Tune control will control remote antenna switching relays when changing bands. Only 7 db less output than a kilowatt (one S unit). Crystal switch, automatic antenna switching, control and frequency scales on PA Load and Tune controls make bandswitching easy — even when mobile — no need to get out of the car. Most inexpensive way to have 175 watts mobile AND fixed.



Mobile Mount
KWM-1 slides in and out very easily with power, speaker and antenna connecting automatically.

DC Power Supply
Completely transistorized. Minimum maintenance. Provides all voltages from 12 volt system. 85% over-all efficiency.

AC Power Supply
Very compact unit supplies all voltages for KWM-1.

DX Conversion Adapter
This box replaces the normal crystal box in the front panel. Provides up to 7 transmitting frequencies within the band and allows reception over a 100 kc band in or out of the band. An export model available with transmitting frequencies outside band. This box and normal crystal box easily interchange for switching back and forth.

Extra Crystal Boxes
These can be obtained with crystals for operation anywhere in the 14 to 30 mc band. Also available for crystal-controlled transmitter for Novice operation. Power is easily reduced to conform with Novice power regulation.

Speaker Console
Contains a 5x7 inch speaker, phone patch and directional wattmeter to give the fixed station that finished touch.

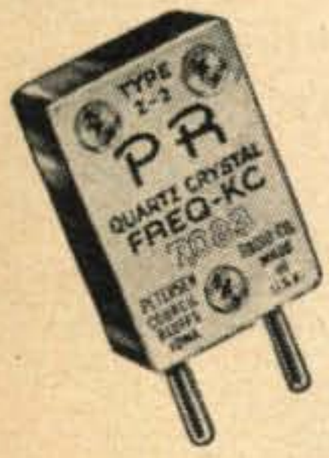
Collins CREATIVE LEADER IN COMMUNICATION

COLLINS

For further information, check number 1 on page 126.

There's a PR for every Service!

AMATEUR



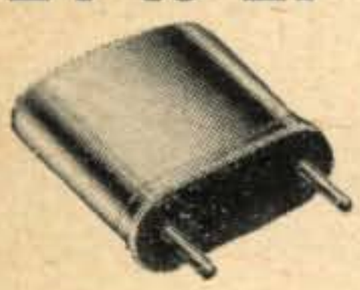
40, 80 and 160 Meters, PR Type Z-2

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

20 Meters, PR Type Z-3

Third overtone oscillator. Low drift. High activity. Can be keyed in most circuits. Fine for doubling to 10 and 11 meters or "straight through" 20 meter operation; ±500 cycles.....**$3.95 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

50 to 54 Mc., PR Type Z-9A

Third overtone; for operating directly in 6-meter band; hermetically sealed; calibrated 50 to 54 mc., ±15 kc.; .050" pins.

$6.95 Net

SPECIAL TYPES

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

Type Z-1, AIRCRAFT

3023.5 Kc., .005%.....**$3.45 Net**

Type Z-1, MARS and CAP

Official assigned transmitter frequencies in the range.

Calibrated to .005%. 1600 to 10000 Kc. **$3.45 Net**

Type Z-6A FREQUENCY STANDARD

To determine band-edge. To keep the VFO and receiver properly calibrated.

100 Kc. . . . . **$6.95 Net**

PR PRINTED OSCILLATOR KIT

Has many uses—

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

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

Each . . . . . **$4.50 Net**

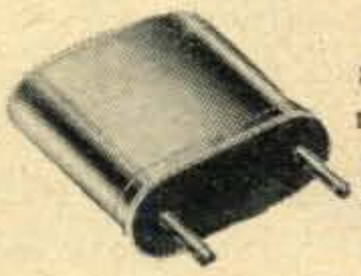
Type 2XP

Suitable for converters, experimental, etc. Same holder dimensions as Type Z-2.

1600 to 12000 Kc. (Fund.) ±5 Kc. . . . **$3.45 Net**

12001 to 25000 Kc. (3d Mode) ±10 Kc. . . . **$4.45 Net**

VHF Type Z-9R, Aircraft



For Lear, Narco and similar equipment operating in the 121 Mc. region, requiring crystals in 30 Mc. range.

Each . . . . . **$4.95 Net**

Type Z-9A RADIO CONTROLLED OBJECTS

27.255 Mc., .04% . . . **$3.95 Net**

Type Z-1 TV Marker Crystals

Channels 2 through 13 . . . . . **$6.45 Net**

3100 Kc. . **$2.95 Net**

4100 Kc. . **$2.95 Net**

4.5 Mc. Intercarrier, .01% . . . **2.95 Net**

5.0 Mc. Sig. Generator, .01% **2.95 Net**

10.7 Mc. FM, IF, .01% . . . **2.95 Net**

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

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For further information, check number 3 on page 126.

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department editors

Tom Aalund, K2VBI *overseas publications*
Bob Adams, W3SW *sideband*
Frank Anzalone, W1HY *contest calendar*
Don Chesser, W4KVX *dx*
Ken Grayson, W2HDM *surplus*
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Norman McLaughlin, W3LNT *grounded grids*

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

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

CQ CERTIFICATES:

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

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

TECHNICAL INFORMATION:

Please check the 11-year cumulative index which was published in the January 1956 CQ for information about articles in past issues of CQ. The December 1956 and 1957 CQ yearly indexes will bring you up to date. Most back issues are available at 50c from us. Check our "Back Issue" ad for details on those not available. Reprints of the Cumulative Index are available free. For further information see the Ham Clinic column.

DISCLAIMER:

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

For further information, check number 4 on page 126.

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HEATH *hams work to bring you*


CHUCK K8CJI

ROGER MACE (W8MWZ)
SENIOR HAM ENGINEER
HEATH COMPANY

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

HEATHKIT 50-WATT CW TRANSMITTER KIT

MODEL DX-20

$35.95

If high efficiency at low cost in a CW transmitter interests you, you should be using a DX-20! It employs a single 6DQ6A tube in the final Amplifier stage for plate power input of 50 watts. The oscillator stage is a 6CL6, and the rectifier is a 5U4GB. Single-knob band-switching is featured to cover 80, 40, 20, 15, 11 and 10 meters, and a pi network output circuit matches antenna impedances between 50 and 1000 ohms to reduce harmonic output. Designed for the novice as well as the advanced class CW operator. The transmitter is actually fun to build, even for a beginner, with complete step-by-step instructions and pictorial diagrams. All the parts are top-quality and well rated for their application. "Potted" transformers, copper-plated chassis, and ceramic switch insulation are typical. Mechanical and electrical construction is such that TVI problems are minimized. If you desire a good clean CW signal, this is the transmitter for you! Shpg. Wt. 19 lbs.

HEATHKIT "APACHE" HAM TRANSMITTER KIT

- Newly Designed VFO—Provision For S.S.B. Adapter
- Modern Styling—Rotating Slide Rule Dial

MODEL TX-1 **$229.50**

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

Fresh out of the Heath Company laboratories, the brand-new "Apache" model TX-1 Ham Transmitter features modern styling and is designed as a handsome companion to the also-new Heathkit "Mohawk" receiver. The "Apache" is a high quality transmitter operating with 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, the "Apache" features built-in switch selected circuitry providing for single-sideband transmission through the use of a plug-in external single-sideband adapter. These Heathkit adapters will be available in the near future. A compact, stable and completely redesigned VFO provides low drift frequency control necessary for single-sideband transmission. An easy-to-read slide rule type illuminated rotating VFO dial with vernier tuning provides ample bandspread and precise frequency setting. Simple band-switching control allows flip-of-the-wrist selection of the amateur bands on 80, 40, 20, 15 and 10 meters (11 M with crystal control). The "Apache" features adjustable low level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL-34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation.

The final amplifier is completely enclosed in a perforated aluminum shielding for greater TVI protection and transmitter stability. Cabinet comes completely preassembled with top hatch for convenient access without taking chassis out of cabinet. Die-cast aluminum knobs and front panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. Incorporates all the refinements necessary with many "plus" features for effective and dependable communications. Shpg. Wt. 115 lbs.

...top quality at lowest prices!

HEATHKIT "MOHAWK" HAM RECEIVER KIT

- All Critical Circuits Prewired and Aligned
- Crystal Controlled Oscillators for Drift-Free Reception

MODEL RX-1 **$274.95**

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

Outstanding results can be expected with the new "Mohawk" receiver which is designed to combine all the necessary functions required in a high quality communications receiver. A perfect companion for the Heathkit "Apache" transmitter, the "Mohawk" features the same wide-band slide rule type vernier tuning and covers all of the amateur bands from 160 through 10 meters on seven bands with an extra band calibrated to cover 6 and 2 meters using a converter. External receiver powered, accommodations are available for these converters which will be available in Heathkits soon. The "Mohawk" is specially designed for single-sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled, wired and aligned front end assures ease of assembly. All critical wiring is done for you insuring top performance. This 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc. Five selectivity positions from 5 kc to 500 CPS. A bridged T-notch filter is employed for maximum heterodyne rejection. Complete accuracy is obtained with the use of a built-in 100 kc crystal calibrator and the set features 10 db signal-to-noise ratio at less than 1 microvolt input. S-meter and many other fine features built-in for top-notch signal reception. Shpg. Wt. 90 lbs.

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

HEATHKIT PHONE & CW TRANSMITTER KIT

MODEL DX-40

$64.95

The DX-40 incorporates the same high quality and stability as the DX-100, but is a lower powered rig for crystal operation, or for use with an external VFO. Plate power input is 75 watts on CW, permitting the novice to utilize maximum power. An efficient, control-carrier modulator for phone operation peaks up to 60-watts, so that the rig has tremendous appeal to the general class operator also. Single-knob switching covers 80, 40, 20, 15, 11 and 10 meters. Pi network output coupling makes for easy antenna loading, and pi network interstage coupling between the buffer and final amplifier improves stability and attenuates harmonics. A line filter is incorporated for power line isolation. The efficient oscillator and buffer circuits provide adequate drive to the 6146 final amplifier from 80 to 10 meters, even with an 80-meter crystal. A drive control adjustment is provided, and the function switch incorporates an extra "tune" position so that the buffer stage can be pretuned before the final is switched on. A switch selects any of three crystals, or a jack for external VFO. High quality D'Arsonval meter for tuning. Shpg. Wt. 26 lbs.

HEATHKIT DX-100 PHONE & CW TRANSMITTER KIT

MODEL DX-100

$189.50

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

You get more for your transmitter dollar when you decide on a DX-100 for your ham shack! Recognized as a leader in its power class, the DX-100 offers such features as a built-in VFO, built-in modulator, TVI suppression, pi network output coupling to match a variety of antenna impedances from 50 to 600 ohms, pi network interstage coupling, and high quality materials throughout. Copper plated 16-gauge steel chassis, ceramic switch contacts, etc., are typical of the kind of parts you get, in assembling this fine rig. The DX-100 covers 160, 80, 40, 20, 15, 11 and 10 meters with a single bandswitch, and with VFO or crystal operation on all bands. RF output is in excess of 100 watts on phone and 120 watts on CW, with a pair of 6146 tubes in parallel for the final amplifier, modulated by a pair of 1625 tubes in parallel. VFO tuning dial and panel meter are both illuminated for easy reading, even under subdued lighting conditions. Attractive front panel and case styling is completely functional, for operating convenience. Designed exclusively for easy step-by-step assembly. No other transmitter in this power class combines high quality and real economy so effectively. Here is a transmitter that you will be proud to own. Time payments are available! Shpg. Wt. 107 lbs.

more fine ham gear from the pioneer

HEATHKIT GRID DIP METER KIT

A Grid Dip Meter is basically an RF Oscillator used to determine the frequency of other Oscillators, or tuned circuits. Numerous other applications such as pretuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, designing new coils, etc. Features continuous frequency coverage from 2 MC to 250 MC, with a complete set of prewound coils, and a 500 ua panel meter. Has sensitivity control and a phone jack for listening to the "Zero-Beat". It will also double as an absorption-type wave meter. Shpg. Wt. 4 lbs.

MODEL GD-1B

$21.95

Low frequency coil kit: two extra plug-in coils extend frequency coverage down to 350 KC.
Shpg. Wt. 1 lb. No. 341-A **$3.00**

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

HEATHKIT ALL-BAND COMMUNICATIONS-TYPE RECEIVER KIT

Ideal for the short wave listener or beginning amateur, this Receiver covers 550 KC through 30 MC in four bands. It provides good sensitivity and selectivity, combined with fine image rejection. Amateur bands are clearly marked on the illuminated dial scale. Features transformer type—power supply—electrical band spread—antenna trimmer—separate RF and AF gain controls—noise limiter—internal 5½" speaker—head phone jack and AGC. Has built-in BFO for CW reception. An accessory power socket is also provided for connecting the Heathkit model QF-1 Q Multiplier. Will supply 250 VDC at 15 ma and 12.6 VAC at 300 ma. Shpg. Wt. 12 lbs.
Cabinet: Fabric covered cabinet with aluminum panel as shown part 91-15A. Shpg. Wt. 5 lbs. **$4.95**

MODEL AR-3

$29.95

ALL-BAND RECEIVER

HEATHKIT ELECTRONIC VOICE CONTROL KIT

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

MODEL VX-1

$23.95

ELECTRONIC VOICE CONTROL

HEATHKIT "Q" MULTIPLIER KIT

This fine Q Multiplier is a worthwhile addition to any communications, or Broadcast Receiver. It provides additional selectivity for separating signals, or will reject one signal and eliminate a hetrodyne. Functions with any AM Receiver having an IF frequency between 450 and 460 KC that is not AC-DC type. Operates from your Receiver power supply, and requires only 6.3 VAC at 300 ma (or 12.6 VAC at 150 ma), and 150 to 250 VDC at 2 ma. Simple to connect with cable and plugs supplied. Effective Q of approximately 4000 for sharp "peak" or "null". A tremendous help on crowded phone or CW bands. Shpg. Wt. 3 lbs.

MODEL QF-1

$9.95

"Q" MULTIPLIER

NOTE: $10.65 WHEN ORDERED WITH AR-3 BECAUSE OF EXCISE TAX.

...in do-it-yourself electronics!

HEATHKIT "AUTOMATIC" CONELRAD ALARM KIT

Designed to give instant warning whenever a monitored station goes off the air, the CA-1 automatically cuts the AC power to your transmitter, and lights a red indicator. Works with any radio receiver; AC-DC—transformer operated—battery powered, so long as the receiver has AVC. A manual "reset" button is provided to reactivate the transmitter. Incorporates a heavy-duty 6-ampere relay, a thyratron tube, and its own built-in power supply. A neon lamp shows that the alarm is working. Simple to install and connect with complete instructions provided for assembly and operation. Shpg. Wt. 4 lbs.

MODEL CA-1

$13.95

"AUTOMATIC" CONELRAD ALARM

HEATHKIT VARIABLE FREQUENCY OSCILLATOR KIT

Enjoy the convenience and flexibility of VFO operation by obtaining this fine variable frequency oscillator. It covers 160-80-40-20-15-11 and 10 meters with three basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Requires 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a, available on most transmitters. It features voltage regulation for frequency stability, and has illuminated frequency dial. VFO operation allows you to move out from under interference and select the portion of the band you want to use without having to be tied down to only 2 or 3 frequencies through the use of crystals. "Zero in" on the other fellows signal and return his CQ on his own frequency! Shpg. Wt. 7 lbs.

MODEL VF-1

$19.50

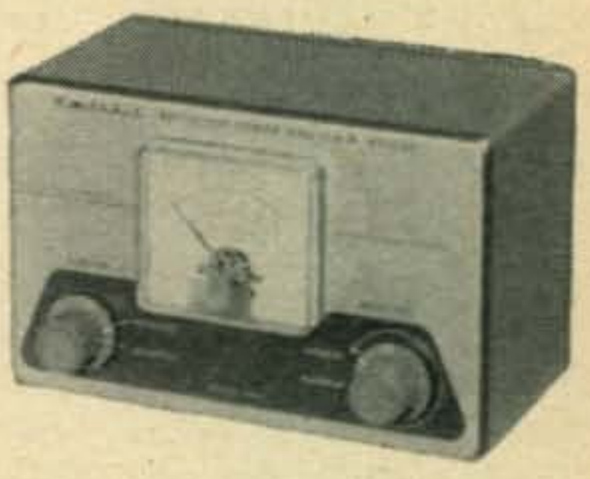
VARIABLE FREQUENCY OSCILLATOR

HEATHKIT REFLECTED POWER METER KIT

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

MODEL AM-2

$15.95



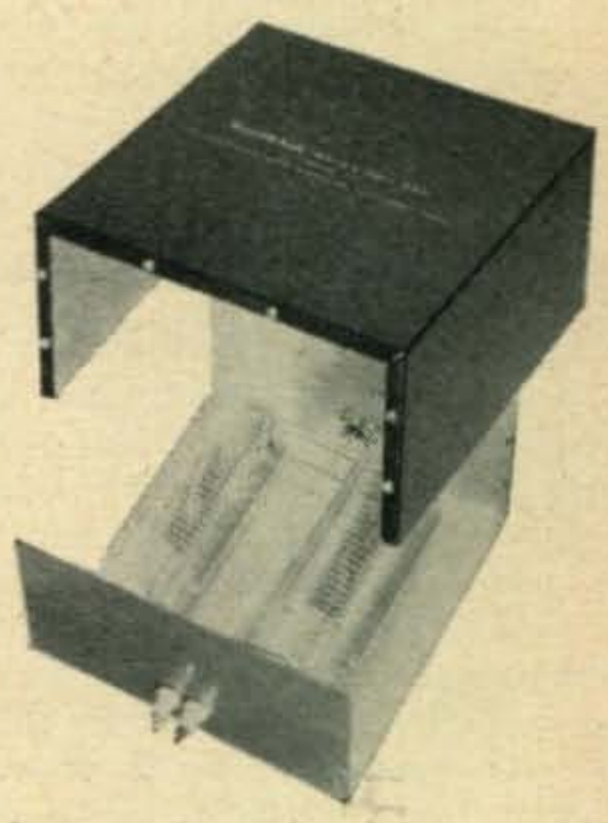
REFLECTED POWER METER

HEATHKIT BALUN COIL KIT

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

MODEL B-1

$8.95



BALUN COIL

save ½ or more . . . with HEATHKITS

FREE 1958 Catalog

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

☐ Rush Free 1958 catalog.

HEATH COMPANY

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

name _____

address _____

city & state _____

QUAN.	ITEM	MODEL NO.	PRICE

$_____ enclosed. Parcel post, include postage—express orders are sent shipping charges collect. All prices quoted are Net F.O.B. Benton Harbor, Mich. and apply to Continental U.S. and Possessions only. All prices and specifications subject to change without notice.

For further information, check number 5 on page 126.

. . . de W2NSD

never say die

The Ham Hop Club

This is a formalization of the traditional ham hospitality which you run into all over the world. A couple of fellows over in England started the whole thing and it is gathering forces quite rapidly.

It goes like this. First you send in a dollar to join the club and get registered with them. Then, when you are planning a trip the club will arrange for you to visit hams in the country you are visiting. These hams will put up you and your family, room and board. In return you must be willing to extend the same courtesy to visiting foreign hams. This certainly looks like a fine idea and it should considerably economize a trip abroad plus putting you in touch with people who can show you around and make your trip more fun. It should be a lot of fun to meet the DX boys when they come to the States too and introduce them to family living instead of a hotel.

This is a new club and is just getting started in this country, though it is well along in Europe. The Ham Hop U.S.A. rep is John Alley, W1DMD, Taunton Street, Box 298, Middleboro, Mass. Johnny is looking for hams interested in being reps in the other nine call areas.

CQ YL

Louisa sent up a copy of her new book, "CQ YL" and I must say that it makes fascinating reading. I'm the sort who reads picture books real well and this one is packed with my most favorite sort of pictures: YL's. But then, lest you be led astray, I must edify a bit and explain that Louisa goes into every phase of YL hamming: VHF, DX'ing, old time YL ops, the YLRL, young YLs, handicapped YLs, DX YLs. . . .

The book is a must for all YLs and for those OMs that are interested in YLs . . . that takes care of everybody, eh? Book costs $3.50 from Louisa, but then she'll probably drop a clue in her column about it.

VHF Bands

Just a little note of further information on the limitations of the new sharing deal on the VHF's wherein amateurs must share all of our VHF bands above two meters with the government. Well, we share it as long as we don't create any interference to the government. Recent articles in *Electronics* point out that the government is going to higher and higher powers on these channels to extend the ranges of their equipment. They are using 7-10 megawatts, and even as high as 21 megawatts, to get some range while we are held down to unpulsed 1 kilowatt powers, and even down to 50 watts unpulsed on 420-450 mc.

California Kilowatts

Several of the California RF factories have been shut down for six months as a result of a recent crackdown. Since there had been no enforcement of the one kilowatt legal maximum regulation and its fracture was a matter of common knowledge rigs of higher and higher power had become pretty common.

The FCC inspections left the multi-kilowatt contingent of our hobby shaking in their boots, wondering what was coming next. Sources in the FCC claim that the crackdown was strictly local and was not part of any overall plan.

So, crank the variac down on those 4-1000A's men, and try going it legally. You may inch your way up the DX lists a little bit slower, but you will be able to look everybody in the eye at the next club meeting when you mention a new one you've hooked.

Navassa Story

The Navassa story, KC4AF, in the June CQ was a highly condensed affair due to the space limitations of CQ. Don Chesser, W4KVX, our DX Editor, has been running a full account of the trip in his weekly Ohio Valley DX Bulletin, and the story is indeed an interesting and exciting one. He has been able to go into a lot of segments of the trip that I had to leave out entirely. By running a couple pages serialized in each issue he has overcome the space limitations and has come up with a swell yarn.

The bulletin is available on a subscription basis from Don, as mentioned in his column.

Cameras

The movies of the KC4AF expedition turned out quite well and our preliminary showing at the Dayton Hamvention was a hit. I will be glad to bring the films along with me to con-

[*Continued on page 18*]

FCV-2 CONVERTER

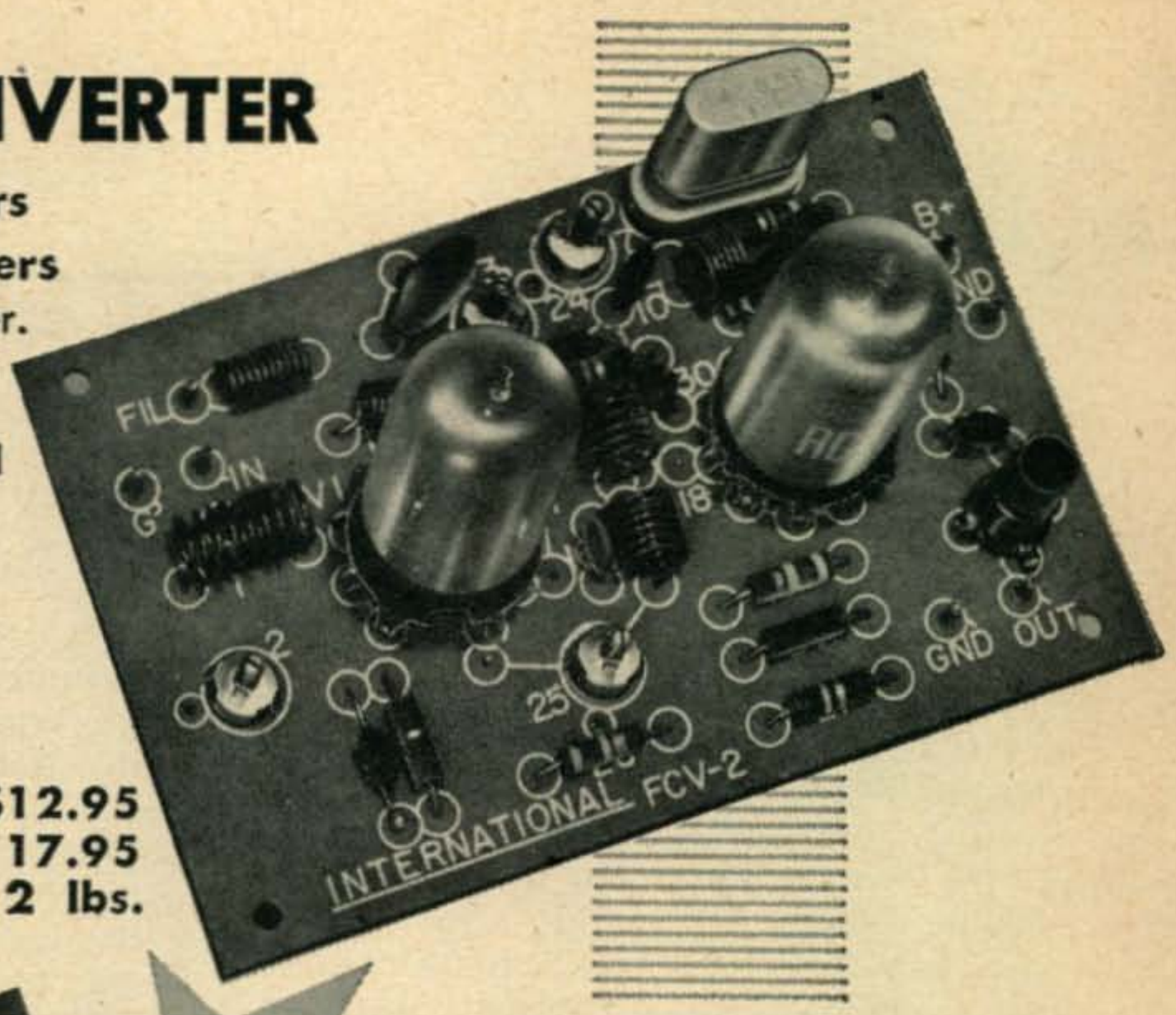
- **Model 50 - 6 Meters**
- **Model 144 - 2 Meters**

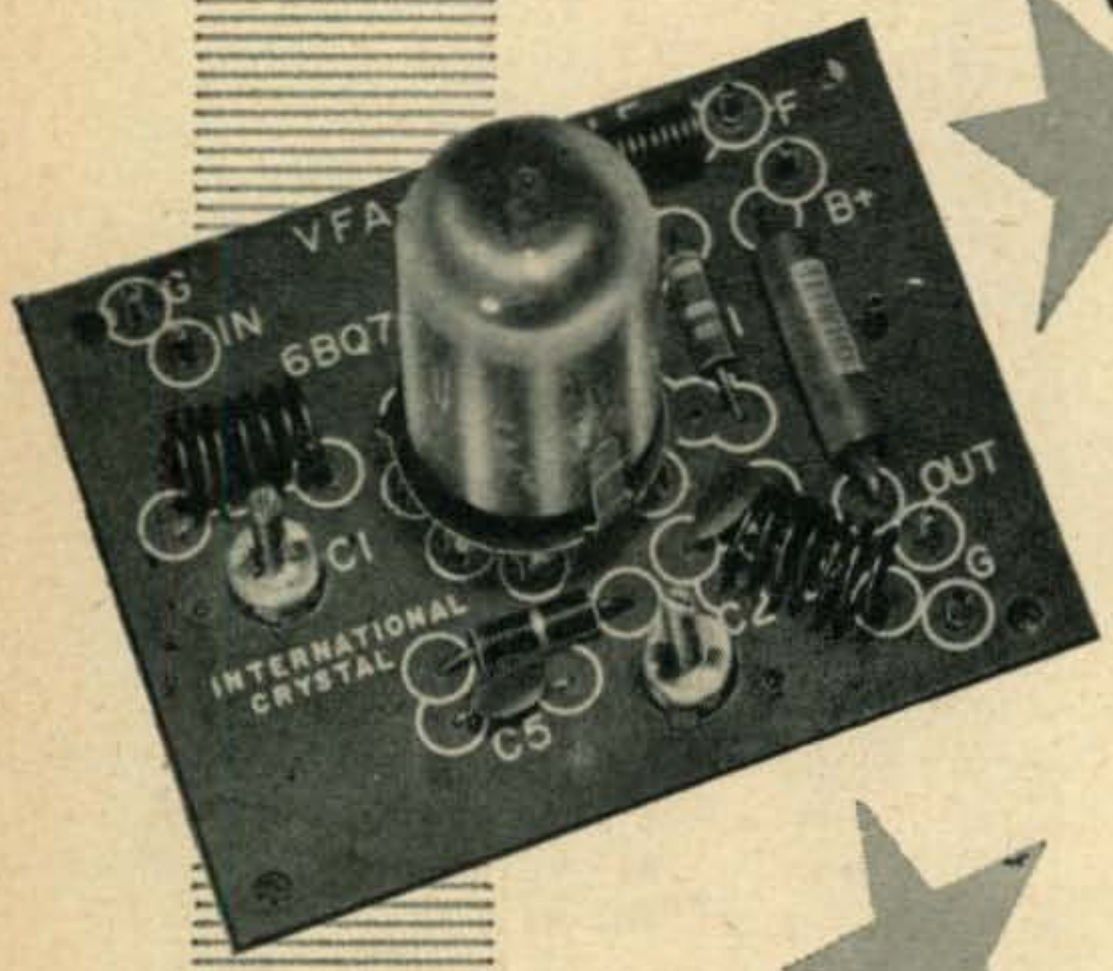
A 6U8 tube is used as oscillator-mixer. Cascode r-f amplifier using 6BQ7A. IF outputs available from broadcast band through 30 MC. (Two standard IFs are available, 600-4600 KC, 7-11 MC; others on request)

Designed to mount in a standard 3″ x 4″ x 5″ minibox.

PRICES

Kit with crystal (less tubes)	$12.95
Wired with crystals and tubes	17.95
Shipping Weight	2 lbs.





VFA-1 CASCODE PRE-AMPLIFIER

For 2 Meters and 6 Meters, using the 6BQ7A in a low noise circuit. Designed to mount in a standard 3″ x 4″ x 5″ minibox.

PRICES

Kit, less tubes	$ 4.75
Wired, with tubes	6.95
Shipping Weight	2 lbs.

IFA-10 AMPLIFIER

For use between converter and receiver. Uses 6AH6 type tube. Available for I-F ranges from broadcast band through 30 MC. Designed to mount in a standard 3″ x 4″ x 5″ minibox. (Specify range when ordering).

Kit, less tube	$ 5.75
Wired, with tube	8.50
Shipping Weight	2 lbs.

HOW TO ORDER

Please supply sufficient information with order to facilitate accurate processing. Shipments are made on open account F. O. B. Oklahoma City when credit has been approved. On C. O. D. orders of $25.00 or over, 1/3 down payment with order is required. Kindly include in check or money order sufficient postage and insurance for your Parcel Post Zone.

Shipping weight each unit 2 lbs.

Zone		Postage
1 x 2	(to 150 miles)	.27
3	(150-300 miles)	.29
4	(300-600 miles)	.31
5	(600-1000 miles)	.36
6	(1000-1400 miles)	.40
7	(1400-1800 miles)	.46
8	(Over 1800 miles)	.51

Insurance—Add 10c for up to $10.00 value; 20c for up to $25.00 value.

Write for COMPLETE CATALOG

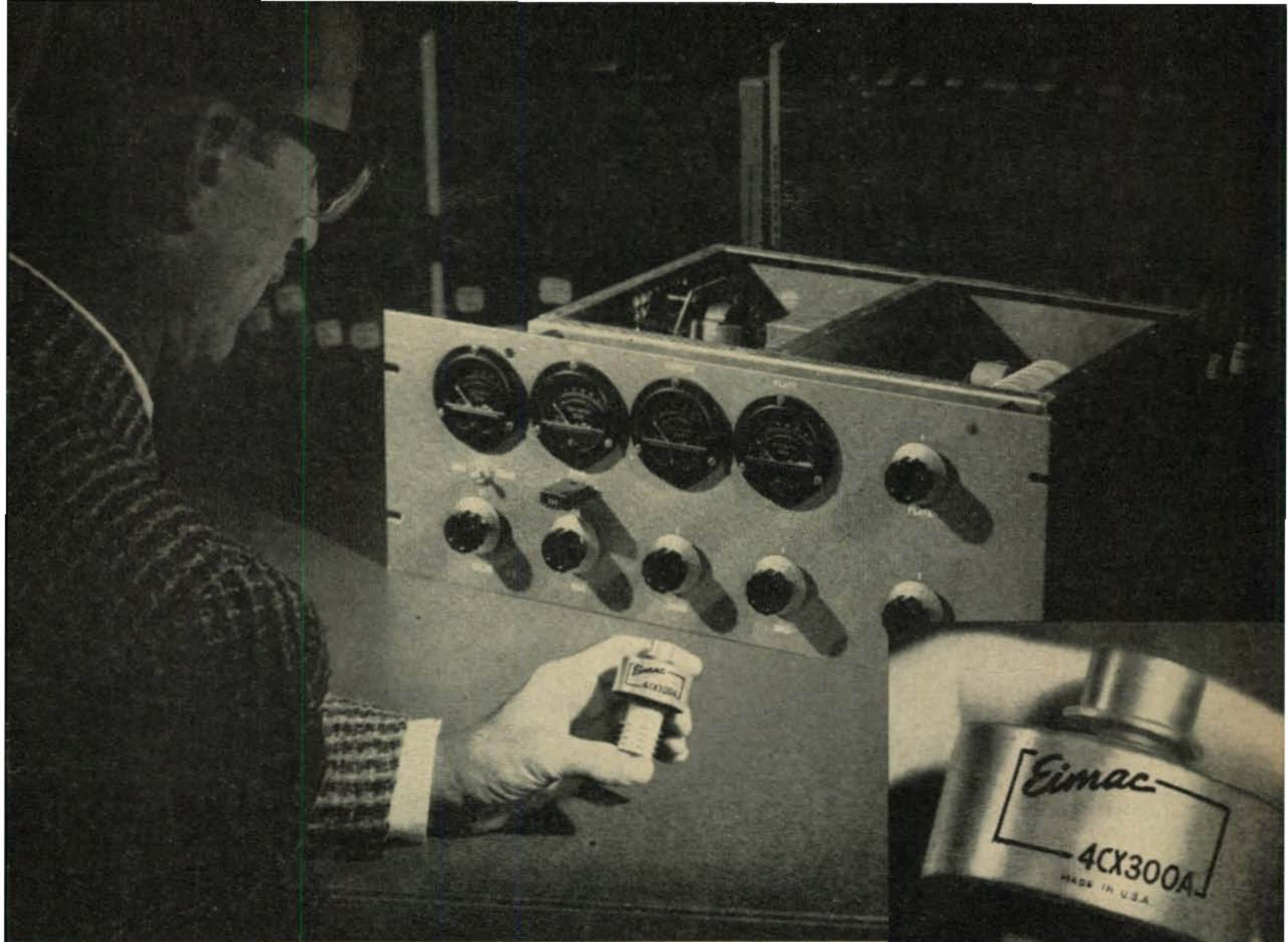
International
CRYSTAL MFG. CO., INC.

18 N. LEE . PHONE RE 6-3741 OKLAHOMA CITY

For further information check number 6 on page 126.

For further information, check number 7 on page 126.→

For further information, check number 8 on page 126.



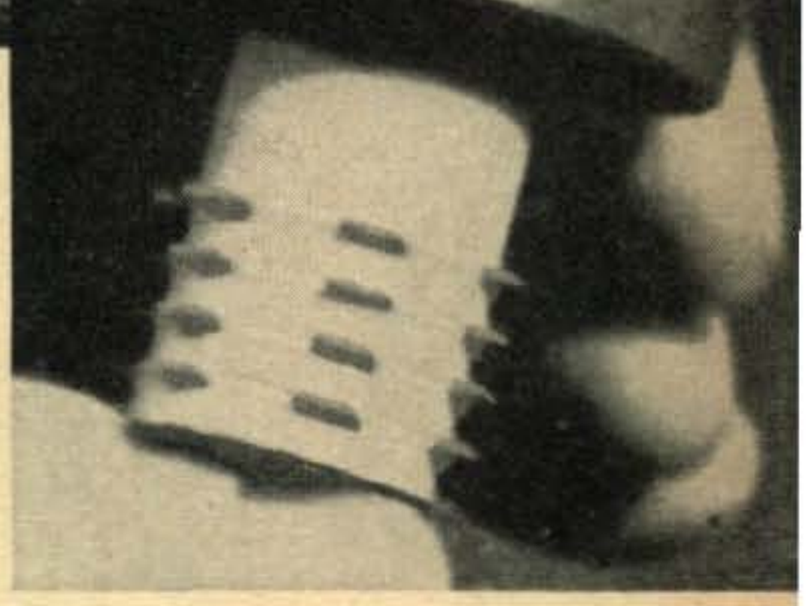
Compact, Powerful 6-Meter Rig Uses Eimac Ceramic 4CX300A

Here is a compact transmitter that puts out a big signal on 6 meters using a single Eimac 4CX300A in the final. Built by W6KEV, this potent handful has been on the air for over two years, logging DX contacts in Asia, Japan, Hawaii, New Zealand, Australia, Southern Rhodesia, and Cuba, as well as the United States and Canada.

An Eimac ceramic-metal 4CX300A was chosen by W6KEV for use as a "straight-through" final amplifier in this 6-meter rig. The compact 4CX300A is conservatively rated at 625 watts CW input and 300 watts AM phone input. At maximum rated CW input the measured output power of this transmitter is 425 watts, thus achieving an excellent 6-meter efficiency of 68 percent.

In an unconventional approach to 6-meter operation, W6KEV uses a 6.25-megacycle crystal in a 6AG7 harmonic oscillator quadrupling to 25 megacycles. A simple 6V6 doubler-driver provides more than adequate drive for the 4CX300A final amplifier.

This transmitter is a fine example of the compact, powerful, highly efficient ham rigs that can be built using Eimac ceramic tubes. Whether you build, or buy your transmitter, reliable Eimac tubes will give you maximum watt-hours per dollar.



ACTUAL

For further information on Eimac ceramic tubes for amateur applications write our Amateur Service Department

EITEL-McCULLOUGH, INC.
SAN CARLOS, CALIFORNIA

***Eimac First* with ceramic tubes that can take it**

For further information, check number 9 on page

4CX300A Typical Operation to 175 Mc.

	CW	AM	SSB		CW	AM	SSB
Input Power	625 watts	300 watts	500 watts (P.E.P.)	DC Grid Voltage	-90 volts	-100 volts	-55 volts
DC Plate Voltage	2500 volts	1500 volts	2000 volts	DC Plate Current	250 ma	200 ma	250 ma
DC Screen Voltage	250 volts	250 volts	350 volts	Driving Power	2.8 watts	1.7 watts	0 watts

Feenix, Ariz.

Deer Hon. Ed:

You knowing old Hon. Saying: Don't crossing bridges until burning them behind you? I think that one I meening. Or maybe it is old Hon. Saying: Bird in hand are worth two hands full of stones with moss on them. At any rate, that are what happening to Scratchi.

Yes indeedy. Scratchi are winning big contest, but nobodys buleeving Scratchi winning big contest. Hon. Ed., I leaving it to you to desiding whether I winning contest or not.

Here are the facks in the matter. Cupple weeks ago local amchoor club are desiding that now with cooler wether coming on—getting down to even hundred these days—they going to having reel 1/c Hidden Xmitter Hunt. Looking in Hon. Treshurey and finding having plenty bux to buying peechy reseever for first prize, and plenty other goodies for other prizes.

Now if are one thing Scratchi needing, it are 1/c reseever. So, are thinking that winning contest are easy way to getting selfsame reseever. Feeling reel serious about matter, so laying out plans for nice little direckshun-finding reseever for car, making up neet little loop for reseever, and getting all mounted in car.

Fixing it so reseever are in trunk of car, and antenna are fastened to back bumber. After getting everything all installed are putting big xmitter in shack on freakwency to be used, and testing out reseever in car. Working like nobuddys busyness.

On day of contest are at leest eleventeen cars at starting line, all raring to go. Rite at 2 pm, when hidden xmitter coming on air, I sitting in front seet listening to BC set, but seeing other peeples starting to tune for hidden xmitter, I jumping out of car, opening trunk, turning antenna, and getting reel peechy signal—direckshun, ded ahed. Other cars seem to be having trubble, but I not wateing.

Driving down road for cupple miles, and taking another reeding. Still ded ahed. Getting in car, driving on another cupple miles, en-

[*Continued on page 114*]

CLUB BULLETINS

by MARVIN D. LIPTON, VE3DQX

311 Rosemary Road, Toronto 10, Ontario, Canada

The British Amateur Television Club publishes a non-profit magazine, CQ-TV, every three months. The bulletin, which is a member of the CQ News Service deals exclusively with amateur TV techniques and happenings all over the world. The club was founded in 1949 to inform, instruct, and co-ordinate the activities of amateur radio enthusiasts experimenting with TV transmission, and to liaise with other enthusiasts similarly engaged in other countries. Circuits, photos, and constructional articles make up the club's quarterly magazine, which is issued free to members. Interested parties can learn more about the aims, objectives, and activities of the club by writing this Department or the club's Canadian Division at 1740 Hartenstein St., Montreal 9, P.Q., Canada.

Syndicate notes: The Sylvania Amateur Radio Assn. of Waltham, Mass., an associated member of our News Service, was granted full membership upon publication of its first copy of SARA WALTHAM NEWS. SATTERFIELD'S W9 ER is celebrating its 30th birthday. AUTO-CALL, Washington Mobile R. C. & Dist. Clubs, just completed 4 years of management by W3NL. ETHER ECHOES, B&F Radio Club, now is the largest associate with 50 interesting pages each month. Doris "Butch" Singer, K9IXD, seems to be the busiest editor in our midst. The gal is presently editing these three publications: AMA-CHEWER, Indianapolis R.C., BISON, Indiana Radio Club Council, and HAWK'S EYE VIEW, Hoosier Amateur Women's Club. How do you find the time OL?

Welcome to these new members who have been added to the mailing list of CQ NEWS, our monthly news release: CHIRPY, Greene A.R.C., SPARK-SOUTH PENN. A.R.C., Western Development Laboratories, RADIO CLEVELAND, Ohio Radio Amateurs, LEHIGH VALLEY HAM, Lehigh Valley A.R.C. Inc., GBARA/GBN BULLETIN, Grey-Bruce A.R.A., and CLIX "N" SPLATTER, Livonia R.C.

CQ NEWS, the official news release of the Club Bulletin Department, is issued monthly to full and associated members of the CQ News Service. Editors of Amateur Radio Club Publication are invited to join the News Service gratis. *Amateur Radio Clubs* not publishing bulletins may become associated members free of charge by notifying this Department. Contents of CQ NEWS are extracted from affiliated club bulletins. Associated members are granted full membership upon publication of a club paper.

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. . . More "Workable Watts" per Dollar!

540w AM & CW; 700w max. on DSB or SSB (P.E.P.) Input

Globe King 500C

Completely Bandswitching 10-160M

W/T: $795.00

Relay-controlled; built-in antenna relay, VFO, commercial type compression circuit. Separate power supply for modulator. Time sequence keying.

350w CW, 275 AM, 450w SSB (P.E.P.) Input

Globe Champion 300A

W/T: $495.00

Kit: $399.00

Bandswitching 10-160. Built-in VFO, Pi-Net output, 48-700 ohms, push-to-talk, antenna changeover relay, time sequence keying, compression circuit. Kit with preassembled VFO.

Plate Modulated . . .

Globe Scout 680A

W/T: $119.95

Kit: $99.95

65w CW
50w AM

Self-contained, bandswitching, 6-80M, with built-in power supply. Pi-Net 10-80M, link-coupled on 6M. High level modulation. Forward Look.

90w CW for 10-160M

Globe Chief 90A

W/T: $74.50

Kit: $59.95

Forward Look cabinet, bandswitching Xmttr. Built-in power supply. Pi-Net. Provisions for external VFO.

Bandswitching 6 & 2M Xmttr.

Globe Hi-Bander

6M: 70w CW, 60w AM

2M: 60w CW, 50w AM

W/T: $139.95 Kit: $119.95

Regulated screen supply. 4-stage RF section allowing straight through operation. Good harmonic and TVI suppression. RF Stages metered. Reserve power for accessories. Provisions for mobile use. 52-72 ohm coax output. Forward Look.

100w PEP DSB Input, Suppressed Carrier
40w AM, 50w CW

Sidebander DSB-100

W/T: $139.95

Kit: $119.95

Complete transmitter, bandswitching 80-10M. Min. 35db carrier suppression. 3-stage RF section, pi-net; speech clipping. Inverse neg. feedback. Ceramic switches throughout. Narrow bandwidth. Forward Look.

Globe's VOX Model 10

For voice operated control, with extra contacts for auxiliary circuits. Plug in socket at rear of DSB Xmttr. Adaptable for other Xmttrs.

W/T: $24.95 Kit: $19.95

VFO 755A

160-10 Meters

W/T: $59.95

Kit: $49.95

For 10-160M; output on 40 & 160M. Vernier drive with shock absorbing features. Self-contained, well-filtered power supply with voltage regulation.

VFO 6-2

W/T: $59.95

Kit: $49.95

Perfect zero beat. Built-in power supply with voltage regulation. Drives 6 & 2M Xmttrs. Temp. compensated. Ideal for Hi-Bander. Sideband stability.

Model 666 for 6M, w/t only, $49.95

Power Attenuator PA-1

Use with Xmttrs. up to 70w input; for swamping drive to linear amplifiers. Three power reduction positions. Coax input and output. W/T: $10.95

Antenna Tuner with VSWR Bridge

Globe Matcher Sr.

W/T: $79.50

Kit: $69.50

Shielded Cabinet

For Xmttr. with final RF input up to 600w, 80-10M. Fixed link coupling in output. Coax input, 2-wire balanced output. Monitor SWR between Tuner and Xmttr.

Globe Matcher Jr., AT-3

For input to Xmttr. of 100w CW, 75w fone or less. Substantial harmonic attenuation. Unbalanced output. Self contained.

W/T: $15.95 Kit: $11.95

Grounded Grid, Class B or C

Globe Linear LA-1

W/T: $124.50 Kit: $99.50

Complete with well-filtered power supply. 200w input AM Class B, 300w DC or 420 PEP input Class B linear SSB or DSB. 300w Class C for CW. Pi-Net 80-10M. 52 ohm Pi-Link coupled on 6M. Extensively TVI-protected.

Versatile Modulator

Plate Modulator UM-1

Modulates RF inputs up to 100w.

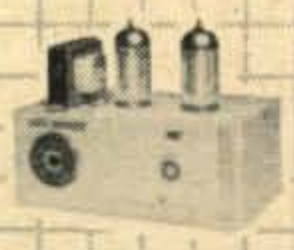
W/T: $49.95

Kit (less tubes): $32.50

Class A or AB_2 modulator, driver for higher power modulator, PA Amplifier. Matches output impedances 500-20,000 ohms. Carbon or crystal mike usable. Perforated steel cover, $3.00 extra. Supplies 10-45w audio output. Ideal for use with Chief.

Controlled Carrier Type

Screen Modulator Kit



Kit: $11.95

Ideal for use with Globe Chief. Permits radio-telephone operation at small cost. Self-contained. Connections, instructions, printed circuits, etc. supplied.

6 Meter Converter

Compact, stable, crystal converter for receivers tuning output frequencies 10-14mc. Cascode RF stage, bandpass coupling, shielded input and output, high sensitivity. Crystal for 10-14mc ouput supplied.

W/T: $27.50 Kit: $19.95

Code Oscillator Kit

Transistor and printed circuit assembly. Code Practice Oscillator. Screw terminal input for key; standard phone tip output jack. Complete with batteries. Kit: $4.95

Peak Limiting Pre-Amplifier

Speech Booster FCL-1

W/T: $24.95 Kit: $15.95

Perfect for Scout, Hi-Bander & other Xmttrs. Clips and filters speech frequencies at pre-set amplitude. Response: 300-3500 cycles. Increases modulation intensity.

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AMATEUR RADIO EQUIPMENT . .

For further information, check number 13 on page 126.

de W2NSD [*from page* 9]

ventions and hamfests if you want to see them. Films were taken with a Eumig camera, backed up with a Bolex.

Readers Coupon

We've added one blank to our readers service coupon so you can make a note of whether you are working in the electronics or radio field in some capacity. Several of our advertisers and potential advertisers are interested to find out about this. Thought you might like to know.

Go East, Young Man

A release from Carl Mosley says that they are opening a plant in England to manufacture the Mosley antennas with G3BHJ, O. J. Russell as manager. This will, perhaps, make it a bit easier for hams throughout the world to get some "American-type" beams since currency restrictions make our products almost prohibitive in most parts of the world.

KC4AF

A note from Jake, W8FGX, says that the Ohio Valley Club has answered all QSL's received with donations, answered all VE and DX QSL's (over 78 countries worked) and answered all cards received with no donations but with return postage up to and including W6. The remaining W districts should be completed by the time this is read. All cards received without return postage will be eventually answered through the W QSL bureaus. The QSL Committee has had a really tough time since many of the cards were received with no dates or times, or the wrong dates or times. Over two thousand cards have been sent out so far. 73, Wayne

HAMFEST

Albany Convention

The Albany Amateur Radio Association, Inc., is sponsoring an ARRL Hudson Division Convention October 10-12, at the Sheraton-Ten Eyck Hotel, Albany, New York. Saturday's program will include a meeting of the various nets and the Quarter Century Wireless Association, technical speakers, movies, FCC examiner, transistor demonstration; and also a single side band, double side band and AM Forum (for 'em or agin 'em); UHF and VHF symposium, and Wouff Hong initiation. The Antique Wireless Program, first shown at the National Convention, will be repeated here. The banquet will be served at 8 PM followed by the drawing of prizes. Those making advance registrations will receive brochures which include complete information concerning hotels, motels, prices, etc. Advance registration (by October 1) is $7.50 each which includes registration and banquet. As the main dining room is limited in capacity, seating will be based on the order of receipt of reservations. Registrations should be sent to: CONVENTION—P. O. Box 573, Albany, New York.

When Gonset, long the foremost producer of mobile converters and receivers, builds an all-band, table-top receiver, you can be certain of outstanding performance . . . advanced design . . . top-dollar value

GONSET'S Two new all-band receivers

G43

G-43 offers peak reception over a wide frequency range . . . sensitivity . . . selectivity . . . highest quality components and materials . . . a fine blend of high performance features and economical pricing.

G33

G-33 has the same basic features as G-43, but incorporates certain design simplification which permits exceptionally reasonable pricing with little sacrifice in performance.

G43 Features high stability and great ease of tuning by use of a 6-band tuner covering the following ranges: .54-1.6 mc, 1.8-5.7 mcs, 5.7-13 mcs, 13-20 mcs, 20-25 mcs, 25-30 mcs . . . Employs drum dial for quick identification of band in use . . . bandspread dial provides calibration of an amateur band on each range, as well as a logging scale . . . calibrations on band 6 provide for use of VHF converters . . . has 6 double-tuned Hi-Q transformers at 1650 kc in I-F section . . . selectivity: 6 kc at 6 db down, 24 kc at 60 db.

Panel controls include: Main tuning, Bandspread tuning, Bandswitch, Audio volume, Sensitivity, Antenna trimmer, ANL on-off, xtal calibr. on-off, Phone-CW, Standby-Receive . . . signal strength meter . . . provision for internal crystal calibrator accessory, available as optional equipment . . . muting connections. Tube complement: 6BE6 (conv), 6BA6 (1st I-F), 6BA6 (2nd I-F), 6AU6 (3rd I-F), 6AL5 (det, AVC, ANL), 12AX7 (1st Audio-BFO), 6CM6 (2nd audio), 6X4 (rect).

G33 Tunes to the following ranges: Band 1, .54-1.6 mc; Band 2, 1.8-6 mcs; Band 3, 6-13 mcs; Band 4, 13-34 mcs . . . bandspread dial provides logging scale and calibrated scales for amateur bands. 1650 kc I-F system results in greatly improved image rejection . . . 3 double-tuned Hi-Q transformers provide excellent selectivity.

Panel controls include: Main tuning, Bandspread tuning, Bandswitch, Audio volume, Antenna trimmer, Sensitivity, and Function selector . . . Tube complement: 6BE6 (conv), 6BA6 (1st I-F), 6BA6 (2nd I-F, BFO), 6AV6 (det, AVC, 1st audio) 6CM6 (2nd audio), 6X4 (rect.)

External speaker is available as an optional accessory. 6" by 9½" speaker is contained in an attractive cabinet designed to match receiver, and blend with surroundings. Has headphone jack and tone control.

For further information, check number 15 on page 126.

GONSET

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BASICS OF DIGITAL COMPUTERS *by John S. Murphy*

catapults you into the exciting digital computer field

If you have a knowledge of the fundamentals of electronics, you can master the basics of digital computers and understand the details of any specific digital computer with this new 3 volume 'picture-book' course. Written by an expert in the computer field, text matter has been tested and proven in the training of computer field engineers and technicians. More than 350 illustrations support the text.

Volume 1: covers the background of computers (development; what a computer is; binary data representation — basis of digital computers; automatic calculation, programming and control).

Volume 2: the components and units (basic building blocks of logical systems; transition from communication electronics to computer electronics; uses of tubes, diodes and magnetic cores; examples combining use of building blocks and elemental circuits).

Volume 3: operation of the computer (major logical systems; storing and transferring data; allied input-output units; magnetic drums and core type of memory; static and dynamic types of registers including shift registers; timing pulses; control; retiming).

For all who wish to enter this exciting new field, or broaden their knowledge of it, Basics of Digital Computers is *must reading*. Ideal as a starting point for technicians, engineers, programming personnel, field sales engineers, maintenance men.

#196, 3 volumes, soft cover set.....**$6.95**
#196-H, cloth bound, all 3 volumes.....**$7.95**

BASIC PULSES *by Irving Gottlieb, P. E.*

Ever since the time Samuel F. B. Morse first opened and closed a switch transmitting series of pulses from Washington to Baltimore, pulses and pulse techniques have become vital to the successful application and expansion of electronic technology. Pulses direct the high speed operation of all types of computers; underlie the functioning of radar systems for early warning, recognition, fire control — in general the gathering of information from distant points by electromagnetic radiation means. Pulses guide industrial operations that require split-second timing for mass production — counting, sorting and testing. Virtually every form of electronic timing involves the use of pulses. The functioning of every television system — over the air or closed circuit — depends on correct pulse frequencies, duration and shape; in fact the application of pulses recognizes almost no boundaries in the field of electronics. You can learn all about pulses and expand your opportunities in these fields quickly, easily and economically with this one volume 'picture-book' training course — all that is necessary is a knowledge of the fundamentals of electronics. Basic Pulses is a thorough crystal-clear presentation of the nature, measurement and application of pulses — what they are and how they are used.

This book is divided into these major sections:

What is a pulse? — definition, various types, relation to sine waves and harmonics, simple pulse generators and applications.

Measurement of pulses — analyzes pulses by means of measurement; rise, decay time, and pulse durations, intervals and repetition rates, duty cycle.

Composition of pulses — describes saw-tooth waves, simple Fourier analysis, d-c components, harmonic combinations, wave symmetry, and harmonic distribution.

Energy storage viewpoint of pulses — presents the essentials of charging networks, including time constant, discharge characteristics, self induction, R-C, L-C L-R networks.

Waveshaping techniques — with filters, transformers, saturable inductors; takes up differentiation, integration, exponential wave forms, clipping, d-c restoration, clamping, diodes and pentodes.

Pulse generators — describes and analyzes all the known pulse generators including tube and transistorized types.

Questions and answers in each section permit you to check your progress. Every equation is made understandable by numerical examples. A glossary of pulse terms is provided.

#216, soft cover, 176 pp. **$3.50**

BASIC TELEVISION *by Alexander Schure, Ph.D.*

Newcomer, or old 'pro' you can learn all about television. Editors of leading electronic magazines, service technician publications and industrial magazines — the experts — unanimously acclaim BASIC TELEVISION, new five volume Rider 'picture-book' training course, as the easiest possible way of learning all about black and white television. Here are typical comments from prominent magazines:

Electronic Technician, April 1958 "One picture is worth 10,000 words," so you can imagine the information contained in the more than 700 figures included here. Each of these drawings is illustrated in the manner which makes the most difficult concept readily understandable. Text is very clear.

Radio & Television News, May 1958 There is no reason why the student with an elementary radio and electronics background couldn't use this 'course' as a springboard to a career as a service technician in the television field.

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I understand I may return the books in 10 days for refund of full purchase price if not satisfied.

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Address.....

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

For further information, check number 16 on page 126.

More power where you want it...

More <u>output</u> to the antenna than any other linear amplifier!

More output to the antenna—that's the only measure of power that really counts when evaluating the performance of an amplifier.

And more output—*greater than any other amateur linear amplifier, bar none*—is yours with the new Hallicrafters HT-33A.

Beautifully engineered, with extra-heavy-duty components, the HT-33A is *conservatively rated* at the maximum legal limit—guarantees one of the big signals on the band and the effortless performance that means so much to efficiency and long life.

New!

HT-33A linear amplifier

Meets FCDA Specifications

FEATURES

- **Maximum legal input.**
- **Highest output in the industry.**
- **Third and fifth order distortion products down in excess of 30 db.**
- **Passive grid circuit. 50 to 75 ohms input.**
- **Built-in r.f. output meter to simplify tune up.**
- **Complete coverage of 80 thru 10 meter amateur bands.**
- **Pi-network for maximum harmonic suppression.**
- **Variable output loading.**
- **All important circuits metered.**
- **Circuit breaker assures protection of power supply.**
- **Perfect match to HT-32 in size, appearance, and drive requirements.**
- **Tubes: (1) PL-172 high power pentode; (2) 866AX rectifiers; (4) OA2 screen regulators.**
- **Front panel controls: Meter selector; Filament switch; High Voltage switch; Bias adjustment; Band switch; Plate tuning; Plate loading.**

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Chicago 24, Ill.

Our 25th year of service

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Raytheon Manufacturing Co., Waltham, Mass.

For further information, check number 17 on page 126.

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Engineered for Greater Performance

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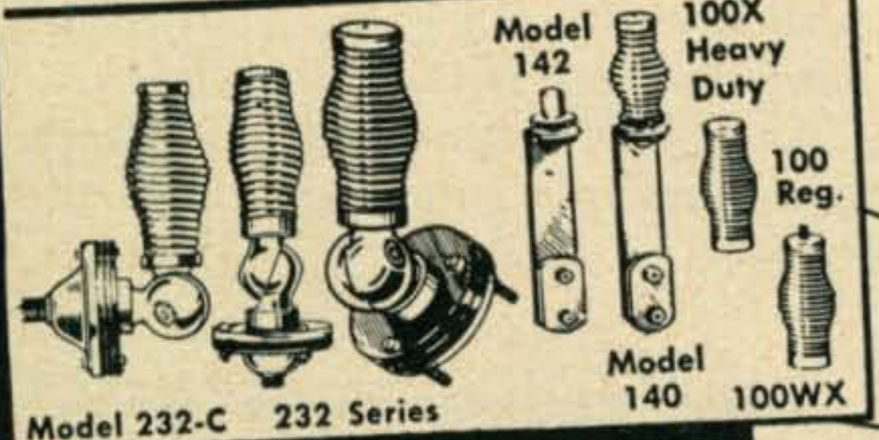
Ebony Finish $6.95 Polished Finish $7.95
Ebony Finish, S. S. Hardware.....$8.95
Polished Finish. S. S. Hardware.....$9.25

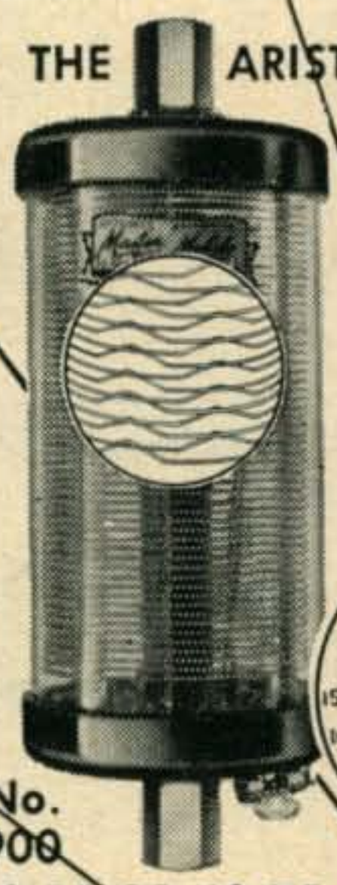


Model 232-C 232 Series

NEW MULTI-BAND ANTENNA COILS

New *Plug-In* type coils for the Ham, designed to operate with a standard 3′ base section and standard 5′ whip

THE ARISTOCRAT



No. 900
10-15-20-40-75 METERS

THE VICTORY

No. 999
10-15-20 METERS

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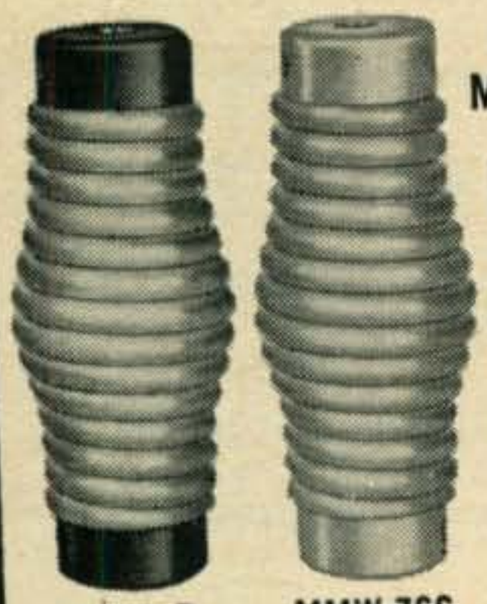

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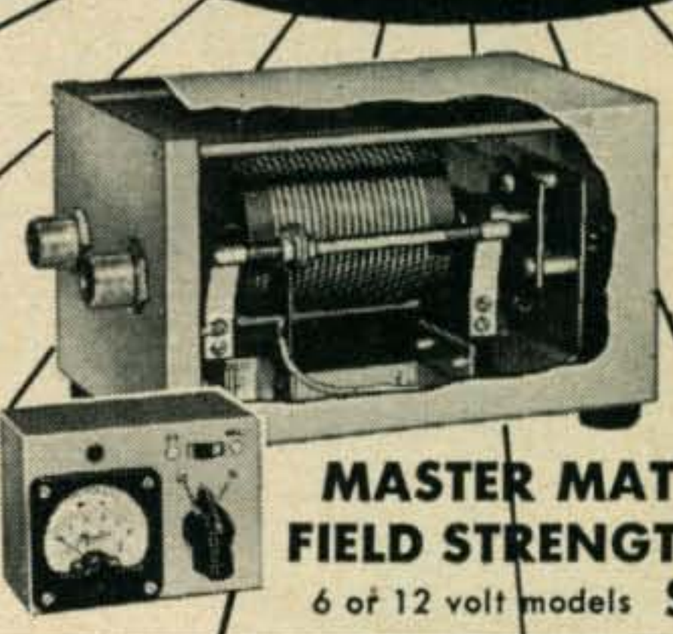

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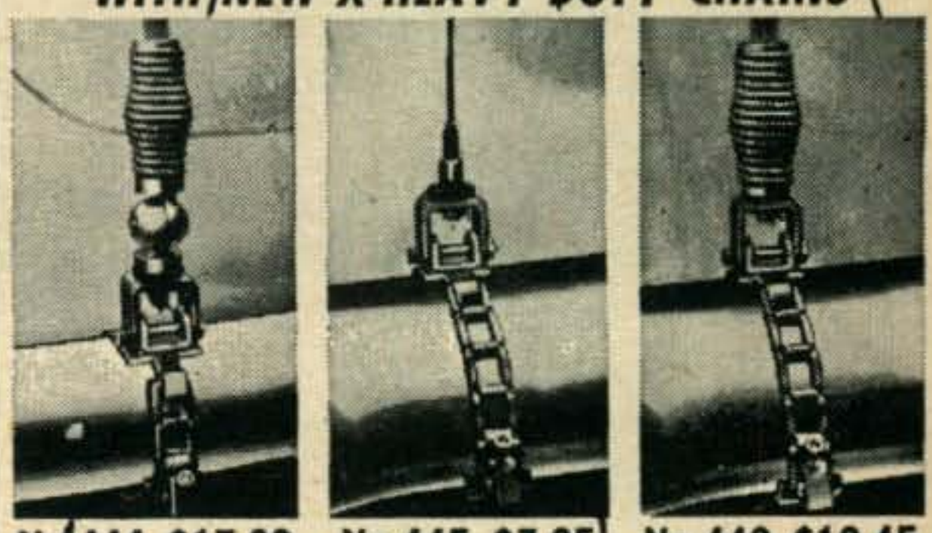

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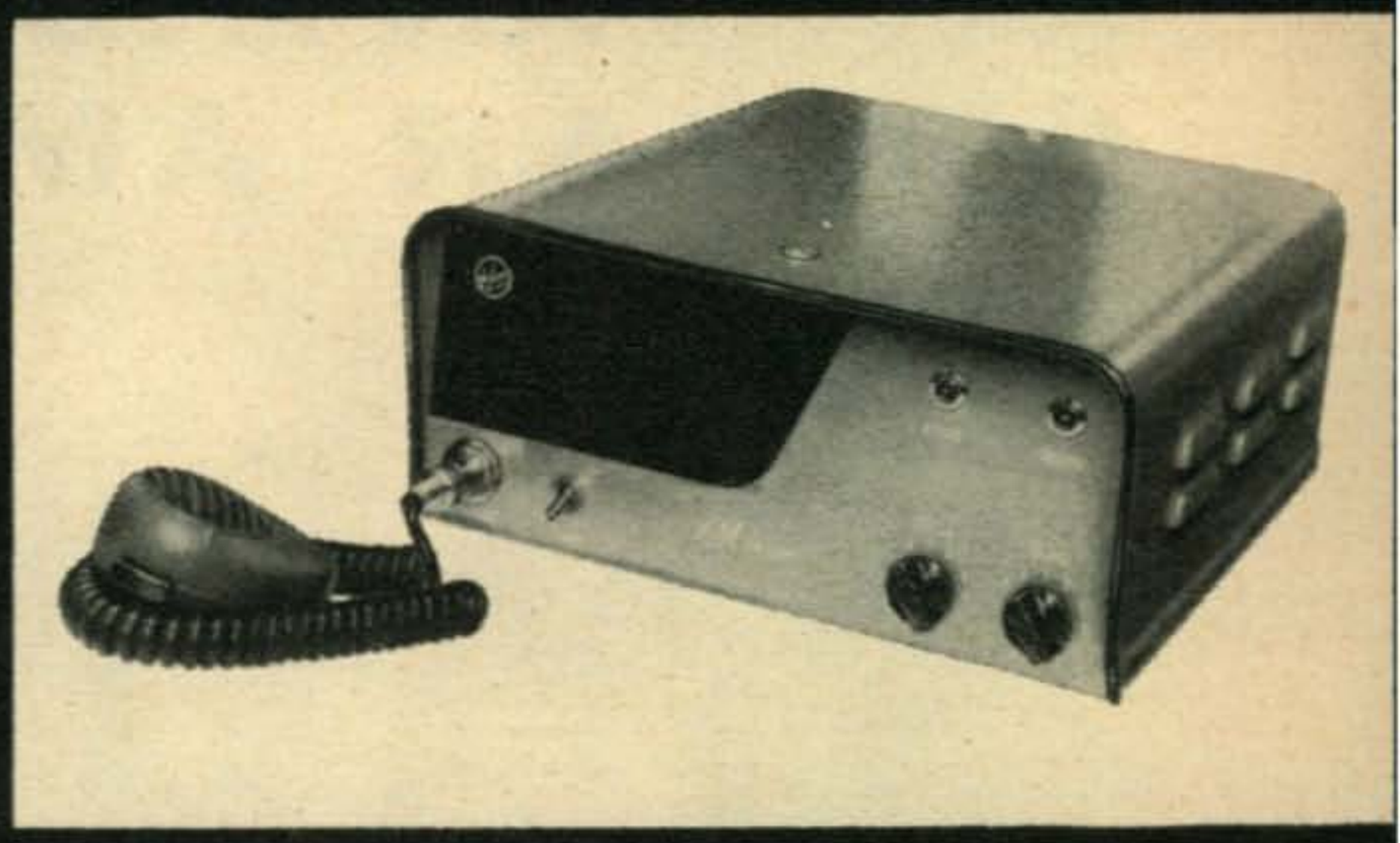

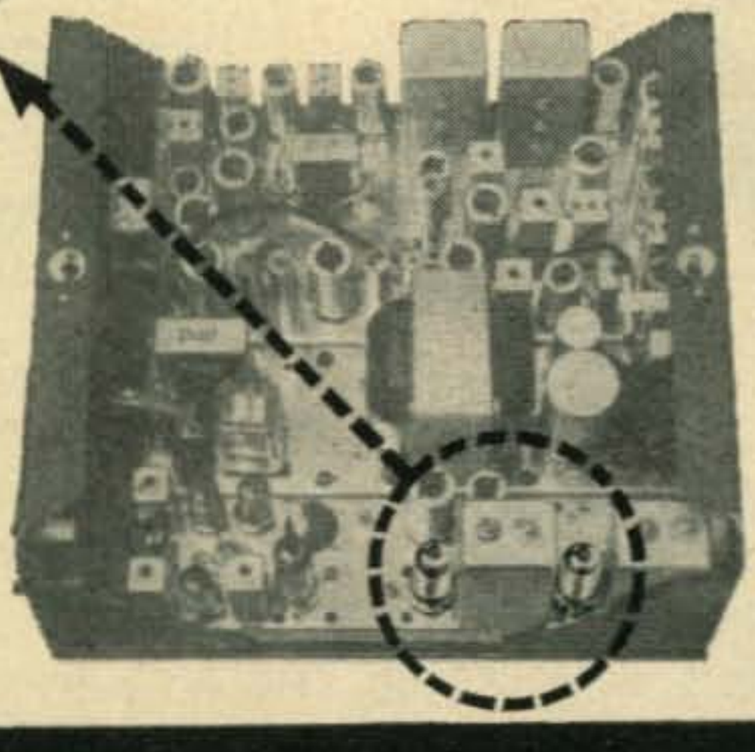

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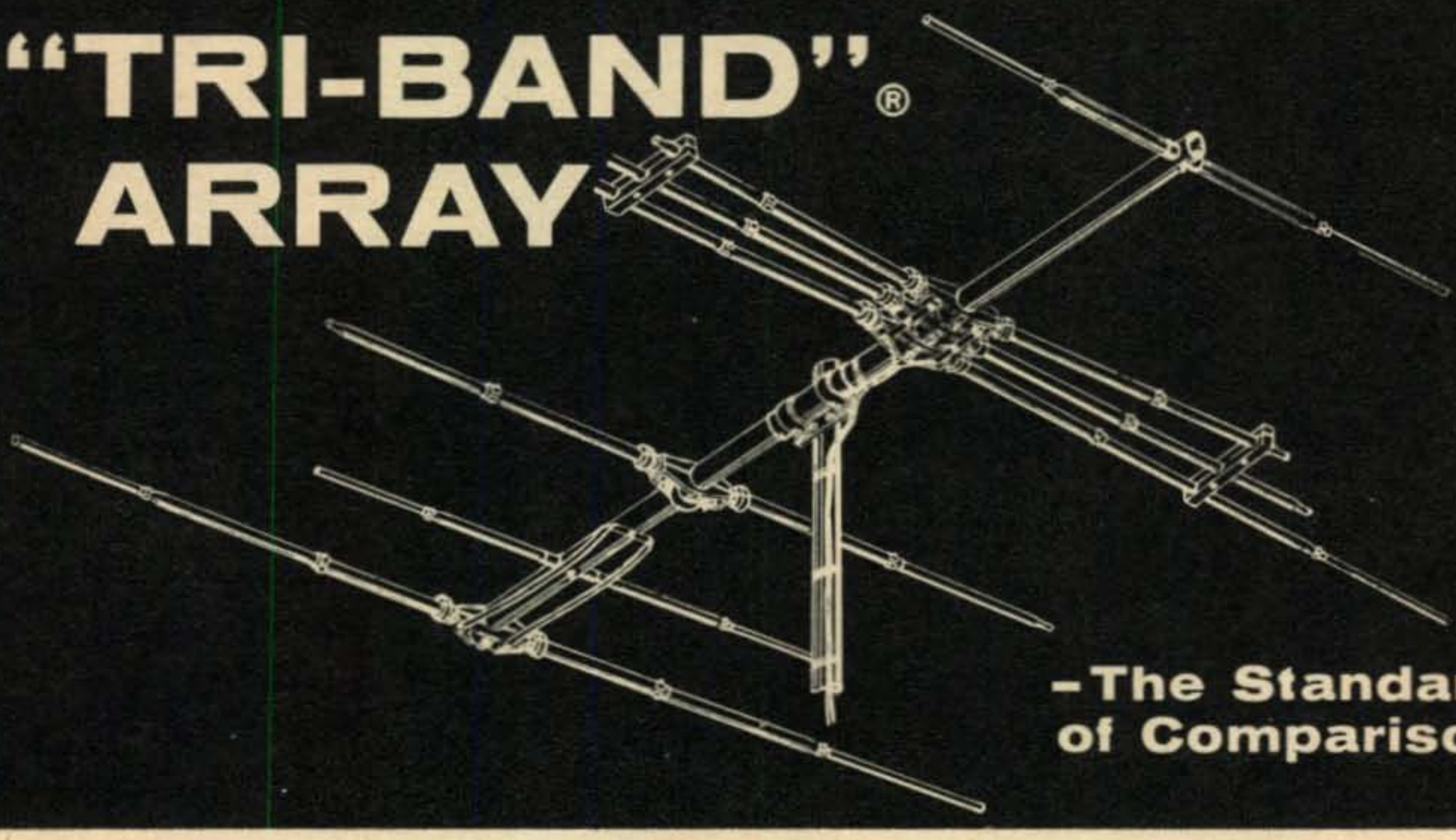

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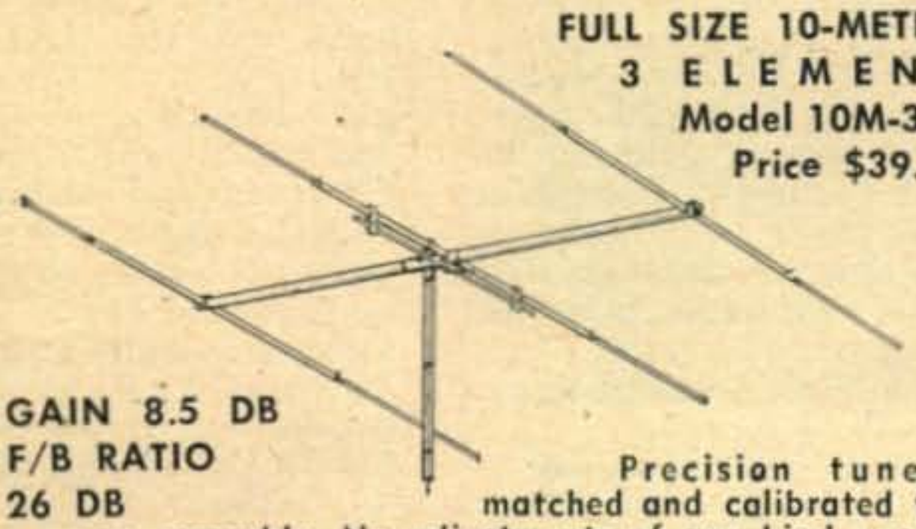

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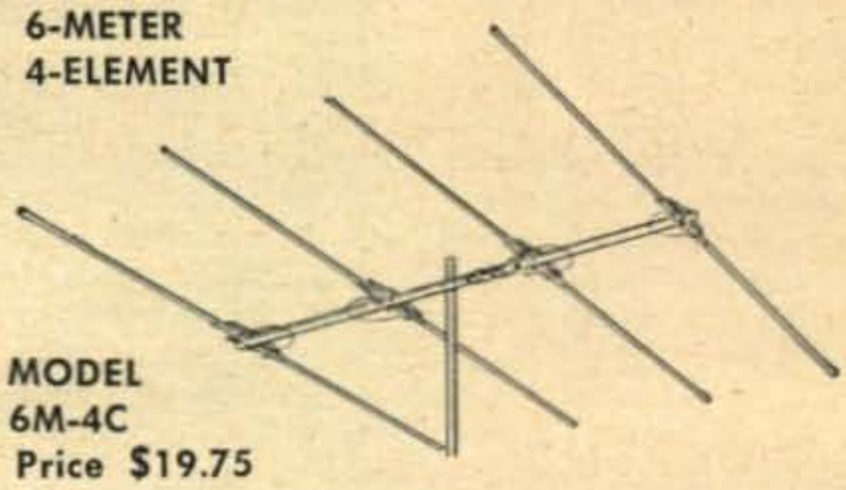

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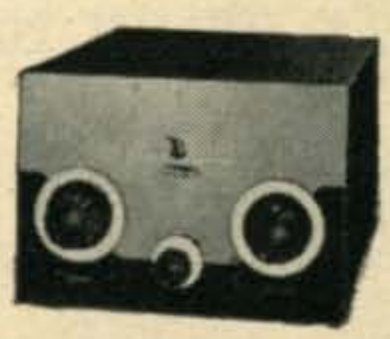

275 WATT "MATCHBOX" Performs antenna loading and switching functions required in medium power amateur stations. Band-switching 80, 40, 20, 15, and 10-11 meters. Matches balanced antennas from 25 to 1250 ohms and unbalanced or single wire antennas from 25 to 3000 ohms. Input impedance, 52 ohms, rated 275 watts. Fully shielded. Provision for RF probe.

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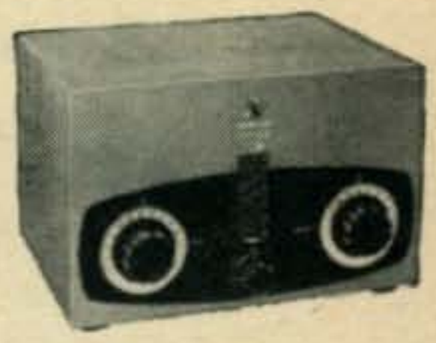

KILOWATT "MATCHBOX" Bandswitching 80, 40, 20, 15, and 10-11 meters—self-contained. Use with transmitters up to 1000 watts input—handles unbalanced line impedances from 50 to 1200 ohms and balanced line impedances from 50 to 2000 ohms. No coils to change, no "tapping down" on the inductor. Fully shielded. Provision for RF probe.

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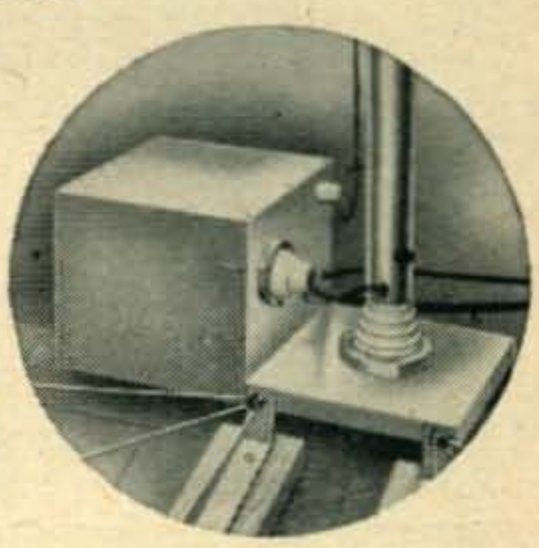

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This power-packed Class B linear amplifier is rated 500 watts P.E.P. input with aux. SSB exciter—500 watts CW and 200 watts AM! Continuous coverage 3.5 to 30 mcs. May be driven by the Viking "Ranger", "Pacemaker" or other unit of comparable output. Drive requirements: 5 to 35 watts. Employs two 811A triodes in parallel—wide range pi-network output. Fully TVI suppressed. Complete with tubes.

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

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

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MOBILE COMPRESSOR

by James L. Tonne, W5SUC
Box 803, State College, N. Mex.

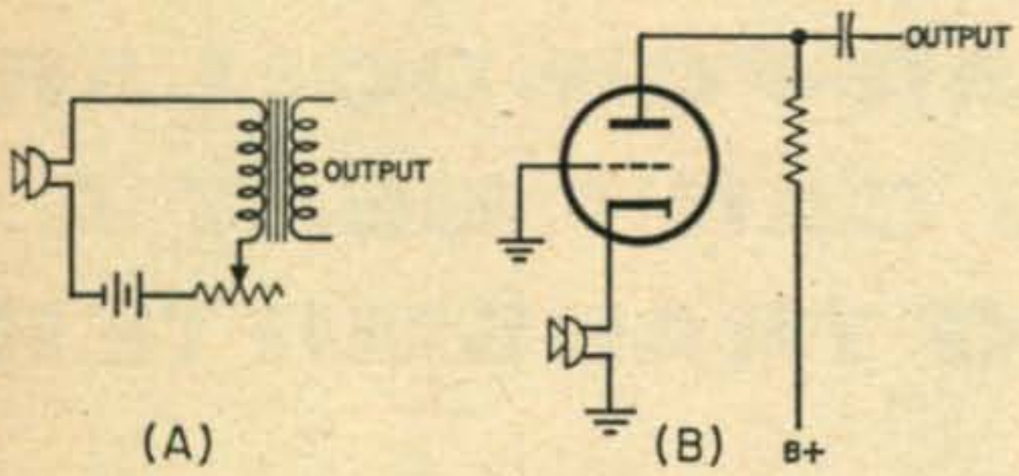


Fig. 1

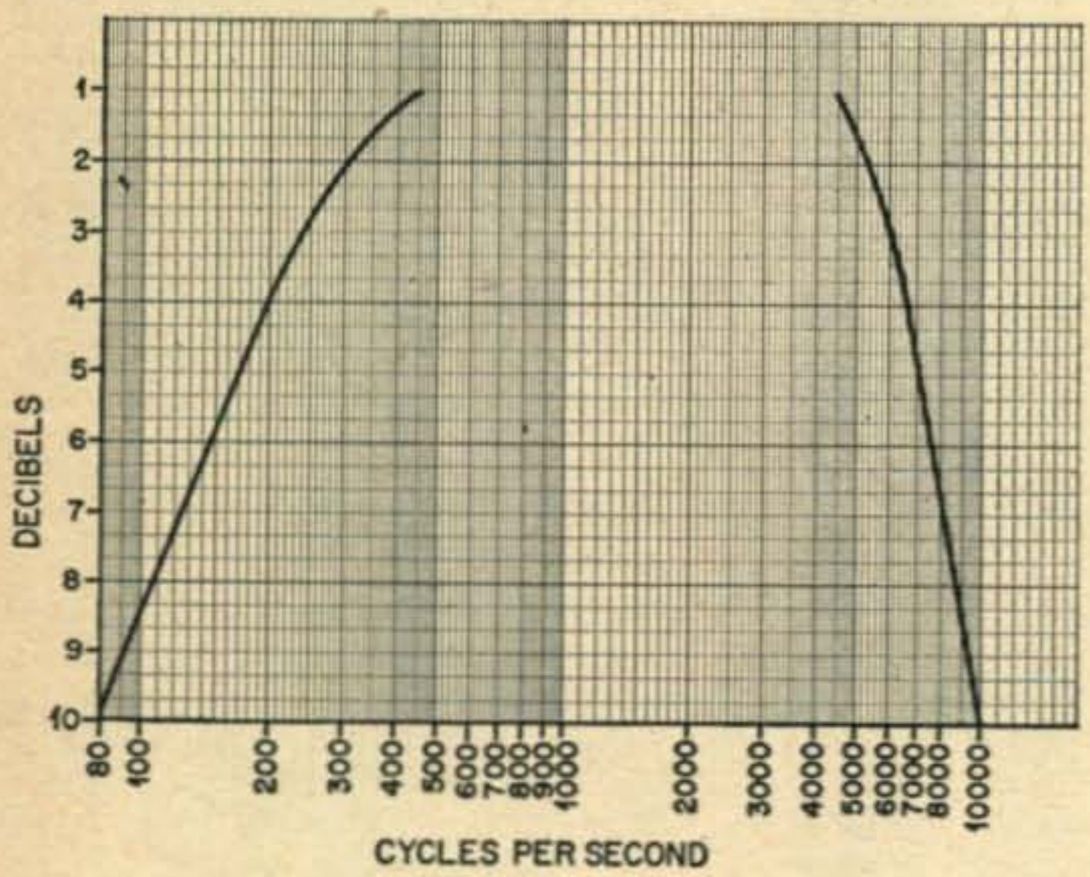


Fig. 4

1 KC = 0 DB

–1	@	450 CPS	–1	@	4500 CPS
–2		300	–2		5200
–3		250	–3		6000
–4		200	–4		6500
–5		175	–5		7000
–6		150	–6		8000
–10		80	–10		10,000

FIG. 4—TYPICAL FREQUENCY RESPONSE

This article is particularly aimed at the mobile fellows, but any 'phone operator in a situation such that he may at times use a carbon microphone should take note of the material presented. The basic idea is that of modifying the input circuitry to the usual mobile modulator in such a manner as to produce a simple but effective automatic gain control system. The circuit is set up so that an existing modulator may be converted to incorporate this system with a minimum of effort. As far as the author knows, this is the only all-electronic system that generates *no* distortion with compression, and furthermore is *impossible* to overload. These may seem like pretty bold claims, but a quick look at the circuitry involved will show this to be true.

Background

In *fig 1A*, the output from the transformer secondary can be varied over a wide range by varying the rheostat. This is probably the oldest method for varying the output from a carbon microphone. Today's mobile operator seldom uses such a scheme, and usually shies away from transformer coupling. *Fig 1B* is quite frequently encountered. It would seem that by applying a negative d-c voltage to the grid of this tube, it could be made to pass less current to the microphone, hence control the output in a similar manner. If this d.c. is derived from rectified and filtered audio output from the modulator, as shown in *Fig 2*, automatic gain control will result. As one talks louder, the modulator produces more output, hence the d-c output from the rectifier goes more negative. This lowers the microphone current, causing a decrease in output. Since the mike output is reduced but not distorted in the least by reducing its current, any desired degree of compression can be obtained with no increase in distortion.

Suppose the operator shouted into the microphone. The modulator output, and so the rectifier output, would rise to such a value that the mike current would drop as necessary nearly to zero. This would restore the output

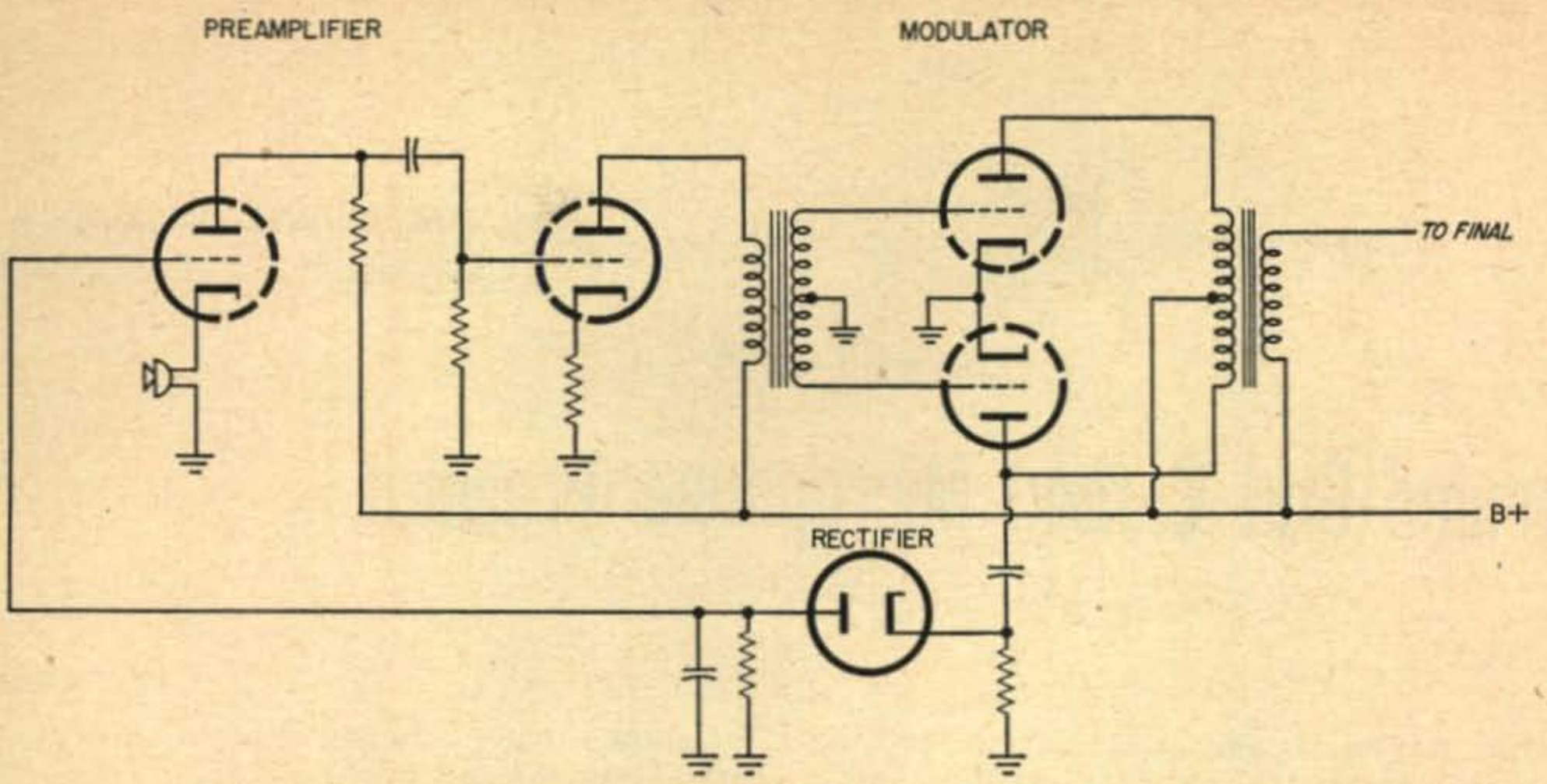


Fig. 2

to normal. There is no limit as to how close to zero the current may go. Since this is true and since the system is reverse-acting, it cannot overload. In fact, it is found in practice that the mike button will overload before the rest of the system will fail. Of course this occurs only at tremendous acoustic inputs.

The Circuit

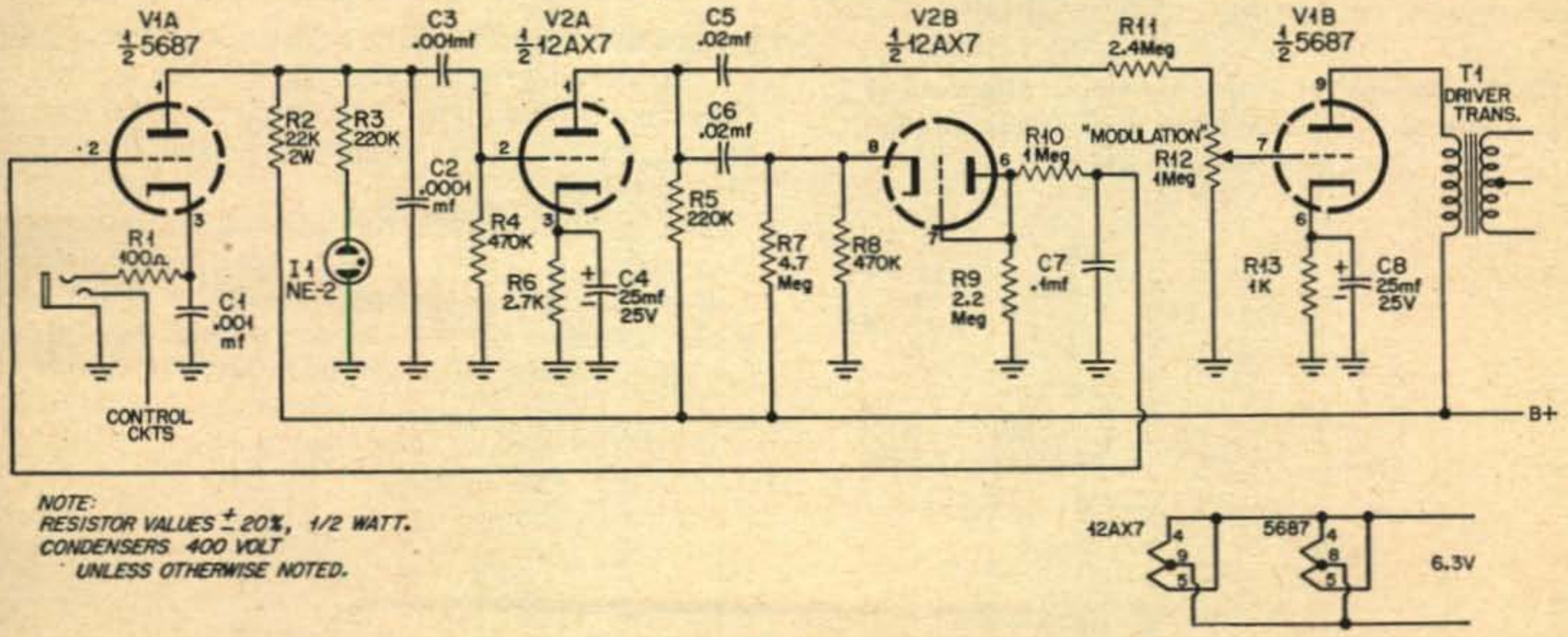
A modulator "front end" which has been painstakingly designed for this application is shown in *fig 3*. Every single component, the circuit arrangement, tube lineup and the like has been set up for optimum performance. As a result, the circuit is stable and efficient. Output is sufficient (.3 watt) to drive a 6N7 or some such tube. Of course if the modulator is operated class A_1, this will suffice for one of a kilowatt rating.

A 5687 is used for the first and last stages because of its high transconductance and consequent efficiency in these two places. One half of a 12AX7 is used for the amplifier in between, and the other half is put into service as a rectifier. No input transformer is used in the interests of economy, compactness and ease of reproduction.

The microphone acts as a variable cathode resistor for the first stage. Audio appearing at the plate is applied through C_3 to the grid of V_{2a}. This tube functions as an ordinary high-gain amplifier. Its cathode resistor is bypassed to obtain maximum gain. The output is coupled through C_5 to R_{12}, the modulation control. R_{12} feeds to V_{1b} the required audio for the modulator tube(s). V_{2a} also drives the rectifier, V_{2b}, through C_6 and a biasing network composed of R_8 and R_7. The rectifier produces a d-c voltage across R_9. This is filtered and applied to the grid of the input stage.

Whereas the first stage is frequently a high-mu triode such as a 12AX7 in hopes of getting more output, this and additional cathode resistance were both shown by long experimentation to be incorrect. For the best output from this stage, one should use a tube with high transconductance, a minimum value of plate load and no additional cathode resistance.

[*Continued on page 96*]



NOTE:
RESISTOR VALUES ± 20%, 1/2 WATT.
CONDENSERS 400 VOLT
UNLESS OTHERWISE NOTED.

Fig. 3

by JIM TONNE, W5SUC
Box 803, State College, New Mexico

Grounded-Grid Carbon Microphone Preamps

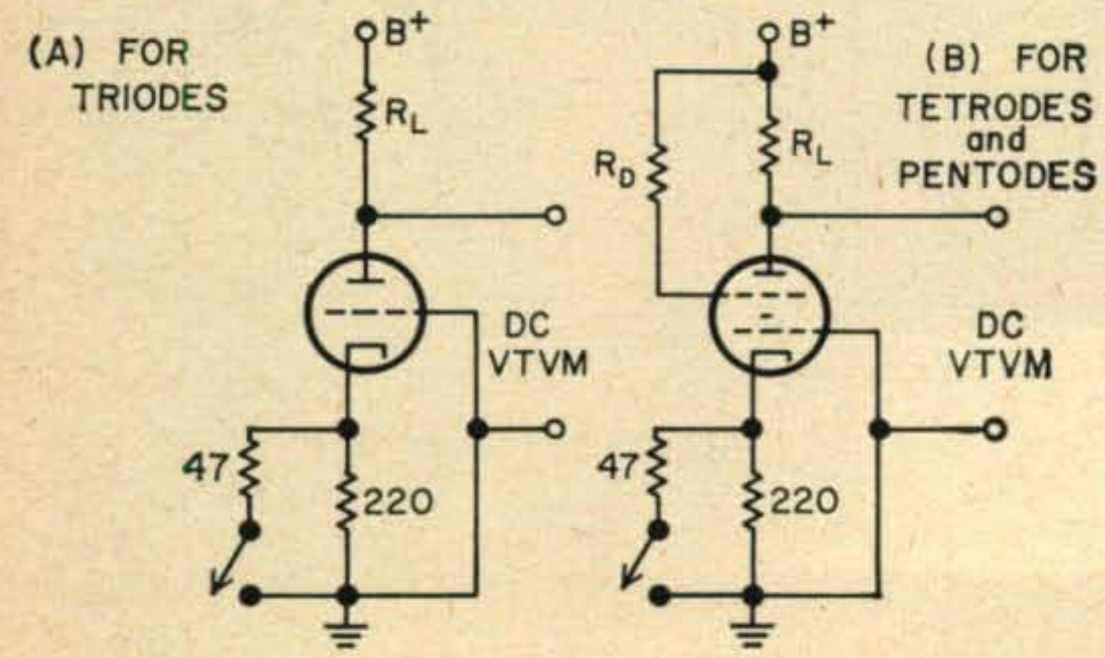
In this day and age, modulation systems using a carbon microphone frequently use a grounded grid first audio stage. This is quite understandable, since the resulting circuit is simple, compact, inexpensive and easy to duplicate. Power consumption is low, and microphone noise may be lower than with any other method. It seems standard practice to use a plate load on this first stage of the order of 100K ohms. In addition, one frequently sees a high-mu triode such as a 12AX7 in this position.

Whether or not a high-mu triode is desired in this location, and whether or not to use a high value of plate resistor such as 100K is highly questionable.

A Look at the Cathode . . .

The usual configurations for grounded-grid audio preamps are shown in Fig. 1. The version shown at *A* is the poorest of the three. This is due in part to the cathode resistor causing a reduction in microphone current along with an audio drop. Bypassing the cathode resistor as in *B* is a step in the right direction, for now the audio is bypassed around the resistor. But the output from a carbon microphone is approximately proportional to the current through it, and the microphone current is still too low for good sensitivity. So shorting out the cathode resistor entirely, as at *C*, is another way of getting more sensitivity. It can be shown using tube curves that this is a "legal" step, causing no troubles from distortion or any such thing. Tube plate current will remain well within bounds.

Fig. 3 — Set-ups for measuring output of grounded grid stages. RD is chosen to drop screen voltage to recommended value.



. . . And the Plate.

The best arrangement of all is that at *D*. While lowering the plate resistor will slightly reduce the effective amplification factor of the tube, the increased plate (and therefore cathode) current will allow the microphone to put out much more. The net result is a vastly increased stage sensitivity. It will pay to look into this a little more closely.

It can be shown, both graphically and experimentally, that varying the plate load resistor has a pronounced effect on stage output. A series of tests were conducted, results of which are shown in Fig. 2. These curves were not made by talking into a microphone and varying a pot; they were obtained with the setup in Fig. 3. This method has proven to be an accurate and easily controlled method of simulating a carbon button. Each tube was further tested by substituting in several values of plate resistors with a carbon mike in the cathode. Output at the plate was observed on a scope to make sure that linearity was being maintained.

It can be seen that the plate load resistors generally used will invariably result in less stage sensitivity than is possible. For example, a common value of plate resistor for the 12AU7 in grounded-grid service is 100K. If this resistor is run down to 10K, stage sensitivity will be increased by a factor of better than 3, or about 10 db.

The graph shows that among the single-section tubes a 6AU6 is the best, and although not indicated, it out-performed several other types tested. The plate load of this tube should be 18 to 22K, with an unbypassed screen re-

Coil Data

Coil L-a: 20T. #30 scramble-wound on a ⅜ slug for m. (8 mc)
Coil L-b: 22T. #22 close-wound on a high value 1-watt res. (24 mc)
Coil L-c: 4T. #22 spaced to ⅜ inch, wound on former coil L-41 form. (50 mc)
Coil L-d: 2T. #16 ½ inch ID, spaced to ¾ inches. *(50 mc)*
Condenser C-a: 7-40 mmfd ceramic trimmer

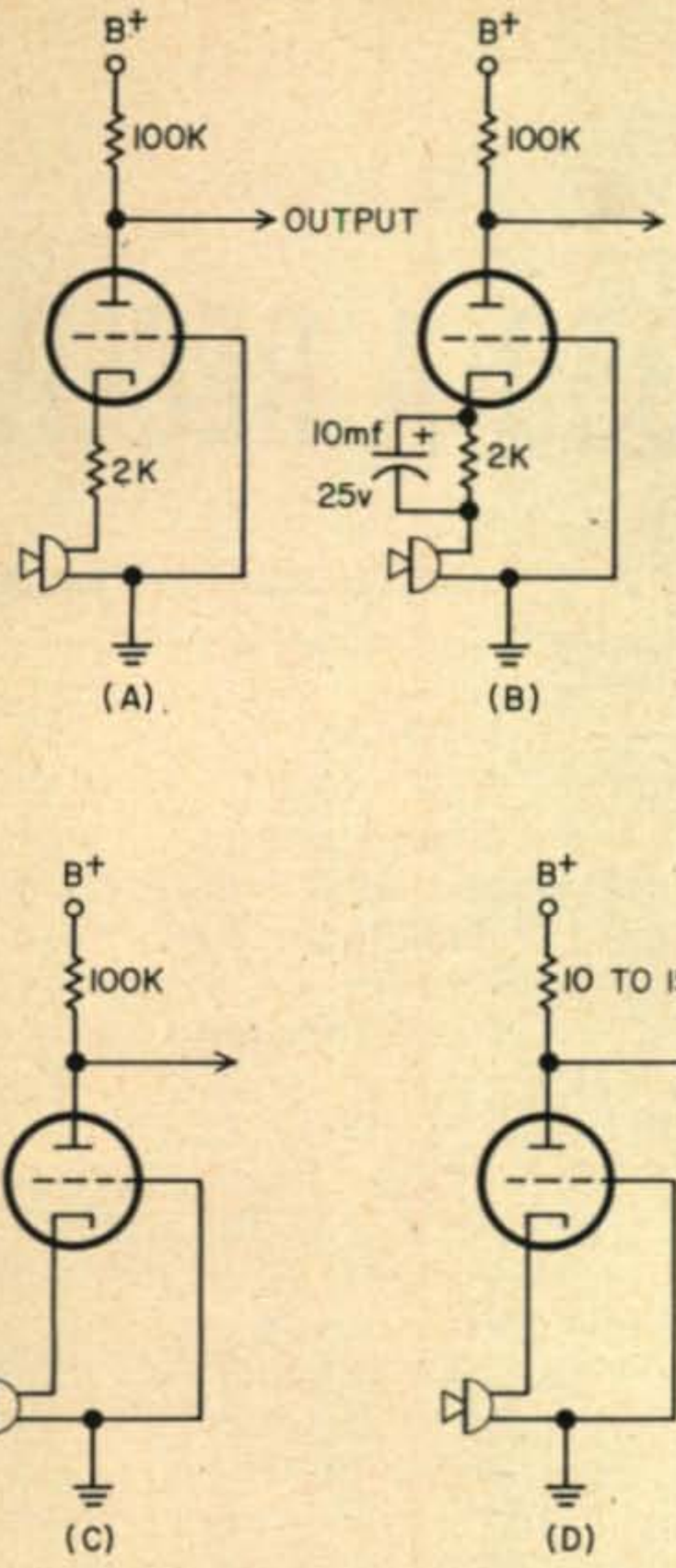


Fig. 1 — Basic circuits for carbon microphone grounded grid preamplifiers as discussed in the text, (A) is the most common and yet the least efficient of the designs shown. The final version as concluded in the text is shown at (D). Tube is assumed to be half a 12AU7.

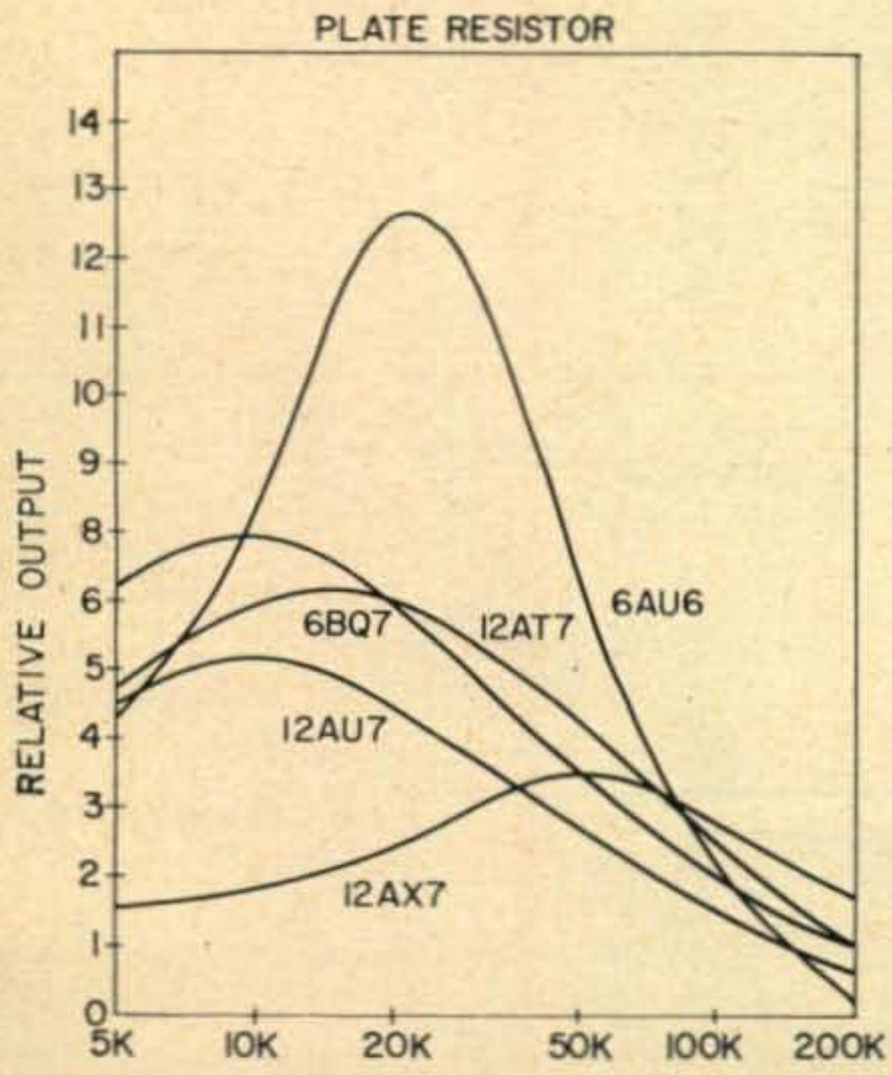


FIG. 2

sistor of 27K. (No, this isn't a misprint!) Among the dual triodes, the 6BQ7 reigns, its best load being 10K. Next is a 12AT7 with a load of 15 or 18K. Third is a 12AU7 with a load of 10K. Lastly comes the 12AX7, its best sensitivity coming with a resistor somewhere between 39 and 62K.

If perhance someone misunderstands, it is emphasized that these recommended values of plate resistors are for grounded grid audio service with a carbon microphone in the cathode circuit. They are far from optimum for most other types of amplifiers.

There are no doubt a few pessimists in the crowd. They'll probably jump up and down, denouncing the claims made in this article, countering with some sort of warning about burning out tubes with excessive plate current. Admittedly, lowering the plate resistor will increase the plate current to a certain extent. But if the plate current rises, so will the cathode current. This will cause a larger drop across the cathode resistor (in this case of a microphone), tending to bias the tube more. Thus the system tends to be self-adjusting. As a matter of fact, it may be comforting to know that none of the tubes shown, when used with its optimum plate resistor, draws over 10 ma. Hence the plate dissipation will never be exceeded.

In Conclusion . . .

To obtain optimum performance from a grounded-grid audio preamplifier being driven by a carbon microphone, the following is recommended:

1) If a selection of tubes is possible, use the one with the highest transconductance (G_m).

2) Find its plate resistance (R_p).

3) Use the next highest standard-value resistor as a plate resistor. Its power rating will probably be 1 watt.

4) Use no cathode resistor; connect the microphone to the cathode terminal directly.

5) If the tube gets too hot to touch comfortably (it shouldn't, but may), run up the value of the plate resistor.

6) If the plate resistor gets warm (again, it shouldn't, but may), increase its wattage value to 2 watts.

7) If rf feedback occurs, bypass the cathode to ground with a capacitance somewhere between .001 and .01 mfd.

This predicament of almost everyone using component values of grossly inferior characteristics can doubtless be blamed on these facts: no one suspected that the plate resistor could be in the least bit critical, and no one knew what the right value for a given tube type was; furthermore, few suspected that auxiliary cathode resistance is detrimental.

To reiterate, maximum output will occur when the plate load resistor is set equal to the plate resistance of the tube. The output will then be roughly proportional to the tube transconductance for a given value of high voltage. ■

CQ reports on:

the RME MODEL 4350 A RECEIVER

by RICHARD C. WEINBERGER, K2ALM
1018 Park Place, Brooklyn, N. Y.

Since the CQ standard receiver test series was established (CQ Feb. '58) several sets have been tried out. Most flunked right off so that the tests were not completed. We were frankly amazed at the high percentage of ham receivers on the market that do not meet basic requirements. After testing a few duds, we got to be sort of pessimistic about receivers. No longer will a pretty box or a well-laid-out front panel impress us. Even neat insides will not influence us any more. When the RME 4350A was delivered, we cast our calloused eyes on the oversized dial with the planetary bandspread, on the four-position crystal filter switch and on the 100 kc calibrator and said, "O.K., let's see." So we made a quick check on the performance. Right away we were impressed. We had finally gotten another GOOD set to check. The receiver was so sensitive that our signal generator could not be cranked below S5 on any band—and that generator goes down to a couple tenths of a microvolt. The calibrator was even zeroed in right on WWV.

The next step was to examine the nine-tube circuit to see what makes it tick. The circuit shown as a block diagram in Figure 1 includes a 6BZ6 RF stage and a 6U8 local oscillator-first mixer. The first IF is 2.195 mc. The second converter is another 6U8 operating crystal controlled at 2.65 mc, making the second IF 455 kc. The crystal filter ahead of the first 455 kc IF stage has three selectivity positions and an OFF position. There are two 455 kc IF amplifiers; one is a 6CB6 and the other is the pentode section of a third 6U8 (the triode section is the BFO). Bandpass circuitry is used instead of the conventional IF transformers to give very steep skirt selectivity. The second IF stage runs the S-Meter in a cathode-follower arrangement. In some receivers using this system, the zero adjustment can move right across the meter. However, in this receiver the balancing (zero adjust) voltage is regulated and no S-Meter drift was found. A 6T8 functions as a full-wave detector, AVC, and first audio stage, and a 6AQ5 provides plenty of audio to headphones or a speaker. The audio output xfmr. is built into the cabinet.

We turned the receiver on again for a closer look at the performance characteristics. Tuning across the bands, the noise level varied from S1 on 10 meters to S3 on 160 meters. A calibration of the S-Meter is given in Table 1.

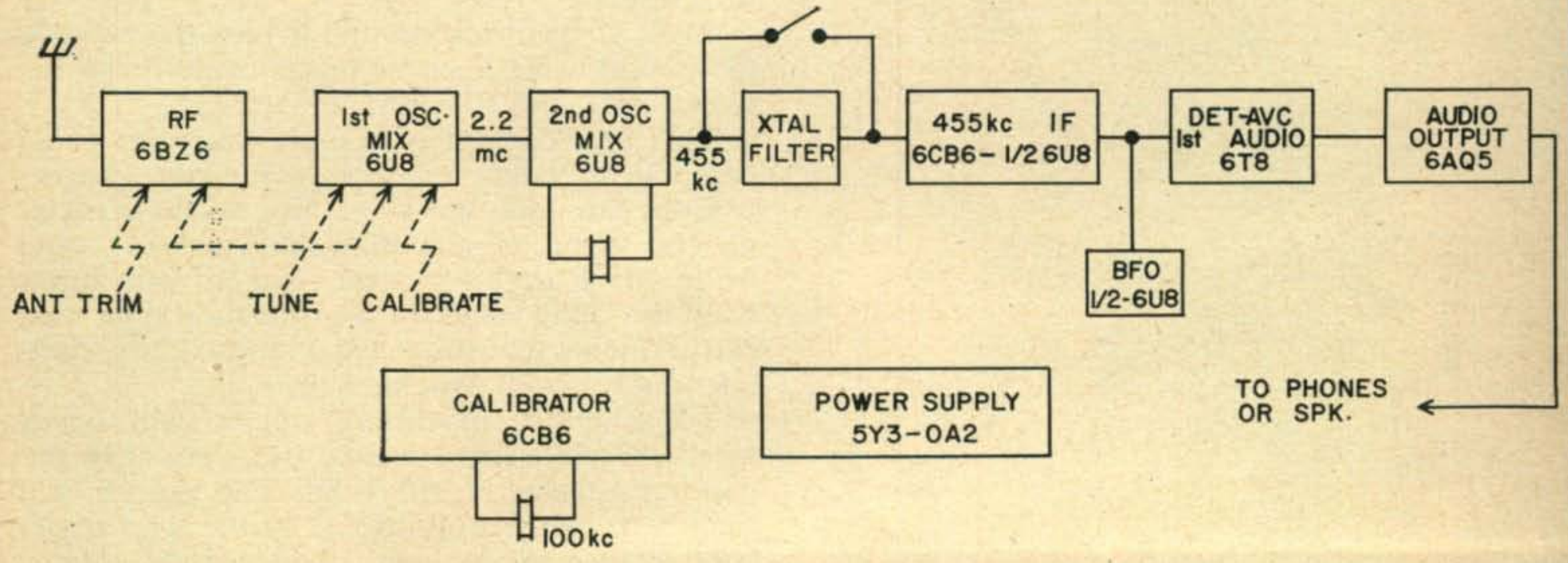


Fig. 1—Block diagram of the RME Model 4350A receiver.

TABLE 1

S-Meter Calibration
Signal Level Across 70-Ohm Antenna

Frequency	S-9	S-9 + 10 db	S-9 + 20 db
1.8 mc	1.2 μv	2.8 μv	5.3 μv
2.0	.63	2.4	4.4
3.5	.87	3.0	6.0
4.0	.55	2.2	4.6
7.0	2.5	8.8	17.0
7.3	1.3	4.8	10.0
14.0	2.9	8.1	15.0
14.3	2.1	6.4	12.0
21.0	5.5	16.0	31.0
21.5	3.7	11.0	21.0
27.0	5.0	15.0	28.0
29.7	3.5	11.0	18.0

TABLE 2

Noise Level

Signal-plus-noise to noise ratio with 70 Ω antenna

Frequency	S-9	S-9 + 10 db
1.8	13 db	19 db
3.5	7	13
4.0	7	13
7.0	14	19
7.3	11	16
14.0	12	18
14.3	10	16
21.0	15	21
21.5	11	17
27.0	12	17
29.7	9	13

TABLE 3

Image Rejection with with 70 Ω antenna

Band	Image Rejection
160 meters	70 db
80	68
40	74
20	67
15	52
10	43

Since the receiver's sensitivity appeared so good, we checked the meaning of S9 and 10 over S9 in terms of signal-plus-noise to noise ratio. The results are shown in Table 2.

The primary image rejection was measured at only 43 db at 10 meters. Although this is better than most receivers, it does not meet RME's 50 db spec. The primary image is 4.4 m chigher than the signal on all bands except 10/11 meters where it is 4.4 mc lower than the signal.

When an IF in the megacycle range is used the sensitivity to signals at or near the IF is an item of major importance. In this receiver, the rejection of 2.195 mc signals was found to be 36 db on 160 and more when tuned to any other ham band.

The bandwidth was found to have very steep skirts in the wideband position. The measured bandwidth of 3.3 kc at 6 db down and 3.6 kc at 20 db down make the wideband position near ideal for both AM and SSB. The audio is peaked at the high end of the audio range so that an AM signal comes through this narrow width with the amazing fidelity of 80 cps to 5.4 kc between 3 db points.

While we were thinking about bandwidths for SSB, we checked the stability of the unit on 10 meters. We chose 10 meters because it is usually the band with the most drift on an all-band receiver. Starting cold the receiver drifted erratically for the first few minutes and was 3 kc higher after 5 minutes. It continued going higher for another 5 minutes at about 1 kc per minute. Then it began to slow down until after half an hour it was "rock stable." The drift from 45 to 60 minutes after starting averaged only 27 cycles per minute—slow enough to hold a whole QSO without retuning.

Any device which tests as good as this must have some important defect. We had to dig to find RME's shortcoming, but we found it, and here it is: The noise limiter improved the signal-plus-noise to noise ratio by only 2 db on an S5 signal. This compares, for example, with the HQ100 noise limiter which gave a 4 db improvement under similar conditions. However, pulse or ignition noise would be attenuated more than ordinary background noise.

After some operation it was found that the planetary tuning mechanism failed to provide fine tuning. However, this was not really a defect, since RME's manual describes how to cure this condition by tightening the proper screws under the knob.

All in all it seems a terrific job was done in the 4350A by RME Division, Electro-Voice, Inc., Buchanan, Michigan. ■

Horatio Potts' Talking Tooth

Bob Wall, ex WN5DUH
111 Cook Ave.
Alexandria, Louisiana

If you're a radio ham like I was, people are always asking you how to replace radio tubes, or how to convert their TV set to receive color, whether electrical storms are good for television reception, whether electrical storms are bad for television reception, and all kinds of questions like that.

So that is why I wasn't surprised to find a thin little man with a radio theory book from the library in his hand and a worried look on his face standing on my front porch one evening.

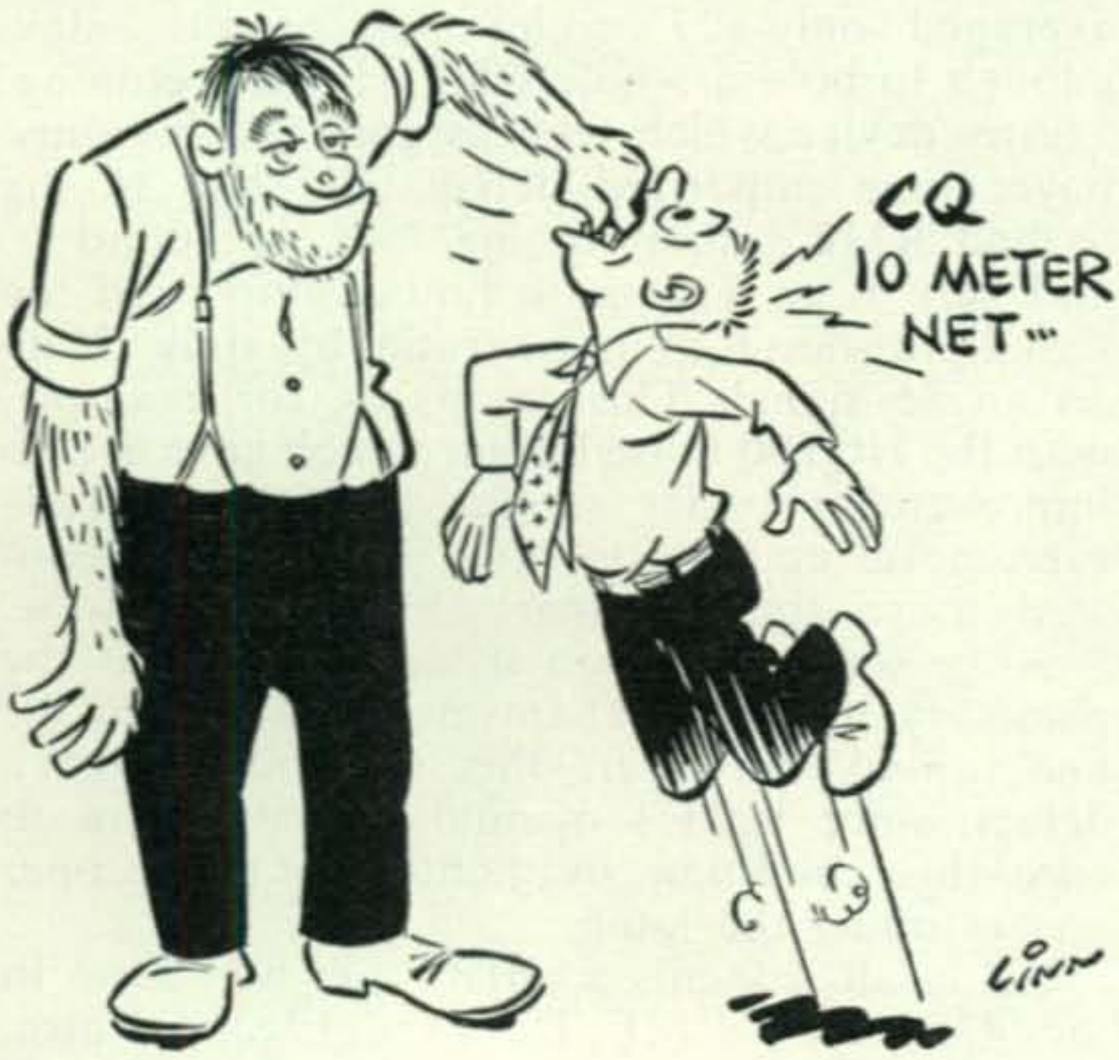
"I am Horatio Potts," he said. "Your neighbor, Oscar Samson, sent me over to get your advice. You see, I—I hear voices in my head."

"You have the wrong house. The psychiatrist lives three doors down," I replied, starting to close the door.

"No! No!" he cried frantically. "I'm not crazy, not yet. But, because of circumstances beyond my control, I am a walking radio!"

"Are you sure you don't want a psychiatrist?" I asked, starting to close the door again. I felt a headache coming on.

"Please let me explain," he pleaded. "You see, I had a tooth filled by my dentist last week. The filling, by some curious coincidence, is so shaped as to be in exact oscillation with the frequency of your local ham net. I hear their voices in my head day and night. So I have come to plead either for helpful advice from the neighborhood amateurs or for peace and quiet on 29.4 megacycles after 10 p.m. I'm a very light sleeper."



"Come in," I said. "I'll see what I can do."

I led him into my living room and invited him to sit down.

"One moment," I said. "I'll go upstairs and get some materials that might aid us in muffling your talking tooth."

I returned with earmuffs, which didn't stop the noise. Neither did cotton stuffed between his teeth, nor did earplugs lessen the noise in Horatio's head.

"I'm afraid the noise comes from inside my head. Those ear attachments don't seem to do much good," he said apologetically.

"Ha, Ha!" I said heartily. "Don't let it get you down yet. Our local ham club is meeting tonight. They'll think of something."

A half hour later we were in the little room on the second floor of the old Town Hall, where the community's radio amateurs get together every Tuesday at 7:30.

I explained the matter to the boys but they had few practical suggestions to offer at the beginning of the meeting.

Shorty Hydefeather suggested that we try tuning Horatio to a commercial station that played soft music all night. Godfrey Goldbottom offered to build a vest pocket transmitter and convert Horatio into a walkie talkie. Sam Ryder had no suggestion, but made a motion that we make him an honorary member and include him in all transmitter hunts.

Jasper Pringle, president of our club, finally suggested that Horatio have the tooth pulled.

Shorty jumped up from his chair and rushed out the door.

"Hold everything," he called from the hallway. "I'll be right back."

Shortly returned in ten minutes with a heavy set giant with an ape like appearance, who carried a large pair of tongs in his right hand.

"This is Hermann Schnaffell," said Shorty. "Say hello to the boys, Hermann."

"Hello, Hermann," we said.

"Duhh," said Hermann.

"Hermann is an apprentice in the blacksmith's shop," explained Shorty. "He pulls horses' teeth sometimes.

"Now just relax," he said turning to Horatio, "because Hermann is going to get rid of that tooth for you."

"I d-don't know—," stammered Horatio.

"It won't hurt a bit," interrupted Shorty. "Go to it, Hermann."

"Duhh—huh, huh," chuckled Hermann as he towered over the shuddering form of Horatio.

Hermann yanked, lifting Horatio bodily out

[*Continued on page 118*]

MODERNIZING THE T-17

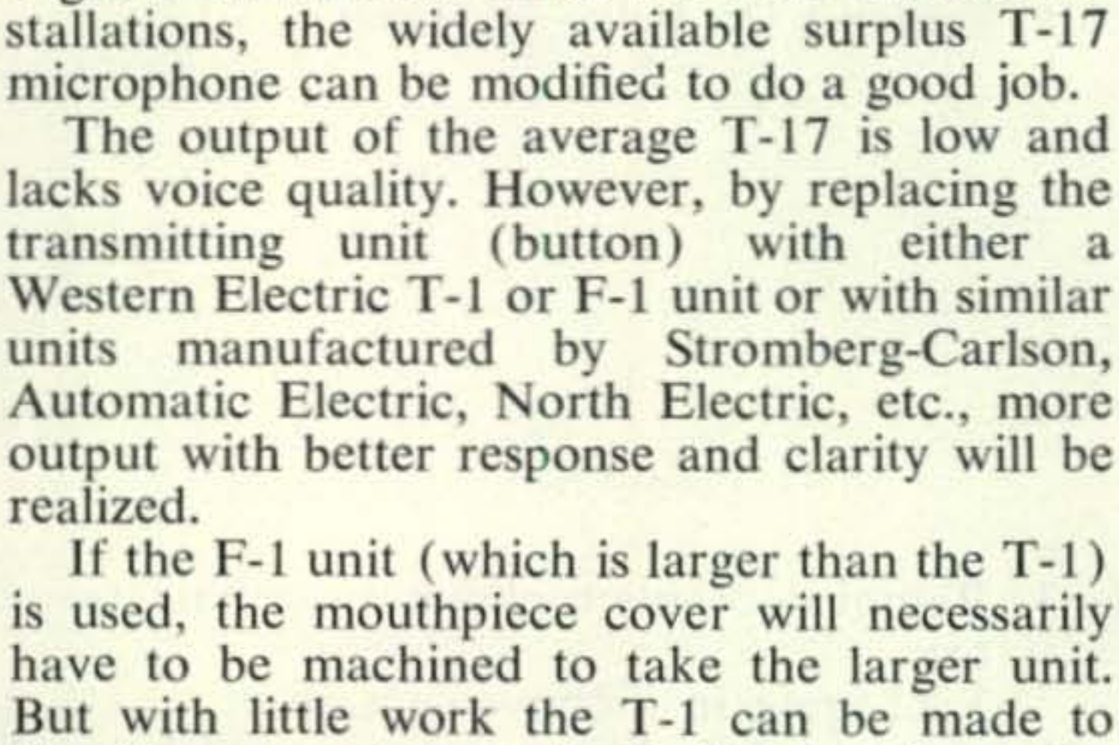
by CHUCK SCHAUERS, W6QLV

For those not having the cash to purchase a good commercial mike for their mobile installations, the widely available surplus T-17 microphone can be modified to do a good job.

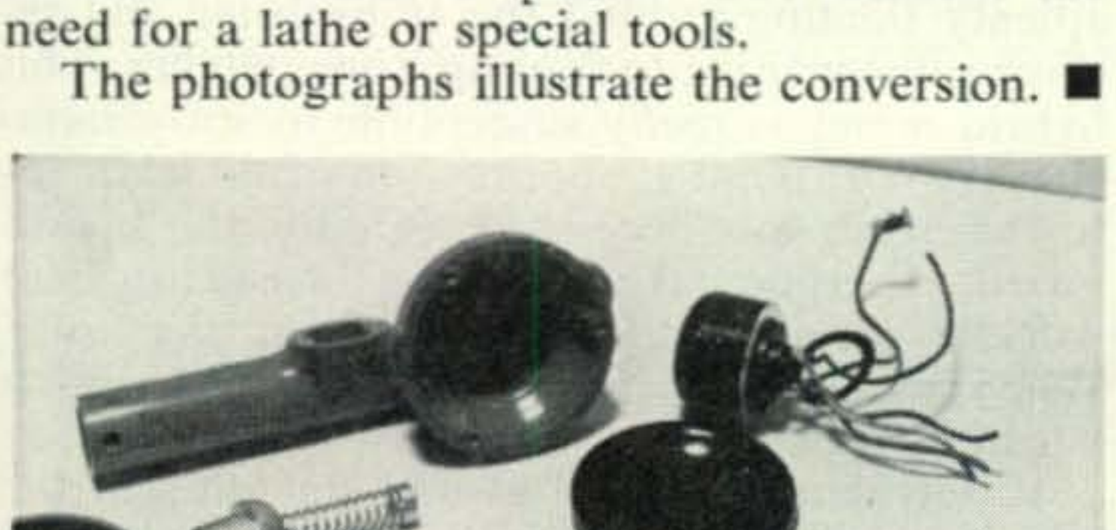
The output of the average T-17 is low and lacks voice quality. However, by replacing the transmitting unit (button) with either a Western Electric T-1 or F-1 unit or with similar units manufactured by Stromberg-Carlson, Automatic Electric, North Electric, etc., more output with better response and clarity will be realized.

If the F-1 unit (which is larger than the T-1) is used, the mouthpiece cover will necessarily have to be machined to take the larger unit. But with little work the T-1 can be made to fit either a metal or plastic T-17 without the need for a lathe or special tools.

The photographs illustrate the conversion. ■

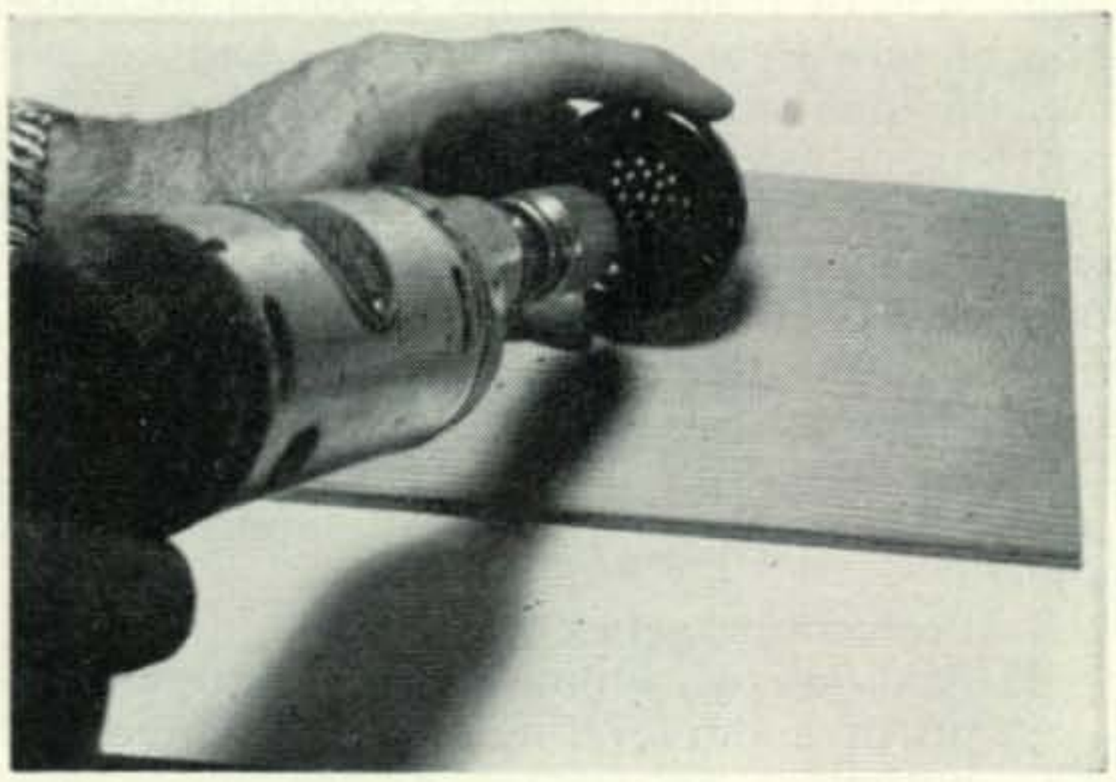


1—T-17 microphone is first carefully disassembled.



2—With a knife, plastic surrounding cover retaining screws is carefully tapered so that T-1 transmitter unit will fit flush with top of microphone (case) cup. A file is used on the metal microphone for the same purpose.

3—T-1 transmitting unit is mounted in microphone cup after two connecting wires from curl cord are carefully soldered to center button and outside ring. Minimum heat should be used for this soldering.



4—Microphone cover is drilled to increase pressure sensitivity.

5—Microphone is reassembled and desired plug attached. Most T-17 microphones contain wire connection diagrams pasted inside of button switch.

Applied Hybrid Husbandry

by JOSEPH A. WHITE, W5KMH
5819 Waggoner Dr. Dallas 30, Texas

On the assumption that there are other constructors like the author who prefer to "wait for the bugs to be worked out" before undertaking a building project, here are some tips for putting the "Hybrid Phone Patch" (November 1957 CQ) to work.

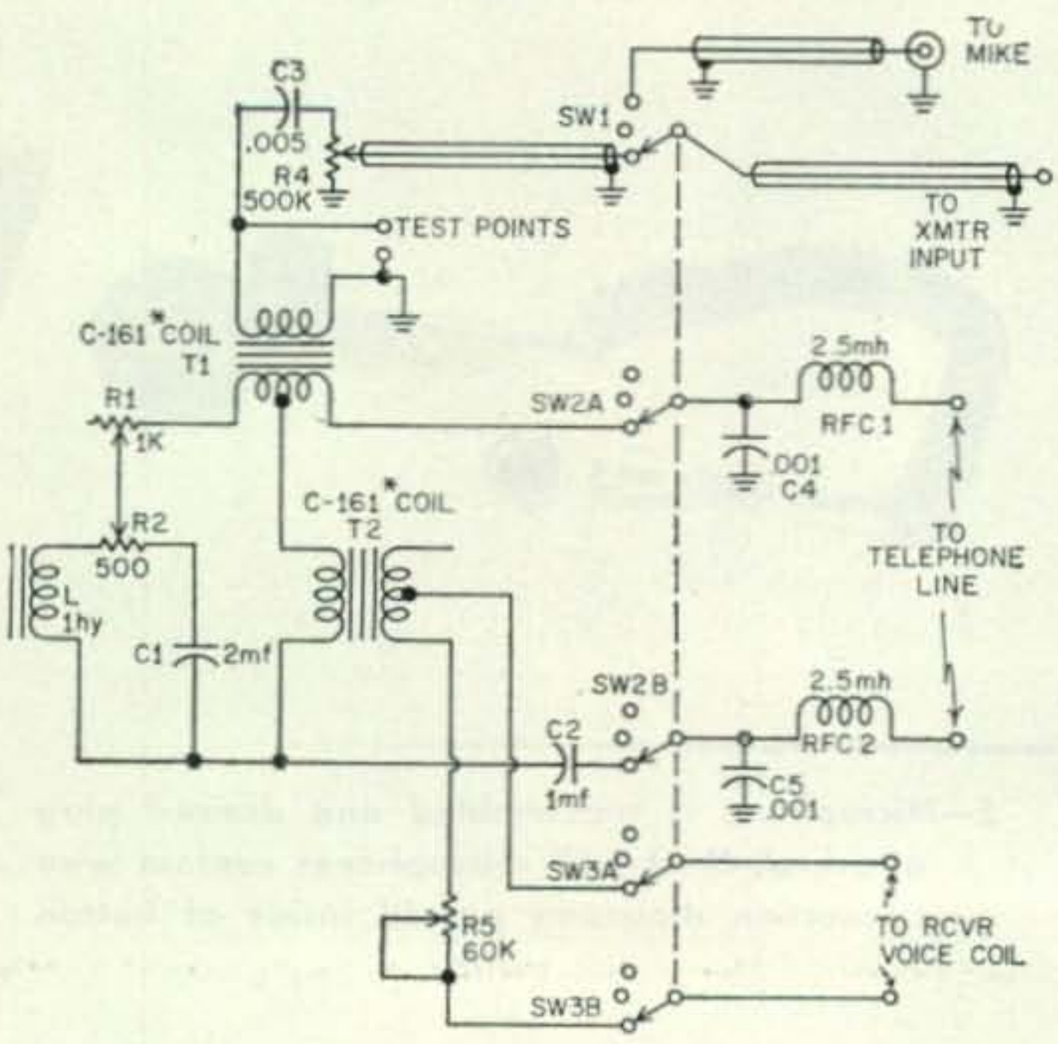
Capt. Sidney Rexford, W2TBZ, is due a large vote of thanks for his excellent explanation of how hybrid circuits work. And believe me, this one works beautifully, judging by reports from listeners in the North Texas area. No hum (a real bugaboo with previous patches we've tried and discarded); positive control of the voice-operated relay in the Central Electronics' 10B exciter, and quality comparable with the usual crystal microphone.

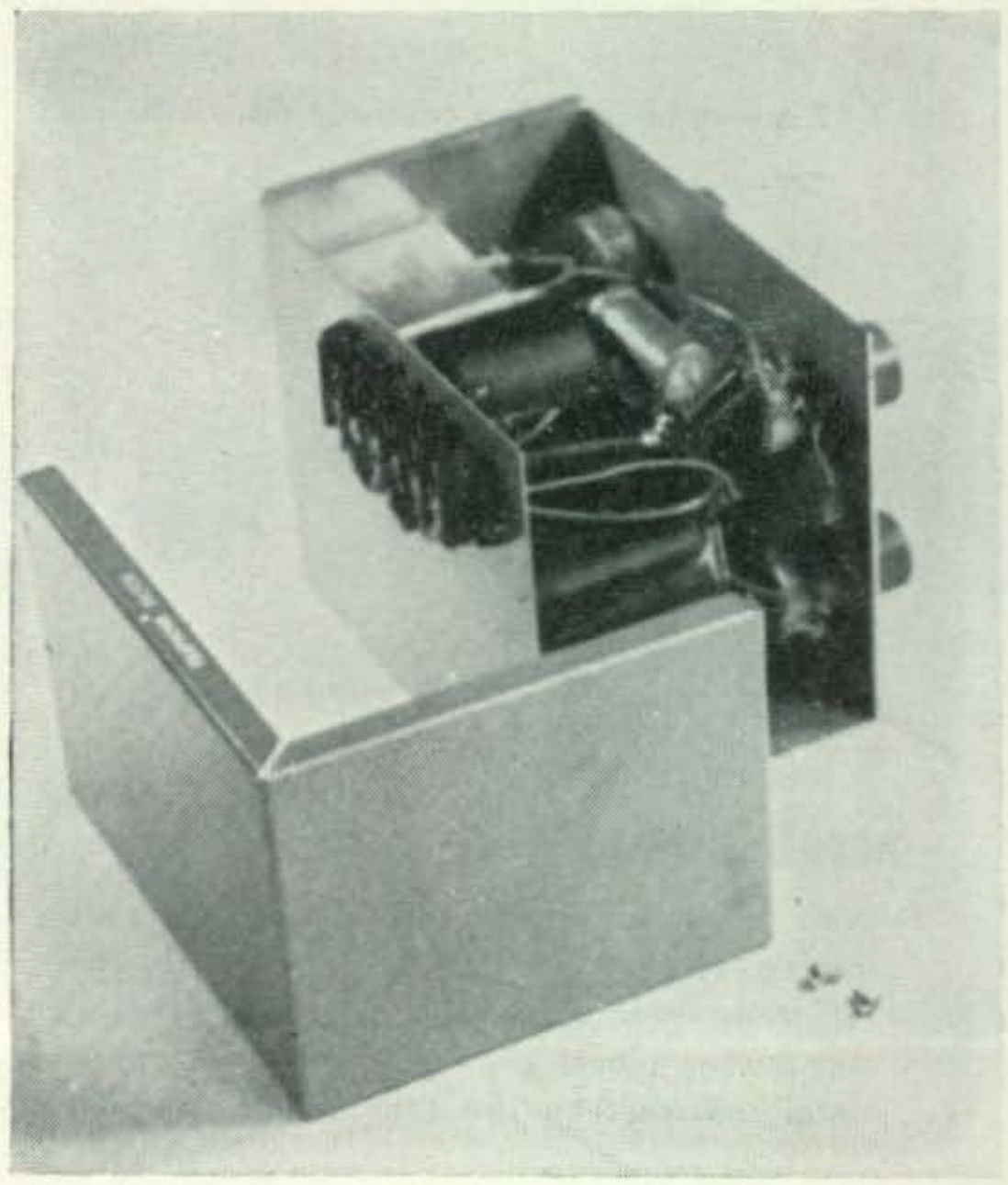
Using Rexford's basic circuit as a take-off point, here is a summary of improvements added:

1. Protection against rf feedback into patch;
2. Addition of a potentiometer to set telephone audio level independent of receiver output;
3. Removal of microphone swamping resistor;
4. Packaging in a convenient case.

If your shack is like mine, you will have rf aplenty floating around the transmitter and receiver, just waiting to foul up 'fone patches. This hybrid honey is *really* susceptible to stray radio energy. We found rf suppression of *all* leads into the patch was necessary. (Oddly, the breadboard experimental model first lashed up here worked great—10 feet away from the xmtr. When we moved it up cozy, the screaming banshees moved in.)

It not being practical to add shielding to the telephone company's household wiring, we took the next best avenue and incorporated 2.5mh rf chokes in each side of the phone line *inside* the shielded patch box, and added .001 bypass capacitors to ground on the patch side of each choke.





Some improvement was noted, but the howls continued, so the speaker leads next got the treatment. We replaced all the zipcord leads between the 75A2 receiver, the 10B, speaker and the patch, grounding the shielding at both ends of every lead. This calmed the feedback almost completely. In keeping with good safety practice, of course, all chassis in the station should be grounded together, including the 'fone patch.

Taking a tip from a commercial hybrid patch, we added a 60K ohm variable resistor in one speaker lead, to enable setting the signal level being fed into the telephone line independently of the station speaker volume. We find it handier to monitor the received signal on the speaker, rather than in the telephone handset—this is especially important if you want to avoid the Donald Duck sounds of an off-tune SSB voice signal. If it sounds queer to you, imagine how bad it sounds to the party listening on the telephone line.

Next to trapping out the rf howls, the biggest problem was obtaining sufficient output to give positive VOX action in the exciter. After much head scratching, the thought dawned: too much loss in the 2K ohm swamping resistor across the transformer T1 secondary. Out came the diagonal cutters, away went the resistor, and up came the output—more than enough. At this point it is possible to set R4 to obtain the same output from the patch as from the station microphone, thus no adjustment is needed when switching from mike input to patch. I like a bit more input from patch than from the mike, however, because the telephone caller inevitably drops the handset away from his mouth midway through the conversation, and his voice level falls enough to make VOX action erratic. You'll appreciate the reserve gain when this happens.

Ol' Pete, who made the listening checks for W2TBZ in Korea, wasn't available when I started experiments with the hybrid patch in Dallas. Fortunately for me, the telephone directory here lists a number which answers with a recorded voice message lasting 55 seconds. The author listened to many minutes of advertising (transmitted into a dummy antenna—don't put any kind of test transmission on the air, PLEASE!) during the adjustment phase of our patch work.

The patch innards will fit neatly into a 4 x 5 x 6-inch cabinet (Premier PMC-1007 or Bud AU-1029) if the bakelite bases are removed from the C-161 transformers and the mounting lip of one transformer is sawed off. For mechanical stability, we bolted the two transformers *together*, side by side, and further bolted the remaining outside lip to the side wall of the cabinet.

Note one change from the original circuit. The right-hand end of T1's secondary winding must be grounded, in order for current to flow through the microphone circuit.

For operational convenience, all switches are ganged in the author's patch. A 5-pole, 3-position wafer switch (Centralab PA-2014) gives the option of (1) patch out, mike in; (2) standby; and (3) patch in, mike out operation. There is no objection to leaving the speaker leads permanently shunted by the T2 primary; however, we couldn't see wasting our audio power during long periods when the patch is idle, so we "break everything" when the patch is not in operation.

The standby position is frosting on the cake—nice, but not necessary. We like to use it during the period when we are setting up the phone call. With the station mike disabled, there is no possibility of tripping the exciter on as we explain to the telephonee why we have unglued him from his TV vigil. When he is properly briefed, a flip of the switch to "patch in" position starts the fun.

Figure 2 illustrates the physical arrangement of controls on our patch. At top center is the mike-standby-patch switch, above the mike input plug. At left, top, is R4, with R5 below. On the right, R1 is above R2. Level-setting controls on the left, balance controls on the right. Hint: a tiny splotch of the XYL's fingernail polish on cabinet and knobs helps you tell at a glance when Junior has readjusted your patch for you.

Unless you are an expert at soldering around corners, it's a shrewd move to pre-wire the switch *before* mounting it. It made sense to wire the panel-mounted pots and switches together before sliding the coils into the cabinet. The L-C1-C2 network also can be sub-assembled more easily outside the cabinet.

Adjustment procedure is simple. After checking the wiring for shorts, connect the telephone leads to the red and green terminals of the telephone wall outlet. With SW-1 in the center (standby) position, dial "1" to kill the dial tone. Place SW1-1 in the "patch" position.

Tune the station receiver to a steady tone (I use the BFO beating against a 100-kc crystal marker oscillator). Starting with R2 set at mid-rotation, adjust R1 for minimum output as measured from the Test Point to ground with an oscilloscope or VTVM. R2 and R1 will interact, so try several positions of each potentiometer for the deepest null.

The optimum null will be found when the impedance of your patch balancing network (R1-R2-L-C1) most nearly approaches the telephone line's impedance. Lack of balance will be apparent if the VOX circuit attempts to trip on a strong signal fed in by the receiver.

A few decals on the panel complete the decoration and will impress your non-amateur friends like crazy. Also makes the patch more valuable when you decide to sell the little gem and build your vastly improved—really "ultimate"—phone patch. ■

A GROUNDED GRID KW

by LT. IRA E. McNALLY, W7HWR
Yuma Test Station, Yuma, Arizona

As a Serviceman who is always moving from one place to another, the size of my equipment has been a constant problem.

For three or four months now I have been experimenting with different types of grounded Grid operation using 813's, 837's and so forth. Through the suggestion of K6HQ, 4-4-65'A's were selected. This tube is available through surplus channels and there seems to be a good many collecting dust around the country. There is nothing complicated in this Amplifier although the circuit differs from the ones given with the FC-15 in that the Grids are grounded direct.

The complete final is mounted on a 17x13x4 inch chassis with a 12¼ inch panel.

The meter used for plate input reading is directly in the high voltage lead.

The power supply is a bridged type and offers no problem in construction. I was lucky enough to obtain a surplus filament transformer with multiple windings but since this has no identifying number the parts list will make reference to three separate ones. No bleeder was used as filtering was adequate with 12 hy choke and 4 mfd capacitor. High voltage will bleed off through the tubes if the filaments

[*Continued on page 100*]

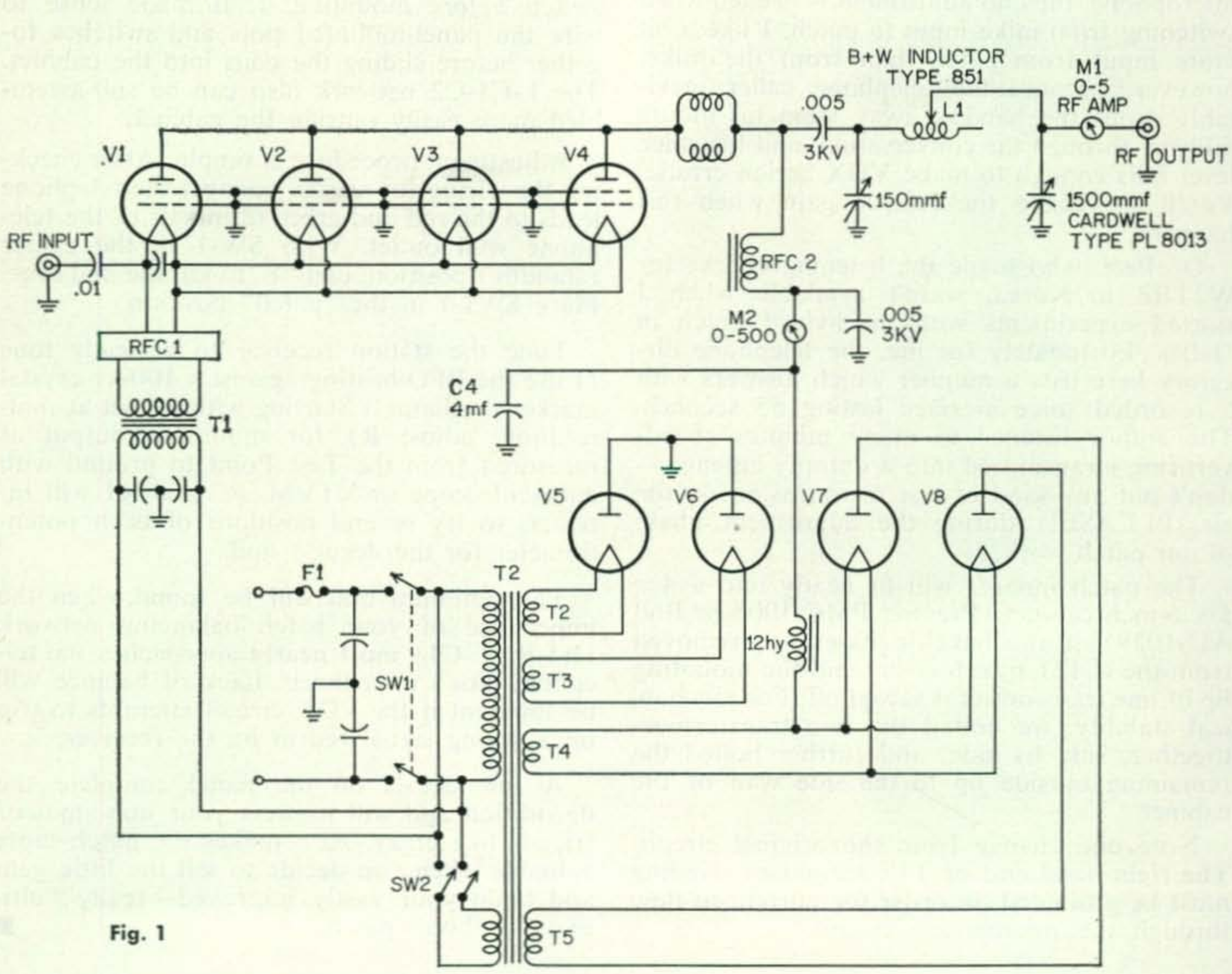


Fig. 1

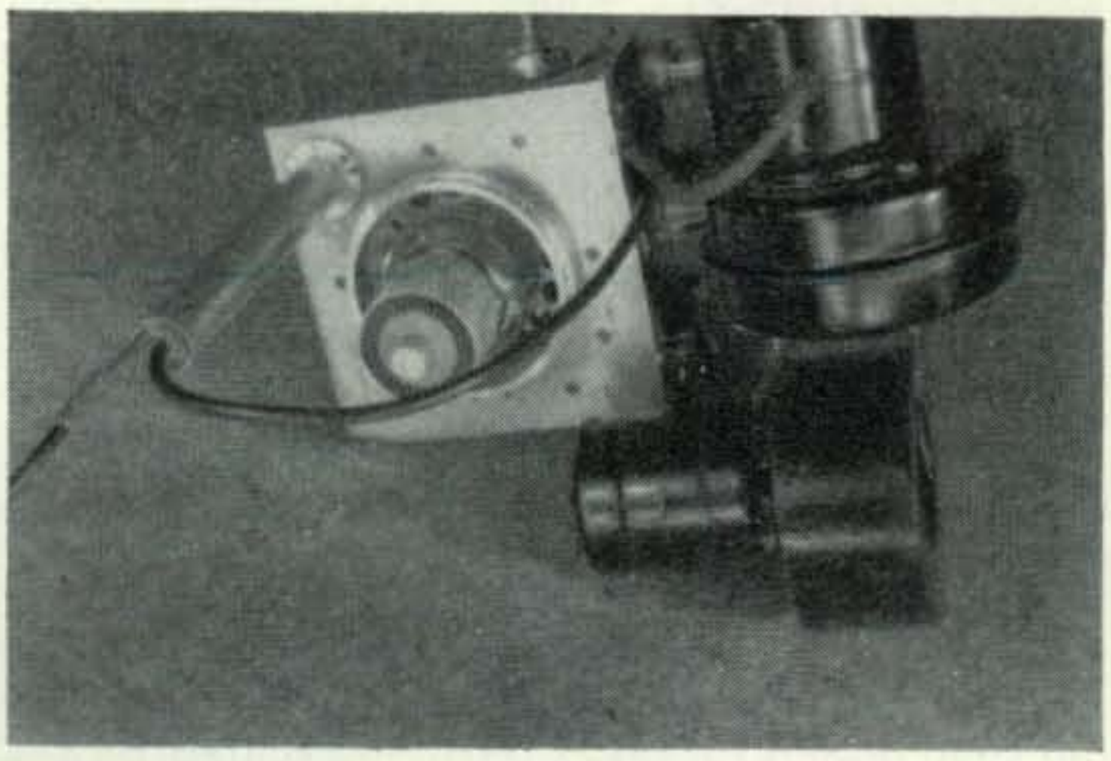
Charles J. Schauers*

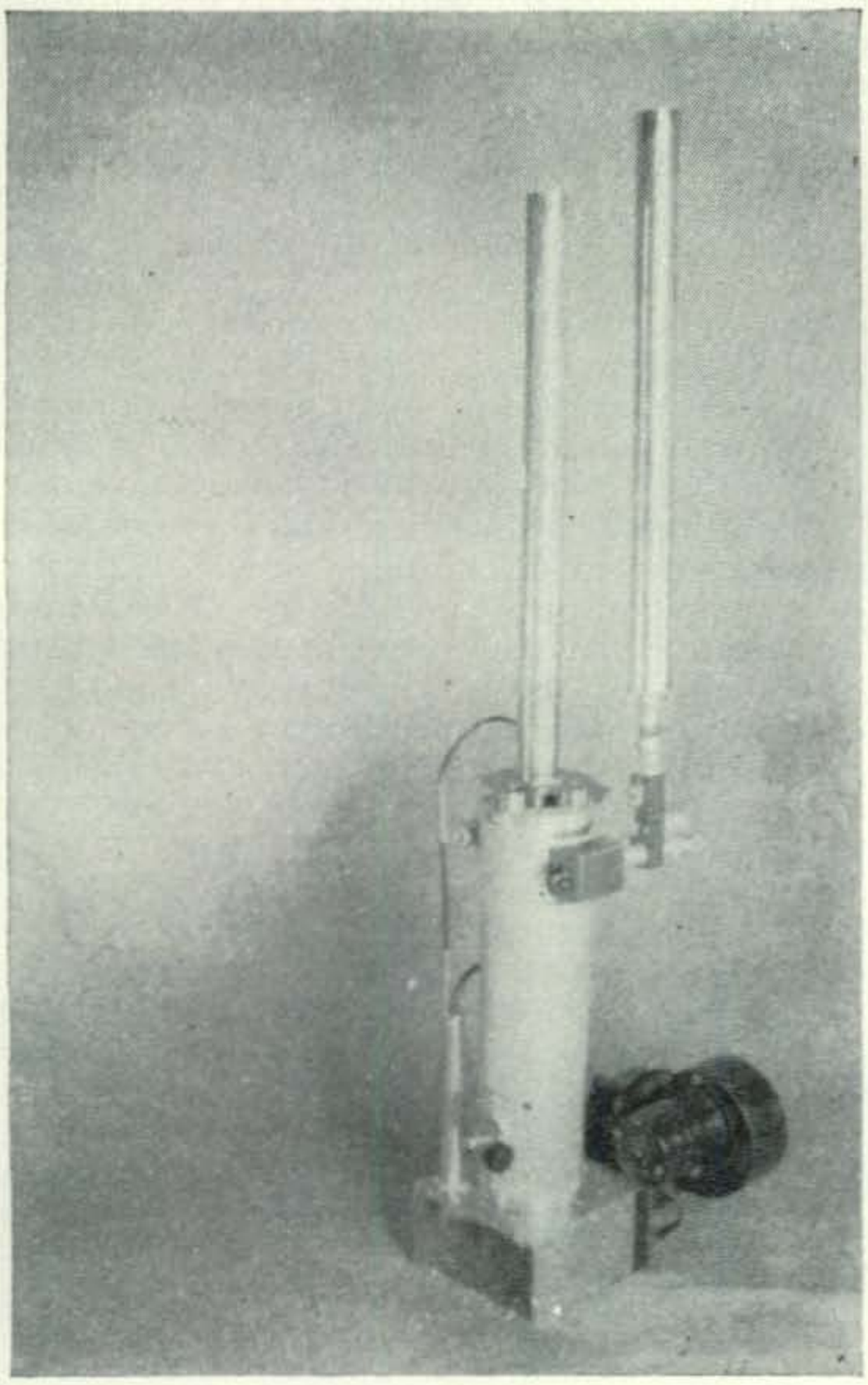
WARNING: If you have a weak stomach or have never been on TWO METERS —turn to the DX section—this is for those hardy few that still build better equipment than you can buy.....TKN

ANTENNA DE-ICER

(Jersey Style)

by Bill Ashby, K2TKN
Box 97
Pluckemin, New Jersey





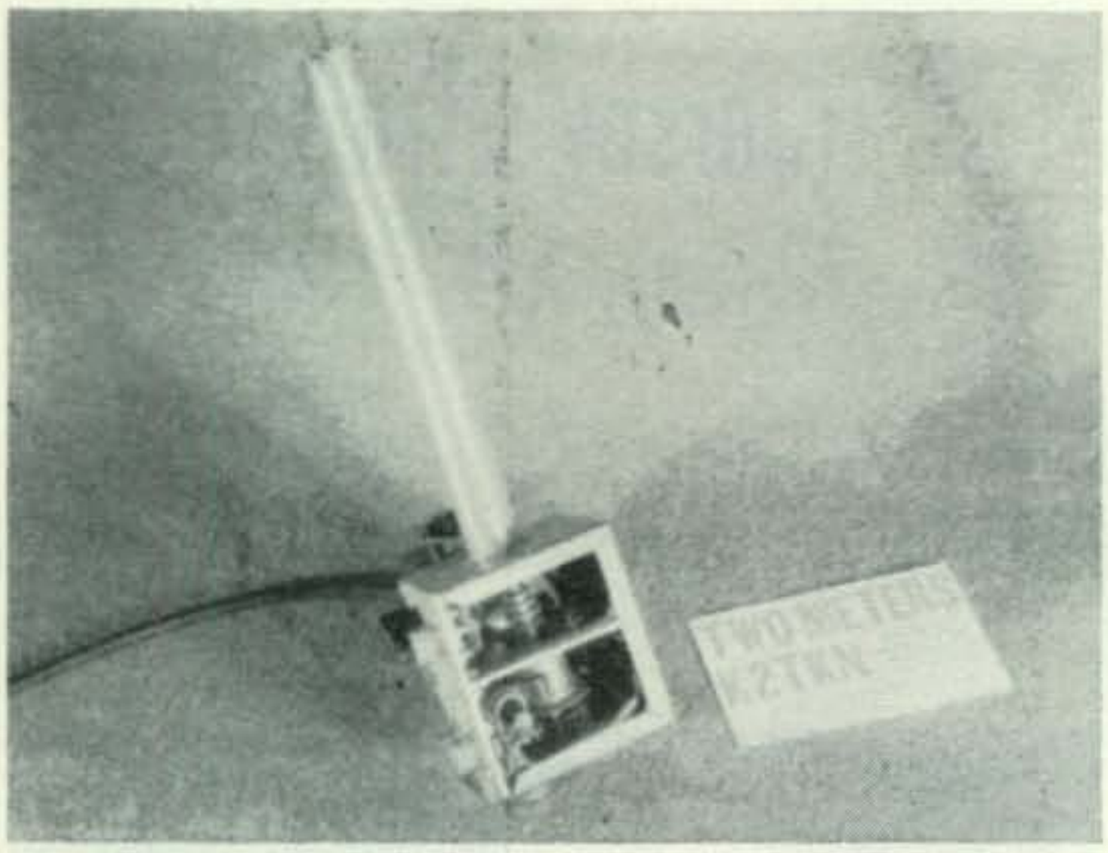
As most of the odd characters that hold down the low end of TWO realize, rack and panel construction and VHF amplifier efficiency just don't mix. These are the stations whose main occupation seems to be to warm up their feedlines on hot summer nights—W2's calling W5's at *30 WPM CW*—on TWO METERS. After years of knuckle busting, chewing out meter holes in steel panels, etc., the conclusion has been reached that you can't put an efficient tuned circuit in a box. If you don't, it sits there and radiates, and this leads to assorted TVI, BCI, etc., and a punch in the nose from the guy next door who is wired for sound. (You were 30 db over S 9 in his hearing aid.)

Most vhf transmitters are designed today in one of two ways;

one.—after getting the r-f sections working, put a shield around it,

two.—or worse, pick out a nice fancy box and just try to stuff it in, one way or another, the heck with efficiency.

All of this doesn't mean much, oh yeah, at the 100 watt level. Fifty or sixty watts of waste r-f in heat will keep the shack warm next winter. Just don't answer the fone when irritated neighbors looking at modulated milk-bottles (TV) call. If reports aren't too good, you can always put up a bigger antenna (this lets the neighbors know who to call). In WØETJ * K2TKN's case, this finally led to a wide spaced 64 element bed-spring on a hundred foot steel tower, and then it gets a little harder to get another 3 db of antenna gain!

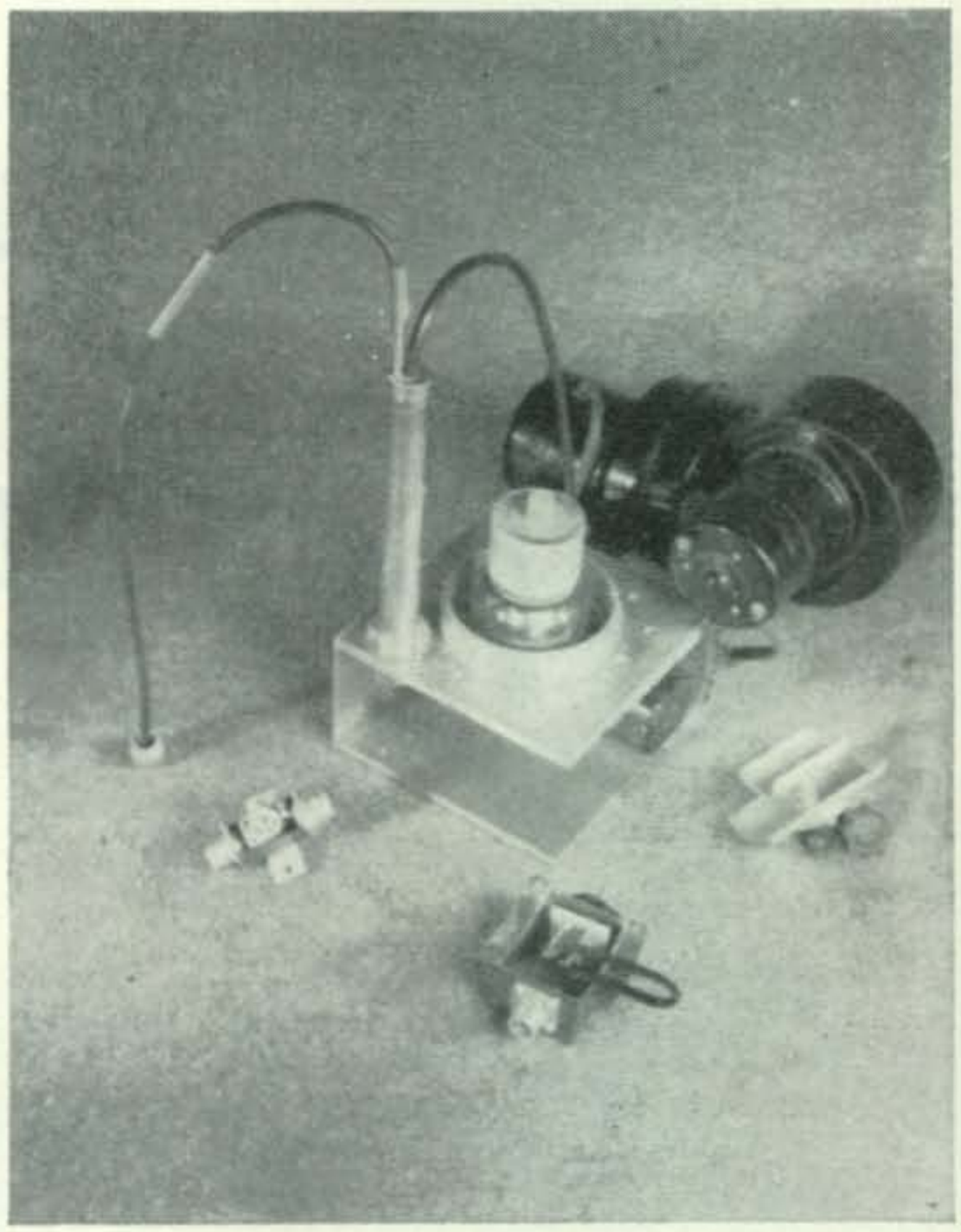


By this time you have started to collect parts for that big final, after all, the book says that raising your power from 100 watts to a kw boosts the signal 10 db in the other guys receiver. After quite a struggle; two weeks of midnite oil, a mangled finger, much horse-trading of surplus, loss of two friends in shady deal for pole-pig (3300 volts at 5 amps), the monster is complete and ready to fly. Push the big switch—and it takes off like a scared bird—much smoke and a few more hours and it is beginning to act more like an amplifier and less an oscillator—loads right up to a kw. No one will talk to you for you have been using their rcvrs for a dummy load for three nights during the taming procedure, but you are getting swell reports — WAC in four minutes on TWO-(WAC- worked all channels)—but the object is to get as much of the r-f in the antenna as possible, after all, the other guy can't listen to your final plate meter, only what is left of the signal after it leaves your antenna. When you start getting six or seven hundred watts of clean r-f into the antenna, and if the antenna is big enough, you can go on the low end of TWO (144.000 to 144.010) and complete with the type signals that reside there.

This can be done in one of two ways;

ONE—run five kw to a typical inefficient final—
(We understand the FCC frowns on this)

TWO—take the cowards way out, get at least 60 percent efficiency out of your final running on actual 1000 watts input.



Good feed line, properly matched, and a few other small details (small—3 db loss per hundred feet of typical feedline means several hundred watts is only melting poly) help, but raising the efficiency of the final from 30% to 60% helps your signal just as much as going from 64 to 128 elements.

Don't expect to buy or copy some piece of commercial equipment at this power level or frequency, either, if you want more than a couple of hundred watts out at one kw in—after all, the commercials are very friendly with power companies and have no input power limitations so can run triodes in grounded grid and other such garbage. Nobody with money seems interested in these frequencies, but they are sure interested in making use of the various new types of propogation that TWO METER KW'S find. The commercials have developed some terrific equipment for the Kilo-megacycle bands on government money, and if they can get fifty percent efficiency on 3000 mcs. CW, there is no reason to run 60 percent in-efficient on TWO. Borrowing heavily from SHF methods, the STEAM ENGINE was developed at K2TKN.

This amplifier isn't pretty, was not put together with the thought that more would be copied from it, but is rock stable and at 4000 volts and 250 mils on the plate will deliver over 600 watts of CW, high level AM, ARTTY, SSB into the input of the feedline to the Antenna. It will melt six feet of flat RG-8U in less than twenty minutes at this input and is easily driven with a 6524 with 30 watts input. With the normal 4000 volts on the plate, 500 volts on the

[*Continued on page 116*]

DON'T LAUGH... it could happen to you

by TOM NEWCOMB, W7YLC
1513 First Avenue North, Great Falls, Montana

The other day I informed the XYL that I was going to purchase a new sidewinder Xmtr. She raised one eyebrow and inquired as to price. I ventured that I could get exactly what I wanted for a half kilo-buck. The only way I can describe the reaction is to compare it with the sound of a mashed cat.

I stood on my rights as the bread winner and head of the household. Both rights were promptly taken from me. I reverted to cajoling, teasing, and finally threats, but to no avail.

After several days of silence between us, I decided that she really meant what she said. I told her that I had to earn the money, and that I would spend it as I pleased. She, through her diplomatic corps, (we have five children), told me that MY money was family property, and could only be spent by majority vote of the membership.

Now this development is right down my alley. Being a salesman for several years and now a sales corporation president, I reasoned that with the proper approach, it would be possible for me to win the votes of three of the jr. ops, and thereby, with my vote, I would have the necessary majority for permission to purchase said Xmtr.

Immediately I sallied forth to win the approval of the board of directors. Upon corralling the eldest, (a small, blonde female with gold digging tendencies), I was told that she would be very happy to cast her vote for my cause, but . . ."

"Daddy," she said, "you know that you told me, that when I was eight, you would buy me a bike. So if you will buy me a bike, I will vote for your transmitter."

I offered a Brownie uniform instead of the bike, but the deal didn't sell. She decided that I would have to get her a Brownie uniform, in addition to the bike.

As you can see with five kids this could get to be rather expensive. I dickered around with the eldest boy, (a seven year old appetite surrounded by dirt) but, the best I could do with him was an electric train and a football.

The three year old daughter was a pushover. I got her vote for the incredibly low price of only a doll buggy and a sawed off high chair, $11.96 total.

I had my three votes, and the deal was all sewed up. Of course the price was a little bit stiffer than the $495.00 I had originally planned to spend, but such is the cost of raising a family. The old budget would be strained to the limit, but by borrowing a hundred clams from the local robbers roost I could make it. I could get the transmitter immediately, and pay off the hundred in three back breaking installments. Back breaking when your allowance is ten bucks a week and you have to buy coffee, smokes, radio parts, and the radio magazines out of it. (Notice to editor: No, I don't subscribe. And don't be putting any of your bleeding pleas for subscribers in here. At least I read your sheet, even when I have to cough up four-bits for it.)

Came the end of the week, the board of directors meeting was held. Much to the consternation of the XYL, the voting took place as I knew it would and I won the right to spend the sum of $500.00 for the transmitter of my choice.

The next morning I got ready to go down to the appliance store that handles communications equipment. The wife yelled that she wanted to ride down with me, so I had to wait another hour.

Impatiently I waited and dreamed of all the contests that I would win. I planned to list my new equipment with the EC and to drop a note to the local club rag, saying, "W7YLC is on the air, sideband, with a new rig."

At long last we were under way, and shortly arrived at the store. The HamShack in this joint is an amateur's dream. Rows and rows of new and used receivers and transmitters. The XYL wandered off to look at all the other junk this place handles. Several of the local gang were there and all of us were batting the breeze about hamming.

I finally collared a clerk and told him that I wanted to buy This Transmitter. He gave me the pitch on it, and then had to answer the phone. He left me to pore over the instruction book . . . and dream. About that time the XYL

[*Continued on page 116*]

Exposing the film. The white streak indicates the path taken by the light in painting the chassis. The shutter is open and the lens stopped down during this procedure.

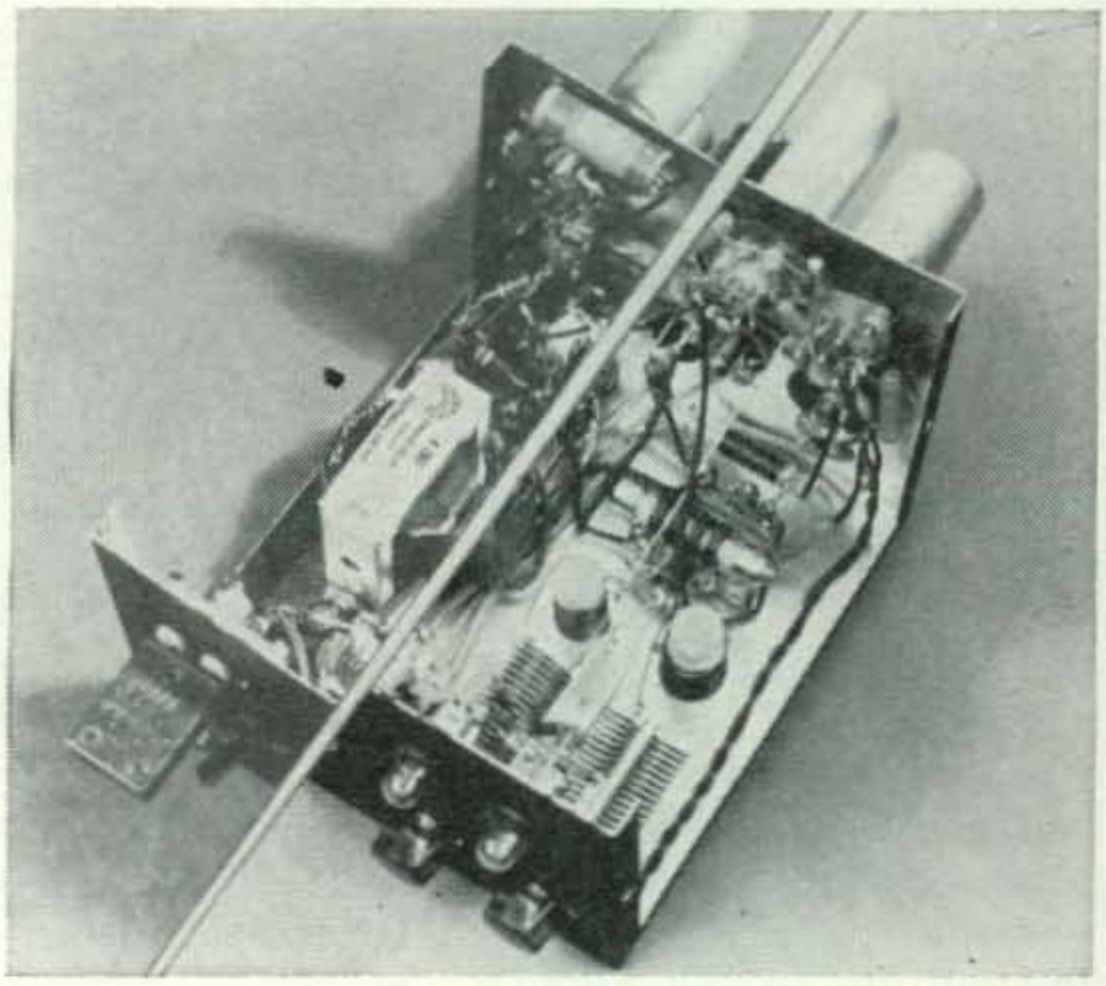
Stuart Gang, WØTIR
2135 Jefferson Avenue
St. Paul, Minnesota

Don't just Photograph it..... .....paint it with light!

Psychologically speaking, it is healthy for one to admit to his frustrations. Therefore, I must acknowledge that on several occasions while studying "Ham" magazines I have been frustrated. I hasten to add, not with the editors, but with my well-meaning fellow hams who turn out fine articles on their latest electronic masterpieces . . . only to illustrate them with globs of gray-tone.

To the thousands of hams who have studied a magazine article construction photograph wondering how WØ — mounted that choke only to discover it buried in some nebulous shadow, this article is respectfully dedicated.

What follows is a description of a highly successful method of photographically lighting radio equipment, whether it be the top or the bottom of a chassis which is to be illustrated. This method is by no means new, it has for many years been used by professional catalog, magazine and illustrative photographers. However, the technique is not often "advertised." It does not call for any special photographic equipment, in fact, as you will discover a minute amount of lighting equipment is needed. Professionally speaking, it is known as "Painting With Light." [*Continued on page 112*]



A comparison of picture quality using two methods of lighting. The left half of this composite cut was photographed using a well-accepted method of cross lighting. The right half used the "Painting With Light" method. Note the difference in detail especially around the tube sockets one of which, on the left-hand portion of the picture, is barely visible.

FILMS FOR HAMS

Louis J. Polskin, Ph.D., M.D.
1401 S. Florida Avenue
Lakeland, Florida

Brighten your courses for training prospective amateur radio operators with motion picture films! Based on very successful teaching programs given during the past two years by the Lakeland (Florida) Amateur Radio Society, the presentation of films has bolstered student and XYL attendance, and supplemented relatively difficult theory most advantageously. One usually begs the ARRL, West Hartford, Connecticut for films on radio principles only to learn regretfully that only one film may be requested for an entire month. In view of the tremendous number of requests for films from the several hundred affiliated radio societies, this is not surprising.

This situation prompted the Lakeland Amateur Radio Society to seek other sources. Using the film libraries listed herein, the Society successfully presented one to three films at each weekly meeting during the 16 week course for the preparation of General class licensure. The cost was relatively small, namely, less than $30.00, which was met by the enrollment fee of three dollars. This included membership in the Society for one year. Since the majority of the films were sent gratis, the expenses defrayed were largely for postage and insurance. To protect the small treasury, films were insured in amounts from 100 to 200 dollars. Parcel post offers a special "film rate" which is much cheaper than that provided by other carriers.

The films obtainable from the sources listed herein necessitate the use of 16mm motion picture sound equipment. As a general rule, a film repository will not send motion pictures gratis for private showing by an individual. Such films are reserved for public showing, non-profit in purpose, such as a service club. In the letter requesting a film, the officer in charge should state who is responsible for the care, showing and return of the film.

The Visual Education Committee

A well-planned training course depends on an ambitious, cooperative Visual Education Committee. Their first job is to gather a bibliography of films. Certain sources noted in this article also offer strip film series or slides with taped lectures on scientific topics. The educational committee may prefer to launch, or supplement, a course with a scientific show. A 45 minute live show is provided without charge by the Public Relations Department, The General Electric Company, Schenectady, New York, entitled, "House of Magic." The Southern Bell Telephone and Telegraph Company, Atlanta, Georgia, provides the following lecture-demonstrations in certain states:

"The Mighty Midget—The Transistor"—25 minutes
"Harnessing the Sun"—25 minutes
"Miracle of Radio Relay"—25 minutes
"Continental Air Defense"—25 minutes

Although one must apologize for the fact that this generous company specializes in communications via wires, much can be learned from their excellent films:

"Co-axial and Microwave Miracle"—11 minutes
"Communications for Civil Defense"—

31 minutes
"The Transistor"—10 minutes
"Mobile Telephones"—11 minutes

For a complete listing, request their "Program Catalog, Films, Demonstrations and Tours."

Logically, the material in the scheduled lecture and that in the motion picture should be similar. To ensure such synchronization, arrangements for films must be made 2 or more months in advance. Since the first lectures emphasize simple electronic principles and terms, the films reserved for the introductory lectures should likewise contain material which is depicted in an elementary fashion. No beginning lectures are better supplemented than with the excellent material presented in the two color films provided free by the General Electric Company, entitled:

"A is for Atom"—15 minutes and
"Principles of Electricity"—20 minutes.

If one wishes to encourage the interest of the XYLs as well as the very youthful participants, one should not overlook the two outstanding films which graphically portray, fundamental electrical terms in cartoon style, namely,

"Basic Electricity"—22 minutes and
"Basic Electronics"—22 minutes.

These are distributed free by the Minneapolis Honeywell Company, 221 Fourth Avenue, New York 3, New York. Similar films, TF-1-4144 and TF-1-4145, are available from the Commander, Orlando AFB, Southern Film Exchange, 1356 Film Library Flight (APCS), Orlando, Florida.

Film Compendia

Two film listings of about 5000 titles will prove most useful for the film library of your society. These are available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. for 35¢ and $1.75, respectively:

"U.S. Government Films for Public Educational Use," Supplement #1, Bulletin #6, 1957 and Bulletin #1, 1955, by S. Reid, A. Carpenter, and A. R. Daugherty.

These compendia of 16 mm films, both in black and white and in color, list subjects not only pertinent to radio and electronic principles, but also to related subjects as atomic energy, loran, civilian defense, and guided missiles.

If your treasury can invest $12.50, the "Educational Film Guide" published by the H. W. Wilson Company, 1950 University Avenue, New York 52, New York, is a very comprehensive listing of 16 mm films. Since the 1953 edition with more than 11000 titles (among which over 3000 films are obtainable gratis) semi-annual supplements have appeared to provide one with the most up to date listings.

For radio technician training films, the catalog distributed by the Aviation Information Officer, Civil Aeronautics Administration, Department of Commerce, Washington 25, D.C., is a treasure. There is a rental charge of approximately one dollar for each of these films which will be obtainable from a university nearest to your address. Another film catalog, generous in subject matter of the physical sciences, is that provided free by the Encyclopaedia Britannica Films, Inc., 1150 Wilmette Avenue, Wilmette, Illinois. This source, too, has a nominal rental charge for their films.

The Armed Forces have been very cooperative in supplying training films at no charge, for use by the Lakeland Amateur Radio Society. One should address the Officer of Information of the respective branches, U.S. Army, Navy or Air Force, Washington 25, D.C., for their film directory and repository nearest to your address. Here are but a few of the films supplied to us by the Office of the Signal Officer, Department of the Army Motion Picture Films, Third Army Area, Fort McPherson, Georgia. (Their catalog of films and film strips, "Public Exhibition List" is available free for anyone in this corps area, roughly comparable to our W4 (K4) region).

"Microwave Oscillators"—18 minutes
"Electricity and Magnetism," Parts I, II, III—14 to 18 minutes each
"Effects of Ionosphere on Radio Wave Propagation"—30 minutes
"Tuned Circuits"—28 minutes
"Basic Principles of Frequency Modulation"—31 minutes
"Circuit Testing with Meters and Multimeters—Theory"—35 minutes

One should not overlook the film library located in your State University, c/o Registrar, General Extension Division. We, in Florida, are particularly proud of the comprehensive listing contained in the "Audio Visual Aids Catalog, 1956-7," obtainable from the University of Florida, Gainesville, Florida. In order to facilitate the acquisition of films from this source it may be necessary to seek the help of the Director of Trade and Industry, County Board of Education, Your County Seat. This is one method of obviating the rental fee for films. Certain of the films which delighted our ham classes are noteworthy:

"Elements of Electrical Circuits"—16 minutes
"Radio Antennas: Creation and Behavior of Radio Waves"—12 minutes
"Radio Technician Training: Capacitance"—31 minutes
"The Triode: Amplification"—14 minutes
"RCL Resistance-Capacitance" — 34 minutes
"Principles of Electricity"—26 minutes

[*Continued on page 106*]

How To Get A Better Job In Radio...

by Leonard E. Geisler, AES,
Chief Engineer, Japan Electronic Trading Co.
CPO Box 1456, Tokyo, Japan

Every now and again you've seen this little action: A man, carrying a large case, climbs the steps of a house, rings the door-bell and steps back a step or two, waiting. Someone answers the door. After a few words, the man is seen to pick up his case and enter the house, obviously invited in.

(This hardly seems the proper introduction to an article on the gentle art of job-hunting, but stick with it, all shall be revealed!)

What *is* involved in job getting? Whether you are an average ham or Somebody (with the capital S) in radio or electronics, you really should know just what is facing you before you start shopping for a new labor QTH.

One fact is crystal clear: For Sale, to the highest bidder, your training, skill, experience and aptitudes.

Another fact, sometimes obscured by muddy thinking induced by reading full page "help-wanted" ads in "CQ," Radio & TV News, QST, Popular Electronics, etc., is: You are a salesman, the prospective (and often unsuspecting) employer is your customer. The job you're after, the job you land, depends on just how good a selling job you do on your prospect. Before you get a job, *you've got to be a good salesman!*

Contrary to popular opinion—often induced by misleading and/or loaded advertising—your services are not being sought after like the guy looking for the gal to fit the glass slipper! If anything, the opposite is true. Yes, manufacturers *are* hard up for competent personnel, but notice I say *competent!* A manufacturer rarely hears how competent you are unless you tell it to him. I say, you've *got* to sell him! Before you can land a really good job you must answer this question: Are you, first of all, a competent salesman?

Now, let us contemplate the personnel managers' side for a moment. Consider the fact he doesn't know you from Adam when you walk into his office, either in person, or by a letter. To be sure, his company advertised for men, but unless you tell him how good you are, he'll file your application you-know-where, or offer you a job cleaning latrines or something similar. If you are dumb enough to accept such an offer, chances are you're going to ruin your future career right then and there! No matter your high IQ, eagerly accepting just any job tossed at you brands you as a complete dope!

On the other hand, the PM doesn't care for coy types either. This too, can cost you a good job and the pay and future which would have gone with it. A little good sense, like a judicious pinch of MSG, will go a long way in making your future really happy and productive. A good salesman knows when to *stop* selling and *start* signing up orders.

Don't oversell yourself out of a good job!

The Mechanics of Obtaining a (Better) Job in Radio

Before you go on your Argosy, it would be a very good idea for you to 1—list your prospective customers, 2—list what they're looking for in the way of employees, 3—what they pay (if it was advertised), 4—their products, 5—etc. I'd suggest you list, or index your prospects in descending order of importance to you, *i.e.*, pay rates, geographic locations, job preferences, etc.

Also, prepare a written version (script, if you like) of your *sales pitch.* List all your training, experience, schooling, hobbies, aptitudes, etc., in a logical manner so that when you *spiel your pitch* it will sound natural and unrehearsed but will give the personnel manager practically a numerical listing—again in descending order—of the many reasons why he should hire you. (Some pepole advocate that the punch line should come at the end of the *spiel,* but I don't. Coming at the end of a long conversation, it might be overlooked. However, there's an art to getting a job, and every artist differs in his technique!) Write your *pitch* so that it may be interrupted at any point, but that its context is so simple that you can pick it up again—after answering a question out of context—and continue to recite, later inserting a comment such as "and as you just asked me, I've had seven years experience coil-winding on used toilet paper roll forms." Above all, don't be long-winded!

If you've had years and years of experience in a particular phase of radio, something which would be good background for the job you're after, but is old-hat, you'd prefer something new, just say: "I've had 10 years in (this) phase," and let it go at that. Dwell a little longer on what you want to do, but again, don't overdo it.

Sometimes it helps if you get the frank opinions of a third party in writing up your *sales pitch.* You'll be surprised, how different you

appear to others. A fresh approach is always helpful, especially in job-hunting!

Job Hunting Has Two Different Phases . . . Direct Contact . . . and Mail.

The one that applies to your own case decides the manner in which you go about selling yourself. We shall now discuss the postal approach for those of you who are unable to take the more direct frontal attack. You might like to know, generally speaking, better jobs are gotten this way.

Now, remember the opening of this article? The man rang the bell and—stepped back! Know why? He's a good salesman. He knows that if he stood close to the door, the housewife would become frightened to some degree and hostile to the salesman's *pitch*. Stepping back causes the prospect to be "drawn out" of his shell by a sort of psychologic osmotic process. It lowers sales resistance by arousing the prospect's curiosity and could be considered the soft shoe in the door. The prospect becomes an easier *mark* with less sales effort called for.

Take your cue from him. Write your letter of application so as to give your prospect a chance to come out of his shell and try to find out more about you. *Don't* give him your entire pitch in one swell foop! Here are a couple of sample letters. Figure out for yourself which one gets the job:

Gentlemen:

I saw your ad for technicians in "CQ" Magazine and said to myself, "here's the job for me!" I'm 23 years old, a high-school graduate and have finished a correspondence course in radio and I don't mind telling you I've had plenty of experience with amateur radio, about 5 years' worth. I worked at Sam's Radio Shoppe of this city during summer vacations and after I graduated from school. After I got into the Army, I took a Signal Corps radio course. Because of this course and my experience, I got along good with my OIC and he got me a pair of Corporal's stripes. I hope I can get a good paying job with your company.

Yours very truly. . . .

Gentlemen:

Recently your advertisement in the March issue of "CQ" Magazine indicating a need for electronics technicians caught my eye. I am under the impression your firm has much to offer to anyone lucky enough to win employment with you. You might like to know your Company has a greatly respected name hereabouts.

Could it be possible that you could use the services of someone with 5 years' active amateur experience as well as 2 years' formal electronics training and some practical radio servicing background? If so, please let me know what your actual job requirements are and I shall be happy to send you full details.

May I hear from you soon?

Yours very sincerely. . . .

Guessed which twin has the Tony?

Pretty sure the second letter gets a good reply. Letter No. 1 has a 50-50 chance of getting any reply at all, and its I-yi-yi approach won't get the writer a job unless the firm is really hard on the rocks for wage slaves!

The second letter is the soft shoe in the door approach. The personnel man reads thousands of letters each month. He answers nearly every one of the letters he reads, usually a big, fat, juicy, form-letter NO! A softly pitched letter like No. 2 above, will come as a welcome relief. After all, everyone likes to be told he's pretty nice, this letter said so, in so many words. It is not begging. It states facts simply and clearly but leaves the door open for further correspondence, if the personnel manager so desires—two steps back from the door, remember? If he writes for further details, you've really gotten your foot well inside the door. Your answer will determine if you've got the other foot firmly planted on a good, new job or in your big mouth.

What about the follow-up letter? A measure of finesse is called for here. Do not, now your prospect's curiosity is aroused, oversell your way out of a job. Again, give him just enough to keep him begging for more.

Example:

Dear Mr. Jones:

(The personnel manager signed the letter, didn't he? Well, write to him, personally! He, temporarily, has taken on the aspect of the prospect, rather than the Company.)

Thank you for your reply to my enquiry about employment with your Company. In compliance with your request for more detailed data, I am listing same below:

(List it man!)

I hope the above is sufficient for your purposes in ascertaining my possible worth to your Company. If not, I shall be most happy to answer any further questions you may have.

May I hear again from you shortly?

Yours most sincerely. . . .

Make your letter detailed, but short and sweet. Toss the ball back to the personnel manager. If he likes your letter and really wants you, he'll sign you up immediately. If he doesn't, he'll be decent enough to let you know why he can't, and usually, will tell you in some detail why you won't do. His reply will be a good indication as to just where you slipped up in your application procedure and a guide in bettering your future applications to other firms. Study all your rejections to find what you omitted, where you oversold or otherwise slipped up. Keep carbon copies of all letters you send so you are able to study your errors and learn thereby.

Your next few applications will reflect the improvements in your job-hunting techniques, and I hope, will result in a new (better) paying job! If not, read this article over again and again and keep trying!

If nothing else, you'll improve your letter writing until it becomes reasonably good! (Of course, a typewriter helps. . .)

Remember, these few points in summing up:

A deferential, but not shy, approach is necessary to arouse the prospect's curiosity. Alarming the prospect by your brashness gets you nothing but lumps.

50% of the sales appeal lies in the paint job. Your personal appearance is part of your sales appeal. Same goes for a letter, with bells. Grammar, spelling, all are part of that vital 50%!

Know when to stop selling and to start signing orders. A blabbermouth never gets a job, except as a circus barker . . . and they're becoming extinct.

Good luck! ■

Complete setup with desk in closed position hiding the 4-125-A amplifier.

by Edward J. White, W1NPL
136 Woodlawn Street,
Chicopee Falls, Mass.

MODERNIZE YOUR INSTALLATION

The vast majority of hams, I'm sure, desire to set up their installation in a business-like manner. That is—conspicuous by its absence —the maze (and mess) of wires, coils, and outboard conglomeration of various extras. A neat installation might even get XYL acceptance. The trend today is to table top transmitters and "in the desk" units. The cost of "desk" units is, safe to say, beyond the average amateur.

Nevertheless, with a little imagination and effort, a neat, compact, comfortable, and efficient setup can be had. Accessibility of equipment and components in case of trouble is of paramount importance, closely followed by a method of dissipating heat from the "in the desk" enclosure. Both problems can be adequately solved as explained in the following desk and amplifier construction.

The over all desk size was made to "fit" around the required amplifier space—and the amplifier dimensions were made to "fit" a standard desk size.

Although it was my intention of having a full kilowatt amplifier, the power input of 800 watts was the maximum output of my power supply (2300 volts at 350 mils.). The amplifier, push-pull, 4-125-A, is a conventional type circuit.

Plate and grid meters in middle "drawer." Meters face upwards for convenient reading.

Desk Construction and Problems

Since my operating room was located in a second floor bedroom and the desk was to be constructed in the basement workshop, it was necessary to build the desk in units. Unit construction made the desk "portable" and "adjustable" in size to accommodate future changes in the setup. Another advantage of unit construction is that it was possible for one person to carry the desk, unit by unit, to the shack.

Two identical ends were made, with the exception that the right hand end had false middle and bottom drawers. These contained the meters and controls respectively. When the drawer fronts are closed, they completely "hide" the amplifier. The top of the desk was fastened in the shack.

Removable End Panel

For service and inspection the right-hand end panel is removable by releasing the catches on the inner top and lifting the bottom pins out of their sockets. To further make the amplifier more accessible the rear panel was hinged.

The area available for the amplifier was 21″ deep, 17″ high and 12″ wide. The area was made to fit the angle iron, chassis-holding, framework. If more area is needed—the inclusion of a 500 watt modulator would require more space—the top, right-hand drawer couuld be eliminated. My desk provided four drawers for orderly storage of miscellaneous spare parts, correspondence and QSLs.

Desk Size Determined by Removable Top

To adjust the desk to size it is only necessary to make a new top and move the "ends" to accommodate. The top is fastened to the ends with small metal angles. A brace was added across the center of the "kneehole," and this bound the desk into one, solid unit, and allowed it to be moved within the operating room, without undue strain. The top can be covered to suit individual preference. I used counter-top linoleum, using the same for the edges. Metal edge stripping would give a more professional appearance.

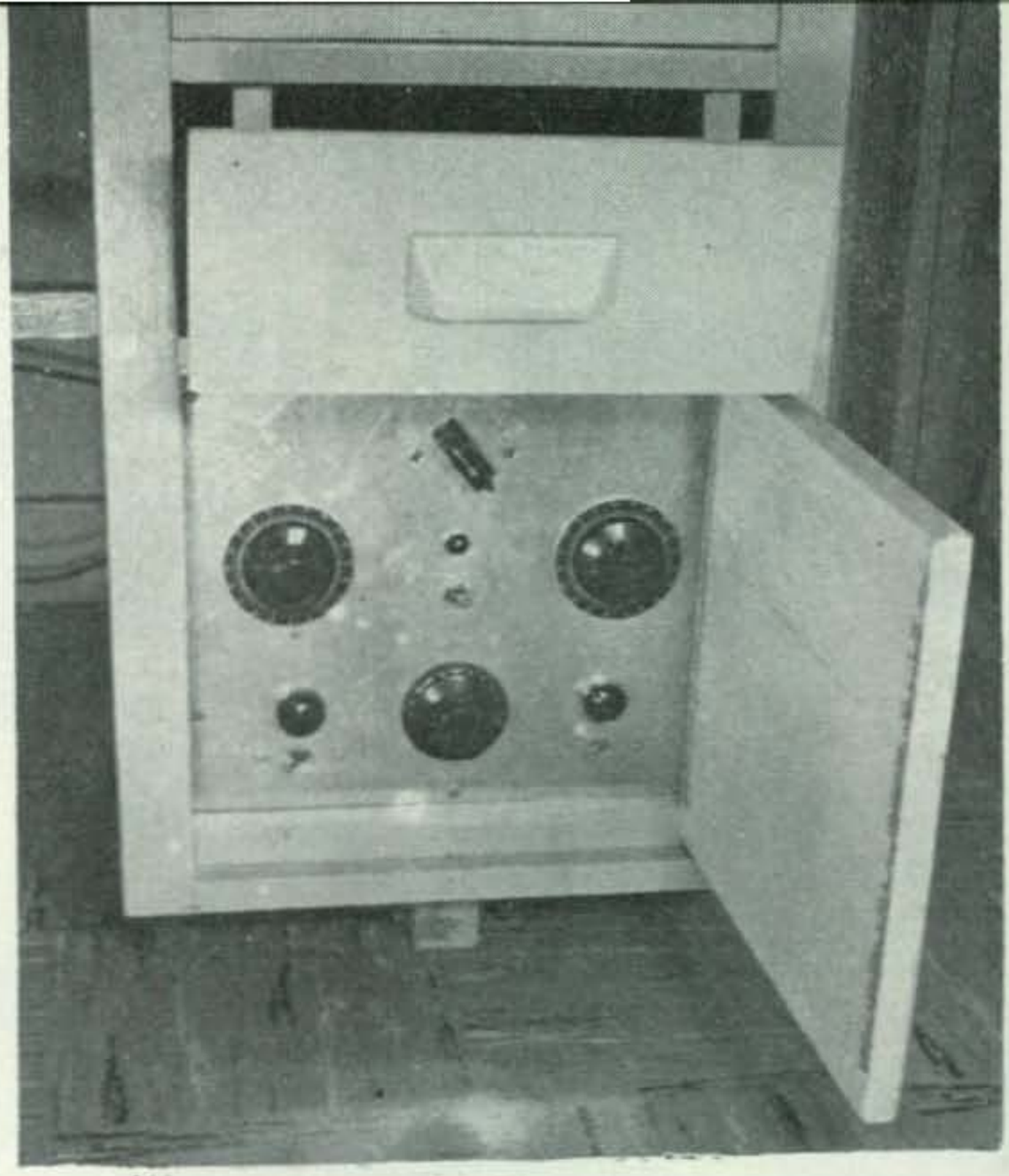
Masonite panels were used to enclose the sides and back of the "ends." Masonite was also used for the drawer bottom and sides, with, of course, wooden front and rear ends.

Dissipating Heat

To enclose the amplifier, yet have adequate ventilation and exhaustion of heat, a cooling fan was directed at the final and rectifier tubes and the ventilating grill. The metal grill was mounted in the removable end panel.

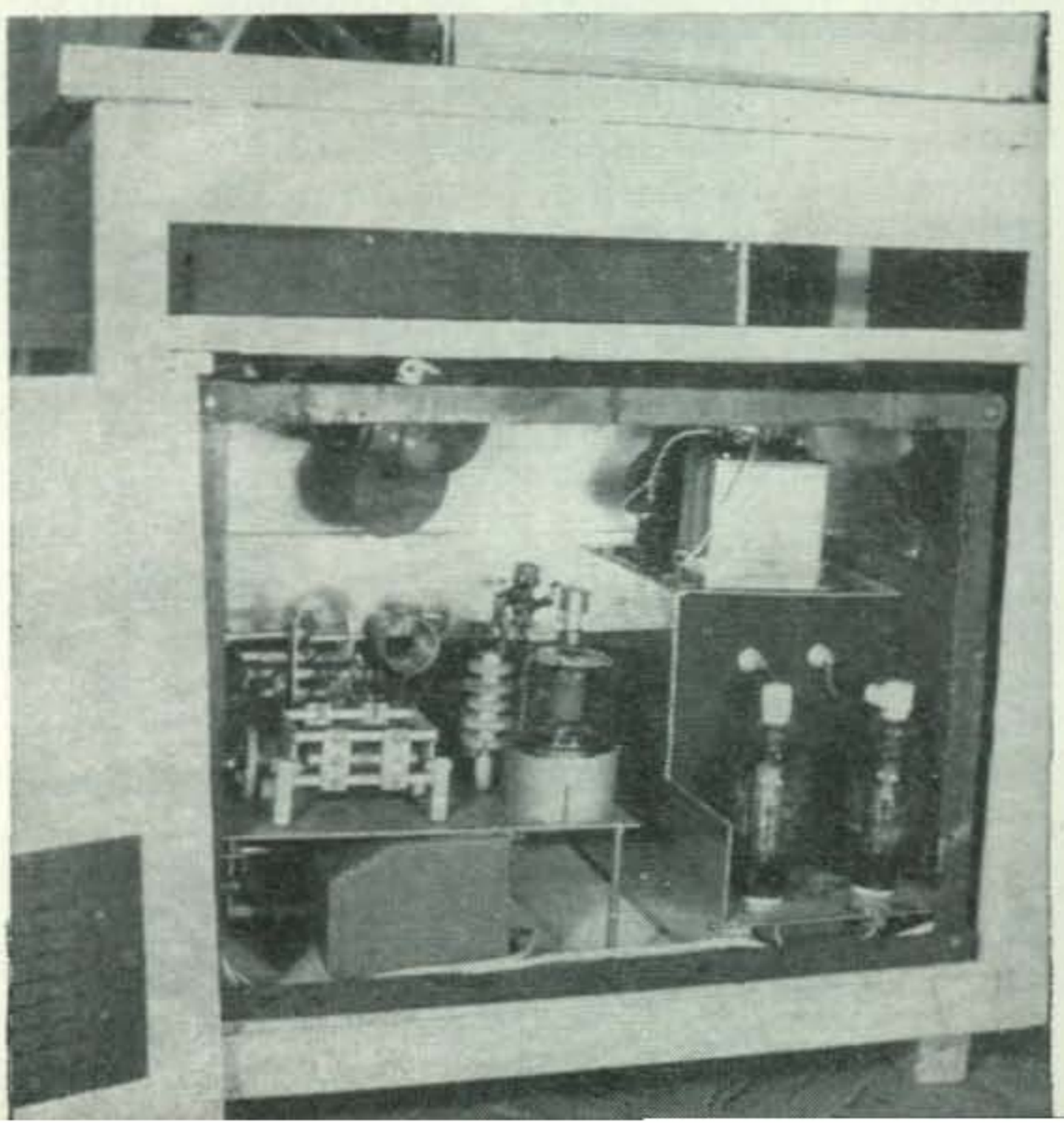
It is common practice to run a cooling fan continuously—that is—the fan starts with the application of filament voltage. I was fortunate enough to have an old, rubber-bladed, automobile defroster fan with a high and low speed switch. The switch was removed, leads extended, and wired to operate on low speed

(*Continued on page* 98)



Control panel in "fake" bottom drawer.

High-power amplifier in its chassis holding framework. Transformer at bottom lying on its side is a multi-filament type.

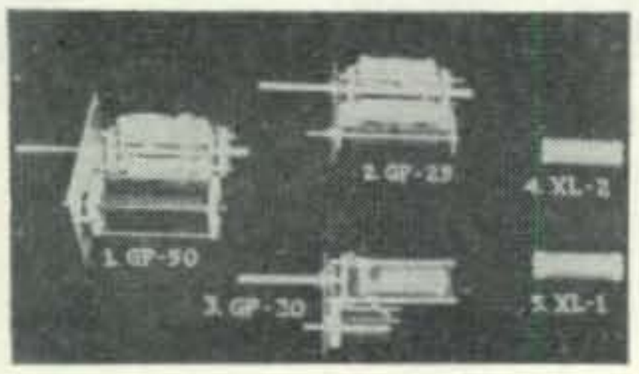


Amplifier in desk with end panel removed. Note ventilating grill partially shown on panel.

New Amateur Equipment

DX Computer

I'll bet that Larry LeKashman had his experienced DX hand in the making of this gem. RME has just come out with a new and revised DX Computer. This is a slide device which sets up the prefix on the slide and indicates the great circle bearings from the East, Midwest, and West of the U.S., the time differential to East, Midwest and West, the postage rates for airmail, 1st class, QSL's and IRC's, the country name, continent and zone in which it is located. It also lists the world QSL bureaus. Quite a package for a dollar. Circle A on page 126.

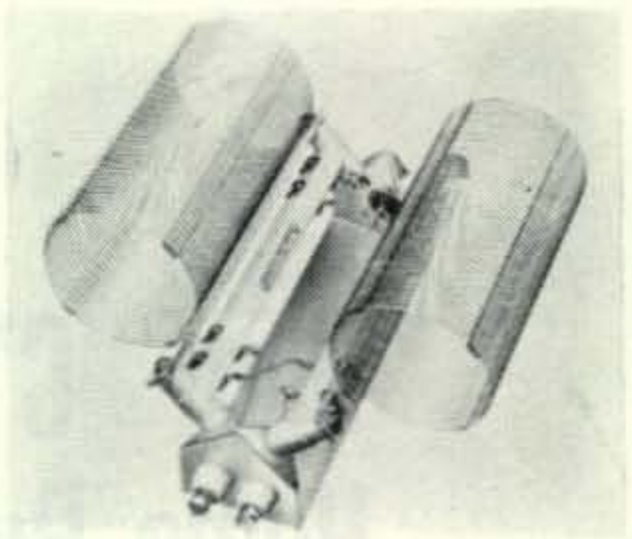


Harrington Electronics

Ed Harrington, W1JEL, who has been in the business of designing things fo ham use for many years (NC-300, etc.) now has started his own company. The first products are a group of cleverly designed tank circuits. Three models, one rated at 50 watts for KW grid circuit applications, one rated at 25 watts for push-pull grid tank or DSB circuits, and one rated at 20 watts for interstage work, are available. All tune from 80 thru 10. Ed also has some fine VFO coils ($1.75) prewound on ceramic forms. All products come with full instructions and application notes. Doodad up number C on page 126 for some soft sell from Ed.

Baluns

B & W's new balun coil kit mounts the coils at right angles to simplify installation problems for you. This is what you must have if you want to connect an unbalanced 75 ohm transmitter output (like a pi-net) to a balanced antenna of 75 or 300 ohms balanced. The coils cover all bands from 10 thru 80 and will handle 250 watts phone, 500 cw, and 1 kw SSB. It is entirely possible that you'd like to read up on this item and become an expert. Cross out D on page 126 and alert your postman that you are expecting mail.



Eico Enters Ham Field

Eico (Electronic Instrument Co.), long well known for their test equipment and hi-fi kits which are sold through jobbers, has come out with their first try for the hams. This is an interestingly designed 90 watt cw transmitter. This looks like quite a package and has all sorts of features. The final runs a 6146, with a 6AQ5 clamper for protection, at up to 90 watts. The plate meter is marked at the 75 watt Novice power limit. The oscillator is a 6CL6 Colpitts feeding a 6AQ5 buffer-multiplier. Bandswitching is used to cover 80-40-20-15-11-10 meters. The unit has its own built-in power supply. The high efficiency pi-network output circuit is designed to match from 50 to 1000 ohms. Terminals are provided for an external plate modulator for a full 65 watts of AM phone. The physical design is something new too, looking more like a living room hi-fi amplifier. Prices? $79.95 in kit form, $119.95 wired. Circle E on page 126 for more details.

Air Force Mars Eastern Technical Net

Sundays 2-4 PM, EDT 3295 KC 7540 KC 15,715 KC

Sept. 7—Long Range Radio Navigation Systems—Mr. Mortimer Rogoff, Exec. Eng., Federal Telecommunications Laboratories.

Sept. 14—Vacuum Tube Applications—Mr. Selig Gertzis, Chief Applications Engineer, Amperex Electronics Corp.

Sept. 21—Vacuum Tube Considerations—Mr. Bert Green, Eng., Amperex Electronics Corp.

Sept. 28—Single Side Band—Mr. William Kaufmann, Chief Engineer, Telechrome Corp.

Oct. 5—The Basics of Transistors—Mr. Charles Simmons, Philco Corp.

ARMY MARS

Sept. 3—"FIFTY YEARS OF REMINISCENCE IN RADIO" by Emil J. Simon, Electronic Engineer and Consultant (Former Assistant to Lee De Forest).

Sept. 10—"FEATURES OF MODERN AMATEUR SSB EQUIPMENT" by Ernest W. Pappenfus, Engineering Dept. Head, Collins Radio Company.

Sept. 17—"APPLICATIONS OF INCREDUCTOR HIGH FREQUENCY SATURABLE REACTORS" by Carl G. Sontheimer, Executive Vice Pres. and Herbert F. Spirer, Asst. Chief Engineer, CGS Laboratories, Inc.

Sept. 24—"AUDITORY TEST EQUIPMENT FOR THE BLIND RADIO AMATEUR AND TECHNICIAN" by Robert Gunderson, W2JIO, Editor, Braille Technical Press.

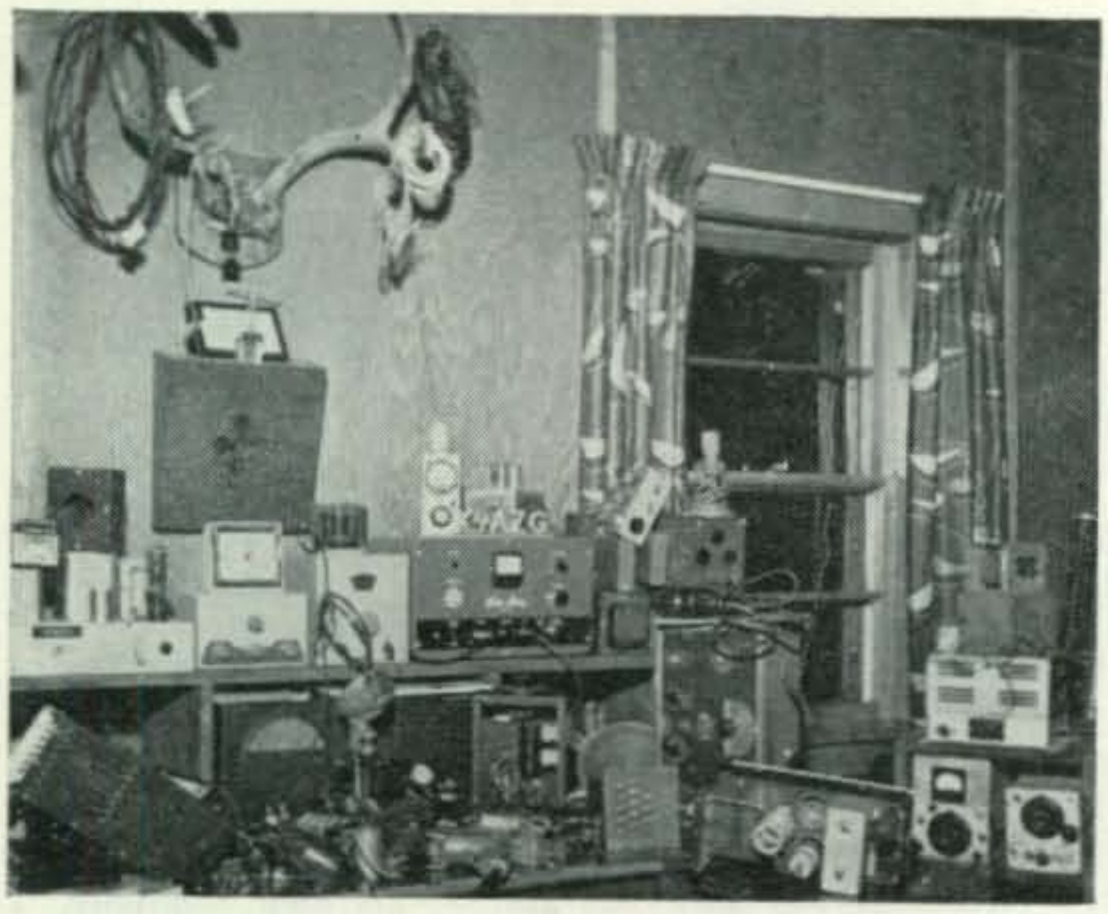


Figure 1: Typical ham shack sans clutter filter.

Figure 2: Top-loading the high-C tank.

High "C" Home Built CLUTTER FILTER

Guy Slaughter, K9AZG

P. O. Box 192

Crown Point, Indiana

Though the need is wide-spread, indeed universal, in the ham fraternity, the amateur press has to date neglected coverage of any form of home-built clutter filter, probably because of the difficulties involved in designing and building high-C tanks with the limited math background and the equally limited metal-working facilities possessed by the average ham.

With this in mind, the author has undertaken some basic research on the problem, and come up with a startlingly simple approach to its solution. The mathematics involved have been compressed to an irreducible minimum by development of empirical formulae, and the variations in design made possible by these formulae are, if not infinite, at least great enough to fit the peculiar requirements of every shack.

That modern clutter filters require high-C tanks is, of course, obvious by its very nature, the clutter problem can be seen by even the most uninformed to be unsolvable by low capacity tanks, since the number of such tanks required would in themselves constitute a whole new clutter problem. But to more fully understand the basics involved, a bit of simplified math is in order:

$$Cp = \frac{(AGO) \times (NYIHR)}{SS}$$

The formula is self-evident when we define the factors. Thus, (Clutter Potential) is equal to (Amount of Gear Owned) times (Number of Years In Ham Radio) divided by (Size of Shack). However, not so obvious are the more complex functions of the factors when further variables are introduced, as:

$$Cp = \frac{(AGO) \times (NYIHR)}{SS} + 100\ (WOBP)$$

In the above, other factors are as previously defined, and the new integer WOBP, whose presence requires the addition of the sum of 100, means When On a Building Project. Of course, proportionately greater complexity of formulae accrue when additional factors come

Figure 3. Proper termination of the tank is essential to continued high-C.

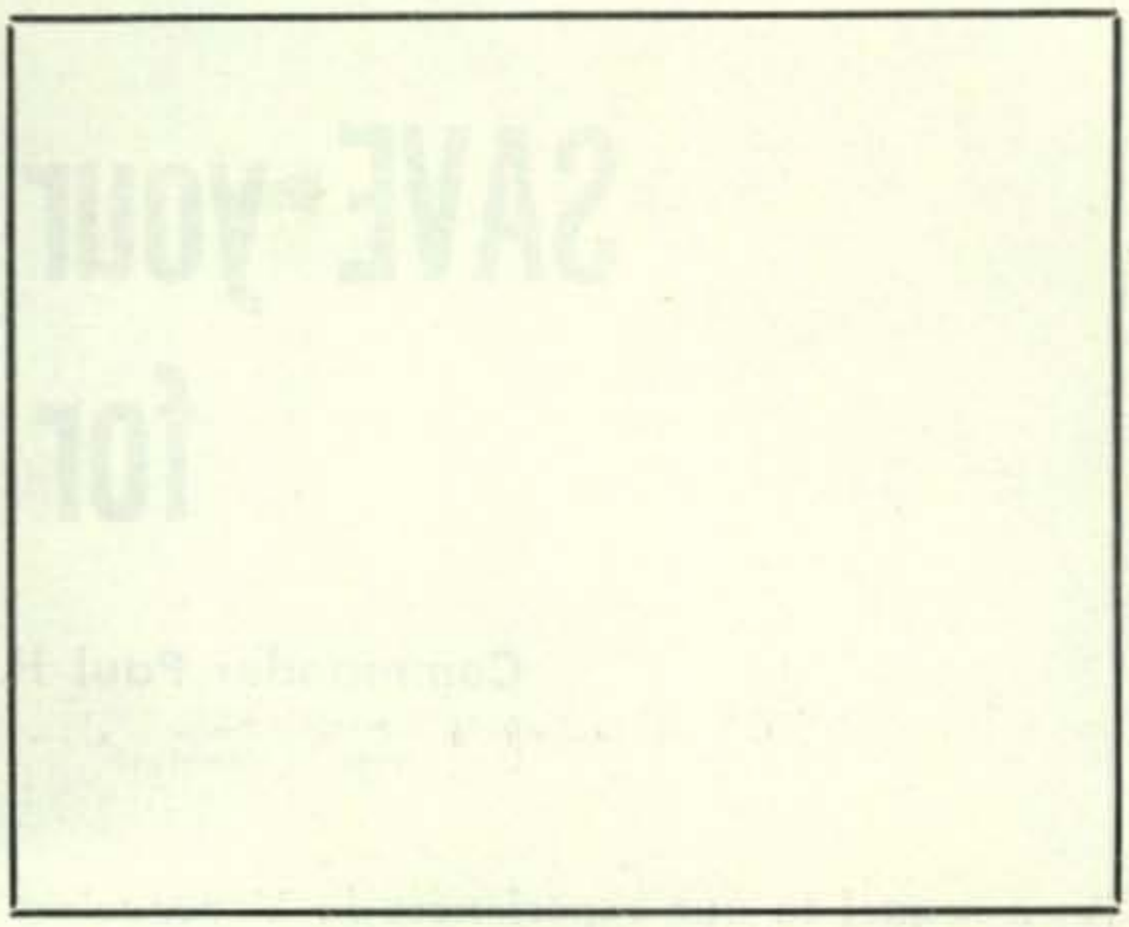


Figure 4. Typical ham shack after installation of clutter filter. In this case tank capacity was higher than absolutely necessary.

into play, such as WWIOOT, whose addition to the equation requires squaring the product of the sums of the factors, and whose meaning is When Wife Is Out of Town.

For calculating the requirements of high-C tanks, then, it follows that the variables of the individual shack must be inserted into the equation in order to arrive at a satisfactory design, and that design must necessarily be completed before building is begun. As a guide to the amateur anxious to add a high-capacity tank clutter filter to his own shack, we shall, in the following paragraphs, run through the computational steps and then through the actual building of just such a device.

In the basic formula

$$Cp = \frac{(AGO) \times (NYIHR)}{SS} + 100(WOBP)$$

(remember that by definition the integer WOBP requires the addition of the sum of 100; we are *always* on a building project, hence must insert this sub-equation) we substitute our particular statistics for the symbols and solve for Cp, thus arriving at the solution Cp equals 112POJIE, where POJIE is Pounds of Junk In Evidence, or, by further factoring, $97.6FOGV^3$, meaning Cubic Feet Of Gear Visible.

So far so good. But perhaps the next, and final, mathematical function necessary before solidifying our design is not quite so transparent; if this be true (and Terman completely neglects this phase) we can only say we sifted and weighed a great mass of observational statistics before developing this part of the calculation, and suggest you just take our word for it: in any shack, Ca is equal to Cp times a constant K, whose numerical equivalent is a trinary variable dependent upon one's marital status, economic position, and relative family station. If you are unmarried, living alone, and reasonably independent economically, then in your shack the constant K is unity,* so that Ca equals Cp, or Actual Clutter is an identity to Potential Clutter. But if you are married, solvent, and the XYL wears the pants, the same formula applies except that K becomes .414.* While if you are married, solvent, and the head of the household, K is equal to .4140001.*

Thus, in the light of the above, and again substituting our own statistics for the symbols (we have to use .414 for the constant K, and you would too if you weren't such a blame liar) we solve for CFT (Clutter Filter Tank) and get as a solution 120 quarts, which can be further factored into the more readily-visualized 30 gallons, truly, you will agree, a high-capacity tank.

So much for the paper work. Actual construction of the device now becomes so simple that little further explanation is necessary. From the resonance tables of any handbook it can be found that a single turn of 16 gauge steel 18½ inches in diameter with a form factor of .66, closed at the cold end with a disc of the same material and the same diameter, can be top-loaded to the computed capacity. (For those who prefer to purchase their gear ready-made, many filling stations and junk yards stock tanks of these and other dimensions; kit-enthusiasts can buy a barrel of oil and empty it themselves.)

Now, with your high-C tank fully loaded it must be properly terminated to transform it into a working clutter filter. Do this by welding to the top another disc of 16 gauge steel, identical with that used to close the cold end; be sure to run a continuous bead all the way around to insure against stray leakage, since only if this final adjustment is properly made can you be sure that the device will maintain its capacity indefinitely and keep the clutter, like the RF, out of the shack. ■

In the computation of the constant K, solvency is assumed, since neither the destitute nor the indigent can afford to buy this expensive magazine; if you are one of these unfortunates who had to borrow CQ, write the editor for special instructions on computing the constant K for *your* shack.

SAVE your SUPER-PRO for SSB

Commander Paul H. Lee, USNR, W3JHR
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As a sequel to our experiences in Venezuela[1] modernizing RCA CR-88A receivers, we decided to tackle our BC-794 Super-Pro and see what could be done to bring it up to date. While in the process of thinking about it and planning these receiver changes, we had the opportunity to snap up a good bargain in the form of a kilowatt single sideband transmitter. This made modernization of the BC-794, or purchase of a new receiver, a necessity. We chose the first course of action for economic reasons, as well as for the satisfaction of doing the job ourselves and experiencing the pride of workmanship.

About this time there appeared in "CQ" an article by Geisler[2]. Careful digestion of the meat of this article gave us several good points to consider. However, we were not completely swayed by the author's very exuberant enthusiasm, nor did we "buy" all of his changes as being necessary or desirable. Several points in his wiring diagrams as published were not clear. Furthermore, we had to carry matters further and come up with something good for SSB reception in order to keep up with the trend in modern point-to-point communications techniques.

One of the first requisites for SSB reception is a good product detector. Another one is frequency stability in the hf oscillator. A third is proper AVC action for SSB to permit running the set with the rf gain wide open. Still another is a 3 kc i-f bandpass curve. With these points uppermost in mind as design criteria we planned and made the changes in our BC-794 which are described here.

It should be pointed out that these changes are equally applicable to the other models of the Super-Pro series, such as BC-779, BC-1004, R-129/U, SP-200, SP-210, and SP-400. These changes may also be used as a design basis for modification of any similar type of superheterodyne receiver, if the reader uses a bit of ingenuity in adapting them to his own particular set. This is a real modernization, not merely the substitution of other types of obsolescent tubes in an old set.

(1) Feb. 1957 CQ, "Worthwhile Improvements for that Old Receiver."
(2) Dec. 1957 CQ, "Souping The Super-Pro."

Our first and most logical point of attack on the BC-794 is the installation of a product detector. Removal of the 6SJ7 BFO tube and its octal socket is easily done. Be sure not to cut the leads from the BFO transformer T5 too short in the process. Substitution of a 7-pin miniature socket mounted on a small square of sheet aluminum to fill the old hole is easily accomplished. A 6BE6 tube is used, with its oscillator section acting both as BFO for CW and as a local oscillator for SSB reception. The circuit should be rewired as shown in fig. 1.

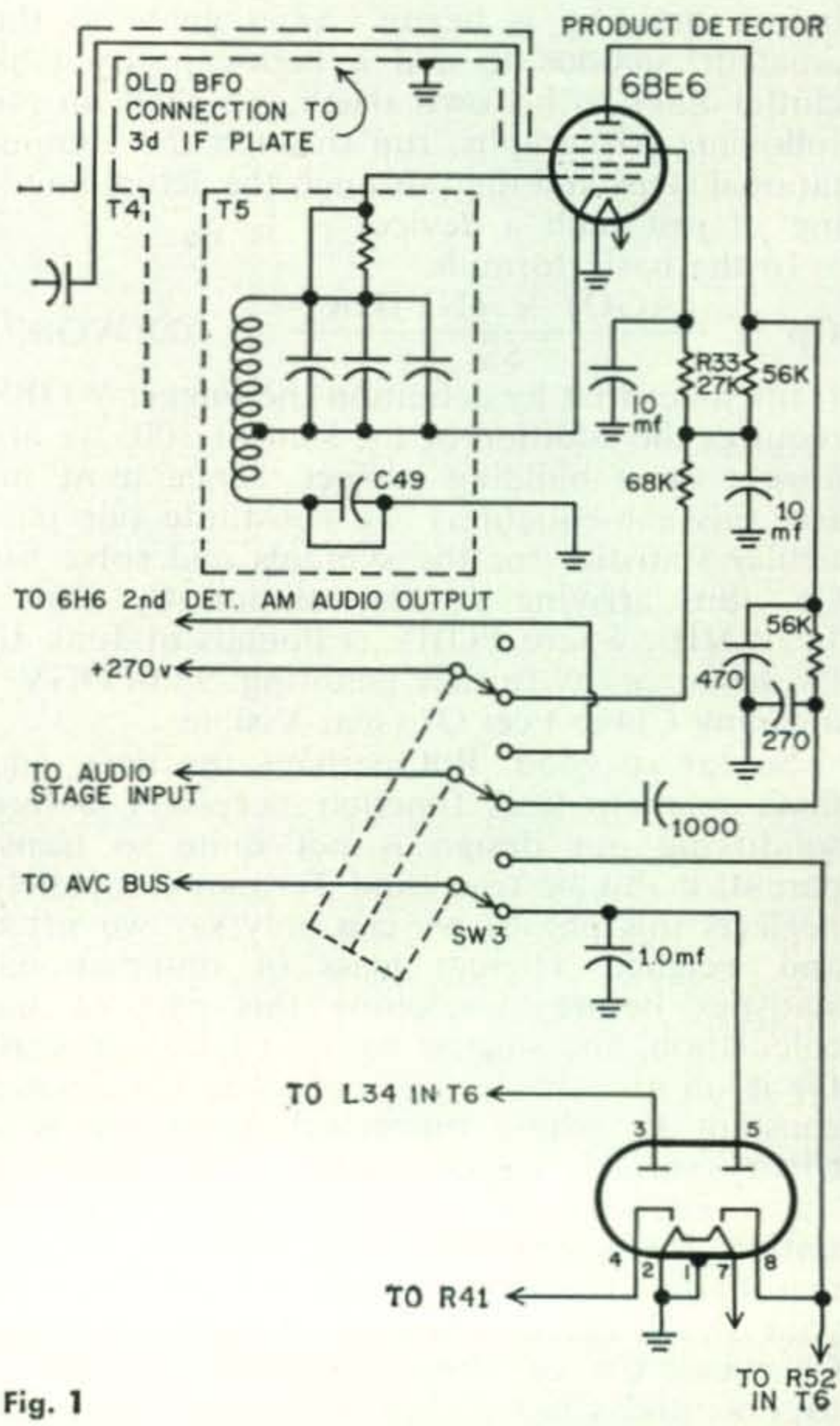


Fig. 1

The value of the screen dropping resistor R33 was found to be quite critical. A strong local oscillator signal is an absolute necessity to avoid the overloading of the detector by strong SSB signals which would produce distortion. R33 was experimentally adjusted in value until all traces of distortion disappeared, and concurrently for the greatest audio output from the detector. It is necessary to remove the shield can from transformer T5 to gain access to C49, the old plate voltage blocking capacitor, and to short out C49 in order to provide a dc return for the cathode of the 6BE6. This is not a difficult operation, but is time-consuming and requires care. In re-assembling the transformer into the can, be sure that there are no internal shorts to the can.

Concurrently with the above, switch SW3 should be replaced with a small 3-pole 2-position rotary switch.

This is necessary to provide an added pole for switching the audio input from the output of the 6H6 AM detector to the output of the 6BE6 SSB detector. Getting the new switch into place is a bit of a squeeze play. We used a Centralab PA-1007. A little bending of an interfering chassis bracket was necessary to make the fit. The new switch SW3 is wired as shown in fig. 1. One pole turns on the 6BE6 plate and screen voltage, another pole throws the audio from the AM to the SSB detector, and the third pole cuts in the special SSB "hanging" avc circuit to be described.

One half of the 6H6 avc diode rectifier, V12, comprising pins 5 and 8, formerly connected in parallel with the other half, is cut free and wired as shown in fig. 1. This section is reverse-connected so that the 1 mfd capacitor which we added to the avc circuit can charge up through the diode, but cannot discharge back through the diode. The 2 megohm avc resistor R19, which is mounted on the back of the AVC-MANUAL switch SW4, should be changed to 10 megohms to provide a slow discharge rate for the 1 mfd capacitor. This provides a fast attack-slow release avc action which permits the avc to ride along on the peaks of the SSB signal. It releases and restores receiver gain quickly enough, however, so that a weak signal in a round table contact is not missed.

The 3-volt bias should be removed from R41 and the 6H6 avc rectifier by moving the two bias lines from terminal 9 of strip E-24 to a convenient ground lug[2]. The avc lines to the 1st rf stage and the mixer should be removed from their terminals on strip E-24 and grounded also, allowing these two stages to operate "wide open"[2].

The product detector is coupled to the 3rd i-f plate transformer T4 by means of the old bfo connection, which is the shielded lead. No change is made here, and this connection works fine.

This is a good point at which to stop work and turn on the receiver and check out all that has been done so far. The local oscillator portion of the 6BE6 may be roughly retuned at this time. Now tune in an SSB signal and try out the new product detector and avc circuit. Run the rf gain wide open, and see how neatly the receiver handles the signals. Gone is the old four-way struggle of rf gain vs. audio gain vs bfo setting vs. tuning. Just sit back and listen to that smooth SSB operation!

While gloating over your work thus far, you will still be dismayed by the frequency drift inherent in all of the Super-Pro series. Well, let's do something about that. Let's do the best we can with what we have and make a practical approach to the problem. Admittedly, we cannot satisfy the "ivory tower" perfectionist and build a long-term stability of one part in ten million into this set and still make it tunable. This is not needed for day to day amateur operations anyway. What we do need and what we can do is to obtain a short-term stability such that during SSB contacts, the other fellow's voice does not grow higher and higher in pitch like an excited Donald Duck and gradually drift out of the i-f passband. The signals will really "stay put", after the changes to be described here.

Following an excellent lead previously published[2], we replaced the hf oscillator and mixer stages with 12AX7 dual high-mu triodes, wired as shown in fig. 2. The octal sockets are removed, and replaced with noval miniature sockets mounted on small sheet aluminum plates. The noval sockets should be oriented so that short, direct rf leads are obtained. Tube shields are used, and should be in place before any subsequent re-alignment is attempted. Next, remove the top cover of the main tuning capacitor, and connect a 3.3 mmfd type N750 negative co-efficient capacitor across the oscillator tuning capacitor. The former 6L7 and 6J7 grid leads should be extended and run through holes in the chassis drilled adjacent to the grid pins. Rubber grommets should be used in the holes. We chose miniature tubes for this modification in the interests of modernization.

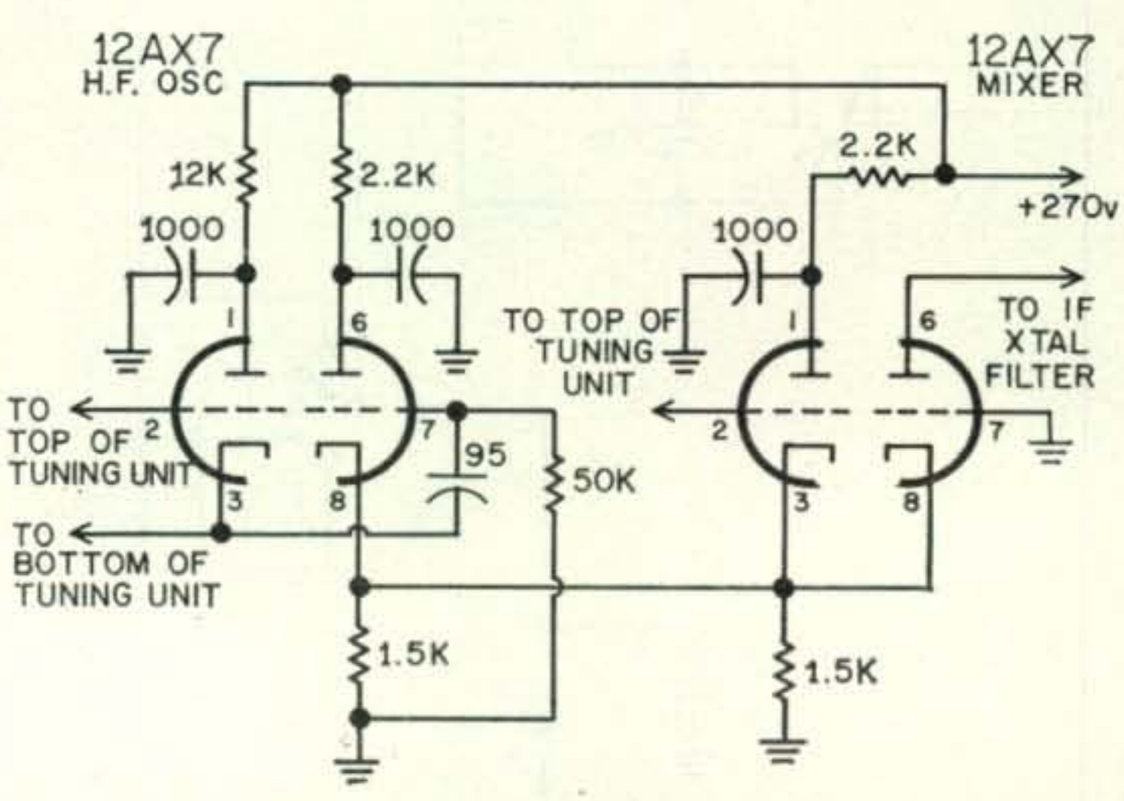


Fig. 2

The important thing is the result of the modification, which is an excellent short-term frequency stability. This is due to the isolation between the oscillator triode section and the remainder of the set afforded by the cathode coupling scheme used.

The next improvement to be made is in the rf stages. We removed the old 6K7's and their octal sockets, and replaced them with 7-pin miniature sockets and 6BA6 tubes. This change greatly increased rf gain and sensitivity. No changes in circuit or components were made, and therefore no diagram is shown here for this change. Here again the grid leads are extended through grommetted holes in the chassis. Tubes are shielded, and the tube shields should be in place before any re-alignment is done. A word of caution is necessary here. If oscillation of either 6BA6 stage is noted in the 20 to 40 mc range, the grounding of the filament, cathode and suppressor pins is not effective. Do not rely on connecting all those pins together and running one common ground lead to the nearest ground lug. Drill a new hole in the chassis adjacent to each pin, and ground each pin separately by a very short connection. We experienced this trouble at the high frequency end of this band, and it took us some time to find the source and apply the cure.

We might say in passing that we tried several other tube types in the 1st rf stage. We tried a 6BZ6, a 6CB6, and a 6DC6, but each of these produced overloading and cross-modulation from strong local signals on the high frequency end of the broadcast band, even with the avc re-applied to the stage. The same was true of the 6BK7A, 6BQ7A, and 6BZ7 dual triodes which we naturally tried as a result of our previous work with the CR-88A[1]. Reasoning that a strong local amateur signal would cause the same effects, we chose the remote cut-off 6BA6, and there is no trouble from overloading nor cross-modulation even from 50 kw WTOP nearby, and with the 6BA6 1st rf. stage running "wide open."

After re-alignment of the rf portion of the set, we then proceeded to the installation of a 3 kc band-pass crystal filter, whose complete circuit is shown in fig. 3. We wished to do this without destroying the usefulness of the receiver for short-wave listening or cw reception, and if possible, without spoiling the front panel appearance. A half-lattice crystal filter was chosen as being the most practical type from the standpoint of available space and a minimum of circuit changes.

First it is necessary to remove the top and side covers of the existing crystal filter. Access to the side is facilitated by temporary removal of the chassis support bracket. The 465 kc crystal and the old 6-position switch should be removed and added to your junk box. The switch can be removed without taking off the front panel by using a thin open-end wrench to turn the locking nut behind the panel. A new switch with 3 poles and 5 positions on a single wafer was installed. Getting the old one out and installing the new one is a tight fit, but it can be done. A small, thin switch with but a single wafer is a necessity to fit in the small space. We used a Centralab type PA-2007. The switch should be lined up so that its five positions correspond to the OFF-1-2-3-4 markings on the front panel. The last figure, 5, is not used. The new crystal filter switch positions are:

OFF-OFF
1—3 kc Bandpass
2—Broad CW
3—Medium CW
4—Sharp CW

A half-lattice filter has the simplified schematic and response curve shown in fig. 4. Crystal X1 is a surplus type FT-241-A for channel 334, whose fundamental frequency is 463.88 kc. Crystal X2 is a companion unit for channel 336, whose fundamental frequency is 466.66 kc. These are the 72nd harmonic crystals which are readily available from surplus crystal suppliers at a cost of about 55¢ each. The separation between this pair is 2.78 kc, which is just about right for a nominal 3 kc filter. Following through the circuit in fig. 3 will show that X1 is used for both cw and SSB, but that X2 is in the circuit only for SSB. Neither crystal is in the circuit when the switch is in the OFF position. On cw positions 2, 3, and 4 the crystal phasing capacitor is connected in the circuit to provide for moving the rejection notch from one side of the received signal to the other for phasing out heterodynes. For SSB, a small (1 or 2 mmfd) capacitor may be added in parallel with X2, to cause rejection notches to appear in the skirts of the passband, if desired.

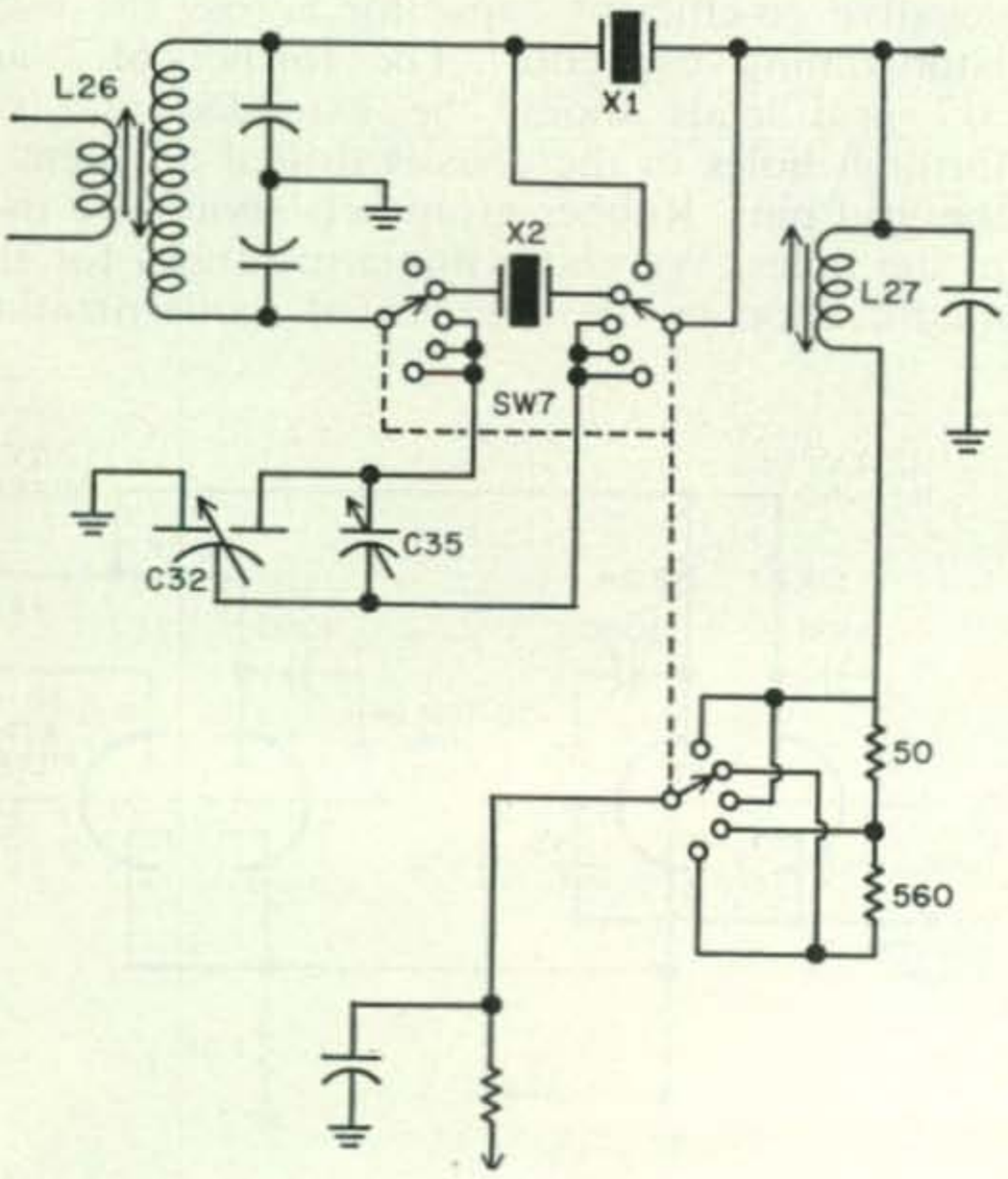


Fig. 3

The values of the secondary loading resistors are changed to 50 and 560 ohms. We chose 560 ohms experimentally because it seemed to give a sharp enough filter without too much of the characteristic crystal "ringing" effect which we found could become objectionable when using the 3 kc position on voice. If the reader wishes to increase the value of this resistor above 560 ohms, it may be done if the "ringing" effect is not considered objectionable.

Crystals X1 and X2 were placed in the space formerly occupied by the old 465 kc crystal, and were connected by merely soldering the leads to the tips of the holder pins. This must be done very quickly and carefully, without excess heat. The pin should be firmly grasped with pliers near the holder while soldering, to minimize the heat travelling back up the pin and causing damage to the crystal and its very delicate connecting wires.

At this point in the operation, replace the 6SK7 avc amplifier and the 6SK7 2nd i-f tube with 6SG7's, and substitute a 6AC7 for the 3rd i-f 6SK7. Then it is wise to thoroughly check over all that has been done to date, to make sure there are no omissions nor errors in wiring. Replace the crystal filter shield covers.

The only stages now being supplied with avc voltage are the 2nd rf and the 1st and 2nd i-f. The 1st rf and the mixer are running with no avc, and the 3 volts bias is still being applied to the 6SG7 avc amplifier. Re-connection of the 6AC7 to the 3 volts bias is necessary, and it is done by disconnecting the old bias lead from the end of R22 (10,000 ohms), and running a new lead from R22 to terminal 9 of strip E24. No 1500 ohm resistor from R22 to ground is used here. (2)

The modifications are now completed. With the crystal switch in the OFF position, and the bandwidth control at 3, the i-f stages should be realigned to 465.27 kc, which is the mid-frequency of the 3 kc passband. This alignment was done with the help of our LM frequency meter as a signal generator. An accurate signal generator is a necessity for plotting the response curves of the filter in the SSB and cw positions. L26 should be peaked up on the mid-frequency also. Now turn the crystal switch to position 3 or 4 and perform the adjustments of L27 and trimmer C35 to obtain the proper rejection curves for the right and left positions of the phasing capacitor C32. The shapes of these rejection curves are shown in fig. 5. These adjustments can best be made with the use of a sweeping oscillator and an oscilloscope so that one can actually see the changes in shape as adjustments are varied, but we used our LM, and a VTVM on the output of the avc amplifier, and used the longer method of plotting results and then making changes.

The shape of the response curve of the 3 kc filter should also be checked. The bandwidth control should be set at 6 or higher for this. Any inequality in the two peaks at the frequencies of X1 and X2 can be evened out by shifting an i-f transformer slightly to one side or the other of the center frequency. There will be a slight dip in the center of the curve, possibly as much as 16%. This is satisfactory and normal, so don't worry about it.

The receiver has enough gain to compensate for the insertion loss of the 3 kc filter when receiving on position 1. It also has sufficient gain to make up for the fact that the cw crystal frequency, 463.88 kc, is 1.39 kc off from the i-f alignment frequency of 465.27 kc. It will be noted that as you swing the crystal switch from position 2 to position 4, a drop in S-meter reading and in gain occurs. This is due to the slight mis-alignment for cw just mentioned. It is not serious, however, and it does not handicap cw reception at all. After all, we have designed for the SSB requirement as our primary objective, and we should not handicap our 3 kc filter by an off-center frequency alignment for the i-f stages.

Now a word about operation of the receiver is in order. For reception of am or cw, the single crystal filter of positions 2, 3, and 4 may be used, and the phasing control adjusted for reduction of heterodyne interference exactly as before. Or, for short-wave broadcast reception, the switch may be left in the OFF position, and the bandwidth control adjusted to suit the listener's tastes.

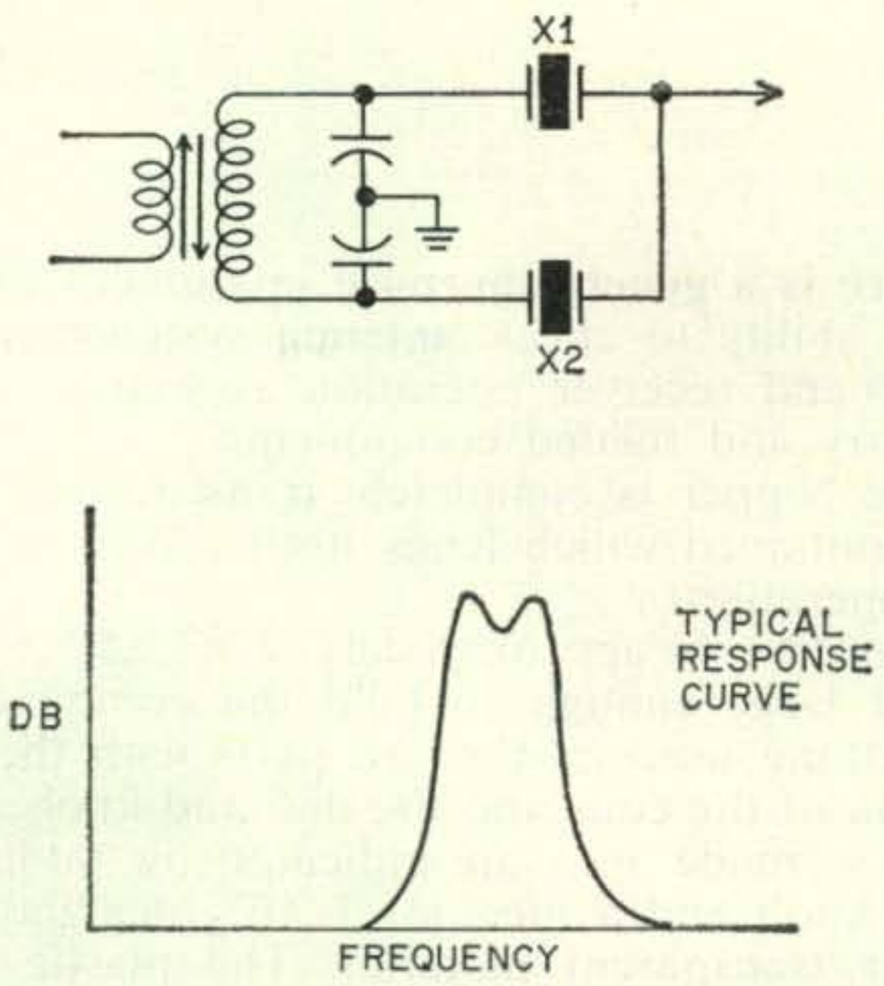
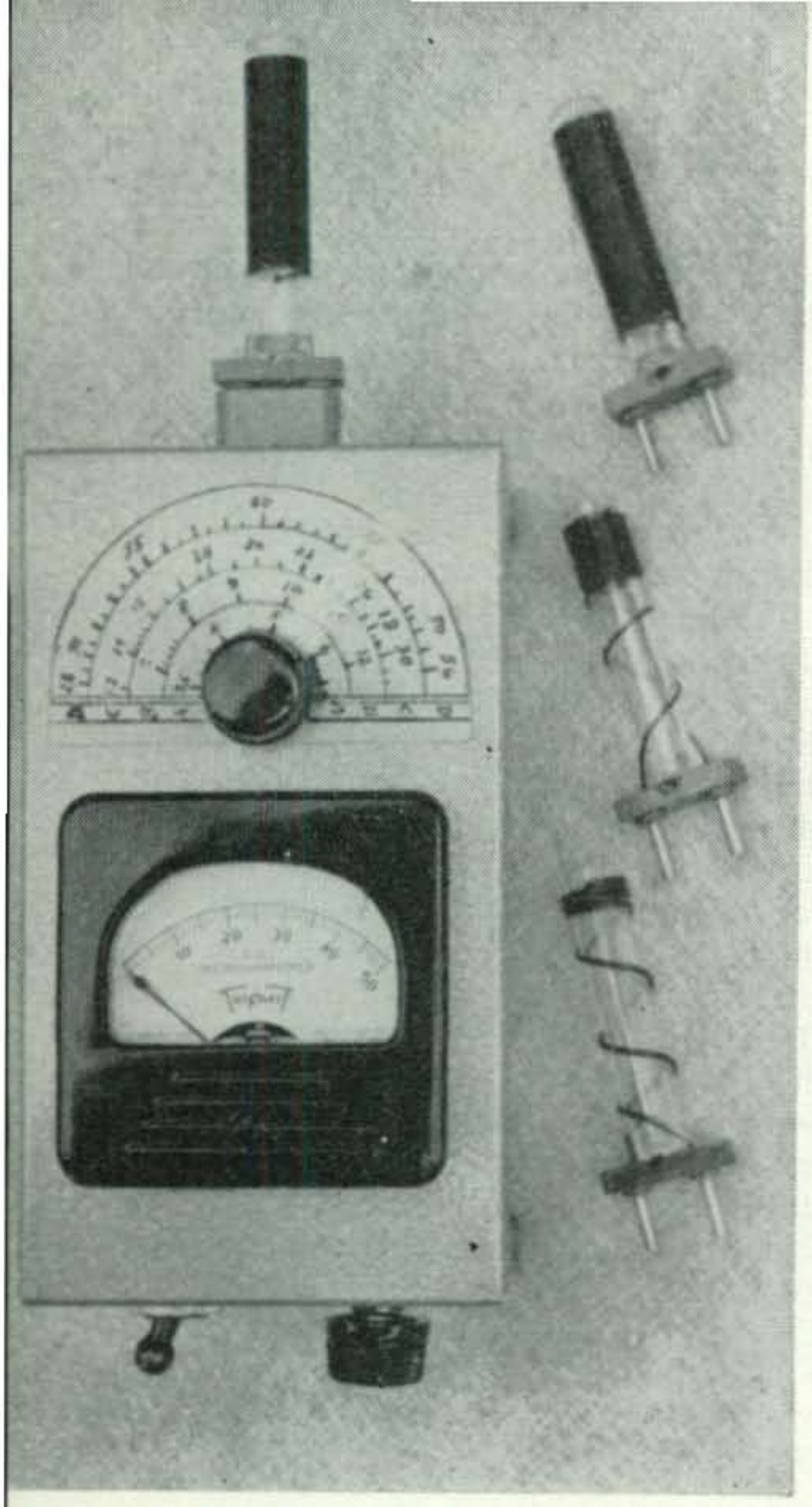


Fig. 4

For SSB reception, we first adjust the local oscillator transformer T5 for zero beat at 465.27 kc, with the bfo knob at zero center. It will then be found that the local oscillator will be at zero beat at 463.88 kc with the knob at about 1.0 on one side of center, and at zero beat on 466.66 kc at about 1.0 on the other side of center. Which side it is, is immaterial. Thus one is able to set the local oscillator to one side or the other of the crystal filter passband, to demodulate whichever sideband is in use by the transmitting station. The actual set-

[*Continued on page 104*]



Der Nipper

by Don Jeppesen, W.QFZ
2318 Second Ave.
Council Bluffs, Iowa

Here is a general purpose instrument useful in its ability to check antenna systems, transmitter and receiver operation as well as their circuitry and related components.

The Nipper is completely transistorized and self contained which lends itself nicely to mobile operation.

The case is approximately 2″x3″x5″ which is just large enough to hold the components. Everything used is standard parts with the exception of the coils and the dial and knob. The knob is made into an indicator by taking a small knob and a piece of 1/16″ plexiglass or similar transparent material. The plastic material is easily filed down to a pointer and then glued and pinned to the knob. It seems that such a pointer isn't available on the market.

The coils were wound on a ⅜″ outside diameter polystrene tubing. Each being cut to 2″ in length. Then take some empty FT-243 Crystal holders and remove the plates from the two prongs. Then with a hack saw, cut the holder as shown in the photos but leave the little bit at the center. This little bit is filed round just so the tubing will slide over it. Then with a little polystrene coil dope applied the tubing will be glued to the holder and the coils can be wound on the forms.

We found the RCA transistor 2N247 to function very well up to 56 mc. However, as this frequency is approached the operation falls off fast. The resistor between the coil and base of the transistor may have to be changed to a different value from the 27K to something up to maybe 47K or down to 20K. However, 27K seems to be the optimum value. Use value that shows most output at 54mc.

This unit is useful from about 3.4mc to 54mc. If it was only necessary to have the unit operating from about 3mc to 30mc the coils could be altered to cover only these frequencies and could be spread out a little more on the dial.

The dial is home manufactured from stiff cardboard, cut out to size and placed under the nut on the shaft of the condenser. The Nipper can be calibrated on a receiver or with a grid dipper. Then when the markings are noted on the dial the dial can be removed and inked in neatly as ever the individual desires.

The battery is mounted with a piece of aluminum attached to one of the meter terminals. Battery life should be about the same a shelf life of the battery since the transistor draws very little current.

The sensitivity control should be kept as far counterclockwise as possible for good meter

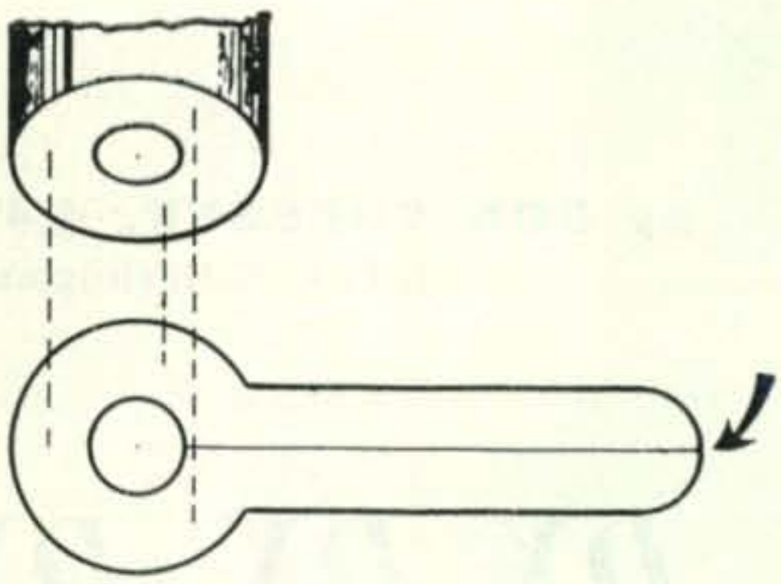


Fig. 1

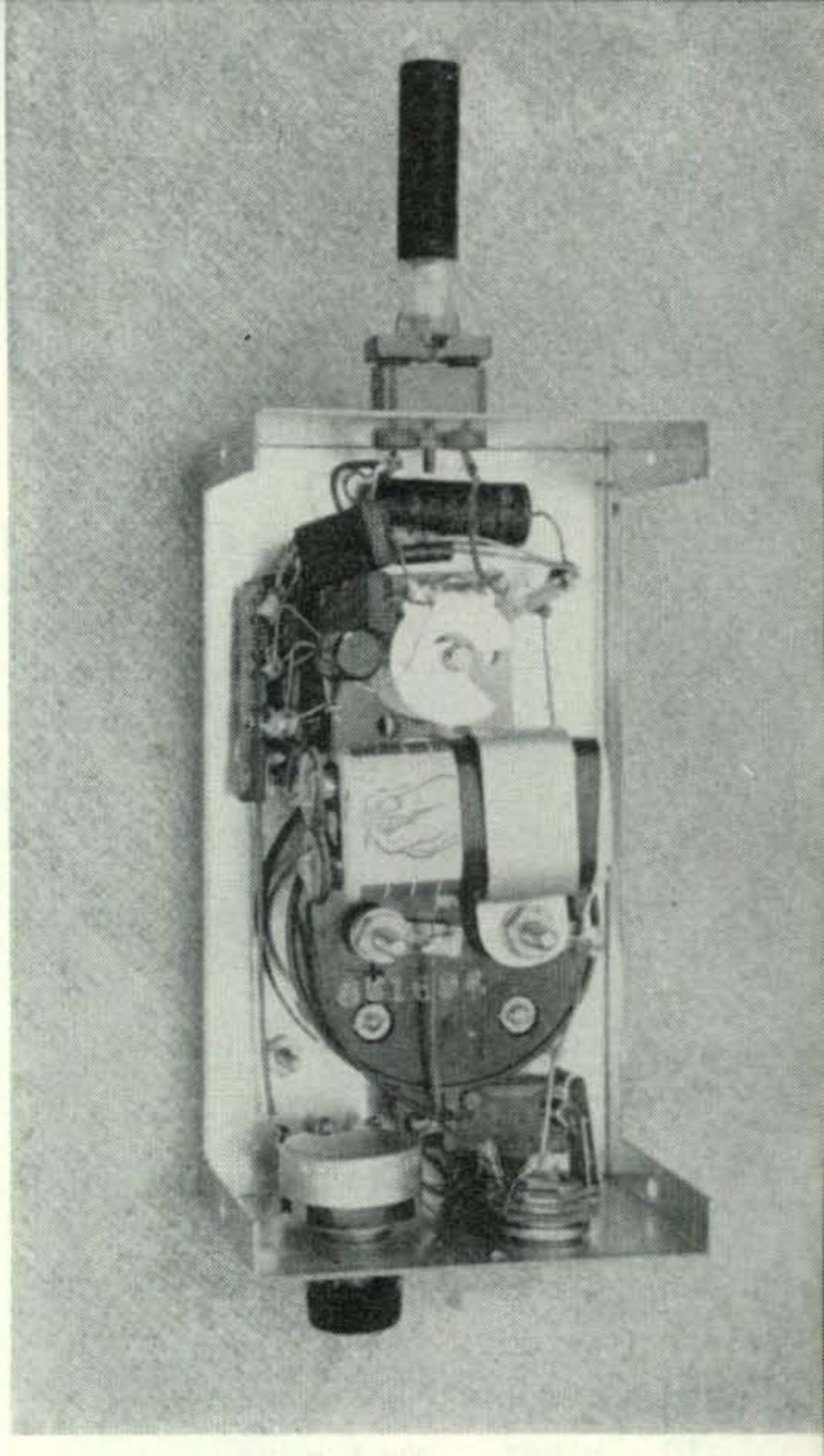
reading, otherwise the meter will indicate up off scale.

Circuit layout isn't important, however, the meter should be mounted so that there is room for the sensitivity control, switch and phone jack. The variable condenser is placed as close to the meter as possible so that the dial can be as large as possible.

The photographs should show enough detail so that the layout can be followed without difficulty.

Here are some of the functions which can be performed by der Nipper:

With the switch turned off, der Nipper is used as a field strength meter and will perform all the functions of turning up a beam or other antenna, finding the resonate frequency of an antenna, checking front to back to side ratio of antennas, etc. Standing waves on a transmission line can be checked with der Nipper, as well as resonate frequency of tuned lines. Der Nipper is useful in tracking down parasitics in transmitters, also can be used for neutralizing amplifier stages. The tanks circuits of transmitters can also be tuned to resonance without transmitter power being applied. Switch must be in the on position on der Nipper for this operation however. The frequency of resonant circuits can be established with der Nipper between the frequencies of the operation of the unit of course. The unit can also be used for calibrating receivers, transmitter vfo's, or other gadgets one may be working with. Undoubtedly many other uses can be found for der Nipper, you will find it very useful. ■



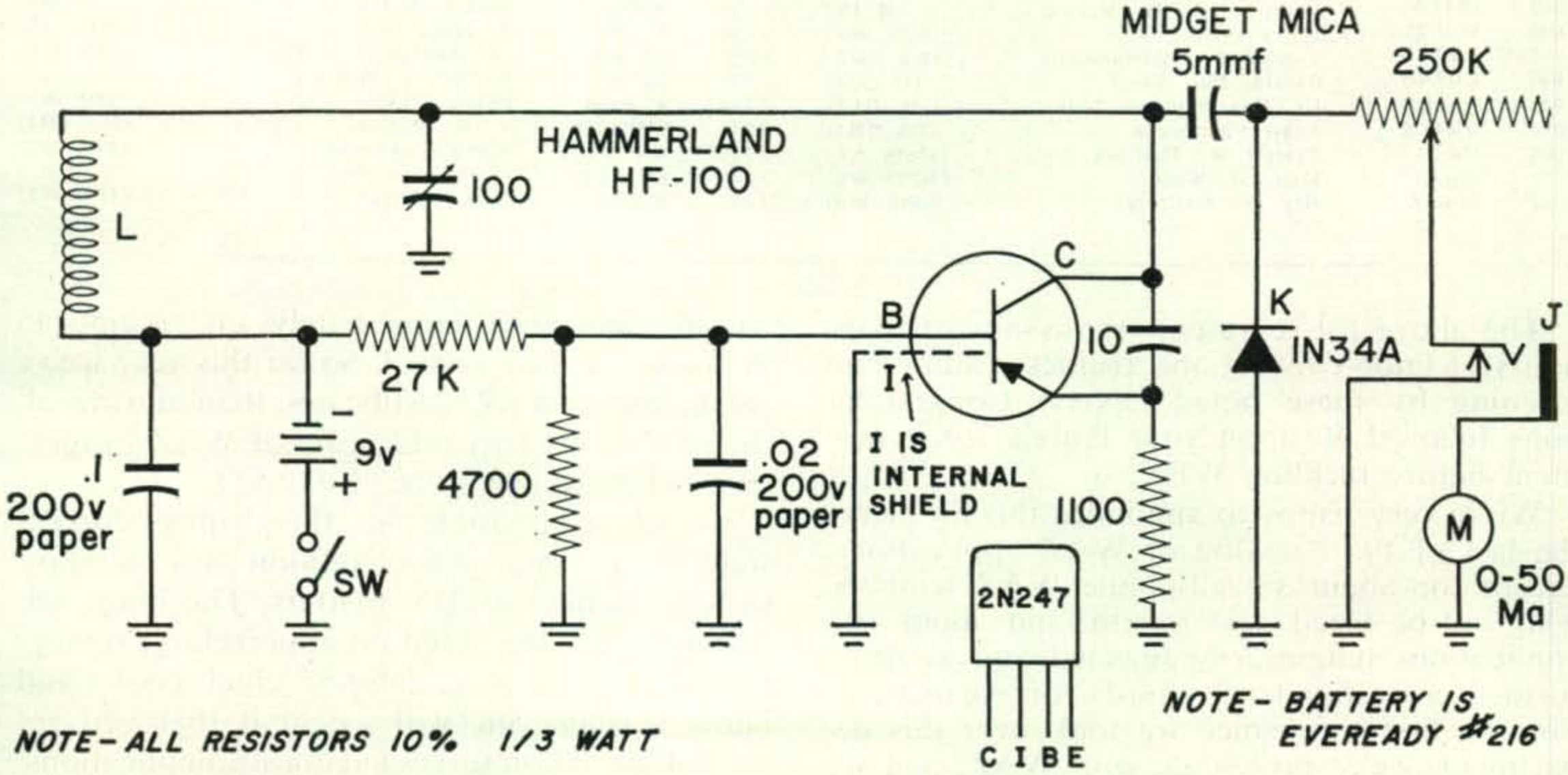


Fig. 2

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

DX DX DX DX DX DX DX DX

WAZ

#651	W6SUQ	Charles Spriestersbach	(163rd W6)
#652	SM5KX	John T. Norlander	(10th SM)
#653	W6RLP	Paul L. Wolf	(164th W6)
#654	W9JUV	Joseph J. Schroeder	(31st W9)
#655	W3AS	George Shaffer	(33rd W3)
#656	ZL2AFZ	George Studd	(8th ZL)
#657	F8XT	Jean Francois Hurtaud	(5th F)
#658	W8AE	James E. Penberthy	(36th W8)
#659	W2FSN	J. G. Walker	(36th W2)
#660	W2REF	Don Peterson	(37th W2)
#661	W2IWC	Fred L. Capossela	(38th W2)
#662	W9ABB	Paul W. Hinkle	(32nd W9)
#663	W1PFA	William C. Loeffler	(15th W1)
#664	WØGUV	Hans George Bloch	(24th WØ)
#665	F3YR	Georges Duranceau	(6th F)
#666	DL3FM	Dr. Karl Gerhard Lickfeld	(18th DL)
#667	OE3WB	Willy Blaschek	(4th OE)
#668	W9OTS	Elmer W. Pearson	(33rd W9)
#669	OK3EA	Harry Cincura	(14th OK)
#670	GM5RH	Denis Q. Aldridge	(3rd GM)
#671	W1KXU	John J. Walsh	(16th W1)
#672	W9MQK	Ray A. Walters	(34th W9)
#673	W2ZVS	Lt. H. E. Kiefer, 3rd	(39th W2)
#674	W9QNO	Russell Wellner	(35th W9)
#675	W6ETJ	W. D. Shugg	(164th W6)
#676	W3ALB	Edwin L. Lewis, Jr.	(34th W3)
#677	W5DML	Frank Wilson, Jr.	(28th W5)
#678	W3IMV	A. J. Hyden	(35th W3)
#679	W2OBX	J. Gregg Stephenson	(39th W2)
#680	OY7ML	Martin Haasen	(1st OY)
#681	W8EWS	G. W. Fuller	(37th W8)
#682	JA7AD	Sakae Kamio	1st JA7)
#683	OH2LA	Toivo Olavi Sorvali	(4th OH2)
#684	W1MV	Leo Wilber	(17th W1)
#685	WØQYE	T. P. Algren	(25th WØ)
#686	W7QON	Lloyd Tony Carlson	(36th W7)
#687	KP4KD	E. W. Mayer	(1st KP4)
#688	CN2SW	Sergio Rubio	(1st CO)
#689	IT1TAI	Domenico A. M. Marino	(1st IT)
#690	W6FZL	Harry Gross	(165th W6)
#691	SM7YO	Gunnar E. Hjalmarsson	(3rd SM7)
#692	LU7AS	Osvaldo Luis Sardi	(1st LU7)
#693	DL7EN	Dr. Hans-Gunther Todt	(4th DL7)
#694	ON4TX	Roger Vanmarcke	(5th ON4)
#695	K6EC	Everett W. Thatcher	(166th K6)
#696	W6ZZ	Miles W. Weeks	(167th W6)
#697	W9KA	Roy W. McCarty	(36th W9)
#698	W5IAH	C. M. Sandidge	(29th W5)
#699	K2CD	Norm Bauman	(40th K2)
#700	DL3BK	Hans-G. Scholz	(4th DL3)
#701	W5MMD	Tom C. Wherry	(30th W5)
#702	G3FXB	Al. J. Slater	(12th G3)
#703	WØVBQ	Oscar H. Baker	(26th WØ)
#704	W2OGE	Bruce Hoag	(41st W2)
#705	DL1GU	Bernhard Tietz	(10th DL1)
#706	HB9MU	Rene Dumas	(5th HB9)
#707	OZ2NU	Svend Nielsen	(2nd OZ)
#708	G6XA	John Withers	(6th G6)
#709	ZS1RM	Margery Snyman	(1st ZS1)
#710	W5MY	Frederic B. Westervelt	(31st W5)
#711	LA4DD	Jac J. Halland	(1st LA4)
#712	GM6MD	David Ross Macadie	(1st GM6)
#713	W3DBX	Samuel Proud	(36th W3)
#714	W9ESD	Robert B. Coats	(37th W9)
#715	ON4DM	F. Mouraux	(7th ON4)
#716	OK3DG	Jozef Kremarik	(3rd OK3)
#717	SM3AKM	Gunnar Linderoth	(2nd SM3)
#718	LA2B	Birger F. Larvin	(1st LA2)
#719	W9YSX	M. R. Franke	(38th W9)
#720	VE7JB	John H. Brown	(6th VE7)
#721	W8DEN	"Syl" Zachary	(38th W8)
#722	W2SUC	Aaron Spiro	(42nd W2)
#723	W5QN	Wilbur Dearing	(32nd W5)
#724	DJ2LK	Egon Bock	(2nd DJ)
#725	DJ2LM	Rolf Klatt	(3rd DJ)
#726	W7GHB	John W. Watson	(37th W7)
#727	OH2TM	Tauno Marvala	(5th OH2)
#728	W2LV	Robert M. Morris	(43rd W2)
#729	W1ZD	John M. Wells	(18th W1)
#730	W2IRV	Mario Cera	(44th W2)
#731	OK3MM	Jan Horsky	(4th OK3)
#732	K2BU	Ken Caswell	(45th K2)
#733	WØYTL	Edward Jasinski	(27th WØ)
#734	VK4DO	Harold Learmonth Hobler	(3rd VK4)
#735	W2DSU	Fred J. Merry	(46th W2)
#736	F3FA	A. Jacob	(3rd F3)
#737	CX1BZ	Dr. Andres Folle Yila	(3rd CX)
#738	DL6YK	Gerhard F. Hoffman	(1st DL6)
#739	W7AQB	Philip True	(38th W7)
#740	SM3AKW	K. G. Mohlin	(3rd SM3)
#741	W9YSQ	Harry R. Franke	(39th W9)
#742	SM5CCE	Kjell Edvardsson	(8th SM5)
#743	W2SSC	John F. Driscoll	(47th W2)

The above list represents thousands of man-hours of knob-twisting and fruitless calling and listening by these noted DXers. Congratulations fellows! Rest on your laurels for a moment before tackling WPX!

We're very happy to announce this list clears the last of the back-log of WAZ applications, except for about six all-phone WAZ winners, who will be listed next month, and about 100 applications temporarily rejected and awaiting further correspondence, cards, or corrections. For the first time since we took over this department, we're up-to-date with WAZ, and we hope to remain that way. Future applications will be processed immediately on receipt, in the order of their arrival. So far this year we've issued more WAZ certificates than during all the previous twenty-odd years of WAZ history! (See what you've done, Ludvik?)

Largely responsible for this happy, current state in this office is the addition of a secretary to help administer DX matters. The poor, unfortunate girl has hired on as secretary, stenographer, Girl Friday, janitor, chief cook, and bottle washer. She will see to it that you get immediate action to your requests, applications, and DX notes. Her name is Jean.

WPX

Our deepest apologies to those of you (including W6KG, W2HMJ, W8WT, W5KC, etc.) who have waited so patiently for us to get WPX launched and functioning. Being of a one track mind, this editor deemed it necessary to clear up one project before starting another. With WAZ now current, we're ready to give WPX the attention it so richly deserves. In this department next month will appear the first box scores of WPX, to be expanded and kept current thereafter. To get in on the ground floor of this new scoring system, get your WPX scores in now and participate in the initial listings. Rules for WPX will be as published in January, 1957, CQ, except that confirmation cards will be required (submitted to this department, to the address at the head of this column) to win a certificate, and for CQ listing above 299. You may participate in CQ listing below that figure simply by keeping us informed of your current WPX score. DX Department deadlines are the 10th of each month, with a publishing interim of six weeks (thus September 10th is our deadline for the November issue of CQ). Your requests for information, application blanks, WPX record books (we still have a few complimentary copies on hand) will get immediate attention. A postage stamp included would be a great kindness!

DX Notes

We're trying something new this month—listing DX notes and activities by zones. Your comments would be most welcome. (All times listed are GMT)

Zone #2 is represented this month by K2IVJ/VE8 and K8JTI/VE8 operating from Frobisher Bay, Baffin Island, with a BC610, S-76 receiver, and 3-element 20-meter and 2-element 10-meter beams on a 40-foot tower. They will be active on 10, 15, and 20 meter phone and CW until February 20, 1959, and promise 100% QSL.

Danny Weil is keeping Zone #8 hot this summer and fall with his coverage of the new British West Indies countries. He just completed a YVØAB session on Aves Island, and goes next to British Virgin Islands as VP2VB, in company with W3CXX, W5PQA, and W3BSF. Frequencies will be 14075 kc CW, 14195 kc AM, and 14305 kc SSB, which will also very likely apply to his other planned stops in this area. W8YIN reports Danny and his crew fired up as YVØAB at 1730GMT July 7, coming on SSB daily at 0200 on 14307 kc. "It was very good hearing the old bloke," comments Mickey. "He sounded his usual sharp self, and he was employing exceptionally good DX tactics." Reg, W6ITH, is going to Anguilla (VP2A-) as VPØRT some time in July, to work mostly SSB, advises W6YY. Reg might also cover some of the other new VP2 DXCC countries this fall, adds K2GFQ. Navassa Island still isn't dead, fellows! KP4AIO, as KC4AE, planned a trek there the last two weeks of July. (Good luck, OM, and give our love to the goats!) Other activities in this zone: VP2LO, St. Lucia, on 14059 kc, at 0300; VP2LB, 21230 kc phone, 0100; VP2AB, Antiqua, 21200 kc phone, 2200.

Stu, W1RST, operated from VP4WI, located at the U. S. Naval Station, Trinidad, Zone #9, from June 29 to July 2, 1958, while traveling in that area as consultant to the U. S. Navy Department. "Prior to those dates the station was operated by another American ham, but I have no way of confirming his contacts—I don't know who he was," writes he. "I'll answer all cards, regardless, but stamped and addressed envelopes would be very welcome. The pile-ups were tough, particularly because I was using an SP-600 receiver without much band-spread. U. S. hams in general were courteous and followed procedure for contest-type QSO's, and replied by call areas when QRM was at a peak. But there were a few lids who busted right in, regardless of my procedure. Their calls went on a blacklist and I didn't work them. If more DX stations were tough on the few violators, the situation would soon change. These short QSO's really aren't any fun for the DX station, and my hat is off to the DX fellows, now that I know firsthand what they have to put up with," concludes Stu. Also active: HKØAI, San Andres I, 14050 kc CW, 0400; PZ1AR, 14050 kc CW, 0200.

From Zone #14 Bart, EA6AF, now under training by the CAA at the San Francisco airport, visited some of the top Los Angeles DXers in July, reports W6YY. Bart, a captain in the Spanish Air Force, is due back in the Balearic Islands in October. He's had over 7,000 DX QSO's since 1949. Tom, GM6UC/M, is working scads of W6's with 30 watts on 15 meter CW from his English Ford in Northern Scotland. Also active: CT2AI, 14010 kc CW, 0400; ZB2A, 21262 kc phone, 0200; EA6AW, 21010 kc CW, 1900; PX1YR, 21206 kc phone, 2100.

Visiting firemen to Naples, Zone #15, wishing some ham chatter and possibly a visit to I1AFS, are invited to contact Del, W8KJP. "Joe, K4EXU, and I would be more than happy to meet them and possibly chew the rag over a plate of spaghetti. Have them call this number on their arrival (in Naples): 80180, extension 2383, and ask for either A/2c Del Clouser or T/Sgt Johnson," suggests Del. (If you don't like spaghetti you're in the wrong country!) I1ADW can't get to San Marino this year, writes K6SXA, but I1DCO/M1 made it, in July. "I logged about ten straight hours calling I1DCO/M1," complains Scotty, KØDQI, "taking time out only for iced tea and the consequences." W3UOX hoped to operate from HV1CN, Vatican City, July 15th, 16th, and 17, on 20 meters and maybe also 15, writes K4CFB. HE9LAC

wants skeds with Utah and South Dakota to complete his WAS, says Nikki, K5ADQ. Remember OK1LM, Alois Kovanda, one of the top Czech Dxers until about 1949? His call has been reassigned to Milos Svoboda, who has started up the ladder to WAZ, WAS, DXCC, and other top awards previously held by the other OK1LM. Don't be confused when you hear that familiar call again. Further Zone #15's this month: IT1CLS, 14085 kc CW, 0500; HV1CN, 14120 kc phone, 0545; I1FKP/M1, 21210 kc phone, 1500; UQ2AK, 14050 ks CW, 0200; ZB1LQ, 21500 kc, 1900.

There's a long story about Peter, VS9O, Sultanate of Oman, Zone #21, who's been putting that rare spot on the air, but most of it can't be told. He operated, mostly 21 mc phone, from the desert 400 miles inside the Oman border. When VS9AP left Aden in July, Peter was scheduled to inherit that rig, which would have put him on the other bands, presumably phone and CW. But he's now QRT, with apparently little chance of getting back on the air due to objections by a local authority, reports W6YY. MP4BBE and MP4BCK are both active on CW from Bahrein Island. Other Zone #21 doings: 9K2AQ, 21038 kc CW, 0230; 9K2AZ, 21155 kc phone, 0200.

The Maldive Islands, Zone #22, may become relatively common soon. K6ENX says a new RAF station, VS9MM, is due any day, presumably permanent, very likely using the DX-35 helped along by W6UOU. VS1JF/VS9 is rumored to be active for 6 to 9 months. And Barry, VS1BB, says he might return, maybe about the time you read this. Also, Zone #22: VU2KM, 14004 kc CW, 1400; VU2PS, 21165 kc phone, 1830.

Rumor has a station signing UAØGP/Ø in Zone #23.

Considering recent DXCC developments, keep an ear out for KR6HP (home call K2LEQ), on Miyako-Jima, a lonely island 9 miles wide and 14 long, located 175 miles south of Okinawa and 100 miles east of Formosa, is active daily at about 1300, using BC610 with 500 watts, 75A2, and 3-element 20 meter beam 500 feet above sea level. He wants to give as many DXers as possible a QSO from this new island. He and Pete, KR6LP, located on Okino Erabu Shima, 120 miles north of Okinawa, are the only stations on their respective islands, writes Don, W6AM, and are the only KR6 stations not on Okinawa. KR6BW has sold his rig, reports W3SOH, but expects to be active with a new station by the time you read this. HL9KR (Thomas E. Williamson, K8HIB) worked K2QXG and WØCVU this month, who reports he now transmits on 14130 kc SSB and listens on 14265 kc for SSB, active daily at 1100. He also worked K2MGE, Dorothy, who is trying to be the first YL to achieve SSB DXCC. (Wayne, how about starting all-SSB WAZ?) New calls in Japan are KA2BW (KØMLL), who plans to be active soon with a BC610, SX-101, and quad; KA2SI (K5LFB), another BC610, 75A3, and 20-meter doublet; and KA2JG (W3NSJ), presently using ART-13 and a long wire, but with a beam in the works. Two other KA2 stations, KA2NY and KA2LL, are currently active, reports the Mike & Key Club of Japan.

From VS1HX and K6ENX: A bunch of the RAF boys from Singapore, including VS1BB, VS1JF, VS1HX, VS1HH, and one more still undecided, plan to operate from the Nicobar Islands, Zone #26, during August and September, and possibly from the Andaman Islands about next February, if the Indian government will grant them permission. At this writing the issue is still in doubt. HS1C just put up a new 3-element beam June 21st, writes W2AYU, and he will be active Sundays at 1030, listening 5 or 10 kc up, until October 1959. HS1A left on TWA for the States July 3rd. He sold his SSB rig to a VS5. Other activities: XW8AI, 14012 kc CW, 1600; XZ2TH, 14025 kc CW, 1600.

VK9JF hopes to get a VS2 call, Zone #28, in the near future, he reports via VK2AGH and W9HUZ, if his future XYL will spare him enough time. Aside from his marital plans, he's been busy finishing up his QSL chores, which means he's answered most of those he's received. He says he didn't get time on Cocos-Keeling to get DXCC. He left VK9LE holding the fort, with his old equipment. VR4JB is now active on 20 meter phone from Guadalcanal, and ZC5VZ is on 20 CW from British North Borneo. Others: VK9VM, Territory of New Guinea, 14045 kc CW, 1200; VS2CV, 14045 kc CW, 1500; VK9DB, Papua, 21195 kc phone, 1630; VS2DW, 21170 kc phone, 1630; VS1JF, 14028 kc CW, 1500; JZØPB, 21263 kc phone, 0600; JZØHA, 14057 kc CW, 1430.

It's still soon for a report on the current operation of VK2AYY/LH, Lord Howe Island, Zone #30, but quite a few have reported working him, including W4LYV, W6KG, and W4CXA. If you didn't snag VK2AYY/LH, listen for VK2FR, who has been on Lord Howe for years, and is getting back on the air after 8 years' absence, advises Ed, W2CNT. His CW is slow, of course, but he's doing his best to QSO as many W's as possible. He was reported on 14045 kc at 1100. Another Lord Howe possibility is revealed by K2QXG, who says another VK2, other than VK2AIR, plans to fly there in August and operate for one week on 20 CW and possibly SSB. K2QXG will handle QSL's if the plans materialize. Other Zone #30: VKØKT, Macquarie Island, 14190 kc phone, 1100; 14057 kc CW, 1200.

Bill and Helen Mace, KB6BK and KB6BL, Canton Island, Zone #31, are now going great guns on SSB with a KWM-1, report K2QXG and W8PUD. John says they have a beautiful signal from about 0900 to 1200 daily, on 14280 and 14298 kc SSB, and Mac writes they

will QSL 100%, but please include a stamped and addressed envelope with your card (see Addresses). If you worked KP6AK anywhere but 75 or 20 meter phone lately, you've snagged another one of "those" things. "Someone has been using my call illegally," writes K4QIJ. "Since the first of this year I have only been using 75 phone in the Line Islands Net for weather and IGY information, and 20 meter phone for my regular skeds with Honolulu with traffic and phone calls. I'll work anyone I can hear calling me *after* the traffic and phone calls have been completed." KB6BH is active 1030 to 1300 many mornings. Other activities: KB6BJ, 14080 kc CW, 1200; KX6BP, 14299 kc SSB, 1600; KW6CE, 14050 kc CW, 1400; KP6AL, 14063 kc CW, 0500; KM6AX, 14299 kc SSB, 0600; KM6BK, 21045 kc CW, 0400; VR1C, 14060 kc CW, 0800.

Dick, KB6BJ, recently worked FW8AA, Wallis Island, Zone #32, on both phone and CW, who reports his activity as being irregular. "He has generator troubles, and he's QRL other business," comments Dick. "He is going to QRT this fall and to go to Ohio via France." The WGDXC bulletin advises FK8AS is planning a short, flying DXpedition to FW8 if he can raise the plane fare. He's already got permission to operate from Wallis, and an invitation to stay with FW8AA. Once a month a DC3 flies to Wallis from New Caledonia on business and remains there 52 hours. If Achille can raise the $120 fare he'll take along his DX-100 and work through the two days. W6ZEN skeds ZK2AB at 0800 on 14 mc phone, and he'll be glad to help anyone needing Niue. ZK2AB needs West Virginia and Rhode Island to complete his WAS. Dotty Kellen, KS6AG, putting American Samoa on the air with her 10 WPM on 14058 kc, wants known her correct QTH (see Addresses). She's not at the Rainmaker Hotel, but lives in town (Pago Pago). The quad antenna of Stan, VK9AD, Norfolk Island, blew down in a recent storm. Since W6UOU's SSB rig is expected on the next plane he's frantically trying to put up a temporary antenna to put that rare spot on 14305 kc SSB. ZL1PA has shipped a SSB exciter to VR2AP for his permanent SB use. Last month in this column we reported ZK1AK being 13 years old. "T'ain't so," says KØDQI, who submitted the item. *"I'm 13*—he's 54! I lay claim to being the youngest DXCC member in the world, at 13 years, 8 months," (Oops!) More Zone #32: FO8AK, 21058 kc CW, 0330; VR2DG, 14075 kc CW, 1100; YJ1DL, 14040 kc CW, 1100; FO8AO, 14349 kc CW, 0600; KS6AD, 14069 kc, 1100; VR2AZ, 21225 kc phone, 0900.

ZD7SA, St. Helena, Zone #36 now working 21046 kc CW with a dipole, and also 7012 kc and 14 and 28 mc, will soon have a quad in operation. At the last mail boat arrival he astounded his neighbors by receiving 2,500 QSL's! OQ5IE, Jane, is the XYL of OQ5GU, a well known contest operator. Other Zone #36: CR5SP, 14120 kc phone, 0600; FQ8HA, 14064 kc CW, 1530; VQ2AB, 14090 kc CW, 2100.

ZS8R, Zone #38, informs W3SOH he has bought a second-hand 1 kw Onan power plant, which means more ZS8R activity when conditions perk up. He's also expecting to build a 100-watt rig instead of the 40-watter previously planned. He expects to have a ground plane, plus dipoles for 14 and 21 mc.

Miscellany

In a recent DX Bulletin we were commenting about the lack of a sense of humor in the calls used by recent phonies. "Don't give up!" replies KØDQI. "In the 1957 CQ DX contest I worked B4UP, claiming to be in Zone #41, which gives WAZ a new slant! I'm sure all you pre-war boys are so, so happy to know that your choice for the 'Phony of the Year' is still alive. Or maybe it's his son, carrying on tradition. Maybe this pirate business is hereditive!"

ZD8LN is reported phony. ZD8SC leaves ZD8 soon, and his rig (120 watts) will be taken over by ZD8JP. TI2PZ tells Paul, K2GFQ, he knows of no TI9 expeditionary activity forthcoming. From the WGDXC bulletin: 9G1BF will QRT at the end of July, but will return in 6 months for another 6 months of duty. W4LYV sent a new crystal (14034 kc) to ZC3AC. VS1JF is still handling some of the cards for ZC3AC. The generator from W3GHD landed in Hong Kong in July, in shipment to CR1ØAA. ZL3VB, Jack Ryan, on Chatham Island, is applying for permission to operate 20 meters (he's on 80, now). A 100 watt CW rig for him has been shipped to Jock, ZL2GX, who will add a power supply and continue the shipment. VR1C is now on the air with a new WRL Globe Scout furnished by Leo. It's putting out a fine signal, and he hopes to use the frequencies of 14190 and 14060 kc.

W8YIN now has 102 countries worked on SSB and 73 confirmed, all with HT-32 transmitter bare-foot! He's trying to be the first W to DXCC SSB with QRP.

W6RLP reminds us of a brand new publication for DXers and award hunters: "Directory for Certificates and Awards", a booklet containing information on over 200 DX and operating awards throughout the world. It is published by William T. Clark, W3RPG, 8 Frances Drive, Harrisburg, Pa., and is available for $2 postpaid.

Of interest to our DX brethen is a beautiful, 14-inch gold cup, to be engraved with call and data and shipped to the fortunate DX station who sends Chas, WØCVU, a card representing WØCVU's 100th SSB country confirmed. Chas won't tell exactly how many he's got confirmed, but the event shouldn't be long, now.

QSL Notes

"I have at hand a recent batch of QSL cards from Americans for my husband, VKØTC, at Macquarie Island," writes Mrs. Sylvia Cordwell. "Many hams are obviously not aware that there is no mail service to and from Macquarie, and they must wait until the end of December for their acknowledgements. Some of them send two or three cards before I have the chance to inform them of these facts. I wonder if you would print a note to the effect that the VKØ hams are not ill-mannered by not answering them immediately.

"In a letter from LA2JE/P he asked me to pass the word that he will be active from Hopen Island, Svalbard, until August or September, 1959, but LA5HE will no longer handle his QSL's," writes Mac, W1ICP. "In the future all LA2JE/P cards must go via the NRRL (Norwegian) bureau. Cards sent to his home address will have to wait until he returns for an answer."

Cards for OY7ML and CT2BO may now go via W6NJU (see Addresses), including a stamped and addressed envelope for replies. K2QXG still has 29 VK9VM cards unclaimed.

Help wanted: The current mailing addresses of KJ6BH (worked September, 1957), VQ3TL (worked in 1957 ARRL DX contest), and KJ6BU. Please notify this editor.

The Ohio Valley DX Bulletins

If you would like much faster and more comprehensive DX news coverage and articles than space in this column can permit, we suggest you try the weekly Ohio Valley DX Bulletins, edited and published by W4KVX. Annual rates, for a minimum of 40 issues, are $5 second class mail, $6 first class, $7.50 air mail, to the U. S., Canada, and Mexico, and $4 a year plus postage to other countries. Write W4KVX (address at the head of this column) for further details, or for your membership to this weekly magazine. Sample copies are available upon request.

Addresses

CT2BO—QSL via Gary Stilwell, W6NJU, 434 No. Laurel Ave., Los Angeles 48, Calif.
CX3CS—P. O. Box 37, Montevideo, Uruguay
FK8AS—Achille Poulet, P. O. Box 151, Noumea, New Caledonia
FP8AB—QSL via K2JGG, Tom Hughes, P. O. Box 1, Morris Plains, N. J.
G3LWS/VP8—E. H. Ross, FIDS, via Port Stanley, Falkland Islands, South Atlantic
GC3MFS—D. Stewart, Boulivot House, Boulivot, Grouville, Jersey, Channel Islands
HC1BP—(new QTH) Ben Lord, P. O. Box 456, McCleary, Washington
I1AFS—Del Clouser, W8KJP, AF2356-4642, Airsouth Box 110, FPO #510, New York, N. Y.
K8JTI/VE8 & K2IVJ/VE8—926 SQ., APO #863, New York, N. Y.
KA2QT—S/Sgt. Albert J. Stepanovich, K3DMX, AF-13481203, 6303 A. & E. Maint. Sqdn., APO 994, San Francisco, California
KAØIJ—Woody, 336 N. Cherry Lane, Forth Worth 8, Texas
KA2NY—Mike & Key Club, Box 73, Navy 3923 c/o FPO, San Francisco, California
KB6BJ—Richard A. Young, c/o CAA, Canton Island, S. Pacific
KB6BL—Helen Mace, Canton Island, Phoenix Group, South Pacific
KR6QM (K9CZX)—Col. Jack F. Hudson, Hdqtrs. U. S. Army Quartermaster Group, Ryukyu Islands, Fort Buckner, APO 331, San Francisco, California
KS6AG—Dotty Kellen, QSL c/o Post Office, Pago Pago, American Samoa
LA2JE/P—In future send cards via Norwegian bureau (NRRL)
LB9OE—Astor/OM Tiber, c/o Halal Shipping Ltd., Camp Aden, Aden
LJ3D—QSL via NRRL (Norway)
LZ1WD—Konstantin Chobanov, K. Popor 44, Sofia 21, Bulgaria
MP4BCK—P. O. Box 3, Bahrein, Persian Gulf
OD5CB—K. Nabhani, P. O. Box 266, Tripoli, Lebanon
OK1LM—(new call assignment) Ing. Milos Svoboda, Bozkov Mnichovice, Czechoslovakia
OQ5IE—Jane Hiernaux, Box 403, Stanleyville, Belgian Congo
OR4VN—QSL to UBA, Box 634, Brussels, Belgium
OY7ML—QSL via Gary Stilwell, W6NJU, 434 No. Laurel Ave., Los Angeles 48, California
PY3ANS—P. O. Box 2180, Porto Alegre, Brazil
PY4AO—Arquelao da Silveira Gomes, Aimores 2042, Belo Horizonte, Minas Gervais, Brazil
SM8AQT/LA/P—QSL to SM5KV
SM8BYG/MM—QSL via SSA to SM5BYG
TF2WCO—M/Sgt. C. L. Mings, AF16041357 Hut 32, 57th Fighter Sqdn., APO 81, New York, N. Y.
UO5PK—QSL (100%) via P. O. Box N-88, Moscow
UQ2AN—Bruno, P. O. Box 1601, Riga, Latvia
USFA—QSL via Central Radio Club, Box 88, Moscow, USSR
ex-VK9JF—Mike Fulton, c/o Cable and Wireless Ltd., 44 Northan Road, Penang, Malaya
VK9VM—QSL via Lauren L. McMaster, K2QXG, P. O. Box 206, Brightwaters, Long Island, N. Y.
VP1DL—D. F. Owen-Lewis, Punta Gorda,

[*Continued on page* 66]

Testing the P & H VFO-matic

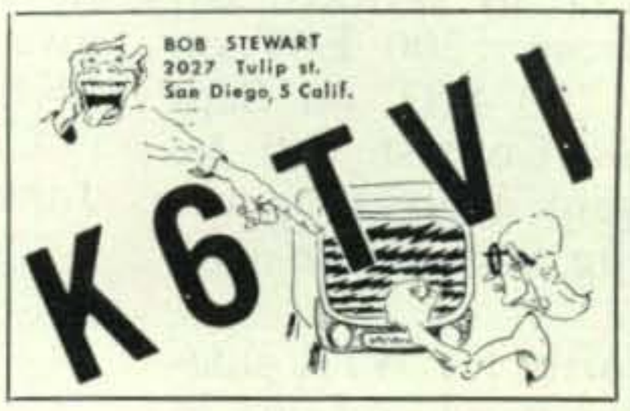
Irving E. Binger, W2CMM
1741 Andrews Ave., Bronx 53, N. Y.

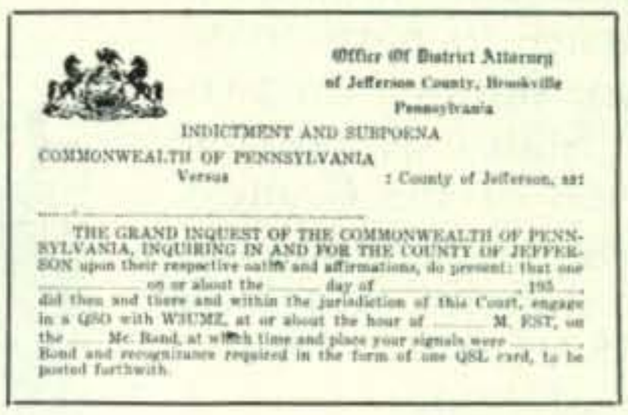
Recently I had the opportunity to try a new product called the *VFO-matic*, an automatic VFO which is designed to be used with any Collins receiver of the 75A2, 3, or 4 series and any 9 mc exciter such as the Central Electronics 10A, 10B, 20A, the Hallicrafter HT-32, or the Phasemaster exciter. The *VFO-matic*, model 8020, is manufactured by the P & H Electronics Company of Lafayette, Indiana. This new device automatically zero beats the exciter to the frequency of the received signal and provides the same ease of operation normally associated with a transceiver. The necessity of tuning a VFO to zero beat with a received signal is completely eliminated.

Connecting the *VFO-matic* is simple. A typical installation might be similar to the one at this station where normally a converted BC-458 is used as a VFO for a 20A exciter. The receiver is a Collins 75A4. Two coaxial cables and connectors are provided with the *VFO-matic*. One of these cables terminates in an octal plug which is inserted in the octal socket on the back apron of the 20A (in place of the output octal plug of the BC458). The other cable with the tube socket adapter, is inserted in the 2nd mixer socket of the 75A4, and the 6BA7 tube is plugged in to the adapter. If desired, the octal plug from the 458 can be plugged in the socket provided on the *VFO-matic*. This permits instantaneous switching from the *VFO-matic* to the 458.

In operation the *VFO-matic* requires no adjustments other than an initial setting of the sideband tuning knob on the front panel. After this has been set to zero beat with a received signal, the transmitter will be on zero beat with any signal you tune in on the receiver. The frequency stability of the unit was found to be excellent and as reliable as the 75A4 itself. One word of caution—when working DX outside of the American phone bands, remember to switch back to the 458 VFO or you may be swamped with QSL's—from the FCC—for out of band operation. ■

QSL contest





Office Of District Attorney
of Jefferson County, Brookville
Pennsylvania

INDICTMENT AND SUBPOENA

COMMONWEALTH OF PENNSYLVANIA
Versus
: County of Jefferson, ss:

THE GRAND INQUEST OF THE COMMONWEALTH OF PENNSYLVANIA, INQUIRING IN AND FOR THE COUNTY OF JEFFERSON upon their respective oaths and affirmations, do present: that one _____ on or about the _____ day of _____, 195__, did then and there and within the jurisdiction of this Court, engage in a QSO with W3UME, at or about the hour of _____ M. EST, on the _____ Mc. Band, at which time and place your signals were _____. Bond and recognizance required in the form of one QSL card, to be posted forthwith.

WINNER **LOSERS**

Winner of this month's years subscription to a well-known radio mag is Henry W. Peters, KN9LMN. Runners-up entitled to an extra free copy to impress visitors are Douglas Whillans, ZL1AFW and The Quart & ½ Club, KA2QT.

sideband sideband sideband

SIDEBAND

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

In last month's column we announced detailed rules to govern the CQ SB Worked All States Contest to be held from 1200 EST on September 20, 1958 until 1200 EST on September 21. We believe this Contest will be very exciting, and will present a great opportunity to pick up the missing States you need for WAC.

While the Contest is primarily for W/K sidebanders it is also open to sideband stations in all foreign countries who desire to participate. The idea is to work as many stations on two-way side-band in as many States as possible in the twenty-four hour period of the Contest.

Your final score will be determined by multiplying the number of stations you have contacted either in the USA or in foreign countries times the number of States worked. All bands may be used but you may only work a station once.

Top scorers in each State and each foreign country will be awarded a beautiful WAS Album with their call in gold, provided they have worked all forty-eight States. These awards are by courtesy of Bill Leonard, W2-SKE, who expects to win one himself.

Conditions have been unusually poor in June and July, although there have been some

Mirko, YU1AD.

periodic openings. Why not take this opportunity to get caught up with your QSL cards? Many letters are received daily from the DX boys asking for assistance in obtaining those elusive ones. We estimate that more than thirty SB stations have worked over one hundred countries two-way side-band, but to date only twelve "Worked 100" certificates have been sent out. Many have from 90 to 98 confirmed and by sending your card tonight you might possibly make some one very happy. Cards from ET2US, MP4KAM, SVØWE, HC2AGI are especially welcome by many W/K stations.

We again pay special tribute to the various DX-peditions including VQ4EO, W4RQR and VE3MR who between them made fifteen countries possible on side-band which did not and still do not have SB activity. They also QSL'd rapidly to every one who sent a card to them. We also do not forget the efforts of ZS6AJ and ZS6AJH, HB9FU, the Ohio Valley Radio Club and of course Ted, W6UOU who besides his own DX-pedition, has loaned the "Little Juggernaut" which has been used in many of the Far East countries.

None of the present twelve recipients of the "Worked 100" certificates would have been close to the 100 confirmations were it not for the above mentioned efforts. That is why it is so necessary for all SB stations in foreign countries to QSL when your card is especially requested. Should the QSL chores be too much of a burden there are many W/K amateurs or clubs who will gladly do it for you, including furnishing the QSL cards.

Mobile activity has been increasing at a rapid pace, and while Mobile operation is usually more interesting in the Summer months, it is my own personal opinion that the wonderful success enjoyed by those now operating will encourage the even more rapid growth of mobiling. In my own case I find that I can work most everyone from the car that I can from home and that the fixed station is used less and less. In seven weeks of activity we have worked thirty-three countries in all continents from the car in spite of the very poor conditions. Al, W8DLD reports 92 countries worked from his fine mobile rig and others including Tony, W2EWL report the same success. This is certainly definite proof that low power on side-band is superior to AM in every way.

Have you noticed how many fellows have sold all of their high power, large and bulky equipment and have purchased KWM-1s for fixed or mobile use? The present trend is definitely towards small, compact, efficient low power gear. All of the newer equipment should be designed to accommodate this requirement. Collins have announced all of their new SB transmitters and receivers will be smaller and lighter in weight, and Hallicrafters will soon be producing their new FPM-200 which is all transistorized except for the driver stage and the final which is capable of 200 watts PEP on all Amateur bands.

We received 4X4DK, Ami's log for the SB Contest too late to be included in the totals. His score of 55,575 points would have qualified him for eleventh place. Good work Ami; and it was all done on twenty meters.

Through the courtesy of A1, W2CFT who was in Belgrade recently we finally are able to show a picture of Mirko, YU1AD who has been one of the most active SB stations in Europe.

Jonathan, W2WK advises that KC4USK, Don has been desperately looking for a South Carolina station to phone-patch him to his home in Florence. Of all the 28 men stationed at the base, Chief Don Drew is the only one who has not talked home. CQ Florence? KC4USK calls CQ traffic each morning at 0300 EST on 14,280. He also QSL's 100%.

"Worked 100" certificates were awarded to W8GCN, VE3MR and W8EAP. Congratulations fellows! Eighteen "Worked 75" awards were also mailed.

Martin, VE3MR reports that his Radio Club would have had a very poor showing on twenty meters on Field Day without the single side-band transmitter. Of the 120 contacts made nearly 100 were made on SB. Martin said there were many favorable comments by the AM brethren, and he expects an increase in Canadian SB operators.

Bill, W2VZV who received his "Worked 75" this month suggests that foreign stations calling CQ should discontinue saying "tuning down from 14.3" and indicate exactly on which frequency they will listen. This practice paid off for many of the high scorers during the DX Contest.

George, PJ2AA has been off the air for several weeks because of failure of his linear and also trouble with his beam antenna. Hope you get everything fixed soon George.

Ben, HC1BP has left Ecuador. He was there with IGY. His QTH for QSL's is Ben Lord, P.O. Box 456, McLeary, Washington.

Danny, YVØAB fired up at 1730Z on July 7th. He operated daily on SSB until July 13th and made a great many contacts. Danny will visit many of the other inactive QTH's around Central and South America before starting his long voyage to remote places in the Pacific. His entire station has been furnished by Hallicrafters. QSL's should go to KV4AA.

Mickey, W8YIN who sends us considerable information each month has worked 102 countries with his bare-foot HT-32. He hopes to be the first W to obtain DXCC on SB with low power.

Next column will be devoted chiefly to the Washington Convention's SB program and will feature many photos of the SB gang in attendance.

73, Bob, W3SW.

CQ Tests the Wacom

The Waco Communications Company of Waco, Texas has introduced an interesting new transmitter kit for six meter operation. The rig comes complete with cabinet, punched chassis, all parts and full instructions for assembling. Less tubes and crystal it sells for $23.50 on a direct mail basis.

Four tubes are used in the circuit. The oscillator is designed to work with 8 mc crystals, the most popular and available kind. Since the unit is primarily designed for mobile use it is quite compact and can easily be mounted under the dash of the car. It will operate with either six or twelve volts, depending on the connections to the power plug in the back. It will deliver a good five watts to the antenna, well modulated, with a 250 volt 100 ma. power supply.

A second plug in the back of the chassis provides meter readings for adjustment of the transmitter. Grid drive can be read on the basis of one volt per grid mil. Plate current registers one volt for every 10 ma. This arrangement is a little complicated for mobile operation so I just used it to check the tuning with the unit on the shack work bench and then used a small field strength meter for peaking in the car and for retuning after changing crystals.

On-the-air reports on the rig are a pleasant surprise for everyone had good words for the speech quality. Signal strength naturally comes out to be about the same as from any other popular five watt rig. ■

DX [*from page* 62]

VP1WN—N. Wakefield, c/o The Citrus Co. of British Honduras, Pomona, Stann Creek, British Honduras
VP2AB—Jim Brown, P. O. Box 29, Antigua, B. W. I.
VP2LB—Amateur Radio VP2LB, St. Lucia, B. W. I.
VP2LO—J. F. Stratfull, The Audit Department, St. Lucia, B. W. I.
VP4WI—(For QSO's June 29-July 2, 1958) QSL to Stuart D. Cowan Jr., W1RST, 45 Park Ave., Old Greenwich, Conn.
VP5RD—Dick, P. O. Box 21, Kingston 5, Jamaica
VP8CC—C. Johnson, c/o Mr. L. Hill, 12 Greencourt Rd., Petts Wood, Kent, England
VP8CI—H. E. Dyer, c/o Westminster Bank Ltd., 12 High St., Southampton, England
VP8CR—L. W. Barclay, 67 Oakleigh Park Drive, Leigh-on-Sea, England
VQ8AJ—QSL via Box 155, Port Louis, Mauritius
VR3A—Ray Baty, c/o Cable and Wireless, Ltd., Fanning Island
VS6DS—Box 541, Hong Kong

VS9O—Peter Rackham, c/o International Aeradio Ltd., Aden

W7CKY/KL7—Box 99, Nome, Alaska

XEØUN—QSL to Wilbur S. Claypool, Blackburn Road, Burtonsville, Md.
XW8AI—Agastin, ECMT/FAL, Vientiane, Laos
XZ2SY—Bo Soe Ya, P. O. Box 833, Rangoon, Burma

ZB1DS—R. A. Strafford, 2 Patricia Flats, Zabbar Rd., Pawla, Malta
ZB1DZ—Geoff Weale, 100 S. U., RAF Luqa, Malta
ZC4FL—Cpl. D. R. Britton, 264 Signals Unit, RAF BFPO 53, Cyprus
ZC4FM—J. Marland, c/o FCO, HQ. Cyprus Police, Paphos Gate, Nicosia, Cyprus
ZD1EO—E. I. Owen, Army Post Office, Freetown, Sierra Leone
ZD1FG—Art Torrie, UNESCO T. A. Mission, Njala, Sierra Leone, Africa
ZD3F—Frank Buckley, c/o Cable and Wireless, Ltd., Bathurst, Gambia
ZE7JF—Jack Campbell, Box 562, Bulawayo, Southern Rhodesia

9K2AP—W. S. Stewart, Box 65, Kuwait, Persian Gulf
9K2AQ—QSL via R. G. Crowther, G3FJU, 236 Westwood Lane, Welling, Kent, England
9K2AZ—(ex-MP4KAC) Wm. N. Burgess, c/o Kuwait Oil Co. Ltd., Kuwait, Persian Gulf
9G1CH—Briff, HQ. Ghana Army, Accra, Ghana

[*Continued on page* 102]

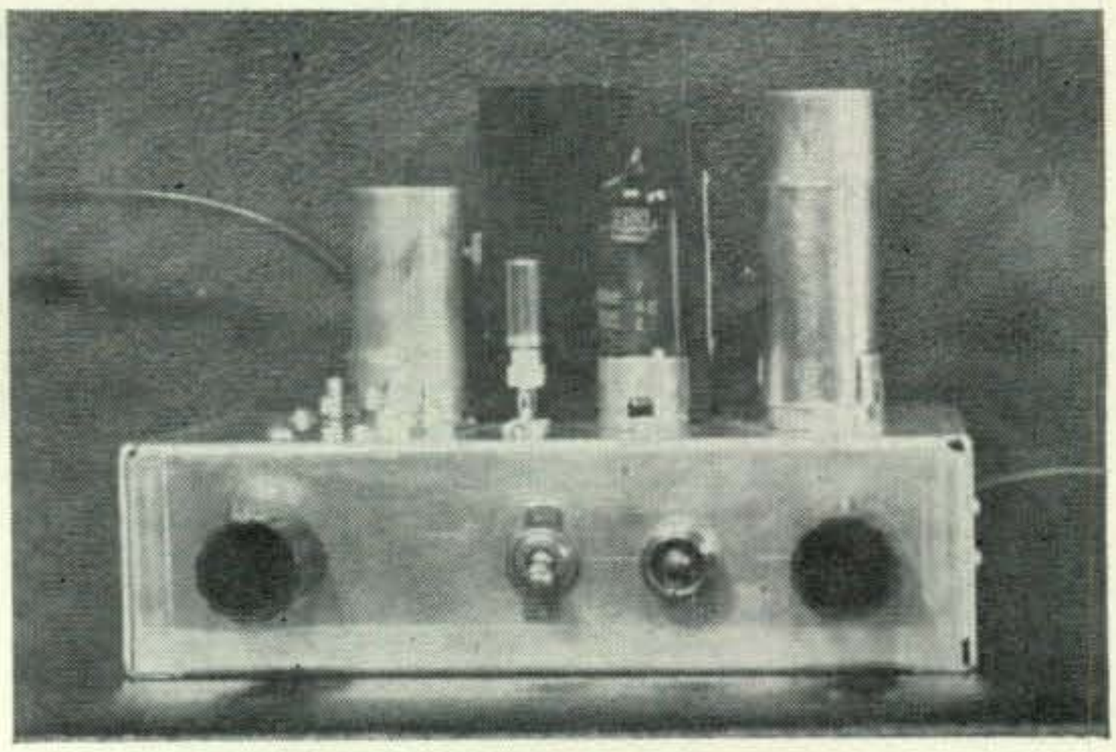
VHF

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

by **SAM HARRIS, W1FZJ**
P.O. Box 2502, Medfield, Mass.

First 220 mc Picnic at the QTH of W9EQC in Aurora, Illinois. Rear row left to right, W9VVH, W9RPF, W9JCI, W9SKN, K9HIH, K9ILH, W9OVL. Bottom front, W9EQC, W9JFP, K9DOE.

Today I saw a parametric amplifier working. I actually had my hand on a working model. A practical one too. Thirteen db gain and a noise figure of three db at 2500 mc. And this one didn't "up convert" or any some such but came right back out at the signal frequency. Furthermore it is a basically simple device. Let's assume we wanted to have a preamp on 432 mc. Basically all we need is a signal source (pump generator to you) at twice the signal frequency. In this case, if you want to keep it simple, a 6AF4 oscillating at 864 mc. would be sufficient. The output of this "pump" is fed into the hard to get part, namely the varactor. This "feeding in" part is supposed to be done in a very scientific manner. This means that if you are a ham you have got it made because if there is anything that hams are good for it is doing things in a scientific manner the easy way. The signal is fed into one end of the varactor mount and taken out the other end all amplified and ready to feed into your Microwave Associates crystal mixer. (What! You didn't write and get one?) Now if this sounds too simple to be true, it's just because you've been confused by all the high falutin' talk which must of necessity accompany all treatises on these new fangled devices. Somewhere in this column there is a diagram of the pump frequency generator which is being constructed for use in our parametric amplifier. After seeing the working model today I am inclined to chop it off at the first 2C39. I can't tell you how much improvement you will get by having a stable, crystal controlled pump instead of a self excited oscillator. My first guess is that it will make the same difference as it does in any normal converter. I can't for the life of me figure out any reason why you don't find out for yourself. If you haven't got a varactor to play with do not be discouraged. Neither do I. It can be pointed out that a varactor is presently described as a device which has capacity the value of which changes when you do things to it. (For a more erudite definition see "Proceedings of the I.R.E." June issue) (incidentally the boat on the cover of the July issue of the Proceedings goes with an article by A1AEQ and others.) Now almost anything will exhibit some such characteristic. Everybody else is trying anything they can



Low power rig built by Hazen Smith, VE11K.

get their hands on, why shouldn't you? First try might be an ordinary crystal mixer. Don't rule out the use of vacuum tubes or ceramic capacitors. Don't wait for someone to give you a genuine varactor. Get on the ball and do some hamming.

Visits

We finally got a chance to meet Connecticut's gift to Two Meters and the number One Two Meter Century Club Certificate holder, Stewart Banks (K1CRQ). Stew came up to Boston to see the sights accompanied by John (KN1HKY), Kevin (KN1CWC), Matthew (K1CDH) and Doug (W1KLK). (Incidentally, KN1CWC won the Connecticut section for the Novice participants in the last contest. K1CRQ won high-score place for Connecticut amongst other participants.) Among other things the boys accomplished while here was to get my two meter kw up on 145,047. Had a nice time chatting with the C.D. net in Meridan. (Yes, W1FZJ is finally back on two meters.) We are expecting the boys back pretty soon as we still have somebody's coat.

Contest

If you are lucky, you will get this issue in time to be reminded of the August VHF contest. If the scoring looks difficult to you, you are in good company. Just remember it was designed to let somebody different win. It doesn't mean you can win without working. You can win without running a kw but you will have to get in there and pitch just as hard as the guy who does if you want to beat him.

Century Club

Now that the 6 meter century club has passed the two hundred mark, and two meters has it's first, second and third (K1CRQ, Stewart Banks; Joseph Nailis, KN2AJG; Wm. Fisher, W2CCK) we are looking forward to the number one 220 winner. The plaque is all engraved and waiting for the name and call. How about it? If you don't have the hundred cards yet, let's get the list in so we can see who is ahead.

By the way, if you have worked W1BU and are waiting for a card, you might as well give up. Those bums don't QSL.

Fredericksburg, Virginia From this historic town and state via Bus Thompson (W4KMS) we hear:

"Wonder if I waited too long to get on six meters. Last year I bought a Johnson 6n2 kit and after several weeks, I had it together. Did not have an antenna for either 6 or 2 meters. Finally bought a Telrex 8 element 2 meter job. To this date (May 19), I have not heard one signal on 2 meters. My converter is an RME 152-A into my NC-173 receiver." *There just must be some two meter activity that-a-way, come on fellas, get on there and call Bus.*

"My regular antenna is an all band job 160-10 meters center-fed with 6-inch spaced open wire line to an antenna coupler to my Viking 2. This antenna also works well on 15 meters too. Then I wondered whether it would work on 6 meters. So, in December last, I made a 6 meter coil for the antenna coupler and tried it out. Loading was perfect. Had several contacts with VE7's and W7's with S9 plus reports on phone."

"Since the first of January I have not heard the six meter band open here. Only a few ground wave stations. At present, am checking into the converter as something must be wrong, especially the 2 meter section. By the way, am also VFO on both bands, having changed a Heathkit VFO to the 8 mc region. Seems to work FB." *Sounds like you're really working at it Bus, but I'm sure you must have found the trouble by now. Six just isn't that dead and don't believe that two meters is either down your way.*

Marissa, Illinois Bob (K9EID) comes through by way of Uncle Sam and the P.O. this time:

"I have really had a ball on six meters the last month. It hasn't closed long enough for me to tally up the states worked. I do know that I worked number 44 last night. Worked W7RT in Seattle!" *Hurrah!*

"Since June 29, 1958, I have worked a hundred and fifty six meter stations. This includes all the call areas except W6's plus VE2 and VE3."

"The ground wave around this area has been very good with quite a few of the fellows on the band. The only trouble is that the band hasn't been closed long enough to rag-chew." *You can't haver everything, Bob.*

"A few of the St. Louis area gang are interested in working some schedules with some Arkansas stations on cw or phone and if any of the Arkansas boys are willing, drop me a line and we will try to set up a sked. We look for Arkansas stations at 0800 CST each morning on six meters. I am on 50.1 and WØYTB is on 50.154." *Must be one of those states hard for you fellas to get. Come on Arkansas, lend a helping hand.*

Orange, Texas From Texas and Charles Carlin (K5QAN) we get some net news:

"Here in Orange we have a six meter net every day of the week except Monday and Thursday. The net comes on at 1900. The station here is going to be an SR-34 with a ground plane antenna." *Thanks for the short run-down Charlie, let us know how things are doing.*

Phoenix, Arizona More net news, this time from Fred Redding (W7PLW):

"The Phoenix VHF Amateur Radio Club installed the following officers at their meeting on June 18th. George L. Jamison, W7DIQ, President; Garth E. Ghering, W7AGG, Vice-President; and Booth Bazzill, W7GGJ, Secretary and Treasurer."

"Our club station, K7DAW, is now in operation on six meters and two meters. There are about fifty active stations on six meters in the greater Phoenix area. Also twelve stations on two meters."

"If there are any six meter amateurs within a radius of seventy-five miles of Phoenix who need assistance with their transmitters or beams, write to W7DIQ or K7BAM, P. O. Box 6602, Phoenix, Arizona." *Notice that a good many of the new clubs (old ones too) are now holding out helping hands to the needy. Good luck to your club in all ways.*

Brooklyn, New York From that place everyone has heard of, from, or about, Brooklyn, Steve Fabricant (K2RDP) emits:

"The New York metropolitan area probably has the greatest concentration of two meter activity in the world. In the five boroughs of New York City alone there are about two hundred two meter stations. Counting adjoining local areas like northern New Jersey and Long Island brings the total to well over three hundred. About 85% of the activity is local low power rag-chewing using Communicators, 522's, etc. In addition, there are quite

a few DX enthusiasts who run higher power."

"I myself have been on two for about eight months. The rig runs 80 to 100 watts on A1, A2, or A3 with an 829B final. The converter is a homebrew preamp into an International Crystal FCV-2, with a coaxial first tank circuit. The antenna is a 32 element collinear array. I haven't worked any real DX but I'll be snooping around the low end on CW this summer." *The statistics are very interesting Steve, have often wondered as to number of VHFers in that particular area. See you on two meters.*

Dallas, Texas One of the "always workin' at it" two meter boys, Leroy (W5AJG) sez:

"We finally got a little dribble of tropo that leaked through to Dallas Sunday, June 29th from 2100 to 2400 CST. Worked on cw WØBFB, WØSMJ, KØEMQ, WØTED in Iowa and W9AAG and W9REM in Illinois. Further on South of Dallas they couldn't hear a thing, so we were on the edge. This stuff sure comes hard. Over in Shreveport which is same distance South but due East it is much better and further due east over in Mississippi it is even better they report. So being more North and East from Dallas a little makes a big difference. Anyway, we are thankful for small favors when the door is opened a little by the 'Old Man'." *Glad you got that one Leroy, and many more of them too, I hope.*

Port Hueneme, California Zane Sprague (W6UWL) comes forth with:

"Have read your column for some time and enjoyed it, even though I never worked VHF frequencies. Just returned from Japan and decided to try VHF. I am now on two meters with a Gonset linear and 60 watts with a twin-six beam. Hope to get on six meters and 220 mc in the future. I also have applied for an XE call and hope to try VHF from across the border in August and September although I haven't received their regulations on VHF frequencies." *Happy to hear you've joined the VHF gang Zane. Know you'll enjoy the VHF bands and who knows, maybe we'll be hearing you from XE land.*

Landisville, New Jersey New Jersey represented by Wally Cantoni (W2HVW) this month.

"On June 19th a good band opening to the mid-west. Starting at 1845 and using a Gonset I worked the following states on six meters: WØOPT-Jessup, Iowa; K9JHH-Rockfort, Illinois; W8DAP/M-Kalamazoo, Michigan; KØEVW-Rochester, Minnesota; and K9ETD-Hudson, Wisconsin." *Thanks for the dope Wally, send it more frequently.*

Bishop, Texas Roy Seiler (K5KKX) comes through with:

"The band has really been open here, almost every day, with nice DX to ZL2DS, LU's, HC's, VE1's and CX2RE. Also have had nice inversions this year, working as far as Pensacola, Florida." *Nice to know what's going on in your vicinity Roy, and very nice DX too.*

Elkins, West Virginia The very popular state of West Virginia represented by Albert Minke (K8AXU).

"Just a few lines to let you know that two meters was wide open on June 4th and 5th. I worked thirty-five contacts with ten new states. I now have 13 states. Best DX for this opening was Ames, Iowa, 750 miles air line."

"I use an Arc 4 running 15 watts input and a four element beam. The answer to the low power and good DX is the QTH. It's 4000 ft above sea level, *Say that again.* I operate K8AXU/8 here as it is ten miles from the home QTH. I now have a ten element beam and will be on the mountain operating the portable off and on all summer. Frequency is 144.170 mc." *Ten new states in one short period on two meters! Whew! Let us know how you continue doing Al.*

Waco, Texas This month is Texas month, this time Jeff Jefferies (W5WIY) sends us news of note:

"The Third Annual Waco Ham Fest will be held on August 31, 1958, at the Cameron Park Club House in Waco. Activities will begin at 0900 and last until 1600. Don't forget that picnic lunch."

"Main prize is the new Hallicrafters SR-34, a complete 6 and 2 meter station." *Guess those Texas fellers are beginning to see that main prizes really should be VHF gear.*

"We now have several rather high power six meter stations and a couple of boys on two meters. While the activity on two is not too much here now, we have hopes of having ten or fifteen stations on by this fall." *Good luck to you and the Ham Fest Jeff. Hope you come home with that main prize.*

New York, New York
San Juan, Porto Rico From San Juan via New York and Roger (KP4AOO ex W8URO) we received the following:

"I've been down here in San Juan for about four months now. I'm at the navy transmitter location and the QRM from the navy rigs is pretty bad in the daytime. The 20 meter band is clean from it most of the time, so I'll have to get that I.F. for a converter. I'm using an SX-71 now."

"When six opens to KP4 land the boys will find me on 50.074 cw and 50.299-50.394 phone. There is local activity on 50 mc here in San Juan about every night but always in Spanish. *Now that is queer.* I've just been here a short time so my Spanish is so poor I can't get much out of it. I can just make a QSO with QTH, name and signal report and that's all for me. None of the local boys use cw."

"I'll be here for the next two years and will try to work six like I did two meters at the home QTH in Michigan." *Very glad to hear from you Roger, and sure will be looking for you on six.*

Arlington, Virginia Once more from historic Virginia, this time from Tom Custer (W4ZBS) some flowers:

"I would like to put in a few words about a man who has put the State of Delaware on the six meter map. His name is Karl, call W3ASD."

"Karl told me the other evening that he has been on six meters for fourteen weeks and in this time he has worked and confirmed forty-five states. He also has proof of this in the six hundred QSL cards he has received. Gets from seven to thirty-two cards a day and needless to say he has given a lot of people Delaware for the first time."

"The three States he has not worked are Washington, Oregon and New Mexico. This guy puts out a signal you can really hear with his six over six and 90 watts. I can work him just about anytime with my 30 watts and three element attic beam. Karl put a signal out like W4UCH did last year up your way on F-2. No matter what way I have the beam I can hear Karl. So-oo-o, my hat is off to Karl, W3ASD, for the good job on six meters." *Very happy to receive the bouquet for Karl from you Tom. He has been coming through to W1 land quite a lot recently and is getting QSL's from this area too. When we don't hear him then we hear 4's, 8's, 9's, and Ø's calling him, so we know he's in there giving out Delaware all the time.*

Oklahoma City, Oklahoma Jim Kyle (K5JKX) has the following good news for us:

"Major achievements hereabouts happened on Field Day, when for the first time in several years VHF communications was included in plans of both the Oklahoma City Amateur Radio Club and the Aeronautical Center ARC at CAA center here."

[*Continued on page 102*]

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

semiconductors

The primary purpose of the semiconductor column is to promote interest in transistors and to present circuits of interest to experimenters. This month I have assembled a collection of interesting circuits and transistor tricks.

Mr. C. Wessels of Johannesburg wrote some time ago inquiring how to transistorize a BC-453 "Q"5'er. This set me to thinking about methods of adapting the components for transistor operation. Naturally the i-f cans were the big problem. They were designed to work into a very high impedance grid circuit, and of course, the base circuit of the transistor represents a very low impedance.

There are several ways of adapting the 85 kc. i-f cans for transistor operation. And, as one might suspect, the best way is the hardest. Fig. 1 shows one method of using the i-f transformer in a transistor stage. The tap placed on the 85 kc. coil is in just the right spot to match the collector impedance and so the primary circuit need not be modified. Impedance matching the secondary is the problem. It is possible to couple the secondary tap to the transistor base through a very small value capacitor (25 mmfd., or so). This method was not attempted for it seemed too easy to be practical! The configuration shown in Fig. 1 was tested and found to work rather well. The i-f transformer modifications consist of locating the side of the transformer with the ungrounded variable capacitor and reconnecting it for series tuning. It is necessary to connect a capacitor from the base to ground to complete the resonant circuit. As the size of this capacitor is increased the bandwidth of the stage will decrease and gain will drop. The choice for this capacitor becomes a compromise between gain and bandwidth. With a reasonable stage gain the bandwidth of this circuit is approximately 15% greater than with a vacuum tube because of "loading" of the secondary winding.

The best method, from the standpoint of narrow bandwith, is to remove the secondary winding from the transformer. Then wind a 150 turn coil on the ceramic form. This coil must be on the side of the winding *away* from the primary. If the 150 turn coil is wound between the primary and secondary, it will increase the coupling and bandwidth. The primary is then connected as shown in Fig. 1, the secondary is left intact, and the 150 turn coil feeds the base of the i-f amplifier transistor. This arrangement is shown in the alternate circuit. This produced a 3-5% loss of bandwidth.

The author did not attempt to transistorize any more than one stage of the BC-453. After all stages have been modified for transistors, the i-f winding with the lowest resonant frequency should be established. The other five coils should be padded down to this frequency. Padding may be accomplished by adding capacity across the coil or by cementing small pieces of powdered iron to the sides of the coils. Incidentally, this system will work with any i-f transformer. If the transformer does not have a primary tap for the collector, the only ill effect will be a slight increase in the bandwidth.

W. D. Briggs, "OC" Division, USS R. B. Anderson DD786, C/O FPO, San Francisco built the transistor Converterettes (CQ May, 58) but would like to crystal control the oscillator. The circuit is shown in Fig. 2. It has been tested in several applications and seems to be trouble free. The resonant frequency of the coil should be displaced from the operating frequency by the i-f frequency. The crystal should be one third of the oscillator frequency. In other words, to run a 20 meter converterette into a one mc. i-f, the oscillator would be on 15 mc. and the crystal would be on 5 mc. War surplus crystals work very well in this circuit. The base resistor (R8) should be selected for one ma. of collector current. The coil data is still valid, except there is no tap on the oscillator coil. OM Briggs also noted a typo in the parts list regards R11 and R12. The schematic is correct, the parts list is incorrect.

Ever experiment with radio control? My relaxation is a R/C airplane with an eight channel radio control receiver. If you haven't been keeping with the state of the art, you many wonder how such a thing is possible. Multichannel operation is quite practical with a new device called a "resonant reed relay." The re-

lay replaces the output transformer in the usual audio amplifier circuit. The 8 channel R/C receiver usually consists of a superregenerative detector and two or three stages of transistor amplification. The amplifier load is the resonant relay. When the proper audio tone appears across the coil, it will energize the reed associated with that tone. The reed contact can be used to trip a power handling relay or to initiate conduction of a transistor "switch." Most 8 channel reed relays cost about $24.00 but Dixon Electronics Company 13444 W. McNichols Road, Detroit 35, Michigan has introduced a new high quality and low cost unit, suitable for transistors (see photo). This relay is extremely rugged since no nuts, bolts, or rivets are used in its construction. Everything is held together with what must be the strongest glue in the world! It will take a terrific beating. I am sure that you can think of many applications for such an ingenious device, Fig. 3 (courtesy of Dixon Electronics) is only one of its many uses. Only four of the eight reeds are shown. Note that each contact is shunted by a capacitor used for energy storage and spark suppression. The PNP transistors are power handling types such as the CBS 2N256, RCA 2N301, or the lighter weight Sylvania 2N307. The current drain of the audio stage is 2- 3 ma. with no signal, and 50- 100ma. with signal. The Dixon resonant reed relay is available directly from Dixon Electronics Co. for $9.95.

OOPS—WE GOOFED . . . The two vhf superregenerative transistor detectors shown in the July issue, Semiconductor column: The top circuit was for six meters and a .001 mfd. disc capacitor was omitted. This capacitor should be connected between the transformer end of the coil, and ground. The lower circuit is not for six meters, but tunes 135- 150 mc. and includes the two meter band.

Did you know that with each one of their transistor components, J. W. Miller Co. 5917 South Main St., Los Angeles 3, California includes a data sheet that describes two radio receivers you can build?

General Electric's Semiconductor Products Department has published two new brochures containing specifications and application information on silicon unijunction transistors. Copies of the two new brochures may be obtained by writing for GP-176 to Semiconductor Products Department, General Electric Co., Syracuse, N. Y.

International Rectifier News for June-July describes the hermetic sealing process for silicon rectifiers, a discussion of selenium power rectifiers, and application data on the new "SEMICAP" a voltage controlled variable capacitor.

Sylvania is now mailing a new transistor characteristic and interchangeability guide. It may be obtained by writing Sylvania Electric Products Inc., 1100 Main St., Buffalo 9, N. Y.

Also, new from Sylvania is a booklet "Performance Tested Transistors Circuits." It includes many circuits of interest to experimenters and may be obtained by sending 35¢ to the above address, or from your local distributor.

An easy way to keep up on new semiconductor products is to get on the mailing list for the Weatherford Report. Write R. V. Weatherford Co., 6921 San Fernando Road, Glendale 1, California. They are distributors for International Rectifier Corp. products.

Hughes Aircraft Company, Semiconductor Division, Los Angeles 45, California is issuing a new data sheet for their quick recovery silicon dioses 1N625-629. Write for DS-38A. Data sheet DS-53 describes their new line of voltage variable silicon capacitors, described in the new products section.

Having trouble locating data on Hoffman silicon semiconductors? You can obtain a complete catalog by writing the rep: Paul F. Wiley Co., 1632 Silverlake Blvd., Los Angeles 26, California.

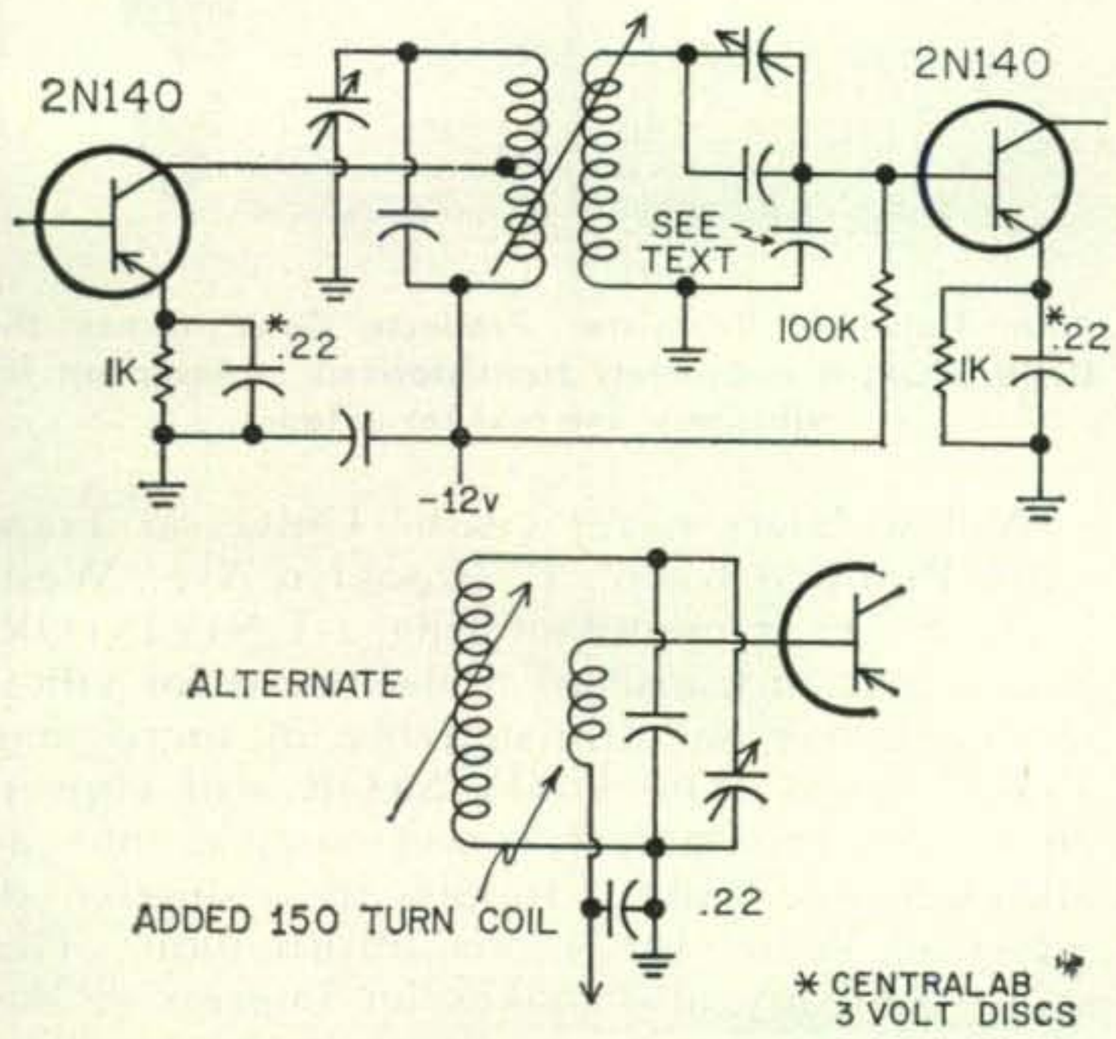


Fig. 1—Modifications of the BC-453 i-f transformers for use with transistors.

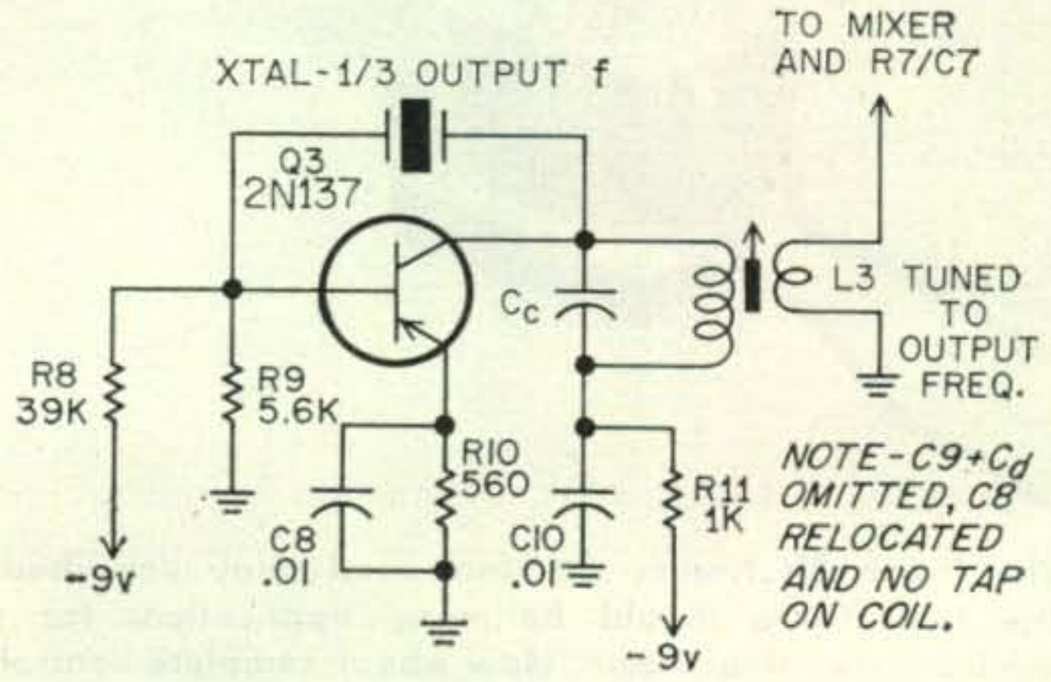


Fig. 2—Crystal controlled oscillator for the Mobile Converterettes (CQ, May 58)

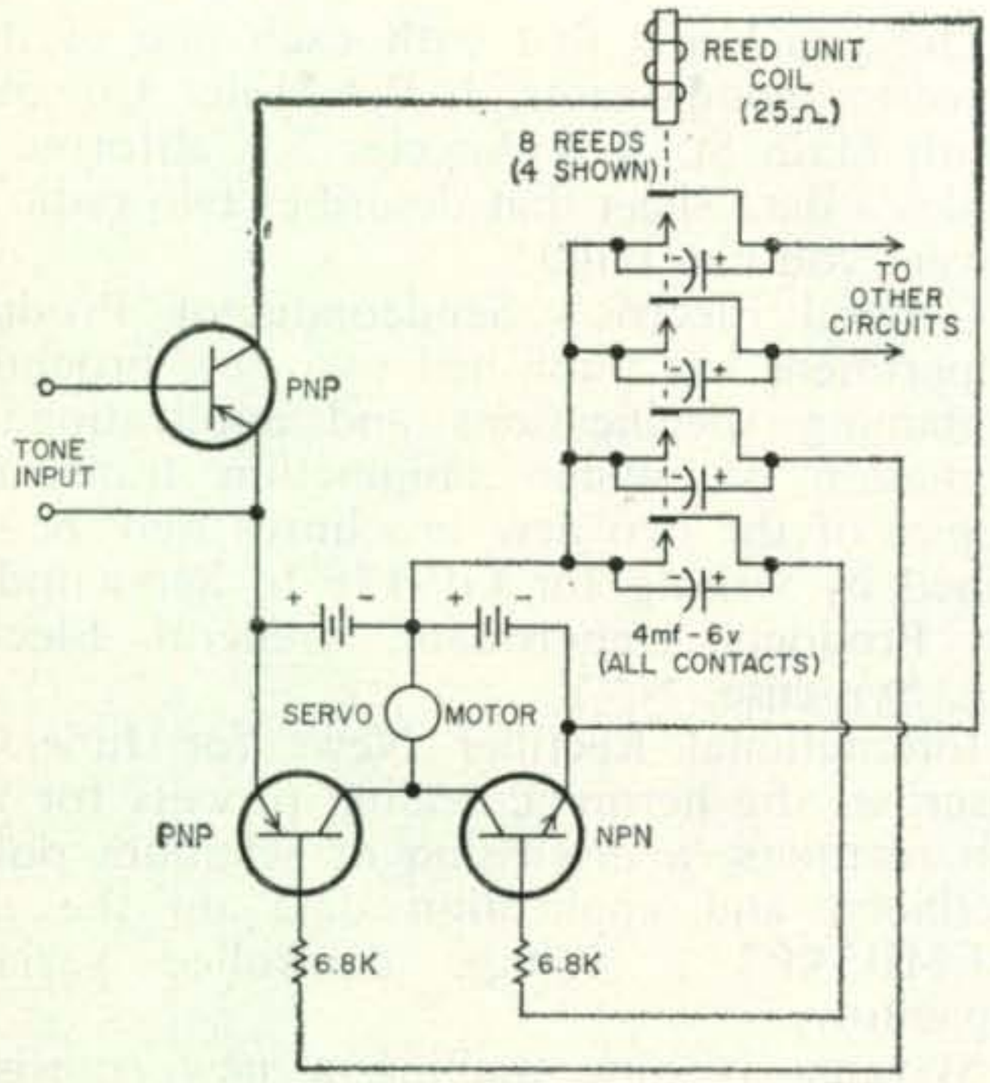
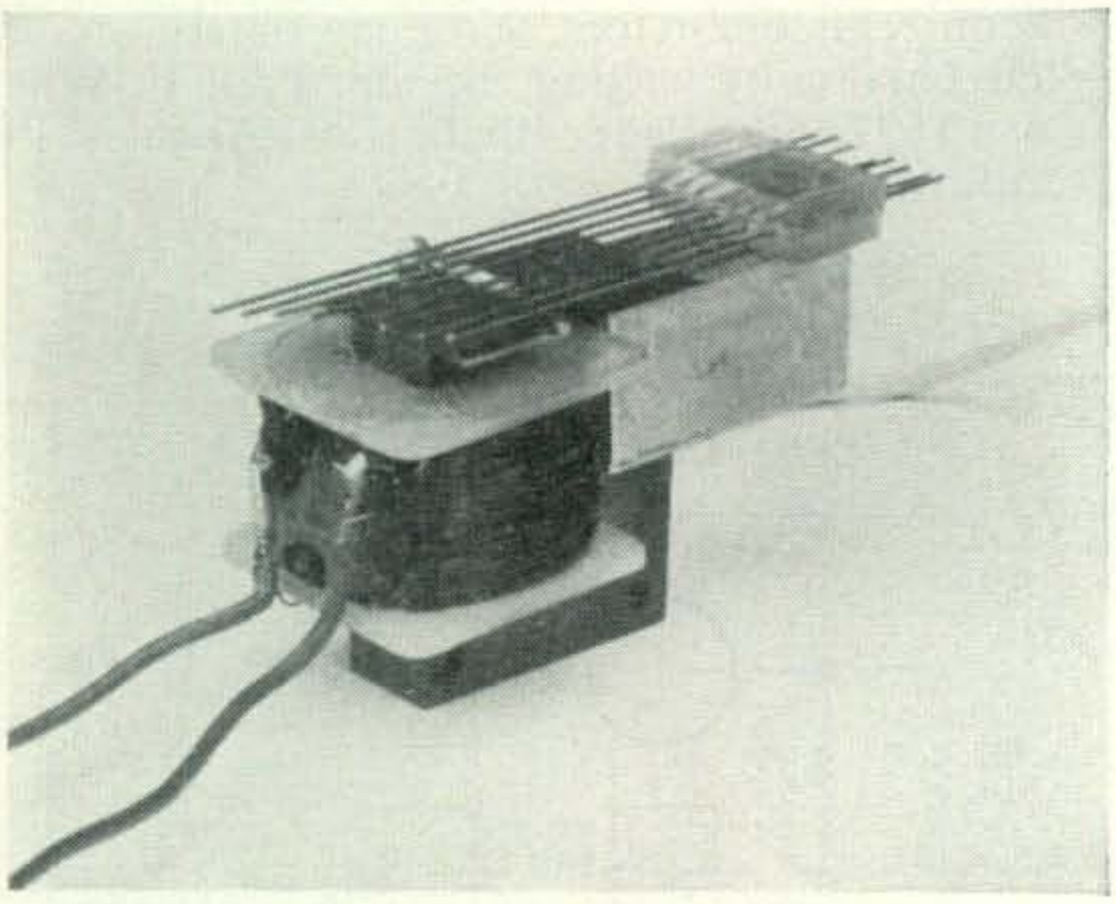


Fig. 3—One of many applications for the Dixon Electronics resonant reed relay. This is a radio controlled servo motor. The relay operates on audio tones.

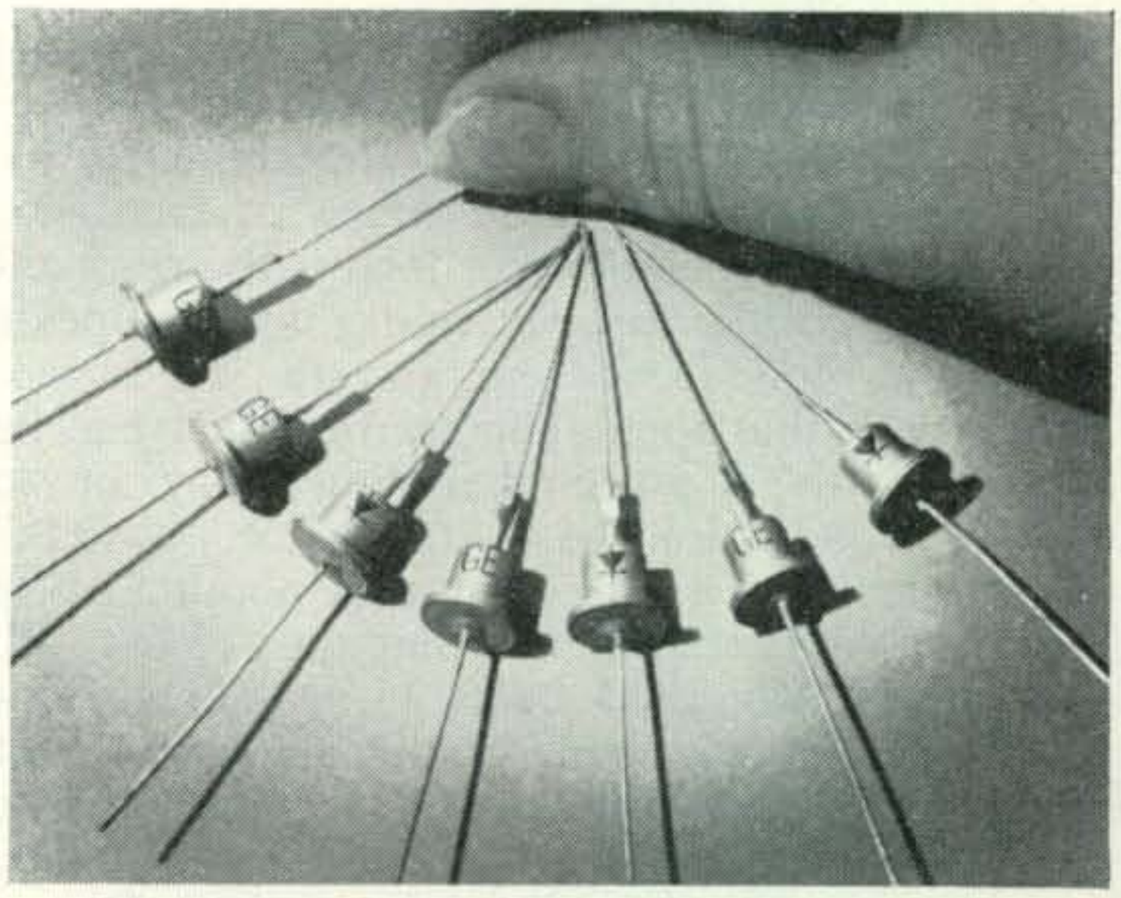
Pacific Semiconductors, Inc., 10451 West Jefferson Boulevard, Culver City, California is marketing four fabulous rectifiers, 1N1730 through 1N1733. The rectifiers are rated at 1000 v, 1500 volts, and 2000 volts at 200 ma. The 1N1733 is rated at 3000 volts -150 ma. The largest (1N1733) is one inch long, and ½ inch diameter!

Lansdale Tube Company, Semiconductor Division of Philco Corporation has appointed Milgray Electronics, Inc. as Industrial Distributor for Philco Transistors.

Raytheon Mfg., Co., Newton 58, Mass. has developed a silicon diffused junction diode, series, 1N645 through 1N648. These rectifiers carry medium piv and current ratings. Write the Semiconductor Division for a data sheet.



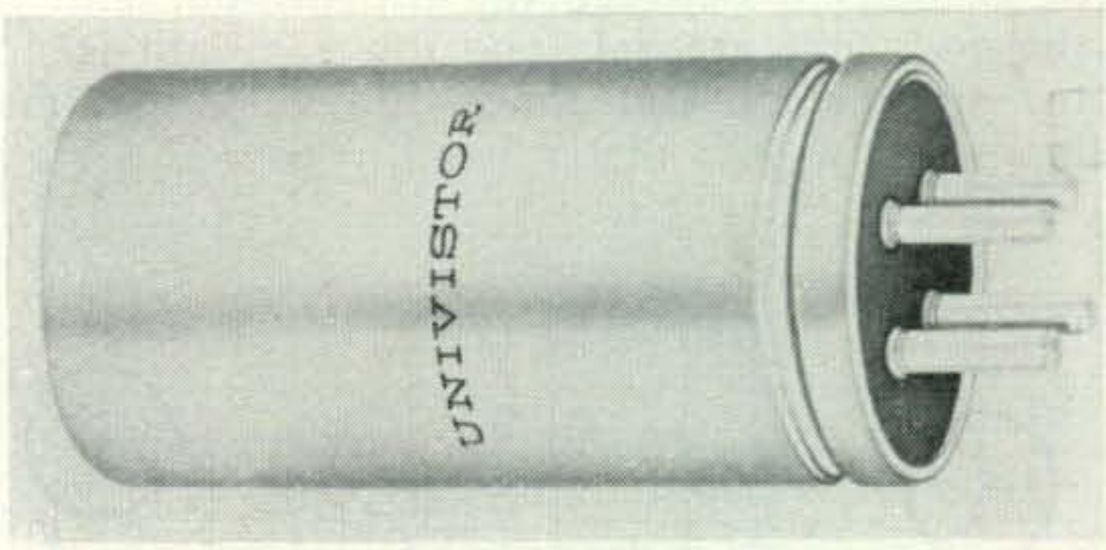
The Dixon Electronics resonant reed relay described in the text. There should be many applications for this device in Amateur radio. How about complete control of a transmitter from a remote location? You could control four servos with the eight channels available!



General Electric's new low priced silicon rectifier cells provide one of the least expensive means of converting alternating current to direct current.

RCA has added a low speed switch, the 2N586 to their line. Also of interest is an 85% increase in the power handling capabilities of the 2N301 and 2N301A. These units can provide an audio frequency power output up to 5 watts in class A service, compared to the 2.7 watts output of the original transistors of these types. Ratings of the 2N301 and 2N301A are based on a mounting flange temperature of 80°C.

Also new from RCA is a germanium PNP alloy junction transistor (2N591) designed for use in large signal class A audio frequency driver stages of automobile radio receivers. Collector dissipation is 100 mw. Data sheets on all the above RCA transistors are available. RCA, Semiconductor Division, Sommerville, N. J.



From Universal Transistor Products Corp. comes the UNIVISTOR, a completely transistorized replacement for vibrators. See text for details.

Will wonders never cease? Universal Transistor Products Corp., 17 Brooklyn Ave., Westbury. N. Y. is manufacturing a UNIVISTOR. It is a plug in transistor replacement for vibrators, and has an estimated life of more than 10,000 hours. The UNIVISTOR will convert an electro-mechanical power supply into an all electronic power supply in a matter of seconds. Write for more information. This same company also makes an impressive line of transistorized power converters for any Amateur application. 73, Don, W6TNS

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

CONTEST CALENDAR

September	6- 7	LABRE CW
September	13-14	LABRE Phone
September	20-21	CQ WAS SSB
September	27-28	MARC VE/W
October	4- 5	VK/ZL Phone
October	11-12	VK/ZL CW
October	11-12	Peruano Phone
October	18-19	Peruano CW
October	25-26	CQ WW DX Phone
November	8- 9	ARRL SS
November	15-16	ARRL SS
November	22-23	RSGB 21/28 Phone
November	29-30	CQ WW DX CW

LABRE

Contest starts at 0001 GMT Saturday and terminates at 2400 GMT Sunday. Progressive type of serial numbers and single and all band competition. This is a world wide contest along the lines of our own World Wide DX Contest. Scoring and other pertinent information in the July issue. Mail your logs to: LABRE Contest Commission, Caixa Postal 2353, Rio de Janeiro, Brazil.

CQ WAS SSB

This is primarily a U.S. affair but foreign stations can also participate. Contest is for a 24 hour period starting at 1200 EST on Saturday. Better read Bob Adams' column for details. Your logs must reach CQ not later than October 20, 1958. Make sure your envelope is marked "SSB Contest."

MARC VE/W

This is strictly a Canadian and U.S. pa[illegible]
Time—1800 EST Saturday, September 27th to 2359 EST Sunday, September 28th. However not more than 20 hours out of the 30 hours can be used. Therefore your logs must show times on and off.
Message—Example: VE2BB de W1WY NR1 RST 579 CONN.
Points—Each completed contact counts 2 points. The same station may be worked on each band, phone and CW.
Multipliers—For U.S. stations. (a) Number of VE sections worked multiplied by 7.22. (b) Power multiplier of 2. if input of less than 30 watts is used, 1.5 if input is 30 to 100 watts and 1. for over 100 watts. (c) Additional multiplier of 2.5 for all W/K stations.
Scoring—Example for W/K stations: Contact points X VE sections worked X 7.22 X power multiplier X 2.5 for final score. A bit complicated, but the 7.22 multiplier is the ratio of VE districts (9) to ARRL sections (65) and the 2.5 multiplier is the ratio of logs received. It is figured that this will equalize the scores between U.S. and Canadian stations.

Each station is expected to tabulate his own score and sign the following declaration. "I hereby state that my station was operated strictly in accordance with the rules of the contest and governmental regulations, and I agree that the decision of the contest committee of the Montreal Amateur Radio Club shall be final in all cases of dispute."

Logs must be postmarked no later than October 12, 1958, and mailed to: Gordon H. Webster, VE2BB, 69 Pine Beach Blvd., Dorval, Quebec, Canada.

VK/ZL

Contest extends over a 24 hour period starting at 1000 GMT Saturday to 1000 GMT Sunday. The usual progressive type serial numbers, multiplied by the total number of VK/ZL districts worked on all bands. Rules in detail in the July Calendar. Make sure your logs reach the N.Z.A.R.T. Contest Committee, Box 489, Wellington, New Zealand, not later than January 23, 1959.

PERUANO

This contest is limited to North and South America only. Progressive serial numbers, multiplier of one for each country worked on each band, one point per contact. Make sure you have at least one OA contact. Activities start at 1200 EST Saturday and end at 2400 EST Sunday. See July Calendar for details. Your logs should be mailed within 20 days to: Radio Club Peruano. Att: Pres. Comision Concursos, Casella 538, Lima, Peru.

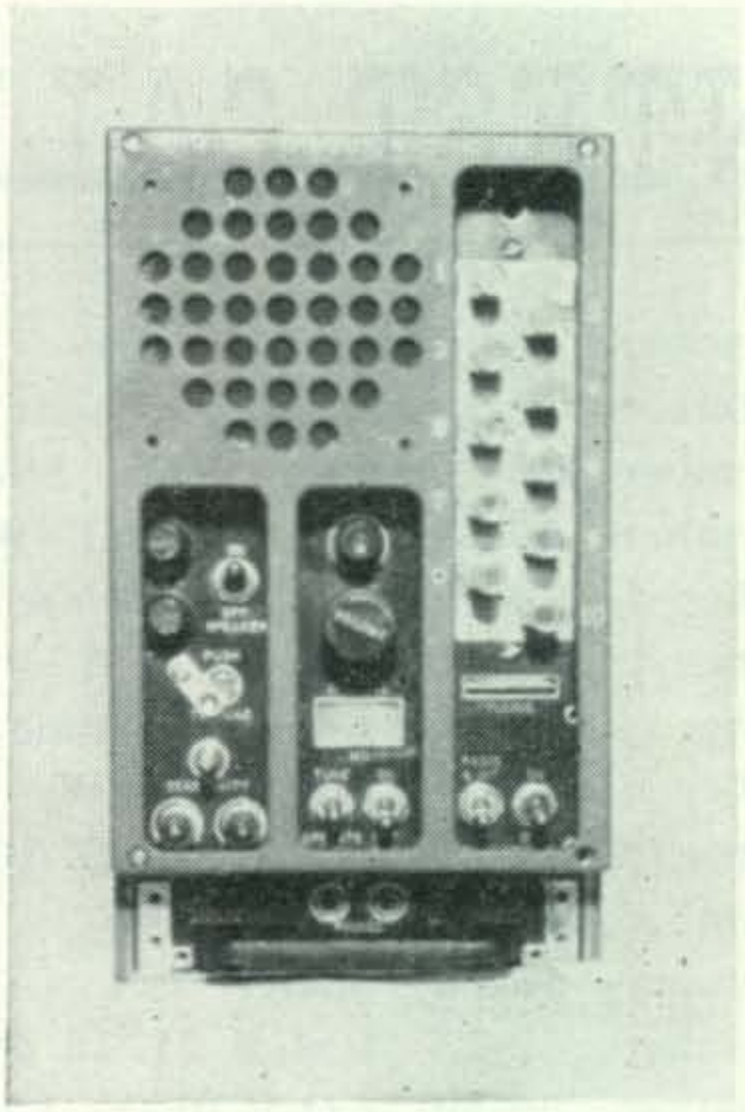
CQ WW DX

No object in repeating what was thoroughly covered in last month's issue. Rules sheets were mailed to all certificate winners as well

[*Continued on page 104*]

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

SURPLUS



Much of the equipment available in quantity still left over from WW-II has been converted. One obvious exception to this is the BC-603 receiver and the companion BC-604 transmitter. Probably this is due to the fact that FM has never really caught on and partly because of the frequency range of the BC-603. This receiver does cover the fifteen and eleven meter bands, but who is on FM on fifteen? Our job was to find out as much as possible about this receiver and make it into something. After a few weeks work we found the BC-603 well worth the few dollars we spent for it and it seems like this could be another ARC-5 in versatility. As a matter of fact we definitely feel that this little rig will open six meter for a lot of people and make it a real crowded band. Built like a you-know-what, it can take a lot of abuse and still stand up, probably due to the fact that it was designed for use in trucks and tanks rather than in aircraft.

The BC-603 is part of a tactical field communications system which also includes the BC-1335 and the BC-659 on the higher frequency end. Except for its frequency range it is identical with the BC-683. Operating in the region of 20-27.9mc. (the BC-683 covers 28-39mc), it is an FM receiver of high sensitivity. Various possibilities resulted in making this conversion cover two months instead of the usual single issue conversion we have been striving for. This month we will make the conversion to 6 meters FM and next month finish off the conversion to AM. No doubt there are many possibilities that could be examined, but we would rather do a complete good job than a half fast sloppy job.

One nice thing about the 603 is that it is not crystal controlled. The transmitter is but that isn't our problem right now. Tuning is accomplished by the conventional variable capacitor and the coils are slug tuned for adjustment with variable trimmer across them for minor adjustments. The push buttons may be reset to any setting you may desire and the dial is completely tunable, with good calibration.

The antenna is coupled to the receiver at the rear of the equipment by means of a coaxial connector in the power plug and also at the front by means of two terminals. The antenna is transformer coupled to the grid of the RF amplifier tube (V-1,6AC7) and the grid is tuned by one section of the variable capacitor. The plate circuit of V-1 is also tuned and coupled to the grid of the mixer (V-2, 6AC7) which is also tuned. This double tuning increases the selectivity of the front end of the receiver. The fourth section of the variable tunes the oscillator.

The 6AC7 mixer uses the suppressor for oscillator injection. The output frequency is 2.65mc which is the IF frequency. Three stages of IF and limiter stages precede the discriminator and there is a single stage of audio ahead of the 6V6 audio output stage. A CW oscillator is used for tuning the equipment and setting up the push buttons on a carrier, but may also be used for CW monitoring and copying. The loudspeaker is self contained in the front panel assembly and a half of a 6SL7 acts as a *squelch tube*.

The squelch is included but can be disabled from the front panel by means of a switch.

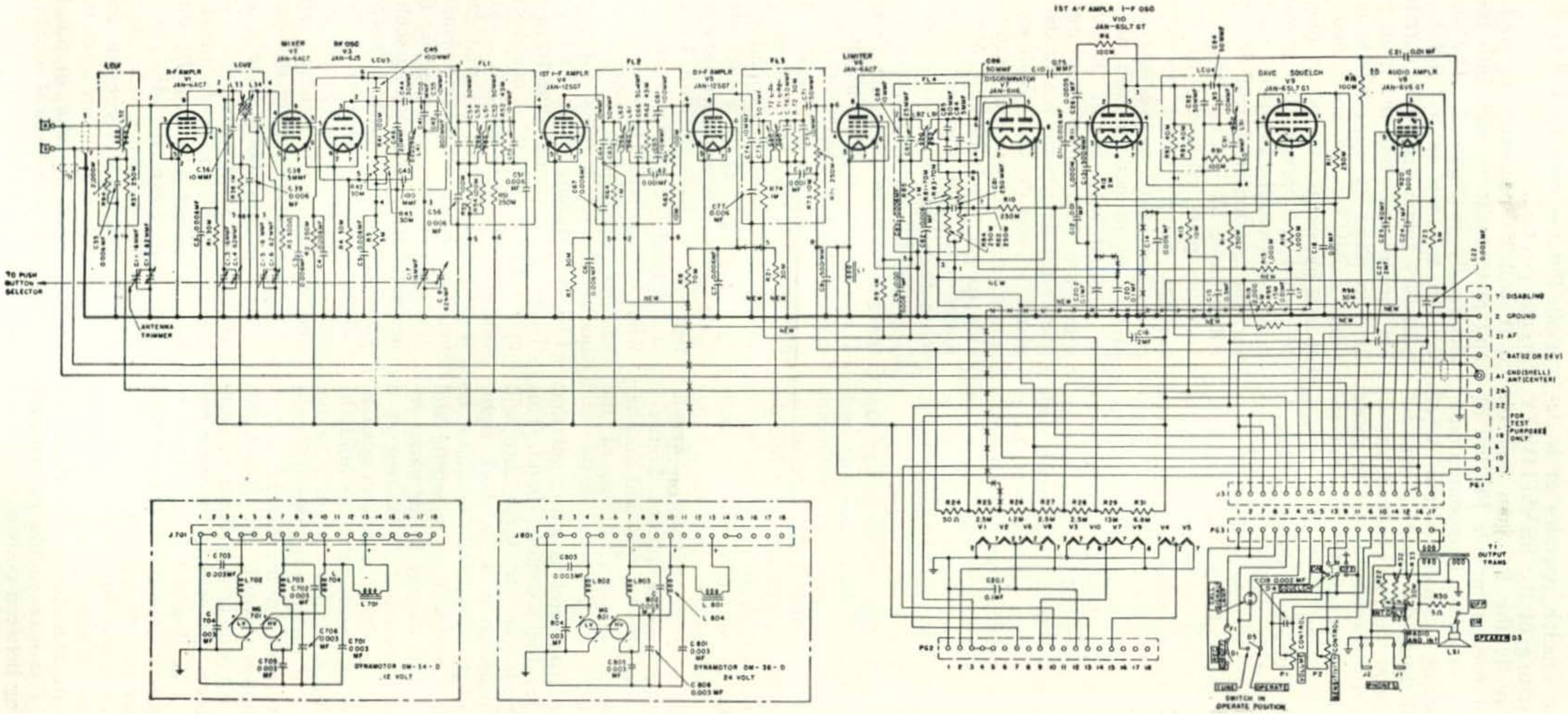


Fig. 1—BC-603 Radio Receiver

The level that the squelch operates at is determined by the setting of the SENSITIVITY control which is really the RF gain control. Other features not needed include the use of the equipment as part of an intercommunications system. Provision is made for the use of earphones by switching the loudspeaker out and when this is done the speaker transformer is terminated with a resistor so as not to cause the output tube to overload due to lead removal.

The basic power supply is shown in Fig 2, and may be used with the FM conversion this month or the AM conversion of next month. Basically they are the same except that the B minus is not returned to ground in the FM model. The original equipment was designed for 12 or 24 volts and used a dynamotor. Only two tubes are 12 volt filaments. These were replaced by their six volt equivalents, the 6SG7. The 6SK7 is very similar and could easy replace the 12SG7 type with little loss in gain. Using all six volt tubes greatly simplifies the power supply connections since all that was necessary was to rewire the filament string and add the high voltage supply. If you have a 12 volt filament transformer handy this won't be necessary.

The first thing to be done is the power supply construction. Concord Radio has one built on the same type of chassis the dynamotor mounts on. The power plug takes care of the filament switching in the original unit but we decided not to use that feature but rather to wire the filaments as we have already mentioned. With the connections shown the front panel switch will control the main power as well as the fusing of the equipment. Figure 1 is a full schematic of the BC-603 and another copy of this appears at the bottom of the equipment cabinet.

Converting the front end is about all that has to be done for the six meter band. This is a slightly ticklish job and some care will be necessary in order to make it work right. It is recommended that a grid-dip-oscillator be used so as to check yourself when wiring and winding the coils. For the six meter band, remove the RF and oscillator coils, one at a time from the chassis. They are held in position by four nuts two of which serve to hold the shield and two to hold the coil in position. Remove all but five turns from the RF coils and all but four turns on the oscillator coil. The other components inside the coil forms are removed as we will rewire them in from the outside. Connect the primary of each coil to the terminals 1 & 2 and the secondary to 3 & 4. Make sure that any of the grounds inside the coils are removed. There are several places where the screw stud also acts as a ground lug. When removing turns from the *Second* RF transformer note that there are two coil forms. The wire should be removed so that the spacing between coils is not altered at all. Put the coils back into the set in their proper position.

It will be necessary to solder the screen and plate resistors back into positions shown electrically in figure 2. The only remaining job left to do is to try and remove the unnecessary plates from the variable condenser. Do this by removing the front panel which is held in place by a multitude of screws. The front panel is also connected to the main chassis by means of a power plug. Care should be taken to prevent the power plug from breaking when the two parts are separated. The variable condenser should be visible now. We will remove all but one plate from the rotor and one plate from the stator. The two remaining plates should be adjacent to each other. The best way we found to remove the plates was to cut the web holding the plates in position with a pair of cutters and then rotate the shaft so we could pry and twist the plate free. Be careful not to damage the other plates as you do this. With one plate on the stator and one on the rotor you should be able to get good tracking over the entire six meter band. The dial will then cover slightly more than the entire six meter band.

Using the grid dipper you should find that the coils will be just about right for the band. Tune the coil slug to about 49.9 mc at the point with the condenser fully closed. Then open the condenser and adjust the trimmer to get the band edge at about 54. Repeat the adjustments until the tuned circuits all tune up the same way. The oscillator may give a little trouble. It was necessary to tap the cathode of the oscillator up by only one turn and spread the windings until we got exactly what we wanted. The oscillator should be set so that it is always 2.65 mc below the frequency the RF is tuned for so as to minimize TVI (Interference from TV). That means that the oscillator should tune from 47.25 to 51.35 mc. When a signal is heard on the air you can peak the coils to that, or you can use the second harmonic of a signal generator should you find that there are no signals around. The dial strip can be calibrated by using the channel numbers as the logging scale and checking against known frequencies such as crystal oscillators etc. The dial strip can then be removed and the true frequencies be put on the dial by means of gummed tape. Return the dial to its position after calibrating it.

By now you should have a pretty good FM set for the six meter band. You can realign the IF stages and even make them sharper by cutting out a few of the shunting resistors that load down the IFs to broaden them slightly. Unbalancing the discriminator will allow a little AM reception and rewiring the limiter stage will be an asset in allowing AM to get to the detector in the first place. All of this will be done next month and a real hot receiver will result.

The BC-603 that we are converting currently was picked up at Concord Radio, which is advertising this rig this month. I don't know if they mentioned it in their ad, but they also have the BC-1335 and the BC-659 as well as the power supplies all ready wired for the BC-603. Leeds, another one of the places that get real gems, got in an AN/ARC-21 which is a full KW on all bands for about seventy five dollars. They only had one and that went fast, but if anyone has any details on this rig I personally would like to get the handbook and schematic so that we can find out what it can be modified to. Cal Williamson, W8HQZ needs an ASB-5 handbook and W4ASD has a BC-322 going to waste without conversion data. H. Paskin at 63-04 Forest Ave., Brooklyn 27, N.Y. has a pair of RBM-3 receivers without an instruction book, and from way up in the colder climates, M/Sgt. C. L. Mings attached to the 57th Fighter Squadron, Hut 32, APO 81 NY, is asking for data and help in converting an RCK and an RCL into teletype receivers. The TBS is still around, and Keith Knowlton, RFD-1 Southbridge, Mass. has one and needs a manual. Clifford Stumb, 12 South Hellertown Ave., Quakertown, Penna. is the "proud" possesser of a B-19 Mark II transceiver and wants conversion data on that in spite of the fact that we keep recommending it as a fine anchor or as a filler for a concrete foundation. W1BWB and K5JZV are both looking for the BC-222 manuals while WØJHW wants plugs and a manual for the BC-375 and a handbook for the LM frequency meter. The weathersonde equipment is floating around, literally, and K5HWY has one known as the AN/AMT-4B but no handbook. W1HEZ needs the BC-654A data and any and all data on the AN/APS-4 would be appreciated by Gene Payne, K5OIT. F. Raymond Dewey has a TS-182 scope and a TN-79/UP oscillator which have no data attached. WN2PXN has an RT-73/UPN-2 but needs help in reworking it. The TBX-8 which we covered a while back wasn't quite the answer to K6PRP who has a TBX-5 without data. W5HPB has an MBF and can't wait till we get the article edited. We have a couple of articles of which the MBF is one that required a lot of editing before being released for print. This column does not take credit for them, but only helps the authors get squared away with a first class (we hope) piece of work. Ben Ward, WØBWD has a BC-AR-230 transmitter and but needs some schematic so he can do a good job in converting it. R. H. Naylor of 961 Parkwood Place, Jackson 6, Mississippi needs the tuning section of an ARC-4X.

73, Ken W2HDM

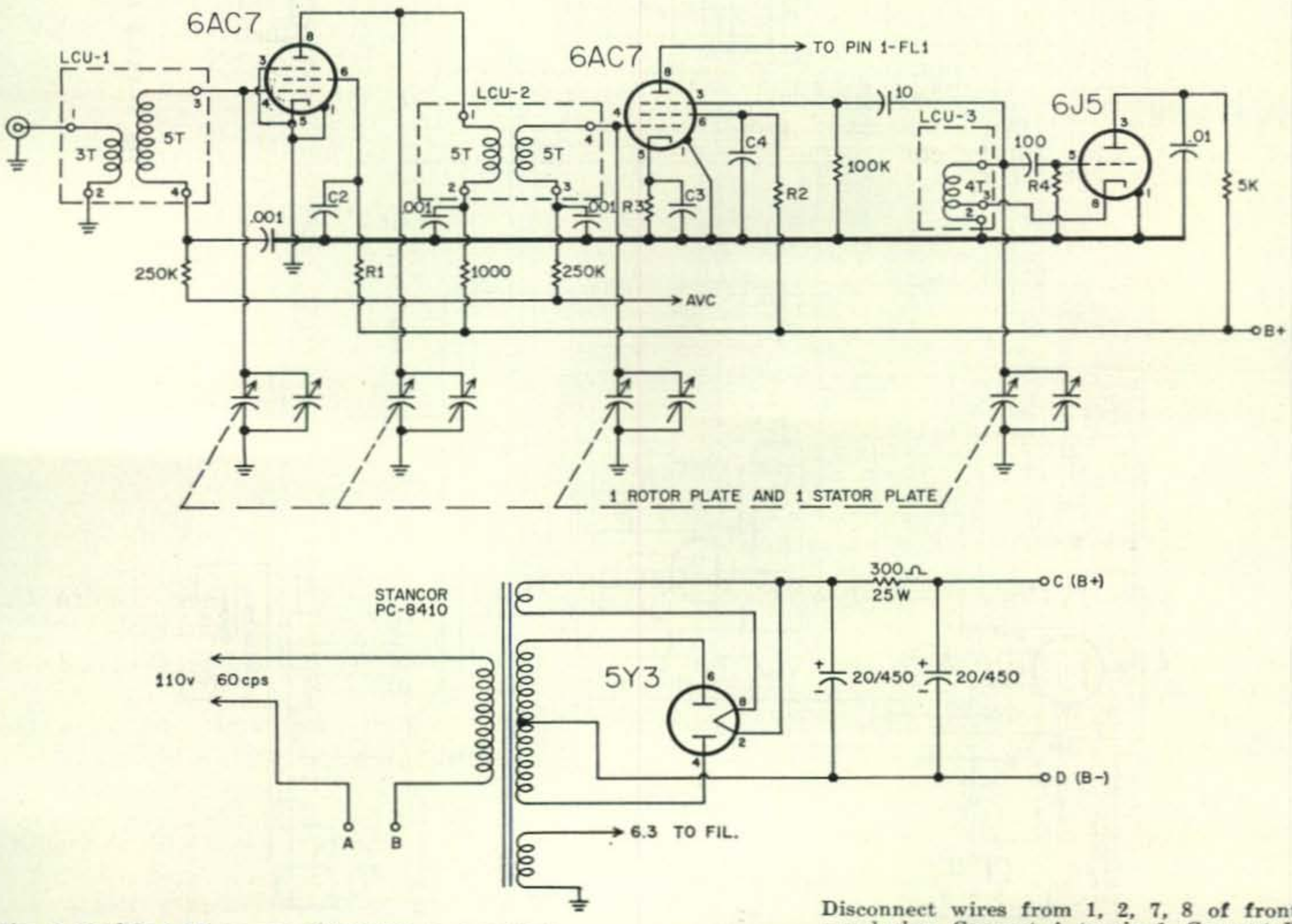


Fig. 2 Modified RF stages of BC-603 to 6 meters and power supply.

Disconnect wires from 1, 2, 7, 8 of front panel plug. Connect A to pin 1. Connect B to pin 2. Connect C to pin 6. Connect D to pin 16.

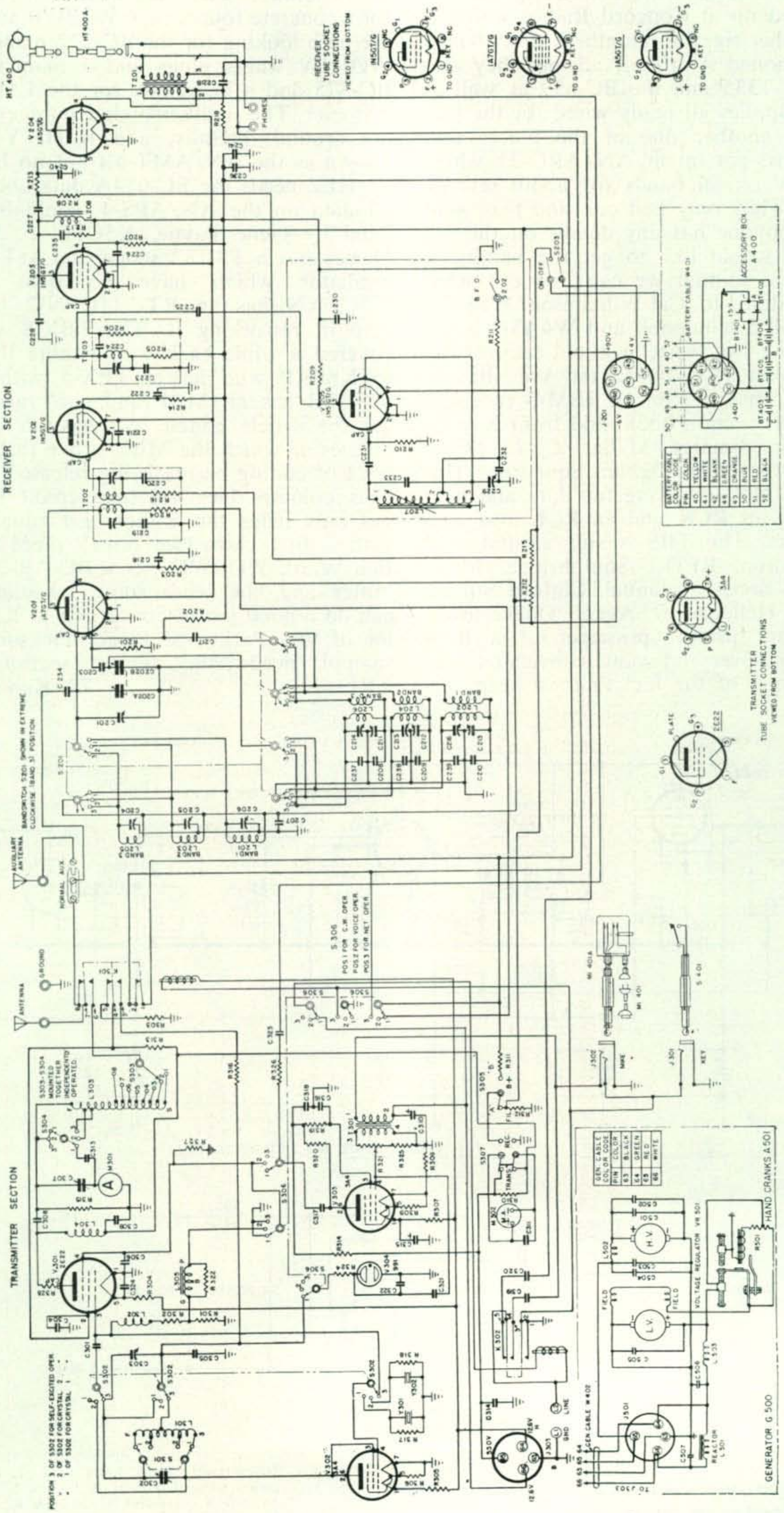


Fig. 3—TBX-8 XMTR-Receiver

by **THOMAS K. AALUND, K2VBI**
Box 13, Roslyn, L. I., New York

overseas echoes

Semiconductor devices have definitely come of age, and the tenth birthday of the transistor is the subject of most electronic publications around the world. While some take knowledge of the subject for granted, the *Revista de Radio de la Union de Radioaficionados Espanoles,* June, 1958, EA, uses the occasion to advantage and carries a twenty-page article entitled "Semiconductors and Transistors." General principles as well as fundamental concepts are covered in detail and various operating characteristics are compared to their equivalents in vacuum tubes.

In the same issue an article describes a 21 mc oscillator circuit, written by W1LZL and translated by EA3GF. Amateurs *are* an international bunch of fellows. Further proof of this is found in the Spanish translation of an article by WØMCB, which originally appeared in the pages of our CQ. It describes Dale's class K modulator circuit.

According to an ad in *Electronic Engineering,* July 1958, G. Mullard has introduced a scope CRT with a rectangular face of 5½ x 1½ inches, their *DG16/7APH1 (CV2352).* In as much as the vertical (or horizontal, depending on how you mount it) face dimension compares with the socket diameter several of these can be stacked for multiple displays in confined spaces, and one wonders why there are not more scope tubes of this type on the market, as they would be great for modulation monitoring, input/output circuit comparisons, etc.

The same issue also covers in detail the circuit of a wide range sine wave generator, with a range of 0.9 cycles to 510 kc; providing an output of up to 2 watts into a 600 ohm load. Frequency stability of better than 0.5 per cent is claimed and the unit uses American tubes.

A triband beam is described by VK2AOU in the June 1958 issue of *Amateur Radio,* VK, based partly on the famous G4ZU design but containing some modifications. Alignment and feeding methods are covered fully. In the same issue VK6EC/T continues his series of design and construction articles on amateur television equipment. This article, the fourth in a series, covers a power supply unit with good regulation—a basic requirement for television equipment power supplies, and a good thing to have in any power supply.

Remember our reference to tubes with a six volt plate voltage requirement in the May issue of this column? You may have waited for more on this, but nothing followed in the next issue of the column. This was due to the fact that when I mentioned these tubes they were so new that they were still undergoing further developments and were not yet available. They still can not be obtained in this country, but the writer is at present taking steps to change this and they will definitely be available. Watch this column or the ad section for further developments. At present things have advanced a little further so that Telefunken is sending this writer some samples for experimental purposes. We can assure you that these tubes will be very interesting and they are bound to open up tremendous possibilities. Experiments conducted at the Telefunken Laboratory indicate that this tube, the *ECC86,* which calls for six volts on the plate, will still operate as an oscillator in the fm broadcast band when the voltage has dropped to around 4.5 volts! To make things more interesting we might add that they are naturally also producing other tubes for low voltage applications, and one can foresee interesting hybrid receivers having these tubes in the front end and transistors for audio and possibly i-f.

"El Radioaficionado"—this was the title of a contribution to a daily of Havana, Cuba. The date was July 21, and the year was 1957. This little article by CO2LY points out to the general public the services radio amateurs around the world render the public. We certainly know what some of our fellow amateurs have accomplied in times past and present, and it might seem like a waste of space to pat ourselves on the back here in the pages of *CQ*. But the point is this—the article referred to appeared a year ago. How often since and in what publications has the radio amateur been brought into the eye of the public? What have we done to make the public aware of us by means other than TVI? At all times, but particularly when frequency allocations are at stake, we should make the public take note of the fact that we are after all a rather useful group of people. You, you, and even you can do something along these lines. You do not have to be on the staff of a newspaper or a radio/TV station to get something across to the public. We amateurs are not the bragging type, so we never boast of what we ourselves have done. But if you hear of another amateur who has done a public service, why not let a newspaper know? Include name, call, and give details.

73, Tom, K2VBI

YL

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

YLRL Awards

The Young Ladies Radio League offers these awards to any amateur anywhere in the world who can qualify for them: WAS/YL, YLCC, and WAC/YL. Rules for these awards are given elsewhere in this column. Space no longer permits publishing the complete list of awards; those given here are the ones which have been issued since the list last appeared in CQ—in Oct. 1957.

In addition, YLRL offers a DX-YL Award to any YL anywhere who works 25 other licensed women operators outside her own country. Since the rules for this award were published in this column only recently (May, 1958), they are not repeated here.

First to receive the DX-YL Award was ZE1JE, Molly Henderson, followed by CR7LU, Lucia Tome.

YL Club Awards

Many of the YL clubs offer certificates to any amateur working a certain number of their club members. A complete listing of these is given in the book "CQ YL" in Chapter 7, "YL Clubs." Please note this correction: Custodian of the RIYL club certificate is listed as Ruth Parker at Hoxsie, R. I. This should be: Ruth Sherman, W1WED, 128 Massasoit Drive, Warwick, R. I.

Latest of the YL clubs to offer a certificate is WHO, of Ft. Worth. A QSO with any 5 members since May 1, 1958, on any band, mobile, cw or phone, will earn this for you. Send log information (no QSLs) to K5CRH, Marie Leak, 3940 Earl St., Ft. Worth, Tex. Stickers may be earned by working 5 members on any band, working 5 all on cw, working 5 while WHO members are mobile, working 5 while applicant is mobile.

WAC/YL

Worked All Continents—YL awards have been issued to these amateurs since the list appeared in CQ for Oct., 1957: The first listed here is certificate No. 84.

CE3DY	JA1AG	LA2B
W7TGG	JA1ACA	PY5QZ
HB9J	W4VPO	W8NNR
FA8RJ	W5RDL	W6CG
W3OQF	W9IU	PY4KL
W5ERY	ON4RC	K6KCI
W9HUZ	PY3AGR	W4ADY
PAØVO	DL1QT	W9SYX
MP4KAC	VK5HW	W7CSW
W4ZMC	PY4PI	LZ1DX
OH3RA	W6BIS	W9YSQ
G3AAE	DL1IB	W9MPX
W6GGX	PY4AO	W9HYM
K6EXV	WØVAF	W4VNE
EA4BH	W4ML	EA5BD
W6JZA	UA9DN	JA5AI
MP4BBE	ON4QX	OH2YV
VE7YR	W1FTT	W9UXL
ZS6IX	SM5WI	W9OQI
JA1ADN	F9DW	TI2OE
W5EGD	W1YPT	W9WHM
W3URU	WØBFS	K6TXR
LU5AQ	W3SOH	W9UZS
K6OWQ	W6YZV	ZL1RD
W6NEQ	SM7MS	

Los Angeles YLRC officers for 1958-59. L. to r., front row: K6BUS, Midge, V.P.; W6JZA, Elsa, president; K6OQD, Jean, treas. Back row: K6PFY, Pat, recording sec'y; W6AVF, Mary, corresponding sec'y.

WAC/YL AWARD

1. The Young Ladies Radio League issues a Worked All Continent-YL certificate to any licensed amateur in the world.
2. Two-way communication must be established on the amateur radio bands with the six continents: North America, South America, Europe, Africa, Asia, and Oceania. Any and all authorized amateur radio bands may be used. Cross-band contacts are permitted; contacts may have been made over any period of years.
3. Contacts with all six continents must be made with duly licensed woman operators.
4. Contacts with all six continents must be made from the same location. Within a given community, one location may be defined as from places no two of which are more than 25 miles apart.
5. Six QSL cards or other written confirmations, showing proof of contacts, must be submitted with application. IRC's, or the equivalent thereof, must be sent with the confirmations to finance their return by first-class mail. The YLRL will not be responsible for any loss or damage to same.
6. Decisions of the WAC/YL custodian regarding interpretations of these rules as here stated, or later amended, shall be final.
7. Send applications and confirmations for this award to: Barbara Houston, KØLYV, 1385 Northview Dr., Marion, Iowa

YLCC

YL Century Certificates have been issued to these amateurs since the list published in Oct. 1957. Beginning with No. 189:

W3APT	W3HWU	WØQWS
W6GQZ	W8OTK	W8KLZ
W3YLL	KØIKL	W2EAF
K2MGE	W8GSH	W4VB
W9QGR	W8BUK	KH6AUJ
DL1IB	K6OWQ	W5VZU
W7NPV	KL7BHE	KH6CKO
K4DRO	K5BJU	K6PWH
W3ZUF	W1HOO	K2TXM
W3SAW	W3ARK	W3MDO
W8IEC	K4DNL	W1GMH
W1JLN	K4CYF	KP4KD
W6HUR	K4KKR	W1AJZ
KL7ALZ	KØGIC	WØBLH
K4APF	WØGAX	K4CDC
K4GKO	W3BVL	W3KQD
W7DXM	W9MPX	KØGZO
K6OQD	W8WUT	W9RTH
K6CHR	W8UAP	K4CLX
K5DER	W7WVB	K4LCD
W4TVT	K1ADY	K4HSC
KØBTV/M	ZE1JE	W4HYW
	W4DBX	

WAS/YL

Worked All States-YL awards have been issued to these amateurs since the list published in CQ for Oct. 1957. Beginning with No. 23: W6GGX, W2OWL, K5BNQ, K4DKE, W6BIS.

With the Clubs

The Texas YL Round-Up Net will hold its fourth birthday party on Nov. 8 at the Blackstone Hotel in Tyler, Tex. For details contact K5IMD, Betty, at 2908 W. Pin Oak, Tyler.

Those aren't prison bars—just the stairway at the Desert Inn in Santa Fe, N.M., scene of the Rocky Mtn. Div. Convention June 14-15, 1958. In front, W5RQK. 2nd row: W5JJI, W5YSJ, WØTYB. 3rd row: K5DAB (wearing the fiesta dress she won as top prize for the ladies), K5LOV, and Mary, jr. op of W5TGZ, awaiting Novice call. Last row: W5RZJ, KØBTV, W5TGZ, W5DZB. Other YLs at the convention: WØKQD, W7BFE and W5RMH. Photo by W5YSK.

YL Century Certificate

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

1. Two-way communication must be established on authorized amateur bands with stations, mobile or fixed, operated by 100 *different* licensed women amateurs. Any and all amateur bands may be used.
2. All contacts must be made from the same location. Within a given community, one location may be defined as from places no two of which are more than 25 miles apart.
3. Contacts may be made over any period of years, provided only that all contacts are from the same location as defined in 2.
4. Contacts with YLs anywhere in the world are recognized, provided only that confirmations clearly indictate the stations contacted were operated by duly licensed women amateur radio operators.
5. 100 QSL cards, or other written communications from the stations worked confirming the necessary two-way contacts, accompanied by a list of claimed contacts, including the full name of the operator, alphabetically arranged, and the date of contact, must be submitted by the applicant diirectly to the YL-CC custodian. Sufficient postage must be sent with the confirmations to finance their return by first class mail. The YLRL will not be responsible for any loss or damage to same.
6. Endorsements: Confirmations of contacts, accompanied by alphabetical list, as described above, from stations operated by additional YLs may be submitted for credit each time 50 additional confirmations are available. Endorsements will be made to the original certificate as application is approved. *Gold* stickers will be awarded to applicants who have worked 50 additional contacts from the same location (or within a 25-miles radius). *Silver* stickers will be awarded to those who have moved from the location in which they earned their original certificate.
7. Decisions of the YL-CC custodian regarding interpretations of these rules as here stated or later amended, shall be final. All inquiries regarding cards, applications, or the certificate should be addressed to her. Address: Katherine M. Johnson, W4SGD, Box 666, Fuquay Springs, N. C.

WAS/YL

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

1. The WAS/YL award, Worked All States-YL, is available to all amateurs.
2. Two-way communications must be established on the amateur bands with all 48 of the United States. Any and all amateur bands may be used. A QSL from the District of Columbia may be submitted in lieu of one from Maryland.
3. Contacts with all 48 states must be made with stations operated by licensed women operators.
4. Contacts with all 48 states must be made from the same location. Within a given community one location may be defined as from places no two of which are more than 25 miles apart.
5. Contacts may be made over any period of years provided only that all contacts are from the same location as defined in #4.
6. 48 QSL cards, or other written communications, from stations worked confirming the necessary two-way contacts, should be submitted by the applicant to: Grace Ryden, W9GME, 2054 N. Lincoln Ave., Chicago 14, Ill. A list of the contacts must accompany the cards and sufficient postage must be sent to finance their return. The YLRL will not be responsible for any loss or damage to same.

The San Diego YL Radio Club (formerly San Diego YLRL) held its installation luncheon on June 7 with these new officers: president, W6WDL, Babs; V.P., W6VSL, Barbara; treas., K6YGJ, Marcia; sec'y, K6UHI, Betty. Others attending: W6's GGX, OLP; K6's VRH, RDV.

The RIYLs held their third annual luncheon on June 14 with 20 R.I. girls and five from out of state. The YLs are planning on the New England Div. Convention to be held in Providence Sept. 28 with YL activities to include a meeting, fashion show, etc.

The HAWKS now number 21. New members include KN9MAL, W7NJS, W9PEX, KN9MPN, W9OAU, W9RUJ, K9CZQ.

The Loaded Clothes Line Net has grown to approximately 30 members, including KØ's ADB, BCQ, BTV, DHA, EDH, EPE, EVG, GIC, HEU, HFB, MNI, GAS, ECP, LGS; WØ's TYB, ZWL, DZB, MMT; W5's BZB, HCE, YSJ; K5's DAB, GYZ, IJB, MBH, MSE; W7GCX/5. 1958 officers are: president and NCS, K5GYZ, Lucille; V.P. and ANCS, KØMNI, Linna; S-T, W5YSJ, Jennie; P/C, WØTYB, Betty. Dues are $1.50 a year. Any YL is invited to check into the net and is eligible for membership after checking in three times out of a possible five.

The YLs are Saying . . .

"The book arrived today (6/20) and time stopped while I went through it page by page. Congratulations on a tremendous job well done!"—W6UXF, Enid

"Congratulations on 'CQ YL'—I am so proud of mine! No more racing through stacks of CQs, QSTs, and YL Harmonics looking for a certain item—so much of it is right at hand in your book."—W4SGD, Katherine

"I think 'CQ YL' is wonderfully done—most interesting and a grand memento for all time. It will be ageless in Ham radio circles."—W2JZX, Vi

"I think the book is just the thing! It is packed with information and the collection of photos is wonderful."—W6WRT, Ruby

"The book is very fine—enjoy it so much. . . . Here is my check for two more copies."—KØGZO, Virginia

"Am thoroughly enjoying the book and know once the gals that have not ordered their copies see it, they will do so. Discussion about the book on the air, by those girls who have received copies, has been most glowing."—K6BUS, Midge

"Congratulations on the book—certainly you put a lot of work into it. Since I'll be at Washington for the National Convention I'll take it **along** and have quite a few autographs added!"—W2EEO, Madeline

"Receiving 'CQ YL' as a gift was one of the most exciting and thrilling things that ever happened to me—it is terrific! Each time I pick it up I find something I didn't see before. I'm going to be enjoying it for years to come. I think all licensed YLs and OMs should own a copy. My OM, K6BNB, really is enjoying it, too."—K6ENK, Wanda

And from the OMs—

"This publication is absolutely superb—splendid! You have done a most remarkable job and I'm sure that as the word gets around you'll find that the Ham fraternity will accept it with open arms."—W7OE, "YB"

"Send me a copy of 'CQ YL'. Took a look at W3CDQ's copy and had no idea it was such a publication—just gotta have one."—W3NL, Andy

Convinced? "CQ YL" contains 18 chapters and 500 photographs covering every aspect of YL participation in Ham radio. Order your copy from your column editor, Louisa Sando, W5RZJ, 212 Sombrio Drive, Santa Fe, N.Mex.

Here and There

Did you note in W4KVX's column that KL7BHE, Sheila Goodhue, has been awarded WAZ? Sheila is only the 5th YL to achieve this DX award, and only the 4th KL7 amateur to do so. . . . Condolences to W4AVA, Elizabeth, whose OM, W4LAB, has become an SK.

Another teen-age YL to be proud of—K6HEY, Joan, graduated from Marymount High School with these awards: Cum Laude Society member; distinction in science; Bank of America Achievement Award for science and math; gold medal in French. Joan, who got her General ticket in June, '58, is active on 40-meter cw running 30 watts to a vertical antenna.

33, Louisa, W5RZJ

RTTY

Byron H. Kretzman, W2JTP
16 Ridge Dr., High Hills,
Huntington Station, N. Y.

Amateur Radioteletype Channels

National, FSK 3620, 7140, 27,200, 29,160, 52,600 kc.
National AFSK 27.2, 147.96, 144.138 mc.
Area Nets:

California	147.85	Mc.	AFSK on AM
Chicago, Ill.	147.70	Mc.	AFSK on FM
Detroit, Mich.	147.30	Mc.	AFSK on FM
Washington, D.C.	147.96	Mc.	AFSK on AM
	147.495	Mc.	AFSK on AM
New York City	147.96	Mc.	AFSK on AM
Livingston, N.J.	146.30	Mc.	AFSK on AM
Buffalo/Niagara	147.50	Mc.	AFK on AM
Boston, Mass.	147.96	Mc.	AFSK on AM
Seattle, Wash.	147.00	Mc.	AFSK on AM
Spokane, Wash.	147.15	Mc.	AFSK on AM
Minneapolis, Minn.	144.90	Mc.	AFSK on AM

Operating a teleprinter on RTTY can be a discouraging experience when QRN is high and when signals are weak. We shouldn't *have* to keep one hand on the machine and the other on the receiver. Over-printing a line is not quite as frustrating as that unknown quantity of alleged intelligence concentrated in a very black square at the end of a line. Wal, it ain't necessary.

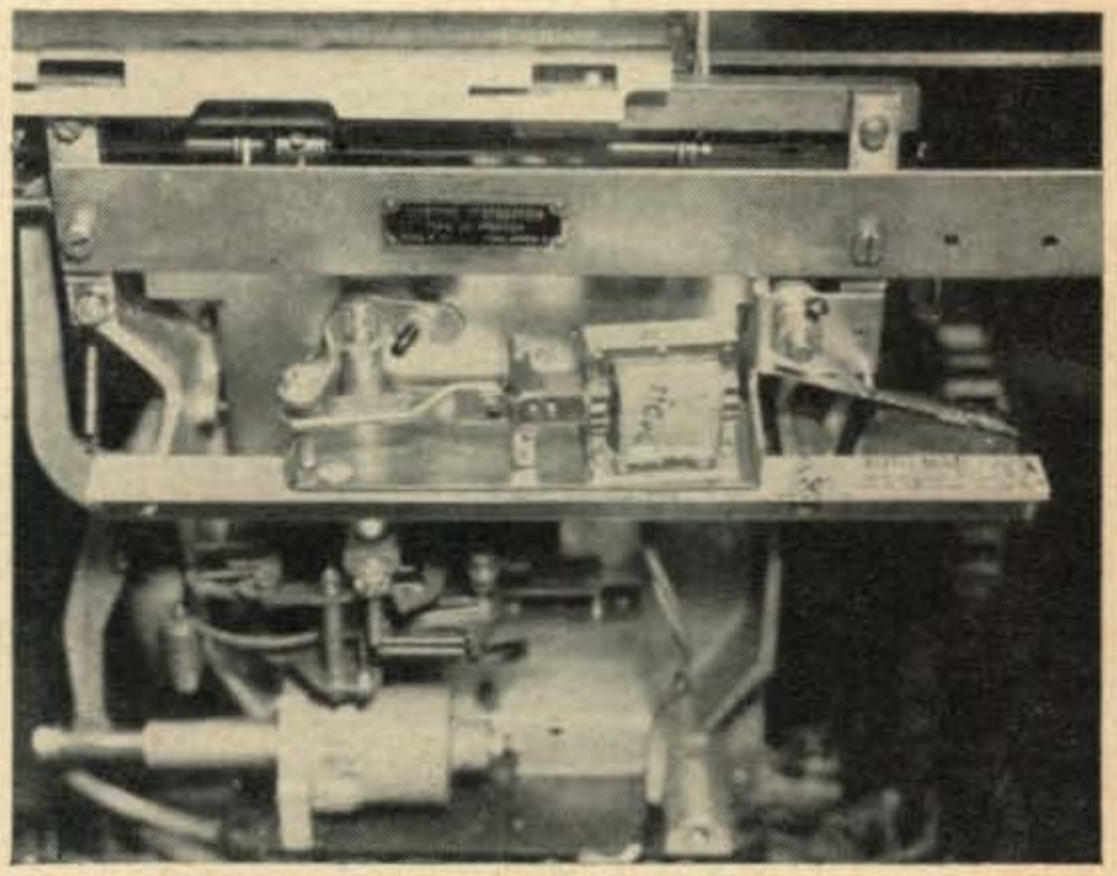
Most of us know that an automatic carriage return and line feed feature is common on the Model 28 and that it is available as a conversion kit for the Model 15. (See W9GRW) Several conversion schemes for the ubiquitous Model 26 have been published, and they were duplicated successfully by many RTTYers with no little effort.

Now, a real contribution to the art has been made by Ben Woodruff, W9UE, of Chicago. Ben has come up with a conversion kit for the Model 26 that can be attached without drilling a hole in a couple of *minutes*. It is simple and very ingenious, but Ben realized that not too many hams (even RTTYers!) have the machine shop facilities available to duplicate his *AUTO-MATE 26*, so he had a local shop make up a modest number for those who wish to buy a commercially made unit. These are now available from Ben at cost, (Ben is not in the amateur supply business.) so, quickly, drop him a line at 6140 N. Harding Avenue, Chicago 45, Illinois.

At the Keyboard

At the head of your RTTY column this month appears a silhouette of a man seated before the keyboard of a Model 26. There is an interesting story behind that picture. Do you old-timers remember the *Amateur Radio Teletype* bulletin that Ye Editor, Wayne, put out between 1951 and 1955? If you dig out No. 24, June 1953, you will see on the cover a similar silhouette of a man seated before the ancient Model 12. The man is none other than ole' Never Say Die himself, and the original drawing was made by Mrs. W. Sanger Green, Wayne's mother.

Time and progress march on. The man is now seated before the newer Model 26, and



AUTO-MATE 26, Automatic Cariage Return and Line Feed attachment for Model 26 of Ben Woodruff, W9UE.

this is the picture that appears on the cover of the *RTTY Handbook* by W2NSD and W2JTP.

The *old* silhouette of Wayne at the Model 12 is still being used, *without permission*, on the stationary and propaganda of that self-styled "national" society or "league." (See Wayne's editorial on page 9 of the April 1958 issue of *CQ*.) **Caveat Emptor!**

Machines

Wading through the reams of printer copy from WØBP (RATS), WØATM (MARTS), and W6VPC (NCARTS), a very good picture of the availability situation of teleprinter machines is obtained. One fact in particular stands out like a sore thumb: Too many hams, having the opportunity to get a Model

W6ASJ, Piedmont, California
Official Bulletin Station, ARRL and NCARTS Bulletins

Operator:	Charles L. Elvin
Transmitters:	20-A exciter, PP 811 Linear Amplifier 310-B exciter, 4-250A Pi-net Final 2-meter Communicator and Linear Amp.
Receiver:	75-A2 with Side-band Slicer
Converter:	Combination Gates-W6AEE
Antennas:	46-foot vertical for 80, 40, and 20 Trap horizontal for 80, 40, 20, and 10 Twin-six 2-meter beam
Machines:	Model 15, Model 14 TD and Typing Reperf.

26, grabbed one and stashed it away (to rust), figuring that someday they *might* get interested in RTTY.

In case you don't know it, the supply of Model 26's is gradually drying up. If you *do* have a Model 26 that you are not using, *please* put it up for sale. Let somebody like W4RRH, WØBP, W6AEE, W6VPC, W9GRW, and/or W7HRC know about it. Or even put an ad in K6SXT's classified *Ham Trader*. (Box 1095, Gardenia, Calif.) It has an RTTY section.

Bob Carlson K9AUR/7, Avalon Trailer Park, 914 Fox Farm Road, Cheyenne, Wyoming, has a Model 15 with an a-c governed motor for sale, complete with 255A relay,

WØIQC, Independence, Missouri
MARTS Member Station

Operator:	Bob Atkeisson (Secretary-Treasurer of MARTS, Inc.)
Transmitter:	BC-610
Receivers:	75-A1 and Super-Pro
Converter:	WØIQC
Machine:	Model 26

RC-29 power supply, table, and TM 11-2215.

W9GRW has some Model 15's for sale or trade as well as some Model 14 TD's and typing reperfs. W9IQS, W6FDJ, W6SFW, and W4BNI each have a Model 26 for sale. (*If they are not gone by this time.*)

Societies

Sam W5TVG reports reception by the Tulsa group of their Certificate of Incorporation from the Secretary of State for Oklahoma as the "Tulsa Amateur Radioteletypers Society." Thus, another legal RRTY society is born. Officers of TARTS are Oren W5WI, Dan K5BSS, Sam W5TVG, and Phil W5ZBI. TARTS voted to go on record as favoring elimination of dual identification. (See Comments at end of last month's column.)

Mac WØATM reminds us that MARTS

W7AZF, Reno, Only RTTY Station in Nevada

Operator:	Steve Woodward
Transmitter:	Ranger exciter, PP 811A Final, 450 watts
Receiver:	75-A2
Antennas:	Separate beams for 20, 15, and 10, all 63-feet high; separate dipoles for 80 and 40 meters.
Machine:	Model 26

[*Continued on page 108*]

ham clinic

by CHARLES J. SCHAUERS, W6QLV

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

During the last three months a number of letters have been received relative to VFO and/or exciter troubles. Complaints vary, but more often than not are relative to instability, lack of output or difficulty in maintaining calibration.

Putting together a home-designed and constructed VFO is not an easy task even for the most experienced amateur. When trouble develops in commercial VFO gear it is sometimes very hard to find.

Mechanical stability, voltage control and the elimination of temperature and humidity effects are absolutely mandatory for proper VFO operation. However, many hams do not seem to realize that nothing has been found yet which will surpass a crystal for frequency control if it is *properly* excited and temperature controlled.

Designing a VFO without warm-up drift is nearly impossible for the average ham to achieve; even manufacturers have this trouble. Those who leave their VFOs operating constantly without shutdown minimize frequency drift problems; *and* believe it or not, increase the life of tubes.

When using a VFO, one should remember that *isolation* is a *must!* This means an additional buffer-doubler stage but is worth the trouble—especially if the VFO used is a one tube affair.

Overloading a VFO invites trouble in many forms too. What is the use of having good voltage and temperature regulation only to defeat them by attempting to draw out more power than the final VFO tube can safely handle? But it is being done, and the results can often be heard on all bands; especially the CW portions.

An often made common mistake by those who design and build their own VFOs is to underdesign the power supply. Personally, I like a supply factor of at least 80%. For a VFO requiring 25 mils I design for 50.

Heat is the greatest enemy of frequency stability. When metal is heated it naturally expands. Coils change inductance and condensers change capacity quickly when there is much heat around. The use of ceramic forms for coils and silver mica condensers must be included in VFO design plans if the effects of heat are to be minimized.

Here are a few VFO trouble-shooting hints: low output—suspect poor tube/s, improper output coupling, low plate and/or screen voltages and improperly aligned tuned circuits. CW-chirp—overloading of VFO, defective VR or oscillator tubes, varying line input voltage, defective isolation stage, poor output impedance matching causing load variation. Poor frequency stability—all of the above, plus excessive heating of tuned circuit components.

Crystals are still the most dependable frequency control device used by nearly all amateurs. However, if the crystals used are overexcited (excessive voltages applied) and are mounted near heat-producing components, they will also give trouble in the form of frequency drift, chirping and *low* output.

But beware of surplus crystals which have not been tested and are not guaranteed!

When in doubt as to the type of crystal you need, drop a line to any of the *first-line* manufacturers who advertise in CQ—they will be very happy to help you.

Certainly, the VFO because it makes band-hopping easy is nice to have but I'll take a crystal for stability any day!

Observations

In the early days of amateur radio those who wanted to go on the air had to build virtually all of the parts, including tubes. It was not as simple then as it is today where the ham can run over to the corner radio parts store and get just about anything his heart desires—if he has the money.

No doubt, there are still a number of you who read this who remember paying the fantastic sum of $45.00 for an old 210 power tube. Yes, those were the days the UV199 was popular!

The old timers who pioneered ham radio certainly did exhibit ingenuity and grit in overcoming the numerous technical obstacles in their paths. Few will argue that today's young ham now profits by what "old pappy" did 35 or more years ago. But yet we sometimes wonder when we receive letters which indicate that the writers want to pursue a wonderful hobby without much effort!

In one letter, the writer asked if it would be all right if he sent us the parts for a transmitter

which was described in CQ so we could build it for him!! Needless to say we sympathized with our correspondent but we refused his request. (We did refer him to a fellow-ham though who said he would do the job for $40.00)

We realize that not everyone has the time or inclination to build their own equipment. To brand an active ham as "lazy" when he buys and operates commercially made gear is wrong; especially when he has been on the air three years or more. However, there is little excuse on the part of *young hams* just starting out *not* to construct *part* of their equipment. One can learn more putting a kit together or building small items of ham equipment described in CQ and other journals than in any other way.

Questions

CLASS AB1

Using a 6146 tube in class AB1 with a plate voltage of 750, drawing about 112 mils on peaks, what should the dc grid voltage be?

About -50volts assuming a screen voltage of 200.

YAGI

How much more power gain can I expect by stacking Yagi antennas?

Two stacked arrays fed in-phase will nearly double power gain.

Q MULTIPLIER

I own an old S40B *Hallicrafters* receiver which continues to operate fine. What I'd like to know is, do you think it would be worth the time and trouble to put in a Q multiplier.

Yes!

GRID CURRENT

Is grid current measurable in a class AB1 amplifier?

It should not be. In class AB1 *no* grid current is drawn—*no* grid power is needed.

LOOPS AND NODES

What's the formula for figuring the length of a ½ wave antenna (in feet) below 30 mcs? Also, on what point of a ½ wave radiator is voltage minimum and current maximum?

Formula: $L \text{ (feet)} = \frac{468}{\text{Freq. (mcs)}}$. Current is highest in center and voltage highest on ends of a ½ wave radiator . . . . and vice versa.

TRANSMITTER

I have about $235.00 to spend for a transmitter, what do you suggest in this price range? I want VFO and all bands.

Look into *Heath's* new "Apache" and *Johnson's* Viking Ranger—they're both tops for the money!

KIT CONSTRUCTION

Do you have any recommendations relative to wiring up do-it-yourself kits such as are obtainable from *Heath, Allied* or *Johnson?*

Yes. If you have never constructed any radio apparatus before, *follow* the manufacturer's instructions to the letter and you can't go wrong. The pictorial diagrams furnished are very easy to follow, even for those with no prior construction experience.

I, like many other hams follow the circuit diagrams checking off connections with a pencil as they are made. I prefer to start by mounting all large parts; wire up filament circuits first then proceed to grid, plate and high voltage circuits. I usually leave control circuits until last.

Because some parts must be mounted in sequence (for proper wiring), it is wise to carefully read the manufacturer's instructions first; you'll save yourself a lot of headaches if you do.

The stumbling block to proper kit assembly is *proper* soldering! Although most people can solder effectively the first time they try it, a cold soldered joint is very easy to make. Make sure you heat both parts, i.e., wire *and* terminal and let the solder "run" into the joint. Never use too much solder; and never move a joint until it is COLD! Make good mechanical connections.

If you do not follow pictorial diagrams (especially in receiver construction) you may run into trouble with proper wire placement which can sometimes result in undesirable feed-back and/or oscillation due to capacity effects.

Kits are here to stay. Because assembly costs have been cut out, you, the amateur profit not only financially but also from the knowledge gained in doing your own work—which incidentally, turns out to be a lot of fun.

HQ 160 RECEIVER

What do you *personally* think of *Hammarlund's* new HQ 160 receiver as compared to the old HQ 129?

I owned an HQ 129 and thought it was a very good receiver. The HQ 160 is tops in its price class. I like the dials and tuning system and the down-to-earth circuit engineering which enables one to pull in the weak signals and hold them.

7OEPTO

Know where I can get hold of a *Collins* 70-EPTO oscillator second hand? Try *Barry Electronics Corp.*, 512 Bdwy. New York 12, N. Y. If they have any left you can get one for $29.50.

TINY TANK

I'm looking for a little tank circuit (commercially made) which I can use with a very small transmitter (4 watts) I'm planning to build. It must cover 10 through 80 meters. The ones I've seen are all too big. Any suggestions?

[*Continued on page 115*]

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

PROPAGATION

Cycle Begins Downward Trend

For the first month since *April, 1954* the sunspot cycle has failed to increase. The Swiss Solar Observatory announced a monthly sunspot number of 168 for *June, 1958*. This results in a *smoothed sunspot number* of 198.5 centered on *December, 1957*. While just a point lower than the smoothed number 199.5 reported for *November*, this is the first indication that the peak of the present cycle has already passed.

This month's *CQ forecast* is based on a predicted smoothed sunspot number of 158 centered on *September, 1958*.

September's Highlights

September usually marks the beginning of the transition from summer to winter propagation conditions. Daytime maximum usable frequencies begin to rise, night time MUF's decline, static levels begin to decrease, sporadic-E short-skip openings occur less frequently, and there is an overall improvement noted on long paths to the other side of the world (Australia, South Africa, etc.). There is a tendency for severe radio storms and brilliant auroral displays to occur during September and early October.

The following is a band-by-band forecast for the month, with a brief discussion of the month-to-month qualitative changes that take place. For specific times of band openings, refer to the *CQ Propagation Charts* on the opposite page.

6 Meters:

Despite the fact that the sunspot cycle is now on the decline, solar activity is expected to be intense enough this fall and winter to support *6-meter* openings to many areas of the world. While conditions on this band won't peak until the winter months, some September openings are forecast to South America. Openings are also likely to occur during late September and early October between California and the Western Pacific. Not many short-skip openings are forecast for the month because of the seasonal decline in sporadic-E propagation.

10 Meters:

Conditions on *10 and 11-meters* are expected to improve considerably during September. Fairly good world-wide openings should be possible on many days of the month from a few hours after dawn until early evening.

15 Meters:

Exceptionally good world-wide DX propagation conditions are forecast almost daily from shortly after sunrise, to considerably after sunset. On many days the band may remain open past midnight, with signals peaking during the late afternoon and early evening hours.

20 Meters:

During the late afternoon hours *20-meters* is expected to begin to open for world-wide DX, remaining open throughout the dark hours and until a few hours atfer sunrise. During the daylight hours, excellent short-skip openings should be possible, with the skip as short as few hundred miles at noon, extending upwards beyond 2200 miles during the late afternoon and evening hours.

40 Meters:

Forty-meter propagation conditions begin to improve during September. Fair DX openings are likely to occur to many areas of the world during the hours of twilight, darkness, and dawn. Static levels should be lower and signals somewhat stronger than during the summer months. Several fairly good openings to Australasia are forecast. Good short-skip propagation should also be possible around the clock, with the skip distance as short as a few miles during the afternoon hours, increasinq to beyond 2200 miles as the hours of darkness approach.

80 Meters:

Although improving as winter nears, propagation conditions on this band during September are still rather poor. Some long distance

LAST MINUTE FORECAST FOR SEPTEMBER

Ionospheric storminess usually increases during September.

A evere radio storm is forecast for Sept. 21-22, with Sept. 4 and 17-18 also forecast to be below normal.

ALL TIMES IN PST

WESTERN USA TO:	10/11 METERS	15 METERS	20 METERS	40/80 METERS
EUROPE & NORTH AFRICA	7A - 9A (1) 9A - 1P (2)	6A - 9A (1) 9A - 2P (3) 2P - 5P (2) 5P - 7P (1)	11A - 1P (1) 1P - 6P (3) 6P -12M (2) 12M - 2A (1)	6P -11P (1) 7P -10P (1) *
CENTRAL & SOUTH AFRICA	7A - 9A (1) 9A -12N (2) 12N- 4P (3) 4P - 6P (1)	9A -11A (1) 11A—1P (2) 1P - 3P (3) 3P - 6P (4) 6P - 9P (2)	11A - 2P (1) 2P - 4P (2) 4P - 8P (4) 8P -12M (3)	6P -10P (2) 7P - 9P (1) *
SOUTH AMERICA	11A - 5P (1) ** 6A -12N (2) 12N- 4P (4) 4P - 7P (2) 8P -10P (1)	12M-10A (2) 10A-12N (1) 12N- 2P (2) 2P - 6P (4) 6P -12M (3)	12M - 4A (2) 4A - 8A (1) 2P - 4P (2) 4P -10P (4) 10P-12M (3)	5P - 2A (3) 6P -12M (2) *
GUAM & MARIANA ISLANDS	5P - 7P (1) ** 12N- 2P (3) 2P - 5P (2) 5P - 7P (3) 7P - 9P (2)	7A - 9A (2) 11A - 1P (2) 1P - 7P (1) 7P -10P (3)	9P -11P (1) 11P - 2A (3) 2A - 6A (2) 6A - 9A (3) 9A -11A (1)	1A - 4A (2) 2A - 3A (1) *
AUSTRALASIA	5P - 7P (1) ** 9A -12N (3) 12N- 5P (2) 5P - 8P (4) 8P -10P (2)	7A -12N (2) 12N- 4P (1) 4P - 8P (2) 8P -12M (4) 12M -4A (2)	8P -10P (2) 10P - 3A(4) 3A - 6A (3) 6A - 9A (2)	10P- 6A (3) 11P - 5A (2) *
JAPAN, OKINAWA & FAR EAST	11A - 1P (3) 1P - 4P (2) 4P - 9P (3)	7A -11A (3) 11A - 7P (2) 7P -11P (3) 11P- 1A (2)	10P-12M (2) 12M -2A (3) 2A - 6A (2) 6A -10A (3) 10A-12N (2)	12M- 5A (3) 1A - 4A (2) *
PHILIPPINE ISLANDS & EAST INDIES	8A - 2P (2) 2P - 4P (3) 4P - 9P (2)	7A -10A (3) 10A - 2P (2) 10P-12M (1)	2A - 4A (1) 4A - 7A (3) 7A -10A (1)	3A - 7A (1)
MALAYA & SOUTH EAST ASIA	7A -11A (2) 3P - 6P (2) 6P -10P (1)	7A -11A (3) 11A -4P (2) 10P-12M (1)	12M- 4A (1) 4A - 8A (3) 8A -10A (1)	3A - 7A (1)
HONG KONG, MACAO & FORMOSA	12N-3P (3) 3P - 10P(2)	8A -12N (3) 12N- 9P (2) 9P -12M (3)	12M- 7A (3) 7A - 9A (2) 9A -11A (1) 10P-12M (1)	2A - 6A (3) 3A - 5A (2) *

CP PROPAGATION CHART
(SHORT-SKIP)

BAND (METERS)	DISTANCE (MILES) 60-250	250-600	600-1200	1200-2200
10	---	---	8A -11A(1-2) 11A-5P(1-3) 5P -8P (1-2)	8A-11A (2-1) 11A-5P (3-2) 5P-8P (2)
15	---	8A -12N (0-1) 12N-4P (0-2) 4P-8P (0-1)	8A-12N (1-2) 12N-6P (2-3) 6P-10P (1-2)	8A-12N (2-3) 12N-5P (3-4) 5P-9P (2-3) 9P-12M (1-2)
20	---	8A-1P (1-2) 1P -6P (1-3) 6P-8A (0-1)	6A-11A (2-4) 11A-6A (3-4) 6P-9P (1-2) 9P-12M (1)	8A-2P (4-3) 2P-11P (4) 11P-8A (2)
40	6A-9A (2-3) 9A-7P (4-5) 7P-10P (3-4) 10P-6A (1-2)	7A-10A (4) 10A-4P (4-3) 4P-12M (4) 12M-7A (2-3)	8A-6P (3-2) 6P-11P (4) 11P-5A (3-4) 5A-8A (3-2)	4P-7P (2) 7P-5A (4) 5A-10A (2-1) 10A-5P (2-0)
80	6A-11A (.5-3) 11A-6P (4-2) 6P-12M (5) 12M-6A (4)	9A-5P (2-1) 5P-7P (3-2) 7P-5A (5-4) 5A-9A (4-2)	5P-7P (2-1) 7P-4A (4) 4A-7A (3-1) 7A-9A (1)	6P-8P (1) 8P-5A (4-3) 5A-7A (2-1)
160	5P-7P (3-2) 7P-7A (5) 7A-9A (3-2)	6P-8P (2) 8P-5A (5-4) 5A-7A (4-2) 7A-9A (2-1)	7P-10P (1) 10P-3A (4-3) 3A-6A (2-1)	10P-5A (3-1)

SYMBOLS FOR NUMBER OF DAYS CIRCUIT PREDICTED TO OPEN:

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

(5) over 26 days

** Indicates time of possible six - meter openings
* Indicates time of possible eighty-meter openings

On the Short-Skip Chart the first symbol in the parenthesis applies to the shorter distance while the second symbol applies to the longer distance for which the forecast is made.

The CQ DX Propagation Charts are based upon a radiated CW power of 150 watts at radiation angles less than thirty degrees and are centered on the Eastern, Central and Western areas of the USA. They are valid through October 15, 1958. The Short-Skip Chart is based upon a radiated CW power of 75 watts, using a dipole antenna a half-wave length above ground. It is valid through October 31, 1958. These forecasts are based upon ionospheric data published by the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado.

ALL TIMES IN EST

EASTERN USA TO:	10/11 METERS	15 METERS	20 METERS	40/80* METERS
WESTERN EUROPE	7A-9A (1) 9A-2P (3) 2P-6P (2)	5A-10A (3) 10A-2P (2) 2P-4P (4) 4P-9P (2)	12M-2P (2) 2P-8P (4) 8P-10P (3) 10P-12M (2)	5P-7P (1) 7P-2A (3) 7P-2A (2) *
SOUTHERN EUROPE & NORTH AFRICA	6A - 8A (1) 8A - 10A (3) 10A - 2P (4) 2P - 6P (2)	5A - 7A (3) 7A - 1P (2) 1P - 5P (4) 5P - 9P (2)	7A - 12N (1) 12N - 3P (2) 3P - 8P (4) 8P - 11P (3) 11P - 7A (2)	6P - 8P (2) 8P - 12M (3) 12M - 2A (2) 7P - 12M (2)*
EASTERN MEDITERRANEAN	6A - 8A (1) 8A - 12N (2) 12N - 2P (1)	5A - 8A (2) 11A - 4P (2)	12N - 3P (1) 3P - 5P (2) 5P - 11P (3)	6P - 11P (2) 8P - 10P (1)*
CENTRAL & SOUTH AFRICA	8A - 10A (1) 10A - 2P (2) 2P - 5P (4) 5P - 7P (1)	10A - 12N (1) 12N - 3P (2) 3P -6P (4) 6P - 12M (2)	2P - 6P (2) 6P - 9P (4) 9P - 2A (3)	6P - 11P (2) 7P - 10P (1)*
SOUTH AMERICA	1P - 6P (1)** 5A - 10A (3) 10A - 2P (2) 2P - 6P (4) 6P - 9P (2)	5A - 9A (3) 9A - 3P (2) 3P - 8P (4) 8P - 11P (3) 11P - 2A (2)	1A - 6A (3) 6A - 8A (2) 3P - 7P (3) 7P - 1A (4)	8P - 3A (3) 3A - 6A (2) 9P - 3A (1)*
PHILIPPINE IS., & EAST INDIES	4P - 7P (1)	8A - 11A (1) 4P - 8P (2) 8P - 10P (1)	6A - 9A (1) 8P - 2A (2)	NIL
AUSTRALASIA	9A - 11A (1) 4P - 7P (3) 7P - 9P (1)	8A - 10A (3) 10A - 12N (1) 3P - 6P (1) 6P - 9P (3) 9P - 11P (2)	6A - 9A (3) 9A - 11A (1) 8P - 11P (2) 11P - 2A (3) 2A - 6A (2)	3A - 4A (2) 4A - 6A (3) 6A - 8A (2) 4A - 6A (1)*
GUAM & PACIFIC	3P -5P (2) 5P - 7P (1)	9A - 11A (1) 3P - 5P (2) 5P - 9P (3)	6A - 8A (2) 6P - 9P (1) 9P - 2A (2)	10P - 3A (1)
JAPAN & FAR EAST	4P - 7P (2)	7A - 9A (1) 3P - 5P (2) 5P - 8P (3) 8P - 10P(1)	6A - 9A (3) 4P - 6P (2) 6P - 8P (3) 8P - 1A (2) 1A - 4A (1)	NIL
MALAYA & S. E. ASIA	2P - 5P (1)	7A - 10A(1) 3P - 5P (1) 5P - 9P (2)	6A - 9A (1) 5P - 10P(2)	NIL

ALL TIMES IN CST

WESTERN USA TO:	10/11 METERS	15 METERS	20 METERS	40/80 METERS
WESTERN & CENTRAL EUROPE	8A - 10A(1) 10A- 1P (3) 1P - 4P (1)	6A - 9A (3) 9A - 1P (2) 1P - 4P (3) 4P - 9P(2)	5A - 7A (2) 7A - 2P (1) 2P - 7P (3) 7P - 2A (1)	6P - 12M(3) 8P - 1A (1)*
SOUTHERN EUROPE & NORTH AFRICA	7A - 9A (1) 9A -11A (2) 11A - 2P (3) 2P - 4P (1)	5A - 7A (2) 7A -12N (1) 12N - 4P (4) 4P - 9P (2)	8A - 2P (1) 2P - 4P (3) 4P - 7P (4) 7P -10P (3) 10P - 8A (2)	6P -12M (3) 8P -12M (1)*
CENTRAL & SOUTH AFRICA	8A -10A (1) 10A - 2P (2) 2P - 4P (4) 4P - 6P (1)	12N - 2P (2) 2P - 5P (4) 5P -11P (2) 11P- 4A (1)	2P - 6P (2) 6P - 8P (4) 8P - 12M (3) 12M- 4A (2)	6P -10P (2) 7P - 9P (1)*
CENTRAL AMERICA & NORTHERN SO. AMERICA	1P - 6P (1)** 6A - 11A (3) 11A - 4P (4) 4P - 6P (3)	5A -9A (3) 9A - 2P (2) 2P - 6P (4) 6P -12M (3)	8A -4P(2) 4P -11P (4) 11P-8A (3)	5P - 8P (2) 8P - 2A (4) 2A - 6A (2) 7P - 3A (3) *
SOUTH AMERICA	1P - 6P (1) ** 5A - 11A (3) 11A - 2P (2) 2P - 5P (4) 5P - 9P (2)	1A - 5A (2) 5A - 9A (3) 9A - 2P (1) 2P - 8P (4) 8P - 1A (3)	2A - 5A (3) 5A - 8A (2) 3P - 7P (3) 7P - 2A (4)	7P - 2A (3) 2A - 5A (2) 8P - 2A (2) *
JAPAN, OKINAWA & FAR EAST	1P - 7P (2)	6A - 9A (2) 1P - 3P (2) 3P - 7P (3) 7P -10P (2)	6A - 9A (3) 2P - 4P (2) 4P -10P (3) 10P- 2A (2)	12M- 6A (1)
SOUTH EAST ASIA	1P - 3P (1) 3P - 6P (2)	7A -12N (1) 12N- 7P (2) 7P - 9P (1)	6A - 9A (1) 5P - 7P (1) 7P - 1A (2)	NIL
HAWAII	11A- 2P (2) 2P - 7P (4) 7P - 9P (3)	8A - 2P (3) 2P -10P (4) 10P- 2A (2)	9A - 4P (2) 4P - 8P (3) 8P - 2A (4) 2A - 9A (3)	10P- 1A (2) 1A - 7A (3) 2A - 6A (2) *
AUSTRALASIA	7A - 9A (1) 2P - 4P (2) 4P - 7P (3) 7P - 9P (2)	7A -10A (2) 10A-3P (1) 3P - 5P (3) 5P -10P (3) 10P- 1A (2)	1A - 6A (2) 6A - 9A (3) 4P - 6P (1) 6P -10P (2) 10P- 1A (4)	12M- 7A (3) 1A - 6A (2) *
McMURDO SOUND ANTARCTICA	12N- 2P (1) 2P - 6P (2) 6P - 9P (1)	1P - 3P (1) 3P - 5P (2) 5P -10P (3) 10P- 1A (2)	3P - 5P (1) 5P - 7P (2) 7P - 1A (3) 1A - 7A (2)	12M- 6A (2) 1A - 4A (1) *
PHILIPPINE IS. & EAST INDIES	3P - 7P (1)	7A -11A (1) 3P-- 5P (1) 5P - 8P (2) 8P -10P (1)	6A - 9A (1) 8P - 2A (1)	NIL

Novice

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

Many Novices writing to this column inquire about modifications to their commercial equipment. Few people realize it, but generally the manufacturers publish periodic sheets listing modifications and production changes for their equipment. If you desire it, they will place you on the mailing list to receive these bulletins. Recently World Radio Labs issued an engineering bulletin (June 12, '58) on 680/680A changes, as an example. If you have this transmitter, and use it on six meters, I suggest that you drop them a line. It describes modifications to reduce TVI, increase grid drive on six, and eliminating r-f feedback in the audio circuits. By the way, World Radio Laboratories have a new name: Globe Electronics, Inc.

The first letter from a WV arrived on June 30, 1958. He is Patrick Barrett, WV6AJI, 324 Cabrillo Road, Arcadia, California. Nice going, Pat, and the 807 is on the way.

Recently, I stuck my neck out and polled the Novices regarding phone operation on the two meter band. Letters flooded in from all over the country. It is the opinion of the Novices (letters from General Class not counted) that they should be restricted to c.w. and m.c.w. on two meters. The ratio fer and agin was 22 to 1! A similar proposal was brought before the ARRL Board of Directors on May 9, 1958. The motion was rejected by a vote of 13 to 2 (See July QST, Page 61) and so that closes the matter for the time being. Also mentioned in these minutes was a proposal to re-allocate the low frequency Novice bands, but the motion did not carry.

When using the modulator described in the June '58 Novice column, the screen dropping resistor in the DX-20 (47K, 2W) will heat up noticeably. This is because the secondary of the modulation transformer lowers the plate voltage, because of its resistance. This, in turn, increases the screen current and more than 2 watts will be dissipated in the 47K resistor. The solution is to replace the 47K, 2 watt resistor with a 50K, 10 watt wire wound resistor. Also, the DX-20 plate voltage is 500 volts, not 700 volts as mentioned.

CALL	DATE	STATE	TIME OF QTH
KN6KRR	27 MAY	CALIF.	ØØØ5
KN8ICA	"	MICH.	ØØ27
KN7BXA	"	UTAH	ØØ4Ø
KNØLCF	"	NEBR.	ØØ43
KNØOOZ	"	KANS.	ØØ48
KN7CEY	"	WASH.	ØL04
KN4SOQ	"	VA.	ØLLØ
KN8KDL	"	W. VA.	ØLL7
KNØMUX	"	MO.	ØL26
KN9J2H	"	ALA.	ØL28
KN5PSZ	"	TEXAS	ØL32
KN4TJG	"	ILL.	Ø342
KN7DIT	"	ORE.	Ø345
KN3CEW	30 MAY	PENNA.	ØØ4Ø
KN8HSU	"	OHIO	ØØ51
KN5PPI	31 MAY	MISS.	2L43
KN4VIA	"	S. CAR.	2L52
KN5KWU	"	N. MEX.	2345
KN4QCS	2 JUN	KY.	2337
KN4UOJ	3 "	FLA.	ØØL5
KNØPQV	4 "	S. DAK.	ØØ38
KNLHHN	"	MASS.	ØØ57
KNØOUT	"	IOWA	ØL03
KN4VIK	"	TENN.	ØL07
KN7DKZ	"	WYO.	ØL3Ø
KN9JKF	"	IND.	ØL38
KN2TTF	"	N. YORK	Ø2ØØ
KN5QWZ	"	OKLA.	Ø254
KNLGUC	14 JUNE	MAINE	ØØ33
KNØPJL	"	MINN.	ØLLØ
KN7CJK	"	ARIZ.	ØL22
KNØLEB	"	COLO.	ØL35
KN7CZQ	"	MONT.	ØL39

Theory

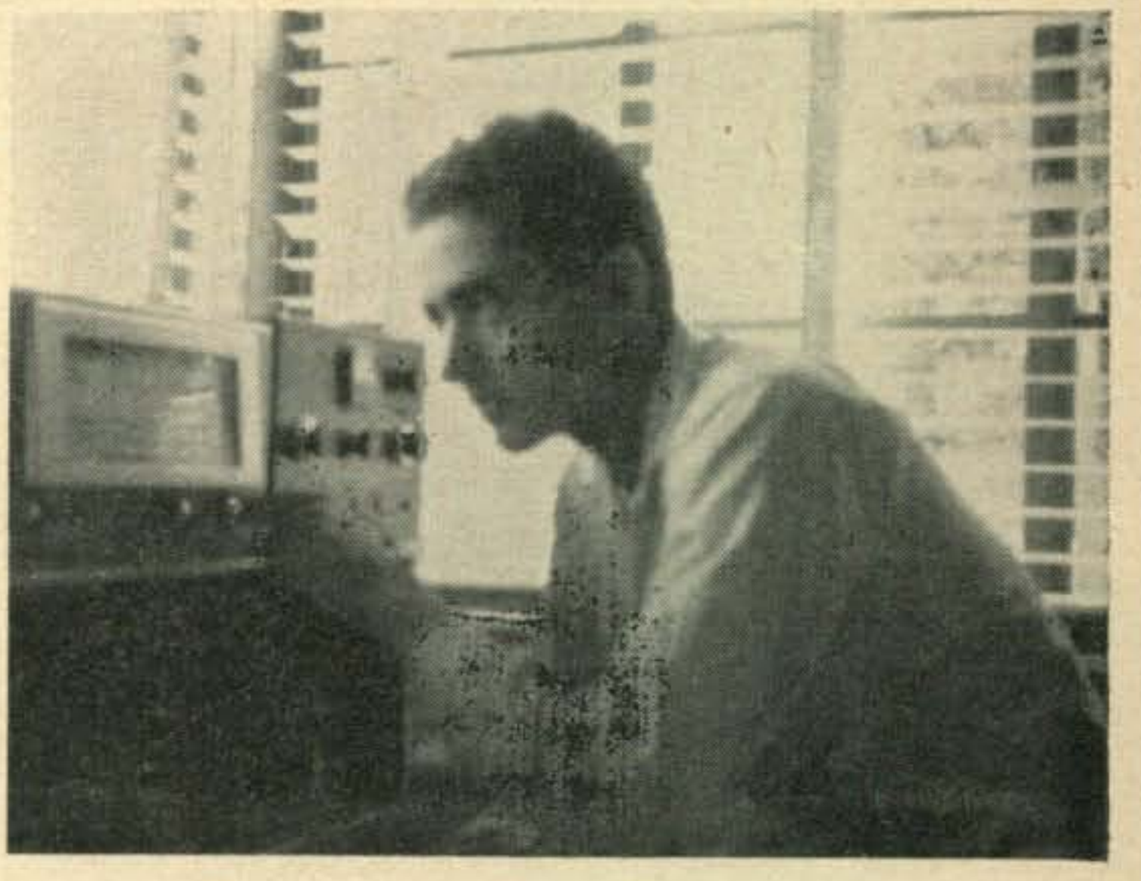
A person attempting to explain the theory of radio would probably start with the oscillation. Oscillations (not to be confused with Osculations) are basic to any radio transmitter or receiver. In fact, without the oscillation, there would be no radio at all. You can make an oscillation simply by placing a steel rule (or similar object) over the end of a table. To start the oscillation, "twang" the rule with your finger and observe what happens. Your finger pushes the rule down and the "springiness" makes it fly back up. If you observe it very carefully you will note that it travels up through its original position, and continues to a peak. Once it reaches the peak, it looses energy, reverses due to the springiness, and heads for its original position. The steel rule will not stop at this point but will travel *almost* to the point where you originally released it. This process will continue (the rule swinging above and below its normal resting

position) until all energy is released, and the rule comes to rest. Basically this is an oscillation; the periodic travel above and below an average point.

If you get your ear close to the rule, you will notice that it makes a humming sound. The motion of the rule moves air, first pushing—then pulling, and creates sound. Another example of an oscillation is down in your "voice box." When you speak, a membrane moves up and down, and forces a column of air in and out of your throat. This device in your voice box can correctly be called an *oscillator*.

Returning to our steel rule, you will note that the sound it produces can be varied simply by changing the length that extends over the edge of the table. The greater the length, the lower the *pitch* of the sound. Conversely, as the length is reduced the pitch will increase. If you look at the oscillations, when the pitch is low you will note that rule makes less oscillations in a given period of time. Or, when the pitch is high it will oscillate more, in the same period of time. In other words, the *frequency* (from the word frequent) of the oscillation will vary with the length of the steel rule. A device that *generates* a low frequency will oscillate less in a given period of time (say a second) than a device that generates a high frequency. In radio transmitters, the device is called an *oscillator*. Sometimes you hear the word *alternation* used interchangeably with oscillation, but an alternator and an oscillator may be two entirely different things. They have one thing in common though, they produce oscillations.

We must have a method of measuring and speaking of the frequency of oscillations. Each oscillation above and below the normal is called a *cycle*. And we speak of the frequency of the oscillation in cycles per second. The pleasant musical note that the rule makes, when "twanged," might be 440 *cycles per second*, as an example. The period of time used as a reference is almost always one second, therefore the term can be shortened to 440 cycles and still be correct. In radio work we deal with *kilocycles per second* (1,000 cycles equals one kc.) and megacycles per second (1,000,000 cycles equals one mc.).



There's that FB8 station now, says Greg Timourian, WN2QEJ, RFD #2, B-2146, Yorktown Heights, N. Y. Greg says that he will be glad to help others and would like to set up a sked with KN2KWI.

Roger Ghiotti, KN6KYK, 1207 Cortez Avenue, Burlingame, California, says this is what his shack looks like after finishing a two week project in two days. Roger would like pen and tape pals and his hobbies are ham radio and sport cars. (me too, Rog.).

If the rule is placed on the table so that exactly six inches extend over the edge of the table, it might oscillate at 400 cycles per second. As we know, the length (or size) determines the frequency of oscillation. Therefore, the six inches of rule is said to be (mechanically) *resonant* at 400 cycles. If we retract it to only five inches, it might be resonant at 600 cycles. Or if we extend only three inches we might raise the *resonant frequency* up to 1200 cycles. *Resonance* is the frequency at which something has the ability to oscillate. You may not realize it, but everything is resonant at some frequency. To prove the point, tap a wooden table with your finger. The table will *radiate* a dull low pitched sound. Its resonant frequency is low. Now, tap a glass vase (or a metal lamp shade). It will make a high pitched sound. In fact anything that you hit will produce a sound (yes, even air- but you can't hear it). A common table fork is another example. It is similar to the musical fork that a piano tuner uses to adjust the frequency of sound that a piano produces (called a tuning fork). By this time, your folks will probably think you have gone stark raving mad (tapping on things, I mean) so we had best progress to the other items on the agenda. Make sure that you understand the italicized terms, for they form the basis for next month's explanation of vacuum tube oscillators. A little supplementary reading on vacuum tubes is recommended also.

Who's DX?

In order to increase efficiency of operating habits and knowledge of his equipment, the Hampton Roads Radio Club will issue a certificate to any Novice who can confirm two way communication with fifty countries. The club feels that this accomplishment is within the capabilities of the Novice during his one year license. The ARRL official countries list will be used in the count and cards for QSO's after January 1, 1958 will be counted. QSL's should be sent with a stamped self addressed envelope to Frank Booth, K4KOY, 1417 Todds Lane, Hampton, Virginia. Thanks to Marion Wise, W4PRO, Corresponding Secretary for the club who sent the information. Go to it fellows.

DX tip—optimum propagation to DX stations usually occurs near 14 mc. Stay down near the 21.1 mc end of your band fellows, for best results. When buying crystals, consider 21.105 to 21.150 mc.

From the beautiful island of Puerto Rico, Roger Burt, KP4A00, writes about the stations that he received on July 4, 1958. Between 2300- 2330 AST, 80 meters; KN1EBT (589), ECP (589), GHZ (569), KN2HTO (579), RDQ (569), KN4VFR (569), VNP (579), VUO (569) KN8KML (579). Between 0700- 0730 and 2330- 2335, 40 meters: KN3DCW (579), DKR (569), DZB (579), EBJ (589), DZG (579), KN4UTY (589), VCX (589), VIK (589), VNH (589), KN5PGX (579), KN8-JPV (589). By the time you read this, Roger should be on the air with his Globe Scout 680 on all bands including six meters. Roger's QTH is Roger Burt, KP4AOO, Box H-3, Navy 116, FPO, NY, NY. Many thanks for the FB report Roger. We will look forward to hearing from you again.

Bud Lafferty, KG1CK, up at Thule Air Base, Greenland sent along his list for HAS (Heard all states). Also included were several calls heard on 40 meters, May 31, 0245-0300 EST: KN6DCY, HVU, KLN, LRZ, OBA, WN6-OOG, KN6OSC, PXM, RGT, RZZ, SQI, TFC. Many thanks Bud, es vry 73.

Help Wanted

The following persons would sincerely appreciate help in obtaining their Amateur licenses:

W2-W. Schmeis, 129-14-135 Avenue, So. Ozone Park, Ny. (phone Jamaica 9-4475) is a merchant marine officer operating between Spain and Turkey, with return trips to New York for about 10 days. Here's a potential dx station, how about some help fellows?

W4- Malcolm DeMunbrun, Route No. 2, Park City, Kentucky (17).
Robert Lowe, RA 11258388, 25 Trans. Co. (Army Aircraft Maint.) Ft. Bragg, North Carolina.

W5- Mack Allred, Route 5, Box 340, Lufkin, Texas (phone NEptune 4-6343)

W6- Michelle Jeanette, 14125 Cerritos Ave. Bellflower, Calif.

Leo Says:

World Radio's Reconditioning Department

Leo I. Meyerson, WØGFQ, says, "Here's a part of our reconditioning department where five trained technicians are continually repairing and perfecting used equipment. As many as 500 new items go through here each month. But we need more. Over the years we have built such a tremendous market for used equipment, that sometimes we even have a waiting list for certain items. Because of this guaranteed market, we can offer you a better price on your trade-ins. We want them! We need them! We'll allow more for them! Let us give you our top quotation for your present gear when you buy your new NC-300."

Guarantees YOU THE BEST, HONEST TRADE-IN OFFER

on National's exciting new

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DREAM RECEIVER

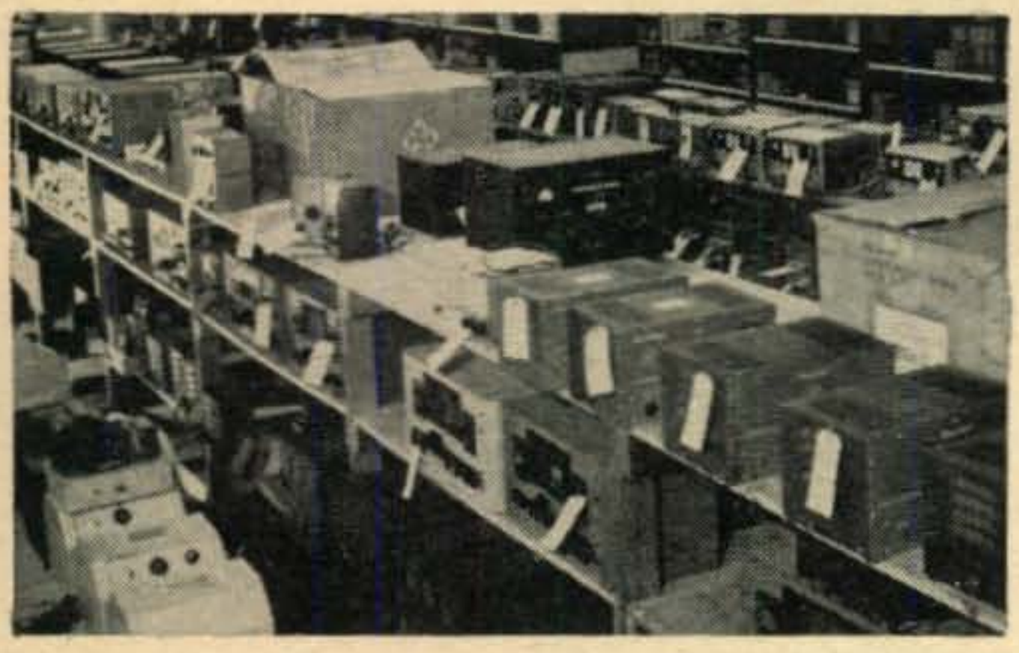
Stable! Sensitive! Features 10 dial scales for coverage of 160 to 1¼ meters with National's exclusive new converter provision with receiver scales calibrated for 6, 2 and ¼M, using a special 30-35 tunable IF band. Longest slide rule dial ever; more than 1 ft. Three position IF selector - .5kc, 3.5kc, 8kc - provides super selectivity. Separate linear detector for single sideband. Calibration reset adjustable from front panel to provide exact frequency setting. Dual conversion.

Amateur Net: $399.00

Only **$22.95 per mo.**

your present equipment may be enough for down payment.

XCU 300 Plug-In Crystal Calibrater: $23.95



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$15.00 VALUE

Gives 2400-hour time every hour of the day in every time zone all over the world. Key cities shown clearly. Direct reading, no computing or calculation necessary. Order your NC-300 now while this offer lasts. Clock will be mailed to you and guaranteed by clock manufacturer.

Dear Leo: Please send your free 1958 Catalog, information on the National line, and quote your best trade offer on my present

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For further information, check number 23 on page 126.

Ronnie Hill, KN60ZL, 1730 East St., Hanford, California hopes to get a Hi-Gain 15 meter beam going so that he can make the DX column. He would also like to see more theory in the Novice column.

K. Radziewicz, 112 Paulaski St., Newark 5, N. J. has converted his Knight 50 watt rig to six, but seems to be having power supply problems. Can anyone, locally, help him?

Fred Capshuv, WV6AFW, 4932 E. Illinois, Fresno, California has already worked nine states in 23 contacts. Fred uses an S-38D and a borrowed Globe Chief 90. As soon as his Globe Scout 680 arrives watch that states total zoom up.

Bruce Hocking, K1DCL, 47 N. Worcester St., RFD #2, Attleboro, Mass. has racked up 42 states with 38 confirmed besides some pretty impressive dx. Bruce will sked anyone needing Mass., and operates on the 80 meter band.

Larry Manson, 101 Georgia St., Travis AFB, California is an expectant Novice and has a DX-40 and an NC-240D all ready to go. Larry would like to thank Max Steinheimer, Gordon (W6MUJ), John (K6ULZ), Lester Sade and Maj. Fitz for the help with the ticket.

Tom Martin, RR3, Greenfield, Indiana is also "expecting." He would like to thank W9ATG, KN9IQI, W9DZC, and K9GSV who prepared him for the examination. Tom will be running up the states total with a Heath AR-3 and an Eldico TR-75TV on 40 and 80 meters.

M. J. Herbert, 2488 South 216 Street, Seattle 88, Washington would like to use the Novice Q5'er on 20 and 15 meters. Sorry, OM, but I do not have the coil dope you have requested. Watch for the 1959 Q5'er which will appear soon. It is xtal controled, triple conversion, and uses no band change switches. Only three tubes plus the BC-453!

Walt, KN7DXX, P. O. Box 1978, Globe, Arizona "cooks" with a Globe Chief 90 and an RME 50 with preselector. He would like to thank Hal, W7PKM, who issued his exam.

Freddy White, KN4QXS, 6415 Patterson Avenue, Richmond 26, Va., has his letter in the June column. He says that he received 40 cards from people who did not have his QTH, five requests for skeds, and two requests on how to hook up a "Q" Multiplier. That's what you call response!

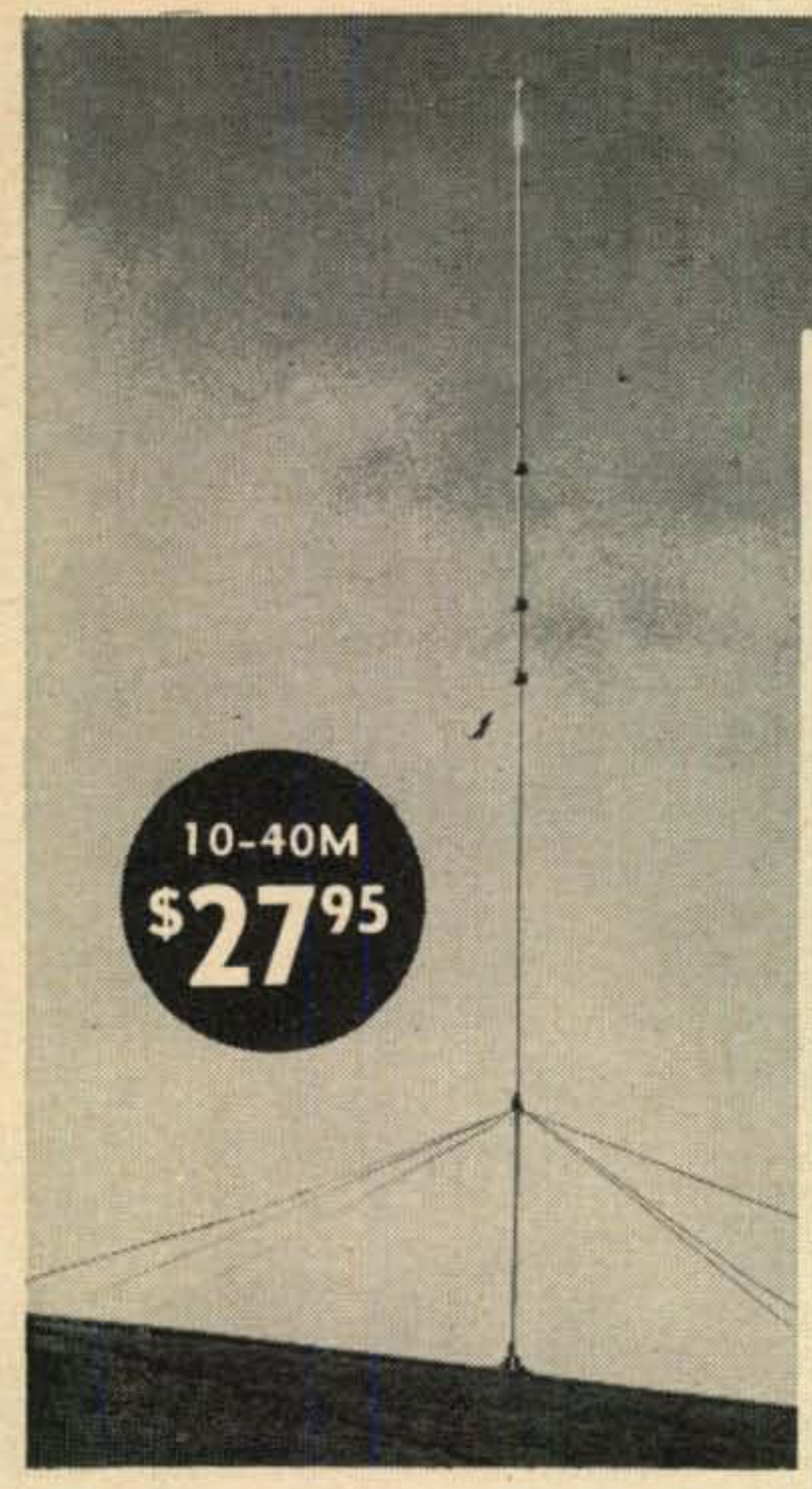
Harland Gould, WV6ARR, 7920 Wish Avenue, Van Nuys, California is percolating with a Globe Chief 90 and an SX-96 receiver. Harland operates 40 meters with a dipole and will QSL 100%.

Roger Palmer, (?) 124 Vidas Avenue, Salt Lake City, Utah operates 21 mc. with a two element rotary beam, an S-53A, and a Globe Scout 680A. Roger designed an effective antenna peaker to bring signals up out of the noise. If interested, drop him a line.

[*Continued on page* 125]

NOW! 6 METERS* ADDED TO THE hy-gain

MULTIBAND TRAP ANTENNAS!



Model LC-80 loading coil for 80M operation of the 14-AV. **$2.00 ham net**

Also available (not shown), is the model 26-AV vertical for the 2 and 6 meter bands, complete with new decoupling sleeve and ground plane. Overall height and length of ground plane: 5 ft. . . . and the model 12-AV Trap Vertical (for 10, 15 & 20M), using the Insu-Trap principle to isolate sections and develop ¼-wave resonance. Combination Guy Wire and Radial Mounting Kit available for rooftop mounting the 12-AV.

Model 26-AV (2-6M) — **$16.95**
max. ht. 6¼'

Model 12-AV (10, 15 20M) — **$19.95**
max. ht. 14'

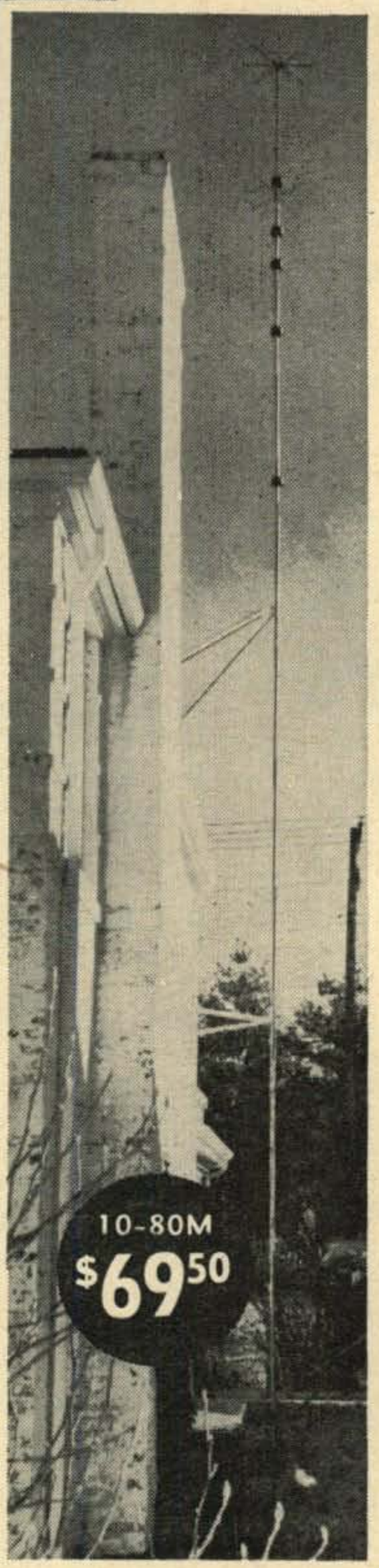
Model 14-AV (10-40M) — **$27.95**
max. ht. 22½'

Model 18-AV (10-80M) — **$69.50**
max. ht. 44'

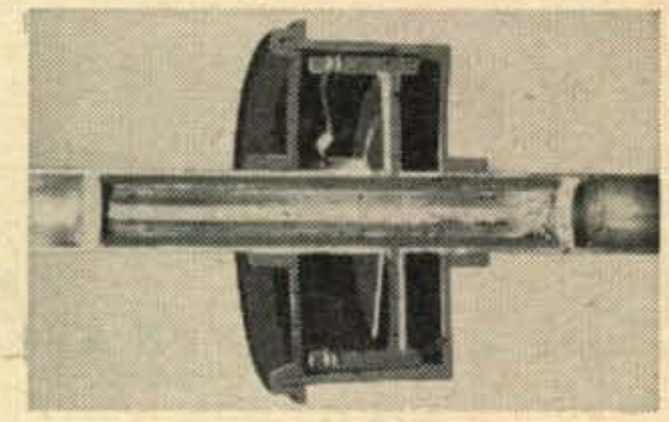
12-AV Mounting Kit — **$8.95**

14-AV Mounting Kit — **$9.95**

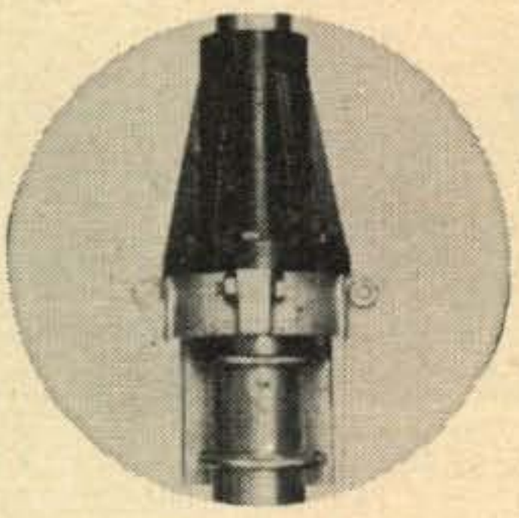
*Available as accessory, specially designed decoupling stub adds 6 meter operation with low SWR to Models 12, 14 or 18-AV. Order Model 6MK: **$4.95 ham net.**



Model 14-AV (for 10-40M), roof mounted, and the 18-AV (for 10-80M), side mounted, each using the sensational Insu-Traps to isolate the various sections of the verticals. 14-AV develops ¼-wave resonance. 18-AV develops ¼-wave resonance on 40-80M; ¾-wave resonance on the 10, 15 & 20 M bands. Each uses new Capacity Hat principle to increase radiating efficiency, and new nylon base insulator for self-support. Less than 2:1 SWR on all bands, single 52 ohm feed line. Combination Guy Wire and Radial Mount Kit available for 14-AV for rooftop mounting. 18-AV comes complete with side-mount bracket fixtures and nylon guring kit, all parts completely weather-treated.



Heart of the hy-gain trap antennas, the Insu-Trap makes possible for the first time a really efficient multi-band antenna system. It acts as an insulator at its resonant frequencies, but allows radio energies of other frequencies to pass freely. This automatic switch action isolates various sections of the verticals to make them the proper length for each band. Completely mechanically and electrically stable, the entire trap circuit is enclosed in a carbon activated polyethylene cover and cap. Traps are effective over the entire band. Completely weather-proof and air tight. Guaranteed for the life of the antenna. Traps will handle 1 KW.



Nylon base assembly makes possible the self-support of the Trap Verticals. Cast aluminum mounting bracket is adjustable for various sizes of masts, with weather protected internal coaxial fitting. All electrical connections are factory sealed. Entire unit completely weather-sealed.

Write for Brochure on the Complete Hy-Gain Line Today!

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For further information, check number 24 on page 126.

ANNOUNCEMENT

Again in this issue a new section appears in CQ where distributors may advertise trade-in and reconditioned equipment. This section, called the TRADING POST will be confined only to legitimate ham distributors as a means of announcing the many excellent used items available.

MOBILE COMPRESSOR

[*from page 29*]

The control voltage produced by the rectifier will cause a side effect at the plate of V_{1a}. This is a control transient or "thump." This transient is slow-acting, due to the filtering action of R_{10} and C_7. Its effect on the following stages can be eliminated by an elementary high-pass filter (C_3 and R_4) between V_{1a} and V_{2a}. Because of this possibility of a thump, C_3, R_4, R_{10} and C_7 should be left about as they are shown on the schematic. It might be mentioned that this transient takes the form of a voltage rise. By measuring it, an indication of compression is obtained. R_3 and I_1 form an inexpensive voltmeter, brilliance of which is proportional to compression. The neon will go out when no compression is occurring.

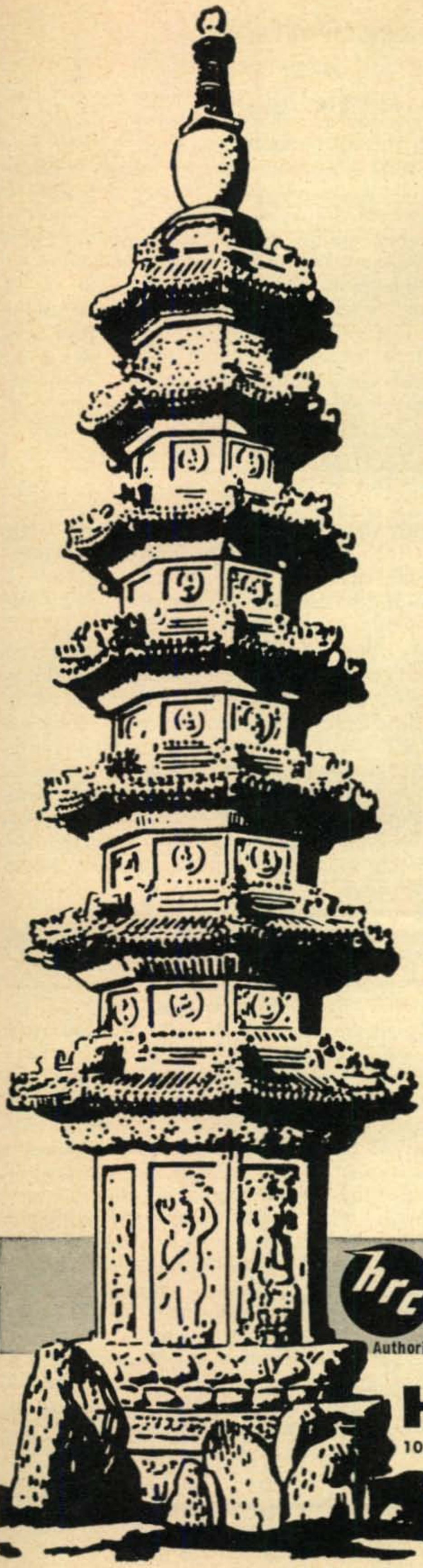
The rectifier in an automatic gain control system should not conduct until a certain signal amplitude is reached. This delay should be approximately equal to the maximum expected control voltage. In this design, the maximum voltage will be about 25 volts. Thus, a divider of 10:1 from the high voltage line to ground will properly bias the rectifier. R_7 in conjunction with R_8 provides this bias for V_{2b}.

Considerable thought was given to the output (in reality a driver) stage, V_{1b}. Negative feedback around V_{1b} and T_1 for better regulation can easily be added, but requires complete redesign for each type of transformer used. Since it was decided at the outset that this circuit was to be set up in such a way that it could easily be duplicated, negative feedback in all forms was abandoned. Internal impedance of V_{1b} is sufficiently low that if a decent transformer is used at T_1, adequate drive to a following class B stage is assured. Be sure to bypass R_{13} with at least several microfarads. R_{11} has been added to prevent overdriving the output stage, V_{1b}.

Due to the fact that an F-1 button or equivalent will probably be used, and since carbon buttons have their own bandpass action, no high or low-frequency cut was employed. An F-1 button will supply good quality of its own accord. The frequency response of this particular unit is shown in *fig 4*. The drop of the high frequencies is due to the driver transformer; the lows drop due to the transformer and the deliberate cut by C_3 and R_4.

When this unit was tried at a fixed station operating with high power, r-f feedback occurred. This was cured by the addition of C_2, C_1, and R_1. These components may not be necessary in an efficient or low-powered installation.

[*Continued on page 98*]



Wherever you are...

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At any point on the globe, from Durban to Dawson, from Bremen to Buna Buna, Harvey Radio's 31 years of service and reliability is with *all hams—regardless of location.*

At Harvey's, all orders for ham equipment are personally supervised and handled in all phases by hams. W2DIO and his ham associates devote immediate attention to your order. Your instructions—in any language—are followed meticulously. The items called for are drawn from Harvey's large up-to-date inventory and are carefully rechecked against your order. Harvey's rapid turnover is your assurance that only the very latest models are shipped.

Upon your instructions, Harvey's will open the original factory sealed cartons and give the equipment complete inspection and checkout. And there is no charge for this extra service, for Harvey's policy is "satisfaction always guaranteed."

Intimate daily working knowledge with overseas shipping requirements enables Harvey to provide the proper protective packaging and crating as well as all necessary forms and paperwork.

Hams around the world know that Harvey means confidence and RCA means dependability. Always ready to discuss your ham problems, always ready to supply your exact requirements—Harvey talks the language of hams—wherever they are.

hrc RCA Authorized Distributor

Harvey Radio carries a complete stock of RCA tubes for every power tube requirement.

Partners in Dependable Global Service

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OUR 31st YEAR

For further information, check number 26 on page 126.

MOBILE COMPRESSOR

[*from page 96*]

Usage

There are no adjustments other than to talk into the mike and adjust R_{12} for adequate modulation. How this is done is best left up to the individual.

Since the audio gain is self-adjusting, the loudness of the operator's voice will no longer affect transmission quality. This may be a point to consider in the construction of a civilian defense station, or for that matter any station that may have a number of operators. An excited or uninformed operator will no longer garble his transmissions. ■

INSTALLATION

[*from page 48*]

when only the filaments were on, and high speed with the application of high voltage. Although the defroster fan had a dc motor, it operated and performed satisfactorily on an ac, 6.3 filament volt winding.

Using the DX-100 "Driver" Alone

Coaxial connectors were used throughout for rf, permitting a reasonable fast power shift when needed. It is only necessary to change the DX-100 output coaxial lead from the antenna relay to the high power final input jack, and connect the final coaxial lead to the antenna relay. My 800 watt final was intended for 10 and 20 meter CW use only. The DX-100 plate switch actuates the final amplifier plate circuit through a relay.

Design of Home Built Equipment

A commercial appearance of home built equipment can be accomplished by building the oscillator or VFO and doublers into small table top cabinets. To reduce overall size, power supplies can be "in the desk." My external HRO-5 power supply is in the rear of the bottom, left-hand drawer. The power supply ac switch is paralleled to the rear of the HRO-5 receiver cabinet.

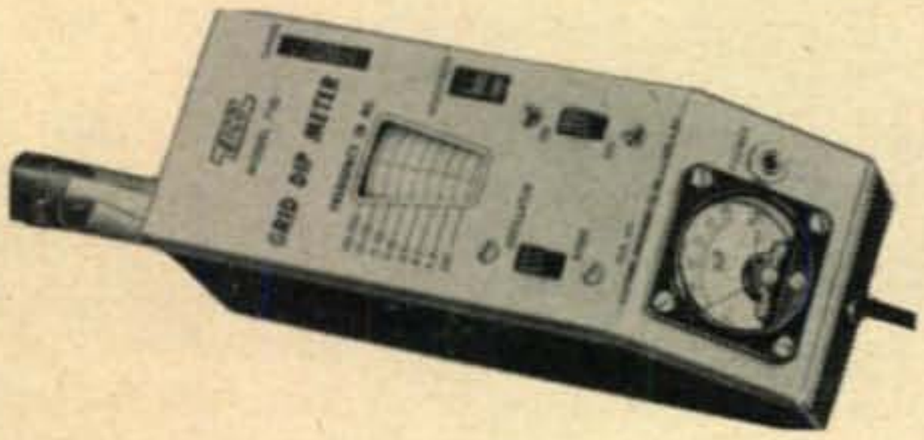
Regardless of how the equipment is "built-in" or how much power is used, one noticeable difference is how easy and comfortable operating can be, with an arrangement of controls —all at your finger tips—plus a systematic filing of QSL cards, operating aids, logs, callbooks, and other amateur necessities. Last but not least, I reserved one (the top left-hand drawer) for amateur hap-hazardry, where a collection of tools, burned out tubes, broken connectors, and bits of worthless wire, maintained my amateur prerogative of rebelling against total orderly organization. All in all operating efficiency and enjoyment was increased tremendously. ■

KEN-ELS *headquarters for* EICO

90-WATT CW TRANSMITTER #720

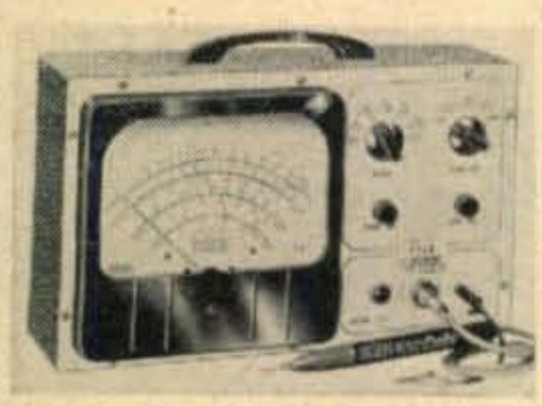
KIT $79.95 WIRED $119.95

Conservative, highly efficient design plus stability, safety, and excellent parts quality. Covers 80 thru 40, 20, 15 11, 10 meters (popular operating bands) with one knob band-switching. Finest quality, conservatively rated parts, copper-plated chassis, ceramic switch insulation. 5" H, 15" W, 9½" D.



NEW GRID DIP METER . . . . . #710

KIT $29.95 WIRED $49.95 including complete set of coils for full band coverage.



EICO Deluxe PEAK-to-PEAK VTVM #249

with 7½" meter and exclusive Uni-Probe (pat. pending). Kit only $39.95; Factory Wired only. **$59.95**

HQ-160 GENERAL COVERAGE RECEIVER

*Telechron automatic clock-timer $10 extra.

$379.00

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KEN-ELS RADIO SUPPLY

NEW UNIVERSAL MODULATOR-DRIVER #730

KIT $49.95 WIRED $79.95 Cover E-5 $4.50

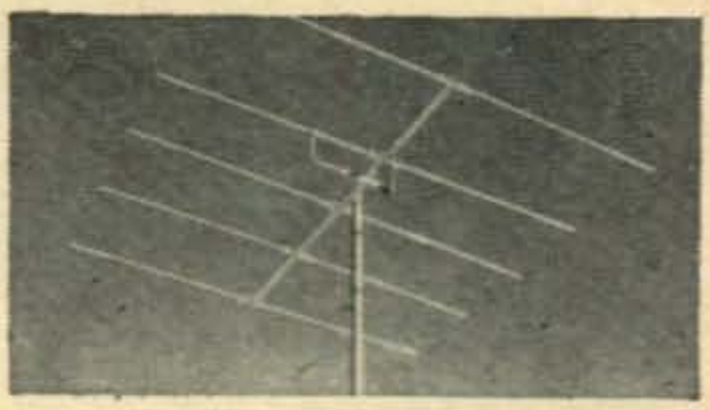
COLOR and Monochrome DC to 5 MC LAB & TV 5" OSCILLOSCOPE #460

KIT $79.95 **WIRED** $129.50

- Features DC Amplifier

5" PUSH-PULL Oscilloscope #425: Kit $44.95, Wired $ 79.95.
7" PUSH-PULL Oscilloscope #470: Kit $79.95, Wired $129.50

A Complete Line of hy-gain



6 METER 5 ELEMENT $12.95

6 METER, 8 ELEMENT BEAM: $24.95

The hy-gain 6-meter beams are adjustable for max. gain over the entire band, from our instructions. No further tuning necessary. Calibration Chart supplied with each instruction manual. Factory preassembled, these beams feature heavy wall ½" aluminum elements of 6061T6 alloy and 1¼" diameter aluminum booms. May be stacked for additional gain. Stacking Bars available at $3.95 extra.

10% down — 24 months to pay. Your trade-in may cover down payment. Export business welcomed.

For further information, check number 28 on page 126.

GROUNDED GRID [*from page 38*]

are left on for a few seconds.

One word of caution in selecting the sockets for the final tubes.

Do not use the military type that contain the built in button capacitors. One of these were used and the length of wire from grid to ground coupled with the capacitors formed a tuned circuit at some unknown frequency and away went the final all by itself.

A small phonograph motor is used for cooling. Forced air cooling is not required.

With high voltage applied the resting current at 2000 V will be 80 ma. This seems a little high but the dissipation capabilities of the four tubes take care of this very easily. If the plate voltage is higher than 2000 V the control Grid may have to be lifted and grounded for rf only through a capacitor and controlling bias applied. 50 volts will suffice.

At a plate input of 600 watts, 350 watts is obtained at the antenna, this is approximately 65%. If driven to a full KW the efficiency runs about 65%. As an added note this final will work fine with two or three tubes.

This amplifier has been trouble free from the day I put it on the air.

Most of the parts were obtained from local hams and with the exception of the tubes the total cost was around $125.00 which is reasonable for 1 KW no matter how you look at it.

PARTS LIST

V1 thru V4—EIMAC 4-65-A tetrode
V5 thru V8—HV rectifier 3B28—(816's or 866's will do)
RFC1—B&W bifilar choke FC-15
RFC2—4.3 mh bud type CH 569
J1—Self closing Jack Carter type J2
L1—Fixed coil or roller coil from BC-375
T1—6V 20 amp Stancor type P-6309
T2—2.5V 5 amp Merit type P-2939
T3—2.5V amp Merit type P-2939
T4—2.5V amp Merit type P2939
T5—2000 volt 750 ma—Saratoga Industries HW-201-P
F1—15 amp little fuse
V1 thru V4—Sockets Johnson type 122-101
M1—0-5 r.f. ammeters
M2—0-700 d c milliammeter Shure type 5312

HAMFESTS:

Southern Jersey

The S.J.R.A. 1958 Hamfest is Sunday September 7th (rain date Sept. 21) at Molia Farms, Old Delsea Drive, Malaga, N. J. $2 registration. Prizes, bathing lake with bath houses, transmitter hunts (3 of 'em), games, etc.

Cincinnati

The Greater Cincinnati Amateur Radio Association is running a Stag Hamfest Sunday, September 7th at Kopling Grove, on Winton Road. Prizes, exhibits, booths, awards, food, games, etc. Looks like this will be a great affair, don't miss it if you're in the area.

HAMFEST

Cedar Rapids

The first of an annual Cedar Rapids Hamfest is being sponsored by the Cedar Valley Amateur Radio Club on Sunday September 7. The location will be Hawkeye Downs fair grounds on Highways 30 and 218 South of Cedar Rapids. There will be prizes and contests. A full day's program is planned for the women. Prizes for the Best QSL and ham from the greatest distance. Collins salvage store will be open. Reasonably priced food will be served by the Xyl club. Tickets are $1.50 for the Men and $1.00 for the Women with a special prize for preregistration.

For information and registration contact Jay Spalti, WØSCM, 3239 Vine Avenue, S. E., Cedar Rapids, Iowa.

NEW CQ RATES

Postal Rate Increases require us to raise the subscription price of CQ. All subscription orders received on or after Nov. 1, 1958 will cost:

1 year $ 5.00
2 years $ 9.00
3 years $13.00

DX [*from page 66*]

Address References

(Need a QTH? If it's listed here you'll find it under Addresses in the DX Department of the 1958 issue of CQ indicated.)

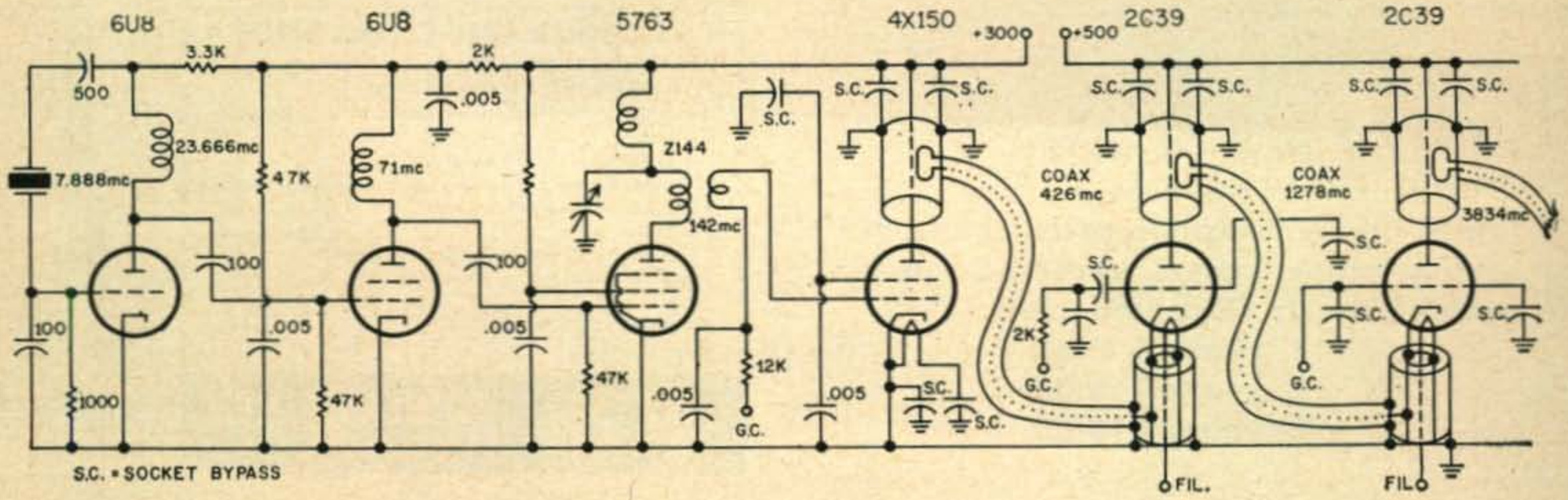
CEØAG	May	HL2AM	Feb.	PJ5AA/	
CN8GU		HL9KS	Mar.	PJ5CA	Feb.
(ZD7SA)	Aug.	HND9A	Aug.	PJ5CB	Aug.
CN8IF	Feb.	ex-HR2WC	July	ST2AR	May
CN8JX	Feb.	HSIA	Mar.	SVIAB	Mar.
CO2YZ	May	HSIC (ex-		SVISP	Feb.
CR4AH	Aug.	K2VOV)	Mar.	SVØ	Feb.
CR8AC	Feb.	JTIAA	Feb.	SVØWB	Aug.
DL4 QSL		JZØHA	May	SVØWE	Aug.
Bureau	July	JZØPB	Aug.	SVØWK	Aug.
DL4BL		K6ICS	Feb.	SVØWN	Aug.
(K4ADU)	Feb.	KA2MP	Mar.	SVØWP	Mar.
FA3DU	May	KA5ZS		SVØWQ	Feb.
DL4DH	Aug.	(W6UWL)	Feb.	SVØWT	Aug.
DL4TW	Aug.	KA8KW	Mar.	SVØWZ	Aug.
ET2TO	July	KAØIJ	May	UAIKAE	
EL3B	Aug.	KAØSC	Feb.	(All)	Aug.
ET3PRS	Aug.	KC4US	Feb.	UA9DK	Feb.
FB8XX	Feb.	KB6BH	Aug.	UA9DN	Mar.
FE8AK	Feb.	KGIBB	Feb.	UAØLA	May
FF8AC	Feb.	KG4AQ	Mar.	UB5DW	Mar.
FL8AC	May	KG6FAE	Mar.	UB5KAB	Mar.
FP8AR	Feb.	KL7CEW	Feb.	UO5AA	Mar.
FP8AS	Feb.	KP4ANU	July	VE3AHU/SU	Feb.
FP8AT	Aug.	KR6JR	July	VK2FR	July
FP8AX	Feb.	KS6AD	Feb.	VK4AL	Aug.
FP8AY	Feb.	KW6CA	Mar.	VK9AD	Feb.
FY7YE	Mar.	KW6CE	Feb.	VK9RR	Aug.
G5RV	July	KX6CH	July	VKØAS	Feb.
HA8WS	Feb.	LUIZS	Mar.	VKØTC	May
HBIPL/AR	May	MP4BCG	Mar.	VP2AZ	Mar.
HBIRS/FL	Feb.	OA4AP	Feb.	VP2KM	Mar.
HC8GI	Feb.	OA4IGY	May	VP4TF	Feb.
HE9LAC	Mar.	PIILS	July	VP5BE	May
HI8RM	Mar.	PJ2SA	Feb.	VP5FH	Mar.
HK7AB	May	PJ3AB	July	VP9CW	Mar.

[*continued on page* 124]

FLASH: ELEVEN DEAD

FCC Docket 11994, just released, informs us that the Eleven Meter Band is removed from Amateur service effective September 11, 1958. Another one down fellows.

VHF [*from page 69*]



"ACARC used only 50 mc with a Gonset, while stations on both 144 mc and 50 mc were used by the OCARC. Both set-ups, of course, were fully on emergency power and operated from simulated disaster conditions, as per all Field Day work."

"The OCARC stations, W5GU/5, made contacts with KØBCX at Wichita, Kansas, close to 250 miles away—with no short-skip conditions. They also talked to another Wichita station as well as several stations at ranges of 75 to 150 miles in Oklahoma, notably Pauls Valley and Tulsa. These contacts were on 50 mc phone. Point—almost none of the more than 50 well-equipped home stations here have managed to work Kansas, and only a handful manage communication with Tulsa, 125 miles northeast. Maybe all we need is more activity on both ends." *That does help an awful lot Jim.*

"The 144 mc station also worked extended range in Kansas and Texas. The ACARC station, W5PAA/5, managed no long-range work but did add appreciably to the club's total score." *Very interesting Jim. Seems like lots of Field Day expeditions are learning about VHF bands through their yeomanlike FD efforts, particularly in the last year or two.*

Pictou, Nova Scotia One of our Canadian neighbors Hazen Smith (VE1IK) sends some interesting information:

"I believe I have an item which will be somewhat interesting to some of the six meter crew. Normally, I run 75 watts to an 829B using a 4 element beam. But, I had the urge to try a low powered rig, so I built one with a 12AT7 as oscillator trip, and doubler final, using a 12AX7 and 6AQ5 and a conventional audio output transformer as choke. Plate supply is 150 volts, using silicon diode rectifier. Input to final is .75 watt (¾)."

"On June 20th, 1958, I worked W4DWY (Art) in Arlington, Virginia. Signal report was from S7 to 9 plus 10. This was on six meters with .75 watt, to the amazement of both of us. Then I went on to work W3LKU, K2OOQ and K2ZIZ."

"Till recently I have been mostly a 75 meter boy, but W1QCC just happened to move to this area and got me interested in six. *We put lots of faith and trust in Russ when he moved to that location, glad to know he hasn't let us down.* I now find that I can work very consistently such stations as VE1ZR, Bud, who is in Halifax; both our signal reports are normally in the nine plus area."

"Activity in this area is not too great on six meters as yet, but I am sure that more of the boys will realize the possibilities of this band for local rag-chewing and DX contacts and VE1's will not be so hard to local." *Nice work Hazen. Welcome to the VHF bands.*

South Bend, Indiana Club news and more news from Don Smith (W9EPT):

"Things in Indiana hopped this last month. We had a strange temperature inversion that lasted three days. It covered a 200-400 mile radius and all stations came in S9 without any fading. Our last weekend, the 14th and 15th (June) the band was open to W1's, W2's W3's, W4's and W5's. In the Michiana area we will have a lot of activity on Field Day."

"We have a net in this area that has operated for two years with an average of twenty-eight members signing in each week. It meets every Tuesday at 2100 local time. Net frequency is 50.5 mc but Net Control tunes the 1st mc of the band. We also have a VHF Club of the Michiana Area. It is named the 'Michiana VHF Club'. W9EPT, President; K8AYF, V.P.; and W9BO, Secretary, Treasurer."

"Notice that last call W9BO. W9BO should be included in the list of two-letter technicians. He held the call before the war and let it expire until he got interested in six meters." *Our apologies to W9BO and a number of other two-letter technicians. We never heard of nor about them until the boo-boo in the June issue, claiming W1FY as the only two letter technician. W1FY did not make the claim, we made it for him.*

73, Sam, W1FZJ

CONTEST CALENDAR [*from page 73*]

as leading amateur radio publications all over the world. Your request for log sheets and report forms should be mailed in at once. Include sufficient postage (new rates) and a large self addressed envelope.

ARRL SS

If you have never heard of The Sweepstakes, don't expect me to tell you about the "facts of ham radio." Write to Phil Simmons at ARRL Headquarters and have him educate you.

RSGB

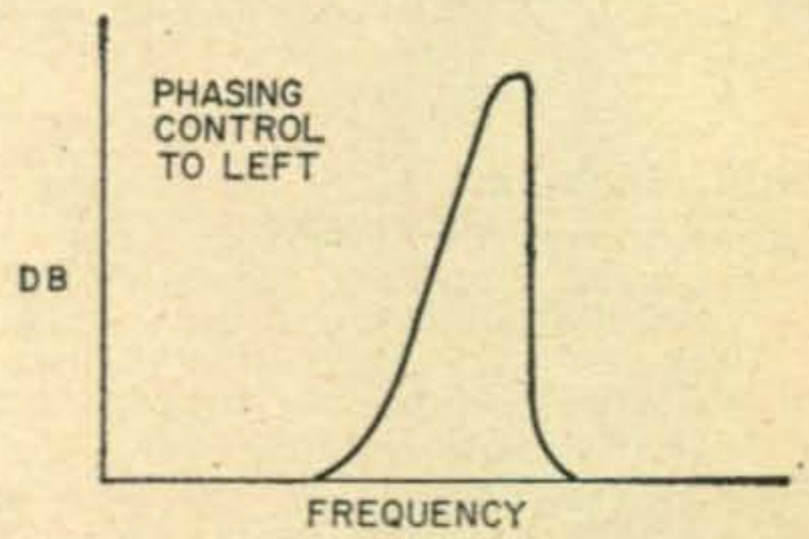
This is a Phone contest only on the 21 and 28 mc bands. We hope to have rules and other pertinent facts in next month's calendar.

And if the above is not enough contest activity for you, The Cleveland Area Council of Amateur Radio Clubs is running a local sweepstakes on the week-ends of Sept. 26/28 and Oct. 3/5. First prize is an expense paid "day" to the Cleveland Amateuradio Convention, October 18th, 1958. Better write to K8AAG, Box 5167, Cleveland 1, Ohio, for more details and log forms.

73, Frank, W1WY

SAVE YOUR SUPER [*from page 55*]

ting of the local oscillator should be about 250 to 300 cycles out beyond the crystal filter frequencies, for increased rejection of unwanted sideband products and for most efficient use of the crystal filter passband. This is shown graphically in fig. 6, which shows the relationships of local oscillator settings, crystal frequencies, and overall passband. A picture at this point is worth more than a thousand words. For 3 kc



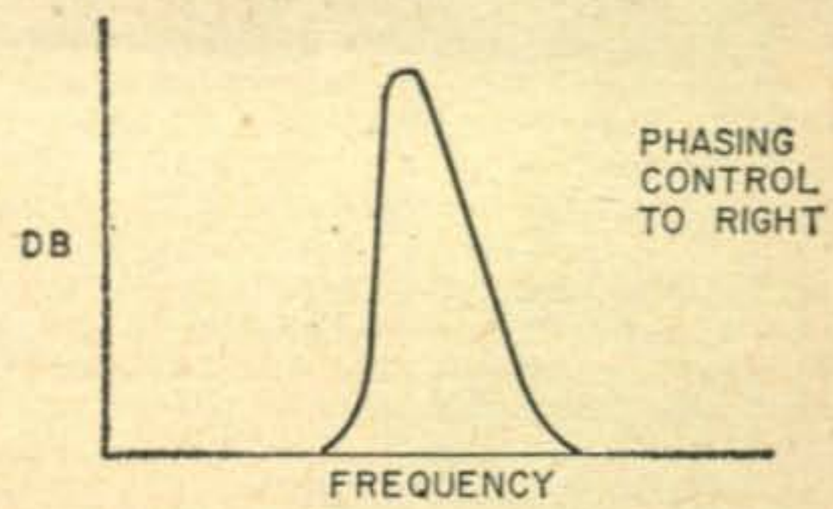


Fig. 5

filter SSB reception, the bandwidth control should be set at 6 or higher, inasmuch as the variable selectivity i-f transformers are after the crystal filter in the i-f chain, and the filter is the controlling factor in bandwidth. We do not wish to compress the filter response curve by setting the bandwidth control at a narrow selectivity position. Nor did we wish to eliminate the bandwidth control entirely, as it does have its value, for certain uses. SSB may also be received with the crystal switch in the OFF position, and best results are then obtained with the bandwidth control set from 4 to 6 depending on interference conditions.

The 3 kc filter can be very useful for AM reception as well as for SSB. If one tunes the AM signal right on the nose, it will be noted that the audio sounds very bass with the high frequency sidebands on both sides cut off. Tuning to one sideband or the other, depending on interference conditions, and thus making good use of the 3 kc passband of the filter, is a great help in reducing interference in AM reception. By experimentally tuning across an AM signal which is not fading, and watching the S-meter, one can get a very good mental picture of what the 3 kc filter does for AM reception as well as for SSB. Refer again to fig. 5 to see the relationship of passband and crystal frequencies.

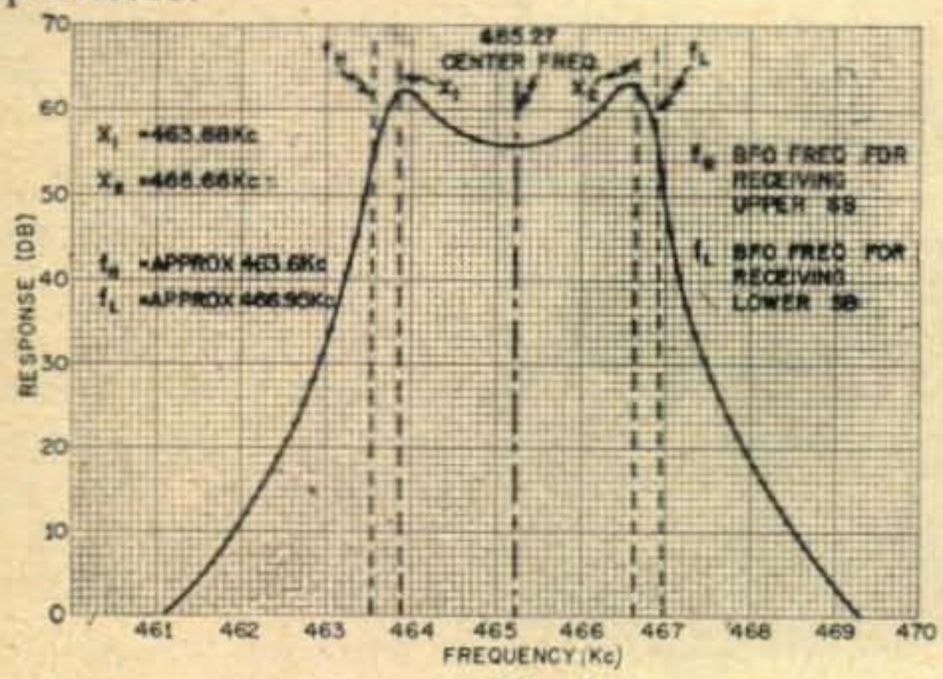


Fig. 6

Operation of this receiver on SSB, our primary objective, is now very simple and straightforward. There is no more fussing with rf and audio gain controls. Just set the rf gain at maximum, the audio gain at a comfortable level, and turn on the product detector and sit back and tune in the SSB signals. The avc does the work—it takes care of the strong ones, and there is plenty of gain for the weak ones "down in the mud." If the going gets rough due to overpopulation of the band, cut in the 3 kc filter. And with the new hf oscillator and mixer the signals stay in tune during contacts. To switch to receive the other sideband, just rotate the old bfo control to a bit over 1.0 on the other side, and there you are—it's as simple as that. Your old Super-Pro has been lifted out of the trade-in class, and you don't have to hand out the cash for a new receiver. SSB reception is now a pleasure instead of a headache! See you on SSB, fellows! 73, Paul, W3JHR

For further information, check number 31 on page 126.

FILMS [*from page* 44]

"Standing Waves on Transmission Lines"
—23 minutes

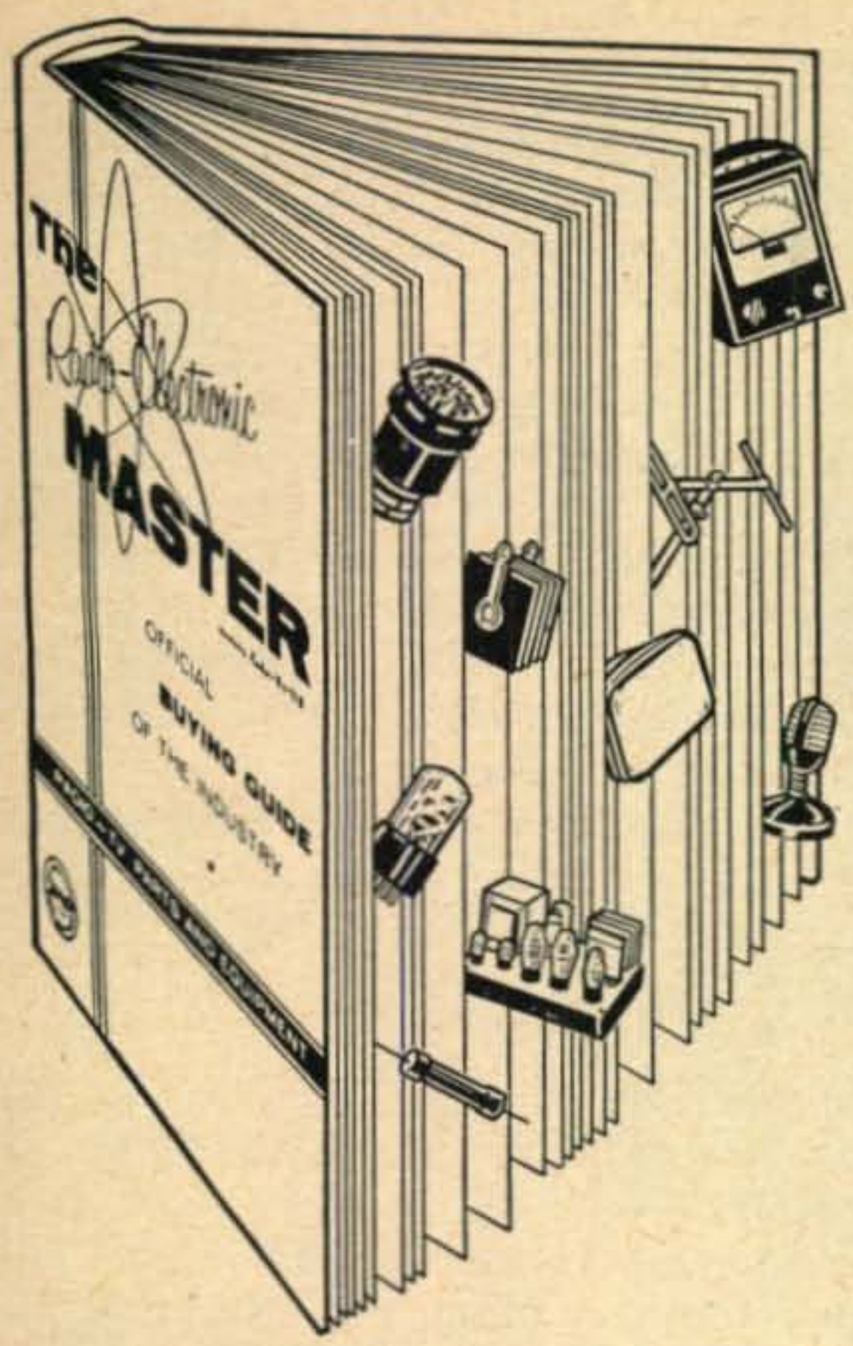
It is to be noted that many of these films are identical to those offered by the CAA, ARRL or armed forces.

Miscellaneous Sources

The following sources supply free film catalogs describing motion pictures on scientific and non-technical subjects, the moiety of which are lent free. For your ham meetings or on special co-ed occasions, the showing of a well-selected film will complement your program.

1) Your public library. In the larger cities (e.g. Atlanta, Georgia) a film lending department may have been inaugurated.
2) E. I. DuPont de Nemours & Co. Inc., Motion Picture Distribution, Wilmington 98, Delaware.
3) General Motors Corporation, Public Relations Staff Film Library, General Motors Building, Detroit 2, Michigan.
4) Motor Boating, 572 Madison Avenue, New York 22, N.Y.
5) Sterling Movies U.S.A., Inc., 205 East 43rd Street, New York 17, New York.
6) Aetna Life Companies, Public Education Department, Hartford, Connecticut.
7) Outdoor Life, 353 Fourth Avenue, New York 10, N.Y.
8) Center for Mass Communication of Columbia University Press, 1125 Amsterdam Avenue, New York 25, N.Y.
9) National Association of Engine and Boat Manufacturers, Boating Films, 420 Lexington Avenue, New York 17, New York.
10) Institute of Visual Training, Inc. Film Catalog, 40 East 49th Street, New York 17, N.Y.
11) Scientific Apparatus Makers Association, 20 N. Wacker Drive, Chicago 6, Illinois.
12) Association Films, Inc., 347 Madison Avenue, New York 17, New York.
13) National Directory of Safety Films, National Safety Council, 425 N. Michigan Avenue, Chicago 11, Illinois.
14) Ideal Pictures, 58 E. South Water Street, Chicago 1, Illinois.
15) Coronet Films, Coronet Building, Chicago 1, Illinois.
16) Modern Talking Picture Service, Inc., 3 East 54th Street, New York 22, New York.
17) Films Incorporated, 1150 Wilmette Avenue, Wilmette, Illinois.
18) Graphic Services Section, Bureau of Mines, Central Experiment Station, 4800 Forbes Street, Pittsburgh 13, Pennsylvania.
19) Office of Information, Motion Picture Service, U.S. Department of Agriculture, Washington 25, D.C.

[*Continued on page 108*]



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For further information, check number 33 on page 126.

FILMS [*from page 106*]

20) Shell Oil Company, Film Library, 50 West 50th Street, New York 20, New York. (Contact all major oil companies for their catalog of motion pictures.)

Nor does the list end here! Remember your ham society is a melting pot of personalities: the proverbial "butcher, baker, and candle stick maker," the teacher, the chemist, the doctor. Instruct each to write to the secretary of the business or technical society in which each holds membership for a possible film listing. In a very short time your Visual Education Committee will amass for your ham group one of the finest film bibliographies in the area!

RTTY [*from page 84*]

had its first birthday March 31st. The Board of Directors elected are Mac WØATM as President, Ralph WØITX as VP, and Bob WØIQC as Secretary-Treasurer. They are still getting equipment enabling the assembly of Model 14's, 15's, and 19's. MARTS also has available for free (you pay the express) 128A or 128-C2 "Sub-sets," useful mostly for parts. Polar relays, such as the *Sigma* and the *WE* 215A and 255A, are also available at low cost. Write Mac.

Forty RTTY Net

WØBP, "Rota Magna" of the famous "Forty RTTY Net," the largest of its kind in the world, by BeeP's own modest admission, reports his commissioning as lieutenants Lyle WØFQW and Ken WØKXB. The normal net frequency is near 7140 kc and simultaneous transmission is made by WØBP on 21,090 kc, listening for replies on this frequency when indicated. W2JTP has had good reception on 15 as late as 5 pm EDT.

6-Meters

Norm W1UHE of North Tiverton, Rhode Island, using a borrowed Model 26, is on 52.6 Mc with 60 watts input and a 4-element beam. All Norm has heard so far is some FAX on 52.5 and 53.75. An FRA converter is used.

Phil WØJHS had a thrill Thursday June 19th at 7:55 pm CDT. During a band opening, with ones, twos, and threes coming through, he called CQ on RTTY on 50.2 Mc. Apparently he got fragments of a reply on RTTY such as "WHAT SAY" and signing W1OL with a carriage return and line feed. Phil is frantic to trace the call. Can anyone help? Another Phil, W2JAV, heard WØJHS a few minutes later and called him without any luck. (*Sam F1FZJ or Helen W1HOY—how about getting that Model 12 out of mothballs and on 6?*)

[*Continued on page 110*]

ASSEMBLE YOUR OWN

WALKIE-TALKIE RADIOPHONES

for as little as

$7.98

plus accessories

NOW 4 MODELS TO CHOOSE FROM IMPROVED CIRCUITS GREATER POWER TRANSISTORIZED

General specifications applying to all models:

Highest quality workmanship and materials, silver plated coils, ceramic capacitors and advanced design assures maximum performance with the longest battery life. Sensitive receivers can detect signals as small as one microvolt and feature automatic volume control and noise clipping. Transmitters use high level amplitude modulation, have a power input of one watt to the R.F. stage and will radiate a signal for 1 to 5 miles (depending on obstructions) using antennas supplied. Up to 40 miles have been reported by some of our customers when communicating with stations having directional beam antennas. Radiophones can be used singularly to communicate with fixed stations or two or more to communicate with each other providing they are for the same frequency band. Fully portable, no external connections needed. Uses standard radio and flashlight batteries available at your local store. Total weight of completed unit including all accessories is less than 5½ lbs.

Model TC-144. Meets F C C requirements for general class amateur license. No minimum age requirement. Variable frequency transceiver circuit. Tunes from 144 to 148 mc. Wired, tested and guaranteed electronic chassis complete with two high frequency triodes (3A5) **$7.98**

Model TR-144. Similar to above but with independently tuned receiver and transmitter circuits, using 4 high frequency triodes (2-3A5's). Permits receiving frequency to be changed without affecting transmitting frequency..... **$11.98**

Model TRX-50. Crystal controlled transmitter and variable frequency receiver with R.F. stage. Tunable from 50 to 54 mc. Meets F C C requirements for general and technician class amateur licenses as well as for civil defense and other special services. Wired, tested and guaranteed electronic chassis complete with six high frequency triodes. (3-3A5's) **$16.98**

Model TRX-50-A. Similar to above but with transistorized audio booster stage for extra loud reception **$18.98**

The following accessories are required to complete the walkie-talkie as illustrated: Strong 16 gauge 8" x 5" x 3" aluminum case satin etched and anodized with all holes punched for quick assembly. Heavy duty battery holders with phosphor-bronze contacts, battery switch, telephone handset cradle, retractable coiled cord, adjustable shoulder strap, 18" or 24" antenna with loading coil (depending on frequency) and necessary hardware. All for only **$9.98**

Western Electric telephone handset with push-to-talk switch **$6.98**

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Very active quartz transmitting crystal for models TRX-50 and TRX-50-A ground to .01% of your desired frequency and hermetically sealed..... **$3.98**

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FREE power output indicator kit with each order over $20.00.

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For further information, check number 35 on page 126.

NOW DOW-KEY *Super*

MOBILE or FIXED STATION *Electronic* ANTENNA CHANGE OVER RELAYS *in One Unit!*

Now available for first time: DKC-TRM, 1.5 to 80 mc and DKC-TR2, 144 to 148 mc. Dow Key GUARANTEE, superb performance and quality. Exceptional ABOVE UNITY gain in both models.

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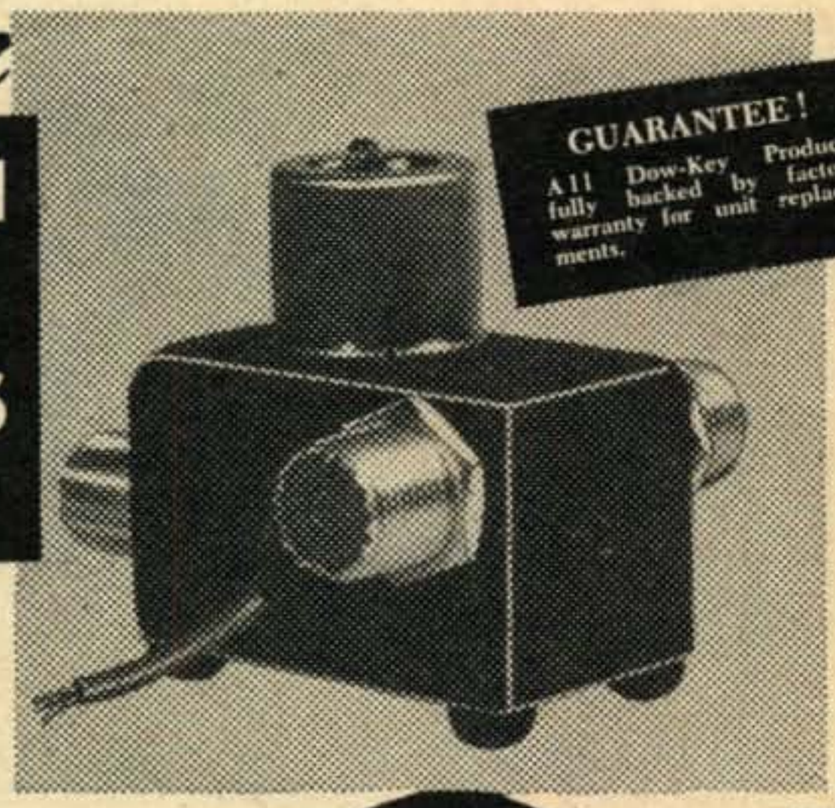

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Positively Guaranteed to operate without AC hum or chatter. High-contact pressures possible with Dow-Key magnet principle, a new concept of low-contact resistance. Durable precision built for long life. Highest standard in performance and quality. Automatic receiver protecting connector (Patented), SPDT and DPDT external switches optional.

Model DKC-GE Models. **10.90 to 14.75**

- See your local electronics dealer or write direct for complete Dow-Key specifications and catalogue sheet.

DKF-2 Double-Male Connector

Rugged, durable, silver plated, locking type. Perfect connection for relays & Antenna switch.

$1.45 each

Dow-Key Panel Mount

Install in 3 Minutes

NEEDS ONLY ONE HOLE, no screws to install this panel mount coax connector in 3 minutes.

70c each

Panel Mount DKC- P

DOW-KEY CO. INC. Thief River Falls, Minnesota

For further information, check number 36 on page 126.

Hits and Bits

Bruce ZL1WB was scheduled to depart for New Zealand July 28th with a shipload of RTTY gear of all sorts and a receiver, all donated by the host of friends he made in the U. S. A. during his tour. In a 4-page letter, which I wish I could reproduce here, Bruce extends his heartfelt appreciation for the hospitality and generosity of RTTYers all across the nation.

With the departure of K6OUR, Bart W6OWP assumes the alternate OBS duties for W6VPC and W6ASJ of the NCARTS. Bob W6NRM acts as repeater on 14,340 kc for the W6ASJ broadcast on 7140 kc and 147.29 Mc Sundays at 2 pm PDT.

Joe W6CJP is now on RTTY with a Model 26, a single-toroid TU with an xtal-controlled converter ahead of a BC-453, and a Viking Adventurer. Best DX worked is WØBP. (!)

Les KØBTJ in Washington, Missouri, near St. Louis, worked WØATM in Independence on 2-meter afsk the night of June 3rd.

Phil W2JAV has worked out a simple circuit to clean up the keying from Model 14 TD's. Watch for it in next month's RTTY column in *CQ*. Phil is also working on a circuit to modify his transistorized TU to use a polar relay.

Plea: Does anyone have a book or circuit on an FRXD4EP252 combined TD and Typing Reperforator? This is similar to a Model 14G. If you do have any information, please drop a line to Byron, W2JTP.

BeePreach: Watch the high voltage—we don't have RTTYers to burn.

Comments

An Amateur Radio license is a privilege and a responsibility—not a right to any citizen of the United States capable of passing the required test. This we seldom realize unless we travel a little around this oblate spheroid of ours and look at amateur radio in other countries. (Some even prohibit RTTY!)

The very existence of our hobby depends upon our *contribution* to the art. This can be in training for future emergencies—national or international; and, the training can be in operation or in technical matters. In the early days of ham radio the technical contributions were many, but now they are few, perhaps because there are so few "frontiers" left. Truly, RTTY has been called the "last frontier" of amateur radio. Here, in this most esoteric (2) branch of our hobby, there is *still* plenty of gear to be designed and to be built, not because it can't be bought over a counter, but because it is such a fertile field for prolific minds. *RTTYers build!*

PS: *RTTY Handbook* $3, postpaid, via W2JTP.

73, Byron, W2JTP

Hint: November 1st New Rates

We're not trying to be difficult or anything . . . it's just that postal rates are going up in 20% leaps and we have to raise the subscription rates if we are to stay in business. The present rate runs $4 per year, $7 for two and $10 for three years. This will go up to $5 for one, $9 for two and $13 for three. Some economies can be realized if you subscribe through your club at our club rates (have your club secretary write for info) or if you buttonhole the editor at a convention or hamfest. All of these arrangements are quite an improvement over the newsstand rate of a flat $6.50 per year. It is therefore highly recommended that you get your subscription in soon, or extend your present subscription at the present rates.

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Lighted Globe

When we first introduced the world globe some two years ago we found that there were a few malcontents who wanted to know if they could put a light in it. Ridiculous, said we, how do you expect to put a light bulb in a plastic globe? So, now we have it. $24.95, including the light bulb and a year's subscription to CQ. A bargain! They sell for up to $25.00 in the stores without CQ. And they are guaranteed, man.

DON'T JUST PHOTOGRAPH [*from page 42*]

Let's begin.

First — you need a section of seamless paper. Its size depending on the relative size of the equipment to be photographed. Rolls of this paper can be purchased at a local art supply house, but a similar item easy to obtain and working almost as well is the brown wrapping paper used by many neighborhood merchants. Being careful not to get any folds in the paper, mount it against a wall as shown in fig. 1. The base used may be either a table or the floor.

Next, place the gear to be photographed on the paper as far from the wall as possible. Keep in mind that the background of your photograph should consist of nothing but a solid tone, (the color of the paper).

Choice of camera will not be discussed in this article. Most hams will use what is available to them and their knowledge of its workings must be assumed. The only demand is that the camera be mounted on a tripod or another stable object. In addition, we will not take up the subject of camera angle to any great extent. The important thing to remember before exposing film is: **MAKE SURE THE LENS IS SEEING WHAT IS IMPORTANT FOR IT TO SEE.**

The reason for this article hinges upon this all-important point. Even though the lens can see each and every part of the important subject matter, poor lighting techniques can destroy the end effect, your wish for a good, clear constructional photograph.

The lighting equipment is simple. It consists of one bulb and a reflector. Size of the bulb is not critical. Anything from 25 watts to a #1 photoflood will work. After you have established your "shooting angle," set your shutter on time and the f stop to its smallest aperture. The suggestion might be made at this point that the room be fairly well divorced from other light sources. Shades should be pulled on windows, etc. Then, open the shutter. The bulb within the reflector is turned on and the light constantly circulated about the material to be photographed. It need not be a frantic movement. Just carefully move the light making sure that each nook and crany gets exposed to light equally. This is important. Don't play favorites, give each section of the gear the same amount of light. Naturally, during the exposure neither the camera or the subject matter may be moved . . . JUST THE LIGHT SOURCE. A 360 degree arc around the equipment is permissible, however, care should be taken not to point the light source directly into the lens of the camera. This could easily create an objectionable flare. After you have thoroughly "painted" the subject with light, the shutter is closed.

Length of exposure will be determined by several factors, emulsion speed of film, size of

[*Continued on page 114*]

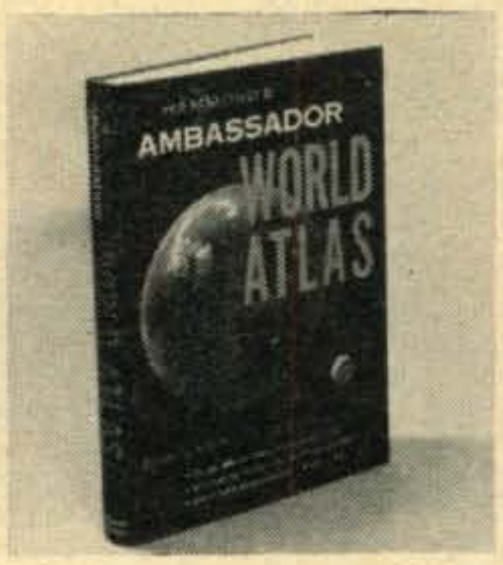
THE HAM SHOP

GLOBE

We can't see how you can get along without this beautiful 19-inch, 8 color World Globe. It can be yours, including a one-year subscription to CQ for: lighted model W/bulb $24.95; unlighted model $19.95.

BINDER

There is no other good way to keep your back issues. Make 'em neat. We supply the binder, with the year embossed in gold, not merely a sticker which will come off later. Specify what year you want stamped on your binder.
$3.50 each



ATLAS

Come on, get with it. Don't pull a blank when some one asks you for the capital of Honduras. For only $12.50 you can own 7 lbs. of full-color maps and a complete gazeteer. Send for this Hammond Atlas. PLUS a one year subscription to CQ.
only $12.50

MOBILE HANDBOOK

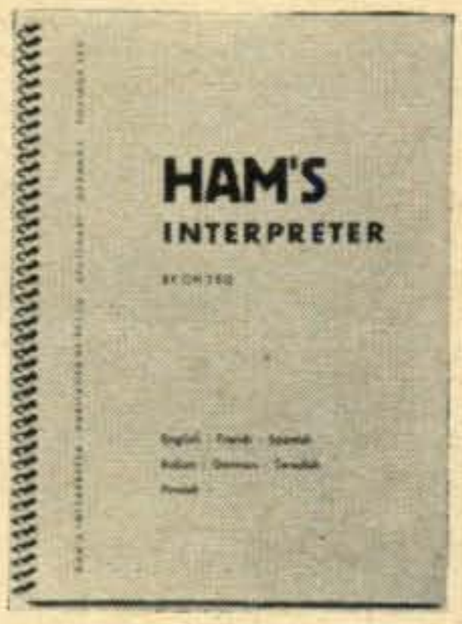
This new Mobile Handbook by Bill Orr, W6SAI, has been getting raves from all of the experienced mobile operators. There is all sorts of information in here that cannot be found anywhere else. This is NOT a collection of reprints. $2.95 postpaid.

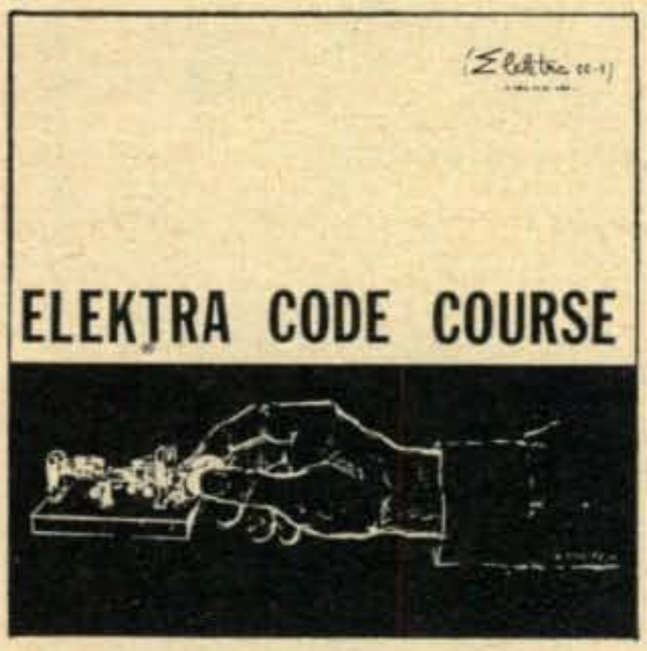
COMMAND SETS

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.

HAM'S INTERPRETER

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.





CODE RECORD

Learning code is a snap with this record. Speeds from 3 to 16 WPM, depending upon 12" LP record has on it all you need to learn the code for turntable speed. This both the Novice and General license. $3.50 each.

C-9

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

SIRS: My check (money order) for $..... is enclosed. Please send the following items to: ☐ Lighted Globe ☐ Unlighted Globe ☐ Log Sheets ☐ Binder—Year Wanted ☐ Atlas ☐ Mobile Handbook ☐ Command Sets ☐ Ham's Interpreter ☐ Code Record

NAME .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

New York City residents add 3% Sales Tax

SCRATCHI [*from page 14*]

joying rockenroll music on BC set while driving. Pulling off road, taking another reeding—still ded ahed, right thru front of car!! That meen taking side road. So, off I go.

Short moment later coming to place where either turning left or rite, but can't going ahed. Pointing car left to taking reeding, and signal coming in ded ahed. Smelling small rodent—howcomes reeding always way car are pointing? Trying with car turned around. Surely enuf—signal still from direckshun car are pointing.

At this point are reely disgusted. Something rong with reseever in car, and there go Scratchi's chance of winning first prize—or any prize for that matter. So, turning off reseever, and driving down dirt road. Not going far when—Hon. Ed, you gessing it—I running right into Hon. Hidden Xmitter!!

Jumping out of car and asking if I first one there. They saying yes indeedy I am, but I not winning prize. I saying howcomes, and they saying on acct. they having trubble and not being able to getting Hon. Hidden Xmitter on air yet. I saying that contest are to finding hidden xmitter, and they can't denying I finding hidden xmitter. They say it not counting, as I not heering signal.

Hon. Ed., I even taking them over to car, and showing them how I heering signal, but then they saying I not heering their signal, so it not counting.

Howsumever, this matter not settled. Next club meeting I going to insisking on my rites, as I only one to finding xmitter. They never did get it working!! Also found out what rong in my car. Evidently BC set having spuryus ossilayshun I heering in direckshun-finding reseever.

It not the principel of the thing—I want that reseever.

Respectively yours,
Hashafisti Scratchi

DON'T JUST PHOTOGRAPH [*from pg. 112*]

light source, and color of item to be photographed. Naturally, as in anything of this nature, some individual experimentation is necessary, but to get you started here is an average situation. With a film speed of 160 (Tri-X, etc.), an f stop of 32, a light source using a 25 watt bulb two feet away from subject, your exposure will be about 10 seconds.

Well, that's it! One of the finest methods of shadowless photography used in professional circles today. Best of all, the technique is simple and requires a minimum of lighting equipment. Try it. I know you're going to like the results. So will the editors of CQ magazine who will have better pictures to print with your articles and so will your fellow hams. They'll be able to see how you mounted that choke that under normal photographic conditions would be hidden in the shadow of that rf shielding.

HAM CLINIC [*from page 86*]

Yes. Ed Harrington, Box 189, Topsfield, Mass. makes a terrific little tank. Write him for details.

KE-93 RECEIVER

I recently purchased a *Pierson* KE-93 receiver and I understand you own one. I am very satisfied with it as a fixed receiver but I'm having trouble with hash when I move it for mobile operation. Any suggestions?

Yes. First of all, make sure that the cable from the power supply to the receiver is well grounded on both ends. Grounding to the receiver proper and the power supply is not always sufficient. *Do not* alter the length of the power feed cable. Also try a new 7HTF3 ballast tube—I found a noisy one. Replacement of this tube not only cured the noise but also improved stability.

FIELD STRENGTH METER

Do you know of a *surplus* field strength meter which will cover the 2 meter band, and where I can get one?

Yes, luckily I do (the question would otherwise go to our fine SURPLUS editor, Ken Grayson). The I-95-A covers 100 to 155 mc. and can be obtained from the C&H Sales Co. 2176 E. Colorado St., Pasadena 8, Calif. (For $12.50 each)

DSB

How come no manufacturer has come out with a DSB transmitter if DSB is such a "hot" transmission medium?

Read the ads in CQ. *WRL Electronics* has a new one called the Sidebander DSB100.

Tech Twist

Want to have those crystals handy for mobile operation without having to dig through a box or tray? Then just glue a small magnet (obtainable from burned out meters) on the back of the crystal and "paste" it to the metal dash. One magnet when cut will give you about 5 "holders."

Information

Often, a kind-hearted ham will write in proffering some information for use in the column. Checking on pre-publication we find that it has appeared before or is of little general interest; but WE DO pass it on to someone needing it. As you no doubt already know, CQ's

[*Continued on page* 117]

DON'T LAUGH [*from page 41*]

came back in.

The ham's tin ear is well known for its ability to tune out unwanted QRM, so the yaking of the OW was unheard. Also, as any husband knows, it is necessary, when your wife is talking to you, to give out with a periodic uh-huh.

After several uh-huhs, with me still absorbed in the instruction book, I was the recipient of a big hug and the XYL dug out of the shack like a Vanguard rocket.

Well you can guess the rest. Unconscious me, standing there with my mind inside a balanced modulator, giving out with the uh-huhs, before I knew what had happened, had relinquished my right to buy the transmitter, and our household is the proud possessor of some ding-fod to do the ironing with. Yes sir, a $495.00 ding-fod.

But can you top this? I'm stillt one bicycle, a football, a Brownie uniform, an electric train, a pair of roller skates, a baby buggy, and a doll high chair (with folding tray), in the hole. To make matters worse I have to buy our five year old girl a sidewalk bike, and she didn't even vote for me. Of course the youngest boy couldn't be forgotten so it was a clean sweep. Just like Christmas, except I didn't get a neck tie.

The hundred bucks I was going to borrow turned into almost two hundred. By scrounging smokes, going without coffee, and reading someone else's CQ, I'll be out of the hole in only five months.

When you hear me on the bands it will be on AM with the old 50 watt YLC special. Unless, . . . say, maybe I can build an exciter. Let's see the junk box . . . ■

DE ICER [*from page 40*]

screen, and 20 grid mils., out of resonance plate current is well above one ampere; loaded up to this gives a pretty good signal, even on the dummy load (64 elements at 100 feet, plus KN2YUD's Gonset about half a mile away). Art forgot and turned his 15 el. long john at my 64 el. and then tuned it to 144.001. We haven't seen him since, but understand there is a big black hole in the ground where the shack was.) The reason it was named the STEAM ENGINE is that at this input smoke pours out the stack, there is plenty of fire in the boiler, and the grid tank on the side reciprocates at 20 wpm. This amplifier was built in a ham shack, not a machine shop; if you are looking for a proto-type for a production run of high efficiency amplifiers just cough up the money and it will be real pretty but couldn't work better than the Steam Engine—some surplus, a lot of mechanical aid from W2UM, and a gallon of elbow grease. There are a number of features that contribute to the stability and efficiency that you may want to incorporate in your next final. ■

HAM CLINIC [*from page 115*]

contents and format take *time* and a lot of *hard* work. If you feel that you cannot wait for publication of your item please let us know so that we can ship it back to you promptly. But remember, items for HAM CLINIC take a minimum of 60 days to publication. Full articles should be sent to the editor, *not* to the CLINIC. However, you may write us and ask what we think of an article you have in mind; we can recommend to the editor that he consider it. Publication time for full articles varies depending upon backlogs, advertising pages, drafting required, issue format etc. Right now (according to our grapevine) the editor is considering construction articles.

Thirty

Some of the communications we have received from readers have asked us to discuss test equipment for the ham. Next month we'll do just that. We hope you continue to read HAM CLINIC and will send in your questions relative to ham radio. We will continue to answer your queries on an amateur-to-amateur basis and repeat what we have said before: opinions and statements expressed in this column are the writer's and do not necessarily carry the indorsement of CQ or any other agency, governmental or civilian. The service is FREE, there's no fee! 73, Chuck, W6QLV/f

PROPAGATION [*from page 88*]

openings, beyond 2000 miles, are likely to occur during the hours of darkness, or pre-dawn period, when static levels are low. During the daylight hours, ionospheric absorption will limit maximum range to about 200 miles or so, with the range increasing as darkness approaches.

160 Meters:

From shortly after sunset, until shortly after sunrise, short-skip propagation up to about 1300 miles should be possible on most nights during the month. When static levels are low, the skip may extend considerably beyond this range. During the daylight hours, intense solar absorption limits *160-meter* propagation to the *groundwave* line-of-sight range.

CQ World-Wide DX Contest

The following are the dates announced for the CQ World-Wide DX Contest for 1958:

October 25-26 Phone
November 29-30 CW

As in past years, next month's column will be devoted entirely to a Contest period propagation analysis and forecast. If you are planning to take part in this years Contest, don't miss next month's *Propagation* column.

73, George, W3ASK

Potts [*from page* 34]

of his chair. The tooth came out, and Horatio dropped on the floor in a moaning heap.

Jasper Pringle leaned over to ascertain the amount of bleeding from Horatio's mouth. "I hate to say this," he murmured in an embarrassed fashion, "but Hermann has pulled the wrong tooth."

"A pity," commented Shorty.

"Ohhh!" moaned Horatio.

"Duhh," said Hermann.

"Well, let's give it another try, Hermann, and do try to be more careful," said Shorty.

"Duh," said Hermann.

As Horatio scrambled up from the floor to fend off another attack from Hermann, Throckmorton, Shorty's eleven year old son, ambled into the room.

"Whatcha doin'?" asked Throckmorton.

"We're engrossed in a very perplexing problem," said Shorty. "Why don't you go over and sit in that corner, Throckmorton, until we're through."

"You promised to teach me something of advanced electronics if I came down to the meeting tonight," said Throckmorton.

"Yes," answered Shorty, "but we are being confronted by a very difficult, technical problem at the moment. Go sit in the corner, Throckmorton and read this beginner's book on elementary electricity."

Throckmorton sat and watched our efforts for some time. At length he rose and joined us around Horatio's chair.

"Am I to understand that Mr. Potts has a metal filling in his tooth, of such structure as to be in resonance with ether waves of radio frequency, thus producing sounds in Mr. Potts' head?"

"Yes," said Shorty, "you have grasped a small part of the technical side of the problem. Now go study your book."

"One moment," said Throckmorton. "May I borrow your penknife, Mr. Pringle?"

"Open your mouth, please," he said to Horatio.

Throckmorton took out a small flashlight and proceeded to prod around in Horatio's mouth with the penknife.

"Be careful there," said Shorty. "Mr. Potts has had a very trying ordeal."

Throckmorton withdrew his knife. The same instant Horatio jumped out of his chair. "The voices have stopped!" he cried.

"What did you do, Throckmorton?" I gasped.

"Simple," answered Throckmorton. "As was ascertained, his filling was of such physical structure as to vibrate in sympathy with the aforementioned frequency. Thus, by making a slight scratch on the surface of Mr. Potts' filling, I altered its structure enough to throw it off frequency."

"Astounding!" I said.

"Amazing!" said Shorty.

"Elementary," said Throckmorton.

"Duhh," said Hermann.

Horatio Potts walked out of the door a happy man. That was the last I saw of him until last week, when, hearing a knock, I opened my front door to find Horatio and a middle aged woman on my porch.

"This is Miss Agatha Prunethimble," he said as I greeted them. "I brought her to see you, because, you see, she has a hearing aid which picks up Radio Moscow. As she is a school teacher and doesn't want to get mixed up in a loyalty oath scandal, I thought you might—"

I closed the door rather abruptly at that point, rushed to my bedroom, and locked myself in a closet. I felt another headache coming on. ■

Advertising Rates

To fill the many requests for advertising rates that come into our office each month, rate information will be provided periodically in the magazine. For more detailed information interested parties may contact our advertising representatives as listed on the mast head.

	1 Time	3 times	6 times	12 times
1 Page	$360.00	$340.00	$310.00	$285.00
½ Page	190.00	180.00	170.00	155.00
⅜ Page	150.00	140.00	132.50	127.00
¼ Page	100.00	95.00	90.00	85.00
⅛ Page	51.00	49.50	48.00	46.50
1/16 Page	26.50	25.50	24.50	23.50

Mechanical Requirements

	Width	Depth	Width	Depth
1 Page	5½	8⅓	.....	.....
½ Page	5½	4	2⅝	8⅓
⅜ Page	5½	3	2⅝	6
¼ Page	5½	2	2⅝	4
⅛ Page	5½	1	2⅝	2
1/16 Page	.....	.....	2⅝	1

Recommended half tone screen—110.

Publication date—25th of preceding month. Last forms close 20th of 2nd preceding month. Proofs furnished only if complete copy and cuts are received on or before closing date.

All advertising is subject to Publisher's approval and acceptance without recourse.

The advertiser agrees to indemnify and protect the publisher from any claims or actions based upon the unauthorized use of any person's name or photograph, or of any sketch, map, words, labels, trademarks, or other copyrighted matter, or based upon libelous statements, in connection with the advertising referred to in this order.

Cont. on Next Page

The Ham Shop

RATES: 25c per word per insertion for commercial business organizations.
10c per word per insertion for individuals on a non-commercial basis.

MINIMUM CHARGE: $1.00

CLOSING DATE: 20th of the 2nd month preceding date of issue.

MAIL: Your typewritten copy with full remittance should be sent to CQ Magazine, 300 West 43rd St., New York 36, N. Y.
Attention: Classified Ad Dept.

NOTE: The products and services advertised in this section are not guaranteed by the publisher of CQ.
Telephone orders not accepted.
Call letters only are undesirable. Please include name and address in all advertisements submitted.

FOR SALE

SELLING OUT: Complete Collins KW-1 station, receivers, etc. Lewis, W3LXE, 37 S. Sixth St., Indiana, Pa.

CRYSTALS GUARANTEED: 2 to 80 meters PT-243, 30¢ ea. SSB filter crystals FT-241A, 10¢ ea. List available. Quaker Electronics, 1040 West Main St., Plymouth, Pa.

RADIO PARTS, TUBES, some receivers, new & used. Free list. D. Reed, 1604 Grange Ave., Racine, Wisc.

PRESERVE YOUR HAM TICKET, Social Security Card, small photo, passes and anything else of value that is wallet size. We will laminate it in clear plastic, guaranteed for life. Lamination will prevent it from getting torn, soiled or frayed. Send your ticket or anything of value with $1. in stamps or cash for each item that you want preserved. 24 hour service. Send to Dept. HW, CQ Magazine, 300 West 43rd St., N.Y. 36, N.Y.

ATTENTION MOBILEERS!! Leece Neville 6 volt 100 amp. system alternator, regulator and rectifier, $45.00. Also Leece Neville 12 volt 100 amp. system, alternator, regulator & rectifier $85.00. Perfect condition. Herbert A. Zimmerman, Jr., 115 Willow St., Brooklyn 1, N.Y. K2PAT, ULster 2-3472.

MULTI-BAND ANTENNA, 80-40-20-15-10, $21.95. Patented. Send stamp for information. Lattin Radio Laboratories, Owensboro, Kentucky.

FOR SALE: Schematics for all military-surplus units $1 each. Dave Rumph Co., P.O. Box 7167, Ft. Worth, Texas.

MUST SELL COMPLETE SSB STATION at once. Kws-1, 75a-4, and Sc-101, must go together. In like new condition, one year old. Price $2500. Write or call Charles Clarke, K5HRJ, Box 535, Knox City, Texas.

CALL PLATES: Deluxe 8" x 1¾" black phenolic laminate with engraved white letters. Only $1.00 pp. Polished plexiglass base $1.00 extra. L. and J. PRODUCTS Co., P. O. Box 122, Downers Grove, Ill.

THIS HALO ANTENNA makes VHF mobile operation worthwhile. Folded dipole elements. 2 meter Model H-144 comes with fitting for standard mounts and 20 feet of coax. Portable Model H-144P mounts directly on your Gonset. Either model only $13—$13.50 west of Denver. L. and J. Products Co., Box 122, Downers Grove, Illinois.

WORKED ALL STATES? Mount your QSLs neatly in first QSL Album designed specially to hold your W.A.S. cards. Heavy leather-textured covers, sturdy wire binding, individual spaces for all 48 states. Cards can be inspected, removed, replaced. $3.50 postpaid. Call letters in gold for affixing to cover $1 extra. Hanover Electronics, 126 East 37th Street, N.Y.C., or your dealer.

FOR SALE: DX-40 XMTR. Excellent condition. Best offer over $50.00. You pay postage. Paul Messinger, K1CZU, Box 437, Groton, Mass.

FOR SALE: 800 watt transmitter built by Frampton Trans. Co. with BC 696 VFO in cabinet on rollers $390.00. O. F. Nash, W5POL, 4210 Avenue D, Austin, Texas.

FOR SALE: Collins 75A2 and DX-100, $300.00. Regency ATC-1 tuner $45.00, all in good condition. Tom Rutherford, 1452 N. First Avenue, Upland, Calif.

BARGAINS: WITH NEW GUARANTEE: Collins 32V-2 $349.00; Collins 30K-1 $550.00; Johnson KW and Desk like new $1,195.00; S-72 $49.50; Hallicrafters HT-30 $349.00; HT-31 $299.00; SX-101 $319.00; HT4 with Speech Amplifier and Antenna Tuner $695.00; SX-88 $449.00; NC-98 $119.00; NC183D $319.00; NC-300 $319.00; HQ129X $159.00; DX35 $55.00; Eldico SSB-100 $395.00; 51-SB $195.00; 51-SB-B $185.00; B&W L-1000-A $295.00; RME 4350 $175.00; Ranger $199.50; Phasemaster II $239.00; Lysco 600 $69.00; Lysco 600S $89.00; Gonset Linears (2M) $99.00;—(6M) $119.00; Globe King 500 $425.00; Globe King 500A $455.00; TBS-50 (Hi or Low Z Mike) $69.50; APS50 Power Supply $29.50; Tape Recorders and test equipment, inquire for models and prices. Free trial, terms, write Leo, WØGFQ for best deals. World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

CRYSTALS AIRMAILED: Novice, net, general. FT-243, Any kilocycle .01%, 3500 to 8600 $1.00, Thin Gonset $1.45; 1700 to 3499 $1.75; 8601 to 21,500 $1.95; New, guaranteed. Marine, amateur, experimental etc. Write frequency listings and brochure. Crystals since 1933. C-W Crystals Box 2065C El Monte, Calif.

FOR SALE: B&W S100B and B&W L1000A. Both in like new condition with all manuals, both for $675. Will separate FOB Chicago. A. Martinka, 3723 Magnolia Ave., Chicago 13, Ill.

FOR SALE: Halicrafter radio telephone sending-receiving set; one charger set; extra hand set. #HT 22-LWS; 154.57 Frequency. Haire Publishing, 111 Fourth Avenue, New York 3, N.Y. ORegon 4-3000, Ext. 48.

BARGAINS: Send for list of reconditioned receivers and transmitters with new guarantee. 10% down with up to 24 months to pay. In stock new Collins, Johnson, Hallicrafters, WRL, National, Hammarlund, Gonset, Elmac, Drake, Central Electronics, B&W, Hy-Gain, Mosley, Gotham beams. Shipped on approval. Write Ken, WØZCN, or Glen, WØZKD for your best deal. Ken-Els Radio Supply Co., 428 Central Ave., Fort Dodge, Iowa.

FOR SALE: Still waiting for WAS, WAZ confirmations? Send Reply-Paid QSL's! 5, 25¢; 25, $1.00. Hart, 467 Park, Birmingham, Michigan.

DRAKE 1A RECEIVER: in excellent condition, really great receiver, but I need money desperately. First $195 gets it. Box 12, CQ Magazine, 300 W. 43 St., NY 36.

HOUSECLEANING, clearance prices. Receivers; transmitters, including KWS-1; accessories; 500W linear amplifier; Heath DX-100 kits; large quantity excellent components. 5-page list, send stamped envelope. W4LDW, 5514 N. 16th, Arlington, Va.

QRG CALIBRATION LOG BOOK: P.O. Box 123 Boston 1, Massachusetts. 43 perforated "work-sheet" 8½ X 11 band spread dial charts—26 pages illustrated text. Range .10MC to 30 MC. plus 2 and 6 meter bands. Correct wave length shown every 10KC. $2.00 USA. $2.50 Foreign.

SELL—National NC-240-D receiver with speaker, $135.00. Heath FM3-A tuner-wired, $25.00. Marc Molyneux, Jr., 106 Bienville Ave., Mobile, Alabama.

SELL MODULATION MONITOR SCOPE: 2BP1 tube. Mounted on 5¼" rack panel, $17.50. Also Deluxe Par-Metal enclosed relay rack gray, cost over $70, sacrifice for $35 or trade. Larry Kleber, K9LKA, Belvidere, Illinois.

FOR SALE: Schematics, radio or T.V. 59¢. Send make and model number. Call Book $5.00, Ham register $5.00, rands T.V.I. $1.75, 100 QSO file cards $1.00, DX QSL'S forwarded 2¢ each after membership. Free flyer. "DX radio coop" Box 5938 Kansas City 11, Missouri.

FOR SALE: National NC-200 recur. with selectable side band adaptor—$140; 4000 UCT (a) 1.75 amp. transformer with chokes—$25; G.E. Mobile transmitters 6 or 10 meters NBFM, up to 180 watts to G146's—$20 each; J. B. Compton, WB BSA, 3525 Raymoor Road, Kensington, Maryland.

FOR SALE: W3dzz Tri-Bander like new $80.00. Gonset Communicator, 3 PR crystals, crystal mike . . . $1500.00. AF67 Morrow converter 5brLN mobile mount plus antennas for 10, 15 and 20 used about 1 year, $195.00. Jack Resnick K2QPP 63-07 71 Street, Middle Village 79, N.Y. TW 4-8980.

FOR SALE [cont'd]

FOR SALE: SX99 RCUR, brand new and in excellent cond. very little use. $115.

FOR SALE: Nearly new globe chief, $48. Heath-kit VFO $15.50, S-38 $28. Going mobile. Mike, K6GCJ, 1771 Point View Street, Los Angeles 35, Calif.

FOR SALE: HQ-129X $99., HRO-60 $298. BC-794 1.2-40 mc $119. Communicator 6m 179. Communicator 2m $159., 75A-4 $495. 32V-1 $289., Gonset G77 $210., 5100-B $325. Teletype machines, converters. Trade your used ham or surplus gear (BC-221, BC-348, BC-610, R-388/URR, URA-8, etc.) for new Johnson Thunderbolt, Valiant, Hallicrafters, Hammarlund, Central Electronics, National, Fisher HI-FI, Bell etc. Write or phone Tom W1AFN, Alltronics-Howard Co. Box 19, Boston 1, Mass. (RIchmond 2-0048) Stores: 278 Friend, Boston; 60 Spring, Newport, R. I.

FOR SALE: BC 221 freq. meter, with Book, $49.59. Tube Checker and Multimeter, Excellent Cond. but old sockets to seven pin, $12.50. OAP-1 Wavemeter—Oscillator, $22.50. K6EYB, Danville, Calif.

FOR SALE: Linear amplifier hallicrafters HT-31, 500 watts new condition $200 quick sale. Joe Corbalis K2GFR, Wappingers Falls, near Beacon, New York.

COMPLETE WALKIE TALKIE OUTFIT: 2-BC 611 talkies, excellent in and out with commercial batteries, carrying bag with strap, army technical manual, tune up/test case with plate meter—antenna indicator-jack for external mike and phones, convenient holder containing 20 sets of crystals (40 units)—2 complete coil sets (24 units) plus duplicate 2 pair for 75 phone band and 2 pair of empty coils for future conversion. Stephen Lloyd Kagan, 20 Linford Road. Great Neck, N.Y. HUnter 7-1281.

TUBES: Brand new 4D32's $22.50, 4-125A $15.00, 4X150A $12.00, 3X25—A3's $60.00, 250th $17.50, 5894 $10.00, 3E29 (829B) $6.00, 832A $4.75, 2E26, $2.25, RK25 $1.50, 813 $7.50, 814 $3.50, 815 $1.75, 802 $2.00, 304TL $10.00, 304th $9.00, 2C39A $8.00, 811 $2.50, 811A $3.50, 4E27 $8.50, Collins Art-13 transmitter, excellent condition $95.00, new batteries for BC-611 $1.75 pair, 500 watt modulation transformer $38.00, 300 watt $18.00, manuals for BC-611, BC-191, SCR-625 $2.00 each. Art-13 modulaiton transformer $8.50, 115v/6000-D-6000 at 400 ma $45.00. Also H. V. chokes, condensers, plate and modulation transformers. All guaranteed C.O.D.'s OK. Bill Slep W4FHY, Box 178, Ellenton, Florida.

TRANSMITTERS, PARTS: Meters. ARC-5, 5.3 to 7.0 Mc. transmitters and VFO's, brand new $6.95. Crystals including novice frequencies $1.00. 7500 volt CT plate transformers $9.95. New I-83 dynamotor test sets with 5 meters $29.50. Parts and equipment of many kinds, write for list. Bob Woods, 2164 Parkway Drive, El Monte, Calif.

WANTED

NEED THE FOLLOWING BACK ISSUES OF CQ: November 1955, July 1956, February 1957. Will swap a brand new first MOBILE HANDBOOK, or copy of COMMAND SETS, or $1 in cash for the above three issues. Must be in good condition. Offer limited to first 100 copies. Send to CQ Magazine, 300 W. 43rd St., N. Y. 36, N. Y.

WANTED: BC-610E and Up, BC-614E and Up, BC-939, BC-221. All types of test equipment, PRC, GRC, URD, SCR. Complete sets or parts. We buy all types of electronic surplus. RADALAB, INC., 87-17 124th Street, Richmond Hills 18, N.Y.

CASH PAID FOR TG-7 and Model 15 teletype and parts. Also BC-312, BC-342, BC-610E, BC-614, BC-939, BC-221, RA-63, JB-70, JB-60 and APR-4, APR-9, ARN-6, 7 and 14, ARC-3, 21, 27 and TEST EQPT. We pay freight. AMBER INDUSTRIAL CORP., 75 Varick St., New York 13, N. Y. CAnal 6-7455.

WANTED: All types of communications receivers, transmitters, test equipment, Teletype printers, URA-8, 75A, 32V, 51J, BC-348, BC-342, BC-221, etc. Cash or trade for NEW Ranger, Valiant, Thunderbolt, HT-32, HQ-160, Gonset Fisher Hi-Fi Bell, etc. Write Tom, W1AFN, Altronics-Howard Co., Box 19, Boston 1, Mass. (Richond 2-0048, Stores: 278 Friend St., Boston, near North Station; 60 Spring St., Newport, R.I.)

WANTED: Hallicrafters portable receivers models S-72 and S-72L new or used. State condition and price. Grote Reber, P.O. Box 2, Green Bank, West Virginia.

WANTED: 500 or 600 watt multi-match modulation transformer. Also want Jennings vacuum variable 300 uuf. type UCS and three 4-250A tubes. Larry Kleber, K9LAA, Belvidere, Illinois.

WANTED: Stereo camera equipment, projector, slide trays, glass and so forth. Trade Ham gear. W9OKM, 1207 Oneida Street, Joliet, Illinois.

WANTED: Top price paid for #11A (20M) and #13A (40M) band spread coil sets (2) for national's old (DC) SW3 receiver! Hasbrouck, 1157 Palms Blvd., Venice, California.

WANTED: Millen 90811—(829B power amplifier) State condition, coils and price . . . Bob Firchau (W9TIE), 595 Bryan St., Elmhurst, Illinois.

QSL

QLS's: Samples, dime. Print Shop, Corwith, Iowa.

QSLs ? ? ? LARGEST variety, samples 25¢. (refunded) CALLBOOKS (Latest) $5. Sackers W8DED, Holland, Michigan.

DELUXE QSLS: Wm. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSL's-SWL's: High quality, reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams Street, Rutland, Vermont.

QUALITY QSL's. Samples, 10¢. Lee, W5CZA, Box 7171, Oklahoma City, Oklahoma.

QSL's-SWL's samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSL SAMPLES, Dime, refundable. Roy Gale, Waterford, Conn.

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!)

QSL's—"Brownie" W3CJI, 3110 Lehigh, Allentown, Pa. Samples. 10¢ with catalogue, 25¢.

QSL's-SWL's. 100—$2.50. Samples, 10¢. QSO file cards, $1.00 per 100. Rusprint. Box 7507, Kansas City 16, Mo.

QSL's-SWL's: That are different, colored, embossed card stock, and "Kromekote." Samples 10¢. K8AIA, Box 953, Hamilton, Ohio.

QSL's: Newest designs glossy stock 2 colors, 100 for $2.50. Sample brochure free. One week service. Box 671 Hawthorne, California.

PHOTO QSL's: samples 10¢. Summerville K8BYN Rfd 3, Niles, Michigan.

QSL's: We've printed a million. Samples 10¢. Larger quantity 25¢. Refunded. VYS QSL's, 1704 Hale, Ft. Wayne, Indiana.

QSL's: Glossy. Samples 10¢. W1OLU, Press 30 Magoun, Medford, Mass.

QSL's: for economy-minded hams. $4.65 for 500. Free brochure. K9EUF Print, 1839 46th Street, Rock Island, Illinois.

MISC.

HAMS! In central Illinois it's Knox Electronic Supply, 67 North Cherry, Galesburg, Illinois.

PRESERVE YOUR HAM TICKET, Social Security Card, small photo, passes and anything else of value that is wallet size. We will laminate it in clear plastic, guaranteed for life. Lamination will prevent it from getting torn, soiled or frayed. Send your ticket or anything of value with $1 in stamps or cash for each item that you want preserved. 24 hour service. Send to Dept. HW, CQ Magazine, 300 West 43rd St., N. Y. 36, N. Y.

For further information, check number 43 on page 126.

MISC. (cont'd.)

DECORATE YOUR CAR WINDSHIELD WITH YOUR CALL LETTERS. Attractive 1" letters and numbers available in gold or black. Complete single set 75¢, two sets for $1.25. Include name, call, address and color preference. Money refunded upon return of unused decals if not satisfied. All orders must be prepaid. Send to Box RJ, c/o CQ Magazine, 300 West 43rd St., N. Y. 36, N. Y.

RESERVE! Sunday September 7 for the Cedar Rapids Hamfest at Hawkeye Downs on highways 30 & 218 south of Cedar Rapids. There will be prizes, contests, lectures, a program for the women and the salvage store will be open. Registration is $1.50 for the men and $1.00 for the women with a special prize for pre-registration. For information and pre-registration contact Jay Spalti, WØSCM, 3239 Vine Ave., S.E., Cedar Rapids, Iowa.

V.H.F. ROUND UP: Don't forget October 11. That is the date of the Syracuse VHF Round-Up. All the big DX men will be there, so don't stay home and listen to a dead band. Contact Bob Mele, W2EMW, 18 Homeland Dr., N. Syracuse, N.Y.

WØCVU GOLD CUP given for 100th country verified Two Way SSB. Airmail your QSL. don't delay. Boegel, 1500 Center Point Road NE, Cedar Rapids, Iowa.

BOB GRAHAM: W1KTJ, (Graham Company), New England's ONLY Exclusive Ham Dealer, Handling ALL lines of new and used Amateur Equipment, is now located at 505 Main Street, Reading, Mass., REading 2-4000.

ELECTRONICS AND RADIO PHYSICISTS, ENGINEERS AND LAB. MECHANICS: The National Bureau of Standards Laboratories in Boulder, Colorado, has several professional, GS-5 to GS-13, and sub-professional, GS-7 to GS-9, openings. The work is in research and development on top national standards and instruments at frequencies to 1000 Mc. Send brief record or request for further information to Section 84.10 of the above laboratories.

ALUMINUM for every Ham need. Before you decide on that next beam or shield your rig, why not write to Dick's Cherry Ave., Route 1, Tiffin, Ohio for list of tubing, angle, channel castings, plain and perforated sheet beam kits, and VHF collinear arrays. Build it yourself and get the best for less.

SWAP OR SELL

RADIO MAGAZINES. Buy, sell, trade. Bob Farmer, Plainview, Texas.

NEED THE FOLLOWING BACK ISSUES OF CQ: November 1955, July 1956, February 1957. Will swap a brand new first MOBILE HANDBOOK or copy of COMMAND SETS, or $1 in cash for the above three issues. Must be in good condition. Offer limited to first 100 copies. Send to CQ Magazine, 300 W. 43rd St., N. Y. 36, N. Y.

SWAP GONSET 3-30 converter for 6M mobile converter. K1DEL, 32 Sigourney St. Jamaica Plain, Mass.

WINCHESTER: .30-.30, model 40 carbine, like new: But prefer good transmitter and receiver. Martin Bess, 236 N. Oakland St. Green Bay, Wis.

SWAP: Reflex and film pack camera for ham equipment. Want VFO-VHF 152A—NC183D. James E. Baker, RFD 3, Orangeburg, South Carolina.

DX [*from page 102*]

VP8CY	Mar.	VU2GE	Mar.	ZD3G	July
VQ2FC	Mar.	VU2RC	May	ZD7SA	July
VQ3DQ	May	W4FCB/KS4	Feb.	ZD7SB	July
VQ4AQ	Mar.	W4QCW	Feb.	ZK1BS	Feb.
VQ8AS	Feb.	W4WHP/KG6	May	ZM6AS	Feb.
VR1A	Mar.	WV4BW	Feb.	ZS6AQA	May
VR3O	May	XEØDOT	Aug.	ZS8R	May
VR4CW	Feb.	XEØUUE	Aug.	ZS9G	May
VR6TC	Mar.	XV5A	Mar.	3A2 Bureau	Feb.
VS1HJ	Feb.	XW8AE	Mar.	3V8CY	Feb.
VS1HS	July	ex-XW8AG	July	4W2RP	Feb.
VS1HU	Feb.	XZ2OM	May	4X4DK	May
VS1HZ	Feb.	XZ2TH	Feb.	5A5TK	May
VS9AG	Feb.	YJ1DL	Mar.	9G1BL	May
VS9AG/ZD3	Mar.	YU1UB	Mar.	9G1BQ	Mar.
VS9AJ	Aug.	ZB2R	Feb.	9G1CM	Mar.
VU2	Feb.	ZC4IP	Mar.	9K2AN	Aug.

NOVICE [*from page 94*]

Along the same line, Dave Bellama, K3BIO, 312 Euclid Avenue, Sharon, Pennsylvania designed a new plug in rf amplifier to replace the old fashioned 6D6 in his receiver. Says it made the receiver 100% better!

Dr. John E. Price, 302 First National Bank Bldg. Paris, Texas finally made the grade and holds the call K5RKF. Congratulations Doc.

Dave Runyan, KNØKZB, Box 57, Carlisle, Iowa would like to hear from more YL's in the Novice column (so would I). He has worked 45 states (43 conf.) and a good bunch of DX with a Johnson Adventurer and S-40B receiver.

Gene Williamson, KN7DBV, Rt. #1, Box 75, Shedd, Oregon operates on 40 meters with a home brew 20 watt rig and an S-38E feeding a 40 meter dipole. Gene QSL's 100%.

David Bainter, Box 70, Coal Valley, Illinois operates station KN9MXN and writes to say that he would like to see more theory in the column. This seems to be the general opinion Dave, hence the new format.

David Beck, K4PBN, Box 786, Mulga, Alabama finally made the grade after being a Novice for 11½ months. He now runs a Viking Valiant and an SX-99 receiver. Several antennas include a 20 meter dipole, folded dipole on 15, and a triplex on 40. DX so far includes 12 countries, three continents, and 44 states.

K6UMV, Don Etheredge, 14087 Herron St., San Fernando, California uses a Bandmaster transmitter, an HQ-140X receiver and a W3DZZ double antenna. As a Novice, he worked 42 states and four continents.

Robert Seputia, 1315 S. 49 Avenue, Cicero 50, Illinois would like some help converting his Globe Scout for operation on six meters. Can anyone help him?

Ed Hungness, 222 Taylor, Decatur, Illinois would like information on small space antennas for the 160 meter band. Possibly one of the General Class readers can help him out.

Jeff May, 3605 N. 12th Avenue, Pensacola, Florida had his Novice (N) 1½ months before earning the call K4RSD. With one crystal, Jeff has worked 55 countries on 20 meters! That's one of the many advantages of having a General ticket, fellows, 20 meter DX is real good.

Late arrivals vying for the 807 were:

Roger Coult, WV6AAL, 148 E. Vodden St., Rialto, California who runs an AT-1 and an SX-24 receiver. Roger will be glad to sked for any reason.

Ralph M. Quelch, WV2AOH, Box 162, Stony Point, N. Y.

Robert A. Osborne, WV2AKF, Ellis Street, Lincoln Park, N. J.

And so to close the Novice column for this month with a cheery note. When applying for WAS make sure there are 49 cards in the envelope, rather than 48.

73, Don, W6TNS

Advertising Index

Reader Service

CQ Magazine, Dept. RS
300 West 43rd Street
New York 36, New York

Reader Service Coupon I
Void after Sept. 25, 1958

Please send me information on your ads in the September 1958 CQ keyed as follows:

1	2	3	4	5	6	7	8	9	10	11	12	
13	14	15	16	17	18	19	20	21	22	23	24	
25	26	27	28	29	30	31	32	33	34	35	36	A C D E
37	38	39	40	41	42	43	44	45	46	47	48	
49	50	51	52	53	54							

Name _____ Call _____ Engineer ☐
(Please Print)
Address _____ Type of work (specify) _____
City _____ Zone _____ State _____

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WRITE FOR COMPLETE TUBE LIST
since 1945 custom service!

Tubes Wanted — **INSPECTED** "TAB" TESTED GUARANTEED

0A2	.70	6BZ7	1.25	*We Trade!*	
0A3	.85	6C4	.49	43	.75
0B2	.65	6C5	.69	45	.49
0C3	.70	6C6	1.08	50L6	.69
0D3	.70	6C8	1.08	RK59	1.39
0Z4	.60	*We Buy & Sell*		RK60	1.17
1A7	.90	6CB6	.80	HY69	2.20
1B3	.78	6CD6	1.49	75	.81
1L4	.82	6CF6	.85	HY75	5.00
1R4	5/$1	6CL6	1.40	83	.95
1R5	.78	6CG7	.89	4-65A	19.00
1S4	.78	6CG8	1.12	4-125A	29.00
1S5	.68	6CM6	.79	4X150A	38.00
1T4	.85	6CS6	.70	4X250B	41.00
1T5	.95	6CU6	1.29	4-400A	45.00
1U4	6/$1	6D6	.99	4E27A	39.00
1U5	.75	6E5	.79	250TL	19.45
1X2	.75	6F4	2.49	307A	.49
2C39A	9.00	6F5	.63	316A	5/$1
2C40	6.00	6F6	.99	VR92	5/$1
2C43	7.00	6F7	.99	350A	2.45
2C51	2.00	6F8	1.39	350B	1.75
2D21	.68	6H6	.59	368A	4.59
2E22	1.75	6J4	1.72	371B	.95
2E24	2.00	6J5	.59	434A	1.95
2E25	3.25	6J6	.59	446A	.69
2E26	2.75	6J7	.99	450TH	43.50
2E30	1.70	6J8	1.39	450TL	43.50
2E35	1.60	6K6	.59	460	11.50
2K25	13.00	6K7	.79	701A	3.95
2K26	39.00	6K8	.99	703A	1.00
2K28	30.00	6L6	1.19	707B	3.50
2V3	.50	6SN7	.72	715C	10.90
2X2	.48	6T8	.98	717A	5/$1
3A4	.70	6V6GT	.90	723AB	8.00
3A5	.55	6X5	.49	725A	2.75
3API	1.95	12AT6	.59	801A	5/$1
3BPI	1.90	12AT7	.89	803	2.00
3C24	2.50	12AU6	.63	804	8.85
3D23	4.00	12AU7	.69	805	4.75
3E29	7.00	12AX7	.79	807	1.19
3Q4	.68	12AY7	1.29	808	.85
3Q5	.86	12B4	.95	809	2.40
4-65	15.00	12BA6	.65	837	1.08
4-125	30.00	12BA7	.99	811	2.70
4-250	34.00	12BD6	.59	812	3.30
4X150	18.00	12BE6	.59	813	8.69
4X250	36.00	12BH6	.79	814	2.35
4X500	37.00	12BH7	.99	815	1.85
5API	2.95	12BY7	1.00	826	.50
5BPI	3.95	12BZ7	.99	828	7.50
5BP4	3.25	12H6	.75	829B	8.00
5CPI	1.95	12J5	.69	832A	6.00
5CP7	5.00	12J7	.69	833A	36.00
5R4	1.00	12J8	1.35	837	2/$2
5T4	1.25	12K8	.89	866A	1.50
5U4	.59	12SA7	.69	954	10/$1
5V4	.89	12SC7	.89	955	3/$1
5Y3	.65	12SF5	.69	957	3/$1
5Z3	.89	12SG7	.89	958A	.50
5Z4	1.00	12SH7	.89	991	5/$1
6A7	1.00	12SJ7	.75	1614	2.00
6A8	.99	12SK7	.75	1619	5/$1
6AB4	.59	12SL7	.79	1620	2.00
6AC7	.79	12SN7	.69	1625	4/$1
6AG5	.69	12SQ7	.69	1626	5/$1
6AG7	.97	12SR7	.69	1629	4/$1
6AK5	.69	15E	1.19	2050	1.25
6AL5	.59	15R	4/$1	5517	1.25
6AQ5	.66	FG17	3.49	5608	3.95
6AR6	1.95	19T8	1.16	5618	3.25
6AS7	3.49	24G	2.00	5651	1.35
6AT6	.49	25A6	1.19	5654	1.20
6AU6	.79	25A7	2.19	5656	4.25
6B8	1.35	25C5	.81	5663	1.15
6BA6	.59	25L6	.72	5670	1.00
6BE6	.59	25T	4.00	5686	1.75
6BG6	1.49	25Z5	.72	5687	2.25
6BH6	.79	25Z6	.75	5691	4.70
6BJ6	.72	26A7	3.69	5725	1.95
6BK7	.99	FG27	8.28	5732	2.00
6BL7	1.95	HV27	19.39	5736	85.00
6BN4	.69	28D7	.89	5749	1.95
6BN6	1.08	FG33	15.00	5750	2.75
6BN7	1.99	EL34	3.49	5751	1.25
6BQ6	1.19	35A5	.69	5814	1.20
6BQ7	.99	35L6	.59	5879	1.20
6BX7	1.11	35T	4.49	5894	$12.00
6BY5	1.19	35Z5	.89		
6BZ6	.91	RK39	2.99		

No See—Write!

"TAB" TERMS: Money Back Gtd. $2 min. order F.O.B. N.Y.C. Add Shpg. charges or for C.O.D. 25% Dep. Tubes Gtd. via R-Exp. only. *Prices shown are subject to change.*

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KITS! *Each "TAB" Kit Contains The Finest Selection*

Kit 35	Precision Resistors
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Kit 15	Volume Controls
Kit 56	Tube Sockets
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Kit 500	Lugs & Eyelets
Kit 10	Bathtub Oil Cond's
Kit 5	lbs. Surprise Package
Kit 10	Transmit Mica Cond's
Kit	Glyptal & Cement
Kit 40	Insulators
Kit 35	Power Resistors
Kit 75	Mica Condensers
Kit 5	Crystal Diodes
Kit	200ft Hook Up Wire.
4	Rolls, 50ft/ea. Asstd.
Kit 100	Fuses, assorted types
Kit 100	Ceramic Condensers
Kit 50	Coil Forms
Kit 5	Crystals & Holders
Kit 65	Inductors & Coils
Kit 5	Microswitches
Kit 10	Wheat Lamps
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Order Ten Kits We Ship Eleven!!! **ONE EACH ABOVE KIT ONLY 99c**

(SEND 25¢ FOR BONUS CATALOG!)

NEW 28VDC RELAY SUPPLIES
Cased Filtered Ready to Work

B24VAR 24VDC at 1 amp Filtered ..... $ 6
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NEW GTD. RADIO & T.V. RECTIFIERS
Postpaid 48 states orders $10.

75Ma 49c, 5 for $2; 100Ma 59c, 6 for $3
150Ma 70c, 8 for $5; 250Ma 79c, 6 for $4
300Ma 88c, 5 for $4; 350Ma $1.00, 8 for $7
400Ma $1.10, 5 for $5; 500Ma $1.35, 4 for $5
65Ma/260V $1.10@, 5 for $5; 100 Ma/260V $1.25@ *Doublers & H.V. to order*

New Silicon 500ma./280VRMS/400 P.I.V.
Hmt Sealed $1.50 @ 5 for $6.50, 40 for $46
orders $10, Postpaid 48 states

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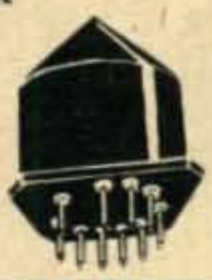

Toroid—Use as gate or counting circuit or logic drive memory device. 3 windings 200Ma/2 microseds switching tape wound core. "IBM" design, fits 9 pin miniature socket. **$1 each, 6 for $5, 15/$10 postpaid.**

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CH1029 CHOKE 8 Hy @ 750ma	$12
CH1030 CHOKE 6 Hy @ 1.25A	$18
CH1031 CHOKE 0.6 Hy @ 3.2A	$10
CH1034 CHOKE 5 Hy @ 500ma	$6
CHOKE 8 Hy @ 150ma	$2
UTC/CG40/10 Hy @ 200ma	$3 @ 2/$5
CTC/RS8150/8 Hy @ 150ma/80Ω	$3
CTC/RS8250/8 Hy @ 250ma/90Ω	$5
CTC/RS8105/8 Hy @ 105ma/100Ω	$2
STAN/C2700/2-12 Hy @ 200ma/80Ω	$6
STAN/C2701/3-12 Hy @ 350ma/80Ω	$10
KEN/T509/7-22 Hy @ 200ma/140Ω	$8
KEN/T510/6-19 Hy @ 300ma/125Ω	$9
CH1011 RCA/10 Hy @ 150ma	$2 @, 3/$5
CH1012 WSTGHSE/200 Hy @ 10ma	@ $1
CH1008 GE/MUMTL/0.5 Hy/HIQ	@ $1
CH1003 UTC/10 Hy @ 125ma	@ $2
KEN/3-14 Hy @ 1.1 Amps/5KV	$25

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Transistorized "TABPAK" Filtered Supply Small in Size! Quiet! Light Wgt. Input 12 to 14VDC (Low Idle Current) Output 450VDC & tap 250VDC @ up to 150MA/65 watts, filtered DC.

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"TAB HDQTRS FOR TRANSISTOR POWER CONVERTORS PARTS

"TABTRAN" Transistor Transformer delivers up to 450VDC & TAP at 225VDC at up to 150MA Output! 12VDC inpt.

"TABTRAN" TB450M3 and data **$14.00**
Transistor (2 Reqd) 2N77/150MA **$10.50**
or for (100ma) (2 Reqd) 2N256/ **$3.00**
Selenium Doubler—150MA/2 ..... **$3.60**
or Silicon Junction Dblrs Rectifiers 150MA/4 for **$7**

THESE ITEMS POSTPAID 48 STATES!

LOWER PRICES!!!
"TAB"—THAT'S A BUY—BARGAINS!

BC457/4 to 5.3mcs as is/good parts ... **$1.39**
AN-ARR2/RCVR as is/good parts ... **$1.79**

MODULATION TRANSFORMERS
Inpt Kenyon 6AQ5s P.P. to G of 807s/811s ... **$2**
Outpt Kenyon 250/500W—12K to 3300Ω 807s to 813s ... **$12**
Inpt 95A71 Driver 1.78 to 1/32K to 10KΩ ... **$2**
STANCOR 95A70 Output 65 to 125W/1.63 to 1/15K to 5700Ω, 807s to 813s ... **$6**
PYRANOL CONDSRS 15mfd @ 1000 VDC /330 VAC $2@, ... 6/$9
VITAMIN Q 4 mfd @ 3000VDC $5@. 2/$9
TUBULAR 4mfd/600V OIL 89c@, ... 3/$2
TUBULAR 2mfd/600V OIL 59c@, ... 5/$2
PYRANOL 1mfd/500V, 15c@, ... 10/$1
RM29 PORTABLE FIELD TEL. $5 @, 2/$8
WILLARD 6V/6AMP Plastic Battery **$3.00**
WILLARD 2V/20A. Plastic Battery **$2.50**
"ORSA" Swedish Wood Saws ... **$3**
CH SWITCH 3PDT/10Amps Hvy dty 2/$1
BANDPASS FILTERS 60 or 90 or 150 Cys ... **$1.95@**

RF-MTR GE/475 Ma & 5 Amp $4@, 2/$7
RF-METER Weston 120Ma $11@, 2/$21
DC-METER Dejur 800 Ma/3½" $3@, 2/$5
DC-METER One Ma/4" Rect $5@, 2/$8
RF-MTR Weston 750Ma ... $4@, 2/$6
DC MTR One/Ma/scale No #'s ... **$2.50**
DC MTR 100Ma/2½" ... $3@, 2/$5

TRANSFORMERS all 115V/60cy/1Ø
6V @ 8A, 5V @ 3A & 1200VCT@200ma **$5**
TPF52/778VCT @ 200ma, 5V @ 3A, 6.3VCT @ 5A $4 @ 3 for ... **$11**
TPF/540VCT @ 30ma/6.3V @ 2A ... **$2**
TPF61/500VCT @ 70ma & 6.3V @ 4A. **$3**
TPF62/550VCT @ 250ma & 6.3VCT @ 2.5A & 12.6V @ 3.5A, & 5V @ 2A **$5**
TF02/2.5VCT @ 10A/5KV ... **$4**
TR400R/2x16V @ 1A ea. ... **$3.45**
TF05/7.5VCT/12A/15KV KENYON ... **$9**
Collins CHITRAN 672N107 PRI 220V 4600CT @ 325ma. 3500CT @ 425ma. **$59**
TP514 Pri/110, 220, 440V—Secd 880VCT @ 735ma G.E./USN Acq **$90 @, $9 @ 2/$15**
TP515XP Pri/115V-Secd 2000VCT @ 700ma E/1.8Hy @ 11Ω 700ma Special **$24**
TS12 Autobooster 300W/115 to 132V ... **$3**

SELENIUM Full Wave Bridge

DC AMP	18VAC 14VDC	36VAC 28VDC	72VAC 54VDC	130VAC 100VDC
½	$1.00	$1.90	$3.85	$5.00
1	1.30	2.00	4.90	8.15
2	2.15	3.00	6.25	11.10
3	2.90	4.00	8.60	13.45
6	4.15	8.00	18.75	31.90
10	6.10	12.15	26.30	41.60
12	7.75	14.90	30.95	43.45
20	12.85	24.60	49.90	76.75
24	15.00	29.45	57.50	81.15

"TABTRAN" Rectifier Xfmrs

Sec'd Volts (DUAL†) 0-9-15-18-&-0-9-15-18. Series Sec'ds 0-3-6-9-12-15-18-21-24-27-30-33-36 Volts

TR4001	@ 1 Amp†	ea/sec/w ... $4.50
TR4002	@ 2 Amp†	ea/sec/w ... 6.90
TR4003	@ 5 Amp†	ea/sec/w ... 8.65
TR4005	@ 12 Amp†	ea/sec/wnds ... 16.70
TR4006	@ 24 Amp†	ea/sec/wnds ... 35.30
TR4007	@ 50 Amp†*	ea/sec/wnds ... 57.45

†Wndgs in Series at Ratings shown: Parallel 2X Current. Voltage output. 0-9-15-18

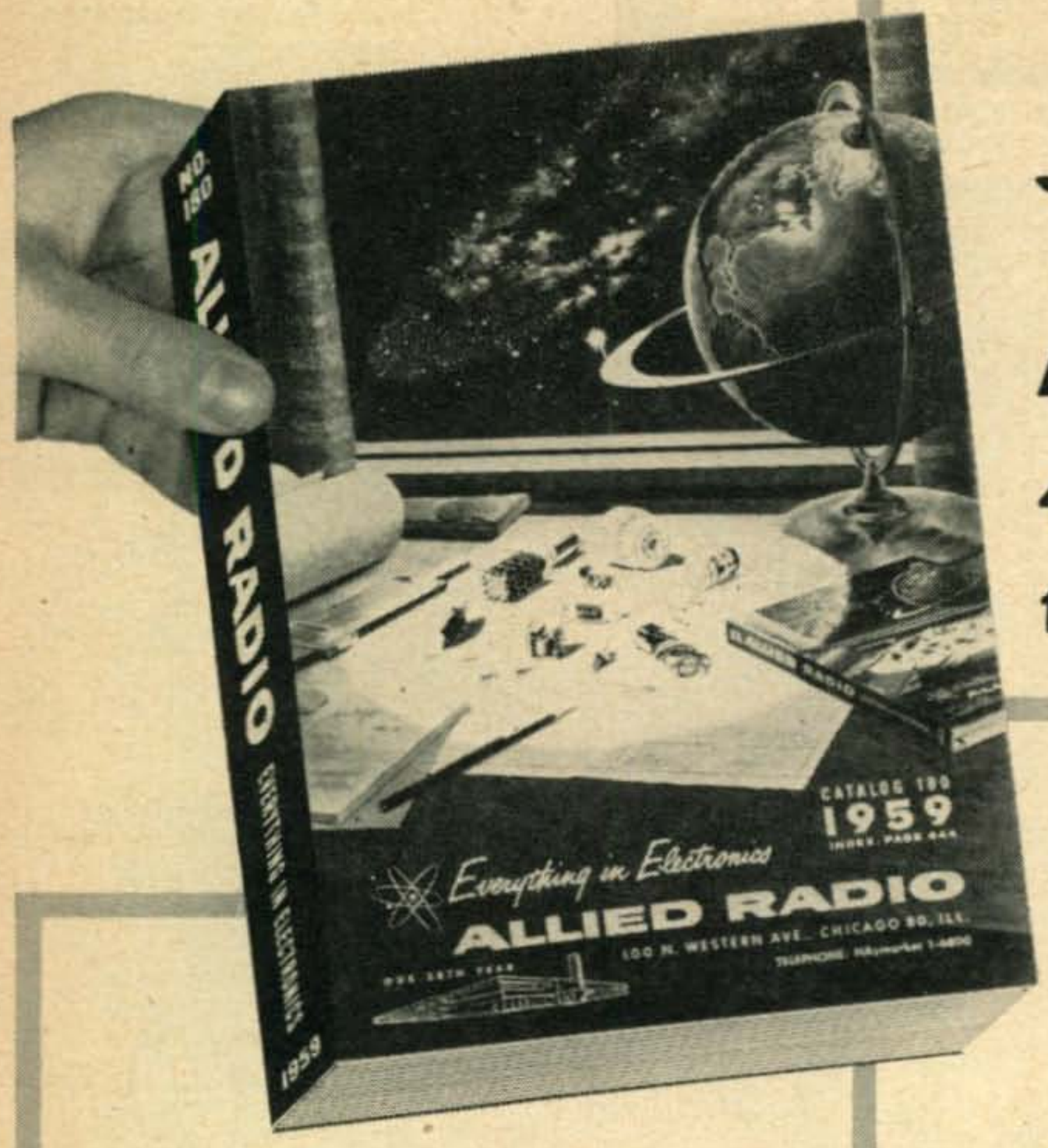
Slim Jim Dynamic Mike Hand or Std **$3.49**
Neck Mike Carbon New ... 89¢@, 3/$2
Telescoping 9 to 38" Antenna ... $1.69, 2/$3
60Mc's/IF-Strip $5; 30Mc's/As is ... **$3.00**
866A/2 Combo & Fil XFMR/7.5KV Ins **5.98**
Xmtting Mica's .006 @ 2500V. 5 for ... **$1.00**
Relay 4PDT/3Acts/12 to 24VDC $1@, 6/$5
Hvy Dty 115V/60Cy Selsyns. 2 for ... **$9.00**
Miller 2.5MH/2.5&5Mtr Chokes ... 8/$1.00
Vibrators 6 or 12VDC $1.49@; 4/ ... **$5.00**
Blower 24VDC/100CFM ... **$2.98**
Blower AC/Miniature 6&12VAC ... **$1.00**
Co-Ax Cnnctrs PL259A/SO239/40c ea. 6/$2
Battery Charger 6 or 12Volt/4A ... **$9.95**
AN Voltmeter 0-30VDC $2.49@, 3 for **$6.00**
RDZ/USN 200-400Mcs Rcvrs As Is **$39.00**

650 to 850VDC up to 450 mils POWER SUPPLY PARTS KIT includes TRANSF. RECTIFIERS, CAPACITORS & DATA 6 & 12 Volt Fil Taps. Delivers 850 VDC (no fil) SPECIAL $16 OR WE BUILD ... **$24**
Write for details

Wanted—Tubes ALL TYPES!!!

417A/5842, 723A, 723AB, 2K25, 2K39, 2K41, 2K42, 2K43, 2K45, 2K50, 3C24, 24G, 4C35, 5C22, 4X150, 6AR6, 807, 304TH, 304TL, 250TH, 450TL, 845, 866A, 866JR, 250R, 4-400 **WRITE!**

Wanted—New or Used Test Equipment.
Send 25¢ for Bonus Catalog!



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For further information, check number 48 on page 126.

On this page next month, National Company, Inc. will proudly present its most recent achievement in the art of communications receiver design.

We at National sincerely believe this new receiver to be the finest value that we have ever been able to offer. It is designed with several exclusive features . . . features we know you want. There is no compromise with quality.

I invite every radio amateur to watch for this announcement and then visit his National Company franchised distributor to see a demonstration of this outstanding new receiver. I am sure that you will agree that it surpasses everything to date.

Sincerely,

Joseph H. Quick, President

National Company, Inc.

MALDEN 48, MASS.

BURTON BROWNE/New York

For further information, check number 2 on page 126.

TOP TUBE PERFORMANCE

RCA Announces a New, Comprehensive Line of Mobile Communications Tubes for 6-cell Storage-Battery Operation.

AGAIN, RCA is FIRST—with a line of communication tubes that insures reliable service in mobile equipment operating with a terminal supply voltage *ranging all the way from 12 to 15 volts (they will take momentary excursions from 11 to 16 volts)!*

Here is a line of tubes for amateur mobile service that can take the extra plate and screen dissipation at "cruising" speeds—and yet deliver satisfactory performance at engine "idle". In addition, the 13.5-volt heaters are specifically designed and controlled to withstand the frequent "on-off" heater operation normally encountered in mobile use.

Check the list for the types you need. They're available at your RCA Industrial Tube Distributor. Tube technical data is available from RCA Commercial Engineering, Section 1-15-M, Harrison, N. J.

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RCA-7054—Power Pentode. For class C power amplifier, oscillator, frequency multiplie up to 40 Mc. Also for modulator, af powe amplifier.

RCA-7055—Twin Diode. For low-current re tifier, detector, speech-clipper.

RCA-7056—Sharp-Cutoff Pentode. For if an plifier and rf amplifier up to 45 Mc.

RCA-7057—Medium-Mμ Twin Triode. For amplifier in cascode-type circuits up to 200 M

RCA-7058—High-Mμ Twin Triode. For phas inverter, resistance-coupled amplifier, oscillator.

RCA-7059—Medium-Mμ Triode-Shar Cutoff Pentode. For oscillator-mixer at if fr quencies up to 40 Mc. Triode unit also useful f vhf oscillator and, connected as diode, for hig perveance rectifier in noise-squelch circuits.

RCA-7060—Medium-Mμ Triode-Power Pe tode. Triode useful for reactance modulato pentode for class C rf power amplifier, and fr quency multiplier, up to 40 Mc.

RCA-7061—Beam Power Tube. For af pow amplifier.

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