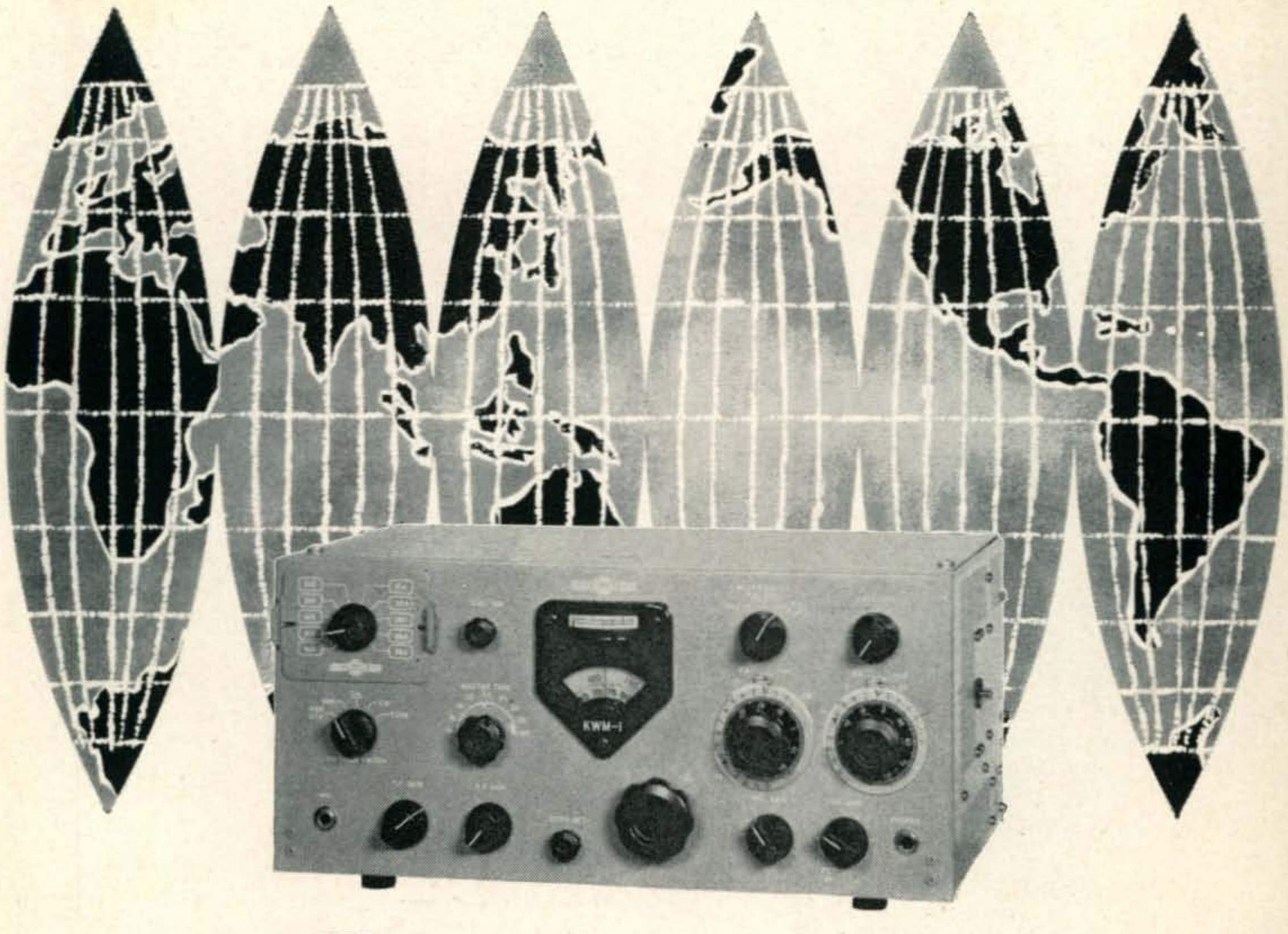
August 1958 50c

CQ

The Radio Amateur's Journal



Collins KWM-1

Favorite of DXpeditions

The versatility of the KWM-1 mobile/fixed SSB Transceiver has made it the natural choice of the amateur operator on the move. It is the most compact traveling companion available, yet it runs 175 watts input on SSB. Besides hundreds in operation from cars (and even light airplanes) all over the United States, the KWM-1 is fast gaining an impressive reputation with amateurs who take the transceiver with them overseas. Representative of areas visited with the KWM-1 are Africa, the South Pacific, Europe, South America, Canada, Greenland, Alaska, the Arctic, English Channel islands, Saint Andres Island, the Dominican Republic, Saint Martin Island and Anguilla.

The KWM-1 is also scheduled for expeditions to Galapagos, Barbados and the Boy Scout Jamboree in New Zealand and for a round-the-world cruise.

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**

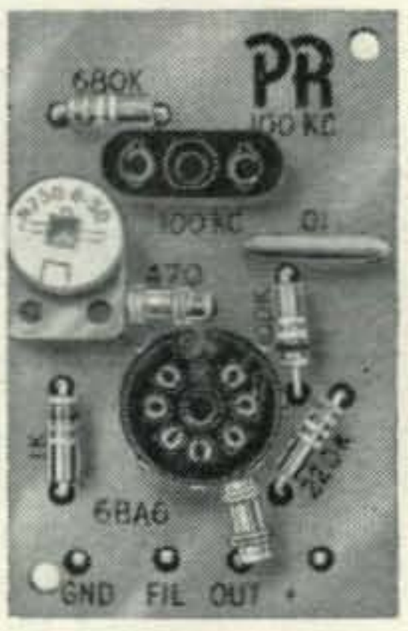
PR PRINTED OSCILLATOR KIT

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.

PETERSEN RADIO COMPANY, INC.

2800 W. BROADWAY • COUNCIL BLUFFS, IOWA

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

For further information, check number 3 on page 126.

Wayne Green, W2NSD — *editor*

Susan B. Quick, W2SLA — *assistant editor*

department editors

Tom Aalund, K2VBI — *overseas publicati*

Bob Adams, W3SW — *sideband*

Frank Anzalone, W1HY — *contest calendar*

Don Chesser, W4KVX — *dx*

Ken Grayson, W2HDM — *surplus*

Sam Harris, W1FZJ — *vhf*

George Jacobs, W3ASK — *propagation*

Byron Kretzman, W2JTP — *rtty*

Marvin Lipton, VE3DQX — *club bulletins*

Louisa Sando, W5RZJ — *yl*

Charles Schauers, W6QDV — *ham clinic*

Don Stoner, W6TNS — *novice & semiconductors*

contributing editors

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

Norman McLaughlin, W3LNT — *grounded grids*

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

Authors would do well to send for the CQ Style sheet which will explain our confused system of abbreviations and symbols. The article "Author Author" (October 1952 CQ) tells all about how to write 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.

CQ—The Radio Amateur's Journal

300 West 43rd Street, New York 36, N. Y.

August, 1958
vol. 14 no. 8

Departments

Branch Advertising Offices: James D. Summers, Suite 556, Pure Oil Building, 35 East Wacker Drive, Chicago 1, Ill. ANdover 3-1154.

Ted E. Schell, 2700 West 3rd Street, Los Angeles 57, Calif. DUnkirk 2-4889.

Charles W. Hoefer, 1664 Emerson Street, Palo Alto, Calif. DAvenport 4-2661.

publisher S. R. Cowan
production manager Bill Gardner, Jr.
circulation manager Harold Weisner
editorial production David Fish
advertising representative Jack Schneider
advertising representative Dick Cowan
classified advertising Phyllis Gelfand

CQ—(title registered U.S. Post Office) is published monthly by Cowan Publishing Corporation. Executive and editorial offices at 300 West 43rd Street, New York 36, N. Y. Telephone JUdson 2-4460. Second Class Mail privileges authorized at New York, N. Y.

SUBSCRIPTION RATES: U.S.A. and Possessions, APO, FPO, Canada and Mexico: one year $4.00; two years $7.00; three years $10.00. Pan-American and foreign: one year $6.00; two years $11.00; three years $16.00.

FOREIGN SUBSCRIPTIONS: Great Britain: RSGB, New Ruskin House, Little Russell St.; London WC 1, England. Australia: Technical Book Co., 297 Swanston St., Melbourne C 1, Victoria, Australia.

Postmaster: Send Form 3579 to CQ, 300 West 43rd Street, New York, N. Y.


CLELL K8DKY


DAR K8ADS


DICK K9BMJ/8


DOUG K8GNA


AL W8HTX


REX K8GND


FRED K8GMY


ERNIE W8VPN


WAYNE W8YRW


FRANK W8WUN


AL K8BLL

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

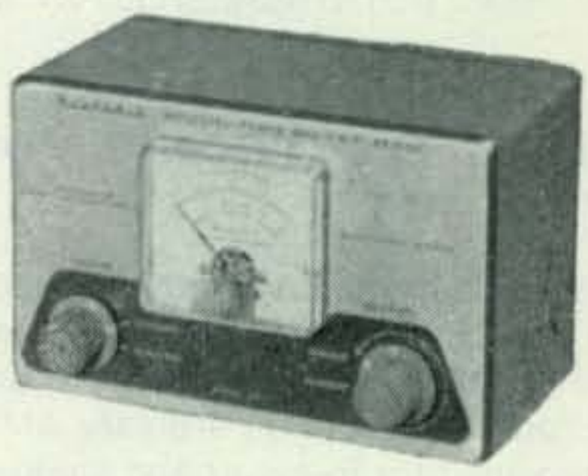
VARIABLE FREQUENCY OSCILLATOR

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



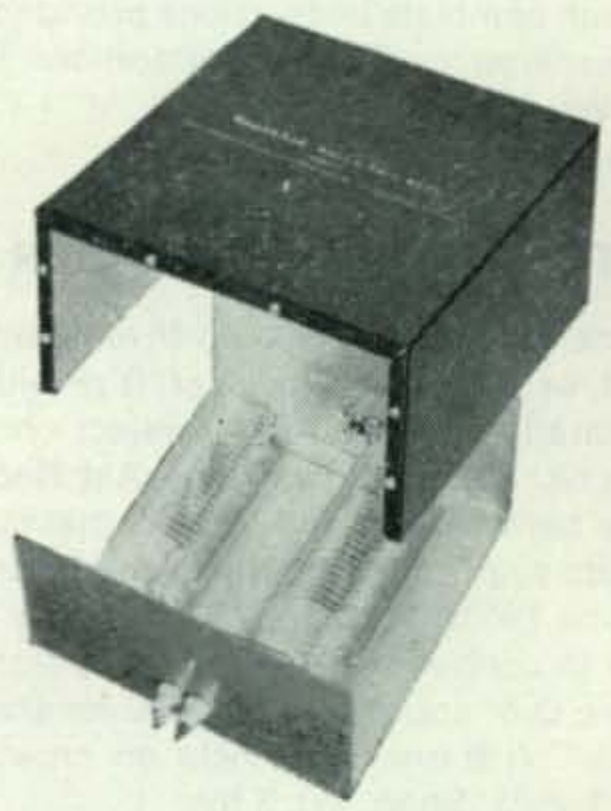
REFLECTED POWER METER

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.

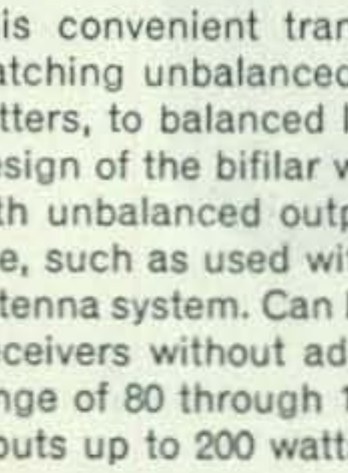
MODEL B-1

$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

Washington, August 15, 16, 17

Hot poop from convention HQ via W4AHG, the convention manager, indicates that this will probably be the biggest and best ARRL National ever run. If you'd like to get a brochure on it drop a card to the Amateur Radio Convention, Sheraton-Park Hotel, Washington, **D. C.**

Some of the features will be: free coffee and donuts courtesy Philco Tech-Rep Division, prizes for the ladies (including a mink scarf), nursery for the babies, tours everywhere for all hands, lunches and dinners for the DX'ers, SSB'ers, RTTY'ers, military, League Officials, and QCWA'ers. There will be special FCC exams, code contests, mobile installation contest, QSL contest, all sorts of awards and prizes, a daily edition of Auto-Call, talks by: W4HEL of CREI, W3MEG of NRI and W1ICP of ARRL for the Novices; W1FZJ moderates the VHF session, W1RUD talks and shows slides on the fantastic W1MHL/1 contest operation and W1HDQ moderates a VHF discussion; W3QQH of Phil-Mont describes their mobile unit, W4QS discusses antenna problems, W4NJF and W3NL round out the mobile session; TVI is covered by W1DBM and an FCC representative; SSB'ers will hear W4QS and representatives of almost every company in the SSB field. I just gave call letters because you should know all of those fellows.

Contests will be discussed by W2IOP, W4KVX, WØCDP, and W2ZDP. RTTY'ers will hear W2JAV, W3PYW, and WØBP. The DX session will be of real interest, featuring W2ICE, W2NSD (with movies of Navassa), W6KG and W1WPO (ARRL). The Public Relations Session will have W2KH and W3YA.

All in all it will be a busy three days and should be a memorable one for you. It is a bit expensive, but then something like this happens only once every few years so it'll be worth it.

CQ'll have a booth there with the usual low-low-low convention subscription prices and fast talking editor to con you into jumping aboard before the impending rate increase.

Rallies

The "Ohio 24" Sports Car Club of America National Rally used ham radio for communications at check points as described in an article in this issue. The Washington Mobile Club has provided similar service down their way in the past. Just recently I participated in the latest SCCA National Rally, the "Historic New York" Rally which was run out of Syracuse, and found several hams involved in the event. I was car #77 and W2GNT had car #76. Communications head of the rally was W2PXA and W2HUA ran the Precision Driving Test.

While in Syracuse for the rally I tried out my Gonset, but got nothing but a severe case of the frustrations trying to get the attention of the local gang who operated all on one frequency and never, even when they signed off, tuned the band. I had disabled the Transcon-6 in the car since rally rules state that no car can have two way radio so I didn't get a chance to try that band out.

The national SCCA rallies are really tough, but they are fun and I think I'll keep at 'em. The next one will be the Berkshire Rally up in Massachusetts in August, the weekend after the Washington convention.

Who? Me?

As editor of CQ almost everyone expects me to be anti-ARRL. Sure, CQ is in a way a sort of competitor of QST and I could understand if I were expected to be anti-QST, but how come I'm supposed to be against ARRL? After all, it is the *only* national ham club that we've got and the club does do a lot of good for the hobby. It performs many services for us, many of which are overlooked when some argument comes up over a difference in policy on some one specific point.

Plus my own membership in ARRL for over twenty years now. And, with almost half of the hams being members of ARRL, a considerable number of them having spent several years working their way up into the vast network of appointed and elected offices, it would certainly be imprudent for me to be anti-ARRL.

Further, I well remember the explosion that erupted when a former editor of CQ started printing some facts about the ARRL about five years ago. The mail soon made it obvious that in general the amateurs didn't want to know what was going on. They wanted to preserve the illusion that they were members of a vast omnipotent organization. It is a nice feeling and I don't blame anyone for wanting to keep it. So I understand their resentment when some scoundrel comes along intruding some "facts" that they don't want to hear and won't believe.

[*More on page 10*]

W2NSD [*from page 9*]

You can therefore understand why, when I took over as editor of CQ, that I decided to just run a magazine dedicated to acting as a communications medium for hams and leaving ARRL alone as much as possible. QST seemed to lean heavily in the direction of traffic nets and technical discussions so I figured that CQ would be of more value if it left this aspect to QST and aimed more at build-it articles and items of good general interest plus a strong set of reporters for the many facets of our multi-hobby.

That's my policy gentlemen. It has been really difficult at times to keep my typewriter shut. Andy, W3NL, in his "Autocall" bulletin is able to tell what is going on without fear of losing advertising and subscriptions and that is the only source I know of for straight dope on things.

Some day, perhaps, we'll be able to let you know what is happening. In the meantime please remember that when it comes to the matter of FCC legislation you have to speak for yourself and send your comments directly to the FCC. While it is true that the comments of ARRL and other clubs will be considered, the main source of information for the FCC on how the amateur really feels about a proposal is reflected in the direct letters received.

CW Bands on Two and Six

The FCC has announced that a petition has been entered to set aside the bottom 100 kc of both two and six meters for exclusive cw operation. The FCC asks that you write to them and give them your feelings on this proposed legislation. The address is FCC, Amateur Division, Washington 25, D. C. The deadline for comment is August 29th so you haven't much time.

If you are a two or six meter operator you will probably have some strong views on this gem. Let's examine the situation a moment and see just who this rule is going to benefit. The greater majority of operators in those bands are using low power equipment and never use cw at all. A lot of 'em couldn't even copy cw on their bfo-less receivers. A very select few, under extraordinary conditions, do fire up on cw to take advantage of weak F-layer propagation which is the result of the temporary sunspot splurge. Even so we find that nothing has been worked on cw that hasn't been worked on phone already. All the DX records have been made on phone.

What does this mean? Well, in a year or so when the sunspots drop off and the bands again become local bands the fellows who sat around and used the band for rag chewing will still be there and the cw men will be gone to greener pastures, only everyone will have lost 100 kc of their band.

I have been operating on two meters ever

[*Still more on page 118*]

One Thing is *Crystal Clear*–Your Signal

HT-32
transmitter/exciter

Exclusive HT-32 High Frequency Crystal Filter System a major, proven advance... cuts unwanted sideband at least 50 db.

Now Proven superior — vastly superior to any other type filter—is Hallicrafters' exclusive 5.0 mc. quartz crystal filter system.

Result of a three-year research program, the system makes possible, for the first time, *high frequency filtering*. Result: unprecedented rejection of unwanted sideband—50 db. or more—and the *cleanest signal of all*, bar none.

This and another major technical advance—Hallicrafters' exclusive Bridged-Tee Modulator—make the HT-32 the most wanted SSB transmitter in history.

Export Sales: International Operations
Raytheon Manufacturing Company
Waltham, Massachusetts

Compare these features

- **5.0 mc. quartz crystal filter cuts unwanted sideband 50 db. or more.**
- **Bridged-Tee modulator; temperature stabilized and compensated.**
- **SSB, AM or CW output on 80, 40, 20, 15, 11-10 meter bands.**
- **High stability, gear driven V.F.O.**
- **144 watts peak power input.**
- **Distortion products down 30 db. or more.**
- **Complete band switching.**

Proof of the HT-32's superiority is heard on ham bands night after night. Listen. You won't be satisfied with anything but the cleanest signal on the air. *The HT-32 is available with convenient terms from your Radio Parts Distributor.*

Approved by F.C.D.A.

The new ideas in communications are born at . . .

In our 25th year of service

hallicrafters
Chicago 24, Ill.

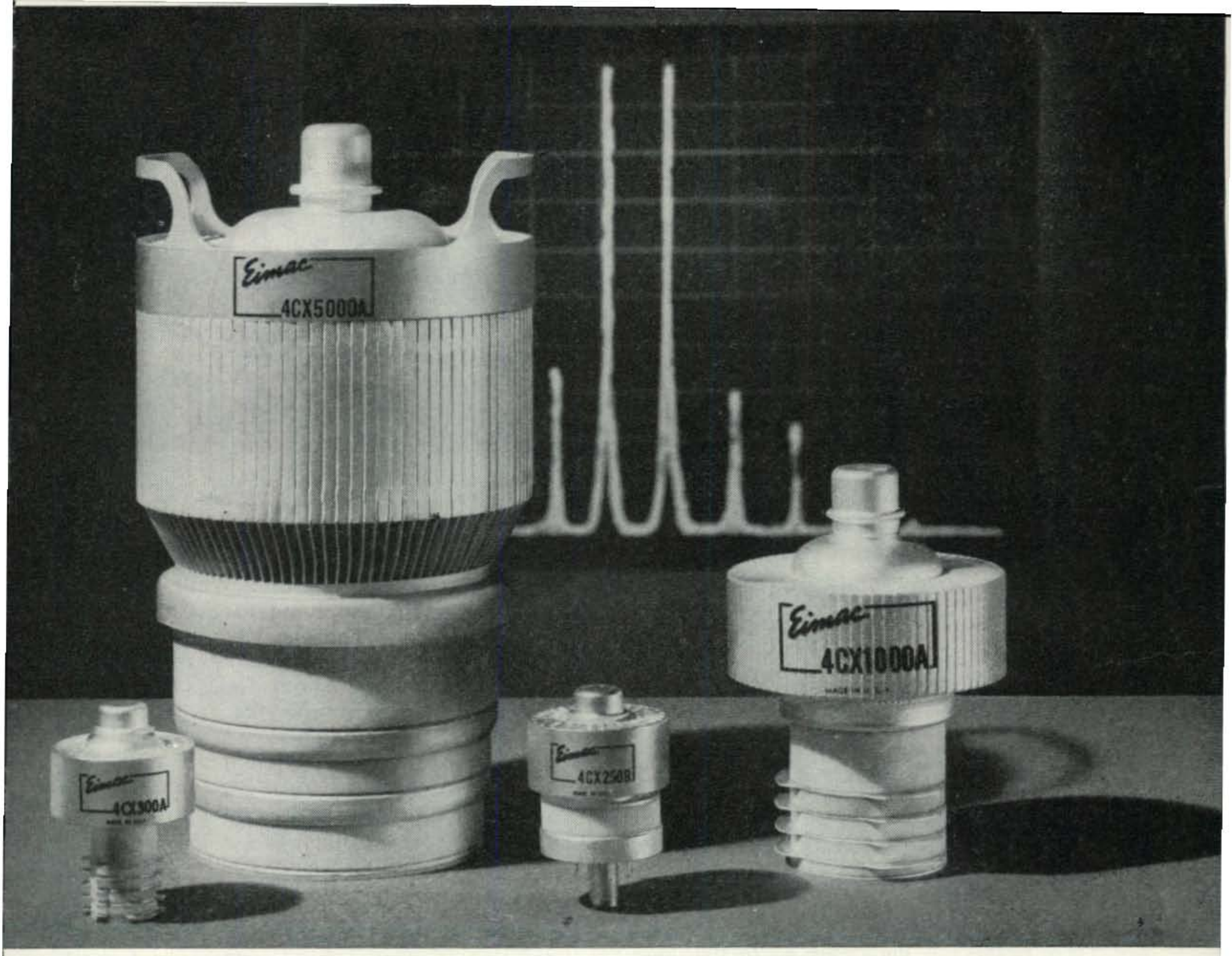
QSL contest

WINNER

LOSERS

Ernst Salvetti, HB9KV is the winner of this month's one year subscription to CQ . . . that's what you win if we think your QSL card is the most interesting one we've received since last month's deadline. Losers whose QSLs are almost-but-not-quite-winners receive a free copy of the magazine. This time they go to Jan Johansson, SM1AS; David Sussman, 5A2TA; and Charles "Chuck" Mooney, K8EWK.

Each month is a new contest and you can enter every month if you can afford the postage. All cards are eligible except those bearing commercial messages, individual handmade cards (they must be reproduced by graphic processes) and picture postcards with calls *emblazoned* in bright red nail polish. Now if there's still a spark of competitive enthusiasm left in you . . . send in that QSL.



The Ideal Approach to SSB . . .

Eimac Ceramic Tetrodes for Class AB_1

Generating a clean SSB signal is one thing . . . amplifying it to the desired power level without distorting or broadening it is another. A modern class AB_1 final amplifier designed around an Eimac ceramic-metal tetrode is the ideal answer to the problem. Three of the four Eimac ceramic tubes shown above — the 4CX250B, the 4CX300A and the new 4CX1000A — are ideal for amateur radio application. All four offer the high power gain, low distortion and superior linear performance that is needed for class AB_1 operation. Each has performance-proved reserve ability to handle the high peak powers encountered in SSB operation. Efficient integral-finned anode cooler and Eimac Air System Sockets keep blower requirements at a minimum and allow compact equipment design. And all four incorporate the many advantages of Eimac ceramic-metal design, which assures compact, rugged, high performance tubes.

The reliability and performance that make Eimac ceramic tubes the choice for government and commercial transmitters can be yours in a compact, SSB tabletop kilowatt or a deluxe mobile rig. Eimac ceramic tetrodes simplify design and give more watt-hours per dollar.

For a copy of Application Bulletin #9 "Single Sideband" write our Amateur Services Department

EITEL-McCULLOUGH, INC.
SAN BRUNO · CALIFORNIA

Eimac First with ceramic tubes that can take it

For further information, check number 8 on page 126.

CLASS AB_1 SSB OPERATION

	4CX250B	4CX300A	4CX1000A	4CX5000A
Plate Voltage	2000 v	2500 v	3000 v	7500 v
Driving Power	0 w	0 w	0 w	0 w
	325 w	400 w	1680 w	11,000 w

Feenix, Ariz.

Deer Hon. Ed:

You knowing the old saying, To Heds Are Better Than Having Fun? Well, that are not old saying that applying to Scratchi resently. No sir indeedy. The one I having trubble with are To Many Cooks Spoiling the Appetite—and I not talking about food. Or about appetites. Or even about cooks. Just talking about to many peepels when they not expected.

Let me explaneing what happening. I been trying to convincing local amchoors to coming to Hamfest I wanting to holding. Like having in yeers before—fun, frolic and plenty cacktus jooce. Howsumever, evrybuddies claiming I charging to much last yeer, so they saying they not coming.

So, one day I on to meters band talking to local amchoor frend about Hamfest I not having. He saying it to bad we not having it. Of coursely, he feeling that way on acct. he feller what having cacktus jooce consesshun if Scratchi holding Hamfest, and therefore he wanting to make cupple bux to.

I telling him that the local amchoors are stubborn mules, and he coming back and saying maybe we should getting load of hay and having Hamfest for them. I going back and saying that we needing cupple loads here at Hon. Brother Itchi's ranch. We both laffing, passing back and forth few more plesentrees, then sineing.

Leeving shack, walking out around ranch, looking over places where would putting things if ackchewally having Hamfest. Finding nice place to having toob throwing contest. That always worth millyun laffs. Also finding nice spot to holding coil unwinding contest. This not being to much fun, but Scratchi getting to keeping all the wire.

Also desiding where to hold cacktus jooce contest. Will having it rite next to swimming pool, so not have to running after chasers all day. Are just abouts to go back of barn to seeing where can holding antenna ereckshun contest, when truck pulling it driveway, and guy getting out and asking me where I wanting load of hay.

I telling him he making mistake, we not

[*Continued on page 96*]

A Clean Sweep in Every Class!

HAMMARLUND

Established 1910

HQ-170

TRIPLE CONVERSION SSB AMATEUR RECEIVER

All the best features of the finest SSB converters, plus the best features of the finest amateur receivers wrapped up in a single, outstanding receiver. Covers the 6, 10, 15, 20, 40, 80 and 160 meter amateur bands. Separate vernier tuning. Dual and triple conversion 17-tube superheterodyne. Adjustable 60 db notch filter. IF passband tuning. Adjustable AVC.

$359.00*

HQ-160

GENERAL COVERAGE

Compares with receivers costing hundreds of dollars more! Dual conversion. 540 KCS to 31 MCS. SSB. Q-multiplier. Electrical bandspread. Separate stabilized BFO. Crystal-controlled 2nd IF. Crystal calibrator. Adjustable 60 db notch filter. 13-tube superheterodyne.

$379.00

HQ-110

AMATEUR RECEIVER

Dual conversion, 12-tube superheterodyne. Full coverage of 6, 10, 15, 20, 40, 80 and 160 meter amateur bands. Built-in crystal calibrator. Q-multiplier. Separate linear detector for SSB and CW. Separate stabilized BFO. Crystal-controlled 2nd conversion oscillator. The set that revolutionized the amateur receiver market!

$249.00*

HQ-100

GENERAL COVERAGE

The hottest, fastest-selling general coverage receiver on the market! Continuous tuning from 540 KCS to 30 MCS. Electrical bandspread tuning. Q multiplier for continuously variable selectivity, 10-tube superheterodyne with automatic noise limiter.

$189.00*

*Telechron clock-timer, $10 extra.

Write For Complete Details . . .

HAMMARLUND MANUFACTURING COMPANY, INC.

460 West 34th Street, New York 1, N. Y.

For further information, check number 10 on page 126.

CLUB BULLETINS

by MARVIN D. LIPTON, VE3DQX

311 Rosemary Road, Toronto 10, Ontario, Canada

This month CQ NEWS, our monthly news release, will carry an "on the spot" report from the National Convention in Washington, D.C. The 114 affiliated club papers of the *CQ* News Service will have this report at their disposal, and will be capable of providing their readers with first hand news of the Convention happenings. Full credit for this scoop goes to our Washington correspondent, Ralph "Andy" Anderson, W3NL, editor of *AUTO-CALL.*

On many occasions in the past *CQ* has carried short excerpts from *AUTO-CALL. AUTO-CALL* has also been quoted several times in *CQ NEWS* and other Ham papers. The Washington Mobile Radio Club, in conjunction with 8 district clubs, produces the journal which usually runs 30 pages. It is mailed to 600 separate addresses monthly and it covers just about every phase of Ham Radio. Mr. Anderson, an avid Ham and editor, is extremely busy with Convention preparations and special plans to run a daily copy of *AUTO-CALL* during the August "get-together." By taking time to write a special report for *CQ NEWS*, Andy is being exceedingly co-operative. By exercising such a policy he has made *AUTO-CALL* one of Hamdom's finest club periodicals.

During the past month we have welcomed these publications to our ranks: *DELAWARE STATION BREAK*, Kent County A.R.C., *THE LISTENING POST*, Queen City Emergency Net, *GRID DIP*, Ham Club, *PEORIA AREA HAM NEWS*, Peoria Area A.R.C., *CONNECTICUT PHONE-PATCH*, Connecticut DX Club, CQ-TV, British Amateur TV Club, *SYDNEY A.R.C.*, Assoc. member, *HAWK'S EYE VIEW*, Hoosier Amateur Women's Club, *FORWARD GAIN*, Norwich & Dist. R.C. (England), *CENTRAL MASS. A.R.A. BULLETIN*, Central Mass. A.R.A., *HAMATEUR CHATTER*, The Milwaukee R.A.C., Inc., and *FEEDBACK*, Mike & Key A.R.C.

Syndicate gossip: R. S. Barnes, WØHAJ, editor of CKRC INK, Central Kansas R.C., resigned to accept a business promotion. Dick Van Wickle, W6TKA, familiar to *CQ* readers, is now editing KEY KLIX, Santa Barbara A.R.C. Inc. E. L. Sringer, editor, *LOUDSPEAKER*, San Gabriel Valley A.R.C. Inc., leaves his position on the club bulletin to assume the presidency of the organization. The North Hills A.R.C., in the *NORTH HILLS R.C. NEWS*, outlines an award for club mem-

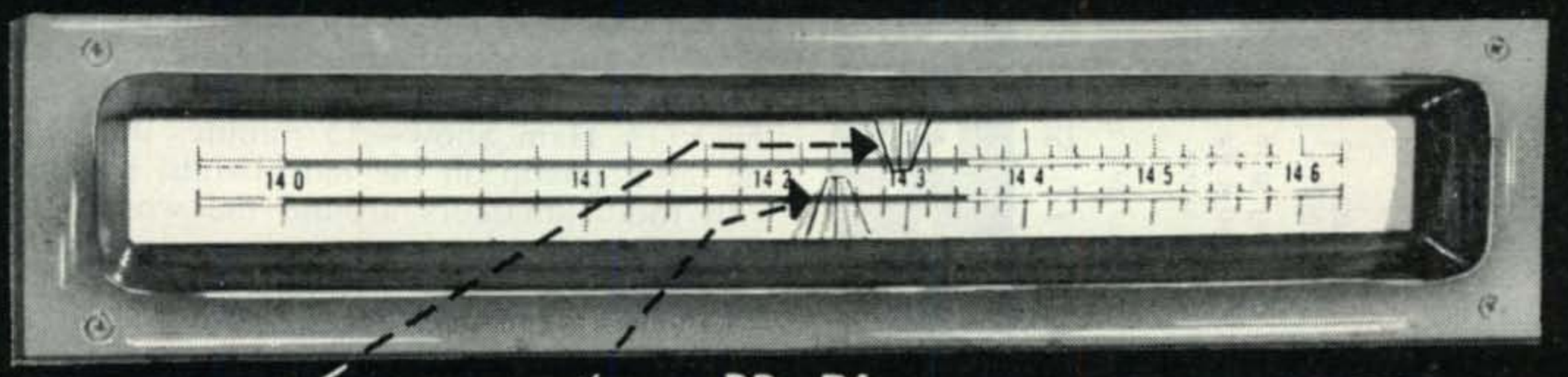
[Continued on page 106]

←For further information, check number 11 on page 12

BECAUSE IT'S SO REVOLUTIONARY

we'd like to explain the four modes of operation of the

COSMOPHONE "35"



SPECIFICATIONS

- Operates on 10, 11, 15, 20, 40 and 80 meter bands.
- Transmits or receives SSB (upper or lower), single sideband with carrier (AM) or C.W.
- Peak-Null "Q" Multiplier.
- Receiver Sensitivity: 1 Micro-volt @ 6 db S/N ratio.
- Single 6146 output.
- Built-in VOX and QT.
- 40 db suppression.
- 3.1 kc mechanical filter for transmission and reception.
- Dual speed tuning knobs with ratios of 20:1 and 100:1 over a 600 kc band spread.
- Meter Indication for R.F. output, final Grid or Plate current and receiver signal strength.
- Dimensions 17" wide x 12" high x 15" deep.

Amateur Net Price

$799.50

Power Supply #P35

$139.50

The Cosmophone "35" is a complete amateur station. It functions as either a 2-channel bilateral transceiver or as 2 independent transmitter-receiver combinations.

HERE'S HOW . . .

1. Set tune selector switch to RA TA. Tune channel A to desired frequency. Peak transmitter. You are now set for the single channel transceiver operation.

2. Set tune selector switch to RB TA. Tune channel B to foreign DXing station. Tune channel A to any desired frequency inside the American ham band. You are now set to transmit inside ham band and receive DXing stations outside the ham band.

3. Set tune selector switch to RA TB. The same tuning procedure applies as to Mode 2 except channel A and channel B are now reversed.

4. Set tune selector switch to RB TB. The same tuning procedure applies as to Mode 1, except you are now transceiving on the channel B frequency.

By alternating between RA TA and RB TB you can maintain contacts with two nets without disturbing any frequency settings.

See the COSMOPHONE 35 at your distributor

For additional information and dealer nearest you, write Dept. Q4

COSMOS INDUSTRIES, INC.

31-28 Queens Boulevard, Long Island City, N. Y.

For further information, check number 12 on page 126.

VOICE OF AMERICA AMATEUR RADIO PROGRAM

CQ, CQ, CQ to all radio amateurs and shortwave listeners from the Voice of America. Each week the Voice of America broadcasts the VOA Ham Show—15 minutes devoted to the latest gossip on the ham bands, interviews with radio amateurs around the world, latest propagation forecasts, and discussions of the latest technical news of interest to radio amateurs and shortwave listeners.

The broadcasts, in the *English* language, are written and voiced by Bill Leonard, W2SKE, one of America's leading news commentators, and a very active radio amateur operator. Gene Kern, W2BAK, produces the program, and propagation forecasts are by George Jacobs, W3ASK, with radio amateurs *everywhere* invited to participate.

Beamed to Europe, but receivable in most areas of the world, the VOA Ham show can be heard as part of the "Report From America" broadcasts *each* Tuesday on the following frequencies during the spring and summer months:

Between 2100-2130 GMT (4-4:30 P.M. EST)

21580	kc	Tangier
21500	kc	WDSI, USA
21485	kc	WLWO, USA
17785	kc	WDSI, USA
15340	kc	Munich
15250	kc	WLWO, USA
9635	kc	Tangier
6170	kc	Munich

The show is repeated at 2200 GMT (5 PM EST) from Munich, Germany on 15340 and 6170 kilocycles. At 2230 GMT it is transmitted on the 1,000 kilowatt longwave (173 kilocycles) station of the VOA located near Munich, Germany. It is repeated again at 0400 GMT (11 PM EST) every Wednesday from Tangier, Morocco on 17710 and 11875 kilocycles.

Since shortwave schedules are subject to change, latest schedules can be obtained directly from:

Amateur Radio
Box 922
Washington 4, D. C.

The VOA has prepared a distinctive QSL card for exchange with listeners of the Ham Show, and W2SKE and the gang are looking forward to receiving QSL cards from radio amateurs and shortwave listeners *everywhere*. ■

For further information, check number 14 on page 126.

International's

NEW 1958 *Catalog!*

NOW AVAILABLE

Precision CRYSTALS and **Electronic EQUIPMENT**

Send for your FREE copy . . . Today!

Ask About the NEW

FCV-2 CONVERTER

Model 50

6 Meters

Model 144

2 Meters

and other PRINTED CIRCUIT UNITS

- *T-12 12-Watt Transmitter*
  3500-4000 KC 7000-7300 KC
- *VFA-1 Cascode Preamplifier*
  For 2 Meters or 6 Meters
- *IFA-10 IF Amplifier*
  For Use Between Converter and Receiver.
- *FO-1 Printed Circuit Oscillator*
  For Generating Spot Frequencies with Guaranteed Tolerance from 200 KC to 60 MC.
- *FO-1L 100KC Oscillator*
  For Band Edge Calibration and Frequency Standard Use.
- *FMV-1 10 KC Multivibrator*
  Used with FO-1L Oscillator
- *FO-6 Oscillator and Buffer Assembly*
- *C-12 Alignment Oscillator*
  12 Most Used Frequencies Instantly Available. 200 KC to 60 MC.

ONE DAY *Processing!.*

FA-9 CRYSTALS

For AMATEURS—EXPERIMENTERS 1500 KC to 50 MC

Wire mounted, plated crystals for use by amateurs and experimenters where tolerances of .01% are permissible and wide range temperatures are not encountered.

CIRCUIT: Designed to operate into a load capacitance of 32 mmf on the fundamental between 1500 KC and 15 MC. Designed to operate at anti-resonance on 3rd overtone modes into grid circuit without additional capacitance load. 5th overtone crystals designed to operate at series resonance. **(Write for recommended circuits)**

Prices Pin Diameter .093"
Pin Spacing .486

(FA-9 Fits Same Socket as FT-243)

FREQUENCY RANGE	TOLERANCE	PRICE
1500-1799 KC	.01%	$ 4.50
1800-1999 KC	.01%	4.00
2000-9999 KC	.01%	3.00
10000-15000 KC	.01%	4.00
Overtone Crystals—3rd Overtone Operation		
15 MC-29.99 MC	.01%	$ 3.00
30 MC-54 MC	.01%	4.00
Overtone Crystals—5th Overtone Operation		
55 MC-75	.01%	4.50
76 MC-90 MC	.01%	6.50

PRECISION CRYSTALS

COMMERCIAL USE

F-6 SERIES
1500 KC — 50 MC

NOTE: The FA units will not necessarily have the correct correlation for Commercial use.
For commercial applications, the F-6 type unit should be used. Write for details!

One Day Service! Specify exact frequency and crystal will be calibrated to .01% or better of this frequency, when operated in the specified operating circuit.

International Crystal Mfg. Co. Inc.

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

For further information, check number 15 on page 126.

For further information, check number 16 on page 126.→

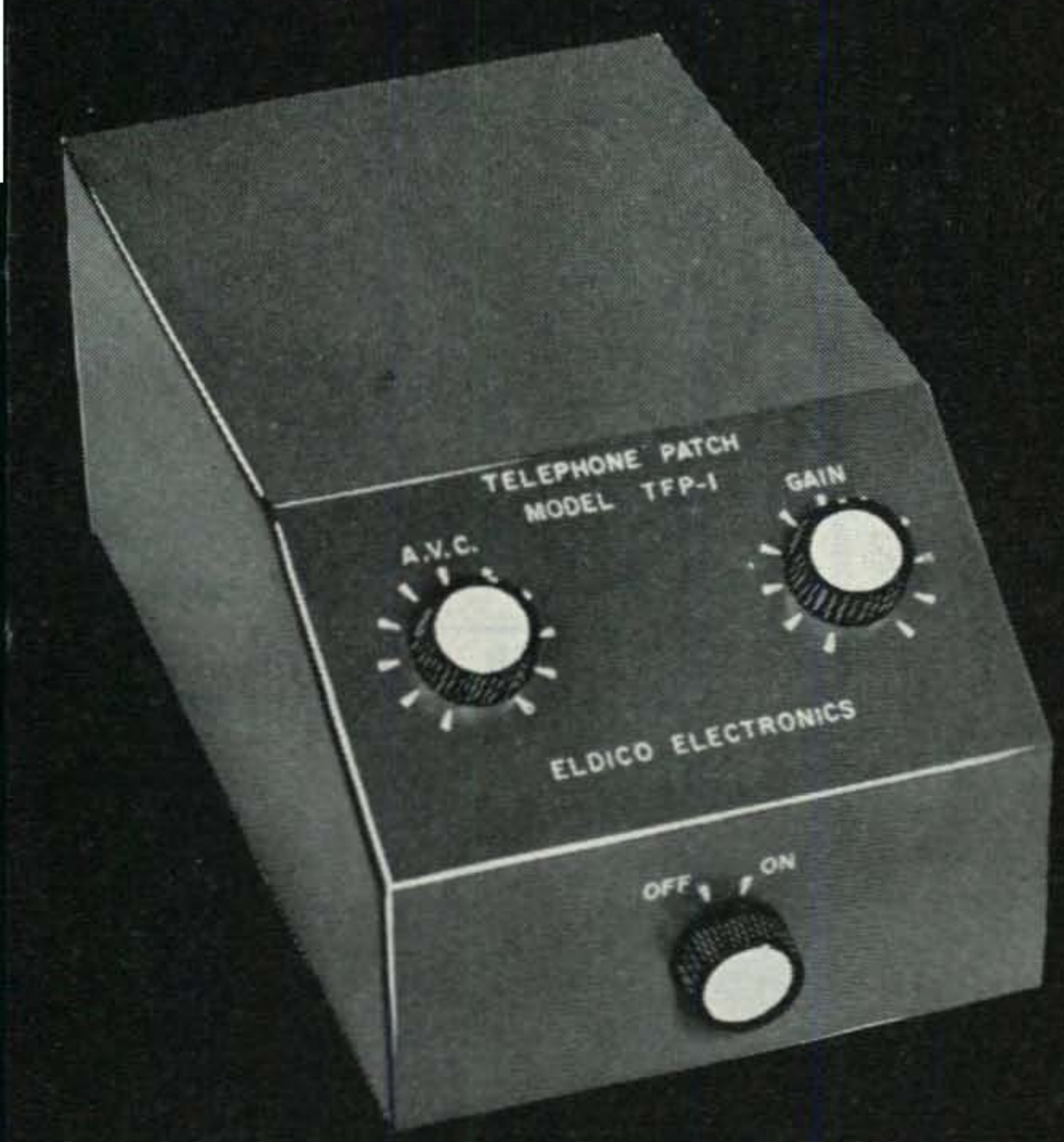
TWINS!

For the C.W. man . . .

EE-3A

The newly improved model of the famous ELDICO electronic key — acclaimed by beginner and old-timer alike! Self-completing type: complete dot or dash plus space are perfectly formed once the character has been initiated and released . . . will make your CW keying sound like tape! ELDICO features include audio oscillator and speaker for monitoring, receiver audio muting circuit for break-in operation, volume and tone controls, and speed control for 5 to 50 WPM continuously variable. $79.95

For the phone man . . .



TFP-1

Transistorized, hybrid-type phone patch for automatic operation of transmitter by either local or remote telephone voice, with both telephone signals held at the same level by means of an AVC amplifier and limiter. Very low drain on the self-contained battery gives extra long life. Speaker and microphone switching is provided. RF filtering and complete shielding insure against RF feedback. $79.95

For further information
see your dealer,
or write
ELDICO direct.

ELDICO ELECTRONICS

29-01 BORDEN AVENUE, LONG ISLAND CITY, NEW YORK

A Division of Radio Engineering Laboratories, Inc.

For further information, check number 17 on page 126.

NEW GONSET SSB GSB-100 TRANSMITTER

Introducing Gonset's big SSB value, the GSB-100. Completely self-contained with highly stable VFO and power supply, for operation on amateur 80, 40, 20, 15, 11 and 10 meter bands.

- Power input of 100 watts — average maximum, single tone basis.
- Operates on SSB with selectable sidebands.
- Operates also on AM, phase modulation or CW. Keying characteristics are excellent.
- Transmits both sidebands when on AM . . . avoids thereby, distortion present when carrier-and-one-sideband signals, at high modulation percentages, are received on conventional AM receiver.
- Frequency control is by fixed quartz crystal and exceptionally stable VFO *. Precise tuning is assured by dial assembly having gear ratio of 100:1.
- New Gonset FILTER-PHASING network gives excellent sideband rejection— quartz crystal band-elimination filter gives more than 60 db carrier suppression, avoids entirely all critical carrier balancing.
- Frequency coverage is full 600 kcs. within all amateur bands, 80 through 10 meters.
- Excellent voice operated control system (VOX). Biasing voltage is available for cut-off of external linear amplifier when receiving.

GSB-100 Transmitter . . . . . Model #3233

*11 meters and CW portion of 10 meter band covered by separate crystals not supplied.

SSB LINEAR AMPLIFIER

New grounded grid linear amplifier is rated at 750 watts peak input power (single tone basis). It is designed to operate with GSB-100, or similar SSB transmitters supplying 75-100 watts peak power drive. Amplifier is self-contained, includes power supply, pi-network output, antenna changeover relay. Provides bandswitched operation on 80, 40, 20, 15, 11 and 10 meters. Attractively styled. Same size cabinet and general appearance as GSB-100 Transmitter. Model #3262

For further information, check number 18 on page 126.

See them at booths #3 and #4, ARRL 10th National Amateur Radio Convention, Sheraton Park Hotel, Washington, D. C., August 15, 16 and 17

GONSET

GONSET

DIVISION OF YOUNG SPRING & WIRE CORPORATION
801 SOUTH MAIN STREET, BURBANK, CALIF.

VIKING "RANGER" TRANSMITTER/EXCITER

Superbly engineered . . . delivers solid audio punch! This popular 75 watt CW or 65 watt phone transmitter also serves as an RF/audio exciter for high power equipment. Built-in VFO or crystal control—instant bandswitching 160 through 10 meters. 6146 final amplifier—wide range pi-network output. Timed sequence keying. TVI suppressed. With tubes, less crystals.

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

VIKING "VALIANT" TRANSMITTER

Here's effective power, wide flexibility, and many unique operating features combined in a compact desk-top transmitter! 275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) and 200 watts phone. Instant bandswitching 160 through 10 meters—built-in VFO or crystal control. Final amplifier utilizes three 614 tubes in parallel—wide range pi-network output. Silver-plated final amplifier inductor—built-in low pass audio filter—low level audio clipping. With tubes, less crystals

Cat. No. 240-104-1..Kit.....**Amateur Net $349.5**
Cat. No. 240-104-2..Wired and tested...**Amateur Net $439.5**

for flexibility and performance

VIKING "PACEMAKER" TRANSMITTER/EXCITER

An outstanding power bargain when used as a transmitter or exciter! 90 watts SSB P.E.P. and CW input . . . 35 watts AM. Unique circuitry uses only 1 mixer for improved spurious signal rejection greater than 50 db. Balanced range audio. Highly stable built-in VFO gives complete coverage of bands without crystal switching or re-tuning. Instant bandswitching 80, 40, 20, 15 and 10 meters. VOX and anti-trip circuits. Wide range pi-network output. Effectively TVI suppressed. With tubes and crystals.

Cat. No. 240-301-2..Wired...**Amateur Net $495.00**

Full 2000 watts SSB*—1000 watts CW and AM!

VIKING "KILOWATT" AMPLIFIER

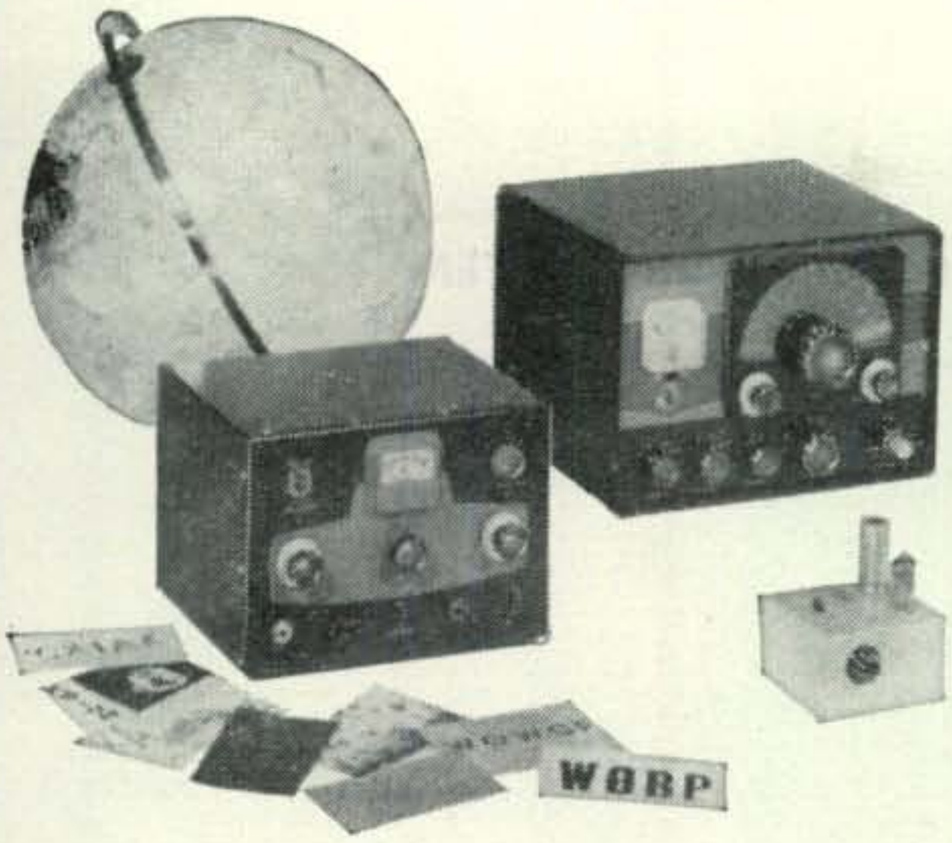
Here's the finest power amplifier ever designed for the amateu service! A sparkling concept of contemporary transmitter desig and engineering craftsmanship, the Viking "Kilowatt" is the onl amplifier that gives your signal the authority of maximum lega power in all modes. Class C final amplifier operation provides plat circuit efficiencies in excess of 70% with unequalled broadcast-typ high level amplitude modulation. Two 4-400A tetrodes in parallel bridge neutralized—wide range pi-network. Pedestal contains th complete unit. Excitation requirements: 30 watts RF and 10 watt audio for AM; 2-3 watts peak for SSB. With tubes.

Cat. No. 240-1000..Wired and tested.....**Amateur Net $1595.00**

Matching accessory desk top, back and three drawer pedestal.

Cat. No. 251-101-1.....**FOB Corry, Pa. $132.00**

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



VIKING "NAVIGATOR" TRANSMITTER/EXCITER
More than a novice transmitter—also serves as a flexible VFO-Exciter delivering enough RF power to excite most high powered amplifiers on CW and AM! 40 watts CW input—6146 final amplifier tube—wide range pi-network output. Built-in VFO or crystal control—bandswitching 160 through 10 meters. Timed sequence keying. TVI suppressed and filtered. Complete with tubes, less crystals.

Cat. No. 240-126-1..Kit.....**Amateur Net $149.50**
Cat. No. 240-126-2..Wired and tested....**Amateur Net $199.50**

VIKING "ADVENTURER" TRANSMITTER
Perfect for the novice or experienced amateur! 50 watts CW input—instant bandswitching 80 through 10 meters. Crystal or external VFO control. Rugged 807 final amplifier tube—wide range pi-network output. Clean, crisp keying. TVI suppressed. Complete with tubes, less crystals.

Cat. No. 240-181-1..Kit.....**Amateur Net $54.95**

SPEECH AMPLIFIER/SCREEN MODULATOR
Designed to provide phone operation for the "Adventurer". High gain—use with crystal or dynamic microphones. With tubes.

Cat. No. 250-40..Kit.....**Amateur Net $12.25**

-you can't beat a Viking!

Dollar-for-dollar and feature-for-feature . . . Viking amateur transmitters are your best buy!

The Viking amateur equipment line offers you a complete choice of power ratings, types of emission and operating features in a wide range of prices. Compare Viking quality and performance—you'll soon see why Viking transmitters are "first choice" among the nation's amateurs.

More than one-half kilowatt of power and operating convenience!

VIKING "FIVE HUNDRED" TRANSMITTER
Rated 600 watts CW input . . . 500 watts phone and SSB (P.E.P. with auxiliary SSB exciter)—instant bandswitching 80 through 10 meters! Compact RF unit designed for desk-top operation—power supply/modulator unit may be placed in any convenient location. All exciter stages ganged to VFO tuning. High gain push-to-talk audio system. Operates by crystal control or highly stable, built-in VFO. Class C 4-400A final amplifier provides plate circuit efficiencies in excess of 70% with unequalled broadcast-type high level amplitude modulation. Wide range pi-network output circuit with silver-plated final tank coil will load virtually any antenna system. Low level audio clipping—effectively TVI suppressed and filtered. Complete with tubes, less crystals.

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

VIKING "COURIER" AMPLIFIER
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

VIKING "THUNDERBOLT" AMPLIFIER
Rated at 2000 watts P.E.P.* input SSB; 1000 watts CW; 800 watts AM linear! Continuous coverage 3.5 to 30 mcs.—instant bandswitching. May be driven by the Viking "Ranger", "Pacemaker" or other unit of comparable output. Drive requirements: approx. 10 watts Class AB_2 linear, 20 watts Class C continuous wave. Employs two 4-400A tetrodes in parallel, bridge neutralized—wide range pi-network output. With tubes.

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

E. F. Johnson Company
2815 SECOND AVENUE S. W. • WASECA, MINNESOTA

For further information, check number 19 on page 126.

Columbus, Ohio Air Force MARS mobiles.

by DICK SOWLER, W8FEM

P.O. Box 311 Mount Vernon, Ohio

The "Ohio 24" National Sports Car Rally Communications Report

The Mount Vernon (Ohio) Amateur Radio Club with the assistance of amateurs throughout the state of Ohio, once again provided communication for the annual "Ohio 24" National Sports Car Rally. The rally, run on May 9-11 is sponsored by the N. E. Ohio Region of the Sports Car Club of America (which is to the sports car enthusiast what the ARRL is to the radio amateur.)

The rally headquarters was in Mount Vernon, Ohio, because of its central location in the state. The Mount Vernon Amateur Radio Club had provided communication for the last rally, run in 1956, this being the first time amateur radio had been used for communication in a national rally. As result the rally results were computed in a fraction of the time normally required. The rally chairman, Mr. Tomi Thomson, of Chagrin Falls, Ohio, and the chief steward, Mr. Bill Schmidt, K8HYL, of Cleveland, Ohio, were so pleased with the results in 1956 that they asked the MVARC to assist again this year. Mr. Al Watts, W8OPU, was selected to be rally communications officer. Al organized the communications program and saw that it was carried out as planned.

Some readers may not be familiar with what occurs at a sports car rally. A sports car rally is a precision driving contest which is run over a specified course. The course usually consists of several legs or stages, each of whose distances are precisely measured. Each stage must be traveled at a specified average speed (usually slower than 40 mph.) There are checkpoints along this course where officials record the exact times that each car passes. Each car receives a given number of penalty points for each second it is early or late at each checkpoint. The car maintaining most closely the average speeds prescribed thus receives the least penalty points and wins the rally.

Each car has a driver and a navigator. The navigator receives the rally instructions when the car is started on the course. These instructions include in various forms: the course to be followed, distances between points, and the average speeds to be maintained. The navigator must decipher the data given, compute arrival times at certain points, and keep the driver and car on course at the speed necessary to reach the points at the precise second they should. The navigator has many aids such as: stopwatches, WWV converters, precision oddometers calibrated in one-hundredths of a mile, and various types of calculators and charts. Each car in the "Ohio 24" was equipped with such aids. Some of these aids are rather costly, so are used only by the serious rallyist.

The 1958 "Ohio 24" drew 64 contestants from 12 or more states. Two competing cars were owned by amateurs, a W3 from Pennsylvania and a W8 from Ohio. The winning car had a total error of 182 seconds for the total of 850 miles. This indicates the high degree of precision which must be adhered to.

The "Ohio 24" being a National Event of the SCCA gave the competing cars and crews points toward the national SCCA rally championship. This being a hobby, the only other rewards for winning were trophies, plaques, and pins. (One might draw a simile between rallying in the sports car group and competing in DX Contests or other contests in the ham radio field.)

The "Ohio 24" rally course consisted of three stages each starting in Mount Vernon, going to some point in the state, and returning to Mount Vernon. The job which the MVARC and those assisting had to perform was to provide communication between the various checkpoints and rally headquarters. The stations at the checkpoints sent the exact arrival times of each car and any other pertinent rally traffic. When the information was received at K8EEN in rally headquarters, it was given to the rally officials who computed the score of each car from the information given. Thus, each car's score could be known a short time after its arrival at the last checkpoint.

The participating cars started at various points nearest their homes on Friday morning. The run from these starting points to Mount Vernon constituted the first portion of Stage 1. The five starting points were: Brecksville (near Cleveland) where W8CTZ, Warren Sladsky handled traffic, (Warren was an invaluable aid throughout the rally by assisting with traffic relays, etc); Washington Court House where no station was available; Steubenville where W8COL, George Cliff handled the traffic; Maumee where W8UPH, Bob Gensler handled the traffic; and St. Mary's K8BYP, Wilbur Campbell handled the traffic. The cars left these towns at half hour intervals, starting at 0900 EST from Brecksville, 0930 from Washington Court House, etc. The cars all had arrived in Mt. Vernon by 1200 EST. There was a safety check and all engines were sealed in preparation for the remainder of the rally.

The second portion of Stage 1 began at 1300 EST. The cars were started at two minute intervals from the Knox County Fair Grounds (1½ miles outside the Mount Vernon city limits.) The course took them to Millersburg where the checkpoint was located, and then back to Mount Vernon. Unfortunately W8JMC who was to handle the Millersburg traffic, was unable to do so for reasons beyond his control. (We appreciate his effort toward assistance anyhow.)

Stage 2 started Saturday morning at 0800 EST. The route for the first portion of Stage 2 went to Brownsville and back to Mount Vernon. The second portion of Stage 2 started at 1300 EST, in Mount Vernon and went through Southeastern Ohio. This portion of the rally was probably the longest, having three checkpoints. The three checkpoints were: Athens where W8PGQ, Wilson Norris handled the traffic; Marrietta where W8VZ, Carl Anderson, and members of the Marietta Radio Club handled the traffic; and Brownsville where W8PEN/8, Royce Woodward MVARC president, handled the traffic. There apparently is little amateur activity in Brownsville, so W8PEN setup a rig in his station wagon at the Brownsville checkpoint. The cars did not return to Mount Vernon for the end of Stage 2, but started Stage 3 from Brownsville.

MVARC members at rally HQ, K8EEN/8. Front row: K8AKK, W8PEN, Lloyd Gaumer, Marc Woodward, W8OPU, Tom Reasoner. Back row: W8FEM, W8NTP, Dave Nash, W8ZIO.

The cars left Brownsville at approximately 1830 EST, on a course which took them through the Senecaville checkpoint where W8LG, Harry Colley of Caldwell handled the traffic. This course eventually returned them to Brownsville where the final portion of Stage 3 was started. All of the cars had left Brownsville by 2115 EST, so W8PEN/8 was allowed to secure operation, pack up the gear, and return to Mount Vernon. The run from Brownsville to Mount Vernon constituted the second portion of Stage 3, and the end of the rally, so K8EEN was dismantled and returned to its home.

Sunday at 1100 EST the final event of the "Ohio 24" took place. This event was a Regularity Run in which only the top 20 cars in the rally were allowed to participate. The course was restricted to roads in Knox County (the county Mount Vernon is the seat of), so mobile units had to be used to provide communication. This event was similar to the previous rally stages, but had 7 checkpoints all but the last of which were hidden. The MVARC group did not have the necessary 7 mobile rigs, so W8OPU asked the Air Force MARS Mobile Group from Columbus, Ohio to provide communication for this event. They gladly consented and a very fine group drove to Mount Vernon to assist. The members of the group who came and did a very commendable job were: K/AAF8AEH, Wilbur Wallerman; W/AF8BSM, Robert Massie; W/AF8HPB, Phillip Will; W/AF8KVV, Ronald Bryant; W/AF8MDX, Ed Enderle (who was the base station at the start and finish line of the regularity run); W/AF8MEG, Paul Heinlein; W/AF800W, Neil Stanfield; W8QEM, Starling Hutt; W/AF8QFU, James Enderle; W/AF8RNZ, Russel Forgrave; and W/AF8RSF, Bruce Hunter.

The members of the Mount Vernon Amateur Radio Club whose efforts made our participation in this rally possible were: W8OPU, Al Watts; W8OPV, Dotty Watts (Al's wife, whose role can be best explained by Al); K8AKK, Bob White; W8CPU, Jim White; W8FEM, Dick Sowler (a sports car fiend!); W8FNW, Jim Ashton (another sports car fiend!); W8NTP, George Barnes; W8PEN, Royce 'Woody' Woodward; W8ZIO, Lewis O'Brien; Mike Gilchrist, Dave Nash, Jack Peterman, Tom Reasoner—KN8??? (on its way), Doug Rhodes, Curt Robbins, Al Schick, and Vincent Spencer—KN8??? (on its way).

The members of the Mount Vernon Amateur Radio Club, and, I'm sure, the officials of the "Ohio 24" National Sports Car Rally are very grateful for the excellent cooperation received from all who participated in this communications effort. This is without doubt, indicative

[*Continued on page 117*]

more about the "MINIBEAM" — part II

by Capt. G. A. "DICK" BIRD, G4ZU
94 Shirley Way, Croydon, Surrey, England

The Super Minibeam

The standard version of the Minibeam was described in detail in the March '57 issue of CQ Magazine. An economy design, and various methods of feeding it with coaxial cable, were dealt with in part one of this present article last month.

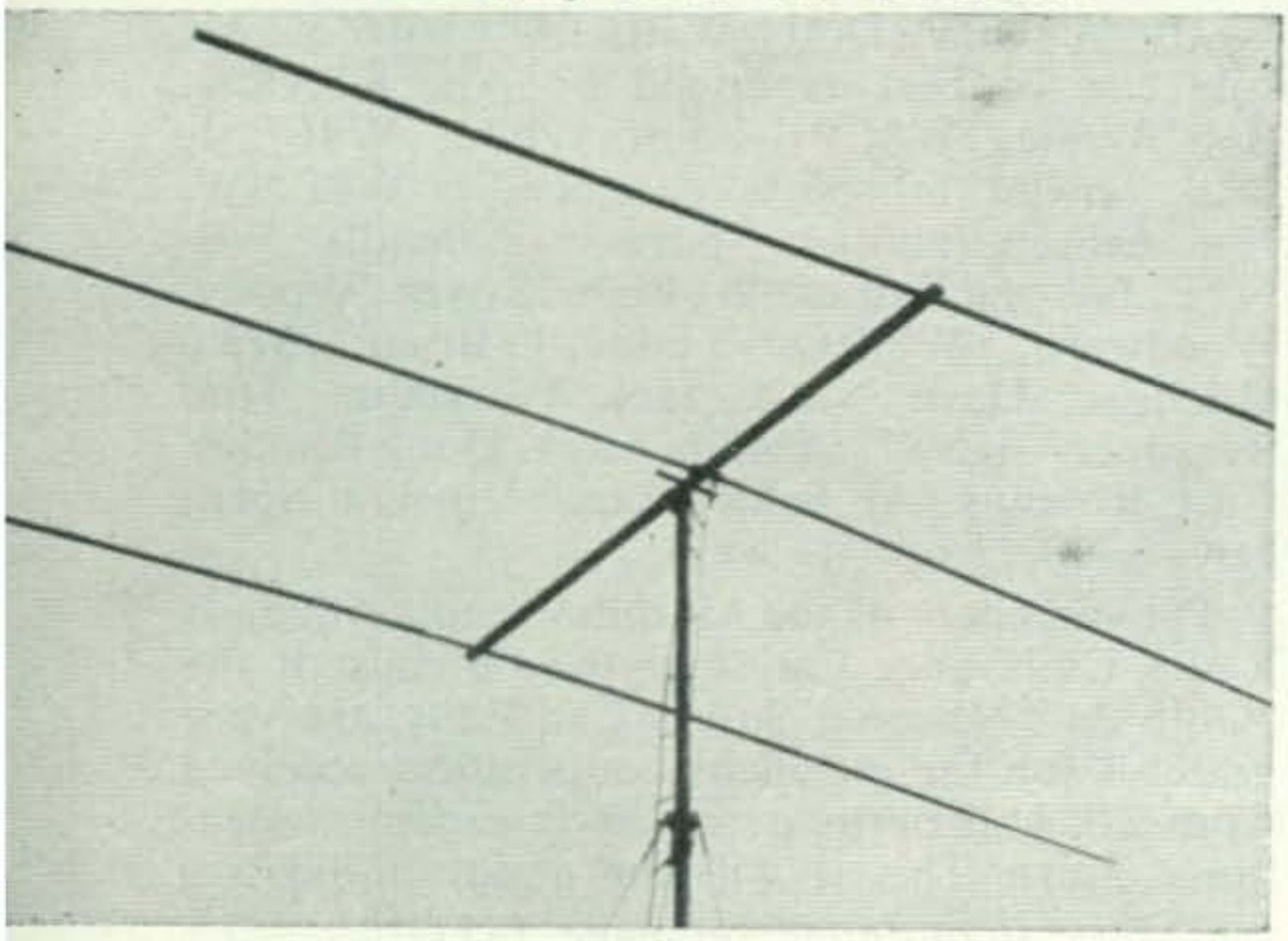
It is now proposed to describe some more ambitious designs that have been developed, with the object of improving the twenty meter performance.

It must be emphasized that these more complex versions are intended mainly for the specialist, who is prepared to go to considerable trouble in the interests of an outstanding signal on every band, and they should not be attempted by the beginner. Some previous experience with the construction and tuning of beams is practically essential.

Three Elements on Twenty

To refresh your memory, the standard Minibeam is shown in fig 1. It operates as five elements on 10m, three elements on 15m, and just two elements on 20m. The inexperienced might feel tempted to lengthen the director to 21 feet and resonate it on three bands in a similar manner to the reflector. This would give three resonant elements on twenty (and six on ten) but unfortunately it would give little increase of gain on twenty metres. Although a *two* element beam will work fairly efficiently with close spacing (0.1λ or about 7 ft on 20m), as soon as a change is made to *three* elements it becomes necessary to use much wider spacing (a minimum of 0.15λ or about 10 ft. on 20m). To make effective use of three elements on 20 metres you must increase the length of the boom from 12 ft to at least 20 ft. Measurements on a beam modified in this way indicated that the gain, and in particular the F/B ratio, were considerably improved as compared with the standard version on 20 metres. The performance on 15 metres was also improved, but to a smaller extent. On 10 metres however, it was found that the F/B ratio had practically disappeared, and the gain was not up to standard, mainly because the element spacings were now too wide for efficient operation on this band. This was corrected by placing an additional director in front of the driven element. Fig. 2. The length and spacing of this ten metre director were found to be fairly critical for best F/B ratio. The optimum length will, in general, lie somewhere between 16 ft. and 16 ft. 3 ins., with a spacing of approximately 3 ft 6 ins. from the driven element. The final step was to carefully adjust the resonant frequency of the three band director on ten metres. This was accomplished by connecting a small variable condenser across the end of the stub at the point where it connected to each half of the element. The function of this condenser will be understood from an examination of Fig. 3, in which the inductance of the twin boom has been represented by a lumped inductor, L_1. On 20m L_1 provides inductive loading, with a certain amount of

A TWO BAND MINIBEAM built with scrap dural by George Guy. G8TH. From a location which he aptly describes as 'a hole in the ground' he puts a good signal into the States, and by tuning the feeders he also manages to resonate the thing on 20 and 40 metres!



shunt capacity due to the capacitive reactance of the stub and variable condenser C_1. On 15 metres, the stub, being a quarter wave long, behaves as a short circuit, and C_1 has no effect. On 10 metres, an effective short circuit appears at the point x, one quarter wave from the open end of the stub. The remaining portion of the and this will appear in parallel with the inductance of the twin boom represented by L_1. The stub will therefore have an inductive reactance, combined inductance is tuned by C_1 so as to excite the two halves of the director after the style of two half waves in phase. See Fig. 4.

The resonant frequency of the *reflector* is much less critical on ten metres and additional capacity will generally not be necessary. Due to the greater length of the element, the capacity of the stub to the inside of the boom members plus the capacity of the mounting channel is normally sufficient to bring the resonant frequency of the complete assembly to around 25 - 27 mc, and this will produce good reflector action over the 11 metre as well as the ten metre band.

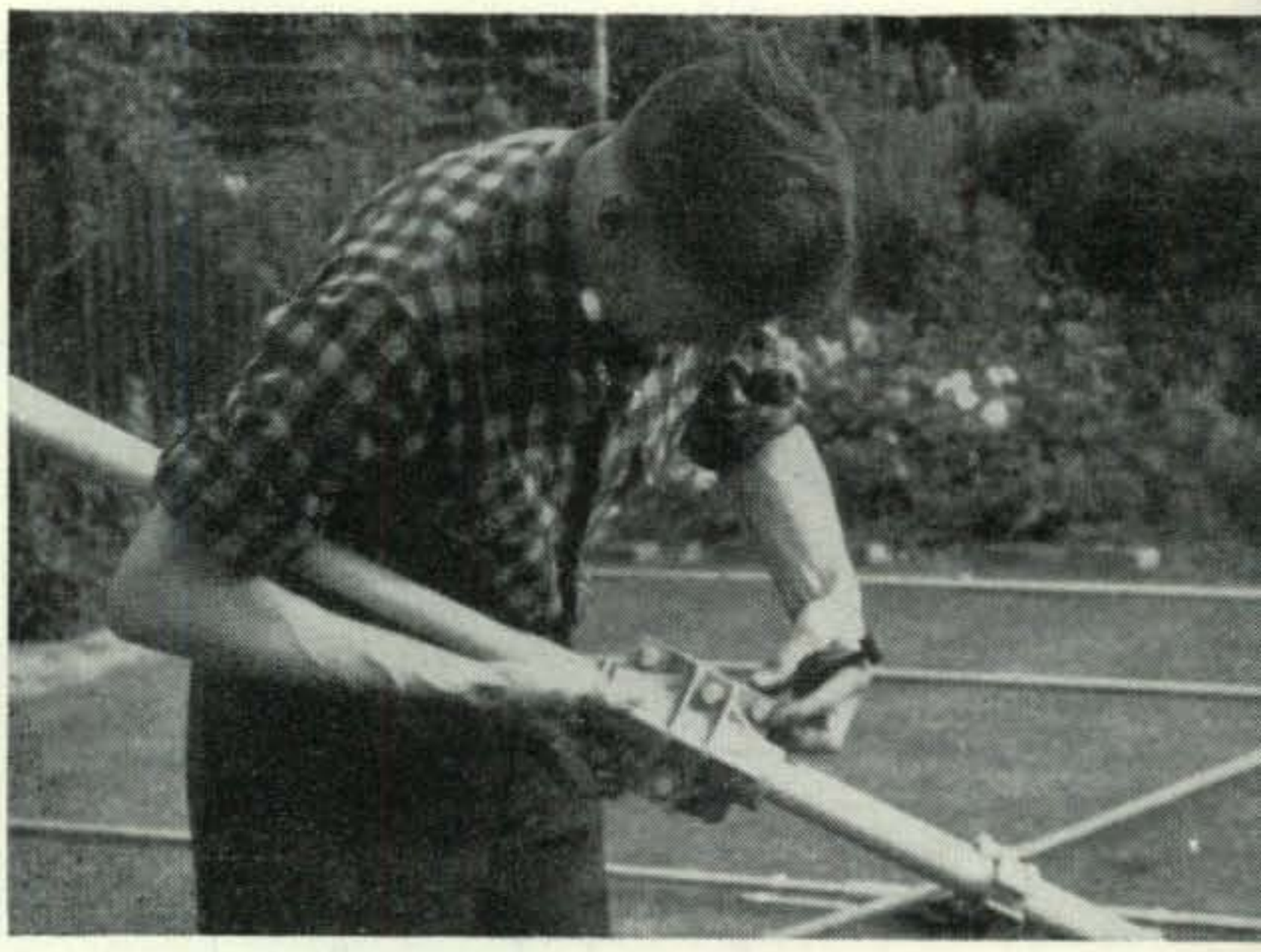
The only thing needed to complete the job was a label. After some thought I settled for 'Super Minibeam', to distinguish it from the standard version.

Tests were also made on an alternative design, Fig. 5, with a 25 ft. boom and additional two band director for 10/15 out front, but the approach of Winter prevented detailed performance figures being obtained.

With the object of obtaining the maximum of information in the least possible time, two local amateurs co-operated by building and testing several other element combinations. G2PL, who had been using a home built Minibeam for some time, made careful checks on the improvement that could be obtained by using a full length 35 ft. reflector on the beam at slightly greater spacing than normal. Numerous tests indicated that although there was some increase in bandwidth, there was only a small improvement in forward gain. He also made measurements on several other designs, both at his home location and at an open site in the country. One which aroused quite a lot of interest was a collapsible version of the economy model, which he designed so that it could be folded up and stowed on the luggage rack when he was operating under field day conditions.

A great deal of help and encouragement has also been received from the well known DX operator G3HLS. At considerable expense he developed a self supporting telescopic mast which at the touch of a button he could rotate or shoot up from 15 to nearly 100 feet above the ground. This greatly speeded up the tests on successive designs from the standard Minibeam through several coax fed versions, to the coax fed Super Minibeam which he is using at the moment.

Others who deserve mention are G8TH, who conducted exhaustive tests on the two band version, and several overseas stations, such as



The Super Minibeam under construction.

VS2DQ and VK6GU etc. who experimented with the more complex designs.

Due to the relatively small market this side of the pond no manufacturer has so far been found who is willing to finance the development of amateur antennas. All this work has been undertaken voluntarily, and at the personal expense of the various amateurs concerned. Their only reward is that others may benefit from their efforts.

Tuning and feeding

It is not possible in the space of one short article to impart all the detailed knowledge which is required in tuning a beam for maximum performance. Advice will however be given on the order in which the adjustments should be made as this will ensure a planned approach and will avoid a lot of wasted time and effort.

It is suggested that the beam be tuned first on *fifteen* metres by adjusting the lengths of the director and reflector. The lengths specified will generally be found to give good F/B ratio and gain, but this should be checked on a field strength meter making a careful note of the readings. Now put a physical short across the centre of the director and reflector, and recheck the readings. If the shorting stubs are doing their job there should be no change. (A short circuit across a short circuit is still a short circuit!) If you do find any marked change in performance, it is essential to get the shorting stubs right before going any further. Once things are correct on fifteen metres, lock the elements at the optimum length and from now on leave them strictly alone!

The next move is to tune up on *twenty*. Slide the shorting bar on the twin boom for the director until you can strike a neon off the end of the element. This will show it is somewhere near resonance. Repeat for the reflector. Now adjust settings very carefully with the aid of a field strength meter for best gain and F/B ratio.

Finally tune on *ten* metres. Adjust the length

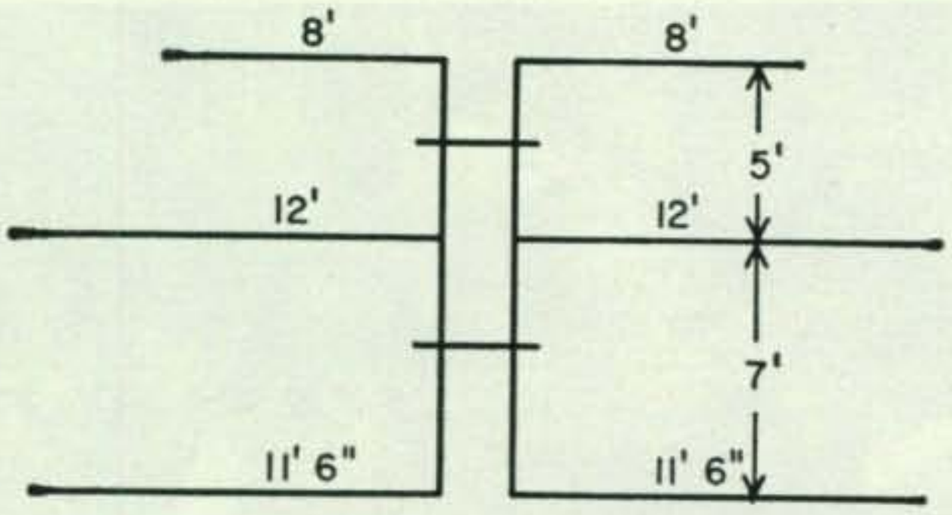


Fig. 1—Standard Minibeam

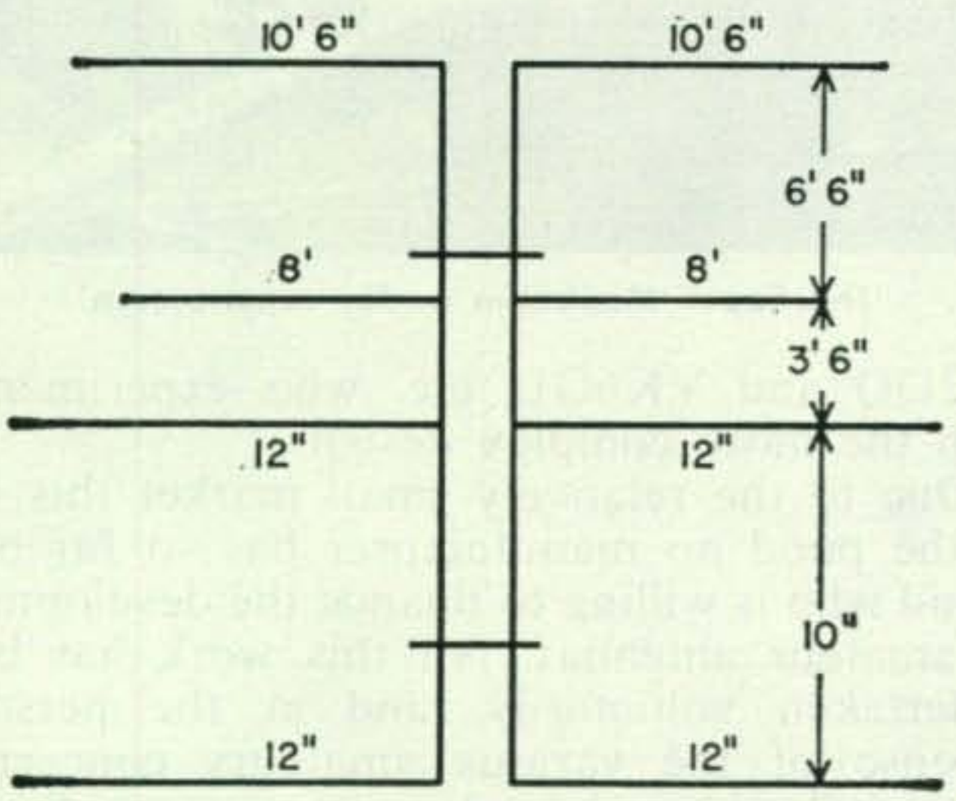


Fig. 2—Super Minibeam

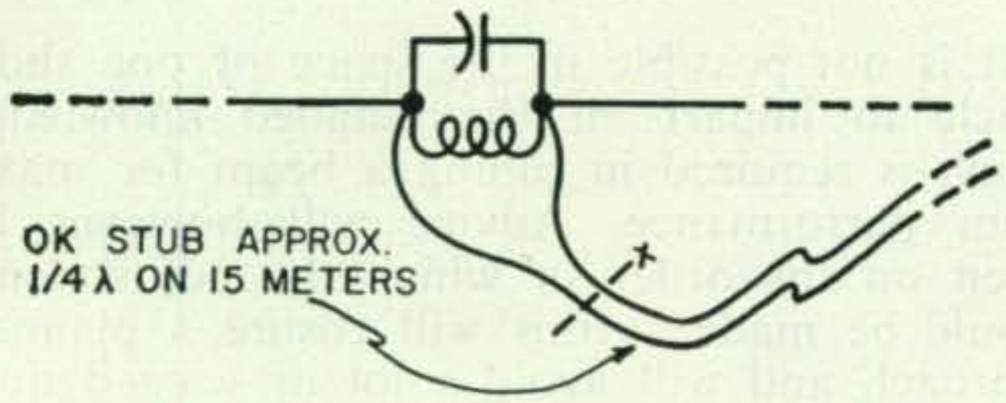


Fig. 3.

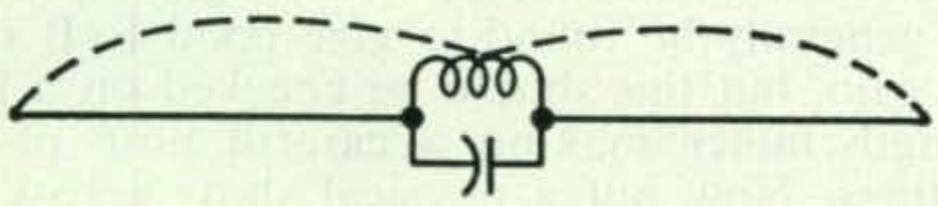


Fig. 4.

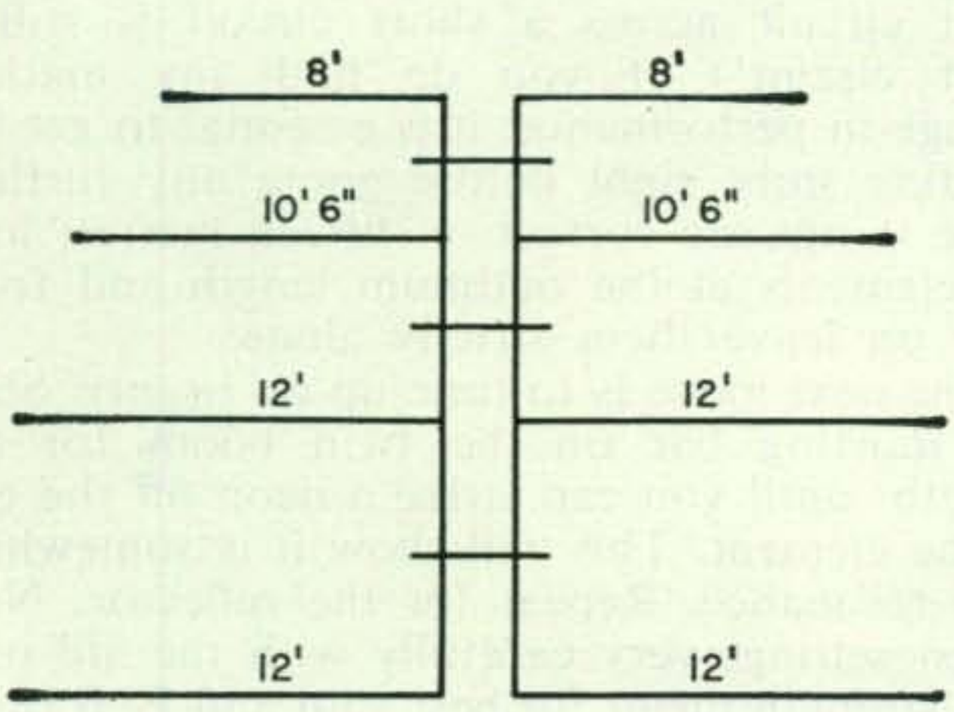


Fig. 5.

of the 16 ft. director. Then tune the small condenser on the three band director. If you have to add more than about 15 to 20 mmfd it would be advisable to recheck the director tuning on *twenty* metres. Preliminary tuning can be conducted with the beam about 9-10 ft. off the ground. The ten and fifteen adjustments won't shift much when the beam is raised. The change on 20 metres will be rather more pronounced, but if you don't bolt up the shorting bars too tight, you may be able to tap them along the boom with the aid of a wooden pole when the beam is in its final working position. This is probably easier than trying to adjust element lengths, as would be necessary with a normal beam!

And now the feeding problem! If you feed the beam with 450 ohm open wire TV line there will *be* no feeding problem. You won't have to worry about standing waves or matching or the exact length of the feeder or the driven element. Simply treat as a tuned line and couple via an antenna tuner which will do a good job holding back your harmonics.

If you favor a little more hard work now for the sake of less effort in the future, try the auto match with specified feeder length as described in March '57 CQ.

If you are *determined* to use coax feed all the way, and most amateurs have a leaning in that direction, then you must remember several important points.

1. The impedance of a beam is very much a function of site conditions and height above ground.

2. The impedance won't vary at the same rate or in the same direction on each band with changing height.

3. With a long feeder run you can easily lose half your power before it even gets to the beam.

4. If you are concerned with covering an amateur band as opposed to a spot frequency, do *not* match the impedance of the beam to the feeder. This may sound crazy, but an examination of Fig. 6 will show that the lowest *average* SWR is obtained when the impedance of the beam at resonance is *lower* than the feeder impedance. The approach is somewhat akin to two point tracking with a receiver, and is obviously better than a precise match at the centre of the band (dotted curve).

After all that, if you *still* want to have a go at coax feed, you have the choice of the methods given in part one of this article. It would take several pages to cover the theory of Fig. 8 (coaxial sleeve with bi-nodal coupling) and at its present stage of development, it requires a degree of precision engineering which would only be justified for a production run. The parallel dipole method is probably best for home construction. You can easily load the 20m section if you want to reduce the total span (Fig. 7).

I am already getting enquires as to when the Super Minibeam will be on the market.

Maybe some manufacturer will get interested in building Super Minibeams in the States, Canada, or some other country. Meantime I can get busy on a Super-Super Minibeam!

In closing, I would like to say thanks to the many people all over the World who have been kind enough to write. Their appreciation makes me feel that the hours I have spent cutting up dural were not entirely wasted.

Technical notes

Stubs for Super Minibeam. All of 300 ohm ribbon.

Director stub res. freq. 22-23 mc. app. length 9 ft.

Reflector stub res. frequency 19-20 mc. length 10 ft.

Shorting bar settings. Dir. 30-40 ins. Ref. 35-45 ins.

Twin boom. 1½ to 2 ins. diameter, spaced 3½ to 4½ ins. between centres. Elements 1 inch or larger.

Directors and reflector shorting stubs are inserted one in each leg of the twin boom. Average weight complete with cast mast head fitting: 35 pounds.

Gain and F/B ratio

The writer is fortunate in having access to gain measurements made by the Research Station of the Dept. of Scientific and Industrial Research and other similar bodies. These make it clear that gain figures obtained under carefully controlled conditions for the same antenna at different sites can show variations of as much as plus or minus 50%. There is an obvious temptation to quote the best figure obtained, and this course may well be adopted by some manufacturers for advertising purposes, but it can hardly be regarded as scientifically accurate. On the other hand, a really honest assessment may not look too impressive when compared with the optimistic claims which are constantly being made for various types of antenna configuration. I have therefore decided that, as a general rule, publication of gain figures is undesirable, and that a design which is basically sound will soon establish its own reputation by giving consistent performance under competitive working conditions. In the long run this is the most certain way of finding out whether a design is good or bad.

References

Reprints and summaries of the original article on the Minibeam have appeared in the National Amateur Magazines of the following countries. France, Holland, Denmark, Germany, Norway, Russia, Finland, Portugal, Malaya, Australia, New Zealand, Czechoslovakia, Spain and the Latin American countries.

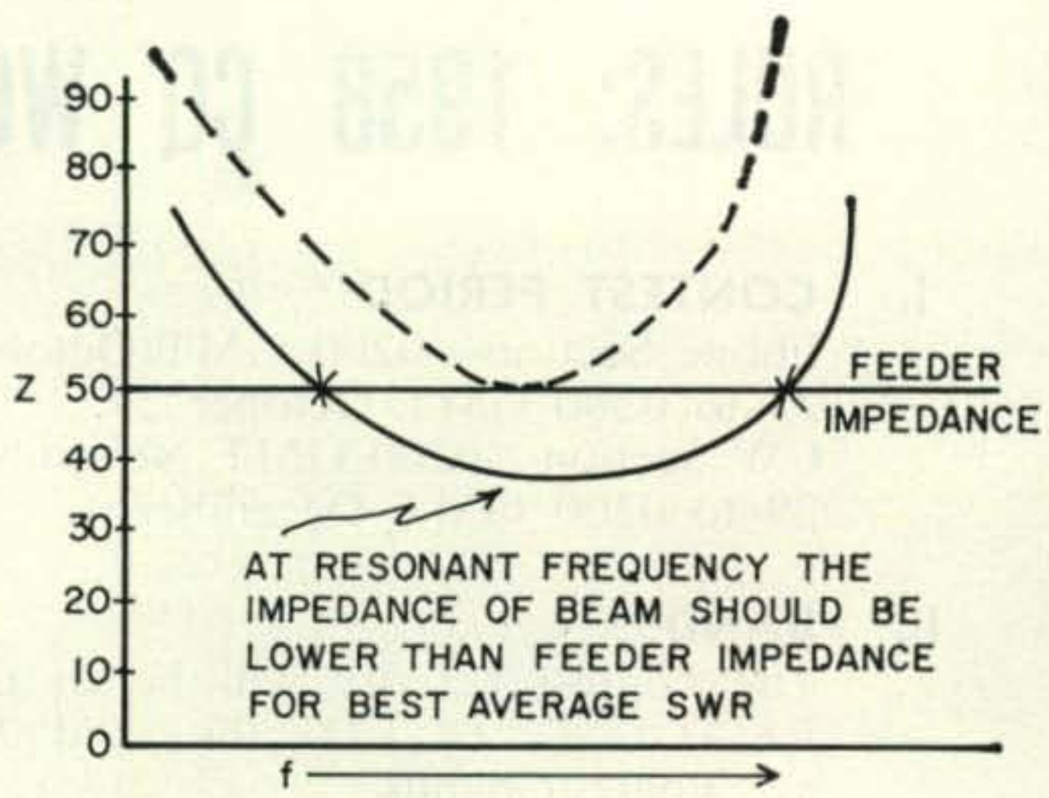


Fig. 6

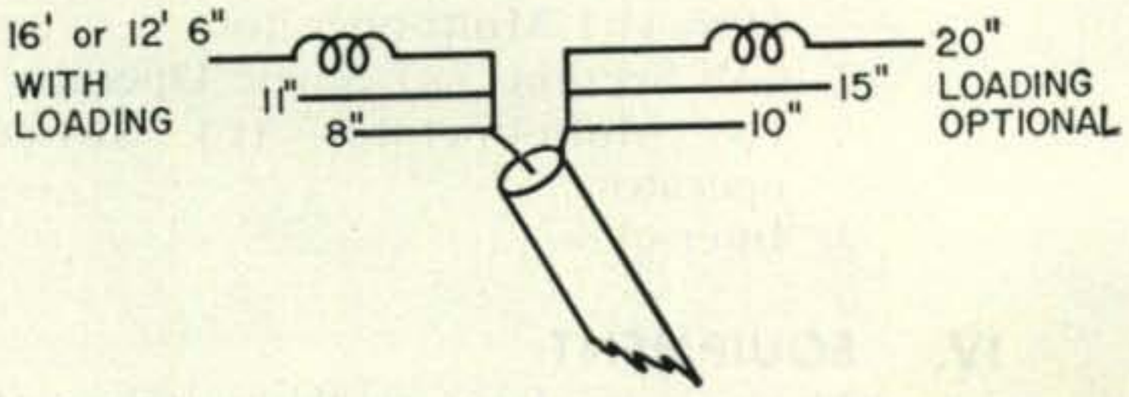


Fig. 7

Other experiments

The designs given in this article represent only a small fraction of the various element combinations which have been tested. The experimentally minded may care to try some of the following suggestions.

(1) *Director on 20.* It is well known that with close spacing a director tends to give better F/B ratio than a reflector. As there is very little interaction between the tuning of a Minibeam from band to band, it is quite easy to resonate the reflector as a *director* on 20m without seriously affecting the performance on the other two bands. Several cases have in fact arisen in which users of the Minibeam have by mistake, set the reflector shorting bar too far out along the boom with the result that the beam fires backwards on 20m. Under these conditions a good F/B ratio is obtained over a limited frequency range. G6ZO has tuned his Minibeam this way deliberately. The fact that the beam fires backwards on 20m under these conditions is not necessarily a disadvantage because long distance DX normally comes in by the short path on 10 & 15, and by the long path on 20m. A constant beam heading can therefore be maintained on all three bands for contacts with a particular area such as the Far East. Setting the beam up in this manner requires no alteration in element length or spacing. Merely an adjustment to the 'reflector' shorting bar.

(2) *Longer elements on 20.* There is a fairly widespread belief that shortened elements en-

Continued on page 106

RULES: 1958 CQ WORLD WIDE DX CONTEST

I. CONTEST PERIOD:

Phone Section—0200 GMT October 25 to 0200 GMT October 27.
CW Section—0200 GMT November 29 to 0200 GMT December 1.

II. BANDS:

The contest activity will be in the 1.8, 3.5, 7., 14., 21., 27., and 28. mc amateur bands.

III. TYPE OF COMPETITION:

1. Phone Section. (a) Single Operator. (b) Multi-operator.
2. CW Section. (a) Single Operator. (b) Multi-operator. (c) Novice operator.
3. Inter-club.

IV. EQUIPMENT:

There is no limit to the number of transmitters and receivers allowed, and competitors may use the maximum power permitted under the terms of their license.

V. SERIAL NUMBERS:

Phone stations will exchange serial numbers consisting of 4 numerals, the first two being the RS report, and the last two being their own Zone number. CW stations will exchange serial numbers consisting of 5 numerals, the first three being the RST report, and the last two being their own Zone number.
Stations in zones 1 thru 9 will prefix their Zone number with zero. (01 and etc.)

VI. POINTS:

Contacts between stations on different continents will count 3 points.
Contacts between stations in the same continent, but not in the same country will count 1 point.
Contacts between stations in the same country will be permitted for the purpose of obtaining a Zone and/or country multiplier but no QSO points are credited. More than one contact between stations on each band will not be permitted.

VII. MULTIPLIER:

Two types of multipliers will be used.

a. A multiplier of 1 for each Zone contacted on each band.
b. A multiplier of 1 for each Country worked on each band.

VIII. SCORING:

1. The score for each Single Band is the sum of the Zone and Country multiplier for that band, multiplied by the total contact points on that band.
2. The total All Band score is the sum of the Zone and Country multipliers of all bands, multiplied by the sum of the contact points on all bands.
3. Everyone who sends in a log for a single band is eligible for a Single Band award only. If a log is submitted for more than one band, indicate which band is to be judged, otherwise it will be judged as an All Band entry.
4. Those who submit a log for two or more bands will be judged for the All Band award.
5. A station is not eligible for more than one award.
6. Single operator contestants must show a minimum of 12 hours of operating time to be eligible for an award. If a contestant operates all bands and wishes to be judged for a specific single band, he must show a minimum of 12 hours on that band.
7. Multi-operator stations must show a minimum of 24 hours of operating time to be eligible for an award.

IX. ZONES AND COUNTRIES:

To check your own Zone number and country for scoring purposes, refer to the ARRL or CQ list as well as the WAZ map. The continental boundaries used for WAC will be recognized. Should any question arise as to the positive location of a station, the official definition will be final.

X. AWARDS:

Certificates will be awarded in each section as follows:

1. To the highest scoring station on each Single Band in the following areas.
   a. Each call area of the U.S.A.
   b. Each call area of Australia and Canada.
   c. All other countries.

[*Continued on page 111*]

CQ reports on:

the Viking "Navigator"

by Donald L. Stoner, W6TNS P. O. Box 137, Ontario, California

One of the first things that impress you, when you build a Johnson kit, is that they do not skimp on parts! As I unpacked the box containing the cabinet and components I was reminded of the old comedy routine where the little Crosley pulls up and about ten very tall people unfold from the interior. I wondered how they ever got half the inventory of a wholesale house into such a small box. As I added the capacitors and resistors I was sure that someone back in Waseca was playing a joke on me. Naturally they all fitted neatly into place, eventually, and the transmitter worked on the first test.

This was my first encounter with the E. F. Johnson Company Viking "Navigator". Later I was to find out what owners mean when they say the "Navigator" is a "cw man's cw rig". Johnson Company has filled the gap between low cost Novice rigs and compromise phone/cw transmitters. The Navigator is designed from the rubber feet up, for the best possible cw performance.

The Viking "Navigator" is a self contained VFO and exciter, and with an input power rating of 40 watts may be used as an exciter or transmitter. It will deliver about 27 watts on all amateur bands between 160 and 10 meters. Like other units in the Viking series, the "Navigator" is nicely packaged and styled in extremely good taste. The cabinet measures 13¼" wide, 10-1/16" deep, and 9⅛" high. The complete transmitter weighs in at 22 pounds and although very compact, the case is well ventilated. The operating controls are grouped on the front panel for maximum operating convenience. No reaching around to the side or rear to make adjustments. The key jack, relay jack, and antenna connector are located on the rear chassis apron so that all plugs and cords are out of the way. As with all other Viking transmitters, the "Navigator" is completely de-TVI'ed. Even the two crystals are located behind a dummy knob cover on the front panel. TVI signals are completely bottled up from every angle. A pi-network output circuit also serves to attenuate VHF harmonics and will match unbalanced resistive antenna loads from 40 to 600 ohms impedance.

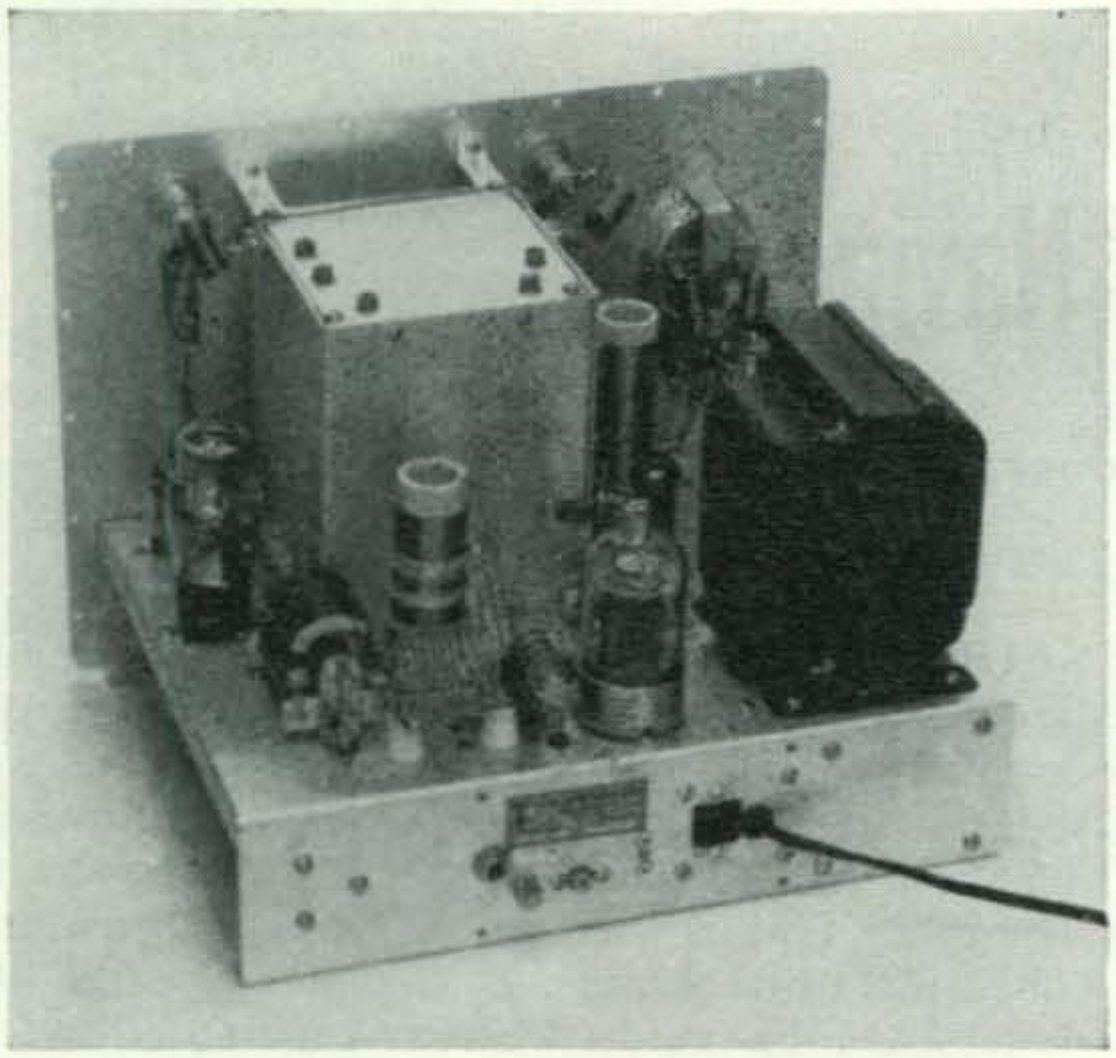
Circuit Description

Exciter. The exciter section consists of a 6AU6 (V2) variable frequency oscillator and a 6CL6 (V3) crystal oscillator/multiplier. The 6AU6 serves as a high stability voltage regulated and temperature compensated electron coupled oscillator. It is equipped with two separate tank circuits, one covering the range 1.75 to 2 mc, for output on 160 and 80 meters. The other tank is used on all higher bands and tunes 7.0 to 7.4 mc on 40, 20, 15 and 10 meters. On 11 meters a shunt capacitor lowers the VFO to 6.725 to 6.84. The 6CL6 oscillator/multiplier serves as a frequency multiplier with a high "Q" plate circuit operating on the same frequency as the final amplifier on all bands. There is no doubling in the "Navigator" final amplifier.

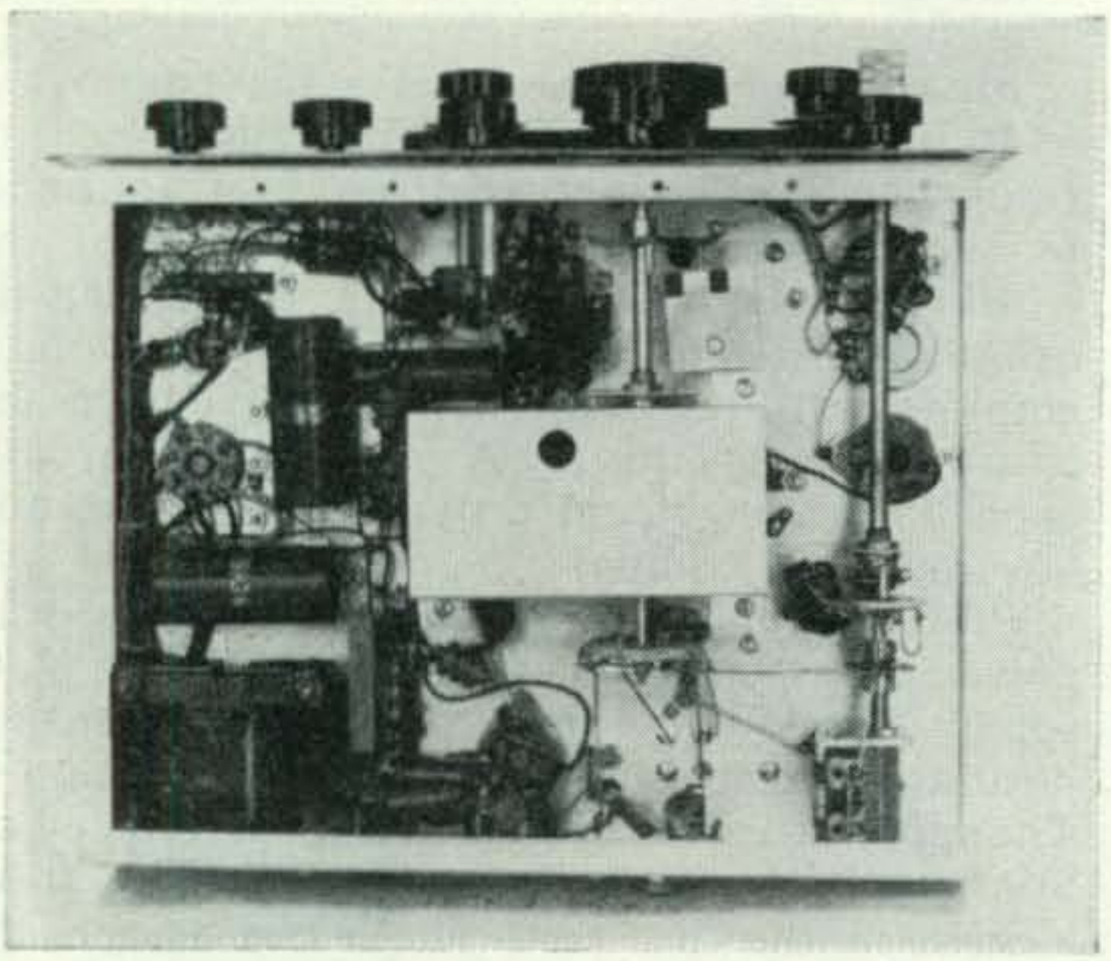
Final Amplifier. The final stage employs a 6146 tube (V6). The amplifier is tuned to resonance by C8, operated from the front panel by the dial marked Final. The screen of the 6146 is regulated to protect the tube when no excitation is applied. Bridge neutralization is employed to provide high stability over the entire frequency range. A switch and variable capacitor arrangement provides for coarse and fine antenna loading.

Power Supplies. Two supplies are used to power the "Navigator"; the high voltage plate supply (nominally 360 volts in the transmit position) and the negative 150 volt bias supply. The supplies are energized by the operate switch SW4, and protected by two 1½ ampere fuses located in the line cord plug. The screens of

Meet the Viking "Navigator". A beautiful job of packaging a 40 watt cw rig, complete with a VFO and Timed Sequence Keying. It operates on all bands, 160 through 10 meters.



Rear view of the "Navigator". Note the TVI filters on the pilot lamps and the grid drive/plate current meter. The modulator jack added by the author for tests can be seen on the rear apron.



The large plate in the center is the buffer shield. Just forward of this shield is the cam for changing the VFO bandchange switch. The parts are neatly grouped to produce a commercial looking wiring job.

the VFO and final amplifier are clamped by V5, a VR-150 voltage regulator tube. 117 volts ac is available at jack J3, for the antenna changeover relay, whenever the transmitter is energized.

Timed Sequence Keying. You may have heard of timed sequence keying but may not understand what it is, or why it is necessary. TSK eliminates two of the biggest bug-a-boos of cw operation; "chirp" and "key clicks." Whenever a VFO is keyed, the frequency will change slightly until the VFO tube reaches its normal operating conditions. We call this frequency change "chirping." The "Navigator" circumvents this problem nicely with timed sequence keying. When the key is depressed, the VFO starts to conduct. As soon as it "settles down" on frequency, the buffer is gated on. When the key is released the VFO continues to oscillate until after the buffer ceases to conduct. Even though the VFO still "chirps" you never hear it on the air because it never reaches the final amplifier. Of course all this happens in a small fraction of a second. When the keyer control is properly adjusted it will follow a "bug", even with the weight off! A breaking station can be heard between the dots too!

Timed sequence keying also eliminates "key clicks." Whenever a transmitter is keyed, the sudden disturbance to the circuits creates what is known as a transient. Did you ever notice when you plug your headphones into the phone jack you often hear a "click" just before the sound starts? A similar thing happens in your transmitter. When you depress the key, the sudden rush of current through the tank coil causes it to ring. The ringing, which occurs just before the oscillation, is propagated as a "click." As we all know, these clicks can be heard many kilocycles away from the carrier frequency. In the "Navigator," the initial surge of current is slowed down or "softened," by the action of the keyer tube. The action is so pronounced (the softness of the signal) that a trained ear can easily detect a transmitter using TSK. It is very pleasant to listen to, indeed.

Kit Construction

Assembling a kit is a time consuming job. The completeness of the Navigator makes it more so. Although the assembly instructions are clearly written and easy to understand, the job cannot be rushed. There are many component designations that sound like others and if the job is hurriedly wired, one might get parts interchanged. The VFO is wired as a separate unit and then connected to the chassis at the proper time. The laced harness makes it an easy task to complete the basic wiring. Here again the constructor should follow the instructions carefully for serveral wires of the same color fan out near each other. Switching wires can cause no end of trouble. The kit took about 15 hours to complete, the counting the calibration and testing.

Performance

I must confess that I am not what you would call a "red hot cw man." I felt that it would be much fairer if it were put on the air by someone that could really "push a paddle." Accordingly, I dashed over to the Mel Thomas (K6GOK) QTH, like a brand new mother with her first offspring. Mel spent at least an hour just running his hands lovingly over the case, with a glassy expression on his face! Becoming impatient, I set him in the nearest chair, wiped the fingerprints off the cabinet and hooked up the "Navigator."

The acid test for a VFO is a few hours operation on 10 meter cw. After a small initial

warm-up drift, the VFO stabilized. Mel used a bug just as fast as he could push it and there was no evidence of key clicks or chirps. The timed sequence keying is not employed on crystal control and some clicks were observed. They were easily cleaned up with a standard key click filter. During the tests many stations were contacted including Haiti, Columbia, So. Africa, Argentina, Mexico, Canada, and all the United States call districts. All stations showed a keen interest in the transmitter and reported T9 plus quality.

As further test Mel used the "Navigator" to drive an 813 rig. There was more than enough drive for the 813 and, as one might suspect, the general run of signal reports was somewhat higher.

During all the tests, the "Navigator" was used in conjunction with a Johnson 250-20 low pass filter. No interference to any television receiver was noted. The transmitter is very clean and free of spurious radiation. The controls all operate smoothly, with no sharp peaks that might suggest regeneration.

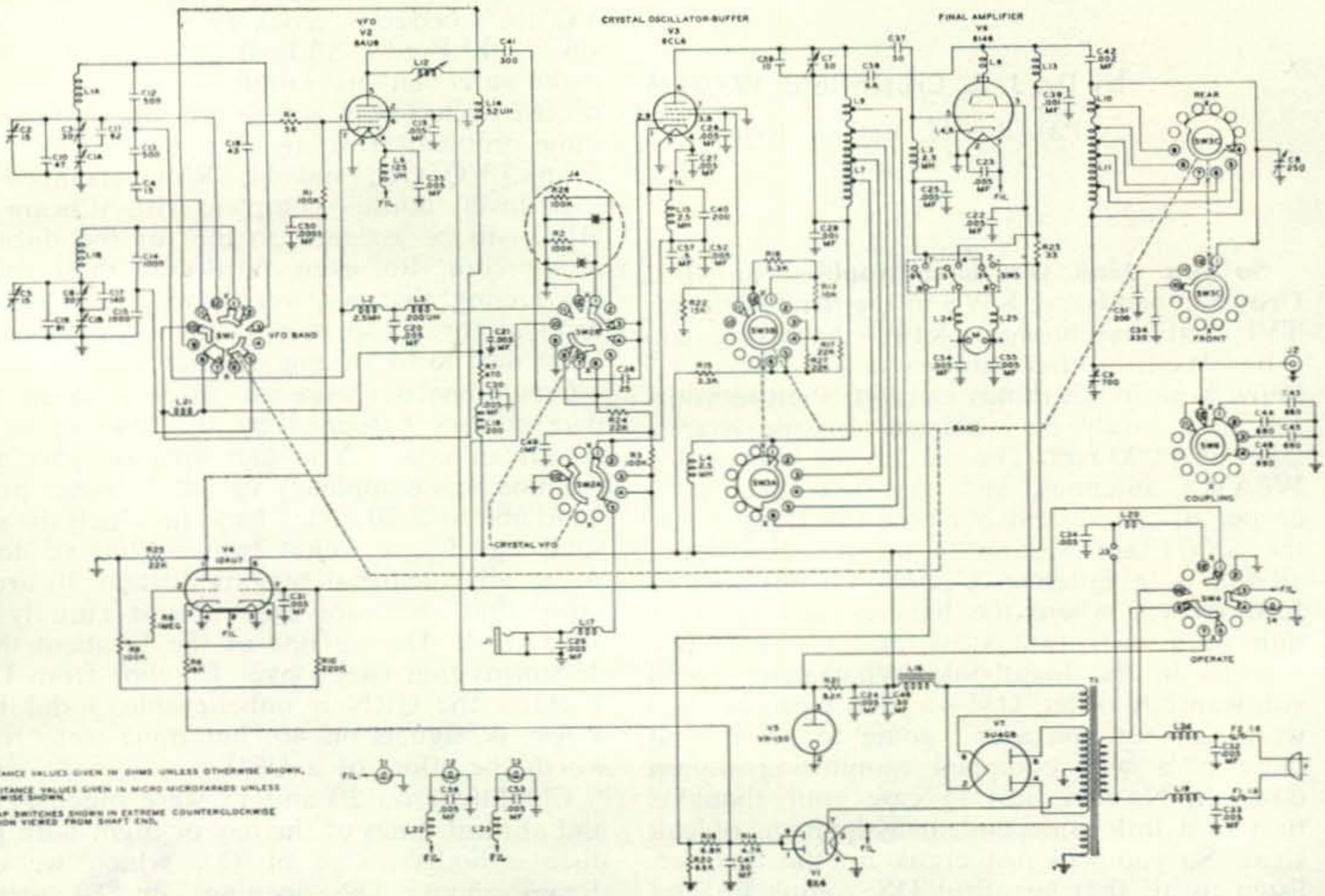
A3 Operation

It seems like sacrilege to even suggest modulating such a beautiful cw rig but there will no doubt be hams like Mel, that want to. It can be done with a minimum of effort and without "butchering" the "Navigator." A four pin Jones connector was mounted just to the left of the power cord grommet. This connector may be seen in the rear view photograph of the "Navigator." The orange wire that connects between R23 and C39 was clipped and each lead connected to one of the socket pins. For cw operation, a jumper is placed across these two pins to complete the circuit. The filament circuit was connected to the third pin of the connector and a wire was connected from the transmit pilot lamp ((I4) to the remaining pin of the connector. The modulator consists of a pair of 6L6's operating from a separate power supply. Two six volt relays are employed in the control circuits. One completes the 117 volt circuit to the modulator, when the filaments of the "Navigator" are turned on. The other relay is connected to the modulator B plus circuit and is energized when the "Navigator" is switched to transmit. On the air tests at K6GOK's QTH showed that the Navigator was easy to modulate and all reports were favorable.

Conclusions

About my most violent complaint of the Navigator is the use of a "phono connector" for the antenna output. This type of connector does not impair the operation and it seems sturdy enough. I just don't like them! They look much better on the $19.95 hi-fi amplifiers etc. Simply a whim of mine.

The Navigator kit (catalog ǂ240-126-1) goes across the counter for $149.50 while the wired and tested unit (catalog ǂ240-126-2) is available at an amateur net of $199.50. All things considered, if you are a cw man at heart, it is a small price to pay for maximum flexibility and probably the finest cw note ever heard on the air. ■



Bwana Crutchfield, W7GFM, in working togs. Seattle was never like this!

FRUSTRATION IN VQ5

by Dr. J. A. Crutchfield, W7GFM

P.O. Box 12, Malindi, Kenya

So you think you have troubles, do you? Crowded bands, six KW's in the neighborhood, TVI, and that broken 4X1000 bothering you a bit? Well, brother, simmer down—you don't know how tough things can get. Picture yourself in a lovely cool cottage, looking over a lake, at 4,000 feet. The yard is big enough for W6AM's antennas, and there's a neat little corner of the verandah where the Ranger and the SX-71 are waiting to be unpacked. And all this is in Entebbe, Uganda, in the heart of East Africa, where the ham population is as thin as a restaurant steak and QRM is just a word in the handbook. What more could you want? A ticket, OM—a little piece of legal wording—but you aren't going to get it, and there is a well equipped monitoring station down in Nairobi, just in case your thoughts turn to a little independent assignment of call signs. So you will just crank up the receiver, listen to all that beautiful DX rolling in, and suffer. I know; I've been doing just that for six months!

Let me hasten to add that this sad state of affairs is not due to the local authorities. Everyone in Uganda, from the hams to the Ministry of Corporations and Communications, made every effort to obtain a license for me, particularly since I was posted here by the Food and Agricultural Organization of the United Nations to assist in the development of the commercial fisheries. The flat refusal of the United States to consider reciprocal licensing of amateurs makes it impossible for American hams to raise a voice when similar restrictions are adopted by other countries.

Apart from the crucial license problem, which is beyond local control, the ham gang in Uganda, in the best amateur tradition, has done a tremendous amount to add to our enjoyment of this intriguing country. We ran into Bill Campling, VQ5EK, soon after our arrival, but had only a few visits with him before he went on leave. While hunting for Bill's QTH in Kampala, I spotted the familiar outlines of a 20 meter beam, and before I knew what had hit me I was enjoying a bit of wet with VQ5AU and his family. Ernie put me in touch with the other Police Radio hams, VQ5GJ and VQ5DM, and with the sage of the Posts and Telecommunications, Fred Cook, VQ5EC.

The fraternity of ham radio has never been so welcome to us. When it appeared that we would be without housing for a month the wheels started to spin, and within two weeks I was installed in VQ5AU's house, using VQ5EC's bedding, crockery and cooking utensils, with Fred's XYL Beryl, standing by to make sure that my family was fed and transported while I was out on the lakes. When the same problem arose again a few months later, Frank, VQ5GC, and his XYL arranged for their lovely house—complete with V beam and HRO—to be assigned to me for the duration of my tour. But even more than these things, the feeling that we were always welcome to drop in for a cup of tea and a chat meant a great deal to us throughout our visit.

Conditions out here are quite a shock to a pair of ears hardened by the blasting of the American ether. You can imagine your own reaction to a completely vacant 75 meter phone band and to a 20 meter band in which the only solid signals are found from 14200 kc down! As in all equatorial regions 80 and 40 are so noisy that they are used almost entirely for local work. During one of the frequent thunderstorms that sweep over Entebbe from Lake Victoria the QRN is unbelievable. I did hear a few W signals on 40, but none were really worth the effort of a QSO.

Conditions on 20 and 15 were much better, and at most times of the day or night both produce a hodge-podge of DX which we only dream about. The openings on 10 seemed

rather spotty, with ZS and ZE the only consistent signals, but on occasion it produced some phenomenal signals from the eastern and midwestern areas of W land, I never could get accustomed to the blase attitudes of the local hams toward such calls as ZC4, FB8, FQ8, ZB, SV and the like, or to their eagerness to snag the odd VK! Oh, well—we always say that it's all in the location.

If you are looking for that VQ 3, 4, or 5 QSO, your best bet would be from 0300 to 0500 GMT on twenty and from 1900 to 2100 GMT on fifteen. Twenty also produces some excellent W signals out here in the late afternoon, but the European QRM is quite rugged, particularly from the swarms of potent Russian signals. You may not believe it—I didn't either—but you will do far better out here in the bush if you avoid the band-edge pile-up like the plague. Even stalwarts like W4IKM, W6MUR, and W8BKT get lost in that squealing mess!

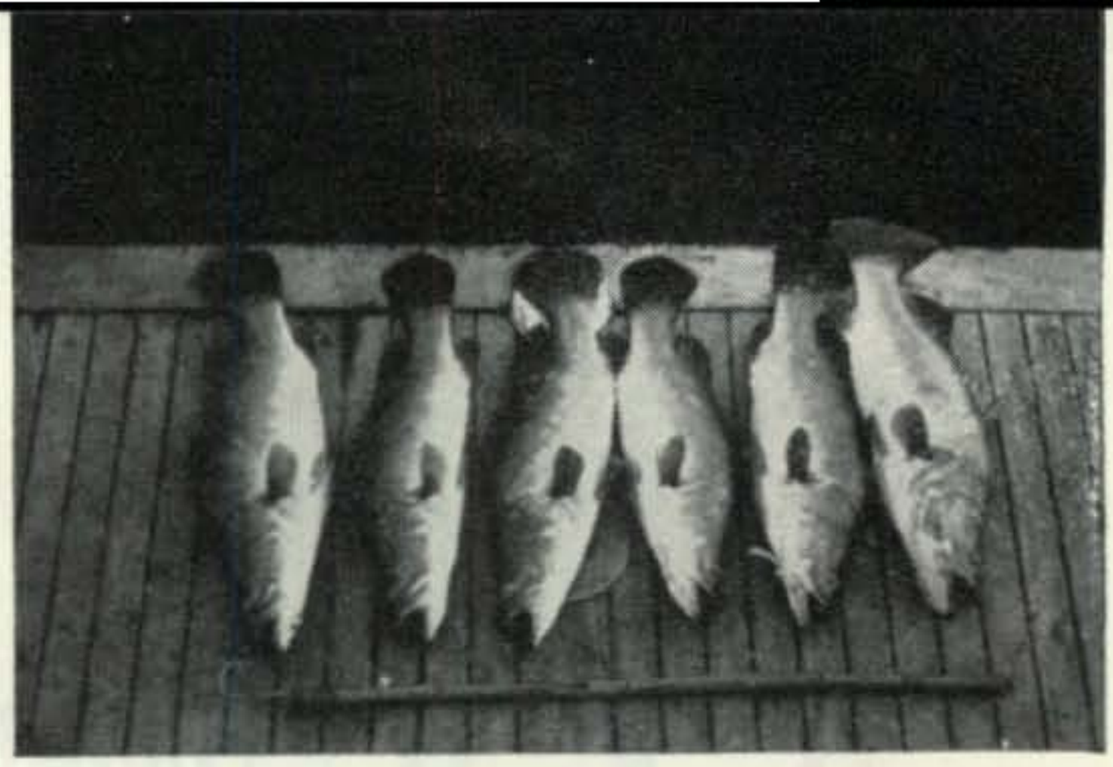
It might be helpful to remember that everyone in Uganda works from 0830 to 1200 on Saturdays. Most of the ham activity is confined to evenings and Sunday mornings. The usual rules about good DX operating prevail with a vengeance. Like most British hams, the chaps in VQ5 are sharp, crisp operators, and the VFO swishers, long callers, and zero beat artists are not likely to get that coveted QSL. Don't get too impatient about your cards; surface mail to the United States takes two months or more, and the airmail rates are just too high to meet the countless requests for direct QSL. If you are like W7GFM, it will take you about fifteen years to work VQ5—why be in a rush for a card?

The exotic prefixes have become rather commonplace by now, and the real thrill comes from the occasional solid signals of old friends and competitors. Perhaps it's just my traditional California loyalty—I held W6EEI for 16 years—but those bell-like booming signals of the top W6 cw stations stand out most clearly in my mind and on the SX71. I hate to think what their light bills must look like at the end of the month.

The VQ gang were given permission to operate on 50 mc a few months ago, but only a few ZS and ZE contacts have been made thus far. Frank, VQ5GC, is probably the most persistent VHF hound in Uganda, but his most memorable achievement to date is a severe case of the screaming jitters when he caught only the local end of some sensational ZS-W6 openings. There is a lot of 2 meter activity in Kenya, but it hasn't spread to Uganda as yet.

Gear is, of course, a severe problem for the hams in East Africa. Exchange restrictions make it almost impossible to obtain American equipment, and even British products are scarce and very expensive. I have a feeling, however, that the VQ prefix does more for the

[*Continued on page 94*]



A morning's catch of Nile Perch from Lake Albert—91 lbs.

My home away from home—Fisheries launch "St. Clair" at Butiaba.

Game Ranger Heppes with a load of confiscated poaching equipment.

An East African Tigerfish . . . Note those dentures!

A. V. C. (Automatic Visitor Control)

by AL AYLING, W6LFM 50 Palm Avenue, Mill Valley, California

This gadget was inspired one cold, rainy December night by a series of events that almost dislodged this amateur from "The World's Finest Hobby." Come back with me through the years to a certain evening which started out quietly in the shack.

It was late Saturday night, and 15 meters was just beginning to fold. I had called the last dying ZL and was straining to recognize my call in the QRN when the great oaken door of the manor shuddered with three thunderous knocks.

Strange, I thought, a caller at this hour. Can't be a TVI complaint. No new neighbors —but I suddenly recalled, there *was* a new neighbor! Most likely has a 21 megacycle I.F. I quickly switched off the rig, threw a dusty sheet over it, and laid out a game of solitaire.

With the door open just a crack, I was able to make out my nocturnal visitor by the light of the arc lamp on the corner. He was dressed casually, in sport clothes, sneakers and a mackinaw. Common costume for these fellows, I've found; makes it easy to hide an ax. His voice rose over the shrieking wind.

"I'm Joe Doakes, your new neighbor," he said. He was smiling, but I wasn't deceived for an instant. I kept the guard chain hooked.

"What do you want?" said I.

"Just paying a friendly call," he answered. "Heard you are an amateur radio operator. I wonder if I could look at your radios. Read about you fellows' work during the big flood. I've always wanted to see one of your stations."

While I was considering this, the wind tore loose a rusty downspout, and my visitor took a couple of gallons on the port side.

"Some other time perhaps," he said and started to back away. "It's a bit late tonight."

I decided to take a chance. "Come in," I said. The situation really called for a hearty handshake, beer, pretzels and the other social graces, but the months of hibernation in the shack had left their mark, (I was trying to WAZ) and I merely mumbled, "Pleased to meetcha."

I led my mysterious visitor down the steps to the basement, through the trap door and down the ladder into the shack. I lit a candle and pulled up a couple of crates to sit on.

Fifteen had folded by this time, so I started to tune up on 40. Changing bands in this shack is a bit of an ugly job, what with winding the feeders around the honeycomb, plugging coils into the Super Wasp, tuning for maximum smoke, etc. Consequently, my visitor had time to get curious. He nosed around the rig, fiddled with the key, and asked a thousand questions. Between trying to answer his queries and keeping his hands out of the power supply, I blew fuses, spilled coffee on the log, and broke my last 807. But I managed to patch it up, and at last, at last . . .

"We're ready," I said, and dredged up half a smile.

This was his cue. He wanted me to contact his mother in Ireland. "Get me Mother," he begged, with shining eyes. "She lives down the street from a ham in Dublin, so it should be easy."

As gently as I could, I broke it to him that talking to his mother was not in the cards. Now he was a nice chap, but this biased him to cut-off. In fact, regarding amateurs in general he was plenty negative. He carried on:

"These things are bad for TV, aren't they? The other night I was watching the fights, and . . . etc."

To counter this required recitation of the carefully worded statement the TVI committee had worked up, but I was tuning around for a station, so I lost the chance.

I called CQ and hoped for a good contact, some friendly guy about eight states away who would be Q5 all the way with a voice as smooth as butter. If you've read this far, you know who I got—the town creep, eight blocks away,

running 17 milliwatts to a filament modulated UX-199, 2 kc's away from a sidebander.

I gave up. Confused and demoralized, I idly estimated what a home-brewed rig with finest parts throughout would bring on the open market. I would keep the Super Wasp because it was old, and they don't make receivers like they used to. It was a fine, proud hobby while it lasted, and a few of the brave ones might carry on, but I was through—washed up.

Sadly I followed my visitor to the door. He vanished into the night convinced he had seen a typical amateur radio contact made.

With a heavy heart I cast myself down on some old surplus tuning units. The candle had sputtered to a mere stub. Clearly, my happy days in ham radio had come to an end. I pulled my cloak about me and drained the last drops of Amontillado from the orange juice can. My gaze fell on a mouse who stared back through the eye of a porcelain insulator. Suddenly, in the nebulous depths of my mind, an idea began to take shape!

I would devise an Automatic Visitor Control! Something to occupy my visitor while I fired up the rig. It must put him in a mellow, friendly mood. Possibly Mumm's '28 and dancing girls? No—not enough space. Laughing gas? Might work. Space doesn't permit listing the possible solutions I considered. Just take my word for it: the one I finally selected is the best, the most effective, and, by all odds, the cheapest.

It is easily constructed from material found in any shack. It requires no external power supply and uses standard parts throughout. No math or theory is involved. You can assemble this gadget in one evening and run a KW with it. Best of all, it has been tested on all bands and really works. In all modesty (and it ill becomes me) I freely admit that it is the best thing for ham radio public relations since the development of the low pass filter.

Construction is deceptively simple. Merely feed a sheet of reasonably clean paper into the mill and pound out the following copy:

VISITORS PLEASE READ

This is the amateur radio station of "Spook," W6LNM & "Dirty Al," W6LFM.

We are licensed by the Federal Communications Commission.

Amateur radio is the hobby of thousands of men and women from all walks of life throughout the world. The special pleasure of building and operating radios may be compared to the thrill you got as a youngster from flying a kite you built or even to the satisfaction of driving a car skillfully. This feeling plus the prospect of meeting new friends on the air makes it a captivating hobby.

Amateurs are licensed after passing a code test and an exam in radio laws and theory. License information may be obtained from amateur radio supply houses.

This equipment does not interfere with TV providing the TV is of good design, filtered, aligned and operated properly and used with a good antenna.

Basic equipment:
- Receiver (like a radio but made especially for amateurs)
- Transmitter (Like the big ones but smaller)
- Antenna
- Microphone
- Telegraph key

Our equipment is worth about $500. Other stations: $25 to $25,000.

Voice is convenient, but code gets farther and is simpler to build.

We are restricted to narrow bands of frequencies. One is near the broadcast band.

Talking to a certain amateur in a certain city at a particular time is a one-in-a-million shot for the simple reason that he may not be listening. This explains why we cannot contact your brother-in-law in Miami, etc.

Amateur operation is strictly for fun. Accepting money is illegal.

We talk of many things, including radio, the weather, our jobs and our families. If you are invited to say something, speak clearly and naturally about 3 inches from the mike, and say, "Hello. My name is . . ." Relax. The mike won't bite.

The exchange of QSL cards is a pleasant custom of confirming a radio contact. Copies of the cards we send are on the wall.

Amateur radio is good for youngsters because it interests them in science.

Repair of HI-FI, TV and table radios requires special skills which many amateurs do not have. We do not install or repair such equipment.

The display of old radio parts dates from about 1900 and is a gift of Mr. Paul Stanley, Howard Young (W6PKH), Dick Danford (ex-W6ECS) and others.

VISITING HAMS PLEASE NOTE

Get checked out on the rig before operating. If you operate, *Sign the log*.

Try to get it on one sheet of paper and use two columns. Its easier to read. Naturally there will be some changes. Insert your own call near the top instead of mine and my XYL's. Change the value of the station to $10,000 or whatever yours is. But don't make it too long. Visitors lose interest if it looks like the charter for the U.N.

Operation is simple. Hand it to your guest, tune up the rig and call CQ. A.V.C. will automatically inform, befriend and entertain your visitor. While he reads, cue the gang that you're demonstrating the rig. Someone will come to your rescue, and from here on, it's up to you. ■

CURE DRIFT FOR 15 CENTS

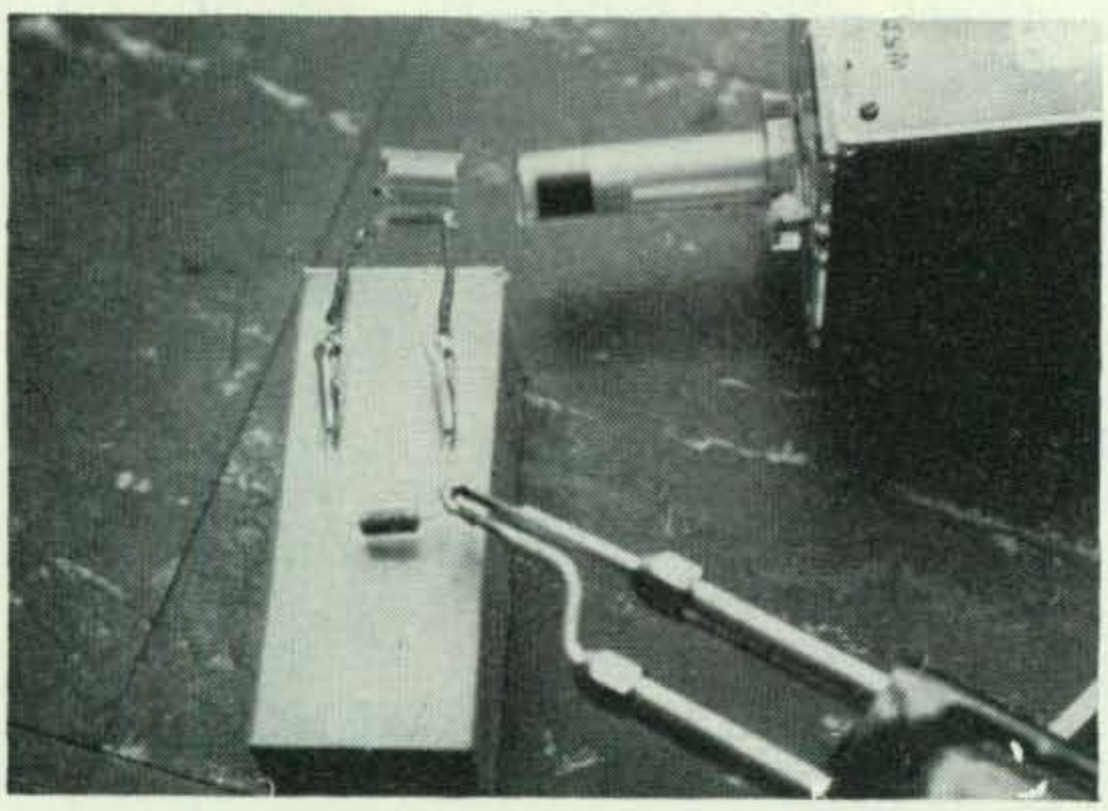
by A. D. Mayo, W5DF 209 Conti St., Jackson, Miss.

According to CQ's survey there are many older receivers in use today. The art and science of ham radio has advanced since these receivers were designed and built to standards of bygone years. The very heart of a ham station is the frequency determining oscillator of the receiver, as well as that of the transmitter. Until recent years nobody heard much about temperature compensation of oscillators, and it might be safe to say that all of the older sets have time drift.

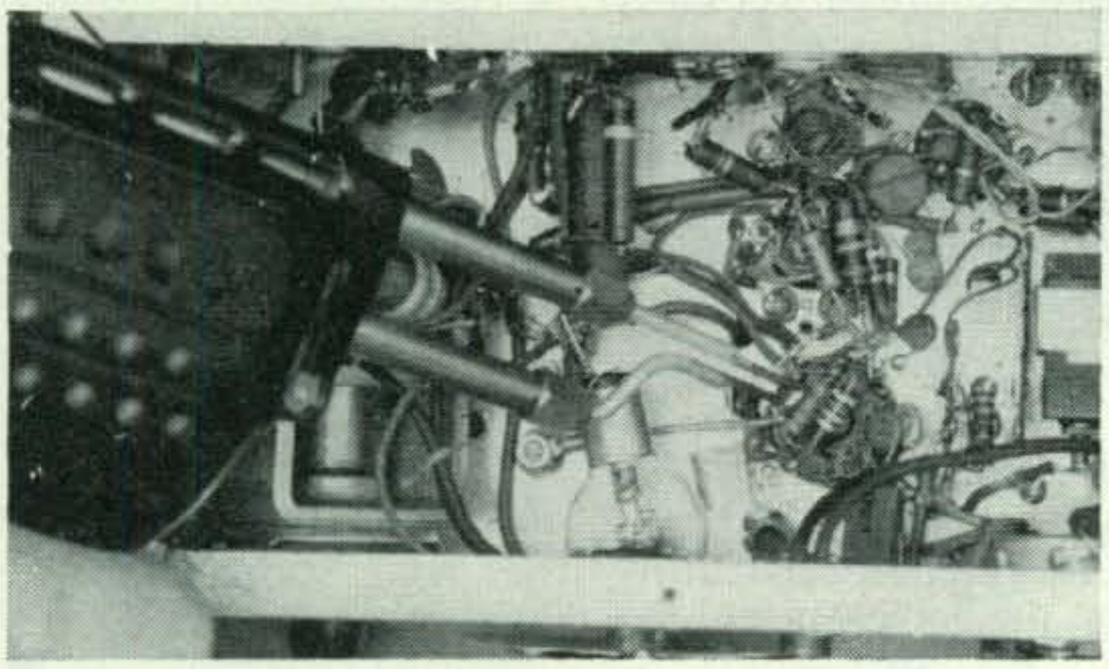
Around 1947 I had a very good receiver but the band edge at 14 mc moved 50 kc during the first 20 or 30 minutes after it was turned on. Being familiar with this shortcoming, I lived with it satisfactorily in that day and made compensations for the drift. Today I would not tolerate it, and in fact could probably remedy it with little effort. This drift could probably be reduced to 5 kc or less by the simple installation of negative temperature coefficient condensers of the correct value and in the correct location. These condensers are standard parts today, but years ago nobody heard much about them, and the need for stability was not as great then as it is now.

Single sideband boys say the carrier reinserted in the signal should be accurate to within 50 cycles of the original. The h.f. oscillator is one determinant of this frequency and must be stable. To follow a sideband signal with my old receiver I might have to make 1000 corrections in the dial setting over the first 20 minutes of operation. An exasperating situation. Herein may lie a lot of difficulty in SSB reception with older equipment. Also, newer receivers are not immune to drift.

Rough check of temperature characteristic by heating condenser and checking frequency by GDO.



Soldering gun placed against outside of general purpose ceramic to check frequency change under heating.



What To Do About It

If you are looking for a quick answer and cureall it is probably as follows in 9 times out of 10. The drift is probably 10 kc at 3.5 mc, and proportionately greater at higher frequencies, and is probably in a positive direction due to increase in inductance of the coil with heating. It is probably correctible to 10% of the original drift by the installation of a negative temperature coefficient condenser 750 ppm/ degree C and the value of this condenser will probably be 3% to 5% of the total capacity in use in your tuned circuit. This is an extreme generalization, but chances are even this is better than no compensation at all.

Calculation is impractical so we make a

change, then check. The first step is to determine the amount and direction of drift and time of drift. Using any reference signal of constant frequency you can check this during one operation period if it is not already known. If the reference signal moves to a higher freq. on the dial it is positive drift and has to be corrected by decreasing the capacity of the tuning condenser. This is the usual case.

Causes Of Drift

The most common cause of positive drift is expansion of copper wire as it is heated, increasing the coil diameter and therefore the inductance. Two hours may be required to reach stability, when the coil gets as warm as it is going to get. Admittedly the change in the dimension of the wire is microscopic, but we are measuring microscopic increments of frequency. Few physical measurements indeed approach the accuracy with which we check frequency every day we operate. A drift of 14 cycles at 14 mc is one part in a million. Other frequency determining parts are fixed or variable padding condensers and the oscillator tube.

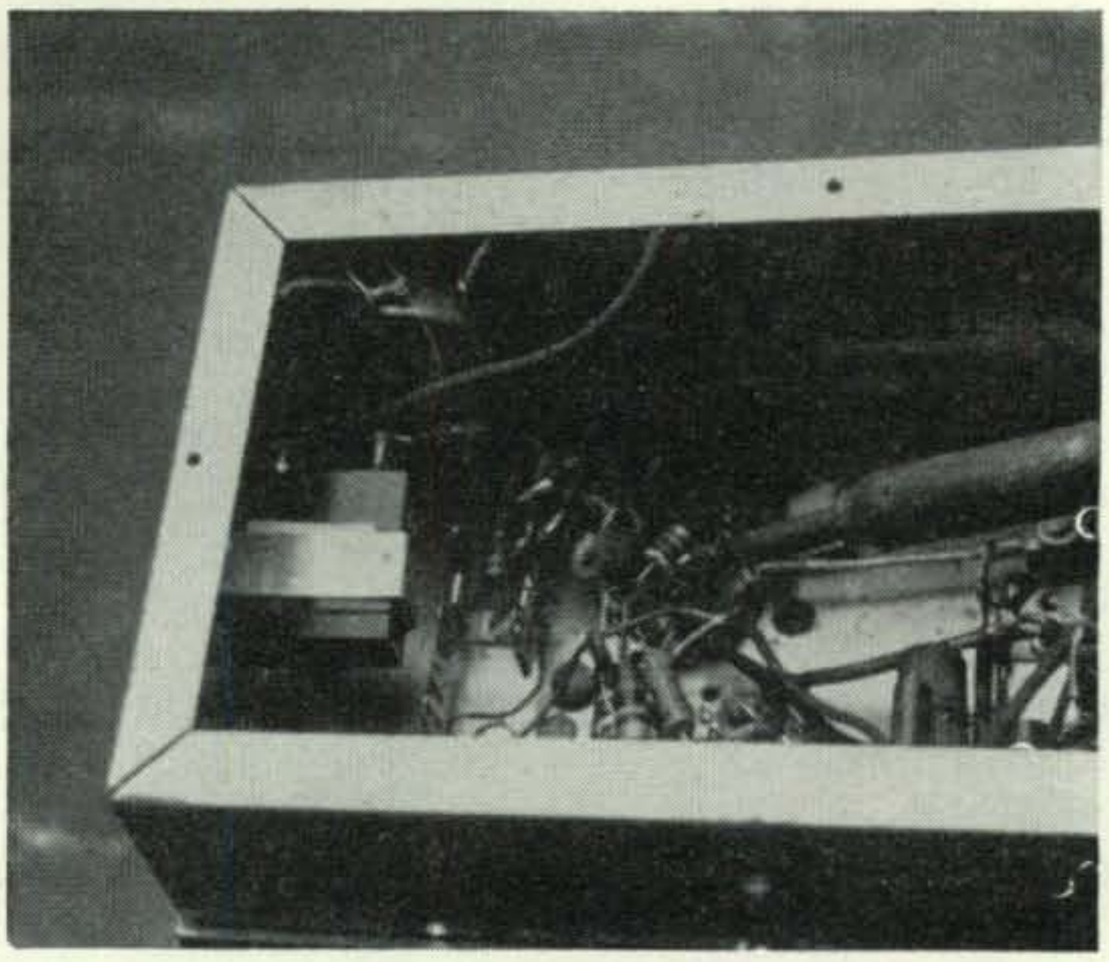
There is a simple way to fairly positively identify the component responsible for long time drift. A signal is tuned in and a soldering gun is used to heat the leads to each component. This should be done intelligently in such a way that only one component is heated at a time. Small condensers can be heated by touching the body of the part with the hot tip. Coils can be heated by placing the tip along the winding, at a terminal, or inserting it in a coil. When the iron is removed and a signal has moved several kc on the dial, you will know the component just heated is at fault.

Be suspicious of any condenser. If it drifts under heating, and is replaceable with a zero temperature coefficient type it is best to replace the condenser. The reason for this is that the fewer temperature sensitive components you have, the easier it is to place the corrective components at the best spot regarding rate of heating.

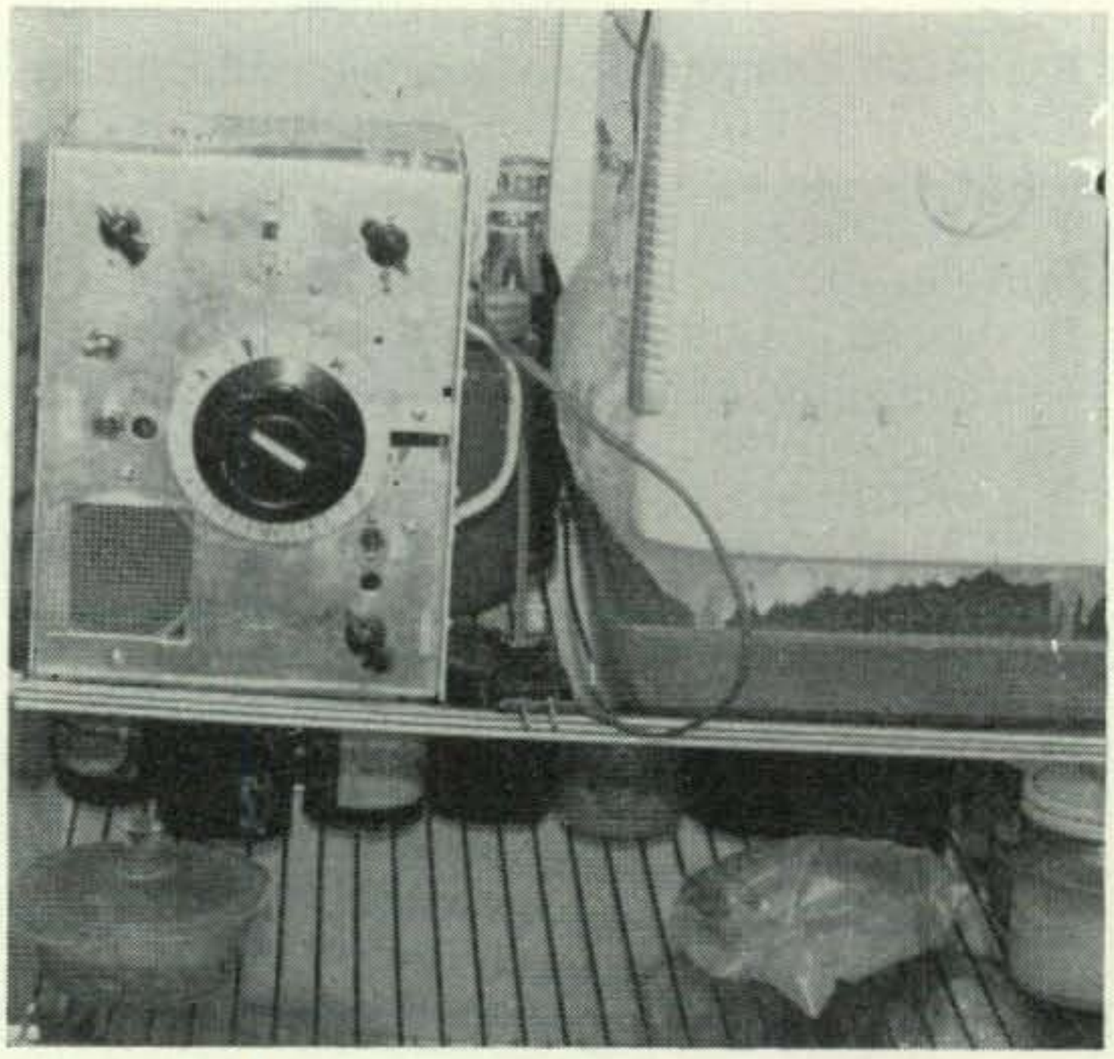
Drift due to changes in internal capacitance and characteristics of the oscillator tube is usually small and completes its movement within 2 or 3 minutes time. If short time drift is serious, another tube might be tried.

Corrective Measures

Before proceeding with temperature compensation, and while on the subject of the oscillator, it is well to check the parts over for stability of mechanical nature. Tuning condenser shafts should be free from wobble, yet move freely. If there are leads that can move under vibration these should be replaced with larger, more rigid, wire and possibly additionally supported. A lead of hook up wire 3 inches long can and will vibrate to impart a bubbling sound to a signal, if this lead is close to oscillator components. It is better replaced with solid No. 12 wire, rigidly supported.



Soldering iron heats component to check oscillator drift.



For extreme checks, bring temperature of entire set down to lower temperature by placing in refrigerator several hours.

It is not generally recognized that non-conductors which can move in the field of a coil can also cause mechanical frequency instability, but they do. A dial cord or piece of plastic near a coil can cause trouble.

Assuming that we are to set out to correct drift caused by heating of the oscillator coil, the logical place to mount the compensating condenser is on the coil itself. When the condenser is installed, a trimmer somewhere will need to be decreased to keep the dial markings and calibration the same.

The capacity of this condenser is probably 3% to 5% of the total capacity in the circuit. If a bandset condenser is used to cover two bands, this may be a total of 300 mmf on one

band while it is 75 mmf on another. I would split the difference and use 5% of 150 mmf or say about 7 mmf of 750 ppm/ deg. C compensation. There are some ceramic variable negative temp. condensers of a range of 5 to 20 mmf and one of these is ideal. Experience has shown that another rough check may be used for a quick indication of amount. With the compensating condenser mounted in place, crimped leads but not soldered, a dial check is taken of a signal. Then the leads are soldered and the signal quickly checked again. If the shift in frequency due to solder heating is about 4 times as great as the original drift of the set, you are on the right track. Then no further check of this compensation should be attempted for several hours while the components cool.

The next normal operating period will indicate whether the drift has been lessened, and whether more or less compensation is needed. If too much compensation has been added, the signal will reach a point of stability in 30 minutes or an hour and then a negative drift will start to come in causing reference signal to move to a lower dial frequency.

If the set reaches a period of stability in 30 minutes or an hour, but seems to drift fairly fast for the first 10 minutes or so it is very difficult to correct this. Some relief can be had by splitting the compensating condenser in two parts. One compensator is mounted directly on the tube pins. Most oscillator circuits will permit mounting from grid to a filament pin. This way the filament pin will more quickly heat the compensator. Sometimes the compensator can be mounted above chassis almost touching the tube shell, for faster take up.

It only takes a few minutes to make these changes and they can then be checked at leisure while operating.

Other Data

Very few fixed condensers are zero temperature units. Very few silver mica condensers are zero temp. For this reason I have abandoned their use in critical circuits and use ceramic NPO. Most of the so called cheap general purpose ceramic condensers have very high negative characteristics and I have used them for compensation, with success. A quick rough check can be had by connecting a condenser across a coil and grid dipping the frequency. Then a soldering iron is used to heat both leads to the condenser. A N750 condenser will move the resonant frequency about 5%.

On one occasion we installed a 10 mmf general purpose ceramic on the oscillator coil of an old set and the owner reported no noticeable drift after that. Considering the 15 cent cost and small effort to accomplish this, and working of probabilities this might be used as a "shotgun dose" of cure for the general case.

Suppose the drift is checked and found to be practically compensated when the set is used on successive nights, but then after a rest of 2 weeks the set is turned on and there is some drift. This condition is common and probably due to humidtiy effects. As long as the set is dried out it is stable but when the coil takes on moisture it will drift until this is expelled again. This condition can be helped by doping the coil but I can not offer a cure. I tried to make some humidity compensators using wood, but with poor success. Then maybe it was not humidity. I do know Collins sealed up their PTO unit, and they attained stability.

The beat oscillator should not be ignored. Some years ago I owned a set that cost several hundred dollars and the beat oscillator drifted over 5 kc every time it was turned on. Then last year I bought a much more expensive set and it only drifted about 1 kc per night. After about 3 nights operation it has moved 3 kc.

It is then stable until it remains idle for a week or so. I tried to find out something from the manufacturer. Then I built a crystal oscillator for a beat oscillator.

In regard to VFO stability for transmitters, I have found it a fallacy to rely on the physical isolation of the tuned circuit from the tubes and other heat producing components. You can maintain stability without temperature compensation as long as the room temperature remains the same but with a change in season you are at the mercy of ambient temperature. For example, a VFO was built and used successfully during the summer months when there was small change in room temperature. Then when cool nights came and my shack was say 50 degrees and rose to maybe 75 or 80 degrees after lighting the gas heater, the VFO frequency would drift very slowly over a period of four hours. This was certainly worse than a fast but finally ending drift that completed itself in an hour. The VFO was stabilized by the addition of 25 mmf neg. and the total circuit shunt capacity was 540 mmf. This VFO was taken from a BC457 and loaded to 3 mc and it will now stay within 1 kc for several hours. ■

Didit dah didadah didah dididit didit dadit dadidadit dadadidah. . . .

CQ reports on:

the VOX BOX

by WAYNE GREEN, W2NSD

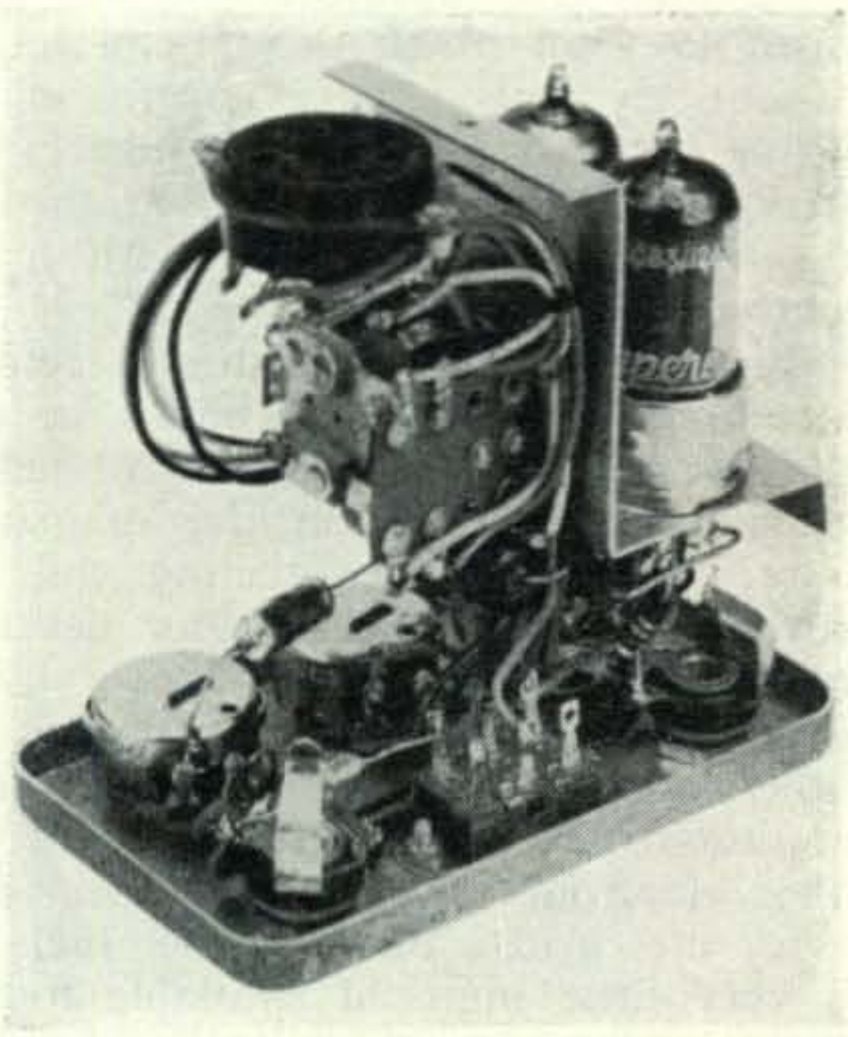
I must admit that the first time this was suggested to me the idea sounded a bit ridiculous, or at least unnecessary. Why on earth should anyone want to go to all the trouble of installing a voice operated send-receive switch in the car?

Two real good reasons. Number one, it allows you to use the Lapel mike and keep your pudgy hands on the wheel, thus possibly extending your life span considerably. Number two is a result of number one; you don't get picked up by the gendarmes for operating while in motion as they can't see you operating —providing you live in one of the backward areas of the country where such archaic laws are still unrepealed—like goode olde Newe Yorke Citye.

The idea of the VOX relay is particularly beneficial to people like me who operate one of those newfangled, stick shift cars. With the usual push-to-talk mike I am busy shifting the mike from one hand to the other as I shift up and down through the gear box. The mike gets dropped in the lap if I have to both shift and steer at the same time. Also, being a small (very small) convertible type car, it is almost impossible for me to use the mike without the police seeing me.

Enter the Creative Electronic VOX BOX, price $27.50, a unit small enough so it even fits under my dash. This gidgit runs a 12AX7 audio pre-amp and a 12AU7 relay and time control. Power is borrowed from anything handy, a 6 or 12 volt for the filaments and 150 to 225 for the plates.

Once installed the adjustment is a bit critical, but you can get it to flip on for you and ignore horns, door slams and traffic. Then you can settle back with a new freedom of operation, your eyes on the road and your hands on the wheel, or wherever else you find they are needed. Ahem! ■



CALLBOOK QUIZ

by AL EDWARDS, W2BOH

Replace calls with family names

Well W9CAT and W2KUW I do not exactly W5LTD W3PSX-to-WØEIQ with a W7MO, but I do have a DL9EJ in the W2JPE to W9OZH the W8SLP W5BCA who is I W8ZJG W5VYD, K6IRH, W1EAT and W6SIJ, also W3HYU and G6JK W3YGW. There's always a W2BU of K6GSO or W2VZQ around, too. But while you're having a W9KCL-WØTKE I'll probably have a W4EHC or a W3MJW W4FTI. Why? Well, WØUCV G3JUE, sit W8WOY and I'll W6IEC you my W9CCH.

At our W7WZW on W2SWL W8NMF nineteen hundred and something, we served K6DVI. That W1MGP was then W8MWP to me and its W2UZM K2JTJ was too much for my W4GCU W5QK. A W7WZW is not the W3VEN time for a G3ATH or an W3OQL, or "K2IXF-W3FJI" like I did. The W8CUM K2JXJ sent me W2TVR and after the W8NMF WØWBU, K4EJB! I was out like a K6BHE. With some W1LQ W5HVE to W9EEJ me up, I was W9TIU for ZS6AHN. Well, W8RIN did it. W8CUM that W9UDZ W8LRG . . . then I W3TN asleep. I slept like a VE2AVE on a W9UPJ until W2LRN the next W5IGW, at G3GFY with the world.

I think I W9ZMG W1HCP a W9SIZ of WØBIM W8FQJ. Believe me, W9FZA, it was a ZL3DT K6EH to hear the W3BWU of my W5SCX xyl for a W4FFL G3DES W9NUR me "W3WBQ-W3TWY" instead of K4ELO. It was like a W6LNF W2SID KN8BNG the W3WAM G2ASL. It W7LRS my G2NP W9MLJ and W9MLJ again. It was W9ZMG a G3AIL of W4NWI . . . G3DEU the WØCAN W5WXR, or something like that, as they W3TTZ in the W5PZS KN2QCQ where I W5DTC. ■

Protecting Tetrode Transmitting Tubes

by THOMAS F. SNYDER, K6PGB
1542 Harvard St., Santa Monica, Calif.

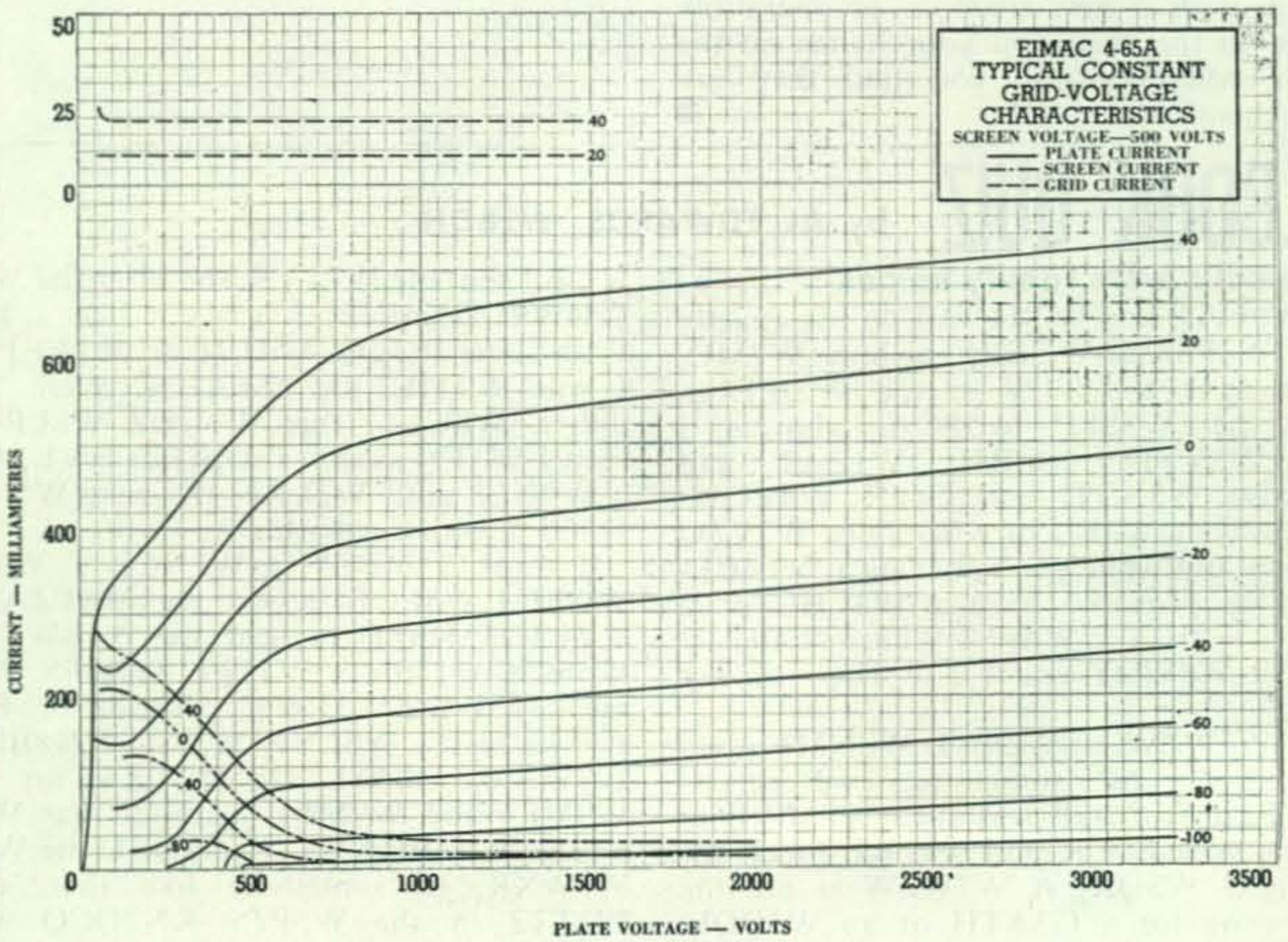
This article was undertaken in sympathy with all the unfortunate hams who have miserably watched the pyrotechnic display inside the final amplifier as that hard-working 4-65A (or pair of 4-1000A's, if the event took place in California) melted down to a blob of metal at the base of the envelope. Sometimes accidents like these are the result of circuit malfunctions or of the prevalent tendency of trying to extract that absolute last watt from the transmitter, but other things can happen that are entirely outside the control of the ham. Who, for instance, would suspect that an infuriated television viewer is right now attacking the transmission lines with a pair of wirecutters?

The higher-power transmitting tetrodes represent a considerable investment in electronic glassware, and in the interest of helping this equipment live to the normal span of its useful life, methods of protecting the gear and preventing such tragedies as described above are the subject of this article.

Aside from being dropped, most injury to a tube comes as a result of getting parts of it too hot, due to excessive dissipation of heat from the electrodes. Damage comes most quickly to the grids, due to the fact that there is very little material available to soak up the heat and keep the temperature from soaring. Due to its large area, the plate is an efficient radiator of heat, and in the case of metal-anode tubes, the principal damage that continued excess plate dissipation will cause is softening of the glass envelope, and ultimately a "suck-in" will open the tube to atmosphere. While excessive control-grid dissipation is not often a problem, it is not at all difficult to burn up a screen, and protection of this element is the most effective approach to the problem.

A screen structure does not necessarily have to melt to ruin the tube; special coatings are placed upon the grid wires to inhibit secondary emission, and once these are evaporated away, the tube's characteristics are radically altered. At a higher temperature, but still below the melting point of the wires, adsorbed gasses can be emitted, and finally, as the temperature continues to rise, holes start to appear in the mesh, and the fireworks mentioned above is the result.

For a given applied screen voltage, excess screen dissipation results from too much screen current. The constant grid-voltage characteristics for a typical tetrode, shown in *fig 1*, will illustrate how circuit conditions or failures can result in excess screen current. In



the case of the sawed-off transmission line, loss of load results. Under this condition, the plate tank circuit has a much higher impedance than when loaded, causing a greater plate-voltage swing. Minimum plate voltage comes at grid-voltage peaks, and at this condition, instantaneous plate voltages much less than 750 v. cause an alarming increase in peak screen current, which, when averaged over the whole cycle, gives the current read on a d-c meter. If the plate-supply voltage is lost, the plate potential is zero at all times, and the effect is much worse.

The "constant-wattage" type of screen power supply has been proposed; this would be a supply with a high series resistance so that, as the screen current increased, the voltage would fall, and the screen dissipation would thus not become excessive. This is the condition existing when the screen voltage is taken through a dropping resistor from the plate supply and is a quite safe one for the tube, but in the case of large transmitters it is wasteful of power (also gets the shack too hot in the summertime). For a tetrode linear amplifier, which demands a stiff screen supply, it is out of the question.

The best answer is a well-regulated screen supply used with an overcurrent relay to remove screen voltage when the current becomes excessive. The G-V Controls Co., of East Orange, N.J., manufactures a line of hermetically sealed, though adjustable, critical-current relays of various current ratings and operating-time delay. These are thermally-actuated and thus have a built-in time delay that will tolerate momentary surges of current. Some types of magnetic circuit breakers possess this property, but thermal relays are preferred, since they have a sort of "memory" of past operating conditions of the equipment being protected, and will adjust the delay in operation according to whether the current before the overload was quite near the critical point or much less. These units are about the size of a 5763 and mount in a ¾ in. hole if you prefer the flange-mounting, solder-in style. They also are designed for mounting in a standard 7-pin miniature tube socket.

To choose the proper type and setting of relay, it is necessary to examine what is meant by the published figures of allowable operating conditions of transmitting tubes. These are not based directly upon the temperatures attained by the elements but rather set a limit on operating conditions which, if exceeded for an extended length of time, might result in damage from any of the factors mentioned above.

In order to protect his reputation, the tube manufacturer must tend toward more conservative ratings so that his products will generally give extended service under all conditions. Thus it is that published ratings, even ICAS, are not necessarily "never exceed" figures. Most hams have had the experience of pegging the screen-current meter as the fuse in the plate supply blows; if you are fast enough in turning off the screen voltage, the tube will usually be found to be undamaged.

Numerical data, however, on the time that a given screen structure can safely sustain a given overload is extremely hard to come by, due in part, no doubt, to the above-mentioned factor of the manufacturer being reluctant to risk his tubes and his reputation upon such marginal operation. But from the "Pulse Service Notes" published by EIMAC, it is possible to generalize that their series of power tetrodes may be subjected to a screen overload of twice rated dissipation for a period of two seconds, starting from a level of 75% rated.

The various critical-current relays differ in their heater resistance and in the thermal mass associated with the heater element and hence in the operating time for a given current change. For reliable operation these relays must be set so that no less than two watts is consumed by the heater, and four watts is preferred. Thus the range of permissible operating points is determined by the heater resistance specified when ordering.

The H-04 relay offers the most nearly optimum response time for screen protection; unfortunately the fact that the highest available heater resistance for this relay is only 200 ohms places a restriction of minimum allowable current setting to 100 ma. This limits its application to the larger tubes. The T-06 relay is about three times slower in operation, but the maximum available heater resistance is 6000 ohms, corresponding to a minimum setting of 18 ma. For a relay setting of 125% of rated dissipation, and a sudden change of operation from one-half to twice rated screen current, the H-04 relay will operate in two seconds, the T-06 in six. Thus the T-06 relay must be set no higher than at rated current, and under the above conditions, it will operate in 3.7 seconds. For additional information and ordering instructions ask the manufacturer for Publication 70. In case it is desired to operate the final in more than one mode of operation, select a relay corresponding to the least current that gives rated screen dissipation, then switch in suitable resistors to shunt the heater of the relay when greater screen currents are allowable.

Fig 2 shows a typical circuit employing one of these relays. It combines a thermal relay as a sensing element and a magnetic relay to remove the screen voltage upon overload. The supply is turned on and off by push-buttons and is quite flexible, in that it may be turned on, off, or reset remotely from the chassis, when an operating console is separate from the transmitter rack. Note that the heater element is in the screen-voltage line; for large tubes the screen voltage may run as high as 1000 v., and this has been found not to be excessive. I ran a couple of units up

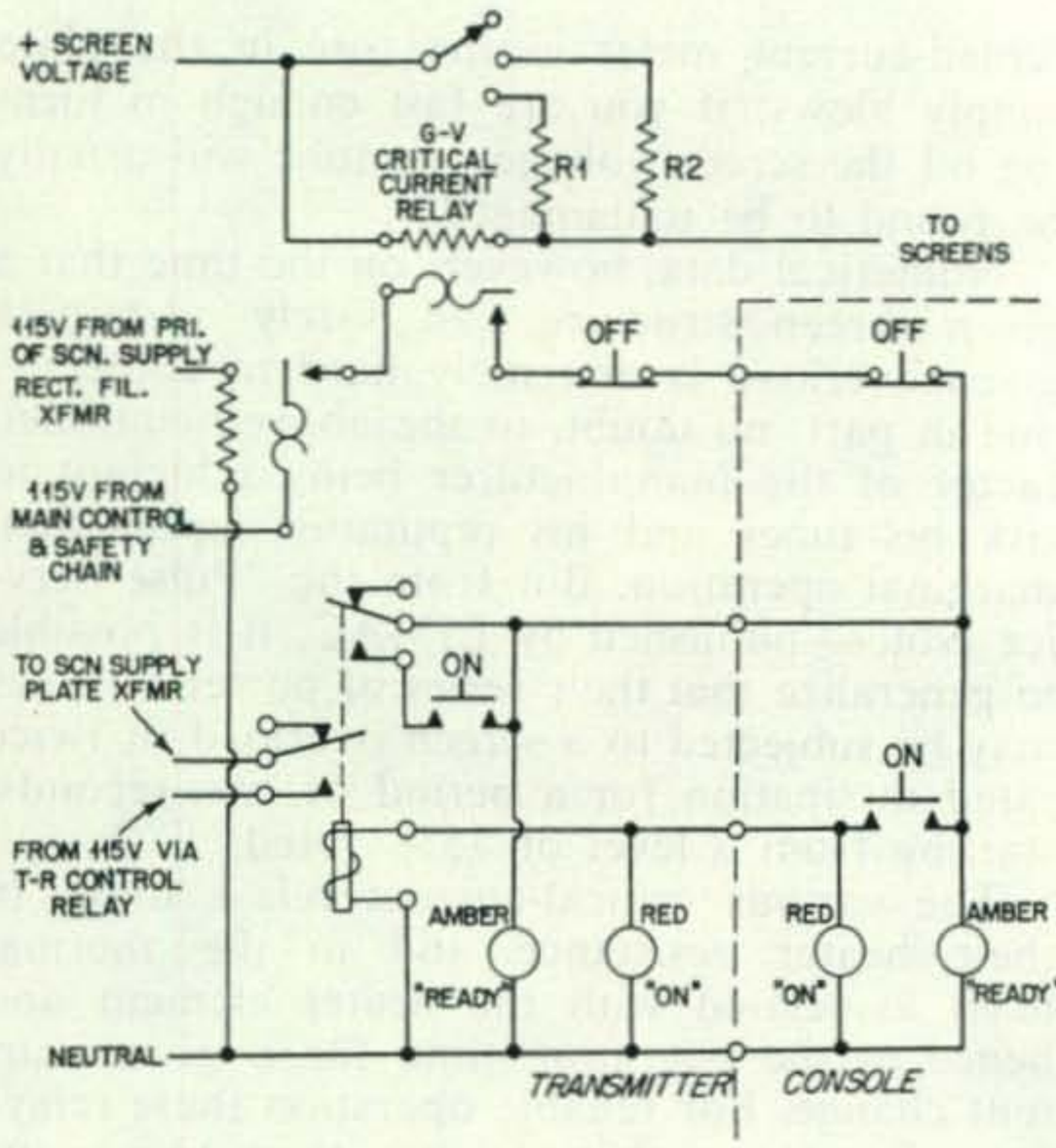


Fig 2. Screen overcurrent protector.*

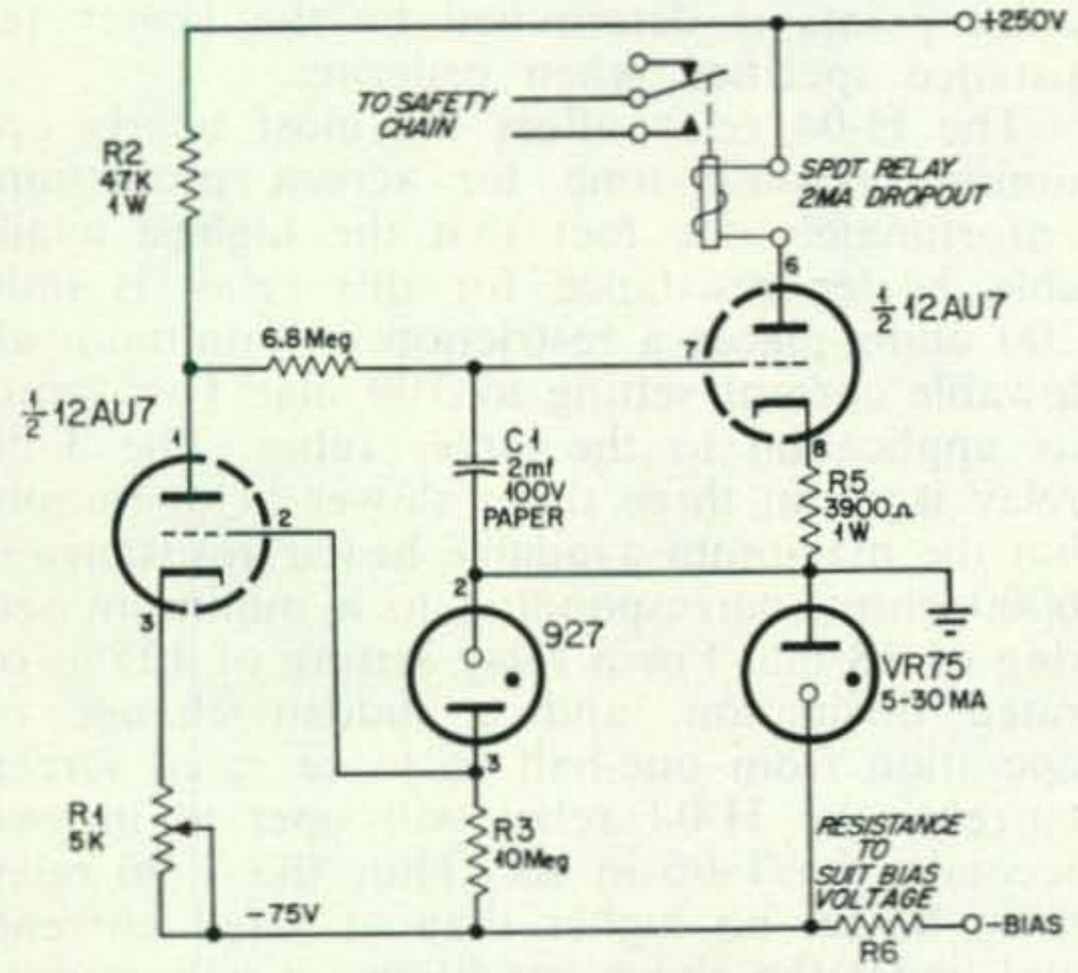


Fig. 3. Plate color monitor. Pin 3 of the 927 connects to the photo emmisive cathode.

to 2000 v. between heater and the contacts and case before arcing began.

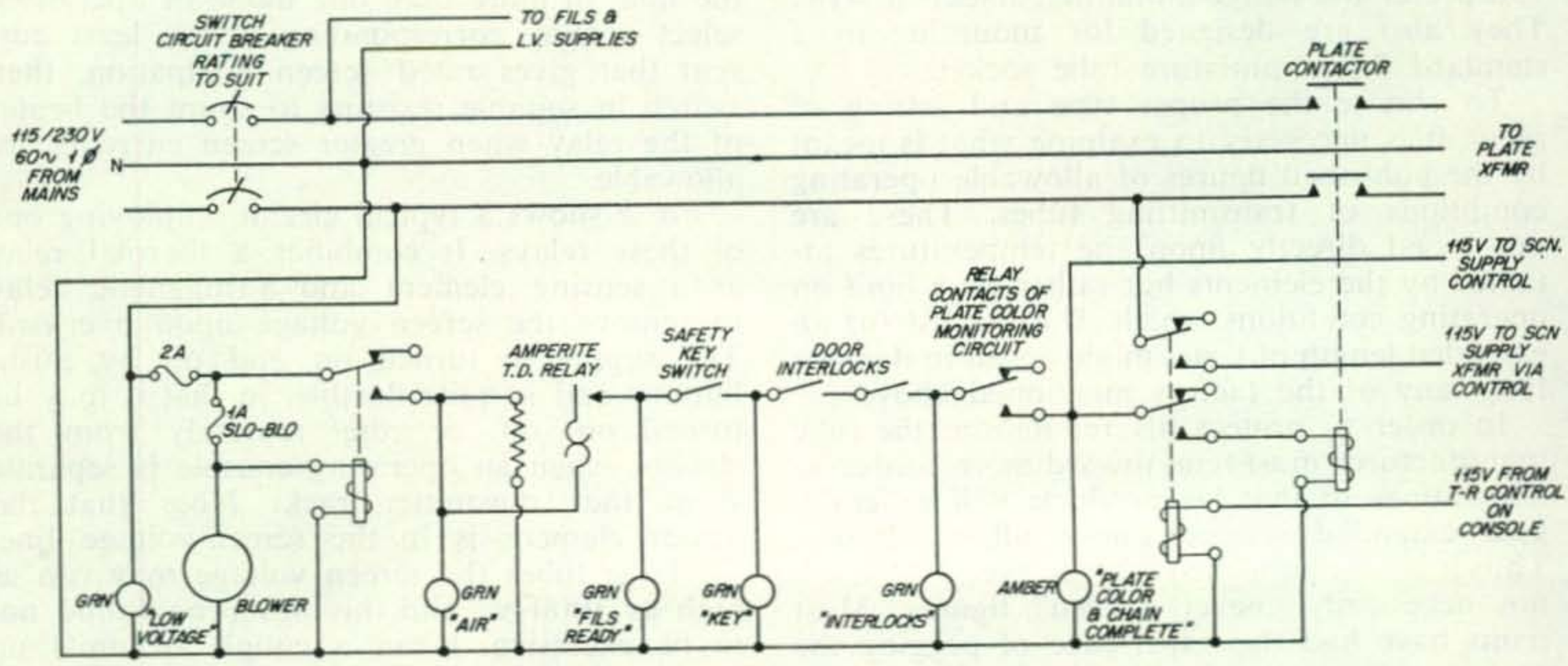
Because a screen grid cannot supply any power output to an external circuit, the current being drawn is a direct indication of the heat being dissipated. It is not so simple a matter with the plate circuit, however, since most of the plate input power does indeed appear as useful output, and a plate-circuit overcurrent device is in fact more useful as protection to the power supply than to the plate itself. However, the *color* of the plate is an excellent indication of the plate dissipation, as witness all those square holes that amateurs have cut in the panel containing their final amplifiers. This is fine, as long as the final amplifier is always in view, but if you have come this far, automatic protection of the anode is in order as well. The circuit described in *fig 3* is one approach. It consists of a gas photocell of suitable spectral sensitivity mounted so as to look at the plate of the tube and connected to operate a relay that removes the plate and screen voltage under conditions of excessive plate dissipation. The light emitted by an ordinary tube at rated plate dissipation is not intense enough to cause a photocell to directly operate a relay priced within the means of most hams, and the amplifier shown is required. The circuit values shown are suitable for a 927 photocell looking at the plate of a 4-1000A. Take care when mounting the photocell that no light from the filament leaks around the anode and onto the photoemissive surface.

To set up the circuit, remove the grid excitation and adjust electrode voltages to give rated plate dissipation, as indicated by d-c plate input. Then adjust potentiometer, *R-1*,

*The top critical current relay should be normally closed, not open as shown. A jumper should also be put between the upper side of the relay coil to the left side of the contact below *"ON"*.

[*Continued on page 100*]

Fig 4. Transmitter Safety Chain.



O - T Regeneration

by JONATHON N. POMERANZ, K4AU/W2WK Box 205, Sanford, North Carolina

The formula would go something like this:

$$20s/30s + \frac{XYL}{TVI} (0) + SSB = \frac{O - T}{Regeneration}$$

What it means is that the old-timers who were active in ham radio up to around Pearl Harbor and who permitted their XYLs and TV and/or TVI to keep them inactive following the War, are mostly returning to active amateur radio because of Single Side Band. It is a sort of "old-timer regeneration."

In my case, not being associated with any phase of the electronics industry, I knew even less of what was going on than almost any other inactive old-timer. Alternating every other week between my home QTH on Long Island and Sanford, North Carolina, I borrowed a portable ARC-5 rig from "Buddy"-W2CB and operated on 40 cw for a spell.

It really felt good to get the "bug" hopping again so I visited with "George"-W2DIO to ask about a really compact cw rig that I could call my own.

George said, "Single Side Band!" I said, "What band?" George said, "Single Side Band." I said, "That's nice, I wish it all the luck in the World." George shouted, "Harvey!" And "Harvey"-W2IJL came along.

George cocked a shoulder toward me and said, "CW." Harvey said, "Impossible! Single Side Band." I said, "If it's Phone, I want CW." Harvey said, "Come-on-a-my-housa Sunday morning."

A-come Sunday morning, I visited with Harvey and, for the first time, saw an SSB rig. Harvey flipped a switch (the show-off) for warm-up, feathered the receiver knob to some talk, homed the exciter, and said, "Break." A voice on top of a voice said, "Who's the breaker?" and Harvey was "in."

Reading from left to right at K4AU is the SSB exciter, under it is a rotator for the upstairs bantam beam and a direct-reading electric clock, the receiver and speaker with an operating light in front of the speaker, the linear amplifier with a phone patch and keys underneath. The box under the middle drawer is for various mike inputs and a recorder.

Perhaps the reader will find of interest the method used for locating the various operating gadgets atop a limited desk area. Putting things on top of transmitting equipment brings them to a source of heat and prevents getting into the equipment. Ordinary wood shelving is put together in 3-sided affairs with angle brackets in the corners for support. These can be tailored dimensionally to fit any specific group of ham radio gear. It is noted that above the receiver, an area is provided for the log book and other writing records and call book.

A "pencil" crystal mike is chest mounted, hung from the neck by ball chain. It completely frees both hands for the fast tempo of SB operating. The log and scratch pad are on top of the desk glass. Under glass are the various data sheets such as a World bearings chart, a small U.S. map with hand-drawn bearings lines, DX prefixes, time conversion chart, "Q" signals, postage list, a two-dollar bill, a dehydrated compressed rabbit's foot and the Ten Commandments.

Behind the wall curtain is the antenna co-ax relay, a co-ax switch with the multi-match long wire and the bantam beam and several assorted doublets terminating into it.

One other operating kink should be reported. The various transmitter tuning knobs have color codes at the operating positions for each band. For instance, to tune to 20, the band-change switches are turned for that band and the associated color is followed through in setting the balance of the knobs. It is then only necessary to do some minor pin-point adjusting with power on. This not only saves a lot of band-switching time but also keeps to a minimum interfering signals going out while tuning up. Color coding is accomplished with clear tape and colored paper snips.

Now we come to what George and Harvey meant when they said, "Single Side Band." Let's forget the technical aspects, there would naturally be two sides to take up the argument. But, there is one phase of SSB in

[*Continued on page 100*]

How to Acquire an XYL Painlessly

by P. G. Roemer, KH6CMM Patrol Squadron SIX, c/o Fleet Post Office, San Francisco, Calif.

This article is being written in hopes of helping some poor, unfortunate (this is debatable) ham who is an unwilling bachelor to acquire an XYL. I have employed it very successfully, although something went wrong at the last minute. For the Ham with a YL, who wishes to remain a bachelor, apply these steps in reverse.

If you are a reasonably young, and not too repulsive OM, you have an excellent chance of winning the hand of a YL. There are several steps to be taken, however, before you start your search.

After seeing to it that you yourself are above reproach in all respects, start renovating your shack, chariot, etc. Remove the mobile rig and store it away for future use. This of course is to avoid frightening a YL off, before you even get started. Mobile rigs are notorious for discouraging YLs.

In this country, there are laws against kidnapping, and to indulge in this activity may earn you the opportunity to operate as W2XYZ/P, P standing for Prison. Therefore, you must use a more subtle approach.

Wander around your office, radio club meeting, company picnic, etc., and take stock of the situation. Decide what type of YL you would like to meet. After you have discovered which type of YL you wish to attract, you are ready for battle. Here's how to go about it for best results.

Use any possible means to meet a YL of this type. A married member of your radio club might be willing to introduce you to an old flame. Perhaps his XYL has a few single girl friends she could invite over for dinner some evening. There are unlimited possibilities. When you meet the YL, be sure to make a lasting impression. Turn on the charm, act a bit shy, and let her believe that this was all her idea. At this point, decide once and for all, whether you wish to withdraw or not. After this, it may be too late.

Once you have established a solid friendship, the battle is on. I have found by experience that if you can make her feel sorry for you, your chances are greatly improved. A woman's sympathy can be almost unbearable. There are many ways to do this. A CW man might suddenly develop a twitch in his wrist, or pound brass with an imaginary key at dinner. When she notices this, and asks what you are doing, look shocked and say "Oh, it's really nothing. Don't worry about it." Be sure to create the impression that you don't wish to talk about it. Repeat the performance from time to time, and then finally break down and tell her that you are a ham operator. Don't carry this too far, as she may think you are really out of this world. For the Phone man, an alternate solution might be to murmur "Hi" occasionally. Be sure to time things just right, so there can be no doubt in her mind that you were not talking to anyone in particular.

Be certain to make it look like you are intowards you, and wouldn't dream of hurting your feelings. Now you are ready for step number two. Invite her up to the shack, so you can show her your station. If you care to operate at all, be sure to use phone, since it makes more of an impression on uninformed people. Before she arrives, prepare the shack for her visit, so there will be no doubt in her mind that you need a woman in the place. Hang all of your certificates unevenly, throw a few issues of a radio magazine around on the floor, spread stray QSL cards around the room, and put a few empty bottles or cans on the operating desk. You might also take down the curtains and remove the lampshades so she can see what a dreary, bleak life you really have.

Be certain to make it look like you are inviting her on the spur of the moment. Then she will know that you have not had time to prepare for her visit. When you show her around, apologize for the appearance of the shack, stare off in the distance, and say something like "I wish this place was nicer, but I'm so lonely here, I can't seem to do anything to make it more comfortable and homey." If you sob slightly, or let a few tears run down your cheek, it will help immensely.

I might mention, before you follow step two, that there may be reasons to regret it later. A close friend of mine recently succeeded in converting a YL to his XYL. When he returned from work one evening he found that his certificates had been taken down, and replaced by landscapes and sea views. The messy antenna tuner had been taken down and stored in the attic. His old log books, which looked unsightly due to the different colored inks used to fill them out, had been thrown out and replaced by clean new ones. Things would have been forgivable, but the new XYL had

Continued on page 102

the HAM ALARM

by HARTLAND B. SMITH, W8VVD
467 Park Avenue, Birmingham, Michigan

Even though his shack contains hundreds of dollars worth of equipment, the average radio amateur has absolutely no means of knowing when his nearby ham friends want to get in touch with him. Unless he accidentally runs into his cronies over the air, the only time that he learns he is wanted is when the telephone rings.

One way of overcoming this rather paradoxical situation is for you and your friends to keep your receivers continuously tuned to some definite frequency. Then, when a member of the local gang wishes to get in touch with someone, he can give a shout on that frequency. This solution to the problem, however, has a number of disadvantages. If you leave a communications receiver running all the time you're home, the result will be an increase in the power bill somewhat out of proportion to the convenience which might possibly accrue. Furthermore, unless the other fellow has a well calibrated VFO, he may end up calling you so far from your listening frequency that you won't hear him at all. Probably the most important reason for not using this system, though, is the annoyance caused by line noises, heterodynes, etc. which come from the speaker during stand-by periods. A squelch circuit, added to the receiver, will remove this particular nuisance, but few of us care to dig that far into a modern chrome plated masterpiece, especially when the resulting modification stands a good chance of seriously reducing its future trade-in value.

Another approach to the signalling problem is a specially built monitor receiver which rings a bell whenever it picks up a call from a nearby station. At all other times it remains silent as a mouse, with no speaker emitting squawks and squeals to disturb your peace of mind. A number of auto-call receivers of this type have been described, but they are both complex and costly.

Happily, for those of us who must watch the pennies or who shy away from involved circuitry, the BC-357 is an item of surplus gear that can be easily converted into an effective signalling monitor. Usually priced in the neighborhood of $5.00, and containing only two tubes, the BC-357 is economical both to buy and to operate. This piece of gear was originally designed to indicate the position of an aircraft over a runway. When a modulated 75 mc signal was picked up as the plane flew over a marker beacon transmitter, the relay in the receiver actuated a signal light to inform the pilot of his location.

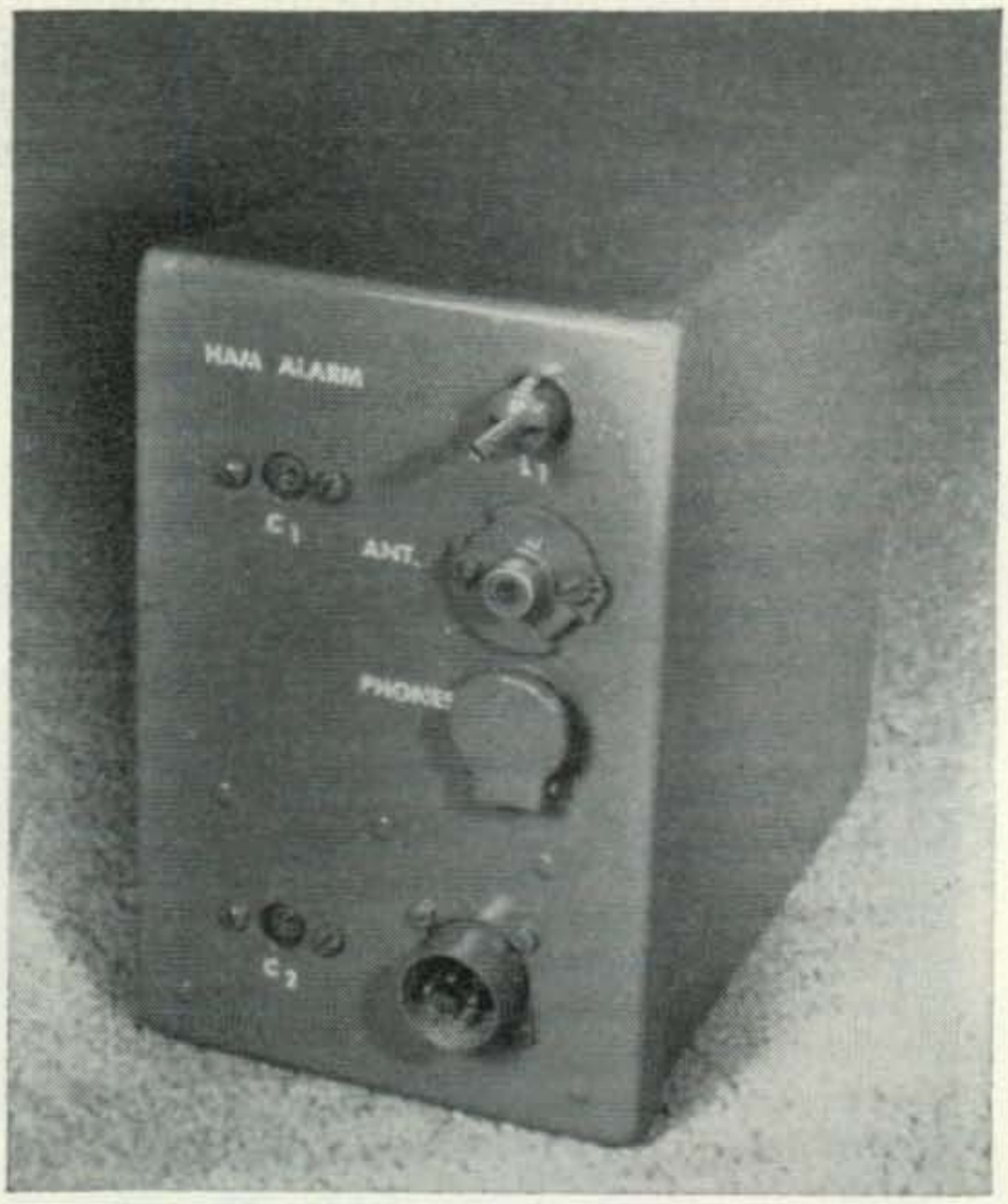
The diagram of the revamped Beacon Receiver is shown in Fig. 1. Modulated rf energy picked up on the antenna is fed to the grid of the 12C8 and is amplified. Blocked by RFC_2 in the 12C8 plate lead, the rf finds its way to the ungrounded 12C8 diode plate and is detected. After detection, the resulting audio is fed back to the grid of the 12C8 via RFC_1 C_5 and R_1. The 12C8, wired as a reflex amplifier, boosts the audio which then passes through RFC_2 and C_6 to the grid of the 12SQ7 where further amplification takes place. The output of the 12SQ7 triode section then is applied, by means of C_7, to the diode plates of the tube for rectification to dc. This dc flows through CH_4 to the coil of the relay, RY_1. The contacts of the relay may be wired to actuate a bell, flasher, siren, whistle or any other attention getting device you may desire to use.

Since I happen to prefer to make local contacts on 75 meters, the conversion data which follows is for that particular band. However, the changes described, except for coil specifications, will hold good on any band from 160 to 6 meters. Just as long as the tuned circuits

Parts Required for Conversion

C_8—50 mfd, 50 v. elec. capacitor
C_{10}, C_{11}—10 mfd., 350 v. elec. capacitor
R_3—100,000 ohm, 1 w. res.
RFC_1, RFC_2 — 2.5 mh. midget rf choke
S_1—SPST Toggle Sw.
CH_3—7 hy., 50 ma. filter choke (Stancor C1707)
CH_4—20 hy., 15 ma. filter choke (Stancor C1515)
T_1—235-0-235 v. @ 40 ma.; 5 v. @ 2 amps.; 6.3 v. @ 2 amps. (Stancor PM8401) Power trans.
L_1, L_2—See text
V_3—6X4 tube
Pilot—No. 47 pilot bulb

Fig. 1—Front view. Gray paint and decals have been used to dress up this converted BC-357 receiver.



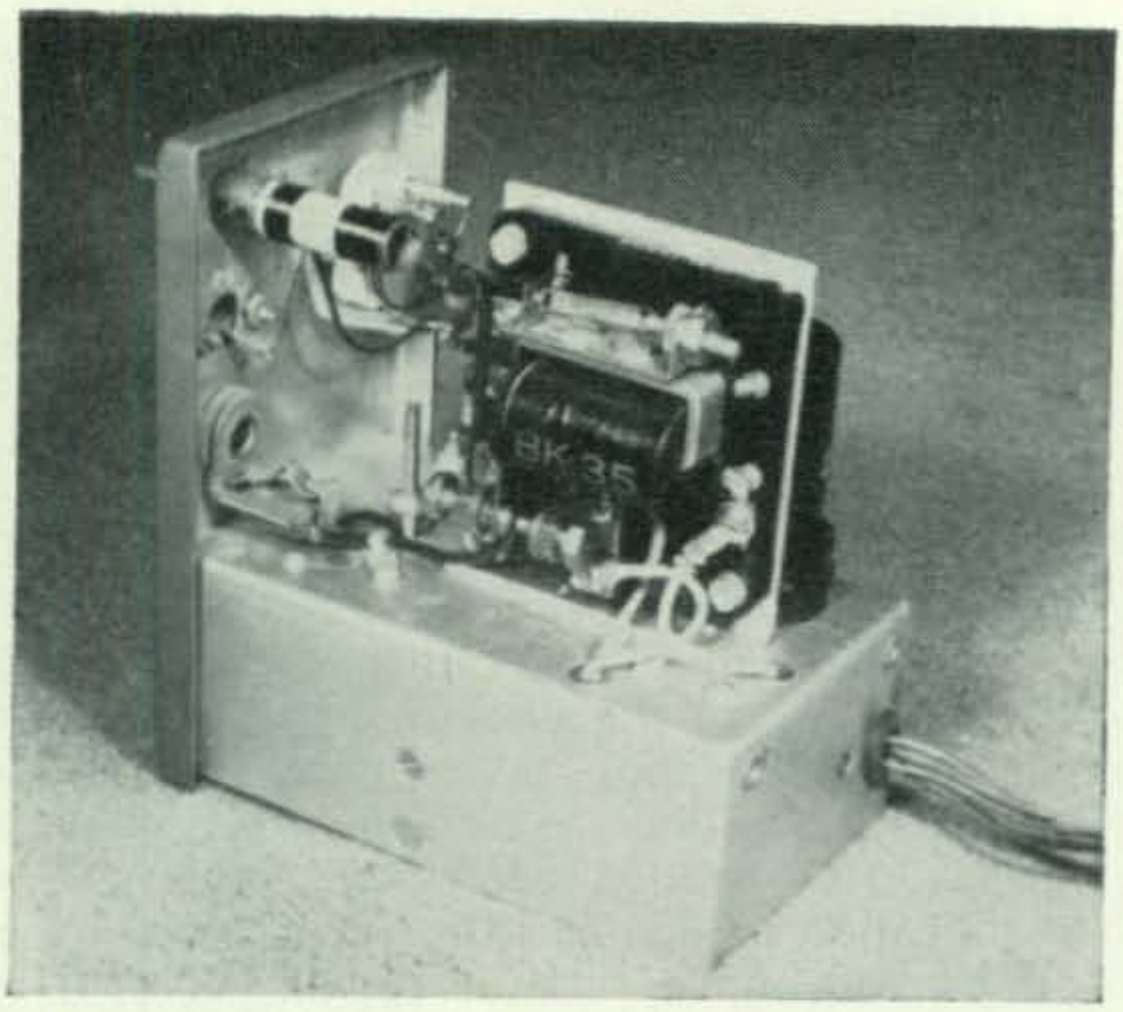


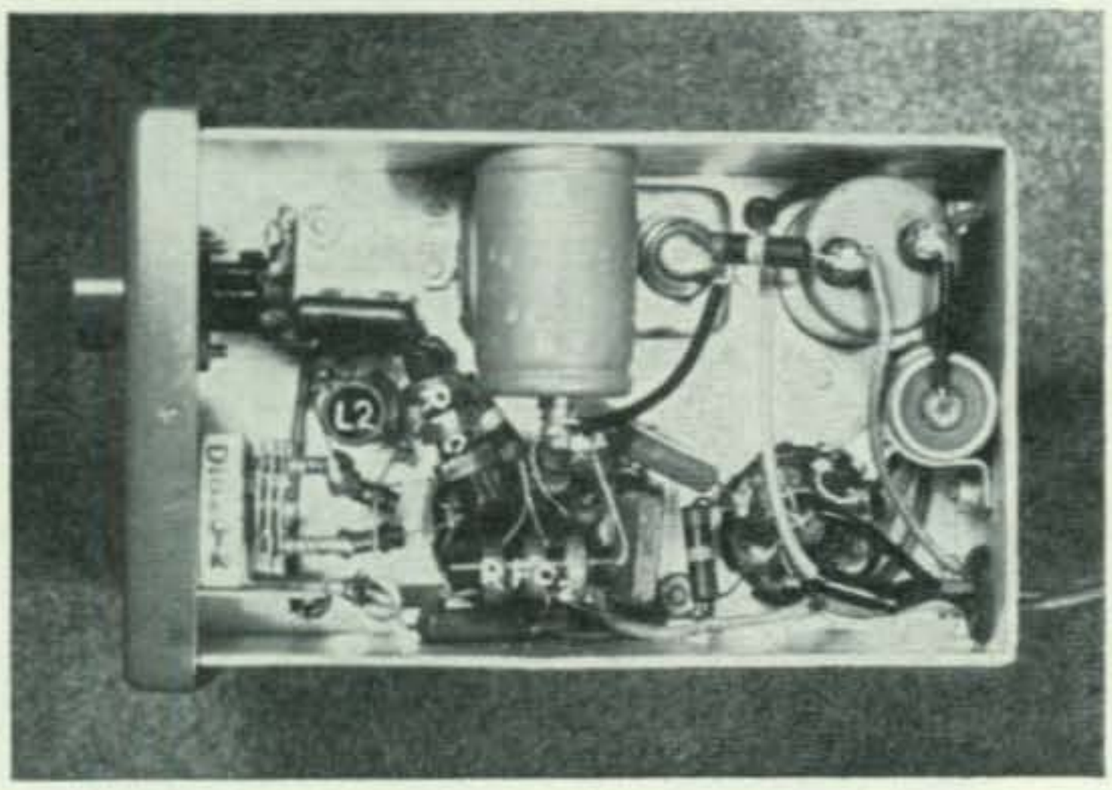
Fig. 2—Ham Alarm with cover removed. Note power supply wires emerging from rear of chassis.

resonate at the calling frequency of your choice, the receiver will work satisfactorily on strong local signals.

Most of the original wiring of the BC-357 can be retained. Only those components which must be changed in the conversion process, or which are specifically mentioned in this article, are given identifying symbols in the schematic.

First, the tube heaters must be placed in parallel. The wire which originally ran from pin 7 of the 12C8 to pin 8 of the 12SQ7 is reconnected so that it runs from pin 7 of the 12C8 to pin 7 of the 12SQ7. A new wire is then added between pin 8 of the 12SQ7 and pin 1, 12SQ7. The three insulated wires which originally terminated at the power plug on the front panel are snipped off at the plug and run out the back of the chassis through a hole which has to be drilled there for the purpose. The red wire is the B plus lead. The brown wire is the heater lead. The green wire comes from the relay contacts and provides power to operate an external alarm, whenever the relay is actuated by a signal. A fourth wire is run through the back of the chassis and is soldered to pin 3, 12SQ7. This lead acts as a common ground return for the heater, alarm and B voltages. A small supply unit, to be described later, must be constructed to furnish filament and plate power.

Fig. 3—Bottom view of chassis. The two new rf chokes and L_2 are clearly visible.



RFC_1 and RFC_2 replace the original chokes which have far too little inductance for satisfactory operation at the lower ham frequencies. Remove the old chokes. Connect RFC_1 between pin 4, 12C8 and the junction of the 500,000 ohm resistor, R_2, and C5, the .004 mfd mica capacitor. RFC_2 goes from pin 3, 12C8 to the terminal of the nearby audio choke where C_9, the 50 mmfd ceramic and C_8, the 750 mmfd mica capacitors are also connected.

Remove the air-wound antenna and detector coils. These will be replaced by L_1 and L_2. Since space is at a premium, miniature slug tuned forms should be used for the new inductors. The coils shown in the photos were wound on Superex type C-4 forms. Any dealer handling Superex Ferri-Loopsticks should be able to procure these forms for you. The C-4 forms are ⅜" in diameter and have a 1¼" winding space. Similar forms, produced by other manufacturers will, of course, be satisfactory. For 75 meter operation, use no. 28 enameled wire for both L_1 and L_2. Each coil should have a close spaced single layer winding 1¼" long. Apply a layer of Scotch electrical tape over the ground end of L_1. Over this put 16 close spaced turns of no. 28 wire to act as a primary antenna coupling coil. When L_1 and L_2 are completed, dope them with radio service cement to hold the turns in place.

If you don't have a plug that will mate with the antenna socket on the BC-357, replace the original with a pin type shielded connector similar to the style used for hi-fi phono gear, as shown in the photo. Above this, on the front panel, mount L_1. The ground ends of both the primary and the secondary of L_1 are connected to the ground lug which is part of the bracket of C_1. The hot lead of L_1's primary goes to the center terminal of the antenna plug. The hot lead of the secondary runs to the stator of C_1.

L_2 is placed on the under side of the chassis, 1¼" behind the front panel. The cold end of L_2 connects to the ground lug on the bracket held in place by the mounting screws of C_2. The other end of L_2 connects to the nearest stator lug of C_2.

Although the BC-357 is immune to unmodulated carriers, the original circuit will respond to any strong modulated signal or to a line noise with a sharp peak. In order to reduce false alarms which might otherwise be caused by such unwanted signals, CH_4 and C_8 should be added to the set. Due to the low average power in speech waves and line noises, C_8 will not usually charge up sufficiently to operate the relay unless a signal with sine wave modulation is being received. A 5 or 10 second whistle in the mike of the calling station will provide positive operation of the alarm, however.

CH_4 may be any small audio choke with an

inductance of at least 20 henries. C_8 should have a capacity of around 50 mfd and be rated for at least 50 volts. The choke and capacitor can be mounted on the power supply chassis. Make certain that it is the positive terminal of C_8 which goes to ground.

Remove the wire which originally ran between pin 4, 12SQ7 and rear coil terminal of the relay. A new wire must be run from pin 4, 12SQ7 through the rear of the chassis to CH_1 on the power supply. Another wire goes from the junction of CH_1 and C_8 back through the hole in the rear of the receiver chassis to the rear terminal screw of RY_1.

The ground lead on J_1 should be removed from the terminal which goes to the tip of the phone plug and run, instead, to the frame of the jack. A new wire should be installed from pin 4, 12SQ7 to the tip terminal of J_1. With a pair of long nosed pliers, bend up the shorting contact of J_1 so that the tip terminal will no longer short against it when the headphone plug is removed from the jack.

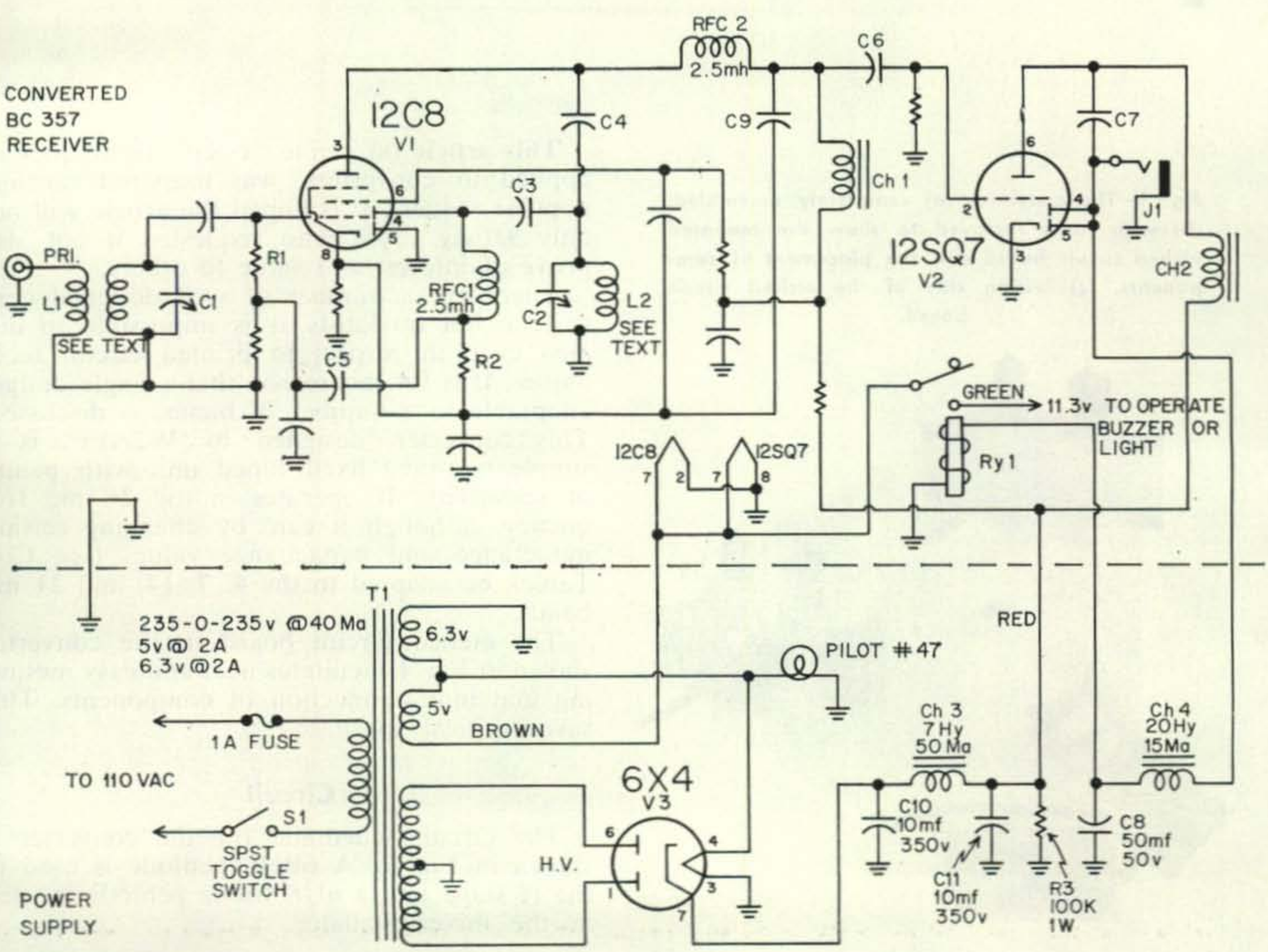
A power supply unit can be constructed on a separate chassis, using the circuit in Fig 1. When connecting the 5 and 6.3 volt transformer windings in series, make sure that they are properly phased When incorrectly hooked up, the two voltages will buck, resulting in an output of only a volt or so, instead of the desired value of 11.3. Should a bucking condition exist, merely reverse the connections of the 5 volt winding. By the way, 11.3 volts amply takes care of the heater requirements of the two 12 volt tubes in the BC-357.

Although they are not absolutely required, both a fuse and a pilot light are worthwhile features of the power supply. Since the Ham Alarm is quiet most of the time, the pilot helps to remind you to turn the gadget off when leaving the shack. A fuse, always good protection against damage resulting from an overload, is especially important in a device which is often operated unattended.

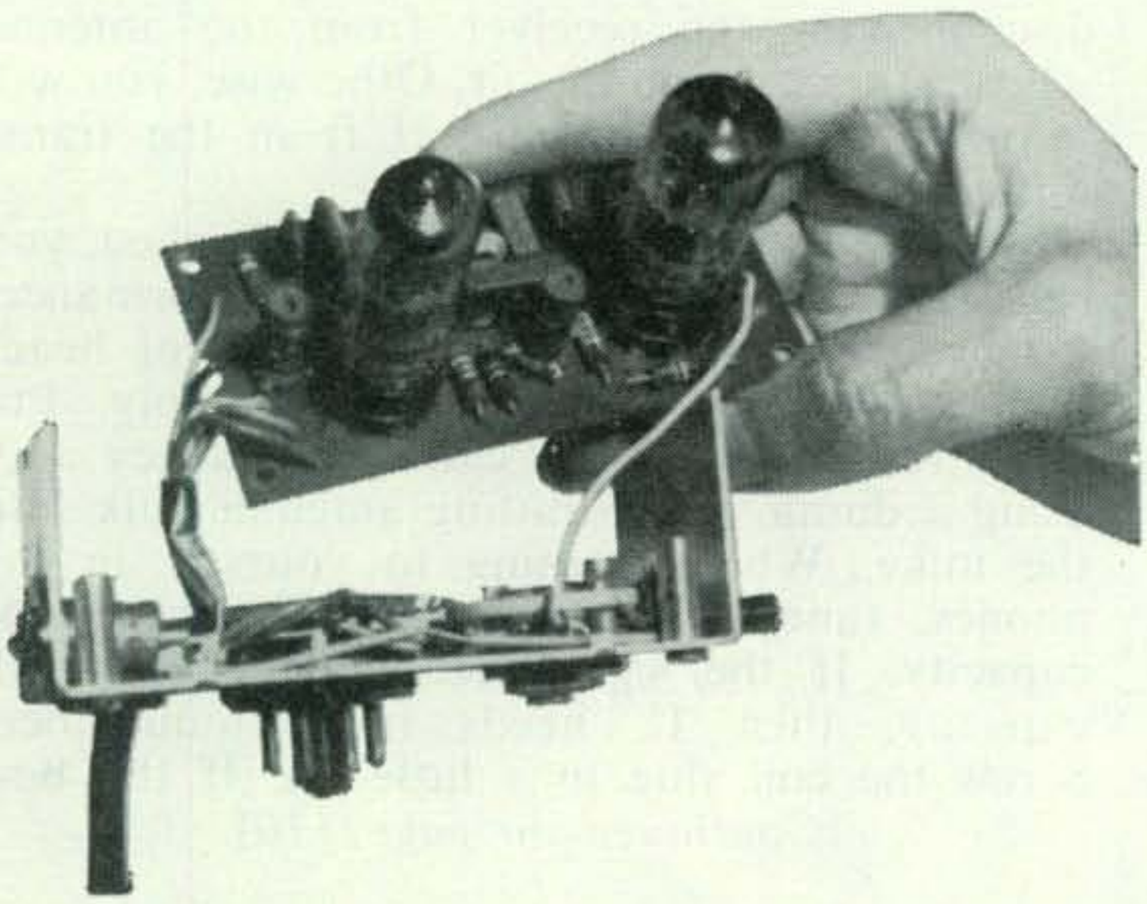
Use a good, outside antenna with the BC-357. Best results will be obtained if you employ your regular transmitting aerial. However, be sure to make some provision for disconnecting the receiver from the antenna whenever you go on the air. Otherwise, you will burn up L_1 with excessive rf from the transmitter.

As soon as the conversion job is finished, you can start tuning the unit for best performance. Connect the antenna, plug in a pair of headphones and turn on the power supply. Put your transmitter on the calling frequency and, using a dummy transmitting antenna, talk into the mike. While listening to yourself in the phones, tune C_1 through its entire range of capacity. If the signal gets louder with full capacity, then L_1 needs more inductance. Screw the coil slug in a little bit. If the best

[*Continued on page 110*]

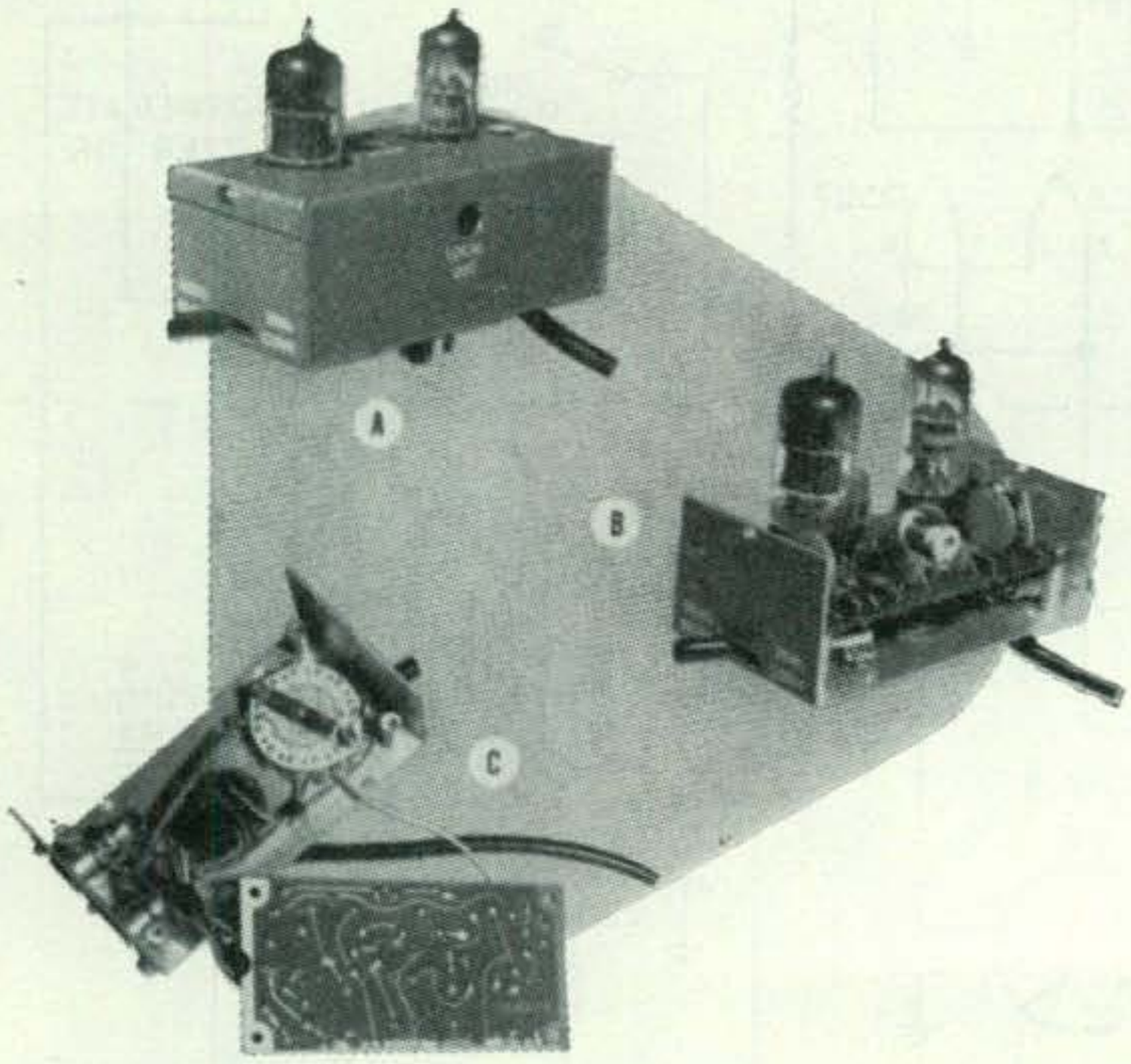


USING PRINTED CIRCUIT TECHNIQUES



by **EUGENE L. KLEIN, W4UHN**
5902 Brunswick St., Springfield, Va.
and **J. W. BRYAN**

Fig. 1—The converter (a) completely assembled, (b) with cover removed to show the mounted etched circuit board and the placement of components, (c) wiring side of the etched circuit board.



This article on printed circuit techniques as applied to converters, was prepared through popular request. It is hoped the article will not only satisfy those who requested it but also prove of interest and value to others.

There are a number of well designed converters, but obviously it is impossible to discuss each in respect to printed circuit techniques. It is for this reason that a single design, adaptable to a number of bands, is discussed. This converter, designed by W2AEF, is a simple two-tube fixed tuned unit with plenty of sensitivity. It operates in the 28 mc frequency, although it can, by changing certain inductance and capacitance values (see Coil Table), be adapted to the 4, 7, 14, and 21 mc bands.

The etched circuit board in the converter shown in Fig. 1 facilitates neat and easy mounting and inter-connection of components. This saves critical space.

Circuit

The circuit schematic for the converter is shown in Fig. 2. A 6BH6 pentode is used in the rf stage and a 6U8 triode pentode is used in the mixer-oscillator.

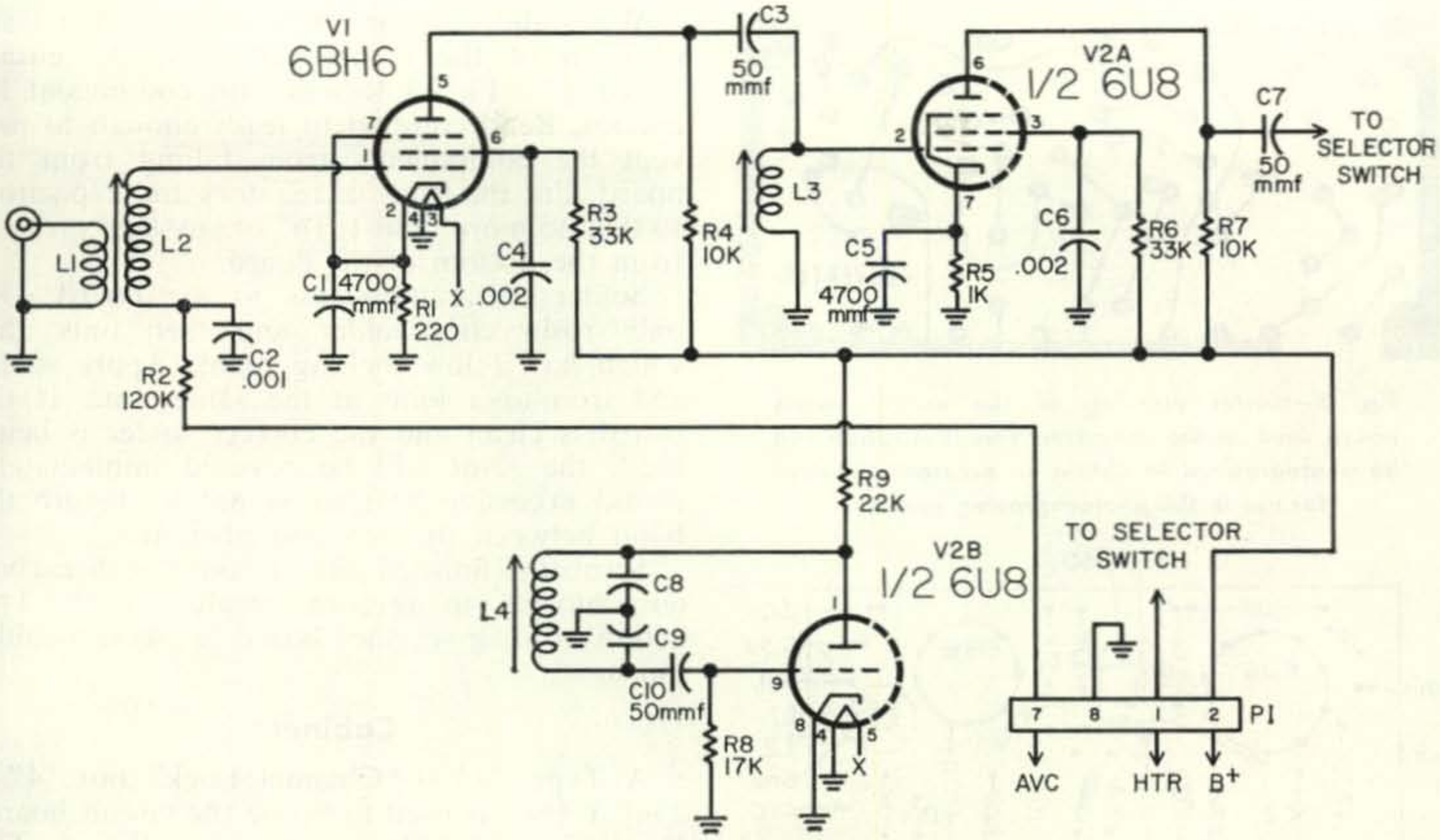


Fig. 2—Schematic diagram of the converter.

The 6BH6 provides high gain with a low noise figure. The grid circuit of this tube is peaked to the center of the band by the slug of coil L2. The 6U8 provides good performance consistent with high gain, low noise, and oscillator stability. The output of the 6U8 is fed directly to the antenna terminal of a BC band radio, through a capacitively coupled coaxial line. The oscillator is stable without voltage regulation.

Parts List for Fig. 2

R1—220 ohms
R2—120,000 ohms
R3—33,000 ohms
R4, R7—10,000 ohms
R5—1,000 ohms
R6—33,000 ohms
R8—17,000 ohms
C1, C5—4700 $\mu\mu$fd. disc ceramic
C2—1,000 $\mu\mu$fd. disc ceramic
C3, C7—50 $\mu\mu$fd. disc ceramic
C4, C6—2,000 $\mu\mu$fd. disc ceramic
C8, C9—see coil table silver mica
C10—50 $\mu\mu$fd. silver mica
V1—6BH6
V2—6UB
P1—Standard octal plug

Construction

Past articles (Amateur Fabrication of Etched Circuit Boards, CQ, April 1956 and Use of Printed Circuit Kits, CQ, November 1956) describe in detail the techniques employed in fabrication of etched circuit boards. However, for the benefit of new readers a resume of the procedure involved in fabricating a circuit board is given below.

1. Determine the placement of components.
2. Prepare a rough layout.
3. Prepare a master drawing (2:1 scale).
4. Prepare a negative.
5. Place the negative over the sensitized board.
6. Expose through the negative.
7. Develop the sensitized board.
8. Drill holes in the board.
9. Solder components to the board.

Steps 1, 2, and 3 are eliminated if the full size accurate illustration in Fig. 3 is used. Photograph the illustration to obtain an accurate negative for use in the photoengraving process.

When the negative is prepared, complete steps 5, 6, 7, and 8 in succession. Before step 9 is started, wind coils L1, L2, L3 and L4 using #24 wire. (See the Coil Table for the number of turns of wire required for each coil.) Use vertical slug tuned coil forms for L1, L2, and L3. Use a horizontal coil form for L4. L1 and L2 are wound on a single coil form. There should be ⅛" clearance between the windings of L1 and L2.

COIL TABLE

FREQUENCY	L1	L2	L3	L4	C8 & C9
28 mc	2 turns #24 en.	19 turns #24 en.	17 turns #24 en.	14 turns #24 en.	100 mmfd

NOTE: Capacitance and inductance data for the 4, 7, 14, and 21 mc. bands can be found in the May 1953 issue of CQ. See the article titled "The W2AEF Converter-ettes". For coil forms use Cambridge Thermionic or equal.

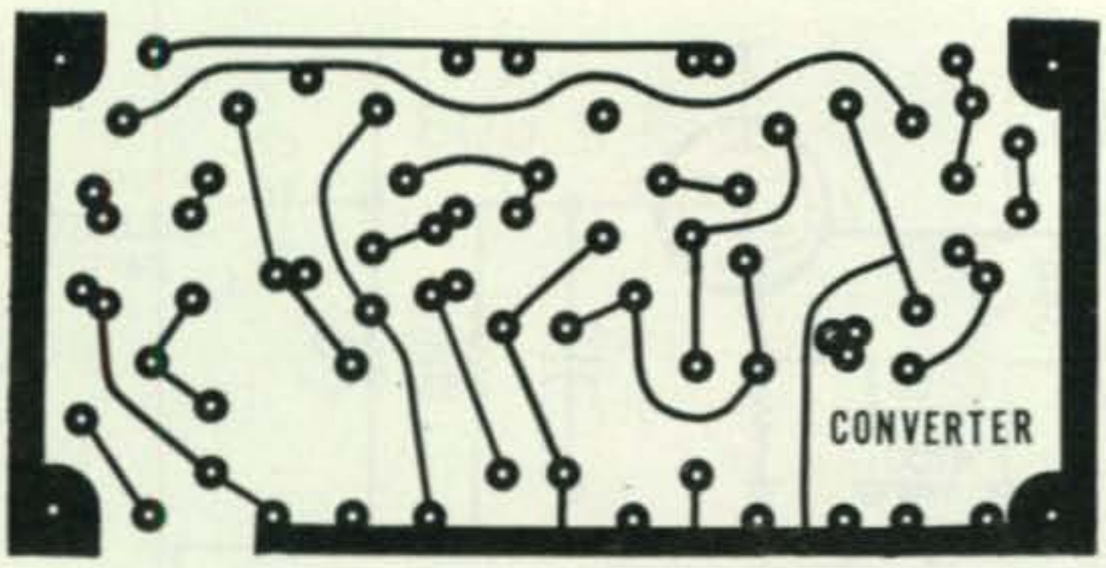


Fig. 3—Master drawing of the etched circuit board used in the converter. This illustration can be photographed to obtain an accurate negative for use in the photoengraving process.

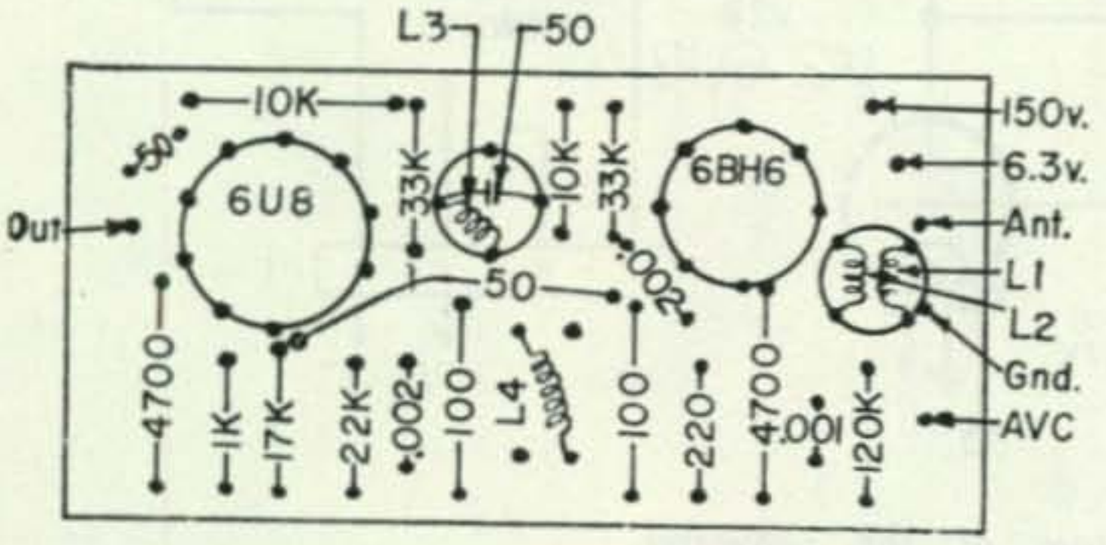


Fig. 4—Top view of etched circuit board showing placement of components. Shaded areas represent the copper foil on the opposite side of the board.

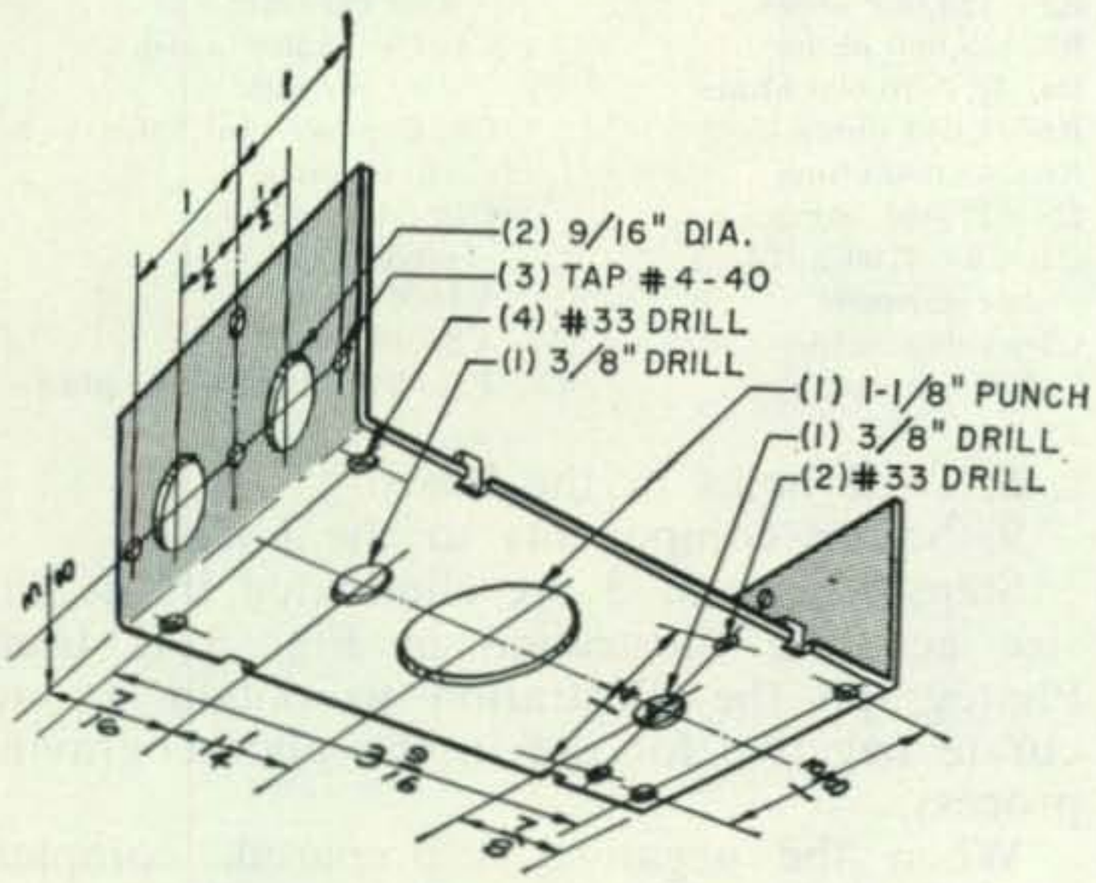


Fig. 5—View of the "Channel Lock" box showing location of holes and listing drill holes.

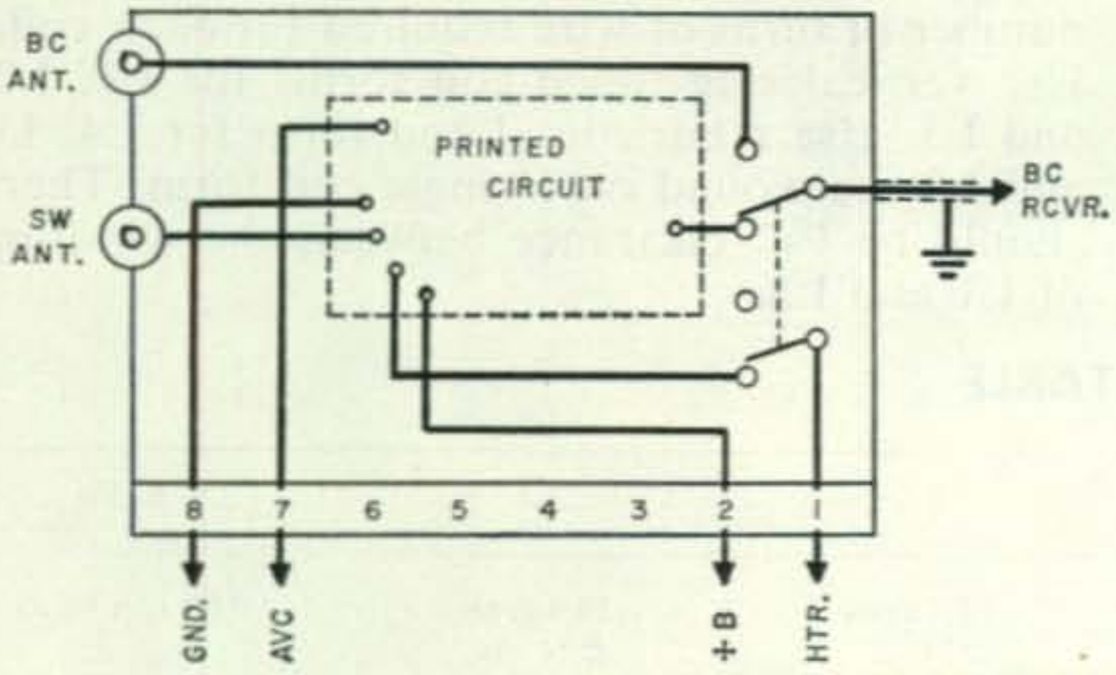


Fig. 7—External connections to the printed circuit board, switch, and octal socket.

When the coils are wound, insert the leads of each of the components into the circuit board. Use Fig. 4 to ascertain component locations. Bend component leads enough to prevent the components from falling from the board. Cut the leads of resistors and capacitors so that no more than 1/16" of any lead projects from the bottom of the board.

Solder the components to the board. Use only rosin core solder and then only that which has a low melting point. Apply solder and iron to a joint at the same time. If the board is clean and the correct solder is being used, the joint will be covered immediately. Avoid excessive heat so as not to disturb the bond between the foil and phenolic.

Scrub the finished circuit board with carbon tetrachloride to remove surplus rosin. This action will give the board a workmanlike finish.

Cabinet

A Type 29400 "Channel Lock" box, 4" x 2⅛" x 1⅝" is used to house the circuit board. Dimensions of holes are given in Fig. 5. The box cover may be prepared after the circuit board is mounted.

When the box is prepared, assemble a switch similar to the one shown in Fig. 6. The bill of material lists all parts required for assembly. Assemble and secure the switch; then install the switch handle. This switch turns the converter ON and OFF.

Next, install the power plug (a standard octal plug), the two antenna receptacles (BC auto antenna type), and the coaxial lead (RG 62A/U). Solder an auto antenna type plug on one end of the coaxial lead.

Use color coded hook-up wire to make connections between the receptacles, plug, switch and the printed circuit board. Terminations of the wires are shown in Fig. 7. External leads to the printed circuit board, to obtain maximum strength, should enter the board through the side opposite the etched wiring pattern. This requires a small cutout at the end of the board where the leads enter.

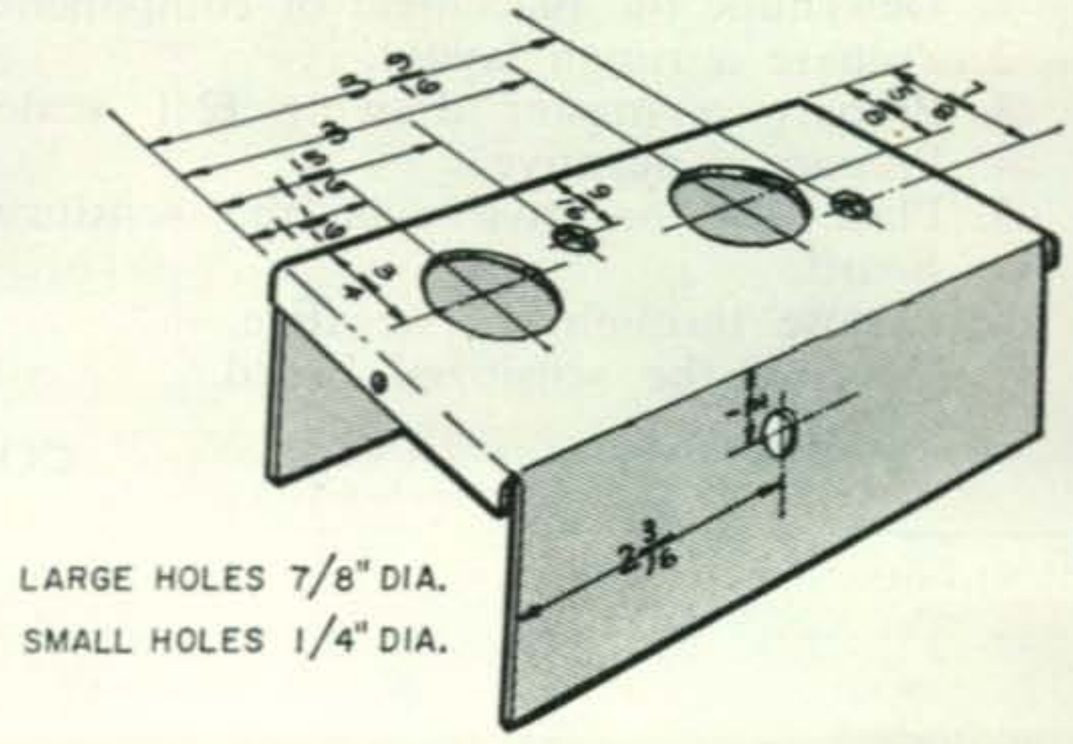


Fig. 8—View of box cover showing location of holes and giving drilling instructions.

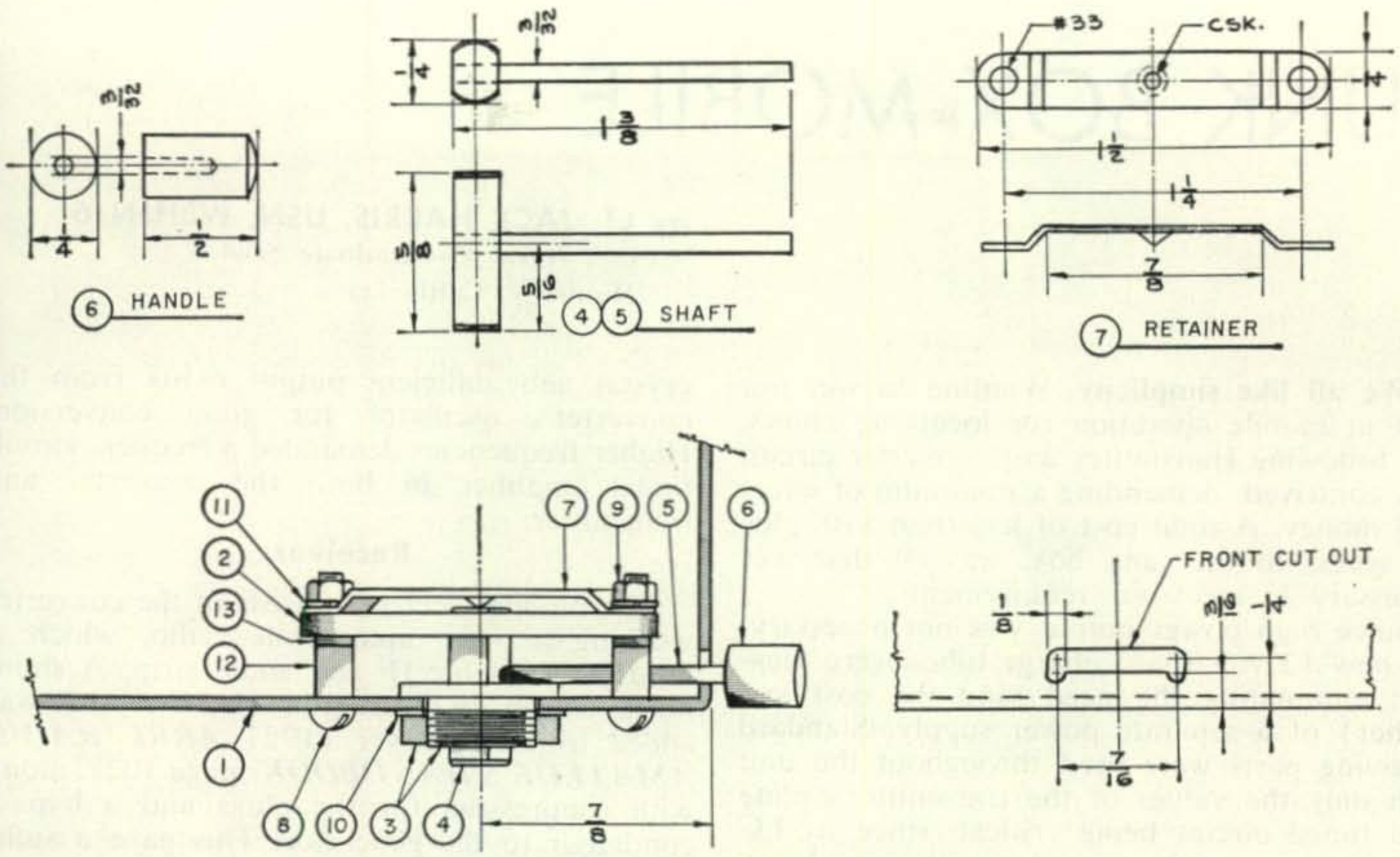


Fig. 6—Converter "ON-OFF" switch.

Parts List for Fig. 6

SYMBOL	PART	QUANTITY
1	Box, "Channel Lock", Type 29400, 1⅝" x 4" x 2⅛"	1
2	Switch, wafer, Centralab PA-35	1
3	Bearing, panel (for standard ¼" shafts)	1
4	Shaft, switch; ¼" dia. (from Centralab rotary switch kit)	1
5	Shaft, switch handle: 3/32" dia. brass	1
6	Handle, bakelite; ¼" dia.	1
7	Retainer, switch; spring brass stock	1
8	Screw, round head, No. 4-40 x ⅝" long	2
9	Nut, hexagon, No. 4-40	2
10	Washer, internal lock (for panel bearing)	1
11	Washer, lock, split; No. 4	2
12	Spacer, mounting; ¼" long (for No. 4-40 screw)	2
13	Washer, fiber, No. 4	2

When all lead wires are soldered in place, mount the circuit board. Mounting spacers ⅝ inch in length can be fabricated from ¼ inch diameter aluminum stock. Drill and tap one end of each spacer to accommodate a No. 6-32 screw ¼ inch long. Drill and tap the other end of each spacer to accommodate a No. 4-40 screw ¼ inch long.

Now prepare the cover. Use the dimensions given in Fig. 8 to layout the required holes. When the holes are made, the cover can be installed and secured.

Adjustment

Before operating the converter use a grid dip meter to tune the local oscillator to approximately 28 mc. This check is made with the converter power plug disconnected but with all tubes in their sockets. When power is ON the grid dip meter serves as an absorption type frequency meter to check the oscillator for frequency and presence of any parasitic oscillations. Additional accuracy may be obtained if another receiver tuned to 28 mc is used. If this method of adjustment is used, adjust coil L4 until a beat note is heard on the receiver.

If it is desirous to use the converter on the phone band, the converter range will be 28 mc plus the frequency to which the broadcast set is tuned. For instance, if the broadcast set covers 500 to 1500 kc, the converter range will be 28.5 to 29.5 mc. If it is desired to tune below 28.5 mc, the local oscillator frequency may be lowered. Accordingly the upper band limits will also be lowered.

If the local oscillator is operating at 28 mc the dial on the broadcast set will serve to calibrate the entire band. If the local oscillator is shifted for any reason, the dial calibration will differ by the amount the oscillator is shifted.

Peaking adjustment may be made either with or without a grid dip meter. If a grid dip meter is used, remove the converter power plug and peak L2 and L3 to approximately 30 mc. Final peaking is best done by tuning in a signal and adjusting L2 and L3 for greatest speaker output. If no signal is present, turn for greatest noise.

When the converter is fitted with coils for bands other than the 28 mc band, a similar tuning and peaking procedure may be used.

Now the converter is ready for operation. It is hoped that this experience with printed circuit techniques was such that it will be only one of many. ■

JUNK BOX MOBILE

by LT. JACK HARRIS, USN, W8HJN/6
U.S. Naval Postgraduate School,
Monterey, California

We all like simplicity. Wanting to wet our feet in mobile operation for local rag chews, the following transmitter and converter circuit was contrived, demanding a minimum of effort and money. A total cost of less than $10, plus an access to the junk box, was all that was necessary to meet our requirements.

Since high power output was not necessary, the new 12 volt space charge tubes were feasible; eliminating the need (and the cost and bother) of a separate power supply. Standard receiving parts were used throughout the unit with only the values of the transmitter's plate final tuned circuit being critical, since its LC ratio determines the Q and output impedence for matching a ¼ wave antenna. All other components were not critical and can be varied to fit the junk box. The values shown in the schematic were used in the author's model and are only to serve as a guide. Placement of parts was not critical, nor was shielding needed.

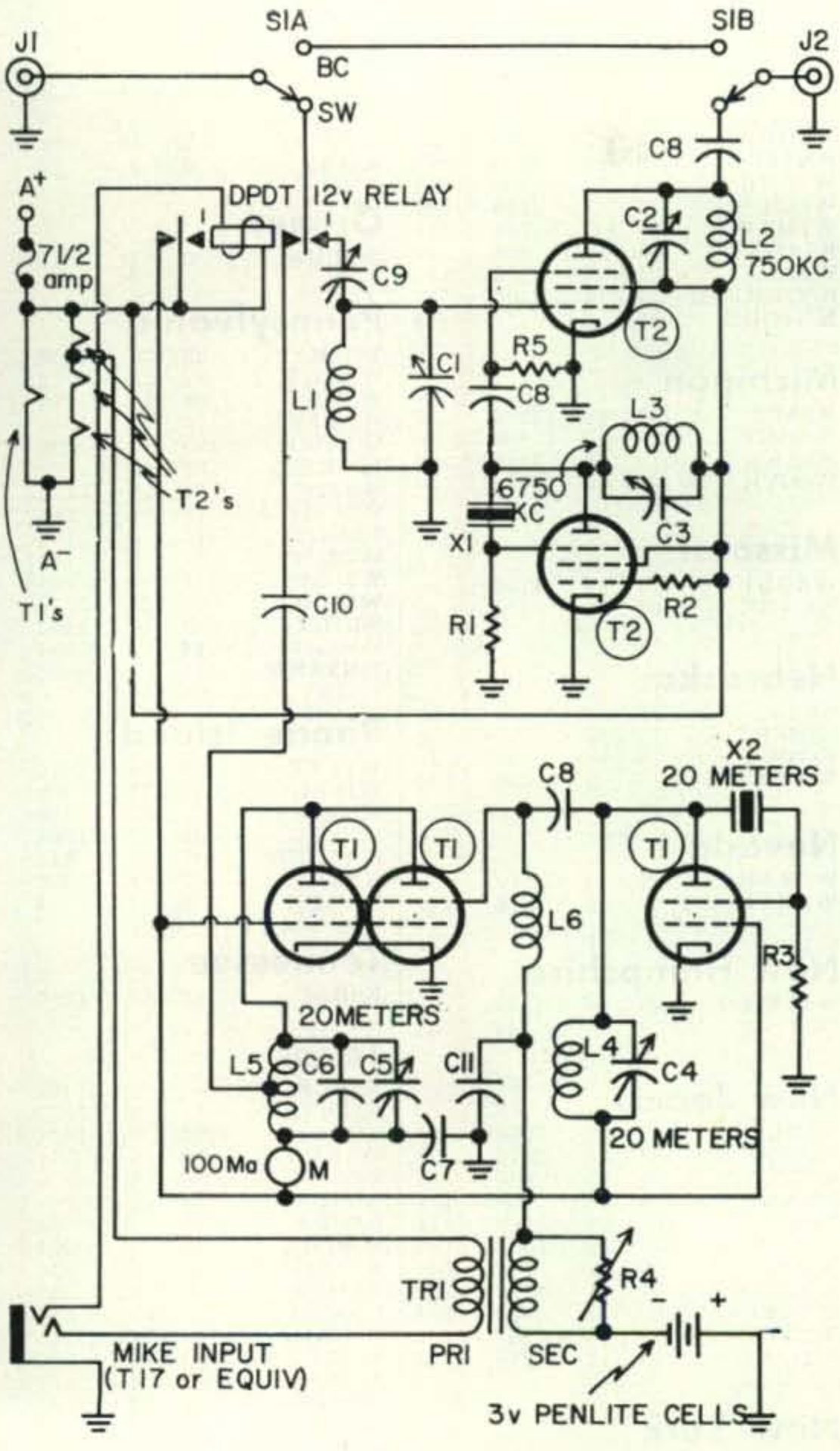
In picking which band to operate, it was decided to use the highest possible frequency in order to achieve maximum antenna efficiency. This led to 20 meters, where the transmitter can operate straight through from a 20 meter crystal and sufficient output exists from the converter's oscillator for good conversion. Higher frequencies demanded a frequency multiplier/amplifier in both the converter and transmitter.

Receiver

The mobile receiver consists of the converter working into an automobile radio, which is used as a tunable IF and audio strip. A shunt noise limiter unit using a 1N34 crystal was added to the receiver (1957 *ARRL RADIO AMATEUR'S HANDBOOK;* page 102), along with suppressors for the plugs and a bypass condenser to the generator. This gave a sufficiently suppressed and sensitive receiver for phone operation. Though there exists specific tubes which require only 12 volts plate and heater supply for operation; in order to keep the cost to a minimum, tubes of the variable mu construction (78, 6D6, 6U7, 6K7), which stand a good chance of being found in the spare tube box, were used instead. These tubes with certain parameters on the elements work very well as mixers and oscillators at low potentials.

Either the fundamental or second harmonic from the oscillator will give sufficient output for good conversion, with fundamental oscillator operation failing around 14 mc. A 6750 kc crystal was used in the author's model, giving 20 meter phone output in the 700-800 KC portion of the broadcast band. The choice of if and oscillator frequency can be varied to fit the quiet spots on the receiver. By striving to use the low end of the broadcast band, stray capacitive coupling, which allows broadcast frequencies to feed through unintentionally, is minimized. A further advantage is that bandspread is normally greater at the lower frequencies. One tube in the circuit is for heater ballast only, giving 4 volts on the heaters, necessary for proper space charge operation with these tubes. This also provides a convenient tap of 8 volts needed for the microphone.

Adjustment consists of temporarily metering the oscillator plate circuit with a 5 ma. meter, and tuning L3C3 for a current null, indicating oscillation. Remove the meter from the circuit and with the converter connected to the radio, adjust the mixer output circuit (L2C2) to the middle of the if frequency to be used. Now with the antenna connected to the converter, place C9 at approximately 75 mmfd, and adjust



C1L1 to 14250 kc. Tune in a fairly weak station and readjust L3C3 for maximum audio output. If output at the extremes of the phone band is too low, increase C9 and retune C1L1 until a satisfactory bandpass is achieved.

Transmitter

The heart of the transmitter is the 12K5 tube. A pair in the final will draw 1/3 watt input with 12 volts plate supply. A 12K5 oscillator on 20 meters capacity coupled to the final furnishes the drive. Grid modulation by a carbon microphone working into an output transformer completes the transmitter. Several unusual features were met when using these tubes. Because no appreciable voltage drop can be tolerated in either the cathode or plate circuits, normal methods of modulation using a choke or transformer were ruled out due to their inherent resistance. This left control grid modulation, with bias supplied by a permanent 3 volt cell (two penlite batteries), which will last the shelf life of the cells. The variable resistor in the secondary of the output transformer, serves as a fixed load on the transformer and improves linearity. Another unusual feature is that the plate and grid are tuned to the same frequency, with no apparent neutralization. No instability resulted when drive was applied, due to the heavily loaded plate circuit and low mu of the 12K5. Finally, the LC ratio of the final output circuit is abnormally low. This is necessary if good Q and coupling characteristics are to be had. The output coil also serves as an impedence matching device, with a tap ¼ the way up from the ground end, which will reflect about 35 ohms to the antenna. Only when the antenna is tuned properly will the transmitter show any effort to load and careful attention to antenna resonance is necessary.

Adjustment consists of tuning the oscillator plate circuit to the crystal frequency. Oscillation will become evident by a sudden increase in the final plate current. This can be checked as the crystal functioning by noting the loss of oscillation when the crystal is disabled. With the antenna properly resonanced and connected to the transmitter, tune the final for minimum plate current. If obtainable, a field strength meter should be used to indicate maximum output. Especially with these low power conditions, the need to maximum output cannot be overstressed if any range is to exist.

For modulation adjustments, connect a scope from the antenna to ground, and adjust the drive for maximum audio output. R4 should be adjusted for minimum resistance with sufficient modulation capabilities remaining. These adjustments are important if best linearity is to be had. If no scope is available, adjust the drive on the low frequency side until 25 mils plate current in the final exists. This will approximate good linearity conditions.

Final efficiency of 80% was obtained, giving ground wave ranges of over 10 miles. With clear frequencies and skip, this can be increased manyfold. A byproduct of this unit was the possibility of fitting into the emergency operations of a medium size community. Its low initial cost and simplicity of operation should make it attractive for this use. ■

Components of Junk Box Mobile

C1—100 mmfd variable padder
C2—500 mmfd variable padder
C3—250 mmfd variable padder
C4—750 mmfd variable padder
C5—1000 mmfd variable padder
C6—1000 mmfd mica, fixed
C7—.02 mfd paper, fixed
C8—250 mmfd mica, fixed
C9—150 mmfd variable padder
C10—.05 mmfd paper, fixed
C11—.001 mmfd paper, fixed
R1—50,000 ohms, ½ watt resistor
R2—3,000 ohms, ½ watt resistor
R3—25,000 ohms, ½ watt resistor
R4—10,000 ohms, ½ watt variable resistor
R5—100,000 ohms, ½ watt resistor
L1—10 turns, #28 wire, ½ inch form closewound
L2—Broadcast antenna coil secondary
L3—20 turns, #28 wire, ½ inch form closewound
L4—10 turns, #28 wire, ½ inch form closewound
L5—3 turns, #14 wire, ½ inch form ¾ inch long, tapped ¼ from bottom
L6—Xmtr final grid choke, 2.5 mhys
S1—DPDT switch
S2—SPST on/off switch
T1—6K7 (see text)
T2—12K5
X1, X2—Fundamental mode crystals
TR1—Audio output transformer, 4 ohms to 2500 ohms nominal

The microphone can be replaced by any carbon microphone with a double throw single throw switch.

VHF CONTEST RESULTS

The April VHF contest activity was somewhat higher than usual. Six meter entries were received from about 150 stations in 21 states and Canada. Two meter scores numbered 80 from 20 states, Canada and Hawaii. 220 mc has only 5 entries, and 420 and up had none. Helen (W1HOY) managed to keep on top with 217 contacts and 45 sections for a total of 19,530. Right behind her were two dandy scores from K9HMB (Ill.) and K8ACC (Mich.) with 13,032 and 13,034. Pretty good going for six meters in the midwest. W8UMF (Ohio) managed 8,772 for third high. W3JMY (Pa.) came in fourth nationally with 6,696 closely followed by K6DTR/6 (Cal.) with 6600. Two meter high score came from K1CRQ (Conn.) with 120 contacts in 39 sections for 9,360 total. W2NKB (N. J.) was second with 7,056, and W6ASH (Cal.) pulled off 6,116 for a close third.

Two percent of the logs did not have any name or call on them. Five percent were not totalled. Six percent did not identify what band they were for. One half percent were completely illegible, and ten per cent would try the patience of Job.

Scores are listed below by state. Winners in each state are in bold-face type.

Call	Contacts	Counties	Score	Band
Arizona				
W7QLZ/7	4	1	8	50
California				
K6DTR/6	150	22	6600	50
K6RNQ	120	16	3840	50
W6OKR	89	16	2848	50
W6NZV/6	63	17	2142	50
W6BXN/6	33	19	1264	50
K6KYU	35	13	910	50
K6VXM	31	11	682	50
K6QXY	20	13	520	50
K6ITZ	11	6	132	50
W6ASH	139	22	6116	144
K6DTR/6	60	18	2160	144
W6OVR	46	17	1564	144
W6KZN	41	12	984	144
K6BHG	16	8	256	144
K6HYX	15	6	180	144
W6NZV/6	2	1	4	220
Connecticut				
K1CRQ	120	39	9360	144
KN1CWC	40	12	960	144
KN1DDO	36	12	864	144
KN1DWL	37	6	444	144
KN1DMM	6	3	36	144
Georgia				
K4DLE	26	9	468	50
K4GYZ	15	8	240	50
Illinois				
K9HMB	181	36	13032	50
W9ROS	140	30	8400	50
K9LFO	90	21	3780	50
K9LTC	76	20	3040	50
W9EET	76	14	2128	50
W9QXU	86	10	1720	50
K9DXT	31	16	992	50
K9DTB	55	9	990	50
W9VGT	69	7	966	50
K9IQF	47	7	658	50
K9LSG	40	8	640	50
W9RSZ	39	6	468	50
W9EGI	39	6	468	50
W9PPW	55	4	440	50
W9JZE	10	6	120	50
W9NDK	64	12	1536	144
K9AJP	59	13	1534	144
W9FHS	48	11	1056	144
K9EEC	45	8	720	144
W9DJ	35	6	420	144
KN9IRG	26	7	364	144
W9RZG	35	5	350	144
W9JZE	12	6	144	144
W9LYA/9	24	2	96	144
KN9JCY	13	3	78	144
Indiana				
K9GFQ	74	39	5762	50
K9GXI	73	39	5694	50
K9JRT	82	34	5576	50
K9KGJ	72	19	2736	50
W9ZJP	70	18	2520	50
W9BHR	38	22	1672	50
W9HPO	43	16	1536	50
K9BQF	28	15	830	50
W9MHP	25	9	450	50
K9AUW	15	7	210	50
K9AQP	30	8	480	144
Iowa				
WØSMJ	14	9	252	50
Kansas				
KØITF	30	7	420	50
Maine				
K1GPJ	39	17	1326	50
W1GKJ	37	13	962	50
W1QXX/1	28	8	448	50
W1QXX/1	2	2	8	144
Maryland				
W3KLA	78	23	3588	50
W3YQD	79	20	3160	50
W3AUT	53	18	1908	50
W3CYZ	31	10	620	50
W3KLA	13	9	234	144
W3YQD	5	4	80	220
Massachusetts				
W1KBN	107	18	4052	50
W1JBA	71	16	2272	50
W1EZZ	47	11	1034	50
W1EGE/1	29	8	464	50
W1DDN	15	7	210	50
KN1GCU	79	12	1896	144
W1LMZ	65	10	1300	144
W1LQ	40	9	720	144
W1MTV	50	7	700	144
K1AGB	33	10	660	144
W1AHE	22	9	396	144
KN1GRF/M	20	4	160	144
KN1GOE	26	6	312	144
Michigan				
K8ACC	133	49	13034	50
W8BKT	120	45	10800	50
K8AKQ	70	16	2240	50
W8GTK	44	14	1232	50
Missouri				
WØODI	114	18	4104	50
KØABK	62	9	1116	50
Nebraska				
KØIAN	31	9	558	50
KØWRT	19	7	266	50
KØBOO	15	4	120	50
WØWRT	15	5	150	144
Nevada				
W7MAH	3	2	12	50
W7MAH	4	1	8	144
New Hampshire				
W1TNO/1	65	18	2340	50
W1TNO	9	8	144	50
New Jersey				
K2HLA	120	29	6960	50
K2OQQ	85	21	3570	50
K2TNW	35	12	840	50
W2NKB	126	28	7056	144
K2KJI/2	109	26	5668	144
K2LGN	107	25	5350	144
K2LSX	70	18	2520	144
KN2GJS	51	11	1122	144
WN2TIN	30	8	480	144
W2DZA	14	8	224	220
W2DWJ	15	7	210	220
New York				
K2VIX	166	31	10292	50
K2CBA	89	36	6408	50
W2TCU/2	92	20	3680	50
K2BVC	80	22	3520	50
K2TGR	100	17	3400	50
W2YLM	65	26	3380	50
K2DLM	67	23	3082	50
K2TFY	57	25	2850	50
K2SJB/2	62	17	2108	50
W2SZ	56	17	1904	50
K2VAW	56	14	1568	50
K2RYE	64	12	1536	50
W2KIJ	50	15	1500	50
W2QPC	48	14	1344	50
K2SAH	55	12	1320	50
W2RHQ	44	12	1056	50
K2OOY	34	13	884	50
K2GEK	29	10	580	50
W2EMW	30	6	360	50
K2CUQ	19	7	266	50
K2OUG	16	7	224	50
K2JIM	16	6	192	50
K2HSY	92	25	4600	144
W2IGS	72	14	2016	144
W2CLE/2	59	14	1652	144
K2MBJ	54	11	1188	144
W2SZ	45	11	990	144
W2QPQ	36	13	936	144
K2TBU	40	11	880	144
K2OZH	35	11	770	144
K2MYS	33	10	660	144
K2RTH	27	11	594	144
K2ZIC	38	7	532	144
KN8JLC/2	41	6	492	144
W2DMI	29	5	290	144
K2UOY	9	7	126	220
K2DLM	6	3	36	144
North Carolina				
K4KSM	1	1	2	50
K4ONO	2	1	2	50
Ohio				
W8UMF	129	34	8772	50
K8IYW	78	15	2340	50
W8WPC	61	18	2196	50
W8IMK	47	11	1034	50
W8GKB	24	2	96	50
W8SFG	41	26	2132	144
W8PBX	52	12	1248	144
W8PLQ	17	10	340	144
K8CEC	6	2	24	144
Oregon				
W7LUH	9	4	72	50
Pennsylvania				
W3JMY	93	36	6696	50
W3OMY	82	23	3772	50
W3BWU	80	11	1760	50
W3HFE	75	11	1650	50
W3AWU	50	12	1200	50
K6IBY/3	37	13	962	50
W3TIF	36	11	792	50
W3FMF/3	18	8	288	50
K3DGT	16	6	192	50
W3ZIM	12	6	144	50
W3UJP	17	4	136	50
W3JLU	70	28	3920	144
W3IKZ	39	19	1482	144
W3TDF	18	14	504	144
KN3AKR	11	4	88	144
Rhode Island				
W1LYT	71	18	2476	50
W1CSG	49	15	1470	50
KN1BZA	70	15	2100	144
W1EIZ	68	14	1904	144
KN1DUO	37	11	814	144
KN1DFU	27	8	432	144
W1GFH	2	1	4	144
Tennessee				
K4OSF	42	15	1260	50
Texas				
K5OCS	80	8	1280	50
K5DCQ	67	8	1072	50
K5BDL	64	8	1024	50
W5FEG	59	8	944	50
W5VXU	58	8	928	50
K5AON	59	6	708	50
K5CDP	49	6	588	50
W5GMA	42	6	504	50
K5JHR	35	6	420	50
K5DXJ	30	6	360	50
K5ADV	35	5	350	50
W5HOD	28	4	224	50
K5EWQ	32	3	192	50
K5BQA	21	4	168	50
K5KDY	21	4	168	50
K5GHR	21	4	168	50
K5ICV	23	3	138	50
K5BLI	23	3	138	50
K5CHF	20	3	120	50
K5BXK	18	3	108	50
W5KSK	16	3	96	50
K5JUS	11	1	22	50
W5TYS	8	1	16	50
Vermont				
W1QXX/1	50	14	1400	50
W1EXZ	5	5	50	50
W1QXX/1	4	2	24	144
KN1GFI	3	2	12	144
Virginia				
K8JNF	40	13	1040	50
K4SKR	32	11	704	50
W4BHD	7	4	56	50
W4LTU	37	22	814	144
W3MSR/4	28	11	616	144
West Virginia				
W3DHQ/8	52	20	2080	50
Wisconsin				
W9JFP	133	42	11176	50
W9JCI/9	93	27	5022	50
W9TQ	34	12	816	50
K9HJI	36	8	576	50
K9COP	12	5	120	50
Ontario, Canada				
VE3DSU	16	8	256	50
VE3AIB	7	4	56	50
VE3DNK	77	14	2156	144
VE3BHZ	61	15	1830	144
VE3AIB	60	13	1560	144
VE3DUU	60	10	1200	144
VE3AEZ	37	8	592	144
VE3DWQ	17	4	136	144
VE3CGV	13	4	104	144
VE3DSU	10	3	60	144
Hawaii				
KH6EE	4	3	24	144

VHF

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

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

The CQ World-Wide VHF Contest

ATTENTION!

Proclaiming to the entire environs of the world a new, colossal and magnificently unique "CQ" world-wide, VHF contest.

Who: All radio amateurs with VHF equipment anywhere, yup, anywhere in this wide, wide world.

When: From 8:00 P.M., local standard time, Saturday, August 23rd, to 8:00 P.M., local standard time, Sunday, August 24th.

Why: To promote VHF operation throughout the world, and provide VHF'ers with a chance to see if their rigs still work.

How: Just get on and call "CQ-Contest," hang on to your hat, but follow the

Rules: (A) **Single-band operation:**

(1) Single-band operation on any one of the VHF bands may be considered for award.

(2) Contest contacts on a single band must contain the following information exchange: Section and state (or country), signal report, contact number, and handle. Also, two way acknowledgment must be made.

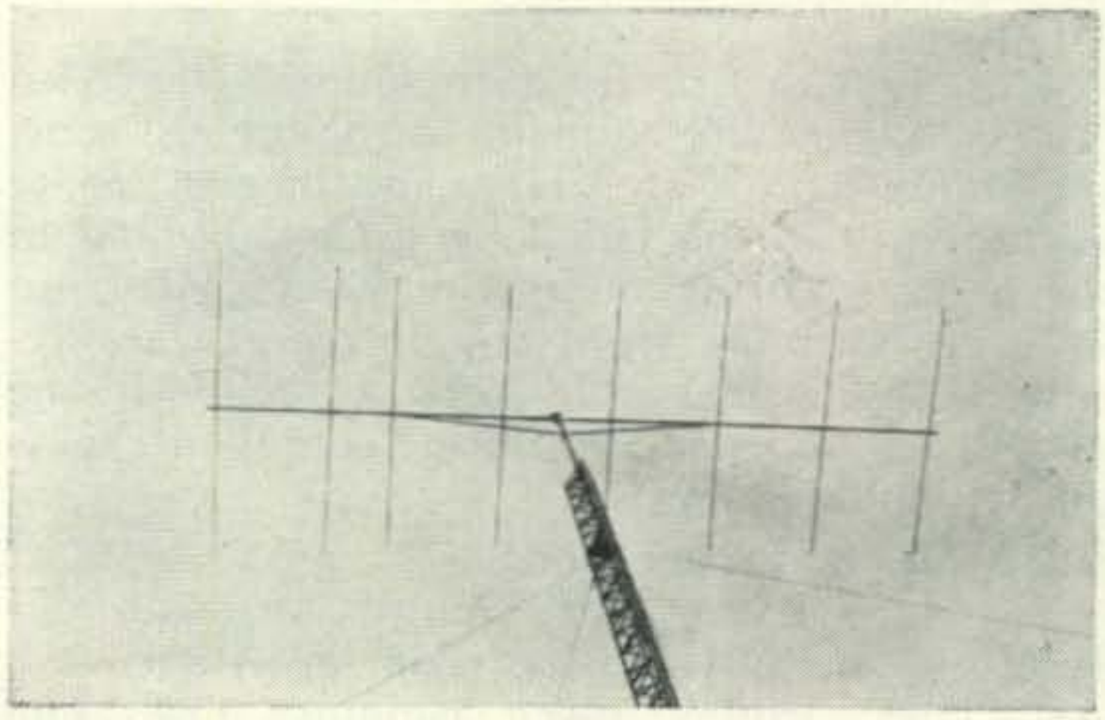
(3) Sections are as they were in previous contests. That is, a section in the U.S.A. or Canada is the county in which the station is located. In other countries, the equivalent political subdivision (i.e. cantons in Switzerland, etc.) counts as a section.

(4) Scoring is as follows: each contact completed counts two points (Uncompleted contacts count zero); the total number of contact points times your multiplier gives your total score. Now, drag out your Philadelphia lawyer cuz we have gone and changed the furschlunginger rules. SO————the multiplier consists of the product of three, count them, three numbers as follows:

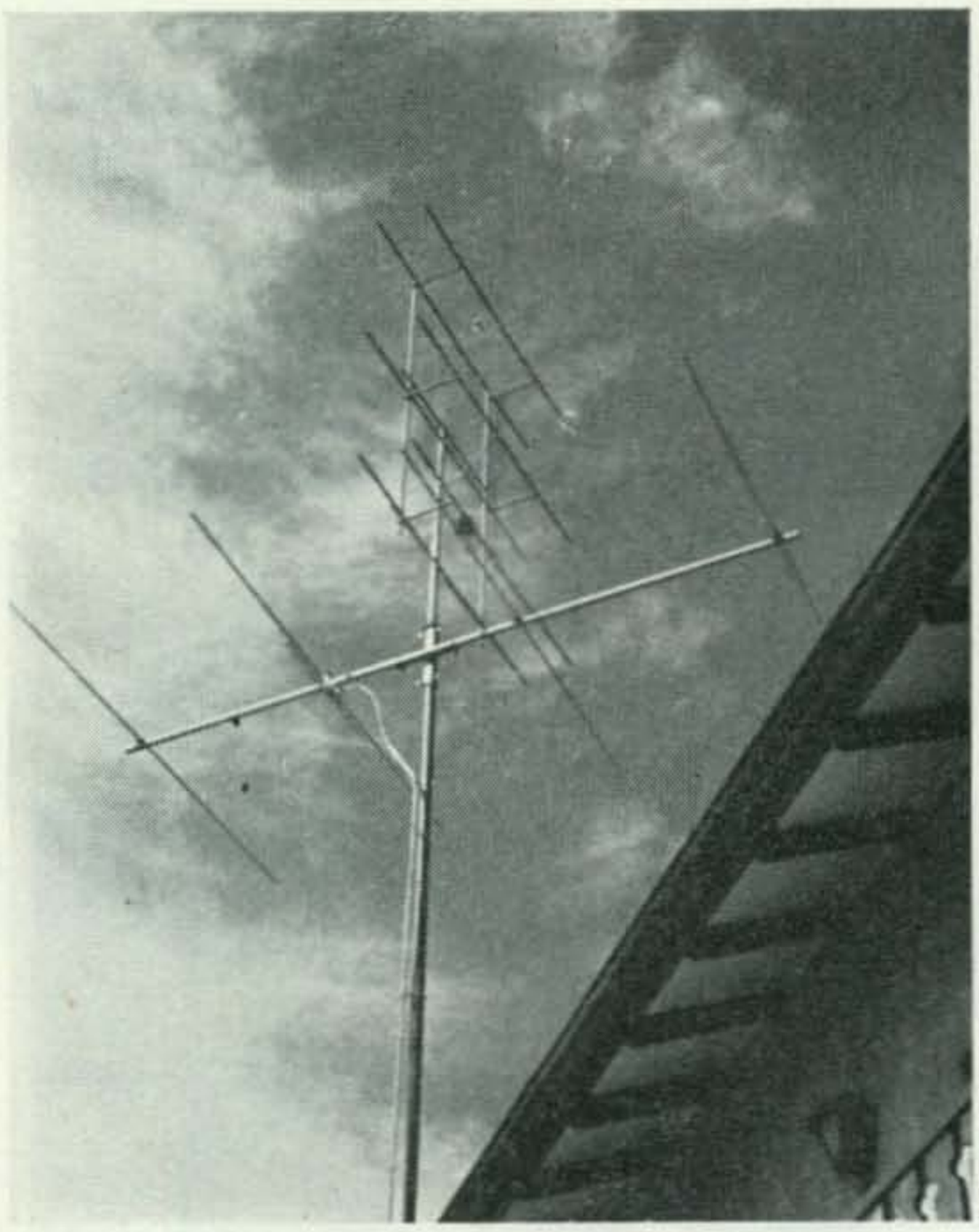
(a) The number of sections;

(b) A multiplier equal to the *total* number of hours of contest operation; (a contest hour

Japan's number 3 C.C.C. holder. Mitsuo (JA1AAT) sent in cards from all over the world. Looked more like a WPX entry than a six meter effort. Number One 6 Meter Century Club winner used this beautifully constructed array. Paul (W6BAZ) doesn't say what it is but we all know what it can do.



Argentina's number 1—6 Meter C.C.C. holder, Mike (LU3DCA) used this wide spaced four element beam. Can't imagine what that one on top is for.



The 6 Meter Club of Dallas decided to get a perpetual trophy, to go to the club member with the highest score in each national contest that comes up. In the April contest the winner, on the left, was K5OCS, Dan Diamond, with 80 contacts in 8 counties. Club social director, K5DCQ, Vic Armstrong is giving it away. The Trophy is a gold mike mounted on a wood pillar, with a gold plate on the front, engraved. If anyone wins it three times they can keep it.

will qualify if at least one contact is made during that hour);

(c) A power multiplier of 10 for final power input of under 20 watts, a multiplier of 5 for power input less than 100 watts and greater than 20 watts, a multiplier of 1 for a power input less than 1000 watts and greater than 100 watts, and a multiplier of ½ for power inputs over 1000 watts.

This all means (if you haven't given up in disgust, by now) that if you have

200 contacts you have
400 contact points (200 x 2)

and if you operated a total of 16 out of the 24 available hours with a power input of 99 watts and worked a total of 45 sections, your multiplier would be 16 x 5 x 45 = 4050; and now your score would be the product of your multiplier times your contact points, ergo 400 x 4050 = 1,620,000.

Now isn't that pretty durn simple?

(5) Awards will be made to the highest scoring stations on each VHF band in every state or province in the U.S.A. and Canada, and to the highest scoring stations on each VHF band in every country from which reports are received. A special gold-plate plaque will be awarded to stations submitting scores in excess of two-million points.

(B) **Multiband operation:**

(1) Here's your last chance to beat "old John" (W8LPD) who has won the Microwave Associates' trophy *twice* running now. *The rules for multiband are just the same as they were last year and do not include the power and hours multiplier.*

(2) Awards will be made to the highest scoring multiband station in every state, province, or country as before, and the Microwave Associates VHF Trophy will be awarded to the world's highest multiband score.

(C) **Logs:**

(1) Logs should be complete in every detail and should display prominently the itemized score and should be accompanied by a cover sheet on which the total score, name, address, call and state of the stations must be clearly printed.

(2) Logs should be postmarked no later than September 15th, 1958, in order to be counted in the results. Mail all logs to

Log Department
Microwave Associates, Inc.
Burlington, Massachusetts, U.S.A.

(3) Mail all complaints, criticisms, comments and bombs to the Rhododendron Swamp, VHF Society, Attention W1BU, P.O. Box 2502, Medfield, Massachusetts.

(D) Have fun and let's really flog the VHF bands for some real astronomical scores. See you on six, two, two-twenty, four-thirty-two, etc., from W1BU.

Masers and Such

My impassioned pleas for someone to make an effort to come up with a maser were not

all in vain. Larry Politzer (K8APG) from Dayton, Ohio (where else) made a determined effort and came up with a working model. Trouble is that Larry, despite the fact that he lives in the V.H.F. center of the country, isn't active on the V.H.F. and didn't make it to work in a ham band. If you are interested in a run-down on his efforts, I would suggest dropping him a line. (Address in the call book.)

Meanwhile the boys at the ranch have been busily thinking of some other way to get low noise figures and as usual they have come up with something new. This time it is an idea that a ham can really get his teeth into. Most of the articles pertaining to this device are concerned with a thing called a parametric amplifier. The most successful of these to date use some form of semiconductor as the active element. Their function is to provide a low noise preamplifier for weak signal amplification in the U.H.F. and up region. They are not as fantastic as the Maser as far as noise figure is concerned but they are most certainly more practical from the home constructor's point of view. I do not have a working model of my own yet. I hope to have one going in time for the next issue. Meanwhile, don't wait for me to do it. Get on the ball and do it yourself. The June 1958 issue of the "Proceedings of the IRE" has several references of interest and the June engineering edition of "Electronics" has an article on a harmonic amplifier for X band local oscillator use that you will find useful when you get to the actual building of your parametric amplifier. My first step is the construction of a crystal controlled converter for the 10,000 mc band. What's yours?

New Clubs

A new club has been formed in Huntington, West Virginia: the name, "The VHF Weather Birds." Officers—Pres. Ray Johnston, K8DFO; V.P. Dean Sturm, K8CYW; Sec. and Treas. John S. Hall, K8HRO. Have Rag Chewers Net every Saturday at 2000 on 50.10 mc. Club meets the third Sunday each month at 1430 at Huntington East High Trade School.

Buenos Aires, Argentina Our friend from the South, Michael Czysch, LU3DCA, has sent us some information from his country.

"I have now worked twenty-three countries on six meters, four of them (ZP, TG, HC, CO) as yet unconfirmed. All continents except Europe are accounted for.

"The equipment used is 80 watts on six, four element beam and cascode converter. On two meters the same power, twelve element beam and p.p. 6J6 converter.

"On May 15th I had my last contact with U.S.A. at 2148 GMT with W5JKB. K5HVC was heard the same day but didn't come back to the calls. May 16 the band was open to the north in the evening; May 18 to the north in the evening (XE1GE), May 19 to the north at noon, May 20 to the north and Europe at noon, May 31 to the north in the evening, and yesterday (June 1) from 1830 to 2030 GMT we heard a TV transmission (video) on 49.75 mc with S9++ but again no amateur signals." *Makes very interesting reading to all of us, Michael, thanks for the information. Also congratulations on Six Meter Century Club.*

Guanajuato, Mexico Another of our DX neighbors comes through, this time it's Rusty LaNier (XE1PY):

"Herewith is a log of stations worked and heard on six meters, May 25, 1958. At least some of the boys heard will be glad to know. All were called but the small rig I was running didn't make the grade in all cases. Expect to have a better set up shortly."

0709—WØIBL	0836—K5IPL	1557—K4BWK
0729—K8AGU	0841—W5FTH	1607—K4KIF
0734—W5KTD	0852—K5HVC	1639—K4IDX/5
0750—W8STX	1016—W9DSP	1915—W6TLA
0758—W5JXV	1334—W5SFW	1928—K6ERG
0805—W5NDE	1408—W5AHG/5	1956—W6BAZ
0814—K5DCQ	1441—K5BWF	2003—W6AJF
0820—K5AON	1525—K4GAQ	2022—W7FFE
0824—K5DXJ	1538—K4BSR	2029—K5ALH
0827—K5EWQ	1544—K5AJF	2055—K4HJB
	1551—W4HZP	

"The foregoing stations are stations worked. The following stations are the ones heard but not worked."

0702—VE3AEJ	1325—WØEQE	1650—W9CFI
0707—W8UNF	1351—WØEQE	1658—W8PFU
0724—W5FBD	1628—W4UUF	1940—K6GOZ/M
0905—K5HVC	1635—W4UUF	

Fine business, Rusty. Bet the fellows you didn't work, don't feel too good about it though.

Anchorage, Alaska Word comes from the cool country, via Jack Reich (KL7AUV).

"Activity has been nil here since February 1, when we heard the W-KH6 activity via backscatter. *What that backscatter does bring in!* Signals were only heard with beams toward KH6 land. I have been in Oklahoma City since March 7th, just returning last Friday (April 25, '58). Expect to join KL7CDG and others in a careful watch of 50 mc from now on."

"Since November 5, 1957, I have made a total of 665 contacts on six meters outside of the local area. Have received cards from 363 of these contacts." *Is that all? Is Alaska easy to get in some places on 50 mc.*

"334 of these contacts were made since January 1, 1958, and out of 188 cards I sent, I received confirmation of 152 contacts. *Pretty good.* Of interest is the fact that ten of the 152 cards I received were dated January, 1957, in error. This poses no particular problem to me, but I imagine others would be mightily displeased with similar errors." *One card we received (with a batch) was dated 1959.*

"To date, I have 36 states actually confirmed, one VE3 contact, several KH6 contacts, and over 30 JA contacts. Have thoroughly enjoyed the activity, and hope to keep it up."

"I have received the WASD award from San Diego, for working 15 San Diego six meter stations." *Congratulations, Jack, on a wonderful job of operating. The few times the band was open from here to your area, we listened to you countin' 'em off.*

Fresno, California We hear from the sunny clime via the U.S. mail and Gib De La Laing (W6BJI):

"Will try to sketch the six meter activity over the past couple of months here in the San Joaquin Valley. ZL's contributed most of the DX during this period with the New Zealand gang coming through on March 1, 2, 4, 5, 8, 12, 13, 18, 19, 20, 22, 26; April 1, 15, 16, 17, 18, 19. Worked a total of fifteen different ZL's in all districts. VK's were in on March 15, 20, 26; April 16, 18. South Americans were in on March 12, 21, 22, 25; April 17, 21." *Helen is drooling.*

73, Sam, W1FZJ

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

DX DX DX DX DX DX DX DX

We've been very busy this month, as evidenced by the length of the following list, but so have the following, who finally won WAZ this month:

#566	W3FYS	C. E. Weir	(27th W3)
#567	JA5AI	Hideto Yamasita	(1st JA5)
#568	OH5PE	Thor Wiksten	(3rd OH5)
#569	K6EVR	Ronald Camp	(154th W/K6)
#570	W2MUM	Elliott Wolheim	(26th W2)
#571	W7HIA	Herb Gilbaugh	(32nd W7)
#572	W1QNC	Walter Hall	(10th W1)
#573	W8YIN	Mickey Unger	(31st W8)
#574	W6TKX	Dick Schellenbach	(155th W6)
#575	DL7AH	Harry Lilienthal	(14th DL)
#576	W1FZ	James E. Thayer	(11th W1)
#577	F3AT	Ivan Pastre	(2nd F)
#578	W2WS	John M. Jeffords	(27th W2)
#579	OE1FF	Frank Friedl	(3rd OE)
#580	W6KG	Lloyd D. Colvin	(156th W6)
#581	K6LZI	George H. Reifenstein	(157th W/K6)
#582	OH2HK	Reino Janhunen	(3rd OH2)
#583	W3LMA	Edward Dillmeier	(28th W3)
#584	W2AZS	Charles Bouteiller	(28th W2)
#585	G8KP	W. T. Pickard	(7th G8)
#586	W5NUT	Gillia Wood	(24th W5)
#587	OK3HM	Jozef Horsky	(1st OK3)
#588	W2GT	A. Edward Hopper	(29th W2)
#589	W3LMO	Joseph Papp	(29th W3)
#590	ZC4IP	George F. Barrett	(1st ZC4)
#591	CN8JX	Glenn H. Luse	(2nd CN8)
#592	W3NKM	Stanley S. Springer	(30th W3)
#593	W6RZS	C. M. Cherrigan	(158th W6)
#594	W2HSZ	F. J. Enge	(30th W2)
#595	VO1DX	Horace W. McNeill	(1st VO)
#596	JA6AO	Akira Nishida	(1st JA6)
#597	PY1HQ	Welodimer Back	(6th PY1)
#598	G8KS	S. L. Hill	(7th G8)
#599	W7SGN	Phil C. Anderson	(33rd W7)
#600	W2DGW	John Lubinski	(31st W2)
#601	W7ADS	Glenn Lay	(34th W7)
#602	W8IRN	R. F. Johnson	(32nd W8)
#603	W4EO	Robert M. Cook	(20th W4)
#604	W2HZY	George W. Wright	(32nd W2)
#605	W9BPW	C. W. Tinsley	(23rd W9)
#606	W9GDI	John W. Turner	(24th W9)
#607	W4CXA	A. Prose Walker	(21st W4)
#608	W6SQP	James L. Hanson	(159th W6)
#609	W2QHH	H. S. Bradley	(23rd W2)
#610	W3KPI	Carlton L. Williams	(31st W3)
#611	W4DQH	Claude W. Bass	(22nd W4)
#612	W1ZZK	Robert C. Beisinger	(12th W1)
#613	VE1PQ	Doug Johnson	(18th VE1)
#614	W2BBS	Bill Peuser	(34th W2)
#615	W1FFO	T. D. Hale	(13th W1)
#616	W8TLL	Robert J. Pastorino	(33rd W8)
#617	W9FDX	Douglas A. Pavek	(25th W9)
#618	W5NW	W. M. Groves	(25th W5)
#619	W8CQ	Franklin Dunn	(34th W8)
#620	WØKOK	Otto J. Degner	(22nd WØ)
#621	G4TM	T. A. Maguire	(3rd G4)
#622	W5LGS	William Obrist	(26th W5)
#623	W6CAE	L. N. Higgins	(160th W6)
#624	ON4QX	Louis Th. Berge	(5th ON4)
#625	K6ENL	Aleta B. Cash	(161st W/K6)
#626	W2PZI	Dick Malanowicz	(35th W2)
#627	PAØLY	W. Blommaart	(2nd PAØ)
#628	W9EHW	A. L. Patrick	(26th W9)
#629	W9GIL	John Scarvaci	(27th W9)
#630	W5URU	Chris Cook	(27th W5)
#631	F9MS	Claude Ronsiaux	(1st F9)
#632	VE7MD	J. Black	(6th VE7)
#633	DJ2BW	Hermann Samson	(1st DJ2)
#634	OH1QE	Olof G. Ahotupa	(2nd OH1)
#635	VE2WW	Don McVicar	(1st VE2)
#636	GM3EST	Andrew Sinclair	(2nd GM)
#637	WØPGI	Joe Novak	(23rd WØ)
#638	K9AGB	Steve Tumo	(28th W/K9)
#639	KH6AYG	Jack Shibata	(13th KH6)
#640	K9DNR	"Uncle Dick" Tlapa	(29th W/K9)
#641	DL3AO	Rolf Schick	(1st DL3)
#642	DL3RK	Walter Geyrhalter	(2nd DL3)
#643	G3BHW	E. J. Hancock	(10th G3)
#644	W1BGA	Leonard M. Luther	(14th W1)
#645	W4JAT	John I. Tremanian	(23rd W4)
#646	W8HMI	Frank Smith	(35th W8)
#647	F8EJ	Rene Frere	(2nd F8)
#648	W7WVE	Dick LeMassena	(35th W7)
#649	W9BZB	M. W. Price	(30th W9)
#650	W3HZQ	W. H. Johnson	(32nd W3)

Whew! We haven't more space but to say, "congratulations!"

DX News

The battle of DXCC continues, seemingly in ever-increasing intensity, over the more recent country reshuffling and committee actions. We understand ARRL is under bombardment of irate letters and telegrams, protesting the confusion. Especially interesting these days are the VP2 situation, combining Jamaica and the Cayman Islands, and nullification of credit for the recent Kermedec Islands QSOs.

Writes G6QB: "Islands such as Fernando de Noronha, Trinidade, Clipperton—of which none of us had ever heard before a DXpedition made a landing and put them on the air—are "countries"—but not Tasmania, or Dickson Island, or the Aleutian Islands, or even Sicily, with its own prefix! For a hundred years the various islands of the British West Indies, such as Antigua, Dominica, St. Kitts-Nevis, Grenada, St. Vincent, and so on, have been issuing their own stamps, but have counted merely as two countries—Leewards and Windwards. Yet now, after the formation of the West Indies Federation, we are informed (not, mark you, by anyone in the U.K. or concerned with the Crown Colonies) that they will in future be counted separately!

"Ruanda-Urundi, with stamps, boundaries, and separate prefix of its own, simply counts as "Belgian Congo"—which it is not! Yet a rock with a lighthouse on it (Navassa) is a separate country.

"Gold Coast and Ghana"—the same place with the same people operating the same gear —count as two separate countries according to whether you worked those people before or after March 4, 1957. And if you worked an Englishman signing VP8 on, say, South Georgia, you could count that as a "country," but not if you worked an Argentian or Chilean national sitting on the same piece of ground and signing LU or CE.

"When Saarland reverted from 9S4 to DL8 (March 31, 1957) it ceased to count as a separate country; similarly, I1 (Trieste) became Italy again on that same date. What hap-

pens to SU and YK contacts made respectively before and after the Federation we do not pretend to know. If you worked an SU and a YK before the Federation they counted as two countries; had you worked the same two stations afterwards, they could have counted as (a) two countries; (b) one country (a new one?); or (c) one country (but one of the old ones). Five points for a correct answer, if anyone recognizes it when they see it."

All this controversy and confusion, in part, influenced the CQ DX Department decision to drop the countries system of scoring and adopt WPX. Even so, DXCC is traditional and time-honored, and we hate to see it muddied by so much turmoil. Isn't it about time the DXCC committee be composed of representative top DXers of the world, rather than in one office? We mean no disrespect, but we do need DXCC stabilization and direction.

Those new countries in the West Indies are getting plenty of attention this summer. VP2DA and VP2KM are active on 14 mc phone; VP-2LB, VP2GX, VP2GV, VP2DJ, and VP2AB on 21 mc phone; VP2SH on 7 mc phone and CW; and Danny, VP2VB, will be working these islands from July until November. At this writing, he's at KV4AA, then he goes to Aves Island in company with two YV operators to put YVØAA and YVØAB on the air from July 3rd through the 10th. Then Danny returns to KV4AA, after which he goes to the British Virgin Islands for another stand.

Chas, F9RS, reveals this year's PX1FC DXpedition has been cancelled. Only he and F8FC, it turned out, were able to go. They are now planning the trip for 1959.

W6BYB and W6CLS, to operate phone and CW respectively, have set up an expedition to VR2, VR5, and KS6, starting about July 12th. They hope to pick up a VR2 in Suva and continue to VR5, the entire trip lasting five weeks. They will get on from KS6 if at all possible to arrange the transportation.

FB8YY, the French Antarctic Expedition, has suspended all amateur radio operations because of other duties, and because the station QRMs the meteorological equipment, continues F9RS. They hope to correct the situation soon.

Peter Naish, G3EIX, was the second foreign visiting ham to be licensed, as PJ5CB, under the new 15-day-per-year Netherlands West Indies licensing system. The first was his good friend G5RV, who appeared last spring as PJ5AA, et al.

If you missed the last Trinidade Island, PY-ØAN, expedition there's another abrewing by PY1CK, PY2CK, PY7AN, and PY1HK, for the last week in July or the first of August. This one should be bigger and better, writes Elmer, W3ROA.

A tale reaches us of a certain Australian ham operator, connected with the VK Antarctic IGY organization, who is reluctant to set foot back on the Australian mainland when his tour of duty is completed. It seems a public subscription was taken up to provide those adventurous explorers with a nice stainless steel bath tub at quite considerable cost, so that the poor motherless souls could keep themselves nice and clean in the frozen wastes. However, our hero had other bright ideas. The said bath tub is duly installed as a first class brewery vat. "T'would be sacrilege to sully it with unwashed humanity," he lets slip during a QSO with a friend back home in Australia. The following day the Australian daily press comes out with suitable headlines!

Nevertheless, as our hero aptly puts it, the home-brew is shimply delischisch!

OR4VN, Henri, of the Belgium Antarctic Expedition, located at 7OS, 24E, will be in operation until January, 1959, provided their ship can reach them by that time. Henri runs 150 watts to a rhombic on Europe. He's unable to operate on a firm schedule but may usually be found around 14010 kc CW at 1900GMT. The Russian Antarctic Expedition has blossomed out with several new stations, other than the Mirna Base, including UA1K-AE/4, UA1KAE/6, and UA1KAE/7, the latter located at the south geomagnetic pole, 78S-86E. VKØKT, Macquarie, has been very active most mornings at about 1300GMT on 14195 kc phone. QSL via VK2EG.

ON4UB is currently on the air from the Brussels World Fair on 14140 kc phone.

Lee, W8CED, writes of a visit by HA5AM, airline pilot on the Hungary-Scandinavian run, to the shack of SM5AHK, and the news that HA5AM/ZA operations are a thing of the past. Albania no longer will permit ham activities by any foreigner, even Hungarian. And there are no legitimate, licensed ZA stations. I1AFS, station of the Allied Forces Southern Europe, in Naples, manned principally by W8-KJP, is planning a hamming trip to San Marino, M1, this summer or early fall. I1ADW can't make it to San Marino this year, however.

All SVØ calls are reissued very quickly, writes Larry, SVØWP, with the probability of one being dropped one week and reassigned the next. Also, the call might be Crete one assignment, and Greece or Rhodes the next. But the chaps on Crete are planning much more activity in the future. Wes, SVØWN, puts out an excellent signal on 14 mc phone with 300 watts to a BC610 (he's not to be confused with the SVØWN of 1956 who didn't QSL!); SVØWB is currently very active on Rhodes, with plans for more CW in the future; SVØWE is on SSB; and Larry himself can be found mostly on 14080 kc CW from 0300 to 0400 GMT daily. He and other SV1 and SVØ stations but those mentioned above are located in Salonika or Athens and vicinity.

Byron, W9FYM, writes us of the possibility of new Afghanistan activities. YA1AA, Pete, formerly W9MOW from Lafayette, Indiana,

an airline pilot flying the Near East area, has official permission to operate from that rare spot, he says. Further YA possibilities come from a ham in the American Embassy, Teheran, Iran, who is planning a trip to Kabul beginning the last of July and extending for several months.

Rundy, ex-XV5A, advises he is now operating as W3ZA/XV under a temporary provisional license pending further negotiations with new Viet-Namese officials for permanent permission. He has notified the FCC and asked them if this change in call letters would change the status of his station with respect to WQSOs. Rundy now has a KWM-1 and plans a visit to Laos (XW8) soon to give the SSB boys a new country. He just returned from a trip to Cambodia, where he reports chances of ham activity good within a year. Tom Moody, W3-COF, and Bernice, ex-W4EYS, XYL of the Senior Police Advisor to Cambodia, Jack Munroe, who is not a ham, are already on the scene.

Further from Zone #26, we learn the Singapore RAF boys are trying to promote a station on the Nicobar Islands. They are trying to get a license for that rare spot, but failing that they hope to interest Indian nationals now stationed on those islands. If it works out the equipment will be sent them by the RAF chaps.

In a letter to Phil, W3SOH, VR1A states he's never worked 15 meters. All those fellows who have recently worked VR1A on that band have worked a phony. VR1A was inactive during all of 1957, and plans no ham activity at all in the near future. Only VR1C is legitimate, and he works only 20 meter phone, although a new 65-watt rig now being shipped will get him on both phone and CW as soon as it arrives. There are eight VR3 stations on Christmas and Fanning Islands, VR1A continues. These islands come under the administration of the Gilbert Islands, and the VR3 licenses are issued by VR1A, himself.

Canton Island is getting better and better representation, on phone. KB6BK and KB6BL are new calls, and plan to operate SSB exclusively with a KWM-1/Mosley Tri-bander combination. KB6BJ is very active on CW, and is looking forward to the CQ DX contest this fall.

ZL1AJU has indefinitely shelved plans for a proposed DXpedition to the Chatham Islands, an excellent possibility for a new DXCC country, because ZL3VB is active there already, on 80 meter CW. Ben, VR2DG, will be active, CW only, on 21066 and 28088 kc for the next six months. K6SXA reports him active between 0300 and 0500GMT.

After long silence ZC3AC is back on, but only for an hour or two a week. He's acutely embarrassed by QRM, we are told, and just couldn't care less.

On April 1, 1958, some EA9's (at Tetuan) changed their prefix to CN9. This should be good news to WPX hunters, but we don't know how it will affect DXCC. EA8BF and W6RLP report EA9AW may be on from Ifni soon.

ZS6IF writes that he will be on the air for a week of the second half of August from Swaziland, signing ZS6IF/7, most probably on 20 and 40 CW only. QSLs will be on a card for card basis, and must go to his home QTH in Johannesburg. He can't easily dispose of IRC's but would rather have U S coin, if you include return postage.

Under miscellany, we note VS90, Oman, is active on 21330 kc phone daily after 2000-GMT. Call him 5 or 10 kcs down, and QSL via RSGB. KC6JC, Eastern Carolines, is active every Thursday on 14020 kc after 1100-GMT. ZK1AK, a new one on from the Cook Islands, is 13 years old!

QSL

CN8GU now has the ZD7SA logs and will handle QSLs, but you must send him a stamped and addressed envelope.

W2SSC has a bunch of VKØAB and VKØ-KT cards at hand for W/K/VE distribution, and VKØTC cards are enroute to him. These are for 1958 QSOs only. If you have one of the above coming please forward a stamped and addressed envelope to: J. Driscoll, W2SSC, 50 Howard Dr., Buffalo 21, N. Y. Outgoing cards to the above stations should still go via VK2EG.

Sam Woodson, WØGXP, Box 483, Kearney, Mo., has arranged to handle the stateside distribution of JZØPB cards. The usual rules apply: All cards will go via bureaus unless stamped and addressed envelopes are furnished Sam for direct reply. JZØPB, incidentally, is active daily, particularly weekends, between 1300 and 1500GMT, a little above or below 21250 kc phone.

ADDRESSES

CN8GU (ZD7SA)—Capt. T. R. Donovan. 1975 AACS, APO 117, New York, N. Y.
CR4AH—Aeroporto dos Espargos, SAL, Cape Verde Islands.
DL4DH—CWO A. F. Lindsey, HQ USASA-EUR, APO 757, New York, N. Y.
DL4TW—Roy S. Goldsmith, 549 Newcomb St. S. E., Washington 20, D. C.
EL3B—Carl Sundberg, c/o LAMCO, Box 69, Monrovia, Liberia.
ET3PRS—P O Box 621, Addis Ababa, Ethiopia.
FF8AC—Box 129, Kankan, French West Africa.
FP8AT—QSL via K2GMV.
HND9A—F. D. Fuqua, Daura Refinery, Box 278, Baghdad, Iraq.
JZØHA—Hugh, Box 420, Sorong, Dutch New Guinea.
JZØPB—QSL via WØGXP.

[*Continued on page 115*]

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

semiconductors

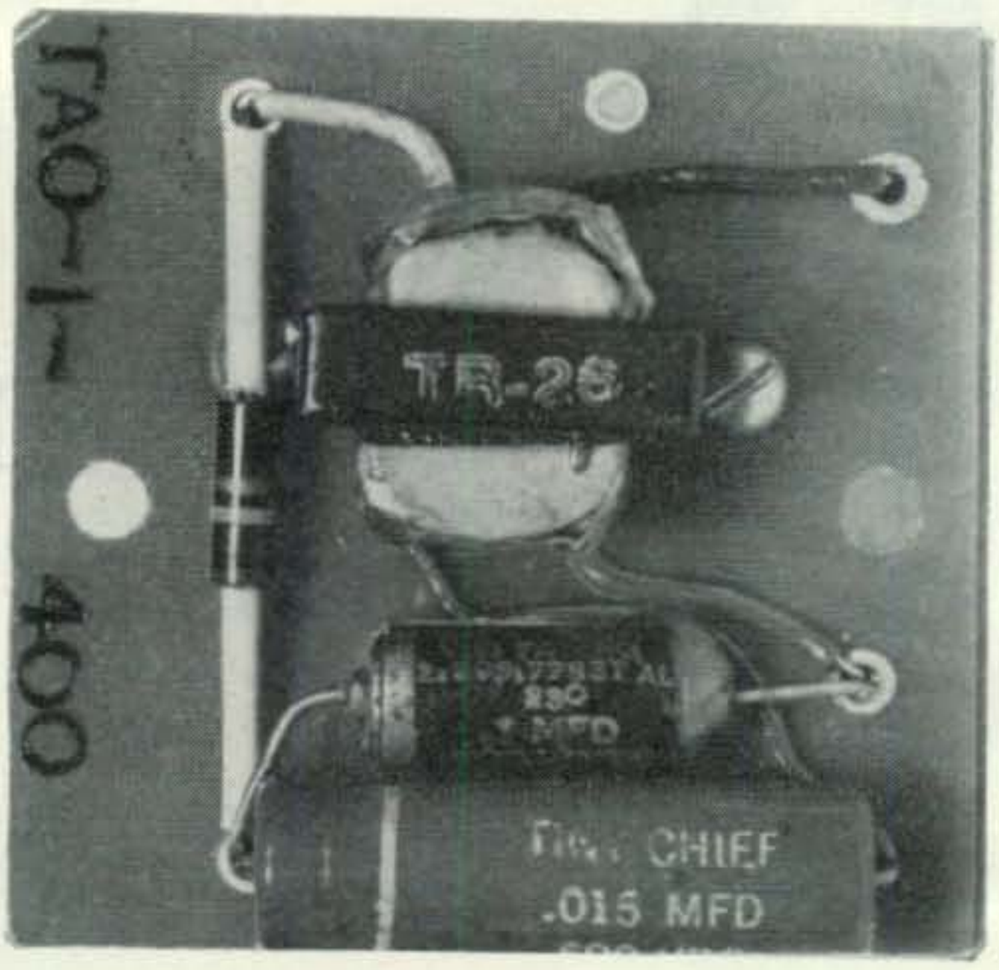
It is interesting to watch as more and more manufacturers climb on the transistor band wagon. As predicted earlier in this column, you may expect to see amateur applications for transistors and silicon rectifiers increase. Many of the new communications receivers and transmitters will be using these silicon rectifiers in the power supply section to increase effciency and reduce heat radiation.

A new manufacturer of transistorized equipment for amateurs is Electronics Unlimited, Merlin Transistor Products Division, 31 Maple Avenue, Saratoga Springs, N. Y. They are currently producing an interesting line of transistorized subassemblies, including crystal oscillators, variable frequency oscillators and audio oscillators for single sideband alignment. Other units for the hi-fi trade are pre-amplifiers, variable reluctance compensated pre-amplifiers, and loudspeaker amplifiers.

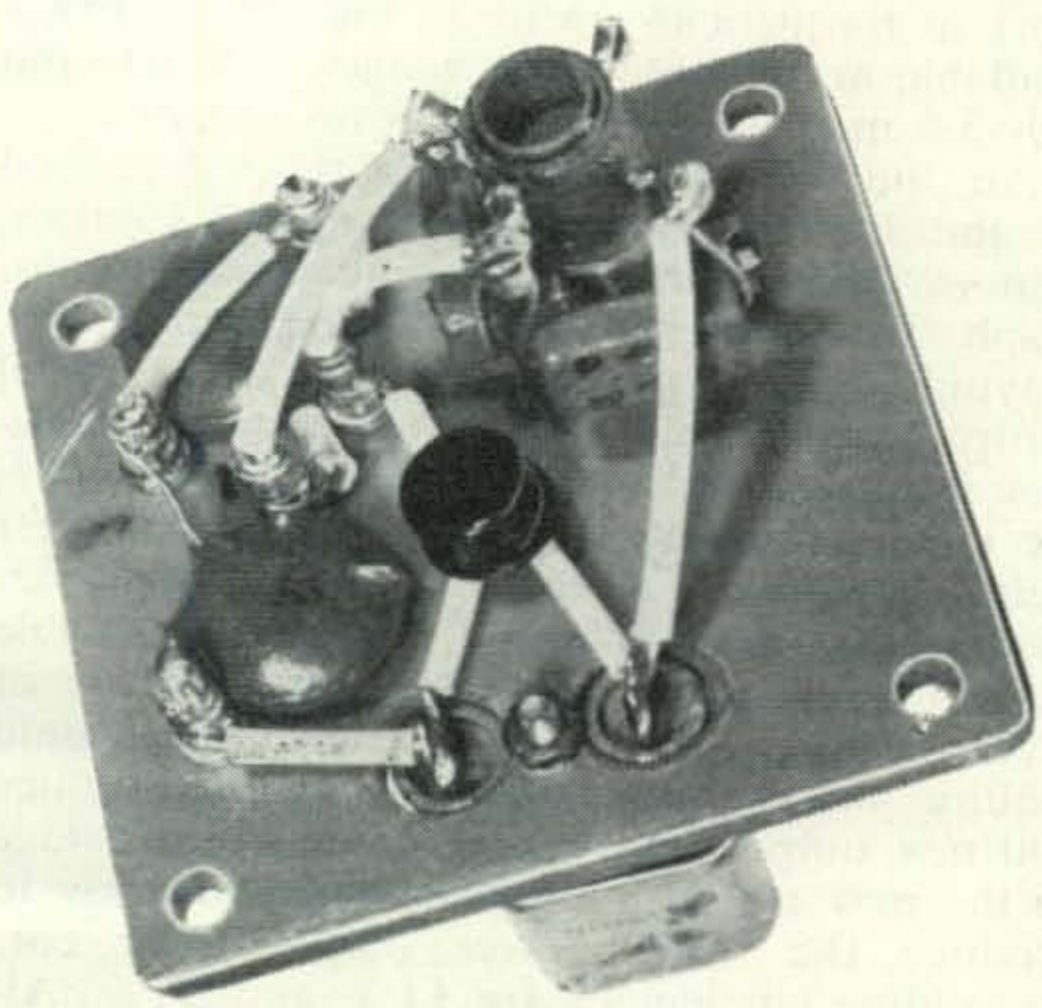
The three units for ham applications are shown here in photos and schematic diagrams. The TCO-1 crystal oscillator is available from 100 kc up and the coil and transistor are changed in the various models. The schematic shows a 2N137 transistor, for the oscillator, which has an alpha cut-off of 10 mc. In this circuit, feedback occurs between the collector and emitter and the crystal acts as a stablizing device. Feedback for the crystal occurs between collector and base with the .01 mf capacitor as part of an impedence matching network. Base bias is supplied by a voltage divider connected across the battery (100K and 33K).

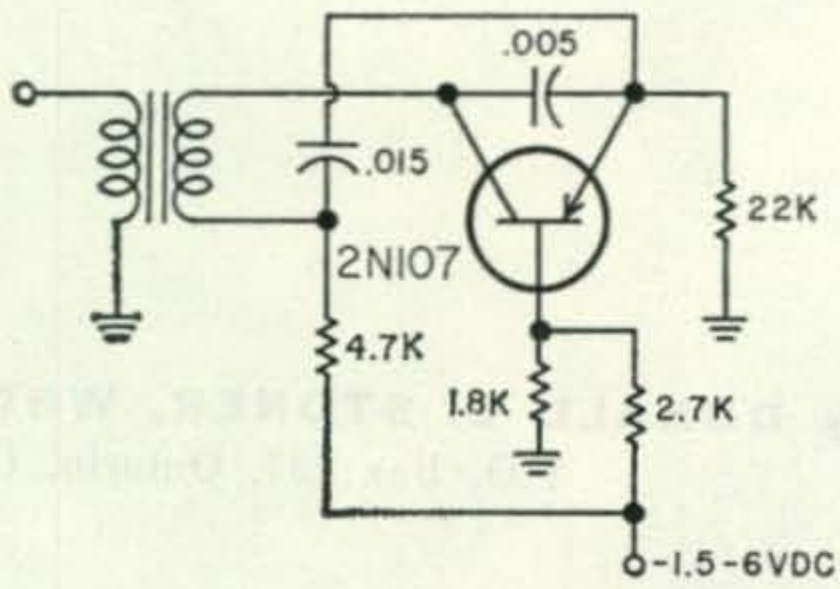
The audio oscillator (Model TAO-1) circuit is standard but extremely good wave shapes are obtained by using a specially gapped transformer. The feedback path occurs through the .015 mf capacitor and the primary of the transformer. It is, in effect, a series tuned circuit. The .005 and .015 capacitors adjust the frequency of oscillation. With a dc input of 1.5 volts, the output voltage is .025 p-p. At 6 volts the output is .14 volts peak to peak.

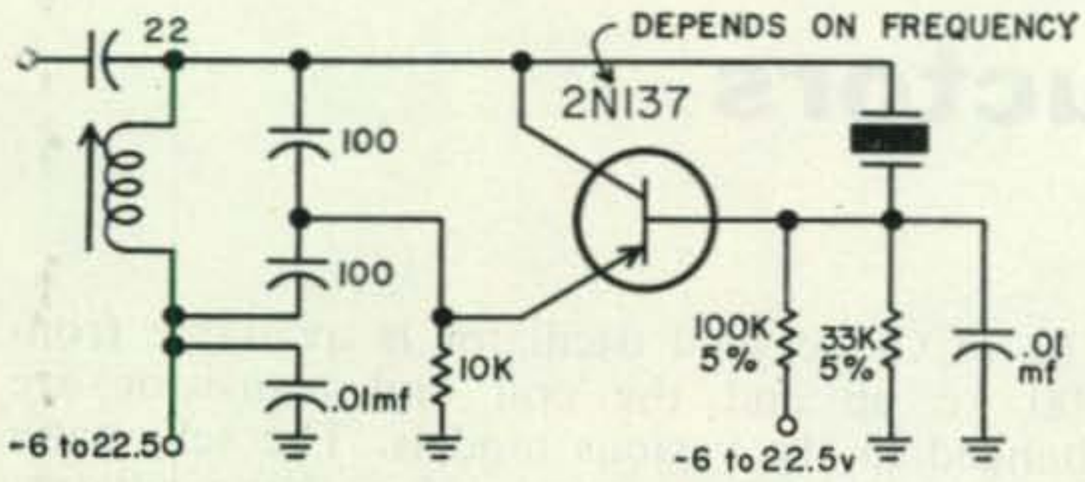
Electronics Unlimited 400 cycle audio oscillator, Model TAO-1 (400). Construction is on a phenolic board and connections are make to "stake-on" terminals.



Underside view of the TCO-1 crystal oscillator showing the method of mounting the components. Transistors and tank coils are substituted for the various ranges.







Schematics of the Electronics Unlimited transistorized Amateur equipment.
Audio Oscillator TAO-1 -1200
Crystal oscillator TCO-1

Because of saturation, the best waveshape occurs at the lower collector voltage. The maximum current drain is .5 ma with 6 volts applied.

The variable frequency oscillator is an extremely clever device and has very good frequency stability. Feedback is between the emitter and collector through a capacitive voltage divider across the tank circuit. Rf output from the oscillator stage is applied to the base of the output transistor. This stage operates class A to prevent loading of the oscillator. Base bias is applied to both the oscillator and the emitter follower. The output stage is analagous to a cathode follower in vacuum tube circuits and has the same low impedance characteristics. Although the transistors are not specified, units such as the RCA 2N370-2N372 would work at frequencies up to 30 mc. This VFO is available in two frequency ranges, 3.5- 4.0 and 5.0- 5.5 mc, other frequencies on request.

An "out of this world" ham rig is described by the DuKane Corporation of St. Charles, Illinois. Shown in the accompanying photograph is the new satellite transmitter, employing all transistors. It consists of a crystal controlled oscillator driving a pair of transistors in push-pull. Western Electric transistors are used throughout. Although the transmitter weighs less than three ounces, and occupies less than six cubic inches of space, it is capable of 500 milliwatts *output*. The output stage of a conventional tube type of transmitter would require 4620 milliwatts of power to produce 500 mw output. By contrast, the output stage of the new transmitter needs only 930 mw to produce the same power output. The corresponding efficiencies are 11% and 54%. Although the circuitry for this transmitter has not been released, it will be made available as soon as possible. Many of the DuKane engineers are hams.

New Literature

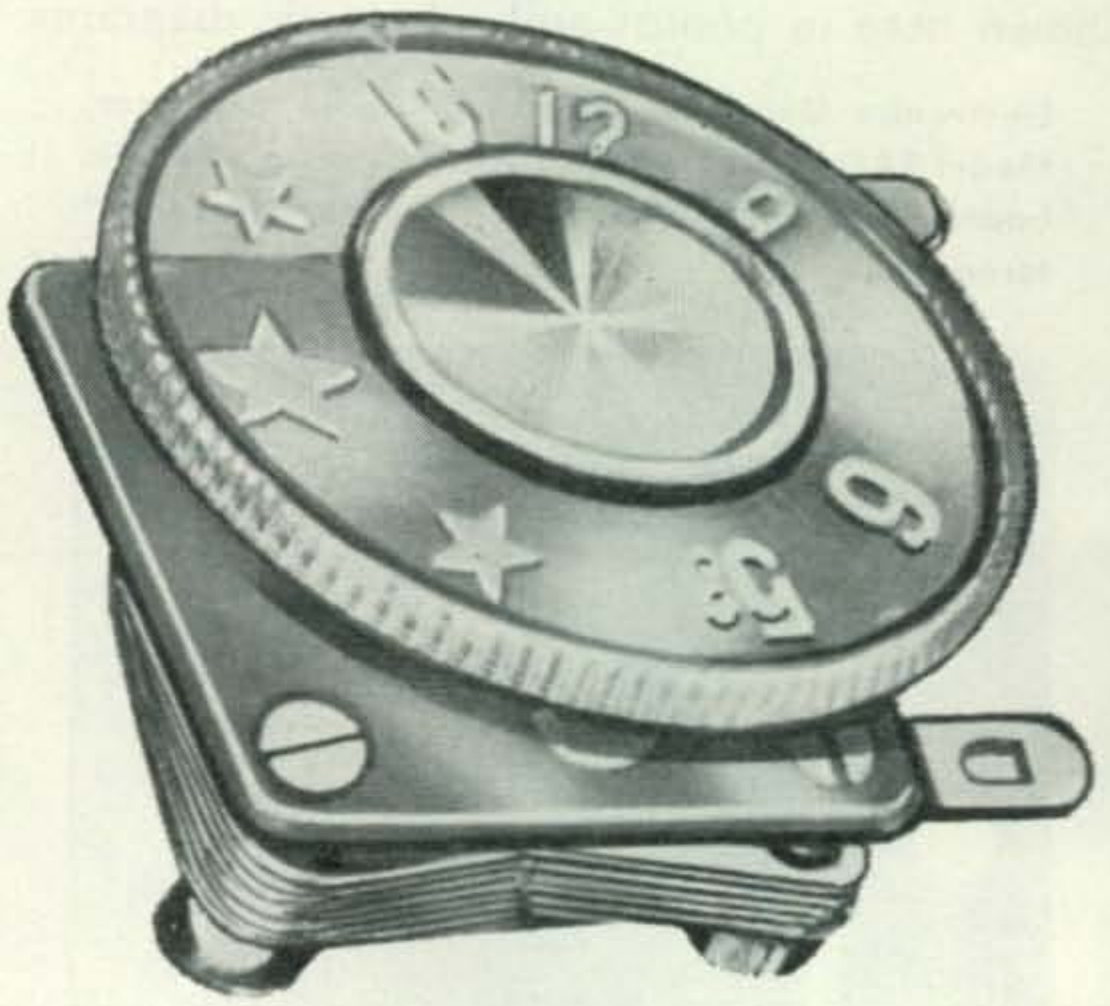
This month's issue of the General Electric Semiconductor Products Newsletter contains an interesting discussion of the Unijunction transistor plus a set of "tongue in cheek" rules on how to ruin transistors.

Sylvania Electric Products, Inc., Woburn, Mass. with a new booklet on transistor applications. It is titled "Performance Tested Transistor Circuits" and includes many circuits (all new) of interest to experimenters, including a voice operated relay. Price—35 cents. Also from Sylvania is their Transistor Characteristics and Interchangeability Guide. Price—10 cents. Both these publications are available at your Sylvania distributor.

New Products

Many of General Electric's transistors will have the tabulation removed. That's the little exaust tip usually found at the top of the package. GE started shipping these shorter transistors about May 25. The characteristics and designation remain the same.

General Electric Co. has reduced the price on several of their transistors and silicon rectifier stacks. Be sure to check them, if you're in the market. Also, GE has added two new tetrodes to their line, the ♯N36 and 3N37. Three new switching transistors, the 2N634, 635, and 636 have been added to the line.



Lafayette Radio introduces the new "Poly-Veri-Con" tuning capacitor. This device uses a polyethylene dielectric which allows much closer spacing than would be possible with the usual air construction. The PVC is one inch square and 7/16 inch deep! Amateur net price is 59 cents.

International Rectifier Corporation, 1521 E. Grand Avenue, El Segundo, California is marketing a voltage variable capacitor called the "Semicap." The Semicap has a "Q" of 1000 plus at 1 mc with a 10 to 1 capacity ratio well within its peak inverse voltage rating of –200 vdc. Bulletin SR-205 describing the Semicap in detail is now available.

Lafayette Radio, 165-08 Liberty Avenue, Jamaica 33, N. Y. has just announced a new series of minature transistor transformers. The TR-97 is an input transformer with a primary inpedance of 100K and a secondary of 1000 ohms. FB for crystal mike to transistor base. The TR-98 is a driver transformer with an impedance of 10K to 2K. The TR-99 is push-pull collector to speaker transformer. The impedance is 500 ohms c. t. to 3.2 ohms. These three new transformers are priced at 79 cents, each. Also from Lafayette is their new Poly-Vari-Con tuning capacitor with polyethylene dielectric. The capacity is variable from 10 to 365 by means of a 1¼ diameter clear plastic knurled dial, calibrated from 530 to 1600 kc in 180° rotation. The capacitor measures one inch square and 7/16" deep, and weighs 5 oz. The capicitor is designated MS-445 and sells for only 59 cents.

Sylvania Electric is now producing three new microwave crystal diode mixers. The 1N26A, 1N53B, and the 1N78B are said to have improved noise figure and greater RF impedance uniformity in the 13 to 35 kmc region.

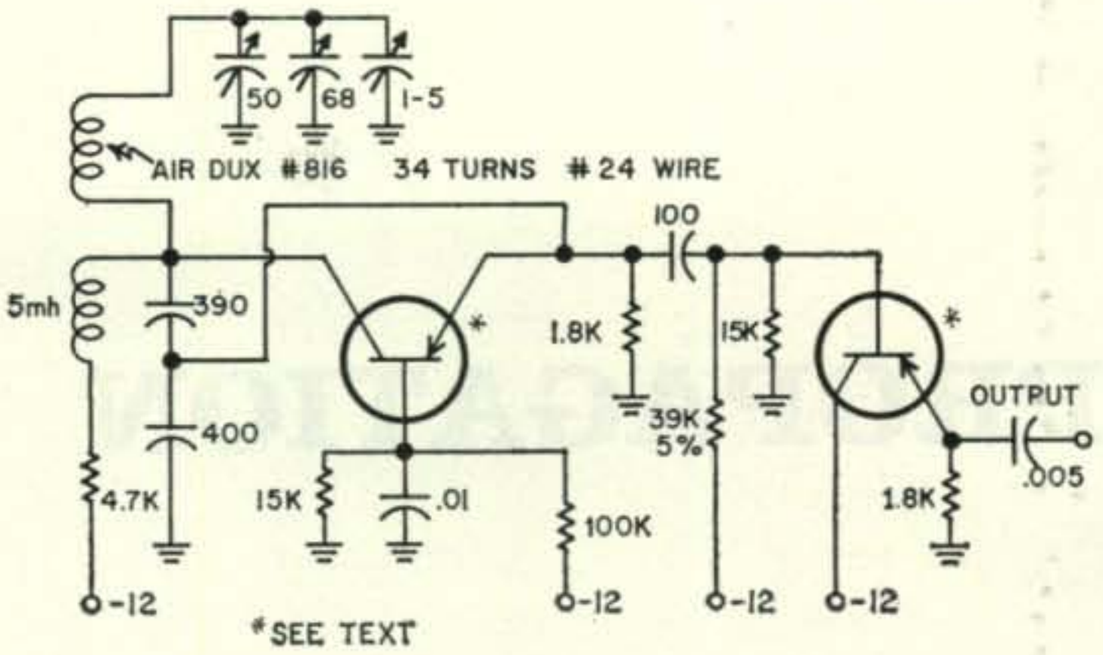
RCA has brought out a new slow speed switching transistor designated the 2N586. The transistor is particularly useful as a relay actuating device and in voltage regulator, multivibrator, dc-to-cc converter, oscillator, and Class A and B audio amplifier circuits. Maximum voltage is –45 volts and maximum dissipation is 250 mw.

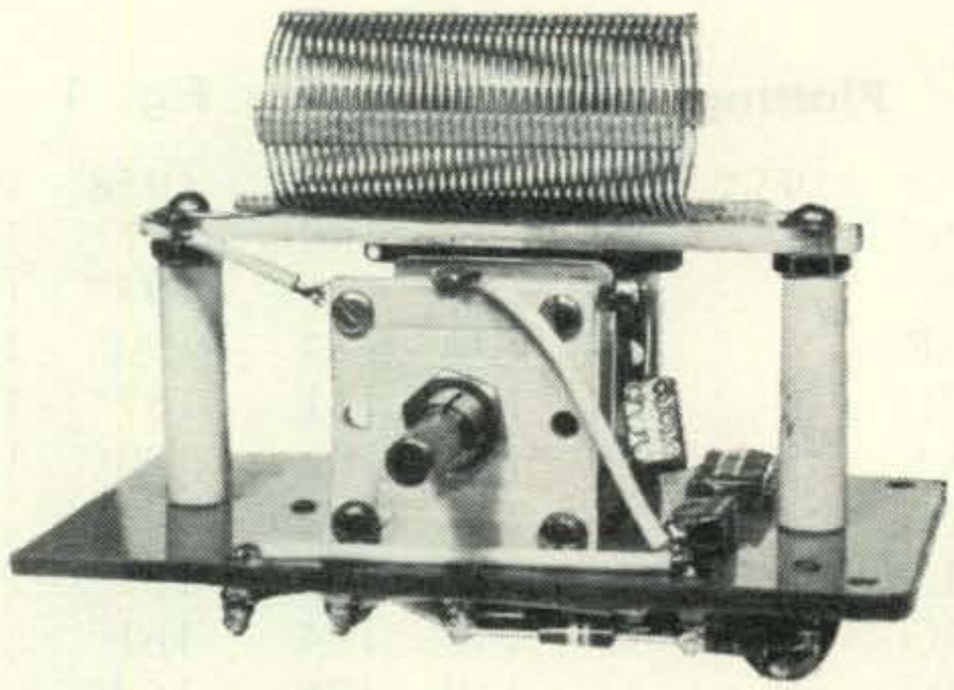
The new Sarkes Tarzian "K" series of silicon rectifiers have pig-tail heads and are rated to 750 ma with a max piv of 400 volts. The dimensions of the new package are ⅝ inch long by .4 inches diameter.

Motorola, Inc, Phoenix, Arizona has introduced several new audio transistors. The 2N650 through 2N655 are PNP types in the standard TO-9 package. These units are designed for general purpose applications in the audio frequency range, including both amplifier and switching service. These units have a maximum junction temperature of 100° C.

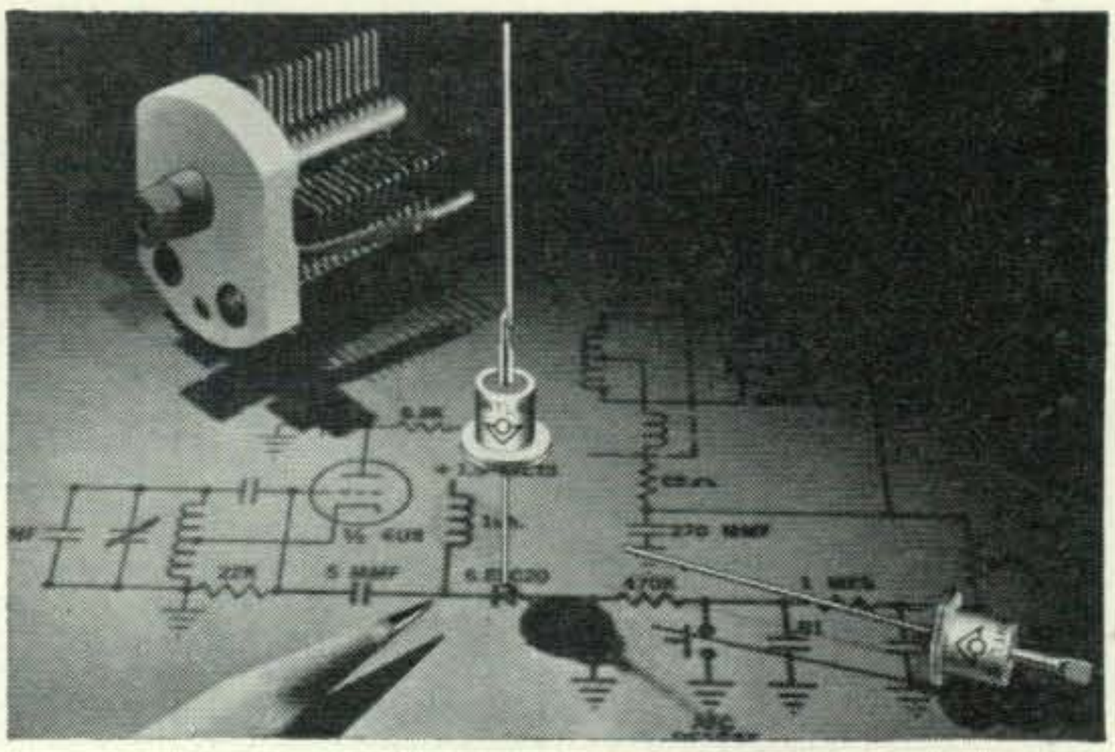
Been looking for thermistors? Fenwal Electronics, Inc, Mellen Street, Framingham, Mass

[*Continued on page 114*]

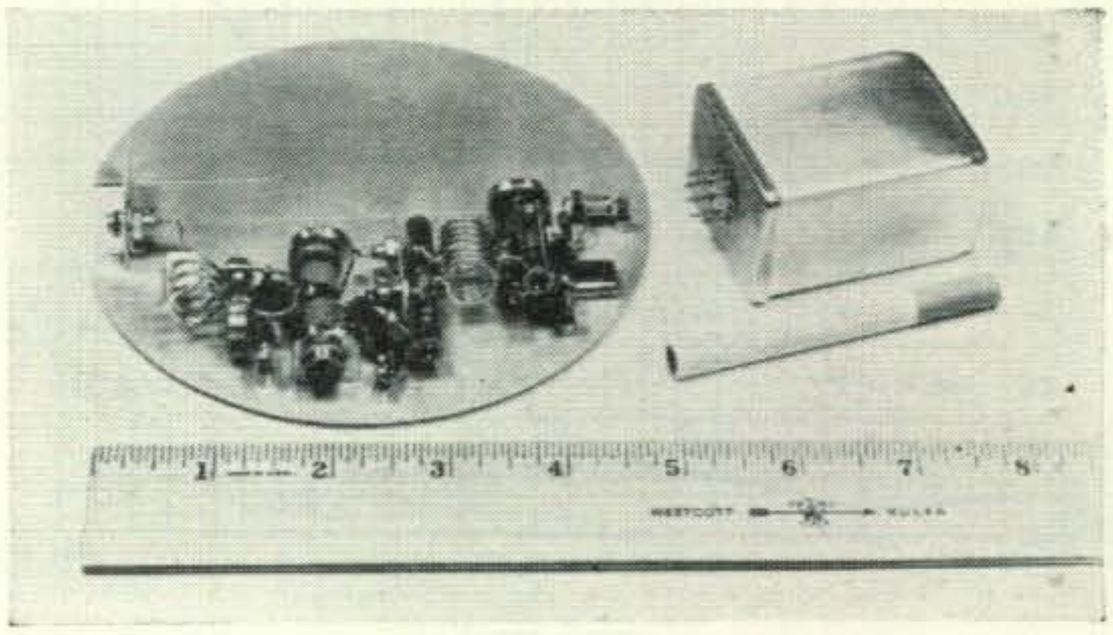




Electronics Unlimited's transistorized VFO.



The "Semicap" is a new silicon high "Q" voltage controlled variable capacitor. It is very useful in fm oscillators, for automatic frequency control, bandpass and filter networks where precision capacitance control is an essential design parameter. International Rectifier Corporation manufactures the device. For a free data sheet, see text for the complete address.



Satellite transmitter developed by DuKane Corporation is all transistorized and weighs only 3 ozs. The plug in unit at the right illustrates how the transmitter could be packaged for other applications. Sorry, the circuit is classified.

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

PROPAGATION

Plotting Information For Fig. 1.

	1954	1955	1956	1957	1958	1959
JAN.	6	14	89	169	197*	146*
FEB.	5	16	99	171	195*	143*
MAR.	4	20	109	174	190*	140*
APR.	3	23	119	181	187*	138*
MAY	3.5	29	127	184	180*	135*
JUNE	4	35	137	188	174*	
JULY	5.5	40	145	192	167*	
AUG.	7	47	148	194	161*	
SEPT.	8	56	149	196	158*	
OCT.	8	64	154	198	154*	
NOV.	9.5	73	157	199.5	152*	
DEC.	12	81	162	199*	148*	

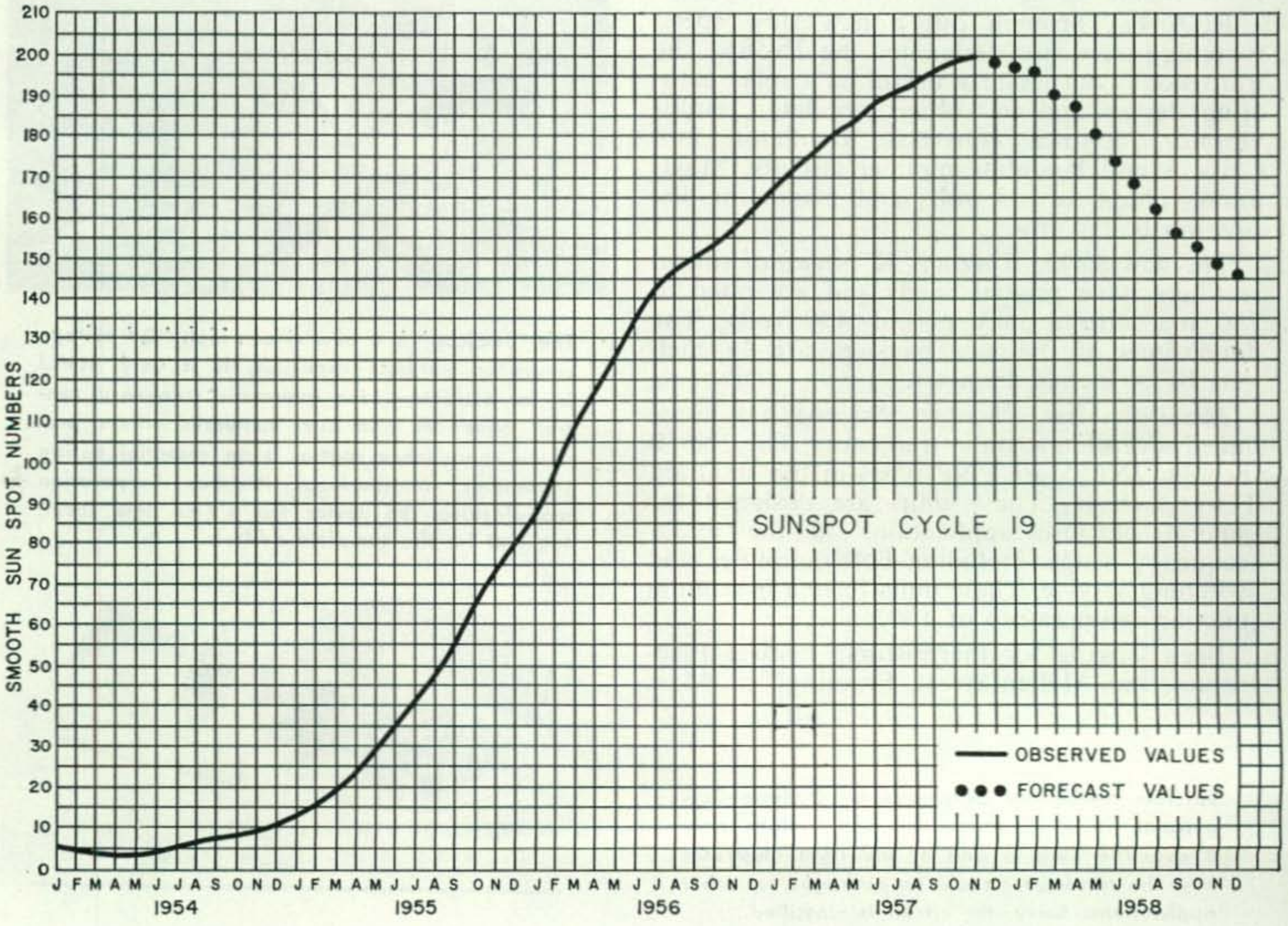
August's Highlights

During August, summer propagation conditions are expected to continue. Static levels will remain high, sporadic-E openings frequent, and not too much difference between day and night time maximum usable frequencies.

While rew DX openings are forecast for *6-meters* until later this fall, some sporadic-E short-skip openings should occur during the month. The Perseids meteor shower will reach a peak during mid-August permitting some meteor type openings on the VHF bands. *Ten meters,* while still in its summer slump, is ex-

[*Continued on page 125*]

Fig. 1



Last minute forecast: Disturbed shortwave propagation conditions are most likely to occur August 4-5, 24-25 and 31. Seasonably normal for the rest of the month.

ALL TIMES IN E. S. T.

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

ALL TIMES IN C. S. T.

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

ALL TIMES IN P. S. T.

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

SYMBOLS FOR NUMBER OF DAYS CIRCUIT FORECAST TO OPEN:

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

** Indicates possible six-meter opening
* Indicates possible eighty-meter opening

Time Symbols: A - A. M. P - P. M. N - Noon M - Midnight

The CQ Propagation Charts are based upon a CQ 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 September 15, 1958. All forecasts are based upon ionospheric data published by the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado.

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

SURPLUS

Want an oscilloscope for ten bucks (no joke)? Well, we dug one up this month and it really works. Maybe it doesn't have the refinements of a three hundred dollar job, but it will allow you to monitor your signals and at that it is well worth the money. It will work on just about no power at all and can be made to work from a mobile or fixed station. K2JRI who takes the photos for this column saw it finished, and couldn't be held down till he found out where to buy it. (C&H, West Coast as well as others).

Wayne (alias Honorable Editor) spotted the ID-60/APG-15 on a recent trip to the west coast and dragged it back home. He threw it at us and said, "So . . . make it work." We did.

We took it apart removing everything but the controls and the pilot light assembly. The transformer, terminal board and diode tube socket went into the junk box. We tried tracing the circuit, but gave up after deciding that the scope had to be rewired. It is without a high voltage power supply as you get it, the transformer serving as a low voltage job to light the tubes. All high voltages are derived from the main equipment to which this unit is attached. The diode served some vague purposes, but not as far as we are concerned. The hardware is salvaged for future use in reassembling the scope case. All frills like the rubber pads and the clamps were removed as well as a nut attached to the sloping rear side of the upper chassis.

The scope socket was not disassembled, but by cutting the harness cord we were able to get at the leads. They were cut about ten inches from the scope socket and stripped and tinned for future use. The power plug and a lot of the wire became garbage, but the heavy vinyl tubing will find additional uses around the shack.

For mobile use the power may be obtained from the transmitter and the power supply therefore omitted. These will further cut the cost down. About 400 to 1000 volts may be used and the current drawn is only about half a mil. The filament uses 0.6 amp. at 6.3 volts.

The first job in reassembling the indicator is to drill two one half inch holes on the rear sloping side of the upper chassis. This is to allow the two centering controls to be mounted with insulated washers. This is necessary because of the high voltage at which these parts must operate at. Get the smallest diameter potentiometer that you can buy without going to the miniature and sub-miniature sizes. They should be about one inch diameter or so. Make sure that you mount these parts with insulated washers and use insulated knobs. We didn't have anything but screw driver adjust types and had to make an insulated shield for them.

Wire a 100K one half watt resistor across the focus control. Although this isn't shown on the diagram, it will allow better centering control of the beam spot . . . then complete the wiring of the scope. Don't connect the two halves of the scope together yet, but mount the transformer using existing holes. Luckily the transformer that we got just fits some of the mounting holes of the original transformer and no new holes were needed.

Four, two contact plus ground lug type terminal strips were soldered directly to the transformer frame, two on the back and two on the front. The power supply components will be wired to the front ones and the rear ones will serve as terminals for C-6 and C-7

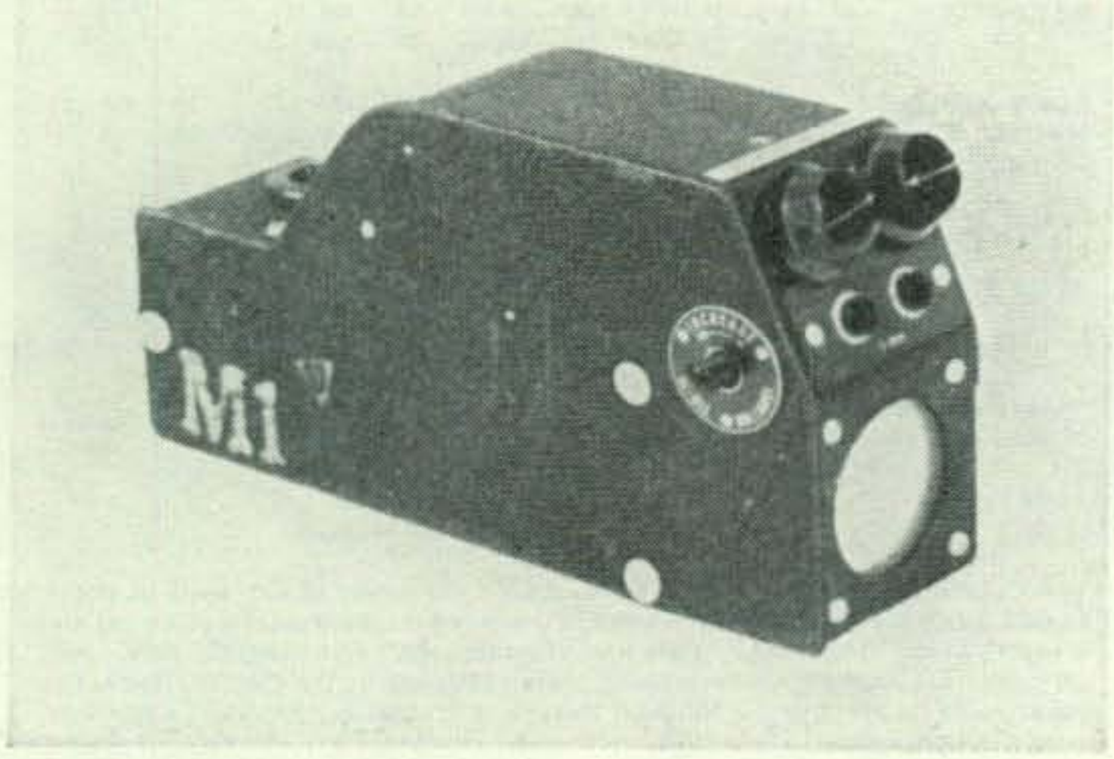
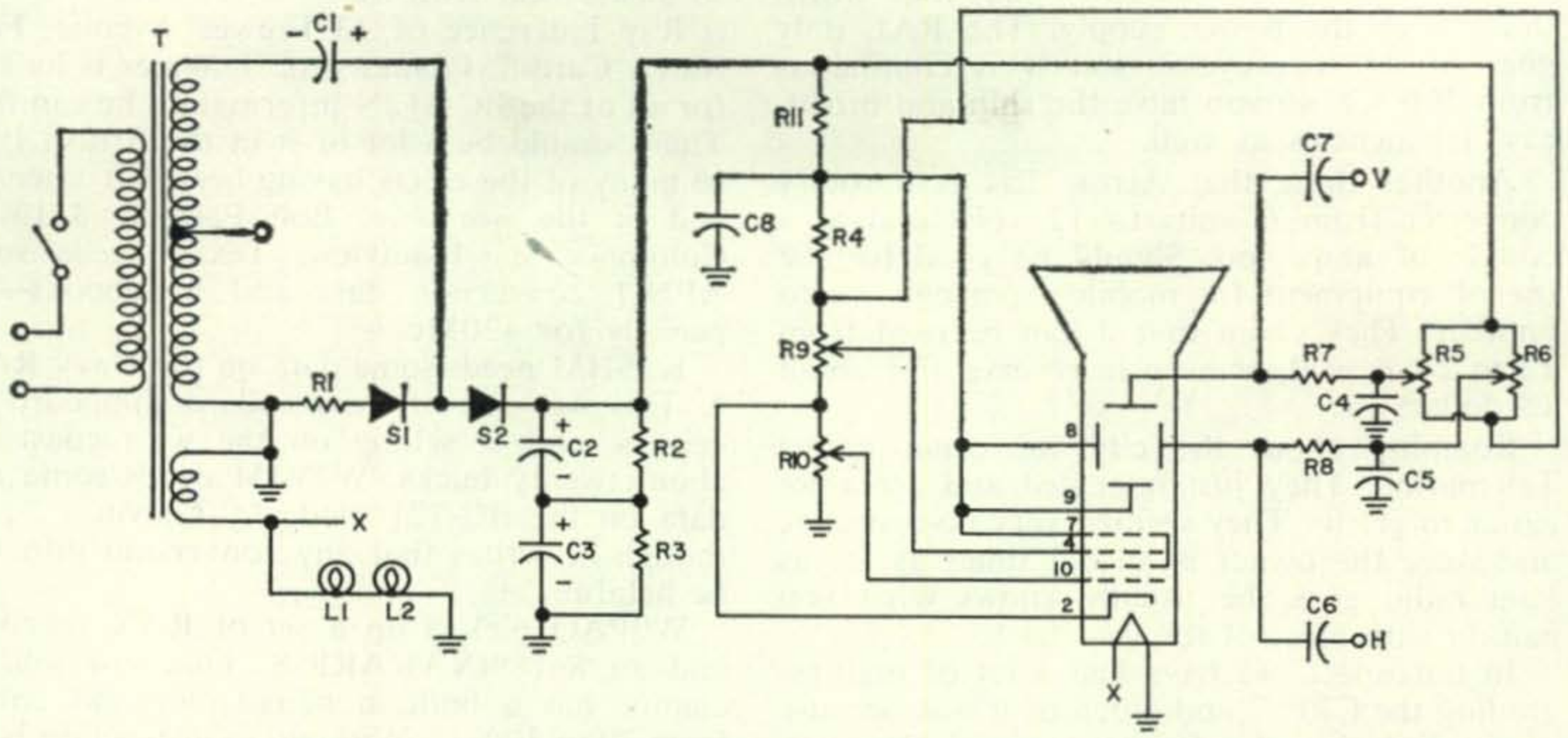


TABLE I
PARTS LIST

T1—Stancor P8416
C1, 2, 3—4mfd 450 volt electrolytic
C4, 5, 6, 7—.Olmfd 1600 volt disc
R1—50 ohm 2 watt
R2, 3—470kohm ½ watt
R4, 11—47kohm ½ watt
R5, 6—100kohm potentiometers
R7, R8—4.7 megohm ½ watt
R9—Focus Control (original equipment)
R10—Intensity Control (original equipment)
SI, 2—Diode Rectifier 1N256 or equivalent
L1, 2—Pilot Lamps (original equipment)



the input blocking condensers. R-11 and R-12 are mounted between one of these and the center terminal of the centering potentiometers. It is important that the voltage ratings of all condensers be followed carefully since the voltages that the scope uses are well above the ratings of the usual disc types.

The voltage doubler circuit is tricky in as much as the diodes must be capable of withstanding twice the usual ratings for selenium rectifiers. Therefore, use two standard type rectifiers of the smallest size that you can get (usually about ten or twenty mils) in series for each diode shown. We used high voltage diodes in the interest of saving space and getting everything inside the case. It is possible that you may have a lot of seleniums around and they may be used—providing they are used in series and that they are insulated to prevent anyone from coming in contact with the high voltage The plus marking on a diode is the cathode and sometimes this is shown as the bar side of the symbol, the pointing triangle is the anode. The output of the power supply is about 700 volts and the usual high voltage precautions should be taken. Make sure that the parts all fit within the indicator case with the cover on— . . . it can be done.

The signals should be fed to the scope using shielded or coax wire. Since there is no amplifications, the signal required will be fairly large . . . somewhere about 100 volts. The unused centertap of the transformer may be used to supply sweep voltages of 60 cycles. If this is too great to allow the signal to be seen it may be reduced by using a potentiometer of about a half megohm across the centertap and ground, and taking the output from the center arm to the input capacitor.

To operate, the centering controls should be turned to a mid-value and the focus and intensity controls set to give a small spot of light. The spot is then finally centered and the scope is ready to go. The total time it took to convert this scope was about three hours and that included the design of the necessary circuits. For specific operating instructions refer to any good handbook.

Chatter

Most of the mail for the last month or two has revolved around the item we converted recently . . . the TBS receiver, and where to buy it. Just for the record, we got our unit at Rex Radio, 88 Cortlandt Street, New York City, N. Y. We stopped in to see them the other day and found that they had none left, but were expecting a few more shortly and could probably take care of the orders that they get— . . . I suggest that you write them first and check and see if they can help you out or you may be a bit disappointed . . . another thing that we found out was that antenna mount that we mentioned for about half a buck (June CQ) will probably run a little higher than that due to additional mailing costs.

Tom, K2VBI, our foreign publications editor informs me that there is a surplus British job that covers 80 through 6 meters transmitting with a 50 watt power output. It should sell for about twenty-five pounds plus shipping in the States . . . follow his column for more details.

People are really digging into surplus of old and odd types. Just a look at the handbook requests will show this to be true—. . . we don't think that the bottom has anywhere been reached in this field. The new stuff that is coming out is really good. I saw a Navy RAL last night and did some copying of CW. (I still don't like it) but it really turned out to be much more sensitive than I had thought. I remember using some of these when I was stationed at NSS during the war and they are still as good as ever. They are really a TRF with regenerative detector and a series of audio filters to tune out interference. I didn't do so good with the SSB sigs, but otherwise it is a good buy for the novice as well as others. The selling price is as low as 20 bucks plus power supply

on the West Coast (Arrow) and well worth thirty with the power supply. The RAL only goes to 23 megacycles, but it is continuous from 300 Kc, so you have the ship and broadcast frequencies as well.

Another thing that Arrow has is a rotary converter from 6 volts to 12 volts and at a couple of amps too. Should be good for the use of equipment for mobile from one car to another. They claim that it can be used from 12 to 24 as well, or even in reverse. For about 18 dollars too.

Roaming about the city we came across Telemarine. They just relocated and are a lot easier to get to. They seemed very co-operative and since the owner is an old timer as far as ham radio goes, he usually knows what you can do with most of the gear he has.

In retrospect, we have had a lot of mail regarding the CRC-7 and much of it was because of the little bit of info that is available on it. As a word to be added, to already accumulated knowledge, don't forget to tune the receiver as well as the transmitter when setting the equipment up. It seems that a lot of readers expected to merely plug in a crystal and get the thing right on frequency. It is simple, but by and large it is not that simple. The transmitter and the receiver require tuning and all transmitter controls are available from the top of the can, while the receiver is tuned from the side, by adjusting a slug. In either case, make sure that the antenna is on. Failure to use the antenna will result in loss of signal due to the mismatch and detuning when the antenna is connected. Batteries should be at least 90 volts. The unit we had was retested at 67 volts and the sensitivity was good, but the transmitter dropped off. Range is good, but still almost line of sight and again make sure that the full case is used, since the bottom part, holding the batteries will serve as a part of the antenna.

With regards to the TBS, we found (and hereby apologize) that a ground was omitted. It should be on the left cathode of the oscillator-mixer. The reason that the actual coil dimensions were not given, was that they have to be tailored to the tuning condenser that you use with the aid of a grid dipper. Actually they seem to be about 5 turns, tinned number ten wire about one inch diameter spaced to get to the proper frequency with the tuning capacitor across it. I hope that answers the many questions regarding this coil . . . we won't let it happen again.

This month we have quite a few requests for handbooks and data. We act only as an advertiser, with all swapping done between interested persons . . . not via CQ. But . . . if you need any particular handbook, conversion data or schematic don't hesitate to write a line and let us know . . . just a postcard will do and the request will be in the earliest possible issue of CQ. It takes about six weeks from the time the column is made up till the magazine is sent out, so please bear with us.

Ray Lawrence of 33 Frewer Avenue, Fairwater, Cardiff, Glamorgan, S. Wales is looking for all of the BC-312N information he can find. There should be a lot of it in the British Isles, so many of these sets having been left after the end of the war . . . Bob Farmer, 3113 N. Columbia St., Plainview, Texas needs some APN-1 conversion data and handbooks—especially for 420Mc.

K2SHM needs some data on the Navy RAL-7. This was one of the standard shipboard receivers, and is selling on the west coast for about twenty bucks. W7VJM needs some coil data on the BC-721 made by Galvin . . . although he writes that any conversion info will be helpful.

W9PAQ picked up a set of RAX receivers and an R-189(XA)/ARR-8. That last job, he claims, has a built in panadapter and covers from 70 to 300Mc. Without an instruction book on either he is lost, but that XA number means experimental and its book may be hard to come by . . . so let us both know about this one. Likewise, anybody knowing the whereabouts of an ID-60/APA-10 and a GP-7 manual, let George D'Antonio of 42 Mohegan Ave, Port Washington, N. Y. know.

We are currently working on a BC-659 so we can't forward our copy of the handbook (it's borrowed anyway) to W3IAF, but maybe some one else can. This conversion is much like the BC-1335, but a little easier due to the additional space. W9ALU asked about converting the Loran indicator ID-6B/APN-4 to a standard scope—any ideas???

Bill Woehr, W9WOP, is looking for the TBS handbook and apparently wants to go a lot further on the conversion than we did. K2MGD came up with a cute transmitter-receiver probably designed for the OSS or some other cloak and dagger outfit. The power supply is an RP-6, the receiver is the RA-6 and the transmitter is the RT-6. Sounds like a good rig with 25 watts in your pocket—almost. There probably aren't too many of these around, but any help would be appreciated.

The BC-733D isn't too plentiful, but W9CSZ has one that he wants to put on the air for satellite monitoring, and he wants to contact anyone who has done this or who may have a handbook. K5HWY wants MD-23/ARA-3 manuals, while W1LWV needs the AM-1/ASQ-1 book and data. M/Sgt Willard Smith at the Syracuse Air Force Station, Syracuse, N. Y. has an RT-77/GRC-9 and needs handbook help. This is a fine rig and very compact—although very few have appeared on the market as of now. Metro in NY had one for a while but at about ninety bucks, but almost worth it. K5CEJ is looking for the BC-620 manual while KN5JTP needs the RT-45/ARQ-1 transceiver conversion from anyone who has worked it out.

73, Ken, W2HDM

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

overseas echoes

To begin with—an apology is due. As a result of certain personal preoccupations and moving to a new QTH a lot of mail has piled up and quite a few letters to this writer are unanswered at this time. From now on all mail will, however, be handled promptly and there is no more delay to be expected. To make your sentence a little lighter I hasten to add that this slight confusion is somewhat connected with amateur radio—the wedding of Suzy, W2SLA, CQ's assistant editor, to the writer of this column.

An apology is also due to G2PU who accidentally was referred to in the June issue of this column as the "late G2PU." Nothing could be further from the truth, as G2PU is enjoying the best of health and is the director of Labgear, Ltd., Cambridge, Great Britain. He heads an antenna research team.

The *Short Wave Magazine*, June 1958, G, carries an article by G3AST describing principles and operation of a controlled carrier modulation unit. The circuit described is stated to have good quality and results far superior to clamp tube modulation are claimed.

The same issue also gives design notes on a 160 meter, or—as they call it over there—'top band' vertical antenna. It is interesting to note that the physical height has been compressed to approximately one eighth of a wavelength, giving a total height of 72 feet. While recent cuts and restriction in this country just about kill this band, we hope that this article may still be of some use to some lucky ham who is in a position to make use of this band.

Somebody scooped us—the above issue also carries a very nice picture of JT1AA and his xyl JT1YL, taken in Ulan-Bator, Mongolia. They are seated in their shack and several of the QSL cards on the wall are from this country.

Amateur Radio, May 1958, VK, states that according to the BBC Jules Madey, of Clark, N. J. (call sign is not given) was instrumental in arranging a phone patch between Dr. Vivian Fuchs on the Antarctica (before he left there) and the BBC in London. Antarctic radio conditions being notoriously miserable, no direct contact could be established. Jules got Dr. Fuchs, and simultaneously placed a transatlantic landline call to a BC reporter in London. The phone patch was connected, and there it was—phone patch from the Antarctica to London, via New Jersey. The conversation was recorded and later broadcast by the BBC over their Home & Overseas News Programme. Another 'impossible' taken care of by amateur radio.

The same magazine has been carrying an interesting series of articles on amateur television by VK6EC/T. The May article is the third one in a series and covers a camera control unit. Diagrams are given as well as construction and adjustment notes. Among active television hams in VK the following are mentioned: VK3ABK, 3AUX, 3AAK, 3BU.

Das DL—QTC, April 1958, DL, also carries an article about amateur television, describing the state of the art in Great Britain. The British Amateur Television Club, founded in 1949, is a subsidiary of the R.S.G.B. and publishes a quarterly, the *CQ—TV*. We learn that they are not only carrying out tests in black and white, but also in color. Amateur television information being quite scarce, G3CVO compiled a book, "An Introduction to Amateur Television Transmission." The British Amateur Television Club also makes films about related fields available to its members, at no charge. The article also shows two pictures of a rather elaborate station setup, belonging to G2WJT.

The above magazine also carries an article covering the design for a 70 mc transmitter. While we do not have a band on this frequency, the articles appearing about 70 me equipment in foreign magazines may still be of interest to many hams. Our line of reasoning is this: What will work on 70 mc can definitely be made to work on 50-54 mc. Looking at it this way these articles gain interest. This writer will be glad to mention articles about 70 mc equipment if the readers feel this is warranted. So please let me know how you feel about it, as there is a lot of activity on the higher bands in Europe and articles appear rather regularly. As a matter of fact—let me know just what types of articles you would like to see covered and if anything in more detail, and this writer will try to do what is possible.

73, Tom, K2VBI

ham clinic

by **CHARLES J. SCHAUERS, W6QLV**

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

The choice of a communications receiver can sometimes be very difficult as attested to by the many letters we receive on this subject. Although one might think that price would normally be the major obstacle, it surprisingly is not, because it is usually given less consideration than many other factors. This perhaps may be due in part to the easy availability of ham gear via the easy-payment route. Of course, price *is* important but if there is quality it does not mean much to the real avid amateur. Proof of this statement is reflected in the thousands of sales of receivers costing over $300.00 manufactured by such fine companies as Collins, Hallicrafters, National, Hammarlund, etc.

So what does the average amateur look for in a receiver?

Well, *all* hams want maximum selectivity and sensitivity. Most want S meters and bandspread tuning as well as rf and af gain controls. Filters —mechanical, crystal and af types are usually wanted by hams who have had the opportunity to own at least two receivers without these devices. The addition of filters to a receiver will help selectivity and partially make up for the lack of multiple tuned circuits.

What seems to worry the average ham most however, is frequency stability. Remember the days when we used regenerative and trf receivers and tuned our sets by "guess and by-gosh"? Today's ham is different—he wants to know *exactly* what frequency he has tuned in. Frequency meters are nice and used by many hams for determining where they are in the spectrum; but why bother with them if one can obtain a receiver with good stability and whose dial can easily be calibrated by the twist of one "little knob." (To me, this "little knob" is important!)

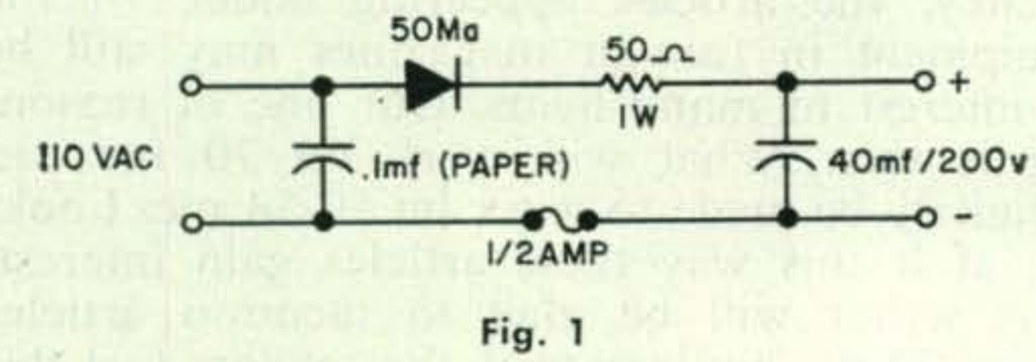


Fig. 1

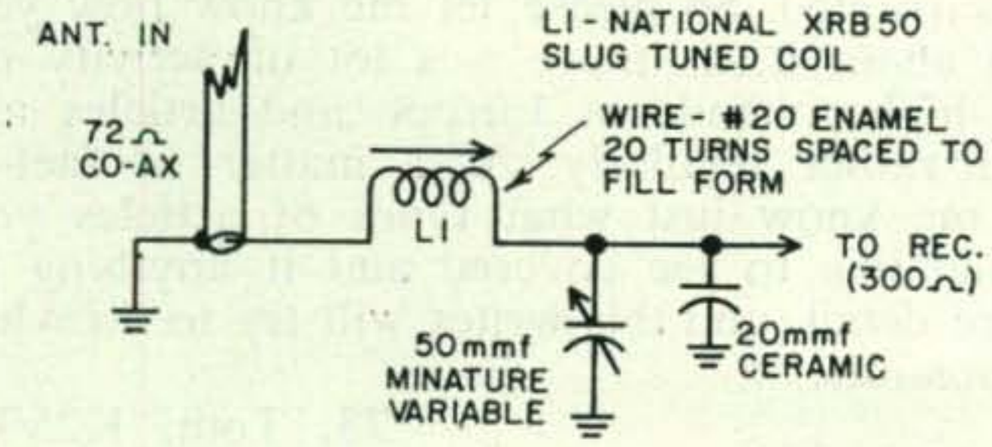


Fig. 2

Those who work with SSB lean toward product detectors and effective filters; frequency stability is a *must* with them. On the other hand, the guy who pushes a bug on CW caters to the single-signal concept and often resorts to af filters to bring his signals out of the "soup."

When we are asked what we think of a particular receiver we *try* to report frankly; taking into consideration not only important technical features but the desires of the inquirer as well. One thing for sure, not everyone is easily pleased! What satisfies one will not satisfy all.

Because of the gigantic strides in receiver design made during the past few years, hams are becoming more particular and are not satisfied as easily as they once were. A receiver in order to command attention cannot get by solely on the brightness of its chrome "appointments." To be widely accepted it must embody the latest technical developments in circuitry and surpass minimum operational requirements.

A receiver, like an automobile does require periodic service and adjustment. However, there are some who will argue that the less one does with a piece of electronic gear, the better. We agree in part but hasten to add that electronic gear ages too and *does* need periodic care. (We are looking forward to the day when ham equipment manufacturers will have mobile maintenance facilities which will visit various areas of the country and provide check-ups, adjustments etc. for a modest fee).

In addition to the letters requesting information on which receiver one should buy for a given amount of money, we also receive many letters requesting information on how to improve the sensitivity and selectivity of old receivers. The stock answer which we usually give and which we believe to be of general interest to print here is as follows: "the receiver you have contains only one (or no) rf stage. Its selectivity when properly aligned is about 5KCS (more or less) and its sensitivity is in the neighborhood of 3 to 5 micovolts per meter (uv/m) (more or less). The average good

communications receiver has a sensitivity of approximately 1.5 uv/m, or more; has selectivity of 4KCS and less (with filters); contains at least one and often two rf stages; multiple tuned IF; double conversion for better image suppression; crystal controlled oscillators; AVC, AFC etc.

"Outside of a pre-selector mounted outboard on your receiver there is little you can do. In the first place, most of your receiver's chassis space is occupied by essential parts leaving little room for additional stages. The addition of a Q multiplier *may* help your tuning problems but does not cure the basic cause of poor selectivity and/or sensitivity—lack of high Q rf and IF stages. A "floating" or outboard IF stage may help if you are really determined to do something about your receiver's operation.

"You can in some instances utilize new low noise-high gain tubes without too many major circuit changes; but again, is the effort worth it? We are inclined to think not. Changing carefully engineered circuits is not an easy task unless one has a lot of patience, proper test and alignment equipment and above *all*—know-how!

"If you buy a used receiver, make certain that the set is aligned, tubes checked and that tuning mechanisms are in good order. See that all pots are noiseless and that switches make positive contact. A set which has been abused will usually show it."

Observation

The average ham is a pretty versatile person. As soon as the electronic industry comes up with something for a commercial application, he will usually grab and adapt it to his own use. A case in point are the new 12.6 volt series tubes which were designed and manufactured for car radio receivers which also use transistors.

These tubes require no additional plate supply voltage from a separate source because they operate with the *low* voltage supplied from the battery of the car which also supplies filament power.

A number of letters asking for receiver-converter circuits using these tubes have been received. Evidently, many mobileers can see the advantage in doing away with a separate B power supply. However, the changeover is not as simple as it may seem. First of all, more capacitive-resistor filtering is needed—because of the *common* plate-filament supply. Unless you have a car generator that is absolutely noiseless you may have a little trouble at the higher frequencies.

Although voltage variation is no large problem, ballast tubes may be needed for extra frequency stability when working in the VHF regions. However, by careful circuit design it is possible to come up with good frequency stability and gain at the higher frequencies.

We intend to try *Tung-Sol's* new 12EZ6 (sharp cut-off pentode) and 12FA6 (pentagrid converter) in some typical ham circuits and we'll let you know how we make out. These tubes replace 3 other types and have up to 50% more gain. Those of you who have tried these tubes for ham applications and have come up with some useable circuits are invited to send us your design for publication in the column.

Questions

More construction articles in *CQ* (bless our Editor!) will necessitate cutting HAM CLINIC wordage to a minimum; we therefore will omit any reference to inquirers, location etc. to save space.

D.C.

"I need about 118 volts DC at 25 mils; what is the easiest way to get it without a transformer?"

See Figure 1. A selenium rectifier in a half-wave circuit will do the trick.

DX100 Modification

"I sometimes get reports that my signal chirps on CW. I understand *Heath* has some circuit change information to modify the DX100. Is this true?"

Yes! W. J. Remer (K8GND) of *Heath* sent me clear modification information which is available to all DX100 owners *from* the Heath Co. for a self-addressed stamped envelope. Ask for the "Improved Keying for the DX100" bulletin. The change is easy to make and *does* help.

Bonding

"What is considered to be an adequate electrical bond in terms of resistance?"

Not more than .001 ohm.

SSB Tuning

"With an *ordinary* radio receiver containing a BFO how do you recommend tuning in a SSB signal?"

Crank up your set's af gain control all the way; reduce your rf gain (if you have one) to a listenable level; switch on the BFO and tune slowly into the signal. Adjust the rf gain control and the BFO pitch control to bring out the signal clearly. If the signal does not clear up, reduce rf gain and retune the set. Always use minimum rf gain and "rock" your BFO control. If you do not have an rf gain control, it is easy to install a pot—usually about 10K in series with an rf tube cathode to ground.)

Lines

"What type of line (balance or unbalanced)

[*Continued on page 107*]

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	29-30	CQ WW DX CW

LABRE

The PY boys start the DX contest season with their annual party the first two week-ends in September. Activities start 0001 GMT Saturday and terminate at 2400 GMT Sunday.

This is a world wide contest and not confined to the Americas only. Therefore it would be wise to check the rules and method of scoring as explained in last month's issue.

Mail your logs to: LABRE Contest Commission, Caixa Postal 2353, Rio de Janeiro, Brazil.

CQ WAS SSB

The SSB boys are having so much success with their contests that W3SW and W2SKE got together and dreamed up a new one. This one will be a local affair altho foreign stations can participate and try for WAS on SSB in a 24 hour period. The rules are quite simple and Bob Adams has covered them thoroughly in his column this month.

This contest covers a 24 hour period starting at 1200 EST Saturday, September 20th to 1200 EST Sunday September 21st.

Your logs must reach CQ Headquarters not later than October 20, 1958. Be sure to mark your envelope "SSB Contest."

MARC VE/W

No details on this one as yet but we know the dates are correct. The object of the contest, if it follows the usual pattern, is to see how many Canadians can be worked by the boys on this side of the border and visa versa. We hope to have the details on scoring and etc. next month.

VK/ZL

This year the contest is sponsored by the NZART and therefore the rules follow the pattern used in 1956 when it was also under the supervision of the same organization.

The contest extends for a 24 hour period, starting at 1000 GMT Saturday and ending at 1000 GMT Sunday.

Logs must show in this order: Date, time in GMT, station worked, serial numbers sent and

[*Continued on page 116*]

1957 VK/ZL DX Contest Winners

CW

Australia

VK2GW	3920
VK3DQ	3125
VK4NL	1350
VK5KU	1920
VK6RU	4375
VK7UW	2780
VK9XK	4045

New Zealand

ZL1AH	4870
ZL2GS	3570
ZL4GA	4085

No. America

W1BIH	1475
W2EQS	1470
W3VKD	2010
W4LZF	1360
W5VHR	2295
W6TT	2680
W7PQE	2245
W8BHW	2595
W9KXK	640
WØRSL	1850
KL7BPK	515
VE3HB	480
XE1PJ	460

So. America

CE3AG	1200
LU7AS	620
PJ2AE	115
PY1ADA	990
YV5DE	520

Europe

DL1KB	1750
EA3KT	345
EI9F	300
F9DW	285
G5RI	1380
GI3JXS	335
GW3AHN	695
HA5BI	860
HB9MO	800
LA2Q	620
LZ1KRF	170
OE6RP	615
OH4NT	985
OK1NC	940
ON4PA	1210
OZ3FL	1020
PAØTAU	870
SM3AKW	1840
SP3PL	1510
UA3KBA	690
UB5KAB	745

Asia

JA1VX	1910

Africa

CN8FD	280
FA3OA	300
ZS5U	400

Oceania

KH6CMM	230
ZS5AL	855

PHONE

Australia

VK2AOU	1860
VK3HL	825
VK4TH	2325
VK5WP	1410
VK6RU	2790
VK7LZ	1035
VK9BW	305

New Zealand

ZL2ATZ	325

No. America

W2BVN	445
W3VKD	1000
W4KYI	820
K5JLY	500
K6DDO	1100
WØGEK	425
VE7AIH	1530
CO2HB	540

So. America

CX2BH	635

Europe

CT1PQ	310
DL1KB	1595
F9RM	385
G5HZ	675
GW3AHN	405
I1AMU	900
OH2OV	1290
OZ3FL	755
PAØFX	620
SM3BIZ	370
SP8CK	290

Africa

CT3AN	170
VE3AHU/SU	390
ZS5OA	625

Asia

JA1AS	580
VU2RC	230

Novice

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

Example of a Typical QSO

CQ CQ CQ DE KN5GFP KN5GFP KN5GFP
CQ CQ CQ DE KN5GFP KN5GFP KN5GFP
CQ CQ CQ DE KN5GFP KN5GFP KN5GFP K

KN5GFP KN5GFP KN5GFP DE KN4WVQ KN4-WVQ KN4WVQ
KN5GFP KN5GFP KN5GFP DE KN4WVQ KN4-WVQ KN4WVQ AR

KN4WVQ KN4WVQ KN4WVQ DE KN5GFP R TNX FER CL BT UR RST 489X 489X HR IN NEW ORLEANS LA BT NAME IS JOE BT WATSA? AR KN4WVQ DE KN5GFP K

KN5GFP DE KN4WVQ R JOE ES GE BT UR RST 589X MOBILE ALA BT SINE IS JACK BT RIG IS DX 4Ø WID 75 WATTS IN BT ANT 8Ø METER DOUBLET BT RCVR S4Ø BT PSE QSL ADR JACK ROWE BT 382 MAPLE ST BT MOBILE ALA BT SO BK 2U AR KN5GFP DE KN4WVQ K

KN4WVQ DE KN5GFP OK JACK BT RIG HR IS GLOBE SCOUT BT ANT IS LONG WIRE BT RCVR IS HQ 1Ø Ø BT SURE WL QSL BT ADR IS JOE EDWARDS BT 1766 SIXTH ST BT NEW ORLEANS LA BT WX HR CLEAR TEMP 61 WINDY BT SOME QRM BUT UR GETTING THRU OK BT QRS UR ADR AGN BT HW? AR KN4WVQ DE KN5GFP K

KN5GFP DE KN4WVQ R OM BT ADR IS JACK ROWE BT 382 MAPLE ST BT MOBILE ALA BT WX HR CLOUDY TEMP 55 WINDY BT WX CHANGING AFTER RAINY WEEK BT WUD LIKE KNOW FREQ UR XTAL? BT MI XTAL 3722 KC BT WATUSA? AR KN5GFP DE KN4WVQ K

KN4WVQ DE KN5GFP R TNX FER RPT BT MI XTAL 3712 RPT 3712 BT MI DIAL SHOWS UR FREQ 372Ø SO CALIB PRETTI GUD BT UR SIGS FADING A LITTLE BT TNX FER QSO BT QRU NW SO 73 ES HOPE GUL VA KN4WVQ DE KN5GFP K

KN5GFP DE KN4WVQ R JOE BT TNX XTAL INFO JUST CKING CALIB MI RCVR WHICH SHOWS UR FREQ 3715 BT FINE QSO OM GN ES 73 VA KN5GFP DE KN4WVQ

KN4WVQ DE KN5GFP R ES GN VA KN4WVQ DE KN5GFP CL

Many observers think that Novice QSO's are sterotyped, that is, they are all the same, and you know just about what the other station is going to say, even before they say it. As an example, when two Novices hook up, the first information is the handle, then an RST report, and the first transmission is concluded with the QTH and a request for a QSL card. The other Novice replies with an identical transmission. When I am working a Novice station, I only write down the handle, my RST, and his QTH. I have heard the other words so many times that it automatically registers like a CQ call. And so, they *are* stereotyped, but for a very good reason.

The Novice is a beginner, and as such, has no end of difficulty copying code particularly through heavy interference. The type of QSO is easier for the beginner to copy for even if he misses a word or two he can guess what they are. But there is no reason for you Novice "ole

Bill, KN9MNS, sent in a letter and picture after his first week of operation. So far he has contacted 14 states on 40 meters with his DX-35 and NC-98. The antenna is a folded dipole about 50 feet high.

The Knight Transistor Code Practice Oscillator mentioned in the text.

timers" (6 months or more—hi) to continue the stereotype QSO. After you have been on the air for a few months, you should develop a QSO "personality." Subjects such as your weather, projects, school, girl friends will make the QSO so much more interesting. If you contact a beginner, you can revert to the handle-RST-QTH type of QSO for that is what he is expecting. But after this basic information has been exchanged, liven up the QSO with interesting comments. You will be doing the other fellow a service (by making him "practice" code) and you will enjoy the contact more. The stereotyped QSO is fine for the beginner but not for you "ole timers." Remember, the FCC examiner isn't going to send you his handle, your RST and his QTH.

Joe de Celis, P. O. Box 208, Gramercy, La. sent in some basic rules (or suggestions) for Novice QSO's, and a typical QSO based on them. I am reproducing them here, along with a few comments of my own, for your information.

1. Listen before transmitting. Search the band for CQ's before originating one of your own. It's rather silly to have a dozen CQ calls all going on at the same time, don't you think?

2. Keep your call short and use the three-by-three system: your call three times, CQ three times, followed by your call three times. This is plenty long enough, but if band conditions are bad, the three-by-three can be repeated two or three times. Don't answer long CQ's, maybe that will discourage them.

3. The letter K, concluding your transmission (sent after your call letters) is an invitation for the other station to transmit.

4. Tune the entire band, and then some. As an example, many DX stations try to contact 40 meter Novice on frequencies between 7140 and 7150 kc.

5. AR after the call letters indicates the end of a transmission before a contact is made. AR before the call letters indicates the end of the message.

6. R means 100% copy, do not use this symbol unless every group is copied. Who ever heard of saying "RRR OM, but missed your handle"? One contradicts the other.

7. BT is preferred to comma and period except in special cases where preciseness is needed.

8. VA (sometimes written SK) means end of QSO and should be used in place of AR before the call letters. VA is never the last signal sent.

9. When ending a QSO not requiring a reply, and when you intend to continue to work the band, end with your call letters, without K. If you intend to close your station put CL after your call letters.

10. The sending speed should be that of the slowest operator in the QSO. Send each character as a recognizable whole, adjusting the speed by the spacing between characters and groups.

11. Be considerate. Don't hurry the QSO. Help and encourage whenever you can. Above all, don't try to "snow" the other fellow with your c.w. prowess. Except in special cases, a bug is entirely out of place in the Novice ham shack.

Although it should really be in the transistor column, I knew you would be interested in the Knight Transistor Code Practice Oscillator. It

is a very simple kit, and an interesting project if you would like to learn more about transistors and associated circuitry. The code practice oscillator needs only a key and headphone to operate. It is completely portable because it obtains its operating power from a self contained battery. The use of a transistor assures extremely long battery life. This unit will operate for approximately 30 weeks *continuously* on a single cell. The oscillator generates a very pleasing tone, about 400-600 cycles depending on the type of headphones used. The transistor is very inexpensive (99 cents) should replacement ever be required. The CK-722 used in this unit is very durable and will probably last longer than you will. The code practice oscillator is contained in a black plastic case measuring 4 X 2⅞ X 1⅝ inches and has an attractive screened and anodized aluminum front panel. The kit, including all parts, battery, wire, and solder, sells for $3.95. The key and phones are extra, of course.

Who's DX?

Just received a card from Wolfgang Hummel, Neuhassen/Filder, Eblinger Str. 18, Stuttgart, Germany. Wolfgang's call is DJ3VW and he advises the Novices: "I will give you the opportunity to work a DJ station on 21 mc c.w. I will standby for all Novices from stateside and will QSL 100%. I am QRV (operating) from Monday thru Friday at 20 hours GMT. Very best DX, gud luck es 73, Wolf" there's your chance to work a new country, go to it fellows.

Our old friend Bud Lafferty, (KG1CK) up in Thule, Greenland sends us his monthly list of stations heard at his QTH. Bud also requests that the fellows not write for schedules. Band conditions, foreign station QRM, plus Bud's duties make it very difficult to meet schedules. Best time to hear him is between 2100 and 2400 E. S. T. so give a listen, with the signal he puts in, you won't have any trouble making connections. May 8, 1958 21.115- 21.160 mc., 2100- 2330 E. S. T. KN4PWY, UAC, KN6CMF, KN7AUE, BFI, CNT, KN9LJW, KNØLCR, PCJ, PGM. May 12, 7150- 7200, 2100- 2130 E. S. T.: KN2LYK, PZF, RGY, WN2PEC, KN3DVU, KN4PMY, QYA, KN5OLE KN8GGT, HBH, IAD, IOJ, JJX, JMC, JUH, JVH, KN9JTZ, IQP, KNØ-PFX. Novice stations contacted by KG1CK, 21.12- 21.15 mc between April 15 and May 12: KN1CNZ, DXA, EJB, KN2DLY, OHC, WN2PUC, KN3AKV, ALS, BTS, KN4RID, SFO, SSM, KN5KKN, KN8GTB, HFB, IFL, KNØJPJ, LKP. May 15, 2330- 2400 E.S.T. 7150- 7200: KN2EJU, WN2PUC, KN3CEM, DEH, DKP, KN4TRV, KN5MIK, PGC, KN6HVF, KN8GHV, JJE, JJX, JPB, JXV, KN9KBQ, KZB, LGL, LNR, MOY, KNØ-MUX, PDE, May 17, 0200 E.S.T. 7150- 7200 the following QSO's were heard: KH6AHZ and KN7DEO, KN7CHG and WN6TFW, KNØ-OWA and KN8JIW, and KNØPDS and KN5PVT. May 18, 0200 EST, 7150- 7200: KN2CFE, KN4TSB, KN8HAU, KN9JHG, LGL, KNØMMF, MZX, PDL, PHS, PMB. May 18, 1345 EST, 21.1- 21.15 mc: KN1CNZ, GHM, KN3CWB, KN8KBH, KN9KQO, KN-ØOER, LNL, MZF. Bud continues his letter with some interesting information. He says "KNØLNL has had the strongest signal I have heard on 15, a conservative 599 (whatcha running, OM?). KN4RID has the best operating technique and is a pleasure to work. I wouldn't be a bit surprised if he is the first to get Novice DXCC (He did!). The most often heard stations are KN4SFO, KN4SSM, KN4RID, and KN8-HFB. They are very active, apparently. The East Coast comes in here the best in the late afternoon and the West Coast about 2100-2400 EST on 15 meters. It is next to impossible to work a KN6. To me, they are rarer than an FB8!"

Bud also passes along some tips for the Novices. He continues "Some of the Novice stations are DX to us and unless their cards are accurate, including the N, they are useless for confirmation. Several CQ calls are much more effective than a four minute call. It is not necessary to give the address over the air. It takes up too much operating time and it is much too expensive for a DX station to QSL direct. They will arrive through the bureau. Also, when Novice stations call CQ-DX some stations take them at their word. I have heard some fine DX, even by General Class standards, passed up by a Novice in preference to an S9 signal a few states away. G3 stations are very strong here. 21.12 and 21.15 mc are real rough here, and the Novices seem to pick the spots with the most activity. Best regards from Greenland, Bud, KG1CK." Many thanks for your fine report and interesting letter. We'll see you next month.

Net News

Howard Nichols, KN2LBK, East Mountain Road, South, Cold Spring, N. Y. would like to know if there are any nets in his area. If not, he would like to start a net, particularly for Naval Reservists.

Help Wanted

The following persons or clubs can be counted on to help prospective Novices in their area:

The Sharon Amateur Radio Association of Sharon, Mass. is conducting code and theory classes. The theory classes are bi-weekly and are under the supervision of K1CNX, Bernie Rosenberg. The code classes are weekly and bi-weekly and are under the direction of Phil Carter, W1CRA. Anyone seriously interested

[*Continued on page 101*]

YL

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

Last Call!

Soon after you will be reading this, the 10th National Amateur Radio Convention will get under way at the Sheraton-Park Hotel in Washington, D. C. Dates are August 15, 16, 17, and it promises to be a big occasion for OM, YL and XYL alike.

Headquarters for the ladies will be the Caribar Room, where there will be continuous tea and coffee service. The nursery will be open from 9 a.m. to 10 p.m. There will be many tours to interesting spots in and around Washington. On Saturday there will be a ladies luncheon with fashion show, prizes and SWOOP initiation, and a YLRL session in the afternoon. On Sunday the highlight will be a boat trip to Mount Vernon.

K6ENK, Wanda Gluck, editor of YL Harmonics for the remainder of 1958.

Members of GAYLARK—Gulf Area Young Ladies Radio Klub—pictured early in '58. L. to r., seated: K5MIZ, sec-treas; K5BJU, president; W5ERH, historian; W5CXM. Standing: K5ALF, KN5POD, KØMET, K5LIU, W5EGD, vice president; K5PFF. For other members, see text. Note the "Gaylark" on table in foreground.

One special feature of the convention will be stations set up at every department of the convention so that one can call for people wherever they may be—even if they are off on a tour, for there will be two mobile units with each tour. Ladies program chairman, W3CN, Tex, also has set up a Hobby Show for exhibits of handicraft—weaving, sewing, painting, ceramics, etc. Bring your prize exhibits and meet other gals with similar interests.

And, in case you haven't already heard about it, top prize for the ladies will be a mink scarf!

YLRL

W7NJS, Beth, president of YLRL, has appointed K6ENK, Wanda Gluck, to be editor of *YL Harmonics* for the remainder of the year. Wanda, who is president of the Camellia Capital Chirps, will do the editing and printing, with help from other members of the 3C's in assembling and addressing the magazines.

Latest count of YLRL membership totals *nearly 800 YLs!* The membership campaign

The Oregon State Convention held at Salem on May 3-4, 1958 drew a registration of between seven and eight hundred, over 50 of whom were licensed YLs. 30 of the 41 attending the licensed YLs luncheon gathered for this photo. L. to r., front row: W7's DHK, WFO, KN7BII, W7's HGS, SPA, SBS, WTK, DIF, CPV, K6OBL, W7QXH. Center row: W7's GWG, FVF, NJS, HHH, ex-W9BEY, W7's VLG, RIC, IGY, HPT, EIU. Back row: W7's HNH, RAX, KN7BED, W7's FKG, DAT, DIC, GLK, N7CBF, W7GNC. Other YLs attending: K7's AJB, BCZ; KN7's AZC, BFD, BHU, DFO, DPA; W7's CCF, CSQ, DVH, ENU, FKS, FWT, ITZ, NOK, NTT, QGF, RVM, SJW, SYF, YUZ, ZLS: K6's MHU, QJQ, UVD. Photo courtesy W7NJS.

instigated by YLRL president W7NJS is bearing fruit. But even 800 is not a large proportion of the total number of licensed YLs—YLRL still wants and needs new members. Membership entitles one to issues of the bi-monthly magazine *YL Harmonics*, to use the YLRL stationary, QSLs and pins. YLRL also sponsors nets and contests and, though any YL is invited to join these, still YLRL needs the support of all the YLs to carry on these projects.

Eastern membership chairman is W8OTK, Alice Geib, RFD 1, Van Buren, Ohio. Western membership chairman is K6BUS, Madge Rommell, 8508 Trask Ave., Playa del Rey, Calif. These girls have lists of non-member YLs. YLs or clubs are requested to write the M/C nearest them requesting a list of names and descriptive literature to be sent to prospective members. At the end of the year there will be prizes for the three bringing in the most new members.

GAYLARK Certificate

The GAYLARKs have a new V. P.—W5EGD, Lillian. This newest of the YL clubs is an enthusiastic group. They plan an all-YL operator Field Day set-up running six rigs covering all bands using cw, am and ssb.

The GAYLARKs also have drawn up these rules for earning their club certificate:

1. The GAYLARK certificate is available to anyone who sends log sheet data (no QSLs) on QSOs with six (6) members of GAYLARK.
2. Send above data with 10¢ to certificate custodian, W5CXM, Phyllis Riblet, 8902 Ilona Lane, Houston 25, Tex.
3. Contacts with any of the members since date of organization of Klub, Jan. 28, 1958, are valid.
4. Current membership: K5's BJU, MIZ, PFF, CZZ, ALF, LIU, HTO: W5's EGD, ERH, MBB, EUG, CXM, DRA; KØMET, KN5POD, Rhea Hurrle and Zola Parker (awaiting Novice calls).

Elected at their April meeting and to be installed in June are these new officers of the Chicago YLRL, Inc.—president, K9JVL, Lillian; V. P., K9CMZ, Charlene; sec-treas, K9GUB, Peggy.

"CQ YL"

Do you have your copy yet? We'll bet you are hearing about "CQ YL" over the air! The first and only book recording the part YLs have played in Ham radio, it contains 18 chapters, 165 pages, 500 photographs—covering every phase of YL Ham radio from 1913 to 1958.

In the nine pages of Chapter 14, "DX, VHF, Field Day," for instance, is recorded the major participation by YLs in these facets of amateur radio. All of the YLs who hold DXCC and WAZ are listed, together with pictures and write-ups on most of them. The VHF section likewise includes those YLs active in this work, while Field Day features the YL clubs that have made an all-YL operator F. D. entry.

Copies will be mailed immediately. Order yours from this column editor, Louisa Sando, W5RZJ, 212 Sombrio Dr., Santa Fe, N. Mex.—$3.50, postpaid. Please indicate if you wish to have it autographed.

33—W5RZJ

sideband sideband sideband

SIDEBAND

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

Harry ZS2HX, Syd, ZL31A and Mick, ZLPJ.

EVA, CN8MM HAS DONE IT AGAIN!

For the second time in a row Eva is the winner of CQ's World-Wide SSB DX Contest. Using three Telrex beams on 10, 15 and 20 meters, with a 32V3 running 150 watts CN8MM totaled 243,110 points. 547 contacts with 95 countries, in a total of 56 zones were made in the twenty-four hour period of the Contest. Congratulations!

Peter, HB91E ran a very close second, with Charlie, F7AF third. The official standing with the first twenty-five stations follows:

CN8MM	243,110	VK3AEE	49,335
HB9IE	202,752	VK6RU	48,806
F7AF	181,480	DL4WX	46,536
OD5BZ	171,974	W4TO	46,050
TI2HP	128,949	KZ5WZ	45,320
ZS6KD	108,100	W6ONP	44,640
ON4DM	100,674	SM6SA	44,978
TG9AD	63,956	W4JUR	43,344
W9EWC	59,249	W1HKK	39,621
W3SW	58,456	VE3MR	36,894
KG4AQ	52,002	KL7PIV	31,291
PY4TK	50,520	ZL3PJ	30,690
	YV5ABD	24,888	

Another "W3SW Award," a silver cup has been sent to CN8MM, and certificates are being forwarded to the others.

"Worked 100 Countries" awards were mailed this month to Reg, W6ITH who sent in 127 cards to be checked, Bob, W8QNF, and to Cliff, W8GCN, Humberto, TI2HP, Ted, W6UOU forwarded 11 more cards to be recorded making a total of 119 countries con-

VE7US.

firmed. Wish he would give us his secret method of obtaining QSLs.

Bob, W4RQR with his flying associates operated from VP5BH on May 31 and just beat the deadline as Cayman after June 1, 1958 counts with Jamaica. That is Bob's last trip for some time as he has been transferred to the Washington area. His new QTH will be: Lt. Col. R. H. Mitchell, USMC, 5804 Accomac Street, Springfield, Va. for those still needing cards.

Helen, KØBFS very kindly forwarded the photo shown of Harry, ZS2HX. Helen has worked over fifty countries on SSB, but most of her operating time is spent working her OM who is stationed in Thule, Greenland.

From WILF, VE7US we learn that the following VE7 stations are active on SSB in British Columbia, mostly on 75: AKN, ACF, ALW, FX, MT, AM, QJ, BK, US, DH, AMJ, EL and BG. WILF has worked over 500 other stations, all on 75 meters. He will soon be mobile on SSB.

Edgar, W1BDF who gave VP4TE a SSB exciter, watched Jim, W5ZO operate 15 from the S.S. United States using a KWM-1 while on a trip to England the last week of May.

Cliff, W8GCN is handling all QSL's for ZS3E and ZS6AJ/ZS8. To obtain your card send Cliff a stamped-self addressed envelope with the card enclosed for the above stations.

HL9KR, in Pusan, Korea is a club station and is active on twenty meters with a KWS-1. They transmit only on 14130, which is the frequency assigned to them by the government, and listen on or around 14,265 for SSB calls. Best operating times are from 1100 to 1200 GMT for contacts on the East Coast. W6IAL is handling QSL's for HL9KR.

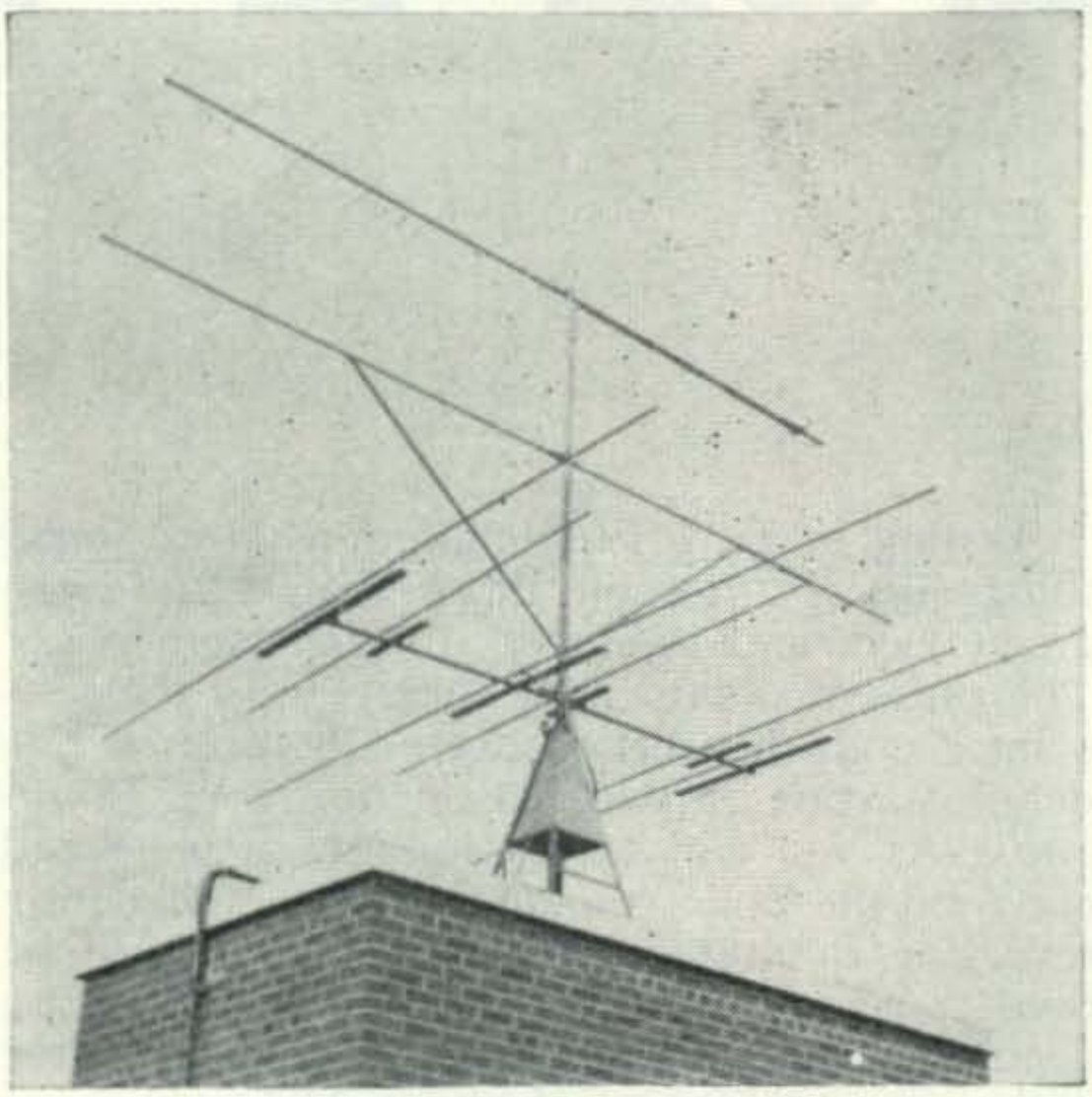
Due to the poor response from those wanting EA2CA and EA2CQ QSL cards, I have sent the balance of over 900 cards to the various QSL Bureaus.

Joe, W4IMP advises that QSL's for HC2AGI should be sent to 1317 North Sixth Street, Nevada, Iowa.

Danny Weil, VP2VG is sailing his new YASME II, to the Virgin Islands and is expected to arrive around June 10th. He will

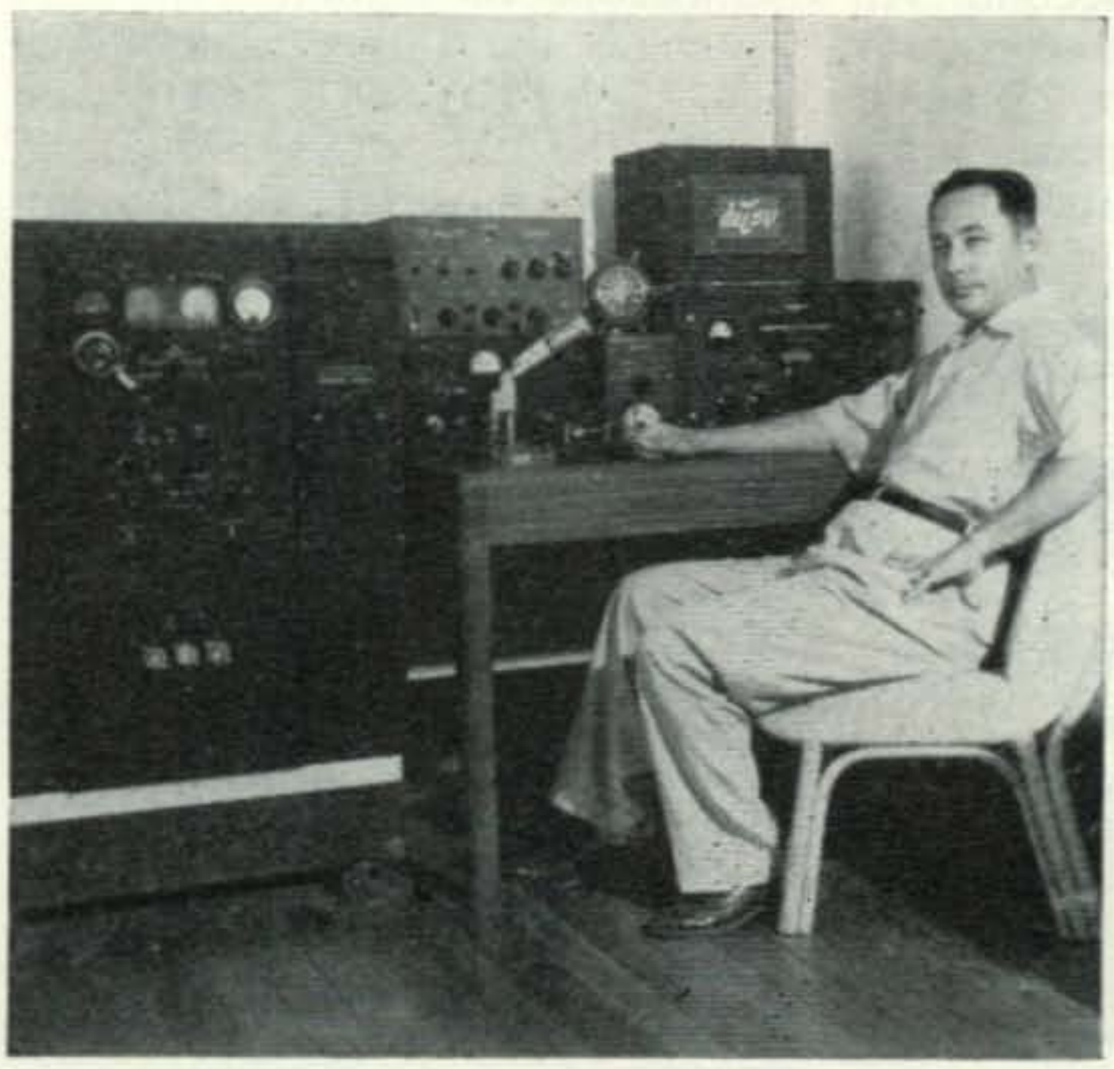
Continued on page 104

Martin, VE3MR, Antennas



Volt, DU7SV

Jose, PY2BS1

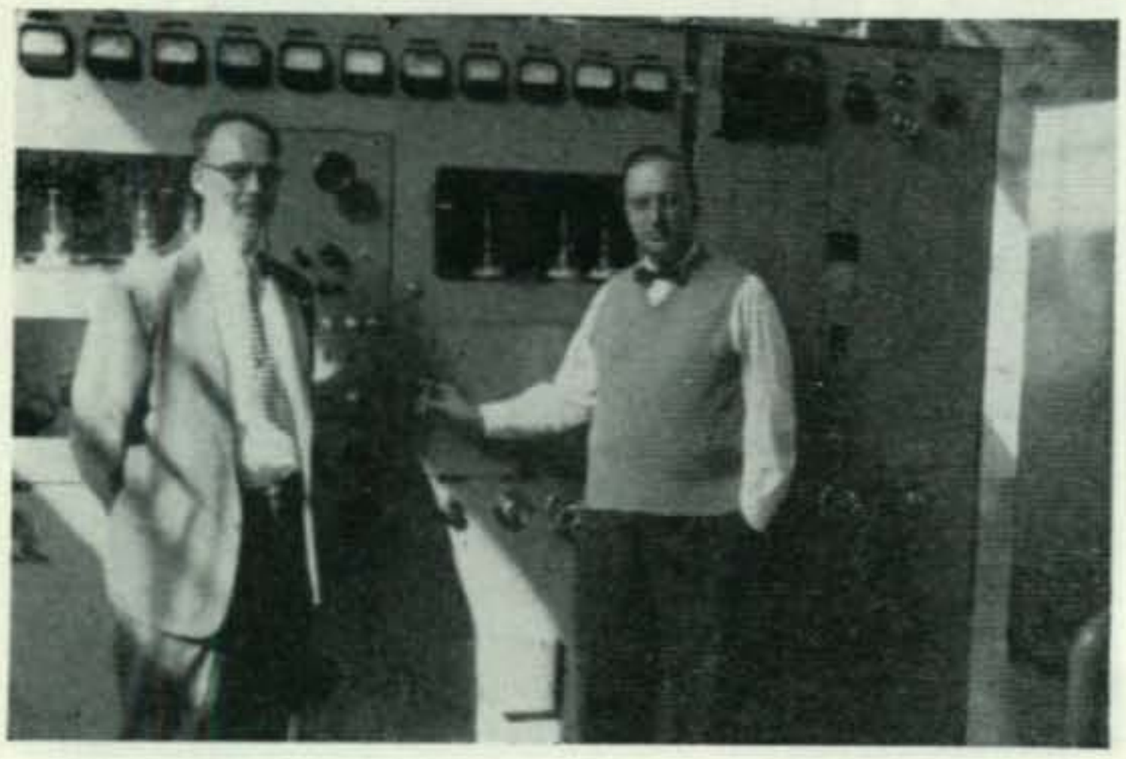


by BYRON H. KRETZMAN, W2JTP
16 Ridge Drive, High Hills, Huntington Station, N. Y.

RTTY

Testing in an RTTY station requires something just a little bit more than hitting the green keys and seeing if it prints someplace. The pulse make-up of a character in the teleprinter code has been covered before; in fine detail, starting on page 14 of the *RTTY Handbook*. As you can see by looking at a printed copy of the code, no character is sufficiently reversing in pulse character to be able to be used as a really good test signal. We therefore need a square-wave signal or a "dot" generator with a repetition rate of about 22.5 cycles per second. An oscilloscope or a meter-type bias distortion set, such as the I-97A as modified by W6CQK (pg 6, *RTTY*, Dec. '57), then permits us to follow the test pulses through an afsk or fsk oscillator, a converter, and through the local loop right to the selector magnets of our printers.

W2JTP Visits Typical California RTTY Kilowatt.



Prolific Phil, W2JAV, has come up with another "little" gadget to answer our testing needs, this time a transistorized Zero Bias or Distortion Generator. This very useful piece of test equipment is not just a "dot" generator with equal *mark* and *space*, but up to 50% marking or spacing bias, continuously variable, can be inserted at will. Unfortunately we don't have a picture, but *Fig. 1*, the schematic diagram, will give you some idea of how little there is to the device.

The unit consists of a 22.5 cps transistorized phase shift oscillator utilizing a 2N109. Another 2N109 is used as an amplifier to drive the 2N270 d-c amplifier which operates the *Western Electric* 255A polar relay. Both contacts are available, through a switch, for a balance check or reversed keying needs. Power is supplied by a self-contained 14-volt dry battery. All the capacitors used are of the miniature tantalytic-type. A FREQ. ADJ. pot is used to set the unit to 22.5 cps, and a BIAS ADJ. pot can be calibrated in terms of % bias, if a W6CQK bias meter is available.

If a 'scope is connected across the contacts and ground while keying the bias meter, the wave form and contact bounce or chatter is readily observed, thus a polar relay can be adjusted in the unit for zero bias and contact condition can be checked. With its self-contained power supply, this portable and ex-

Bruce Rowlings, ZL1WB, ddresses a Dinner Meeting of NCARTS held in Milbrae, California, May 23rd. Only part of the audience of 25 RTTYers and 12 XYL's is shown. There were plenty of prizes, including a special ladies prize. Bruce gave a most interesting account of his 9 months tour of the United States. By now, ZL1WB should be back on RTTY from "down under."

tremely stable keying source can be used to check an RTTY station from stem to stern. A real enlightening experience can be had by having someone actually key a transmitter on the air with it and then observing the bias on a meter at the receiving end of a long radio circuit.

By the way, if you have any questions about this little gadget, Phil asks that you write to Byron, W2JTP.

Good Grief Dept.

Back in the Feb. '58 issue, page 80, there were two omissions in *Fig. 1*, the schematic of the W2JAV Tone Generator. A 0.1 ufd capacitor should be inserted in the lead going from the emitter of the 2N109 oscillator to the common lead on the bank of tuning capacitors, at the bottom of the .008 capacitor. Secondly, there should be a connection between the bottom ends of the 2.2k and the 27k resistors.

In the June '58 issue, page 74, the notes that were supposed to go with the diagram of the transistorized TU fell under Suzy's desk when Tom, K2VBI, came in, so here they are:

1—Tune the 88-mhy toroids; capacitor values are approximate.

2—Adjust the 100k pot for equal voltage swing from the diodes with the 2N146 removed.

3—Select battery voltage tap going to jack for the desired printer magnet current.

4—All diodes are of the 1N69 type.

Not exactly "grief," but it could be: In Phil's Improved Converter in the April '58 *CQ;* if neon lamp *I-4* will not extinguish (with no signal in), increase the plate resistor of *V-4A* to 1.5 Megohm. Some tubes were found that wouldn't cut-off with the 3.3 Megohm grid resistor.

Also, many fellows have asked for the d-c resistance of the FL-8 Range Filter *37M* coil that is used in the RTTY Notch Filter that was described in the Dec. '57 RTTY column. Apparently some are not marked. Anyway, it should measure about 250-ohms with an ohmmeter.

Off the Floor

Actually, with apology to Merrill W6AEE, it's page copy off the floor, mostly from W6VPC and WØBP. (*Oh, no. Not again? Ed.*)

Ole' two-finger BeeP is boasting again. Not satisfied with the first WAS on RTTY, he sends copy of WØBP working Eric, VK3KF in Melbourne, Australia—neglecting to mention that Bud W6CG worked him for the *first* RTTY contact with the U.S.A. the night before! Eric has a Model 15 and was running 100 watts to a three-element beam on 21,083 kc. Also worked was Mary K6OWQ, Carl W8GIG, and Geri KL7ALZ at Bunny Gulch, Alaska.

BeeP also neglects to mention that it was Bob W3TCQ in Seaford, Delaware, that made his 48th State. It was Bob's *first* RTTY contact, and it was on 3650 kc. Bob wishes to acknowledge the help of A3FU of Salisbury, Maryland, whose help made BeeP's 48th State contact possible.

VE8FO says that he is the only active VE8 left, and admits working WØBP. Remember, Canadians can't work the high end of 20. Look for them around 14,100 kc. Jim would like to see calling and working frequencies established for both 15 and 20. Any comments?

George, KH6EM, on Maui in the Hawaiian Islands is on 15 and 20 now with a KWS-1 and a 75A4 having a ball working all across the country. (*Hey George, they have a 2-meter net in the Islands, too!*)

W2ORX reports W2NRQ, W2ICA, W2IGX, K2DOH, W2WKL, W2IHD, and K2VAM active RTTYers of the Livingston (N.J.) Radio Club. W2JTP is still on 2-meter (147.96 Mc) autostart every hour on the hour from 6 pm until 11 pm EDT.

W4DPH is in the PBX, *Teletype*, department of the *Southern Bell Telephone Company*. W4IYP is building a W4EHU converter. K4PAE would like to know if any other 17yr-olds are RTTYers. W4EHU is dreaming up a heterodyne VFO which will use his receiver local oscillator for tracking. K4KKZ has a Canadian *RCA* i-f "Receiver Adaptor FS/ǂC1" and is looking for information, either the manual or a schematic. W4FH has a Model 26 and has modified his 75A1 by adding an 85kc i-f amplifier. (*See the 85kc i-f converter on page 48 of the RTTY Handbook, Bob.*) K4AAR would like to trade a Model 26 and an a-f converter for a 10-B *Central Electronics* exciter.

W6NBE/7 is using FL-5 range filter coils for his converter. (*See page 59 of the RTTY Handbook for W2JAV's famous "Little Nemo."*) W6CQK now has up a vertical antenna at his remote transmitter. W6UUX is now Chief Engineer of the Far East Network on Kyushu, Japan, and will soon be on RTTY with the call KA7AX.

K8HQF/9 wants to know where he can get standard pallets to replace the fractions on his Model 26. (*Try W2ZKV or W9GRW, OM.*) K8DDC (Box 251, Chillicothe, Ohio) has some *Sigma* 7JOZ-16OT and some *WE* polar relays for sale. W8LGL has an AN/FRR-3 and is looking for an AN/FGC-1 to go with it. W8AYT has a Model 15 and is about to operate on his 32V3 for fsk.

WØIRV has a *Drake* receiver and wants to know if the W2JTP i-f converter (pg 61, *CQ*, May '58) can be used. (*No, Doc; the BFO can't be turned off. Suggest trying Phil's a-f TU in the April '58 issue.*)

Comments

As you all know, the ARRL Board of Directors instructed General Manager Budlong to investigate the feasibility of eliminating the FCC-required dual identification by A-1 or A-3 when using other modes. (See page 64A of June *QST*)

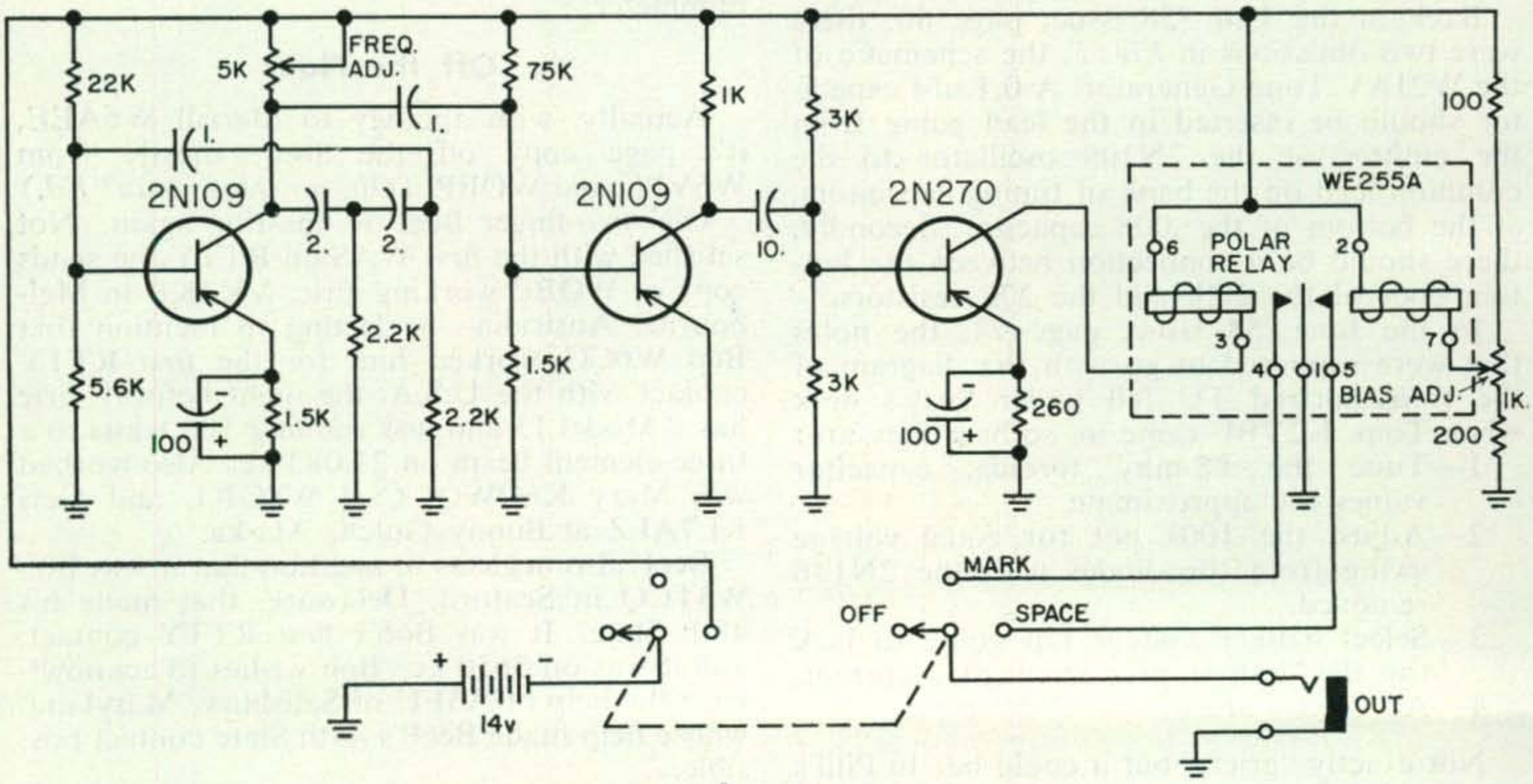
Dual identification long has been a thorn in the sides of RTTY operators. Besides being a handicap to RTTY operation, we believe it is so unnecessary in the light of the precise standards stipulated in Part 12.107 of the FCC Regulations and the availability to the FCC of ordinary machines using these common standards. Sure, we can still see that dual identification is necessary where "odd-ball" amateur TV, facsimile, and pulse emissions might be used, but an FCC monitor can easily identify an amateur RTTY station without listening for some other mode.

This is an important issue to all amateur RTTYers. Send General Manager Budlong, care of ARRL, West Hartford, Connecticut, a card and let him know how you feel about this.

Let's drop dual identification for RTTY!

73, Byron, W2JTP

Zero Bias or Distortion Generator.



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

NC-300

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

FREE — Limited Time Only!

2400 Hour Clock with NC-300 Purchase

$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

_____

for a new NC-300.

NAME: _____

ADDRESS: _____

CITY & STATE: _____

WORLD'S MOST PERSONALIZED RADIO SUPPLY HOUSE

World Radio LABORATORIES

ELECTRONIC HEADQUARTERS

3415 W. BROADWAY, CO. BLUFFS, IA., Phone 2-0277

For further information, check number 54 on page 126.

11 METER CONTEST RESULTS

Wheew . . . What a contest . . . January proved a good month for radio condx. Ole man propagation didn't let us down.

From past performances it seems to me that we ought to make this an annual event. Let's mark our calendars accordingly and set aside the weekend of Jan. 10 & 11th for the second annual 11 meter gettogether.

There seemed to be some doubts about the status of Canada. It counted as a country no matter how many provinces you worked. Some of you counted the provinces and will find your scores much lower than you calculated.

Please, in the next one take time out to figure your score. With the great number of logs handled it was quite a task to sit down and also figure out his or hers score. Quite a few were guilty in this dept.

The state of California seemed to have the most 11 meter hams and it was a real battle

Colorado
WØCDP — 6,308
WØHQT — 2,697
WØFWH —1,960

Connecticut
K1ACC — 612

Dist. of Col.
W3CMX — 392
W3III — 320

Florida
K4RWX —13,348
K4OXZ —12,643
K4KUZ 12,190
W4BIL — 4,964
K4CEF — 1,584

Idaho
W7ITN — 840

Illinois
W9UNG — 6811
W9BIQ — 5,504
K9AKS — 3,750
W9ZUL — 3,300
K9BGZ — 2,112
W9KIK — 1,650
W9JMY — 615
W9VKS — 504

Indiana

Michigan
W8DGP —10,912
K8CFU — 6,000
W8JXU — 2,425
W8CFA — 24

Minnesota
KØISJ — 5,181
KØEKR — 3,060
WØHGW— 2,746
WØQDP — 2,400

Mississippi
W5PGG — 1,992

Missouri
WØTFQ — 8,028
KØDXM — 7,520
WØFNN —6,014
KØGJD — 3,220
WØLFE — 2,754
WØQWS — 2,300
KØHQX — 945

Montana
W7DXM —13,860
W7JHL — 7,917
W7SFK — 1,334
W7YUB — 104

Nebraska
WØUIO — 828

Nevada

W8FEM — 640
W8LOF — 450
W8OMY — 221
W8TCO — 4

Oregon
W7BBH —15,043
W7JRI — 7,448
W7VOK — 7,360

Pennsylvania
W3SHT — 4,752
W3NHO — 4,260
W3KBS — 1,206
W3VKD — 1,122
W3IHS — 648
W3ARK — 455
W3CGS — 210
W3KZW — 25
W3VJP — 8

R. Island
W1ZJQ — 6,825
W1WKO — 1,950

Tennessee
K4EQM — 5,616
W4WBK — 935
K4BOM — 611

Texas
K5AUZ —11,240
W5AUT — 9,435
W5PYI — 8,568
W5RT — 8,541

HARVEY stocks the New Cesco Reflectometers

Now! with new dual scale all clear meter calibrated in SWR and relative power.

A quality instrument employing mutual inductance and capacity coupling between linear conductors for continuous measurement of standing waves on transmission lines. Suitable for frequency range from 3 to 200 megacycles. For continuous line insertion at power from 25 to 1000 watts. Will work satisfactorily on power input of 10 watts at 7 mcs. and up. Will work on 5 watts output 100 mcs and up. Line insertion power loss less than 1 DB at 30 mcs.

FEATURES:

- Uses sensitive 0-100 microamp meter calibrated in SWR
- Has relative power scale
- For continuous transmission line insertion
- Power to 1000 watts and over
- Prevents false loading from antenna tuner, match box, PI network etc.
- SWR observed immediately at all times without adjustment of Reflectometer
- Power output indicator
- Makes possible increased radiated power by reduction of line reflection
- Simplifies adjustment of antenna match
- No balancing adjustments, no reversing
- Each unit accurately hand calibrated and perfectly balanced
- Frequency tested from 3 to 200 mcs.

MODEL CM-52
For 52 ohm coaxial cable
MODEL CM-75
For 75 ohm coaxial cable

Contains phasing unit, loading control and reversing toggle switch, equipped with SO-239 at each end for inserting into feedline. Ideal unit for inserting in feedline at antenna for visual readings while making antenna adjustments. Housed in an aluminum box, Hammertone finish. Has all features as specified.

Amateur and Industrial net
$29.95

DUAL UNITS
MODELS CM-52-2 AND CM-75-2

Identical electrically to models CM-52 and CM-75 and has all features except in two units for remote control. Supplied with ten feet of cable and plug wired to control and indicator unit. Standard finish Dove Grey.
Amateur and Industrial Net
Phase and control unit **$34.95**

SPECIAL CONTROL PANEL
For Collins Speaker Grill or Built-In Installations

Special panel containing meter, control, reversing switch and with ten feet of cable and plug. For use with CM-52-2 or CM-75-2 phase units. Standard finish control panel and phase unit Machine Grey.

Amateur and Industrial Net
Phase unit and Control Panel **$34.95**

MINIBRIDGE
MODEL CL-52-72

A resistive type unit for observing line standing waves when adjusting antenna match. For use with either 52, 72 or 75 ohm coaxial line. Designed for use with small amounts of RF excitation or Grid Dip Meter. Requires the use of an external indicator such as 0-100 Microamp meter.

Amateur and Industrial Net **$12.95**

We're Generous on Trade-Ins
If You Want to Talk SWAPS and DEALS write . . . or call **W2DIO**

NOTE: Prices Net, F.O.B., N.Y.C. Subject to change without notice.

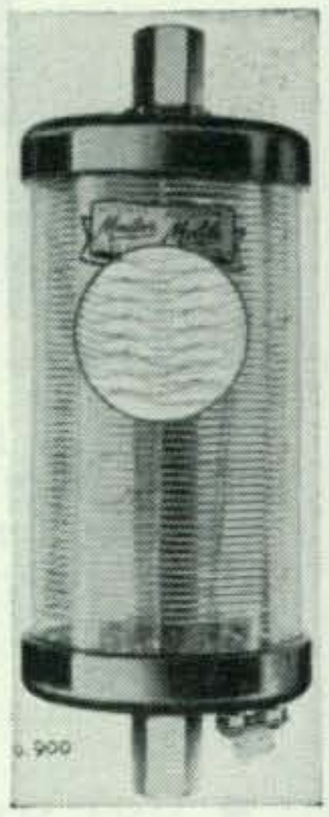
HARVEY is known the world over, wherever Hams operate, as a reliable source for Ham Equipment. All orders shipped same day received.

Harvey RADIO CO., INC.
103 W. 43rd St., New York 36, N.Y. • JUdson 2-1500
Established 1927

For further information, check number 21 on page 126.

New Amateur Equipment:

More on page 92



Tapped Mobile Coils

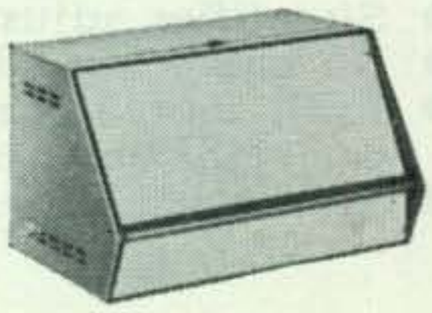
Master Mobile Mounts has a new coil available with a progressive shorting jack arrangement to cover 10-11-15-20-40-80. Just put the jumper in the correct set of jacks for the band you want and you are all set to go. Designed to work with 3 ft extension and 5 ft whip. Mark up A on page 126 for more hot scoop.

DSB-100 by WRL

Leo has just announced the first commercially produced amateur double sideband suppressed carrier transmitter, with the usual AM and CW available at reduced powers. 6DQ6A's in the final run 100 watts PEP on DSB suppressed carrier, 40 watts on AM phone and 50 watts on CW. Uses crystals or external VFO and tunes 3-9 mc and 12-30 mc, covering all popular ham bands plus CAP, MARS and emergency frequencies. The price is surprising: $119.95 in kit form and $139.95 wired and tested. Circle B on page 126 for info.

New Racks

Van Norman Industries are really hustling these days. Their newest line includes 19" rack cabinets and frames. The cabinets feature sloping panels, chassis support brackets, recessed handles, and flush fitting snap locks. These are real beauties. If you'd like a catalog just mark up C on page 126.



Hammarlund HQ-160

This is a general coverage receiver with the 540 kc to 31 mc range spread over six tuning bands. Double conversion, 14 tuned i-f circuits, Q-multiplier, X-tal controlled second i-f, 60 db notch filter, 100 kc standard, and scads of other features are crammed into this box. But then why expect everything in this little squib. Circle D on page 126 for all the real details.

KW Grounded Grid Linear

The B & W L-1001A runs two 813's at 1000 watts CW, 375 watts AM phone and 1000 watts SSB two tone test with your 3000 volt power supply. The broadbanded input circuitry requires no tuning. Bias and filament voltages are self contained. Price? Dunno, but they'll let you know if you indicate E on page 126. The unit is exactly like the L-1000A except you use your own power supply and save gool old m-o-n-e-y.

25 Watt Exciter

B & W has come up with a new idea, using four broadband 6AQ5 stages and one 807 amplifier for 25 watts output, this exciter switches with one switch from band to band, covering the 10-11-15-20-40-80 meter bands with an external crystal oscillator or VFO in the 3350-4000 kc range. For more data gouge out F on page 126.

Dummy Load

Workman TV, Inc., are making a 500 watt 50 ohm non-inductive resistor for dummy load applications. It is 18" long and 2" in diameter, designed to be clip mounted. This should turn out to be a real handy item. Net $42.00 What else could you possibly want to know? Circle G on page 126 and you'll know it.

AN OPEN LETTER TO ALL OUR READERS:

Dear OM,

Last year's first gigantic, colossal, behemoth ANNUAL issue was a smash success. This coming November we'll do it again, but we're going one step further in serving you, our readers. The DOUBLY GIGANTIC, COLOSSAL, BEHEMOTH 1958 ANNUAL will include at no extra cost a special distributor section as did last year's but in addition there will be a separate listing for each nationally advertised manufacturer listing all the distributors that stock his line of products.

The listings will look like this:

1 Ack Radio Supply Co.,
3101 4th Avenue, South
Birmingham 5, Alabama

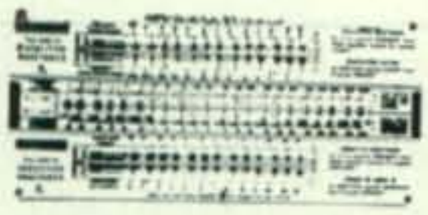
AMPEREX ELECTRONIC CORP.
Electron Tubes
3, 4, 5, 8, 9, 11, 13, 22, 24, 25, 27, 29,
51, 54, 56, 61, 63, 70, 71, 84, 85

This means the November issue will be a valuable buyers' guide as well as a SUPER CQ issue with more than FIFTY FABULOUS ARTICLES plus all our regular columns.

Be sure and ask your ham gear distributor to put a copy aside for you. (Or be doubly sure and subscribe now.) The November '57 CQ was a complete sell-out despite an extra large printing. Don't be among the unfortunates of last year who didn't get their copy. Reserve yours today.

If your local distributor hasn't yet heard of our special distributor listings, urge him to write to: Dick Cowan, CQ, 300 West 43rd Street, New York 36, N.Y. for immediate information.

73, Dick

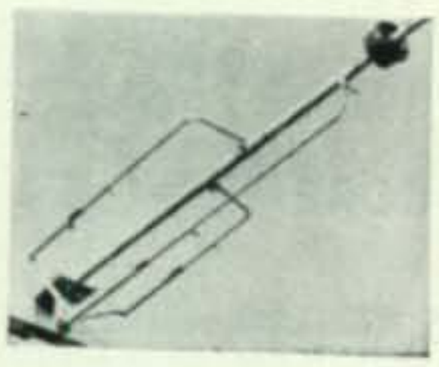


New Shure Slide Rule

The Shure Reactance Slide Rule has been famous for over fifteen years and is the simplest answer to working out reactance problems, Q, and resonant frequency. The rule has been in steady use by just about every radio school ever since its first appearance. Costs 75¢. See your parts dealer.

Anyone for CW?

Lafayette Radio has glommed onto some hand keys which they are selling for a record low price: 79¢. Bargain hunters will also be delighted with their $1.95 solid polished brass key, complete with silver contacts, ball bearing pivots, and circuit closing switch. Buzzer is 99¢. Circle J on page 126.



Triaxial Gamma Match

Hy-Gain has come up with a new and interesting idea in gamma match systems. This one provides a separate gamma for each band on the tri-band beams allowing optimum matching for each band with a resultant low SWR over a wide range of frequencies on each band. Try circling K on page 126.

Basic Television Course

Rider has been real busy publishing a lot of new books lately. One set that they can be quite proud of is their new five volume "Basic Television" by A. Schure. The entire set runs to $10. The set is broken down into: The Transmitter; Organization of the TV Receiver; TV Receiver Circuits Explanations (3 vols). As usual the set is profusely illustrated and written for easy understanding. Keep up the good work there W2RID. Circle L on page 126.

Phone Patches

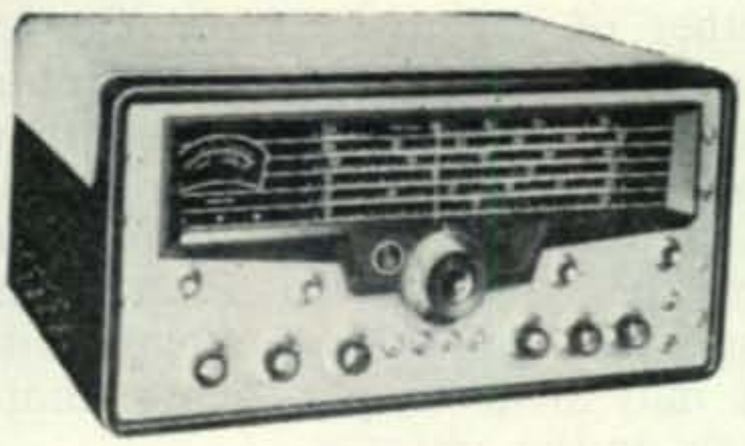
Cesco of Dayton has three types of phone patches available. The "Original" model, selling for $14.95, connects the phone line to your receiver or to your transmitter with a switch built in for changeover. There is a matching transformer in the patch to match the phone line, mike input and receiver output impedances.

The Cesco "Supreme" model phone patch has all the features of the "Original" model plus controlling the transmitter with the same switch as the phone patch. Thus, when you turn on the patch you turn on the rig when you switch it to "Transmit." With the "Original" model you have to turn the transmitter on and off separately. Price is $24.95 Amattur Net. Notch M on page 126.

For further information, check number 53 on page 126.

KEN-ELS RADIO SUPPLY *headquarters for*

hallicrafters



SX-100 $395

RECEIVER

- Utmost mechanical and electrical stability.
- Complete coverage of 7 amateur bands; 160, 80, 40, 20, 15, 11-10 meters.
- Exclusive crystal-controlled upper/lower sideband selection
- S-meter functions with A.V.C. off/on.
- Tee-notch filter.
- Built-in crystal calibrator.

HT-32 $675

TRANSMITTER — EXCITER

- 5.0 mc quartz crystal filter cuts unwanted sideband 50 db. or more.
- Bridged-Tee modulator; temperature stabilized and compensated.
- SSB, AM or CW output on 80, 40, 20, 15, 11-10 meter bands.
- High stability, gear driven V.F.O.
- 114 watts peak power input.
- Distortion products down 30 db. or more.
- complete band switching.

SR-34

WRITE KEN-ELS FOR PRICE

SEE PAGE 12 JUNE, 1958

TRANSMITTER — RECEIVER

General description: The SR-34 is designed for either AM or CW and combines, for the first time in one compact package, the complete functions of a two *and* six meter radio station. It operates on 115-V. A.C., 6-V. D.C., or 12-V. DC and features a highly efficient transistorized power supply for the 6 and 12 volt operation

SX-100 $295

SELECTABLE SIDEBAND RECEIVER

- Selectable saidband operation.
- "Tee-Notch" Filter.
- Notch depth control.
- Antenna trimmer.
- Plug in laboratory type evacuated 100 KC Quartz crystal calibrator.
- Logging dials for both tuning controls.
- Full precision gear drive dial system.
- Frequency range: 538-1580 kc. 1720 kc-34 mc.

KEN-ELS RADIO SUPPLY

WØZKD—Glen
WØZCN—Ken } *Fort Dodge*

428 Central Ave., Fort Dodge, Iowa
Phone: 5-2451

WØCRP—Russ
KØABO—Rog } *Cedar Rapids*

67 16th Ave., S.W., Cedar Rapids, Iowa
Phone: EM 4-1172

10% down — 24 months to pay. Your trade-in may cover down payment. Export business welcomed.

For further information, check number 23 on page 126.

FRUSTRATION [*from page 37*]

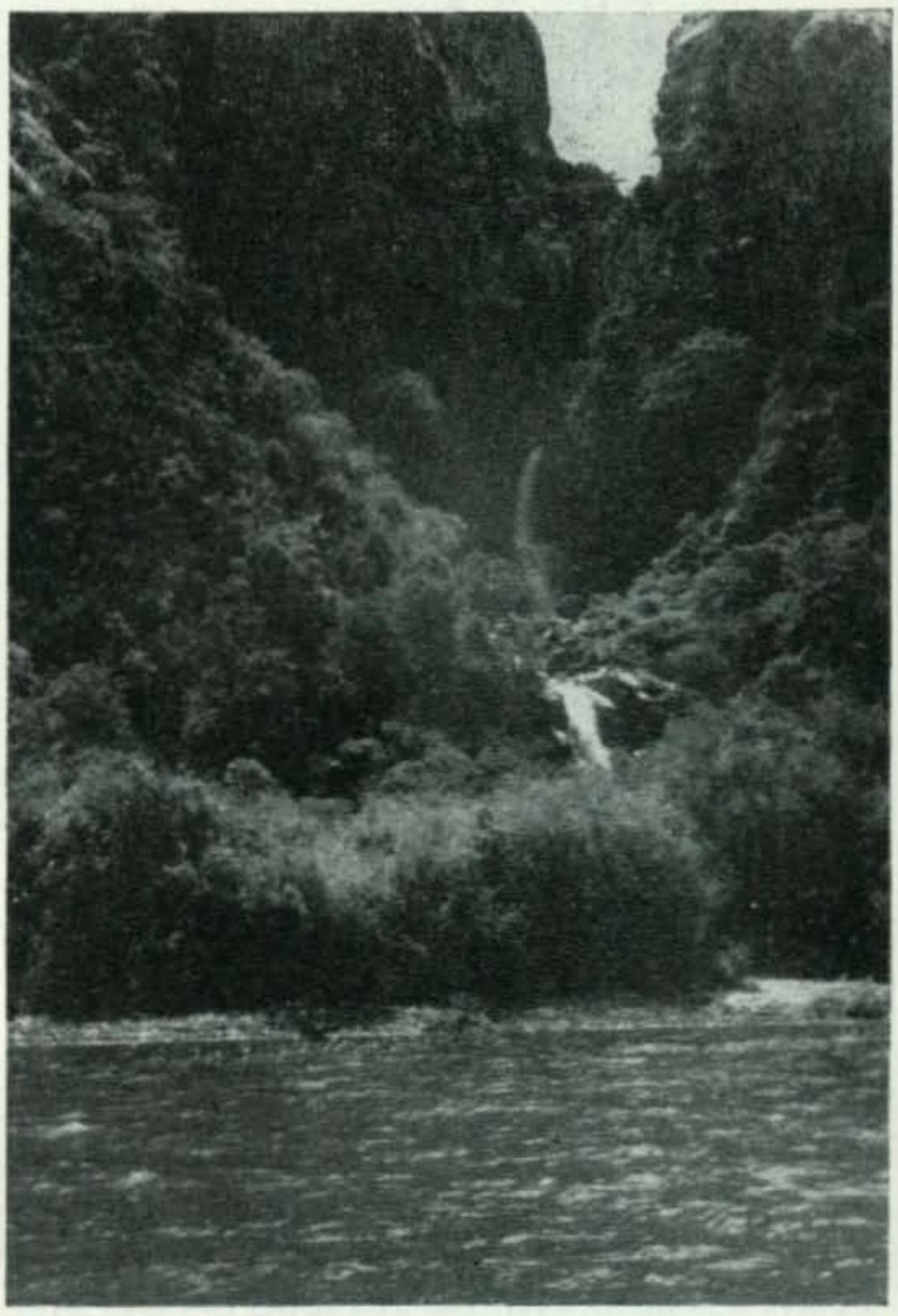
signal than stacked beams and a California kilowatt. Most of the stations are running less than the 150 watt limit, and they work a fantastic amount of DX. They are all accomplished junk-box artists, and probably enjoy more of the true ham spirit than we, with our drift toward brute force and manufactured gear.

Like many of the 7000 Europeans in Uganda, the majority of the hams are in one branch or another of the government. Consequently they are frequently on safari up-country or on leave and there are rarely more than five who are active at any given time. AC is available only in the larger towns at present, but juice from the great Owen Falls Dam project is being pushed into other areas quite rapidly, which may help to put a few more solid VQ5 signals on the air.

This was my first opportunity to compare SSB and AM under really difficult conditions, and the experience was a revelation. Take it from an old die-hard, men, SSB is here to stay. Time after time I've listened to solid copy from a dozen or more side-banders, many of them running low power, when AM signals were completely unreadable. Even signals too weak to budge the meter could be copied, while only the strongest of the AM stations rose above the mass of heterodynes long enough

[*Continued on page 96*]

The Nkusi River falls from Lake Albert—a fabulous fishing spot.

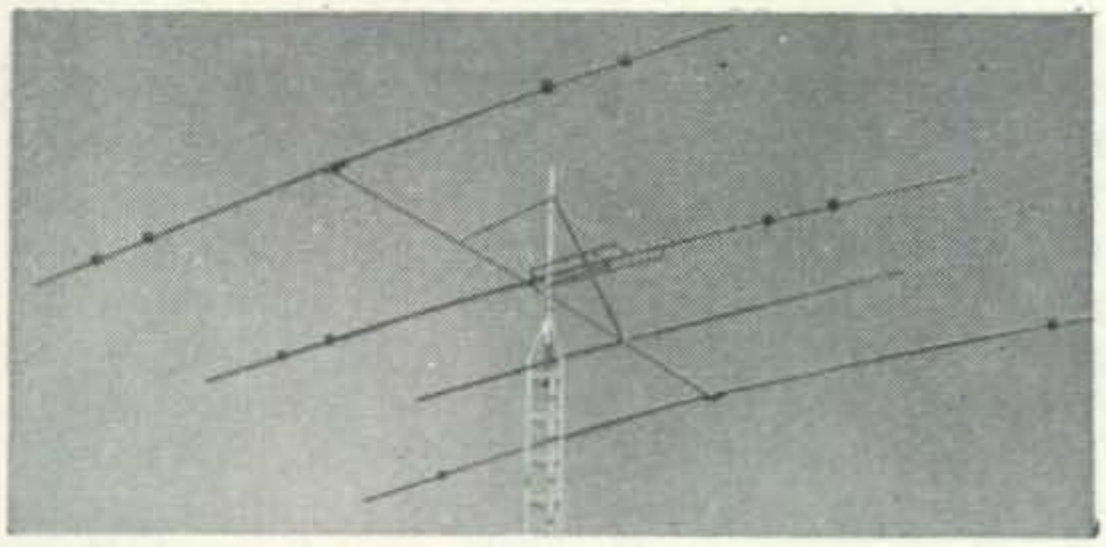


for the final proof of operating excellence . . . compare on the air!

THESE GREAT SERIES OF

hy-gain trap tribanders

the FULL-SIZE trap tribanders



the 3-element trap tribander

99.75

The 3-Element Tribander shown above is now considered as the standard of performance in the field of amateur communications. F/B Ratio: approx. 25 db. Forward gain: 8 db. average.

the 2-element trap tribander

69.50

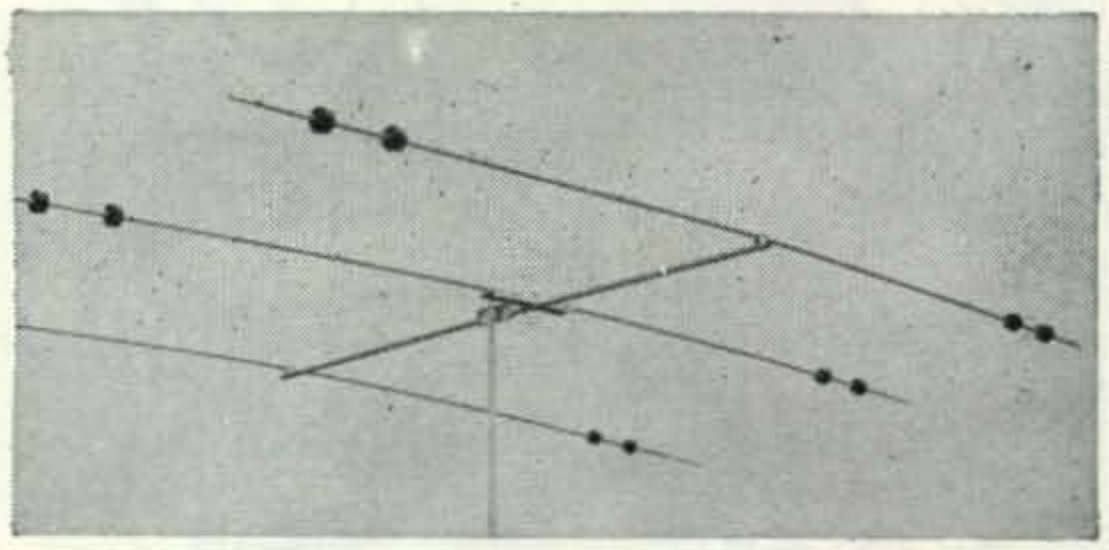
For use in limited space when top quality transmission is desired on 10, 15 & 20M. Single transmission line. F/B Ratio: approx. 18 db. Forward gain: 5.8 db. average.

the 5-element trap tribander

495.00

The finest, highest gain, rotatable array available. Heavy duty construction. Uses 36', 2x31" rectangular aluminum boom. F/B Ratio: approx. 25 db. Forward gain: 12 db. average.

the NEW mini-tribanders



the 3-element mini-tribander

69.95

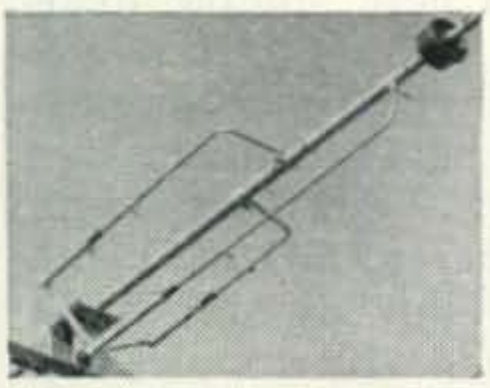
Extremely lightweight, only 39.8 lbs. Turning radius: 13'10", installable almost anywhere, yet boasting many features of the full-size line. Hy-gain top quality performance guaranteed.

the 2-element mini-tribander

49.95

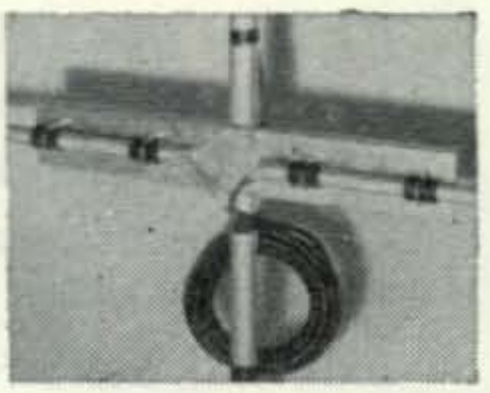
Practically a featherweight: — only 33.8 lbs., easily one-man installed in the shortest possible time and nearly anywhere. Turning radius: 12'11". Top features at minimum cost.

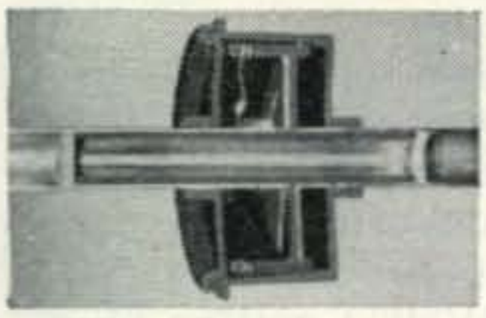
Here's the smallest practical size consistant with efficient operation, to which the trap tribanders may be reduced. Install in the smallest city lots. Light weight & rotatable by most TV rotators. Factory pre-tuned, with dimensions given for quick, easy assembly in a matter of minutes.



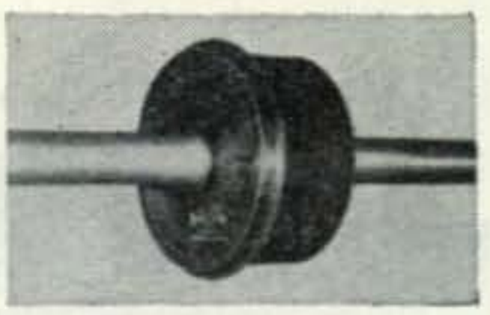
Perfect 1:1 SWR is made possible by the new, pre-calibrated Triaxial Gamma Match System with coaxially formed reactance cancelling capacitor built in. Exceptional band width maintains low SWR over entire band. Coax connector for 52 ohm feed line included. Gamma rod and capacitor section calibrated for exact setting over each band. No external baluns, antenna tuners or matching networks needed.

Split insulated dipole feed with coaxial choke results in SWR of less than 2:1 on all bands. No adjustments needed; simply attach 52 ohm feedline to dipole terminals. Heavy 12 ga. hot dipped galvanized steel channel and polyethylene insulated U-bolts support Hy-gain's driven element. Compare this construction with the flimsy supports using self-tapping metal screws.





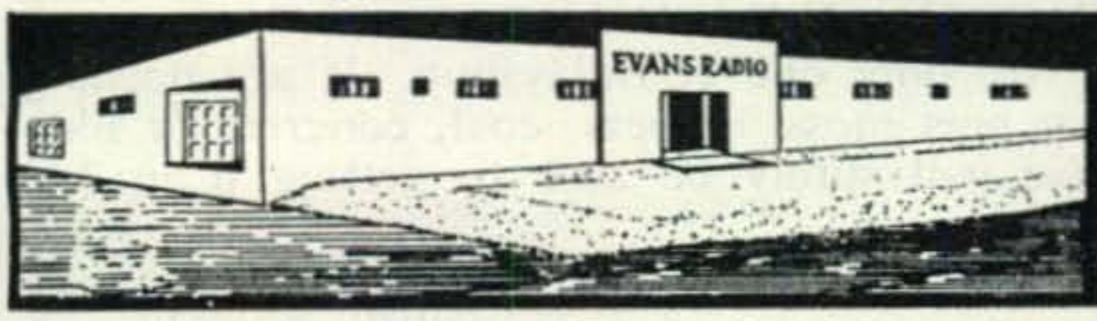
The automatic switch action of the Insu-Traps is employed in both series of tribanders. They act as insulators at their resonating frequencies, but allow radio energies of other frequencies to pass, isolating various sections of the antennas. Mechanically and electrically stable, the traps are hermetically sealed at the factory in polyethylene cover and cap, completely weatherproof. Hi-Q coils wound on styron form. Guaranteed for the life of the beam. The Mini-Tribander Traps are specially weight-designed for wind loading efficiency.



Send for information on the Trap Tribanders as well as the Complete Line of

hy-gain antenna products

Terms can be arranged on both new and used equipment. Write W1RVQ for credit application form and an explanation of our terms and Used Equipment List.



Evans RADIO

P.O. BOX 312 • CONCORD, N. H.

For further information, check number 25 on page 126.

FRUSTRATION [*from page 94*]

for a useful QSO. Only the shortage of equipment is holding the African hams back, and I suspect that in a few years much of the serious phone DX work will be done with the monkey chatter boxes.

Apart from the sad licensing situation, Uganda is a wonderfully interesting part of the world. Although it straddles the equator, most of the country is 3800 feet or more above sea level, and the climate is very mild. It is rarely above 85° during the day, and the nights are invariably cool enough for a blanket in most areas. The scenery is magnificent, and though hunting is not as readily available as in the neighbouring Kenya and Tanganyika, the two great national parks provide the finest view of game in its natural setting to be found in all Africa. If, like me, you are a fisherman, you'll find the local Tigerfish, Nile Perch, and Barbel well worth a safari or two. Above all, Uganda offers a good sample of the traditional East African hospitality and wonder of wonders—the beer is always served cold!

So pop around if you are in this part of the world. Bring your camera, fishing gear, and thirst along—but if you value your sanity, leave that receiver at home. ■

SCRATCHI [*from page 14*]

needing hay, and he saying his dispatcher telling him to bringing out load of hay. Scratchi just starting to get into 1/c argewment when heering tinkle of bells and into driveway coming panel truck and driver asking me where he putting load of diapers. I giving him same rewteen, and he say his 2-way radio dispatcher telling him to deliver, right here, cupple loads of diapers.

What I yelling back at him he never heering, on acct. just then to large, hevvy concrete-mix trucks roaring into driveway, and first driver asking where I wanting concrete poured. Can't even answering, not when following him in are coal truck and nursery truck with cupple tons of peet moss on it.

I prolly still be there argewing with various drivers of trucks if not cupple of them calling dispatcher on 2-way radio and finding that they not having any orders to delivering coal, diapers, peet moss, concrete or hay.

So what are happening? Well, I getting glimmer of idea when are seeing each truck having 2-way radio, but if you thinking I telling truck drivers about it you crazy in hed.

Evidently are having slite parasite in to meter rig what putting rig on channel where 2-way radio peeples working. You not thinking that likely, Hon Ed?

Are only one consolayshun. If are needing any peet moss, diapers, coal, concrete or likewise will surely be able to getting it in 1/c hurry.

Respectively yours,
Hashafisti Scratchi

For Coupling Energy Into Space . . . Anywhere in the Radio Spectrum

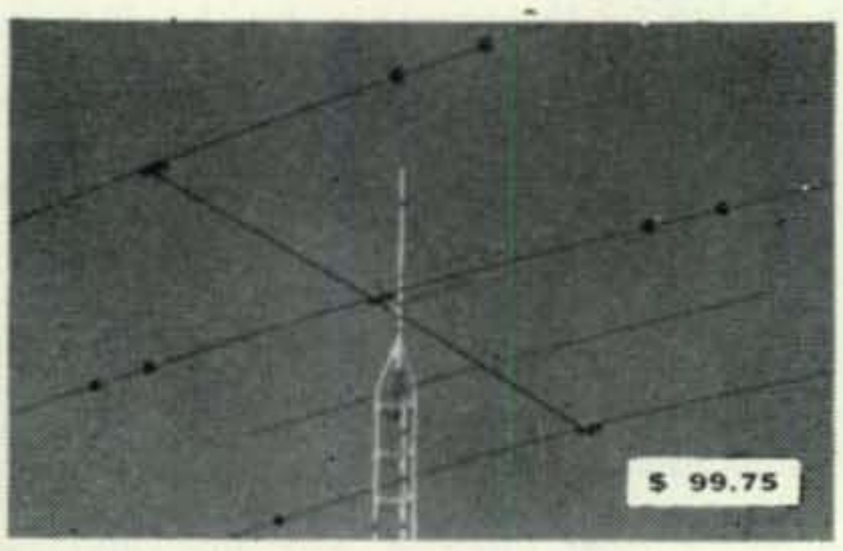
hy-gain HAS THE ANTENNA!

the hy-gain Multi-band trap antennas

The Full-Size Trap Tribanders

There are more hy-gain Trap Tribanders in use than all other 3-band beams combined. Incorporate the startling Insu-Trap which effectively isolates various sections of the beams with its automatic switch action. New precalibrated Tri-axial Gamma Match Systems afford 1:1 SWR. Rugged construction throughout.

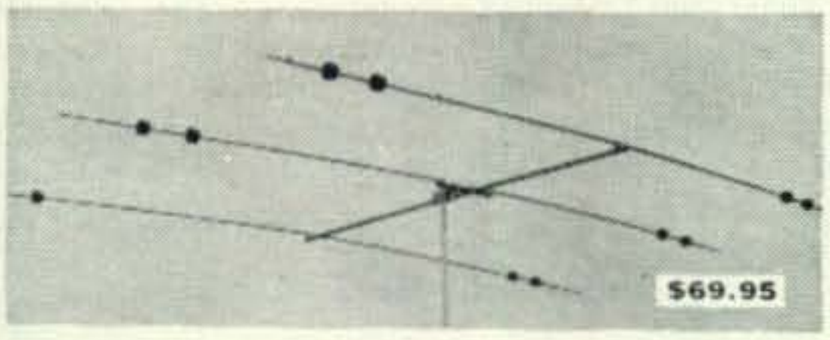
2-Element Tribander .....$ 69.50
3-Element Standard .....$ 99.75
5-Element Champion $495.00

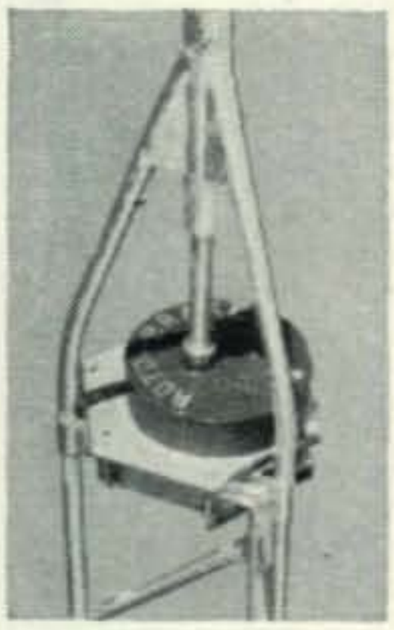


The Mini-Tribanders

Smallest practical size to which Trap Tribanders can be reduced for efficient operation. Light weight: easily rotated. Factory pre-tuned with dimensions for rapid assembly. Approx. 13' turning radius. Special Insu-Traps and Split Insulated Dipole Feed.

2-Element Mini-Tribander $49.95
3-Element Mini-Tribander $69.95





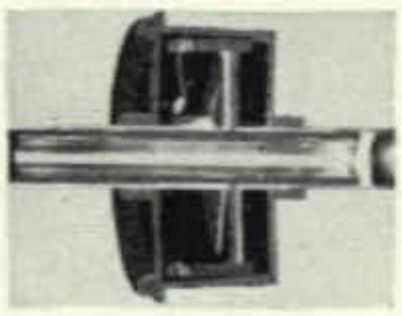
The RotoBrake

At last, a complete rotating assembly which rotates, holds and indicates . . . and can be relied on. Includes powerful twin 3600 rpm motors built-in. 750 in. lbs. rotating power, 10,000 in. lbs. braking power. Great Circle Wall Map indicator with indicator, a moving wedge of light, 10° wide at perimeter shows beam width and direction.

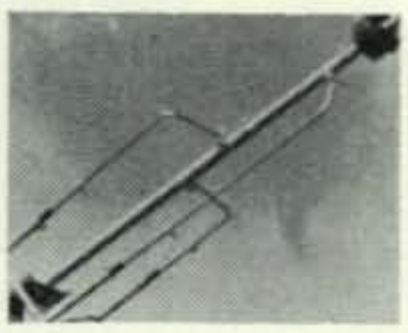
$149.95

Wall Map Indicator

Rotator & Brake



Mechanically & electrically stable, the Insu-Trap is enclosed in completely weatherproof polyethylene cover. Hi-Q coils. No air dielectric



Triaxial Gamma Match System with coaxially formed reactance cancelling capacitor built-in makes possible 1:1 SWR. Precalibrated.

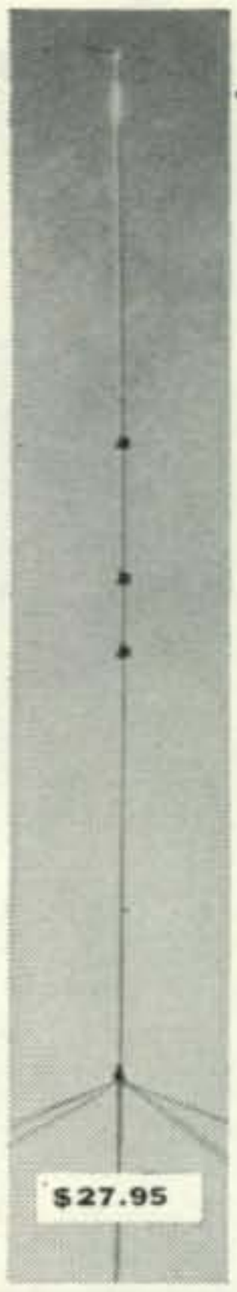
The Trap Verticals

Using the Insu-Traps, these Verticals also feature the nylon base assembly for self-support. Use Capacity Hat principle to increase radiating efficiency. Less than 2:1 SWR on all bands. Single 52 ohm feed line.

26-AV (for 2 & 6M) $16.95
12-AV (for 10, 15 & 20M) 19.95
14-AV (for 10-40M) 27.95
18-AV (for 10-80M) 69.50
12-AV Mount Kit 8.95
14-AV Mount Kit 9.95

4 & 5-Band Doublets

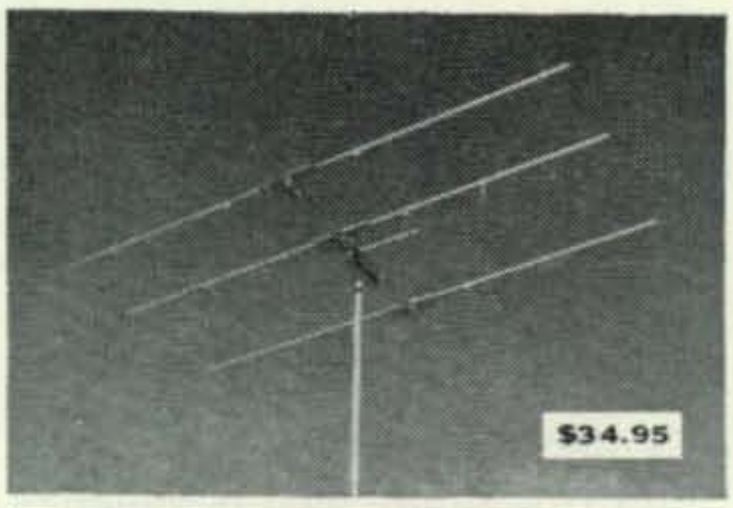
Hi-Q Insu-Trap circuits used with pressure clamp ends: — Insu-Traps for 10-80M, traps only, per pair, $12.50. Insu-Traps for 10-40M, traps only, per pair, $12.50. 4-Band Doublet Kit (less traps) for use with traps, $14.00. 5-Band Doublet Kit (less traps) for use with traps, $15.00.



The Monobanders

Perfect 1:1 SWR with the new Gammaxial Gamma Match System, precalibrated. All beams pre-tuned and pre-matched, complete with easy-to-follow instructions. Large diameter elements with ruggedly-built Boom/Mast clamps.

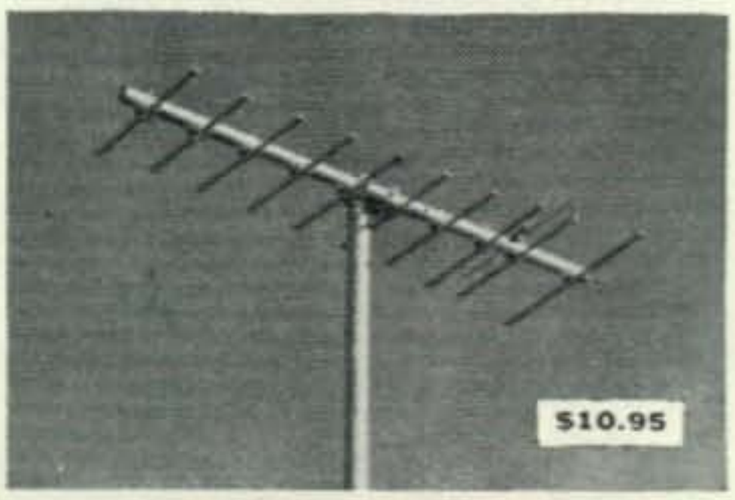
10M, 3-Elements $24.95
15M, 3-Elements $34.95
20M, 3-Elements $59.95



The VHF Beams

Here are antennas for the VHF bands of 1¼, 2 and 6M. Sturdy construction throughout. Additional gain available through stacking. New Gammaxial Gamma Match System makes possible perfect 1:1 SWR.

6M, 5-Element $15.95
6M, 8-Element $26.95
2M, 5-Element .....$ 6.95
1¼M, 10-Element ....$ 9.95
2M, 10-Element $10.95



For further information, check number 24 on page 126.

Letters . . . to the editor

A Shocker, This . . .

Dear Wayne:

I imagine you and also the thousands of your readers have gone through an electrical shock. Those that are still alive, thank God first. After 1500 Volts—a complexion that turned white—a nervous system that went into full oscillation, a wrist watch that was missing, a left wrist and hand that was bleeding, this poor soul sat down. The power was off!! It was open!! Sure, so was the bleeder.

Over 10 years ago CQ published an article on electric shock. It is the November issue 1947—preserved very well in my shack. I think it is the duty of *every* Radio Amateur Publication to print this article at *least* once a year. With the influx of the younger generation into the Novice ranks it should be published for them and also for the older ones that forget the basic laws of safety.

Let us all remember that a voltage above 25 Volts can cause death!

Another,
Wayne "P" Green, W8DPJ

Mobill vs. Mo-bile?

Dear Sir:

I have just been glancing through my October, 1957 copy of CQ Magazine, and read the "Pet Peeves" article by W5AXI/MM. While I agree most heartily with his comments, I must take exception to one glaring error.

As a dauntless proponent of the correct usage of the English language, I must disagree with his advice regarding the pronunciation of the word "mobile." According to all the laws of English grammar, at least when I went to school, (I doubt that they have changed) the "e" on the end of "mobile" dictates that the "i" be given the pronunciation as in, to use W5AXI/MM's example, "bile."

Now, I will go so far as to concede that this may not apply to correct usage of "English" as-she-is spoke, by our fair American cousins. I have personally seen examples of this very case; nevertheless, recognizing the fact that English is a fluid, or changing language, the basic rules of grammatical usage do not change, simply because of more or less local adoption of certain pronunciations.

Now to get back to my issue of CQ. Hope to CU soon with any one antenna.

L. D. Laurie, W7TGK

Nothing Fishy Here

Dear Wayne,

Here's a "hint." This nylon Seine Net cord #18 makes fine guy wires, and is more reasonable than wire. It has a test of about 450 lbs. It is easily obtainable at most hardware stores, as masons use it for chalk line in constructing buildings. The cost in this locale is about $1.25 per ¼ pound, which contains about 225 feet.

The only thing to be careful about is abrasion. I have found that plain black tape, surgical tape or electrical tape, wrapped around a place that might be abraided works very nicely. This cord will last about five to ten years here on the desert, which is too long to be happy with a new VE8 call.

Paul MacDougall, VE2YQ

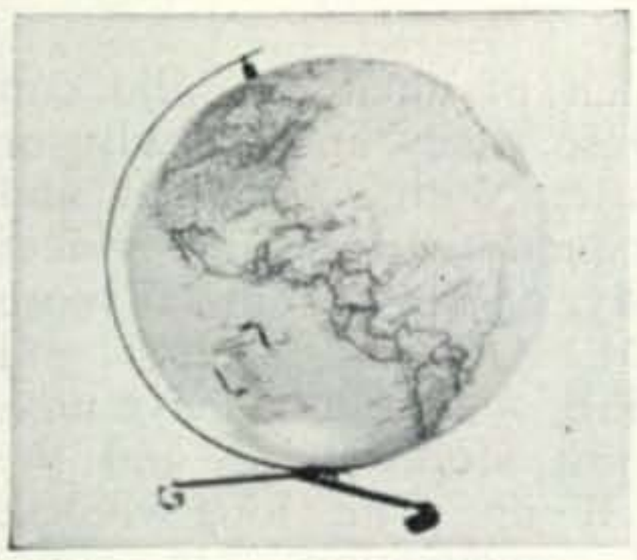
Oh Joy! A Subscription!

CQ Magazine
300 West 43rd Street
New York 36, New York
Attention: Janitor
Dear Janitor:

After being a faithful newsstand buyer all these years, now you've done it to me. I'll never read your magazine again! In fact I want it sent to my worst enemy: a 3-year subscription will really make him sick!

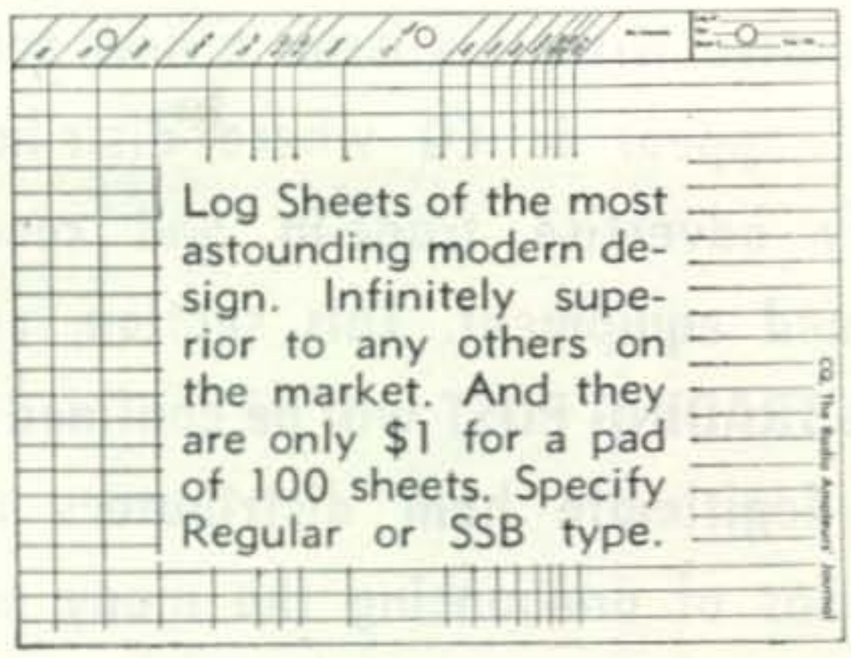
Disgustingly yours,
Anonymous

THE HAM SHOP



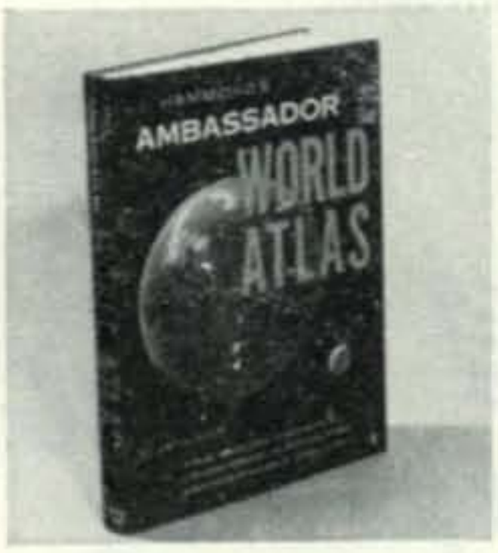
GLOBE

Here it's Wednesday already . . . what better time to give the XYL this globe for your shack . . . and *you're getting a FREE year of CQ to boot.* Costs $25.00 in the stores . . . only $19.95 on this CQ deal.



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

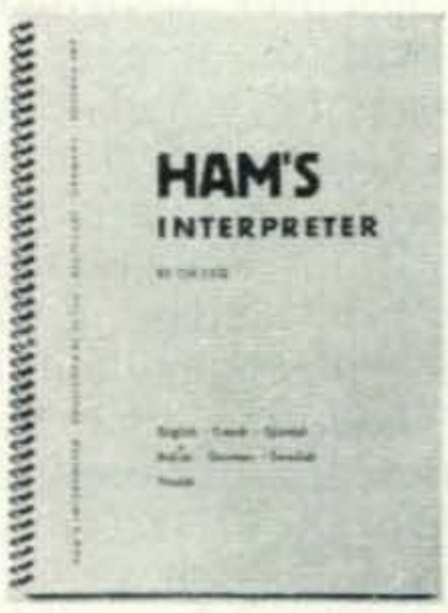
This new Mobile Handbook by Bill Orr, W6SAI, has been getting raves from all of the experienced mobile operators. There is all sorts of information in here that cannot be found anywhere else. This is NOT a collection of reprints. $2.95 postpaid.

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-7

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: ☐ Globe ☐ Atlas ☐ Binder—Year Wanted ☐ Log Sheets ☐ Mobile Handbook ☐ Command Sets ☐ Ham's Interpreter ☐ Code Record

NAME .....

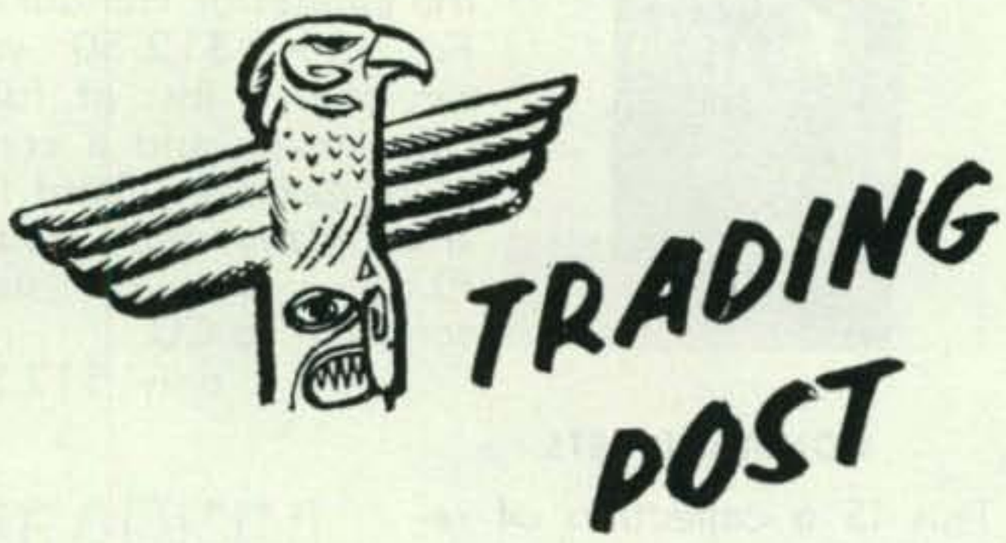
ADDRESS .....

CITY ..... ZONE ..... STATE .....

New York City residents add 3% Sales Tax

ANNOUNCEMENT

Effective with this issue a new section will appear 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.



O-T REGENERATION [*from page 47*]

which there is no room for opposition. It is in the operating end.

In no other branch of amateur radio can one get into a QSO so easily and quickly, or get out, for that matter. With voice-break and the ability to understand two or more voices talking simultaneously, SSB offers much more excitement than AM. And, unlike AM and C.W. operating, in SSB, if you don't have anything to say, you just stop talking and the other fellow takes it up. The long-winded, sometimes artificial conversations are gone, thank God.

It is, in truth, a new, excitingly different World of Amateur Radio where young and old alike are finding pleasures beyond imagination. One day, not far from now, all will be SSB and there will not live a single inactive amateur for all old-timers will be regenerated.

Thank you, George and Harvey. ■

TUBES [*from page 46*]

Some large tubes require forced-air cooling, and with these, an alarm should be provided for the failure of this important item. In commercial installations it is customary to provide a Microswitch with a vane attached to the lever arm so that the air blast keeps the switch closed. Unless you are using a dust filter for the cooling air, which may become clogged, about the only way you can lose air is for the blower to stall, and if you have provided a slo-blow fuse in the motor circuit, this can be arranged to remove power from the tube as well as the motor.

Fig 4 shows a complete safety chain for a transmitter, designed to operate in conjunction with the screen protective circuit of *fig 2*. Closing the switch circuit breaker in the line circuit turns on the transmitter and rectifier filaments and provides primary power for the various low-voltage supplies. Providing the blower is delivering air a filament time-delay relay will begin counting down, after it goes, and assuming that the various switches and interlocks are closed, it is possible to turn on the plate and screen voltages. It is important that any switch or protective device that removes the plate voltage also removes the screen voltage, since depending upon the screen overcurrent circuit to do it for you is only inviting trouble. ■

in the Novice license is invited to join the class. The phone is SUnset 4-3167 or look for them on two and six meters.

Howard Nichols, KN2LBK, East Mountain Road South, Cold Spring N. Y. will be glad to assist prospective Novices.

Robert Markman, KN2JPH, 1785 Townsend Avenue, Bronx 53, N. Y. will give a helping hand to prospective hams.

Lester Sade, 652 Second, San Bruno, California can be counted on for a helping hand.

The following persons like assistance in obtaining their licenses:

W2—David Rajewski, 659 Lansing Street, Schenectady, N. Y.
W. Schmeis, 129-14-135 Avenue, South Ozone Park, N. Y. Phone Jamaica 9-4475
Charles Louda, 430 E. 105 St., N. Y. 29, N. Y. Phone LE 4-2147

W4—Doug Thurston (13), 603 Hill Street, Rocky Mount, N. C.
Ed. DA. Charles, Jr. (15), 513 Rosewood Drive, Florence, S. C. Phone MO 9-9812

W5—Earl Saucier (40), 135 E. Laurel St., Magnolia, Mississippi.

W7—Richard Imes (14), 315 Lark Casper, Wyoming. Phone 3-5285
George Babb, 240½ W. Main., Apt. #37, Spokane, Washington

W9—John Dynda, 1612 N. 74 Court, Elmwood Park, Illinois. Phone GLadstone 3-0701.
Thomas Flasch (13), 918 W. 35 Place, Chicago 9, Illinois.
Bob Bernat, 8551 Kimball Avenue, Skokie, Illinois.

WØ—R. B. Callan, 5025 Walnut, Kansas City, Mo. Phone VA 1-5686 or GR 1-5460.

Letters

Robert Markman (15) KN2JPH, 1785 Townsend Avenue, Bronx 53, N. Y. says: "I build—not buy." Bob is using a surplus BC-455 and BC-453 for receiving and a Knight 50 watt transmitter modified for a 6146. That's the spirit. Bob, keep up the good work.

Bob Brown, 67 Russell Avenue, Rahway, N. J. is working on his 4th ARRL log book and has over 500 QSL cards on the wall. He recently passed his General test and plans to use the CQ Tested Modulator on 75 and 40 meter phone.

Sanford Hutson, Box 27, Stuttgart, Arkansas has worked 8 states since receiving the call KN5QHS. He runs a DX-20 into a 40 meter dipole on 7185 kc. Sanford would like to see the new Novice calls in this column. I'm working on it, OM.

Wayman C. Dunlap, K5MDZ, 136 Pike Avenue, Jacksonville, Arkansas inhales with an S-38C modified for a Heath QF-1 "Q"

[*Continued on page 103*]

XYL [*from page 48*]

painted his nice new receiver black, to match the old transmitter. While he was in the hospital recovering, his OW decided ham radio was bad his health, and sold all of his equipment.

If you have gotten this far, now is the time to make your pitch. Devote less and less time to your favorite band, and more time to the YL. Start cleaning up your shack and chariot, etc., so she can see that you are trying to turn over a new leaf in order to be worthy of her. It may be wise to re-install the mobile rig at this time, so that she can get accustomed to it. If you wait until after the ceremony, she may lay down the law.

Let things continue as they are for a few weeks, while you devote some time and cash to the purchase of new equipment you may need. Be sure to do this *now*, since it will be a long time before you buy new gear, after the ceremony. Remove a few knobs, scratch the cabinet, and store in a dusty place. Later, when you remove the gear from it's hiding place, you can claim that it's just some old stuff which has been laying around for ages.

Now you are ready to pop the question. Drive to a dark, lonely spot, and keep your mouth shut. Clam up completely, and stare off in the distance. You should be quite proficient at this, by now. When she asks why you are so quiet, assure her that it is nothing at all, and resume staring. Invariably, she will ask again. Now you can explain that you care so much for her, etc., but that you can't believe that anyone as nice as her could possibly care for you. If she is at all normal, she will assure you of her feelings, and you can pop the big question while she is feeling romantic and sympathetic. At this time, if your approach has been right, you stand a very excellent chance of getting a favorable answer immediately. When you have the answer you have been waiting for, take her home before she realizes what she has let herself in for, and plan the ceremony as soon as possible.

Now you have reached your ultimate goal, and can sit back and wonder if it all was worth the effort. Opinions on this will vary, depending upon the qualities of the YL. Now might be an excellent time to sit down and cry, since your days of DX contests, QSO parties, and other activities may be curtailed for some time to come.

Be sure to look me up on 20 meters and let me know how things worked out for you. I'm usually on the low end of the CW portion almost every day, sitting around in my small bachelor apartment on Waikiki, sipping a cool one. If you have any trouble getting the XYL interested in ham radio, be sure to give me a call and I will be glad to furnish foolproof instructions for getting her a license. Good luck, 73's and C U L. ■

NOVICE [*from page 101*]

Multiplier. His exhaler is a WRL Globe Chief 90. Wayman will sked for any reason and QSL's 100%. Sorry I couldn't use the pix Wayman but it was too "teenie weenie."

Bud Question Mark, KN4SSM, 815 Coleman Street, Raleigh, North Carolina has just completed his WAC and is waiting for the QSL's to come in (gud luck!). His WAS total is 43 worked and 40 confirmed with a Globe Chief 90 transmitter and a HRO-60 receiver. A three element beam, a dipole, and a long wire complete the picture. Bud also has constructed the Knight Kit Receiver and likes it very much. He would like skeds with Nev., Ark., Del., N. H. and Maine. Also if anyone is interested in getting a net going in his area, drop him a line.

Alan Armstrong, W7JBG, 829 S. W. 143rd, Seattle 66, Washington would like to stress that a kilowatt isn't necessary for DX work. He runs an AT-1 with about 7 watts output and has a terrific string of DX contacts to back up his point.

William H. Hall, Jr., K8EKT, 5095 Sandy Rd., SE., Canton 7, Ohio brings a "goof" to my attention. He points out that the DX-20 runs 50 watts input (500 volts—100 ma) and not 70 watts (700 volts—100 ma) as I said. My face is red, Bill.

Larry Fuller, KN?, 2125 East 4th Avenue, Mesa, Arizona has been on the air for three months running a Globe Chief and an HQ110, and has worked 31 states plus KH6. He needs Nev., Wyo., La., N. Dak., N. Y., W. Vir., Mont., and Miss. and would like skeds. Look for him on 40 and 15 meters.

Ken Question Mark (no relation to Bud), KN2KUT, 2244 Nottingham Way, Trenton, N. J. is going to take his General exam soon and would like to complete his WAS as a Novice. He would like skeds with Ida., S. D., Maine, and S. C. With a DX-35 and an S-76, Ken has worked VK3TX, ZL1APM, and YU1AG. Nice going, Ken.

Harold McDermott, KN8HIW, 2155 Summers Avenue, Kent, Ohio would also like some help making WAS as a Novice. He needs the states of Vt., R. I., Maine, Fla., and Ala. Hal can be found on 7173 and 7190 running an AT-1 and an NC-300. He QSL's 100%.

Bob Johanson, 9624 Crawford, Skokie, Illinois holds the call KN9JTI and operates 15 meters with a Knight 50 watter and an SX-99. He has racked up 46 states in 10 months and the DX includes KG4, KP4, WH6, G2, VE2, 5, and 8. Bob would like to mention that he is looking for a used Viking Ranger. By the way, Bob, see the help wanted section.

That will fill the pages for another month, fellows. Don't forget to keep the pictures coming (large as possible please). The column is pretty bare this month.

73, Don, W6TNS

SB [*from page 83*]

stock up on food, water and gasoline and begin another trip to the remote spots of the Pacific. Danny operates SSB on 14,309 at 2300 GMT.

Friends of Peter, OZ3EA, will be pleased to know that he will arrive in the USA early in August and that he plans to visit as many SSB hams as possible. He will arrive at W3SW for a week's stay around August 17th.

Your Editor was interviewed by Bill Leonard, W2SKE on a Voice of America program, about SSB and I was very surprised and pleased to learn how many Hams listened to it all over the World.

John, PY2JU is now up to 105 countries and should soon have the necessary QSL's to qualify for his "Worked 100" certificate. Cyril, VK3AEE is over 125 worked. A suggestion has been made by several that we start qualifying for W.A.Z. on SSB. What say?

Charles, WØCVU is stuck at 72-confirmations, with 80 worked is willing to offer a cup to the one who gives him number 100. Charles said he has tried every other way to get there. Hi.

Now for the news many of the SSB stations have been awaiting, especially the hundreds of newcomers to SSB who were active in SS activities previously.

ANNOUNCING A Worked All States Contest for SSB to be held the week-end of September 20th. Bill Leonard, W2SKE, a well-known name in SS and DX Contests suggested that we sponsor a SSB-SS and will award to the contest winners a beautiful W.A.S. QSL Album with the call letters in gold. While this contest is principally for US Hams, foreign stations may participate. Details will be given frequently on Bill's V.O.A. Broadcasts.

The Contest will begin on *Saturday, September 20th at 1200 EST* and *end at 1200 EST on Sunday, September 21st, 1958.* (A 24 hour period.)

Simple Scoring: Total contacts times the number of States worked.

Bands: Any or all Amateur bands may be used, but a station may only be worked once. There is no multiplier credit allowed for multi-band operation.

Serial Exchange: Signal report plus consecutive number of contacts (59001) plus name of State. Foreign station will substitute his Country.

Eligibility: All SSB Hams. U. S. stations can count foreign stations including VE for contacts but not as a multiplier.

Prizes: A W.A.S. Album (including call letters in gold) to all State and Foreign *winners who have worked all 48 States* in the Contest period. Certificates will be awarded the top scorers in each State. Also certificates to five top scorers in North American

[*Continued on page 106*]

For further information, check number 52 on page 126.

MESSAGE TO ALL WHO HAVE SUBSCRIBED TO CQ:

CONGRATULATIONS, GENTLEMEN, on your shrewdness, your business acumen, your obvious display of intelligence. The editor thanks you. Suzy thanks you. For, besides being a clever way to save a lot of money, your subscription is also an encouragement to all of us to work a little harder to bring you a darned good magazine.

To those of you who have not voted yet you may fill out the ballot below:

Check One

☐ **CQ is great, keep up the good work.**

☐ **CQ is terrible, but I want to save money while I am waiting for it to improve.**

SB [*from page 104*]

Continent plus the top five in each of the other five continents.

Logs: To qualify, all logs must be received at CQ Headquarters by October 20th, 1958. There will be available from CQ official log blanks, but it is not necessary to use these particular forms. Talk this Contest up on the air fellows.

73, Bob, W3SW

CLUB BULLETINS [*from page 16*]

bers able to copy 15 wpm. R. McCoy, K9DZF, editor *SWANI NEWS,* S.W.A.N.I. A.R.C., sends in word of a club sponsored "WAS" contest. Members draw 1 fictitious QSL card from a box at each meeting. First to make "WAS" wins a prize. The DDD Dxer, Blackstone Valley A.R.C. Inc., runs a column describing a Jr. Member Plan, designed to provide young members with a course of instruction at a level that they can understand.

That's it for now. Next month more news. Until then, 73,

73, Marv, VE3DQX

MINIBEAM [*from page 31*]

tail a loss of efficiency, and this is true up to a point. Although a dipole can be shortened to half its normal length and still retain an efficiency of 95% it does not necessarily work out this way with shortened *beams.* It is generally found that a *16 ft.* short beam on 20m will produce a gain of 3db at the most. Increasing the elements to 22-24 ft. will provide a gain of perhaps 4-4½ db. Further lengthening to 26-28 ft. will provide about ½ to 1 db additional gain and the performance will then be practically identical with that of a full size beam. This technique *can* be used with the Minibeam if site conditions permit the use of longer elements.

For example, the reflector and driven element can be lengthened to 26 or 28 ft. so as to slightly increase the 20m. gain. The reflector will then have excess inductive reactance on 15 metres, but this can be corrected by shortening the 15m 'Quarter wave shorting stub' till it has a capacitive reactance equal and opposite to the inductive reactance which it is desired to eliminate. Ten metre resonance can be maintained by means of a condenser as in Fig. 3. The disadavantage of this approach is that there will be interaction between the tuning on the three bands, so that adjustment becomes rather laborious, and it is doubtful whether the extra db or so of gain really justifies the extra work involved.

With the normally recommended element lengths the quarter wave shorting stubs effectively isolate the twin boom loading on ten and fifteen metres respectively, so that no interaction occurs and tuning adjustments are delightfully simple. ■

do you like for feeding a dipole or folded dipole? (Transmitter has a pi final.)"

I would (and do) use an unbalanced line for the dipole (72 ohms) and balanced for the folded dipole (300 ohms). Of course I also use baluns! There have been many discussions relative to various types of transmission lines to be used with a pi final, but little resolution of the problem. Characteristic impedance termination is the important factor in the choice of any transmission line. Most well designed pi networks will cover a large range of impedances when both inductance and capacity can be adjusted for proper match. However, the pi circuit (L or Z) does *not* guarantee maximum power transfer unless the antenna itself is *properly* terminated.

813 GG Linear

Why, we do not know, but we have recently received numerous requests for a circuit of an 813 in grounded-grid linear (class B). We have not designed and/or built one of these and have furnished purely "guestimate" information which we cannot guarantee. If any of you *have* designed and built such a final which works using an 813, how about letting us have full information so we can pass it on and make a few SSB boys happy?

Question of the Month

"Can you give me a diagram of a receiver matching device which will match my receiver's input impedance of 300 ohms to a 72 ohm coaxial feeder and be effective on 10 meters?"

See Figure 2. The unit is adjusted by screwing the coil slug (in or out) and tuning the variable midget condenser for maximum S reading on a *steady* 10 meter signal. Shorting out the unit will show the effectiveness of the match. Coverage for other bands is possible by changing coil L-1 and substituting one wound for the desired band. Coil winding information is usually supplied with the *National* form.

Thirty

We wish to thank those readers who wrote in commenting on the article in the May mobile issue of *CQ* on noise elimination. It seems that we helped a large number of VW owners who have "gone mobile." We are glad! We hope you will continue to use HAM CLINIC'S service and we will do our best to assist you with your technical problems. We are *not* "world hotshots" but we are sincere in our effort to do the best we can. Again, if you have some technical tip or information which would help another fellow ham, send it to us for publication.

73, Chuck, W6QLV

BOKSHOOP

1 Electronics & Radio Eng. by Terman
1078 entertaining educational pages, this one is a gotta for every hamshack, too bad it's so expensive **$13.50**

2 E. E. Handbook by McIlwain
1618 pages, a better buy per pound than Terman, but it gives just formulas, tables & circuits, not so much explanation **$10.00**

3 Cybrenetics by Weiner
No reason to buy this one except it is a classic & the title is visible from 10 feet. Confusing **$3.50**

4 Electronics Manual for Radio Engineers
You'll never find twice as much book for half the price, guaranteed rouser . . . almost a corker **$14.00**

5 Antennas by Kraus (W8JK)
Handy if you ever plan to understand antennas..... **$10.00**

7 SOS At Midnight by K6ATX
Ham adventure book, dunno why we advertise it here **$2.75**

9 License Q & A Manual
Newest dope on commercial licenses, become a professional for **$6.00**

11 Radio Handbook by W6SAI
Another guaranteed rouser, great book, hundreds of build-its, a hamshack gotta, this is *the* book..... **$7.50**

13 Reference Data, 4th Edition
1152 pages of pure data, data, data . . . facts..... **$6.00**

16 Ham Register by W3VKD
Honest, no shack is complete without this, real interesting **$5.00**

20 RTTY Handbook by W2JTP
A-Z of ham Teletype, supply running out, very popular **$3.00**

21 VHF Handbook by W6QKI.
Covers just about every aspect of VHF..... **$2.95**

22 Beam Antenna Handbook by W6SAI.
Practical, includes both theory and construction..... **$2.70**

23 Novice Handbook by W6TNS.
Receiver, transmitter and antenna theory and construction for the Novice and Technician. Terrific..... **$2.85**

24 Better Shortwave Reception by W6SAI.
Fine handbook for SWL'ing, long needed **$2.85**

25 Mathematics for Electricians & Radiomen by Cooke.
This is the standard text book in this field..... **$5.50**

26 Surplus Radio Conversion Manual I.
BC-221, 342, 312, 348, 412, 645, 946, 1068A. SCR-274, 522. TBY, PE-103, etc..... **$2.50**

27 Surplus Radio Conversion Manual II.
BC-454-459 Xmtr-Rcvrs; APS-13; ARC-5 VHF Xmtr-Rcvrs; BC-357, 946B, 375; TA-12B; ART-13; AVT-112A; GO-9; LM; etc. **$2.50**

28 Television Interference by Rand.
Latest complete dope on licking TVI..... **$1.75**

29 QSL Album for WAS by Hanover Products.
Mount your 48 cards for display..... **$3.50**

30 Miniature Call Letter License Plate.
No ∅ available, sorry..... **75¢**

31 Western Radio Amateur
Years subscription only **$2.00**

Permission granted to use separate paper if you want.
OK fellas, send me postpaid the items circled, and get a move on.

1	2	3	4	5	9	7	11	13	16	20
21	22	23	24	25	26	27	28	29	30	31

Name..... Call.....

Address.....

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

Cash, check or money order enclosed, of course.
N.Y.C.'ers add 3% for Wagner

Radio Bokshoop

1379 East 15th St., Brooklyn 30, N. Y.
Patronize Ham Industry, bub.

PRICES REDUCED!

Amplifier—Easily converted to 6 watt mobile P.A. Complete with 3 6V6 and 12 Volt dynamotor (250 volt)—50 MA) output, Exc. **$3.45**
2 for **$6.95**

ARB/RCA SIX TUBE all purpose super het Receiver covering 195 Kc to 9000 Kc including weather, lighthouse, aircraft radio range broadcast, marine and amateur 160 meter, 80 meter, 75 meter and 40 meter, with tubes and 24 volt dyno. Exc. **$17.95**

See June 1958 "CQ" for conversion

BC-659 FM Receiver-transmitter, xtal controlled, two channels, freq. range 27-38.9 Mc, 13 tubes, built-in speaker, dual meter for testing filament and plate circuits.
Exc. **$6.95**
New **$12.95**

BC603. Ten Channel Push-Button on continuous tuning FM Receiver 20 to 27 Mc, complete with tubes, speaker, squelch circuit.
Brand New **$12.95**
Exc. ..... **$ 6.95**
Used ..... **$ 4.95**
Ideal for spare parts
12 Volt Dyna for above receiver Exc. **$2.95**

BC 603. Same as above except to 20 to 27 Mc **$6.95**
12 Volt Dynamotor for above receivers. Exc. ..... **$2.95 ea.**

$45.00 Hi-Fi Headset

Uses annular grooved plastic fibre cones with voice coils as in speakers, and rubber ear pads to obtain spacing for correct accoustical load. GIVES FINEST MUSIC REPRODUCTIONS! Input 300 Ohms per unit or 600 Ohms when wire series.

BRAND NEW **$9.95**

Less Headband **$6.95**

BC669. Six Channel Crystal Controlled, 50 Watt Radio Telephone, 1600 to 4500 KC. Ideal for boats or land station, less power supply.
Used **$59.50**

BC453 Command Receiver 190 KC 550 KC complete with tubes and dynamotor.
Exc. **$12.95**

WRITE FOR NEW BULLETIN

Quantity Prices

25% Deposit required with orders

R W ELECTRONICS

2430 So. Michigan Ave., Chicago 16, Ill Dept. CQ
Phone: CAlumet 5-1281

For further information, check number 32 on page 126.

HAM ALARM [*from page 51*]

signal is achieved with the plates of C_1 wide open, L_1 has too much inductance. Screw the slug counterclockwise, or remove a few turns from the coil. When properly adjusted, resonance of the L_1-C_1 circuit will occur with the plates of C_1 about 50% meshed. After the input circuit has been tuned up, a similar adjustment for the L_2-C_2 combination is in order.

Remove the headphones from J_1. Whistling into the mike should now cause the relay to close, after a short delay occasioned by the time constant of the CH_4-C_8 circuit. You can now give the Alarm a final test by checking it out with the signal of another local station.

It is possible that the contact spacing and spring tension on the relay may have to be reset. Reducing the spring tension will increase the relay's sensitivity. Likewise, the closer the armature is to the pole piece, when the relay is not energized, the greater will be the sensitivity. On the other hand, increasing the spring tension and armature to pole piece spacing will reduce the sensitivity. Optimum performance will be achieved when the relay is working at a point where a low power station a couple of miles away is just able to set off the Alarm. Selectivity of the unit is broad enough so that a local station several kc off the calling frequency will still be able to activate the relay.

If more than two amateurs in an area decide to use Ham Alarms, all units will respond whenever a call is made. This effect can be mitigated by assigning a special ring to each station, as is done on a party telephone line. Short letters of the Morse alphabet (for example: a, n, u, d and t) may be employed for this purpose. The calling station can then whistle the letter of the particular station he wants to make contact with. An oral identification should always be included with such transmissions.

Even though there may be no hams in your immediate locality, you can still make use of a Ham Alarm. By omitting the CH_4-C_8 filter circuit, and by adjusting RY_1 for maximum sensitivity, you'll be surprised at the small amount of signal required to actuate the device. Any well modulated carrier of the S9 to S9 plus variety will operate the relay. Thus, the BC-357 can be used to monitor a state net frequency for daytime activity or to detect the presence of mobiles passing through your neighborhood. The unit can also be employed to keep tabs on a band which has relatively little activity. For example, if you like 160 meters, but only find an occasional station on the air, you can allow the Ham Alarm to take over the job of informing you whenever a good workable signal is coming through.

Whether you live in a built up metropolitan area, or in the wide open spaces, the Ham Alarm will prove to be a truly useful addition to your shack. ■

RULES [*from page 32*]

2. To the station having the highest All Band score (more than one band) in the following areas.
   a. Each call area of the U.S.A.
   b. Each call area of Australia and Canada.
   c. All other countries.

XI. SPECIAL AWARDS:

1. A cup will be awarded to the highest scoring Single Operator, All Band, Phone Station in the world. (*Donated by W2SKE*)
2. A cup will be awarded to the highest scoring Single Operator, All Band, CW Station in the world. (*Donated by W21OP*)
3. A cup will be awarded to the highest scoring Multi-operator, All Band Phone Station in the world. (*Donated by K2AAA*)
4. A cup will be awarded to the highest scoring Multi-operator, All Band CW Station in the world. (*Donated by K2GL*)
5. A plaque will be awarded to the affiliated DX Club submitting the highest aggregate score of the scores submitted by its members. (*Donated by CQ*)

[*Continued on page 112*]

All Band Entry [X] Phone [ ] Station Call Letters W2JB

Single Band Entry [ ] CW [X] Number of Operators 1

CQ WORLD-WIDE DX CONTEST

Band	QSO's	Zone Multipliers		Country Multipliers		Points		Score	Band
1.8 MC	2	2	÷	2	x	1	=	4	1.8
3.5 MC	10	5	÷	4	x	18	=	162	3.5
7 MC	15	6	÷	10	x	33	=	528	7
14 MC	18	7	÷	13	x	45	=	900	14
21 MC	20	10	÷	12	x	60	=	1320	21
27 MC	5	3	÷	3	x	5	=	30	27
28 MC	30	17	÷	18	x	80	=	2400	28
TOTAL	100	45	÷	62	x	242	=	25,894	All Bands

INSTRUCTIONS: To determine All Band score, total each column with the heavy lines. Single band stations are permitted to operate on more than one band. However, indicate and total ONLY the band you wish judged.

...ifier Description and Power _____

...ub Participation _____

This is to certify that in this contest I have operated my transmitter within the limitations of my license and observed fully the rules and regulations of the contest.

B. Lazarus

Benjamin N. Lazarus — W2JB
Name — Call

173 West 78th Street
Street and Number

New York 24, N.Y.
City — Country

Logs must be postmarked not later than December 1, 1958 for Phone section and January 15, 1959 for CW section.

Submit logs to: CQ Magazine, 300 West 43rd St., New York 36, N.Y. Att: Contest Comm.

This is a typical contest report form. Note pledge which must be signed.

RULES [*from page 111*]

a. For a club to enter, an officer of the club must submit a list of its participating members and their scores.
b. This list may include scores of Single operator and Multi-operator stations; both Phone and CW.
c. Stations that are members of a competing club therefore must indicate this fact on their report forms.

6. At the request of the donors, previous winners are not eligible for the 1958 awards. In other words the cups cannot be won more than once by the same station. This however, does not apply to the plaque award.
7. Also such special or additional awards as the Committee shall choose to make. In countries or sections where the returns justify, second and even third place certificates may be awarded.

XII. OPERATING SUGGESTIONS:

1. Foreign amateurs; remember, scores are based on the greatest number of Countries and Zones as well as stations worked. Therefore do not concentrate on working only U.S. stations. This is a world wide competition.
2. DX stations; it is recommended that you give the call of the station you are working at the end of each transmission. This will prevent confusion.
3. Overseas phone operators; it is strongly recommended that you indicate which portion of the phone band, American or foreign, you intend to cover.
4. CW stations; calling on or off the frequency of the DX station, must be left up to the individual operator. This is generally governed by the technique of operators at the DX station.

XIII. LOG INSTRUCTIONS:

1. In keeping log, fill in Zone number and Country, **ONLY FIRST TIME** it is contacted on each band.
2. Use a separate sheet for each band and a final tally sheet or report form.
3. Keep all times in **GMT**.
4. All contestants are expected to compute their scores. Logs should be checked for contact

[*Continued on page 113*]

RULES [*from preceding page*]

duplications and proper point credit before they are submitted.

5. Make sure name and address is clearly noted on each log. Print or type.
6. Each contestant must sign a pledge that all rules and regulations have been observed. Note sample contest report form.
7. If official log forms are not available, it is hoped that a duplicate form as illustrated will be used. The size is 8½" x 11" with 52 contacts to the page.
8. Copies of the Zone and Country list and log report forms are available from CQ, address listed below. Send a self addressed stamped envelope, or in the case of overseas stations, IRC coupons. Make sure to include sufficient postage, state how many sheets are needed and allow sufficient time for mailing.

WORLD-WIDE DX CONTEST LOG

CALL [illegible]
LOG FOR 14. MC BAND
COUNTRY U.S.A.
CALL LETTERS OF OTHER OPERATORS - - -
PHONE ☐ CW ☒
NR. OPERATORS 1

DATE (GMT)	TIME (GMT)	STATION	SERIAL NUMBERS SENT	SERIAL NUMBERS RECEIVED	ZONE	NAME OF COUNTRY	POINTS (1 or 3)
Nov. 29	0210	W1GTE	56905	55905	5	U.S.A.	–
"	15	XE2PA	59906	58906	6	Mexico	1
"	20	W6JJF	59905	57903	3		–
"	25	CX2CO	58905	58983	13	Uruguay	3
"	0310	KV4AA	59905	59908	8	Virgin Is.	1
"	15	KH6IJ	57905	56931	31	Hawaii	3
"	30	CE3AG	57905	57912	12	Chile	3
"	1200	W4KFC	56905	55904	4		–
"	05	VE3API	55905	55904		Canada	1
"	15	4S7WP	55905	55922	22	Ceylon	3
"	30	JA1AA	55905	44925	25	Japan	3
"	2200	GW3ZV	59905	57914	14	Wales	3
"	10	F9RS	57905	56914		France	3
"	15	DL7AA	57905	56914		Germany	3
"	20	DJ1BZ	57905	56914			3
Nov. 30	0110	4X4JR	56905	55920	20	Israel	3
"	15	OK1JX	57905	56915	15	Czech'vkia	3

TOTAL NUMBER ZONES, COUNTRIES, POINTS: 13 | 14 | 36

A typical log sheet

XIV. RULE CHANGES:

The minimum operating time has been increased to 12 hours for single operators and 24 hours for multi-operated stations. This is a contest, not a leisurely weekend at your hobby.

The Committee is also going to be more critical regarding the observations of the rules and the keeping and scoring of your logs.

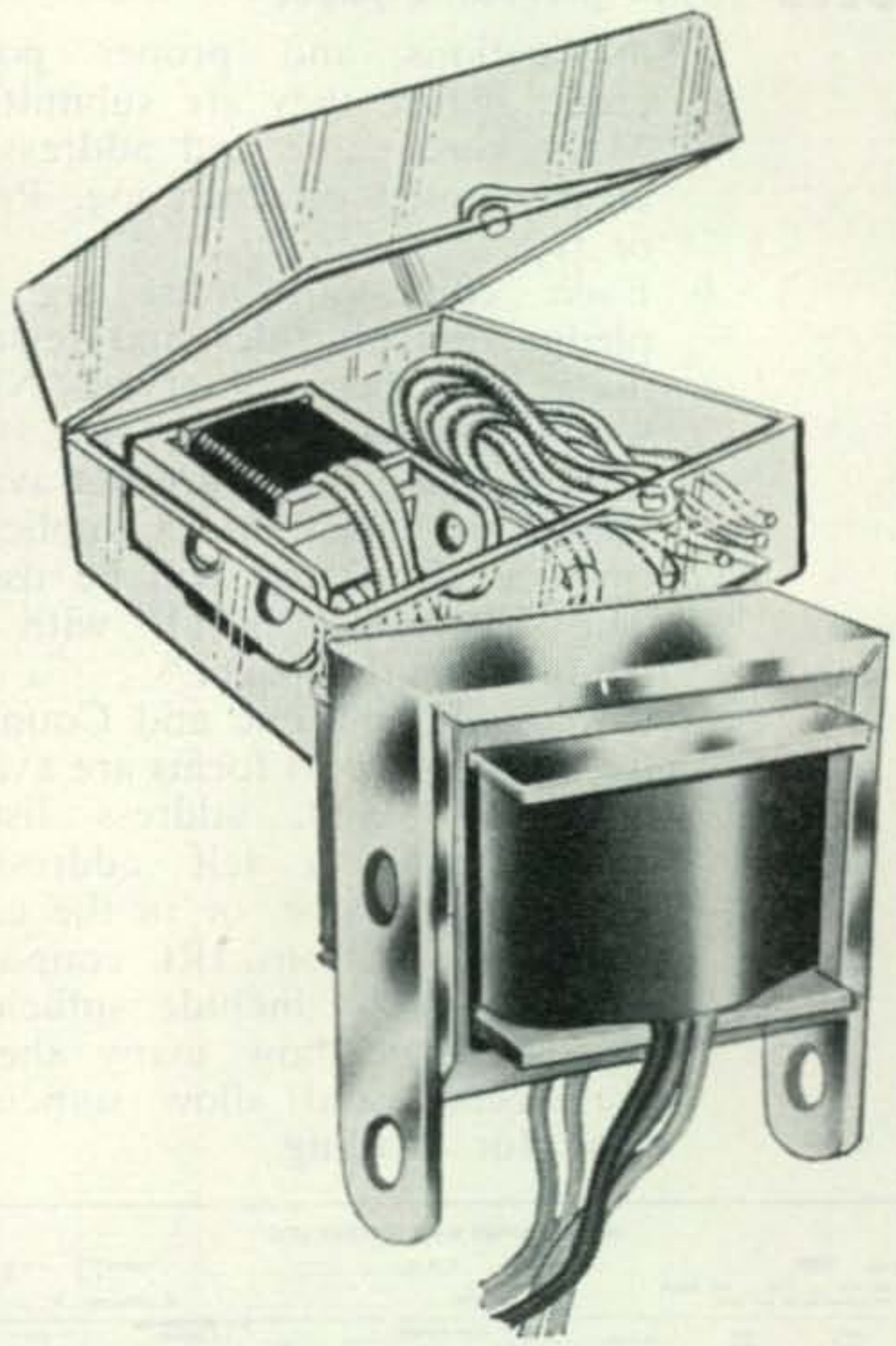
XV. DEADLINE:

All logs must be postmarked **NO LATER** than December 1, 1958 for the Phone Section and January 15, 1959 for the CW Section.

Send all logs directly to:

CQ Magazine
300 West 43rd St.,
New York 36, N. Y.
Att: Contest Committee

SEMICONDUCTORS [from page 67]



An interesting new line of transistor transformers is available from Lafayette Radio. Price? Only 79 cents each! See text for more details.

are offering a thermistor kit for experimenters. The kit contains two glass probes, three beads, two disc, three rods and two washer types. Each thermistor is separately packaged in its own matchbook cover and complete performance data is imprinted on the cover. A free catalog sheet describes these units fully. The price of the kit is $19.95 or they may be purchased separately.

Mr. Seymour Schwarts, President of Transistor Applications, Inc., 50 Broad St. Boston, Mass. announces that contract NObsr-75231 was recently awarded their company by the Department of the Navy, Bureau of Ships, for

the compilation and publishing of a Semiconductor Selected Circuits Handbook. The purpose of this manual will be to assist better engineering practice in the design and reliability of military equipment, as well as to standardize semiconductor engineering presentations. Industrial concerns, government organizations, educational institutions and individuals working in the transistor circuit field are invited to submit circuits for the handbook. Contributors will receive full recognition by including the name of their organization, as well as the originator, with each circuit. It is planned that this manual will become a permanent source of circuit reference, design procedure, as well as a basis for standardization of the semiconductor circuit symbols.

73, Don, /W6TNS

DX [*from page 64*]

KB6BH—Chuck Singletary, Box 653 USPO 06-50000, Canton Island, Phoenix Group, South Pacific.
PJ5CB—QSL to G3EIX.
SVØWB (Rhodes)—John W. Lowther, USCG Courier, APO 223, New York, N. Y.
SVØWE (Rhodes)—Henry B. Wood, USCG Courier, APO 223, New York, N. Y.
SVØWK (Crete)—Gleneth B. Berry, 6938 RSM, APO 291, New York, N. Y.
SVØWN (Crete)—Clyde S. Geist, 6390 RGM USAF, APO 291, New York, N. Y.
SVØWT (Crete)—MARS 6938 RSM, APO 291, New York, N. Y.
SVØWZ (Crete)—Ward E. McNeal Jr., 6930 RGM USAF, APO 291, New York, N. Y.
UA1KAE (all)—QSL via Box N-88, Moscow.
VK4AL—Ev Brown, Clontarf Beach P O, Redcliffe, Queensland, Australia.
VK9RR—Bob Hooper, Box 56, Port Moresby, Papua Territory.
VS9AJ—APL Signal SQDN, Aden.
XEØDOT—QSL to W6DOT.
XEØUUE—QSL to WØUUE, Fred C. Holzapfel, 5001 Olson Hwy., Minneapolis 22, Minn.
ZS8R—Archie Parkhouse, Leribe, Basutoland.
9K2AN—P O Box 736, Kuwait.

See you next month! 73, Don, W4KVX

The Ohio Valley DX Bulletins

If you would like much faster and more comprehensive DX news and articles than space in this column can permit, we suggest you try the Ohio Valley DX Bulletins, edited and published by W4KVX. Published weekly, for a total of 40 or more issues a year, it costs but $5 a year via second class mail, $6 via first class, and $7.50 air mail to U. S., Canada, and Mexico. Foreign rates are $4 plus postage. Write W4KVX (address at the head of the DX column) for further details or for your membership to this excellent service. Sample copies may be had for the asking.

CONTEST CALENDAR [*from page 76*]

received and each new district worked. Use a separate sheet for each band. Rules in details were published in the July Calendar.

Your logs must reach the N.Z.A.R.T. Contest Committee, Box 489, Wellington, New Zealand, not later than January 23, 1959.

PERUANO

This is a Panamerican contest and activity of course is limited to the American continents only. Altho last year's operation was mostly on phone, more CW activity is promised this year. So this offers a good opportunity to fatten up your "WAA" total.

Contest starts at 1200 EST on Saturday and ends at 2400 EST on Sunday. Rules in detail in last month's calendar.

Logs should be mailed within 20 days to: Radio Club Peruano, Att: Pres. Comision Concursos, Casilla 538, Lima, Peru.

CQ WW DX

See page 32 this issue for complete rules. No changes from last year's rules with exception of VIII. Scoring: ♯6 ♯7. The minimum operating time has been increased to 12 and 24 hours respectively. Since the contest extends over a 48 hour period, we feel justified in making this change.

ARRL SS

This one has been around a long time, now in its 25th year, so needs no introduction. Altho strictly a home affair, the activity is terrific. Over 2000 entries were received in the last one. See "you know what magazine" for details.

Ed. Comments

All certificates for the 1957 World Wide affair have been mailed, along with a complete list of scores, rules for the 1958 contest and sample log and report form. As a suggestion to you certificate winners: why don't you mail the score and rule sheets to some overseas friend after you have absorbed the contents. Especially to someone in those rare spots.

Recently I had the pleasure of being interviewed by Bill Leonard, W2SKE on his Voice of America program. Naturally we talked about the CQ World Wide DX Contest and covered the results of the CW section. The V.O.A. program is on every Tuesday at 2100 GMT. It can be picked up almost anywhere in the world since a flock of different frequencies are used. Wonder if any of you fellows happened to be tuned in.

Incidentally a very interesting article on "ham radio" and contests appeared in the June 30th issue of Sports Illustrated magazine. Try to dig up a copy, its worthwhile. That's all for this time.

73, Frank, W1WY

"OHIO 24" [*from page 27*]

of the true amateur spirit which prevails among the members of our fraternity.

The headquarters station, K8EEN (Mount Vernon Amateur Radio Club station) was located in the rally headquarters room on the second floor of the Curtis Hotel in downtown Mount Vernon. The station equipment used belongs to the club members, because as yet the club has no equipment of its own. (A club room is being prepared at present, and when completed equipment will be the next order of business.) The rig consisted of a World Radio Laboratory 500-B transmitter, a Hammarlund HQ-129X receiver, and a half wave dipole antenna located on the hotel roof. The frequency used was 3860 kc. (plus or minus depending on conditions) with an alternate 80 meter cw frequency and an alternate 40 meter frequency. Fortunately the alternate frequencies did not have to be used, in spite of terrific QRM and QRN.

Unfortunately the first schedules which were on Friday morning were not too successful from K8EEN. We had planned for such problems by having an alternate base station in Mount Vernon. This station, W8NTP, had to do most of the traffic handling Friday morning. We were sure that conditions would be no better during the schedules to come, so we must remedy the situation. The antenna would not take the rf, so I was feeling a little uneasy, because the antenna had been my baby. We checked to see if the coax was shorted or open, and it wasn't. Some decided the flat-top was not the correct length; I argued it was. Finally after many trips to the roof (W8PEN, W8OPU, and I became very familiar with the topography of the roof) we arrived at the solution. The flat-top had to be placed very near the roof (which was flat) with the ends folded, making them pass through a small tv antenna farm. With the aid of a forward and reflected power meter we discovered that the formula for the length of a half wave dipole is fine in free space, but does not take into consideration the obstacles encountered on a hotel roof. Though the antenna was the correct physical length (according to formula), the close proximity to the roof (2 to 4 feet in most places) and to the tv antenna farm made it appear too long. We shortened the antenna 4 feet, straightened out the ends, and dropped one end over the side of the hotel. Test runs with stations throughout the state indicated we now were boring through the 75 meter rat race very well. The Friday evening schedules and all succeeding ones were met with little difficulty except the usual 75 meter QRM and QRN.

The event involved a lot of work (and problems), but a very gratifying experience. We have learned a lot in the past two events; maybe next year the operation will be even more efficient.

W2NSD [*from page 10*]

since the band opened back in 1946 and have put in quite a bit of time on cw on that band. The band is sufficiently wide, even in the heart of New York City which is certainly the most congested two meter area in the world, to permit cw operation without undue QRM at all times. There is a gentlemen's agreement that the lower end of the band will be left for cw when conditions are good for that mode of operation and very few operators have caused trouble to the serious cw DX'ers.

Frankly, I'm against setting up rules and regulations for every little whim. We could do very well with a lot less rules and depend more on a regard for others. Once these rules get on the books they stay there forever.

So, you fellows who are using six and two meters, here is your chance to take your own interests to heart. The chaps who are trying to get this rule will largely be heard when the band is open and will not be talking to locals. They certainly will not be doing anything much to qualify as being in the Public Interest (PICON). And when the bands go dead again you will have nothing but the 100 kc monument to remember them by.

The six meter gang will be hit even more than the two meter contingent since they are mainly gathered in the bottom 200 kc of the band now. This will essentially take away half of their presently used band and will force them to move up higher in frequency where the TVI demons cast their spell with fervor.

Reciprocation

A 21-gun salute to J. Bruce Siff, W2GBX who on April 28th sent a petition to the FCC with over a hundred signatures of licensed amateurs. Here is what it said . . .

"We, the undersigned, being interested in attempting to promote goodwill and further amateur radio operation between all countries of the world, do hereby petition the Federal

[*Continued on page 119*]

FLASH!

We just got a wire from E. F. Johnson that a brand new catalog on the complete Johnson line of ham equipment is rolling off the presses. You won't want to miss this one, so write immediately to Bill Bruring, W9ZSO, E. F. Johnson, Waseca, Minnesota for Catalog #209. This will make sure you get one while they last.

11 METER RESULTS [*from page 88*]

Hawaii
KH6PM —13,284
KH6CKO— 1,326

Labrador
KØMNJ/VO2 — 2,660

Mexico
XE1QB — 231

Puerto Rico
KP4AEB—20,034

N. Zealand
ZL1MQ — 3,232

Uruguay
CX3BH — 1,200

Venezeuela
YV5ABD— 5,112

UNITED STATES — CW

Alabama
K4ANB — 561

Arizona
W7PZ — 336

California
K6LVT — 6,437
W6ETJ — 4,339
K6SXA — 3,939
W6EYH — 2,871
W6ASH — 2,706
W6UYK — 1,958
W6JAI — 640
W6ZOL — 416
W6SRT — 260
K6ICS — 56

Colorado
WØCDP — 3,600

Connecticut
W1ODW — 2,277

Dist. of Col.
W3III — 285

Florida
W4IEH — 3,024

Georgia
W4ZKU — 3,128

Illinois
W9NII — 4,212
W9UNG — 247

Iowa
KØAZJ — 1,040
KØDQI — 742
WØQUZ — 1

Kansas
WØVFE — 608

Kentucky
W4JBQ — 1,170

Maine
W1GKJ — 1,485
K1AKO — 168
W1HAG — 143

Maryland
W3MSR — 1,620
W3JO — 480

Mass.
W1AQE — 3,330
W1CTW — 1,647
W1KT — 1,485
W1DDO — 989
W1PLJ — 28

Michigan
W8CFA — 45

Minnesota
WØQDP — 242

Mississippi
W5PGG — 15

Missouri
KØGJD — 300

Montana
W7DXM — 25

New Hamp.
W1BFT — 4,368

New Jersey
W2EQS — 7,266
K2PTU — 2,133
W2QDY — 850
W2BVE — 210
W2CVW — 30

New Mexico
K5IQA — 378

New York
W2CJM — 3,774
W2DGW — 3,400
W2HAE — 1,534
K2KND — 8

Ohio
W8AJW — 4,536

Pennsylvania
W3VDV — 2,890
W3VKD — 1,798
W3ARK — 1,450
W3CGS — 840
W3HTF — 630
W3DAO — 592
W3DYL — 558

Tennessee
W4WBK — 20

Texas
K5ABV — 3,498
K5AUZ — 1,750
W5VGR — 476
K5GTH — 98
W5GSE — 88

Virginia
K4OMR — 60

Washington
W7EMY — 4,255
W7SRX — 1,820
W7PQE — 368

West Virginia
W8UMR — 4

Wisconsin
W9YNB — 989
K9ELT — 104

Canada
VE4SX — 2,640
VE2AKF— 702
VE3RN — 221

Alaska
KL7JDC — 3,328

Costa Rica
TI2CAH — 20

New Zealand
ZL1MQ — 468

Puerto Rico
KP4KD — 4,200

W2NSD [*from page 118*]

Communications Commission to investigate into and report on the legislation necessary to allow reciprocal licensing of foreign amateurs in the United States."

I know I'm speaking for every amateur in the country when I say "thanks Bruce."

Word To The Wise

Ponder this, you phone men on the DX bands: suppose someone should make a tape of your next transmission. Could it be used as living proof that the hams don't deserve to have all those frequencies?

3 3 3 3 3 3 3 3 3 3
3 3 3 3 3 3 3 3 3 3
3 3 3 3 3 3 3 3 3 3
3 3 3 3 3 3 3 3 3 3
3 3 3 3 3 3 3 3 3 3
3 3 3 3 3 3 3 3 3 3
3 3 3 3 3 3 3 3 3 3 3, Wayne, W2NSD

Cont. on Next Page

The Ham Shop

RATES: 25¢ 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

BARGAINS: WITH NEW GUARANTEE: KWS-1 $1,399; Collins 30K-1 $550; Johnson KW and desk like new $1195; S-72 $49.50; Hallicrafters HT-30 $349; HT-31 $299; HT-4 with speech amplifier and antenna tuner $695; NC-98 $119; NC183D $329; NC-300 $319; HQ-129X $159; Lysco 600 $69; Eldico SSB-100 $395; BW 51-SB $195; BW 51-SB-B $185; BW L-1000-A $295; Ranger $199.50; Phasemaster II $239; Gonset Linears (2M) $99. (6M) $119; Globe King 500 $425; Globe King 500A $455; Communicator II 6 meter $179; Johnson Rotomatic $125. Free trial, terms, write Leo, WØGFQ for best deals. World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

CRYSTALS AIR MAILED: Novice, general, net, mobile, FT-243. Any kilocycle, 3500 to 8600 $1; Thin Gonset $1.45; 1700 to 3499 $1.75; 8601 to 21,500 $1.95; Tested lattice filter crystals 25¢. Write for general crystal list. Crystals since 1933. C-W Crystals, Box 2065-c, El Monte, Calif.

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 H-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.

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.

MULTI-BAND ANTENNA, 80-40-20-15-10, $21.95. Patented. Send stamp for information. Lattin Radio Laboratories, Owensboro, Kentucky.

TRANSMITTERS, PARTS, METERS. ARC-5, 5.3 to 7.0 Mc. Transmitters and VFO's brand new $6.95. Crystals, including novice frequencies $1. 7500 V. CT plate transformers $9.95. Parts and equipment of many kinds. Write for list. Box Woods, W6KEG, 2164 Parkway, El Monte, Calif.

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.

TWO-WAY COMMUNICATIONS: Mobile, Industrial, Aviation. Free catalog. RCE, 520 S. Virginia, Reno, Nevada.

ATTENTION MOBILEERS! Leece Neville 6 volt 100 amp. system alternator, regulator and rectifier, $45. Also Leece Neville 12 volt 100 amp. system, alternator, regulator & rectifier, $85. Gonset Communicator 3058-B, 6 meter 12 volt and 110. $170. Perfect condition. Herbert Zimmerman, Jr., 115 Willow St., Brooklyn 1, N.Y., K2PAT, ULster 2-3472.

ALUMINUM FOR THE HAMS who want the best for less. Write for list of angle, channel, plain and perforated sheet, castings, fasteners, beam kits, etc. VHF collinear arrays $14,20 up. Six and ten meter beam specials $15.95. Dick's, W8IJL, Cherry Avenue, Route 1, Tiffin, Ohio. Successor to Radcliff's.

FOR SALE: Perma-Guy—the lifetime Polyethylene guy line. 3/16"—700 lb working. $4.98 per 100'. Stamp for sample. Labtronix, 5208 Baltimore St., Los Angeles 42, Calif.

CLEANING HOUSE: New tubes: 304th, $15; 250th, $18; 4x150A, $15; 829B, $7.50; 832A, $4; Drake Hipatch, $20; B&W 380B, TR sw, $15; Millan RGer & 15, 20 coils, $15; Multimatch mod. & driver xformers, 811A's etc.; both $25; 3000 volt C.T. @ 300 ma. cased, $15; 2100 V. 300 ma. for bridge, cased, $12. Alliance U83 TennaRotor perfect, $18; Multiphase MM1, perfect $70; Collins large gear knob, $10; sealed relays, 4 asst'd, $5. Halliday, K6HQ, 5208 Baltimore St., Los Angeles 42, Calif.

AMATEUR ELECTRONIC SUPPLY, Wisconsin's largest ham distributor, has moved to 3832 West Lisbon, Milwaukee. Write for free used equipment lists.

FOR SALE: Clean 75A2 w/calibrator and speaker $315. Phasemaster II with Bandhopper VFO perfect GG driver trade for 75A3 or sell. Byars, WØBNF, P.O. Box 105, Kearney, Nebr.

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.

EASY PATCH quality guarantees Voice Controlled Phone Patch operation. $24.95. DuoDens Products, Inc., Suite 101, 317 S. State St., Ann Arbor, Mich.

FOR SALE: ELMAC PMR 6A rcvr with TNS $75; 12 v pow sup, $15; Johnson Mobile xmtr $70; mobile VFO $25; Dynamotor with filter, 12 v—400v/400 ma $10; or $170 takes all. FOB, NYC, Bill Herzog, W2KOO, 31-32 104th Street, East Elmhurst 69, N. Y.

FOR SALE: Six or 2M Phone transmitter, 100 watts complete with mike, crystal, power supply, TVI'd—New, beautiful cabinet $99.50. Have ten, guaranteed 1 yr. Free catalog sheets, bargain lists. KØKJX, L. P. Jackson, 645 Marshall, St. Louis 19, Mo.

TUBES: Brand new 813's $7.50; 832A $4.75, 3E29 (829B) $6; 2E26 $2.25; 4E27 $6.50; 872A $2; 866A $1.50; 5933/807W a hot bottle $1.50; 4-65A $12; 4-125A $15; Big bottles 4-1000A $45; 3X2500 A3 $50; 5593 $35; New BC-348 receiver $60; ART-13 transmitter, perfect condition $125 or trade, TBY transceiver, 10 and 6 meters $30; ART-13 modulation transformer $8.50; New 2000 V.C.T.—500ma plate transformer $22; BC-669 with power supply; transmitter-receiver, used on C.A.P. and 75 meters $90; other tubes, tech manuals, transformers, H.V. chokes, condensors, all guaranteed, C.O.D.'s OK. Bill Slep, W4FHY, Box 178, Ellenton, Florida.

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 SALE: BC779 Super Pro $70; E200 signal generator, $20, Dumont 241 scope, $75; RME-84 receiver 550 kc-44 mc, $50; world map, $1; surplus schematics, 25¢; Gonset 3008, 2 meter converter, $20. S. Consalvo, 4905 Roanne Drive, Wash. 21, D. C.

FOR SALE: Complete radio station yours at bargain prices. 1 NC-300 receiver, 1 Johnson Viking II Xmtr—350 watts—Johnson Viking VFO—1 Globe Scout Model 65 Xmtr—1 Vibraplex Speed Key, 1 CW Modulator—Other miscellaneous items yours for only $450 complete. Station will be sold separately if component parts desired. Delivery of either Xmtr or Receiver within radius of 250 miles. Contact Mrs. Merle Small, Colfax, Illinois for further information.

FOR SALE: Eldico TR75TV transmitter, completely overhauled, works fine. $22.50 plus postage. Sam B. Trickey, K5BDU, Box 5783, Denton, Texas.

FOR SALE: DX-100 with factory recommended keying modification, $175. Almost new HQ-110 in original carton, $200. WØGML, A. Verne Roberts, 5520 Porter, Wichita, Kansas.

VIKING 500: Good condition. One year old. $700 FOB Nashville. Reason for selling: trying to finish KW. Frank Schwartz, W4KFK, 2400 West End Ave., Nashville, Tenn.

SELLING OUT: Complete Collins KW-1 station, receivers, etc. Lewis, W3LXE, 37 S. Sixth St., Indiana, Pa.

FOR SALE [*Con't.*]

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: Monitoradio FM mobile receiver, 152-162 mc with squelch, good condition, original cost $72. Hallicrafters 5-10 receiver. Davis, W8KJ, 14,935 E. Warren, Detroit 24, Mich.

KWM-1 in carton $695; 75A-4 serial #4818 used 1 mo. $569; Drake 1-A $229; 6 KC mechanical filter for 75A-3, $25; Barnes, W8WGA, 3451 Ridge Ave., Dayton 14, Ohio. Phone—CRestview 7-0409.

HEATHKIT AR-3 with cabinet in good condition $30. Needs alignment. Write Bob Beals, 500 E. Adams St., Plymouth, Indiana.

FOR SALE: HQ-100 receiver with clock-timer and manuals $149, operating condition and appearance as new. Calkins, K6VRM, 5641 Dorset Way, Sacramento, Calif.

FOR SALE: Brand new factory wired globe linear and PA-1 Power Reducer $110. Cole, K4IZW, 4708 Wisconsin Ave., Tampa, Florida.

FOR SALE: 32V3 $429.50; B & W S1SB, like new, $174.50; Elenco SS-57 and 500W linear, $199.95; Morrow MBR-5, MB560, power supplies, $399.95. We buy as well as sell. H & H Electronic Supply, 506 Kishwaukee, Rockford, Illinois.

FOR SALE: BC-745-B complete w/ps PE-157 & tu BC-746 & btry, $50, R25/ARC5 1.5-3mc ex cond & convtd, $8; BC-1206-CM ex cond, $6; LW-61, 2 mtr converter 7-11mc IF, $10; BC-1066-B recvr in cabinet, $6; all cards answered, Rod Hogg, KØEQH, Minneapolis, Kansas.

FREE Kilowatt station brochure less items sold piecemeal. Johnson, W3BJI, 1804 Maltravers Road, Glen Burnie, Maryland.

FOR SALE: By popular demand we are again offering the pictures and step by step instructions for making the light, strong, G4ZU Beam. Works on 10, 11, 15 and 20. $1.50 postpaid. R. L. Kalmbach, W4IW, Hopkins, South Carolina.

HEATHKIT DX100—Excellent condition. First $175 takes it. Will not ship. L. M. Klentz, 825 Howland Wilson Rd., Warren, Ohio. Telephone 83651.

FOR SALE: Globe King 500C new condition. Used five hours—Push Talk Mike guaranteed perfect shape, price $600. Krantz, W8CHP, Box 261, Charleston, W. Virginia.

FOR SALE: Like new 400C Globe King with 40 mtr coils, WRL V.F.O. 755 and Brute force filter $325. Gonset Tri-Band Conv. $18; excellent super six conv. $30. All for $350. Herman Nobe, W9EWU, 812a. So. Church St., Belleville, Illinois.

RADIO PARTS, TUBES, some receivers, new & used. Free list. D. Reed, 1604 Grange Ave., Racine, Wisc.

ATT: DX'ers: Sell 57' Aermotor tower, 253 countries—$195 FOB QTH or delivered Chicago area, W9ABA, 1606 Lake Ave., Wilmette, Ill.

FOR SALE: Schematics for all military surplus units $1 each. Dave Rumph Co., P.O. Box 7167, Ft. Worth, Texas.

FOR SALE: Viking Adventurer, $30; Johnson low pass filter, $5; Dow coax relay, $5; Vibroplex Zephyr, $10. Thomas Scheller, 30 Seaman Ave., N.Y. 34, N.Y.

GONSET G-66 with universal power supply, $150; NC125, $130. Both excellent condition. Norman Welte, W7HJM, Hingham, Mont.

FOR SALE: Hallicrafter S53A receiver, new August 1957, $50; PP U.S.A., Richard Wirkkanen, R #1, Box 199, Ely, Minnesota.

FOR SALE: New, used 22 hrs. NC-109 plus 6 mtr. converter & power supply. Worth $225. Best over $175. Need money for college. Rick Wilcox, Goldwater, Michigan.

FOR SALE: Viking II with VFO and NC-183, all in good condition, $295. Mrs. S. G. Swartz, Rt. 2, Box 34, Las Cruces, New Mexico.

FOR SALE: HRO-60, four coils, extal calib. $335. B&W 5100-B, $345. BC-794-B, 1.25-40 Mc. $125. 75A-4, $525; FRA Converter $49. RME #4300, $125. 32V-2, $345. Viking II, $225; G-77 Trans. $195 complete; R-9 Recvr $119. Write Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. (Richmond 2-0048)

LIKE NEW: HQ-110c (clock) not a scratch on it. $170. Hank Steckler, 75-80 179th St., Flushing 66, N. Y.

FOR SALE: New HQ-170 and Hallicrafter SR-34, just purchased. Make reasonable offer. Need surplus HRO or BC-348. S. Louv, 107 Dwight Road, Springfield, Mass.

SELL COLLINS 75A4, $495; Hallicrafter HT30 SSB Exciter $295; HT31-500 watt linear amplifier, $195. All like new with instruction books. Young, W6UGH, 8209 Nada, Downey, California.

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: 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. (Richmond 2-0048, Stores: 278 Friend St., Boston, near North Station; 60 Spring St., Newport, R.I.)

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: 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.

WANTED Big dish wanted desperately, six feet or more diameter, solid or perforated, describe size and method of possible shipment. Want to break 1296 mc record, anyone interested? K2TKN, Box 97, Pluckemin, N. J.

WANTED: A good used Globe Scout, or DX-35, or similar transmitter. Please quote price, condition, and how long transmitter has been out. R. L. Wildman, 505 7th St., Phillipsburg, Kansas.

HELP: Need schematic or manuals to convert BC-624C (SCR522) receiver. Also schematic navy model CVR-50248 modulator-dynamotor unit. Bob La Brenz, 940 W. Hampton Rd., Essexville, Mich.

WANTED: All amateurs to attend the Hudson Division Convention at Albany, New York, October 10-12. Watch for detailed announcement later.

WANTED: Will pay $75 for HRO5, HRO7. Emil, K5JTP, Floresville, Texas.

QSL

QSLs ? ? ? LARGEST variety, samples 25¢. (refunded) CALLBOOKS (Latest) $5. Sackers W8DED, Holland, Michigan.

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: Samples, dime. Print Shop, Corwith, Iowa.

QSL SAMPLES. Dime, refundable. Roy Gale, Waterford, Conn.

QSL stock samples, dime. Give us a try. St. Louis Amateur Radio Club, Inc., 628 Buder Bldg., St. Louis 1, Mo.

For further information, check number 26 on page 126.

QSL [*Con't.*]

CREATIVE QSL & SWL CARDS. Are you proud of your card? If not, let us print your next order. Write for booklet and samples. Personal attention given to all requests. Bob Wilkins, Jr., Creative Printing, P. O. Box 1064-B, Atascadero, Calif.

QSL's for economy-minded hams. $4.65 for 500. Free brochure. K9EUF Print, 1839 46th Street, Rock Island, Illinois.

QSL's—"Brownie" W3CJI, 3110 Lehigh, Allentown, Pa. Samples. 10¢ with catalogue, 25¢.

QSL's-SWL's samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

FREE FLYER. DX QSL, Radio Coop., Box 5938, Kansas City 11, Mo.

QUALITY QSL's. Samples, 10¢. Lee, W5CZA, Box 7171, Oklahoma City, Oklahoma.

QSL's—Glossy. Samples 10¢, W1OLU Press, 30 Magoun, Medford, Mass.

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: We've printed a million. Samples 10¢. VYS QSLs, 1704 Hale, Ft. Wayne, Indiana.

MISCELLANEOUS

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.

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.

HAMS! In central Illinois it's Knox Electronic Supply, 67 North Cherry, Galesbury, Illinois.

HAMFESTERS RADIO CLUB announces its 24th annual picnic, to be held Sunday, August 10, 1958 at Santa Fe Park, near Chicago. See July Hamfest Calendar or write Mongeau, W9TJP, 245 E. 136 St., Chicago, Ill.

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.

RADIO MAGAZINES. Buy, sell, trade. Bob Farmer, Plainview, Texas.

SWAP OR SELL

Will trade model 26 teletype in excellent condition for late model speed graphic camera or make cash offer. Bill Keely, W8QDS, 1130 Lincoln, Ann Arbor, Michigan.

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

PROPAGATION [*from page 69*]

pected to begin to pick up during late August and early September. DX openings to many areas of the world are forecast during the afternoon hours, while short-skip openings are expected to occur almost daily. Good world-wide openings are forecast for *15-meters* during the late afternoon and early evening hours, with the band expected to remain open around-the-clock to some areas when conditions are better than average. Frequent short-skip openings, between approximately 400 and 2400 miles, are also forecast for August. *Twenty-meters* continues to be the best band for DX during the evening and early morning hours. Good openings are forecast to almost all areas of the world. During the full daylight hours seasonally higher ionospheric absorption will limit *20-meter* openings to less than approximately 2200 miles. Some night time and early morning DX may be possible on *40-meters,* but during the daylight hours openings will usually be limited to less than 500 miles. DX conditions are expected to be poor on both *80 and 160-meters* during August, although some openings may be possible on 80-meters when static levels are low. During the daylight hours, *80-meter* openings will not generally exceed 200 miles, while only ground-wave propagation will be possible on *160-meters*. During the hours of darkness, when ionospheric absorption decreases considerably, openings up to 2,000 miles should be possible on *80-meters*, and up to 1,000 miles on *160-meters*.

Sunspot Cycle Progress

The Zurich Solar Observatory announced a monthly sunspot number of 175 for May, 1958. This results in a smoothed sunspot number of 199.5 centered on November, 1957.

Fig. 1 depicts the progress of the present record breaking sunspot cycle, cycle #19, since its beginning during April, 1954. According to the CQ smoothed sunspot number prediction, the present cycle reached its peak during November, 1957 with a smoothed number of 199.5. It will, however, be several months before this can be confirmed. The CQ forecast for the next year shows the cycle *declining* from the peak of 199.5 in November, 1957 to a level of 135 by May, 1959. This general level of solar activity, while lower than the past two years, is nevertheless, considered to be exceptionally high. This month's *CQ Propagation Charts* are based on a predicted smoothed sunspot number of 161 centered on August, 1958.

73, George, W3ASK

REMEMBER:

only 2 more months 'til we raise the CQ subscription rates . . . we told you so.

Advertising Index

Reader Service

CQ Magazine
300 West 43rd Street
New York 36, New York

Reader Service Coupon H
Void after Aug. 25, 1958

Please send me information on your ads in the August 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
37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54						

A B C D
E F G
J K L M

Name _____ Call _____
(Please Print)
Address _____
City _____ Zone _____ State _____

"TAB" — THAT'S A BUY

WRITE FOR COMPLETE TUBE LIST

"TAB"—THAT'S A BUY—BARGAINS!

BC457/4 to 5.3mcs as is/good parts $1.49
AN-ARR2/RCVR as is/good parts $1.89
RF-MTR GE/475 Ma & 5 Amp $5@, 2/$9
RF-METER Weston 120Ma $12@; 2/$22
DC-METER Dejur 800 Ma/3½" $4@; 2/$6
DC-METER One Ma/4" Rect $6@; 2/$10

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@

Slim Jim Dynamic Mike Hand or Std $3.98
Neck Mike Carbon New ..... $ .98
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 290-400Mcs Revrs As Is $39.00

AS89 MOUNTING & ANT. $3.95

650 to 850VDC up to 450 mils POWER SUPPLY PARTS KIT includes TRANSF, RECTIFICERS, CAPACITORS & DATA 6 & 12 Volt Fil Taps. Delivers 850 VDC (no fil) SPECIAL $16 OR WE BUILD $24

TOROID COMPUTER LOGIC TRANSFORMER

Toroid—Use as gate or counting circuit or logic drive memory device. 3 windings 200Ma/2 microsecds switching tape wound core. "IBM" design, fits 9 pin miniature socket. **$1.50 each. 5 for $5** postpaid.

DIAMOND PHONO-NEEDLES! Postpaid 48 States! REGISTERED ONE YEAR. GUARANTEED BY THE MFGR! ALL MAKES LP&78—ONE DIAMOND $6; TWO DIAMONDS $12; DIAMOND & SAPPEIRE $8. PLEASE SEND CARTRIDGE NAME & NUMBER.

WRITE for CATALOG!

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

FILTER & SWINGING CHOKES
CHOKE 1.8 Hys. @ 700ma $3
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/R88150/8 Hy @ 150ma/80Ω $3
CTC/R88250/8 Hy @ 250ma/90Ω $5
CTC/R88105/8 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

Wanted—Tubes ALL TYPES!!!
Wanted—New or Used Test Equipment.

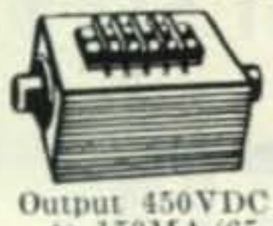
Tubes Wanted — **INSPECTED "TAB" TESTED GUARANTEED**

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	.88	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	No See—Write!	
6BZ6	.91	RK39	2.99		

"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.*

111LC Liberty St., N.Y. 6, N.Y., REctor 2-6245

MOBILEERS — NEW IDEAL POWER SOURCE! *KIT OR ASSEMBLED*



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.
"TABPAK" Assembled TR39CB ... $35
"TABPAK" Kit TR39CK $30
"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!

SELENIUM & SILICON RECTIFIERS
all types & sizes
• DATED ONE YEAR GTD.

DC AMP	Single Phase Full Wave Bridge 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
36	23.15	46.00	89.90	142.90
50	31.45	60.90	128.00	183.15

"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

NEW 28VDC RELAY SUPPLIES
Cased Filtered Ready to Work
B24VAR 24VDC at 1 amp Filtered ..... $ 6
B24VER 24VDC at 2 amp Filtered 11

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

"TAB" FOR THE BEST KITS!

KITS! *Each "TAB" Kit Contains The Finest Selection*

Order Ten Kits We Ship Eleven!!! — ONE EACH ABOVE KIT ONLY 99c

Kit 85 Precision Resistors
Kit 10 Switches
Kit 75 Resistors ½/1/2W
Kit 150 Carbon Resistors
Kit 25 Panel Lamps
Kit 12 Electrolytic Cond's
Kit 15 Volume Controls
Kit 56 Tube Sockets
Kit 65 Tubular Condensers
Kit 500 Lugs & Eyelets
Kit 10 Bathtub Oil Cond's
Kit 5 lbs. Surprise Package
Kit 10 Transmit Mica Cond's
Kit Glyptal & Cement

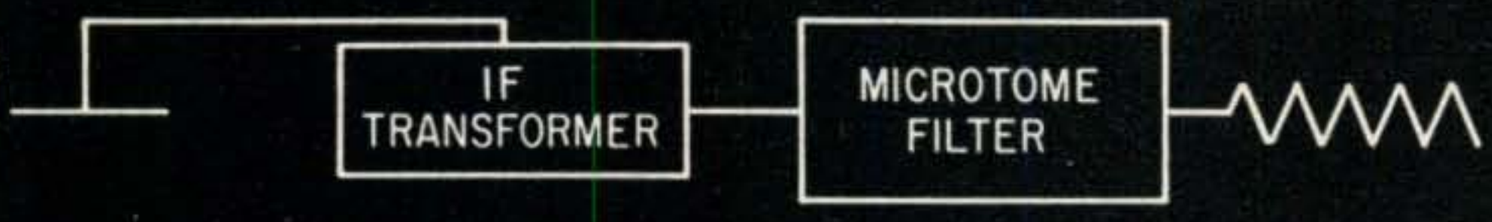
Kit 40 Insulators
Kit 85 Power Resistors
Kit 75 Mica Condensers
Kit 5 Crystal Diodes
Kit 200ft Hook Up Wire, 4 Rolls, 50ft/ea. Asstd.
Kit 100 Fuses, assorted types
Kit 100 Ceramic Condensers
Kit 110 Coil Forms
Kit 5 Crystals & Holders
Kit 65 Inductors & Coils
Kit 5 Microswitches
Kit 10 Wheat Lamps
Kit 3 Transistor Xtnrs

(WRITE FOR BONUS CATALOG)

For further information, check number 49 on page 126.

ONLY NATIONAL'S NC-109 HAS THE NEW MICROTOME FILTER

For further information, check number 2 on page 126.



FEATURING:

- **Five degrees of sharp selectivity with variable bandwidth from 50 to 4000 cycles (6 db down).**
- **Deep, sharp phasing notch capable of phasing within 250 cycles of desired signal.**
- **Desired signal cannot be phased out on AM.**
- **Provides up to 10 db more gain at sharpest position — no more losses!**

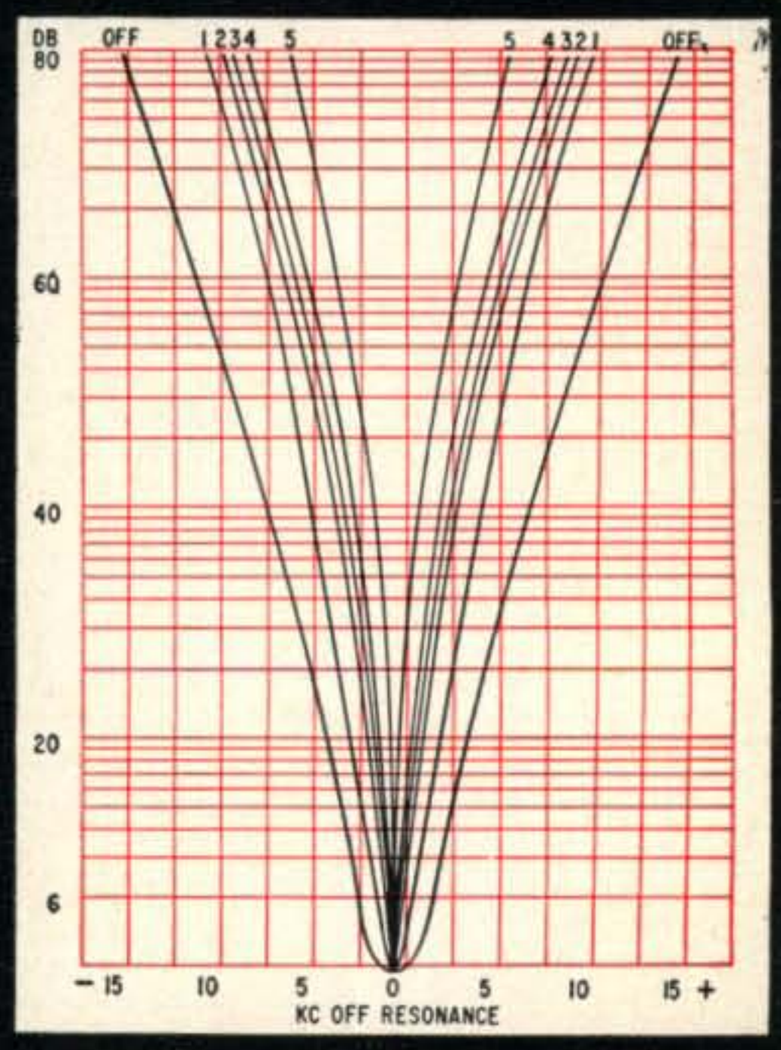
WHY IS THE NC-109 FOR YOU?

National's new NC-109 is the lowest priced general coverage receiver available today with the exclusive new **Microtome** filter and separate product detector for CW and SSB operation. Covers 540 kc to 40 mc in 4 bands, including broadcast band. Voice, CW or SSB.

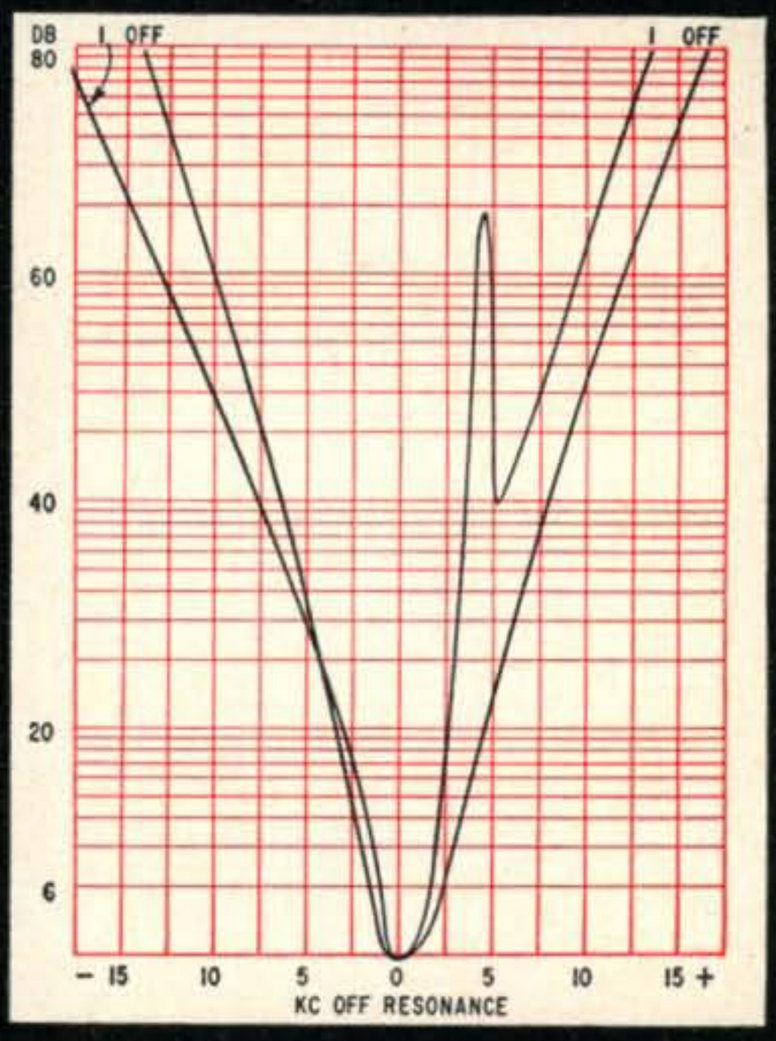
YOURS FOR ONLY $19.95 DOWN *

Write for complete specifications or see your National distributor today and try the NC-109 — you'll agree it's the finest amateur receiver in its price class.

* Only $19.95 down
Up to 20 months to pay at most receiver distributors.
* Suggested price: $199.95 **
** Prices slightly higher west of Rockies and outside U. S. A.
Eight out of 10 U.S. Navy Ships use National Receivers



IF SELECTIVITY CHARACTERISTICS



MICROTOME FILTER SELECTIVITY CHARACTERISTICS

tuned to tomorrow

National NC®

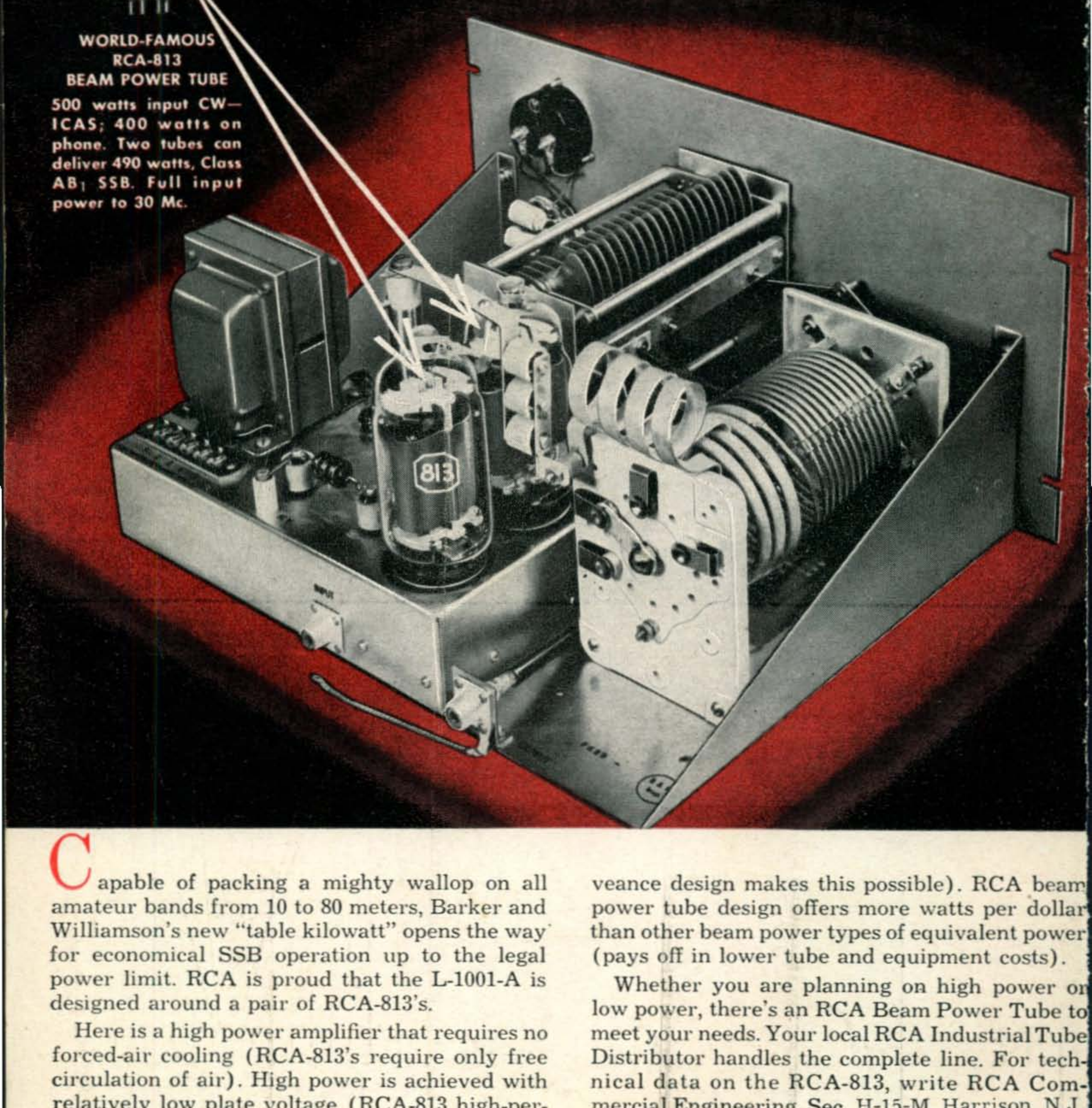
Since 1914 MALDEN 48, MASS.

NEW BARKER & WILLIAMSON L-1001-A 1 KW GROUNDED-GRID LINEAR

....USES RCA-813's

WORLD-FAMOUS RCA-813 BEAM POWER TUBE

500 watts input CW—ICAS; 400 watts on phone. Two tubes can deliver 490 watts, Class AB_1 SSB. Full input power to 30 Mc.



Capable of packing a mighty wallop on all amateur bands from 10 to 80 meters, Barker and Williamson's new "table kilowatt" opens the way for economical SSB operation up to the legal power limit. RCA is proud that the L-1001-A is designed around a pair of RCA-813's.

Here is a high power amplifier that requires no forced-air cooling (RCA-813's require only free circulation of air). High power is achieved with relatively low plate voltage (RCA-813 high-perveance design makes this possible). RCA beam power tube design offers more watts per dollar than other beam power types of equivalent power (pays off in lower tube and equipment costs).

Whether you are planning on high power or low power, there's an RCA Beam Power Tube to meet your needs. Your local RCA Industrial Tube Distributor handles the complete line. For technical data on the RCA-813, write RCA Commercial Engineering, Sec. H-15-M, Harrison, N.J.

RADIO CORPORATION OF AMERICA

Electron Tube Division **Harrison, N. J.**