
QST
devoted entirely to
amateur radio
March 1959
50 Cents
id 55c in Canada
for
196
LETTERS FROM TRAFFIC MEN
Quiet Please!
F LOGS
ZC3 LOGS
LOGS
CONTEST DESK
Cough drops
THE ONLY GUY WHO DIDN'T ENJOY THE DX CONTEST

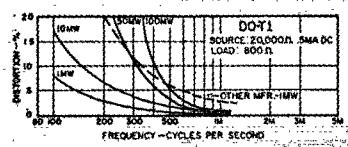
TO MAKE YOUR EQUIPMENT SMALLER YET MORE RELIABLE

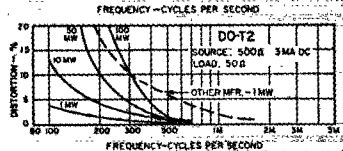
REVOLUTIONARY TRANSISTOR* TRANSFORMERS, HERMETIC TO MIL-T-27A

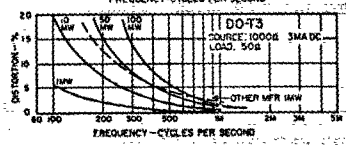
Conventional miniaturized transistor transformers have inherently poor electrical characteristics, perform with insufficient reliability and are woefully inadequate for many applications. The radical design of the new UTC DO-T and DI-T transistor transformers provides unprecedented power handling capacity and reliability, coupled with extremely small size.

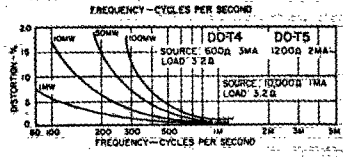
TYPICAL DO-T PERFORMANCE CURVES

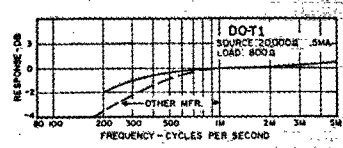
Power curves based on setting output power at 1 KC, then maintaining same input level over frequency range.

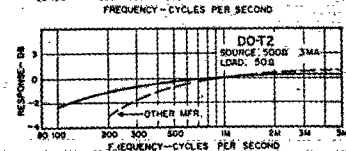


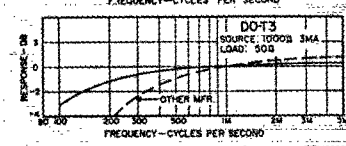


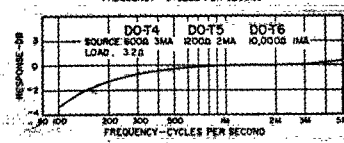




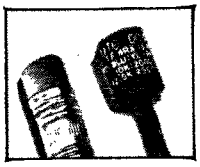








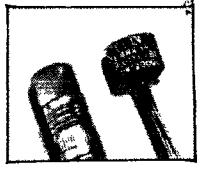
DO-T



5/16 Dia. x 13/32, 1/10 Oz.

- **High Power Rating** . . . up to 100 times greater.
- **Excellent Response** . . . twice as good.
- **Low Distortion** . . . reduced 80%.
- **High Efficiency** . . . up to 30% better.
- **Moisture Proof** . . . hermetic to MIL-T-27A.
- **Rugged** . . . completely cased.
- **Anchored Leads** . . . will stand 10 lb. pull, plastic leads for printed circuits.

DI-T



5/16 Dia. x 1/4, 1/20 Oz.

To fully appreciate DO-T transistor transformers, the curves indicate their performance compared to that of similar size units now on the market. DI-T transformers are still smaller in size. Power rating and other characteristics are identical to DO-T, but low frequency response (3 db down point) is 30% higher in frequency. Units can be used for different impedances than those shown, keeping in mind that impedance ratio is constant. Lower source impedance will improve response and level ratings . . . higher source will reduce them. Units may be used reversed, input to secondary.

DO-T No.	MIL Type	Application	Pri. Imp.	D.C. Ma.‡ in Pri.	Sec. Imp.	Pri. Res.	Level Mw.	DI-T No.
DO-T1	TF4RX13YY	Interstage	20,000 30,000	.5 .5	800 1200	850	50	
DO-T2	TF4RX17YY	Output	500 600	3 3	50 60	60	100	DI-T2
DO-T3	TF4RX13YY	Output	1000 1200	3 3	50 60	115	100	DI-T3
DO-T4	TF4RX17YY	Output	600	3	3.2	60	100	
DO-T5	TF4RX13YY	Output	1200	2	3.2	115	100	
DO-T6	TF4RX13YY	Output	10,000	1	3.2	1000	100	
DO-T7	TF4RX16YY	Input	200,000	0	1000	8500	25	
DO-T8	TF4RX20YY	Reactor 3.5 Hys. @ 2 Ma. DC, 1 Hy @ 5 Ma. DC (DI-T8 is 2.5 Hy @ 2 Ma.)				630		DI-T8
DO-T9	TF4RX13YY	Output or driver	10,000 12,500	1 1	500 CT 600 CT	800	100	DI-T9
DO-T10	TF4RX13YY	Driver	10,000 12,500	1 1	1200 CT 1500 CT	800	100	DI-T10
DO-T11	TF4RX13YY	Driver	10,000 12,000	1 1	2000 CT 2500 CT	800	100	DI-T11
DO-T12	TF4RX17YY	Single or PP output	150 CT 200 CT	10 10	12 16	11	500	
DO-T13	TF4RX17YY	Single or PP output	300 CT 400 CT	7 7	12 16	20	500	
DO-T14	TF4RX17YY	Single or PP output	600 CT 800 CT	5 5	12 16	43	500	
DO-T15	TF4RX17YY	Single or PP output	800 CT 1070 CT	4 4	12 16	51	500	
DO-T16	TF4RX13YY	Single or PP output	1000 CT 1330 CT	3.5 3.5	12 16	71	500	
DO-T17	TF4RX13YY	Single or PP output	1500 CT 2000 CT	3 3	12 16	108	500	
DO-T18	TF4RX13YY	Single or PP output	7500 CT 10,000 CT	1 1	12 16	505	500	
DO-T19	TF4RX17YY	Output to line	300 CT	7	600	19	500	DI-T19
DO-T20	TF4RX17YY	Output or matching to line	500 CT	5.5	600	31	500	DI-T20
DO-T21	TF4RX17YY	Output to line	900 CT	4	600	53	500	
DO-T22	TF4RX13YY	Output to line	1500 CT	3	600	86	500	DI-T22
DO-T23	TF4RX13YY	Interstage	20,000 CT 30,000 CT	.5 .5	800 CT 1200 CT	850	100	DI-T23
DO-T24	TF4RX16YY	Input (usable for chopper service)	200,000 CT	0	1000 CT	8500	25	
DO-T25	TF4RX13YY	Interstage	10,000 CT 12,000 CT	1 1	1500 CT 1800 CT	800	100	
DO-T26	TF4RX20YY	Reactor 6 Hy. @ 2 Ma. DC, 1.5 Hy. @ 5 Ma. DC				2100		
DO-T27	TF4RX20YY	Reactor 1.25 Hy. @ 2 Ma. DC, .5 Hy. @ 11 Ma. DC				100		
DO-T5H	Drawn Hipermalloy shield and cover for DO-T's, provides 25 to 30 db shielding.							

‡DCMA shown is for single ended useage (under 5% distortion—100MW—1KC) . . . for push pull, DCMA can be any balanced value taken by .5W transistors (under 5% distortion—500MW—1KC)

*DO-T units have been designed for transistor application only . . . not for vacuum tube service. Patents Pending

SPECIAL UNITS AVAILABLE TO YOUR SPECIFICATIONS.

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Also available—
A. C.—only model

World's first complete two and six meter radio station... features transistorized, built-in power supply

Make reservations now for annual SSB dinner, New York City, March 24th

COMPLETE SPECIFICATIONS

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. D.C. and features a highly efficient transistorized power supply for the 6 and 12 volt operation.

Exclusive features: The perfect unit for short-range portable, fixed or mobile communication, the SR-34 meets—and exceeds—F.C.D.A. matching-fund specifications. The crystal sockets and transmitter tuning controls are concealed behind a panel which may be sealed to prevent tampering. Instantaneous selection of desired voltage possible and also "crossbanding" between the two and six meter bands. The specially designed cover has mounting clips for two-band antenna, owner's microphone, and cords.

Both receiver and transmitter may be used for C.W.; key jack and adjustable B.F.O. are provided. Drip-proof case is specially designed for safe outdoor use.

The transmitter is crystal-controlled; up to four crystals may be switch-selected. A fifth position on this switch permits external V.F.O. operation. Band selection also is front-panel controlled.

The receiver is a double conversion superheterodyne, having a quartz crystal controlled second oscillator. This offers outstanding selectivity and high image rejection. Highest stability is obtained through separate oscillator and R.F. sections for each band.

All receiver functions provided—S-meter B.F.O., ANL, etc. Sensitivities average 1 microvolt on both bands. Transistorized power supply eliminates noisy, erratic operation encountered with vibrator-type power supplies.

Front Panel Controls: *Receiver:* Band Selector (49-54 mc., 143.5 to 148.2 mc.); Main Tuning; Sensitivity; Audio Volume; B.F.O. Pitch; Squelch Level; Headphone Jack. *Transmitter:* Function Switch (P.A., Rec., Cal., AM, CW); Power On/Off; Band Switch; Crystal Selector and V.F.O.; Oscillator Tuning; Doubler Tuning; Tripler Tuning; Final Tuning; Final Loading; Meter Switch.

Power output: 6 to 7½ watts on 2 meter, and 7 to 10 watts on 6 meter AM or CW, 100% mod. negative peak clipping. *Rear Apron:* Speech input level control; key jack; P.A. speaker terminals; mic. selector (high Z or carbon); mic. input; A.C. and D.C. fuses; power plug.

Available with convenient terms from your Radio Parts Distributor.

Export Sales: International Division—Raytheon Manufacturing Co.—Waltham, Massachusetts

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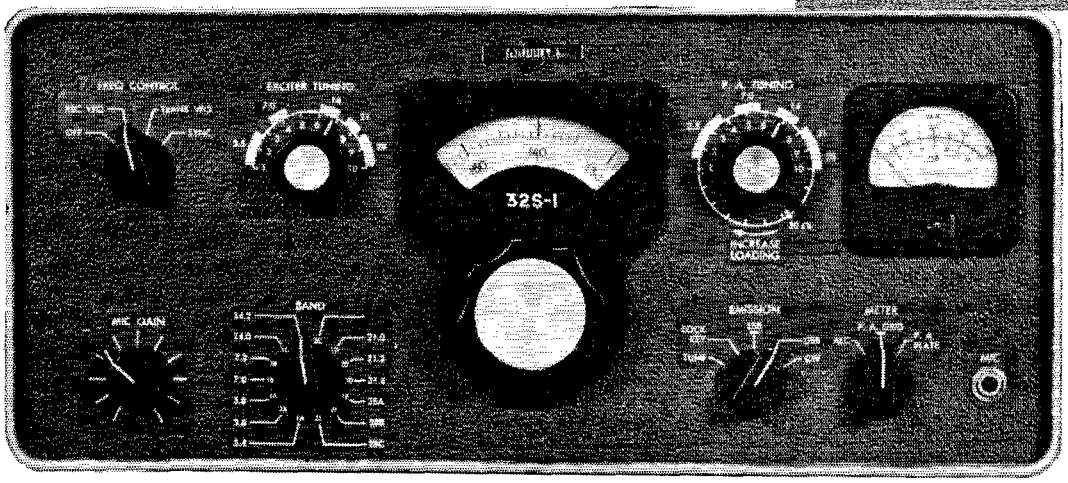
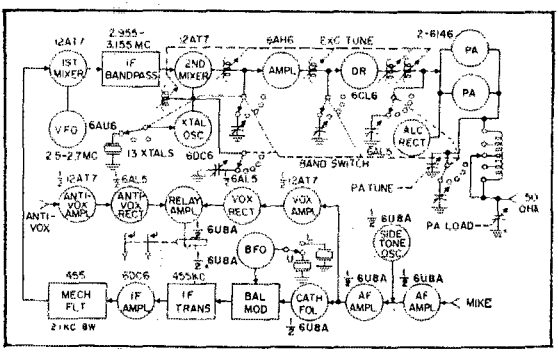
In our 25th year of service



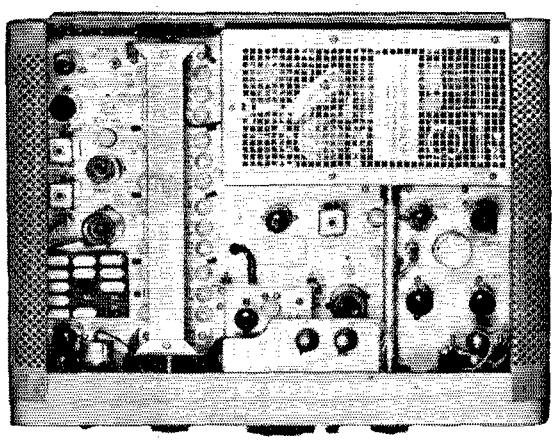
Straightforward design features permeability tuned VFO, crystal controlled HF oscillator, Mechanical Filter sideband generator, RF feedback, and automatic load control.

Compact circuit arrangement results in a basic transmitter package measuring only 14½" W, 11⅝" D and 6⅞" H. Operation is simplified with fewer front panel controls.



COLLINS 32S-1 TRANSMITTER

Compact Styling . . .
Advanced SSB Performance



The new 32S-1 SSB and CW Transmitter, handsomely packaged in a desk-top cabinet, provides nominal output of 100 watts — 175 watts PEP input on SSB, 160 watts input on CW.

It offers the amateur a refreshing simplicity of operation with its reduced number of controls; excellent stability; highly accurate, 1-kc calibrated dial. By a flick of a switch, transceiver operation may be selected, with the 75S-1 Receiver controlling the transmitter frequency.

The Mechanical Filter sideband generator assures clean voice signals without additional audio filters. Automatic load control prevents over modulation and provides 10 db compression for higher average talk power. Excellent linearity is obtained by RF feedback around the PA and driver.

The 32S-1 comes supplied with crystals for operation on all amateur bands between 3.5 and 29.7 mc. Frequencies between ham bands are available by substituting crystals. An ac power supply is housed in a separate, matching cabinet. The transmitter will also operate from accessory 12 or 28 v dc supplies — a useful feature for such activities as field days or mobile operation.

Visit your Collins distributor to examine the 32S-1, its associated 75S-1 Receiver and the 30S-1 Linear Amplifier, which may be driven by the 32S-1 to provide full legal input (1 kw average) on SSB and 1 kw input CW.

COLLINS

Make your reservation for the *ANNUAL SINGLE SIDEBAND DINNER*, March 24, 1959.
Contact the SSB Amateur Radio Association, 1741 Andrews Avenue, New York 53, New York.

QST

MARCH 1959

VOLUME XLIII • NUMBER 3

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—CONTENTS—

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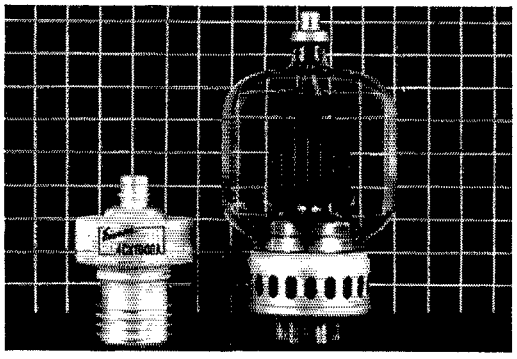
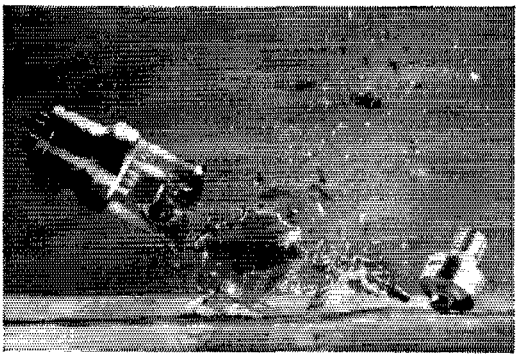
in more than 40 tube types



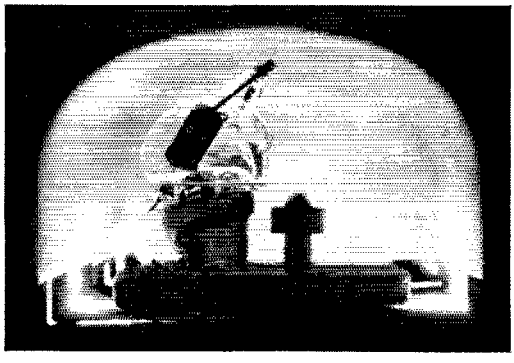
SMALLER SIZE



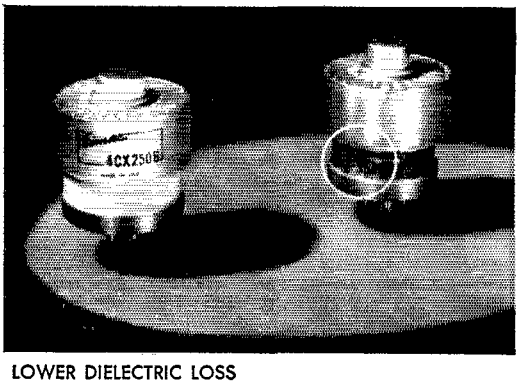
IMPACT SURVIVAL

VIBRATION SURVIVAL

EXACT DIMENSIONAL UNIFORMITY



EXTREME HEAT SURVIVAL



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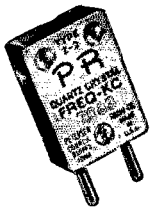
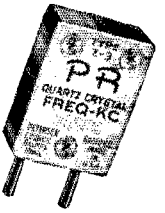


40, 80 and 160 Meters, PR Type Z-2

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

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

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SPECIAL TYPES

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

Type Z-1, AIRCRAFT

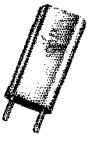
3023.5 Kc., .005%.....**$3.45 Net**

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.

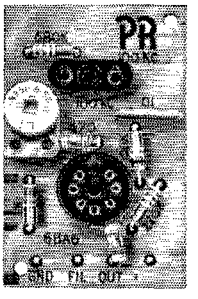
100 Kc. . . . . **$6.95 Net**

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**

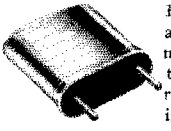
Type 2XP

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.

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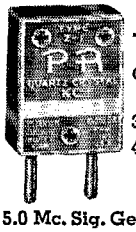
Type Z-9A RADIO CONTROLLED OBJECTS

27.255 Mc., .005% . . . **$4.25 Net**



Type Z-1 TV Marker Crystals

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

3100 Kc. . **$2.95 Net**

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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**

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. OES appointment is available to Novices and Technicians.

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Idaho	W7RKI	Rev. Francis A. Peterson	Box 542	St. Anthony
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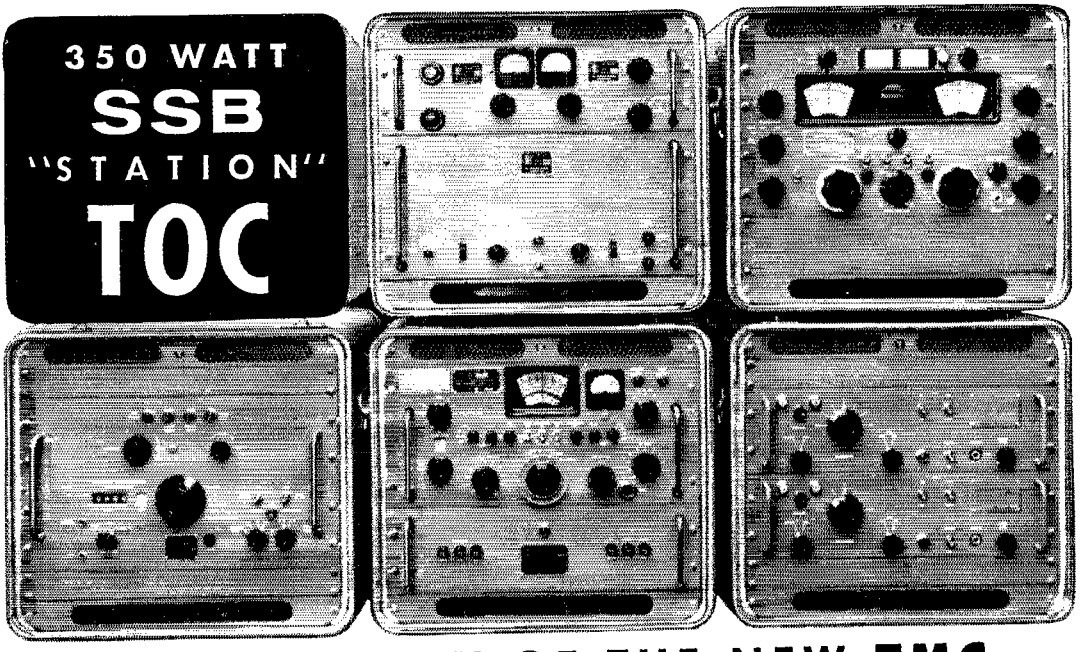
350 WATT

SSB

"STATION"

TOC



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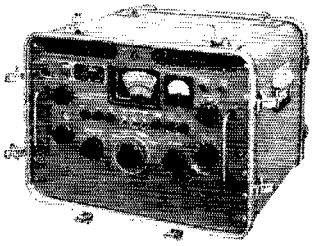

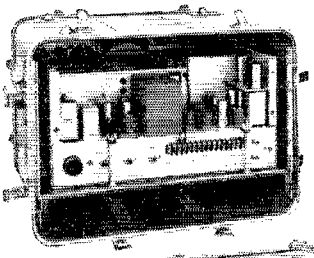

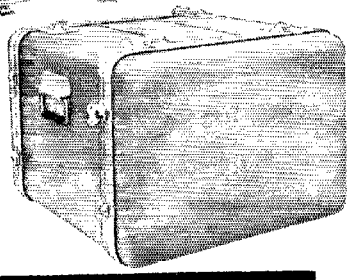

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THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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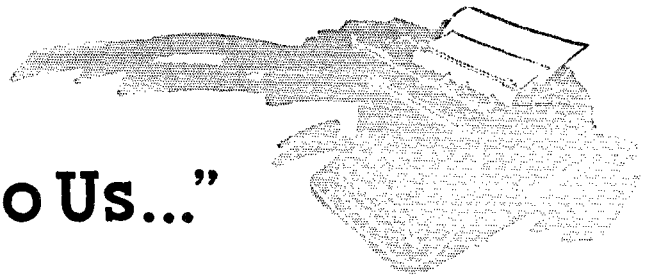


"It Seems to Us..."

QST PREFERENCES

In editing *QST* it is our constant aim to select articles which will be most useful to the largest number of readers. To accomplish this it is of course necessary to obtain opinions and certain statistical information from League membership. Every now and then, therefore, by means of a questionnaire we solicit general views from a random sampling of ARRL members. We completed another such survey last year, but this time basing it on readership reaction to the contents of a specific issue of *QST* rather than generalities. Each article and department was listed in questionnaire form, with suitable spaces for checking various interests.

The results do not surprise us — least of all the decision for the winner and all-time champ of *QST* favorites — "Hints & Kinks." It rates tops over any other department, or article in the chosen issue, both for the type of material hams like to read and in the percentage of those who actually sat down to read it. The runners-up got slightly shuffled around depending on the nature of the question — readers selected several technical articles as typical of what they would particularly like to see in *QST*, but when it came to a tabulation of what actually was read, the non-technical material took the lead: the editorial, members' correspondence, Happenings, recent equipment descriptions, and miscellaneous fillers like "Strays." That antennas are still a main amateur technical interest is once again borne out by the selection of an antenna description as the top technical interest in that particular issue.

The questionnaire was not simple and required a few minutes of the reader's time. A surprising number started checking their interests, found they were answering all questions "yes," and so scrawled across the page such comments as, "As you can see I like *QST* and read almost every article" . . . "Guess I just like the old mag!" . . . "I became tired of checking them — the whole issue was great" . . . "Too much trouble to check yes and no; I read every issue from cover to cover."

We received a number of constructive suggestions — and a few brickbats. In the latter category were three remarks to the effect that "*QST* is much too technical; get some simple articles for a change." Yet what surprised us was the fact that these were all from hams who had been licensed 16 years or more (pre-war II); not a single postwar ham offered any such comment.

It was gratifying to us to find a growing realization that many facets of ham radio have to be covered by a complete magazine today. Time and again there were comments such as, "I don't expect every issue will contain everything I like" . . . "I would not have you eliminate the ones I don't read just because I'm not interested; I think you do a fine job of covering all phases" . . . "I know that sometimes all the articles can't please everyone." To be more specific, while the total who actually read YL News & Views and the Novice Roundup story was low, as would certainly be expected from the limited interest, nevertheless a large majority of all those responding indicated they thought such material should definitely be a part of *QST*.

Our thanks to those who returned the questionnaires and helped us appraise relative interest in various types of articles and departments. We'll be asking similar questions of another sampling of readership again soon, as a regular check of what hamdom thinks of current *QST* material.

WHAT "AMERICAN GROUP AT GENEVA?"

Seems the editor of our esteemed [1] contemporary has just returned from Europe and while Porsche-barreling around was "dumbfounded" [2] to find we hadn't gotten in touch with "the American group at Geneva" in connection with the defense of amateur rights at the forthcoming Geneva telecommunications conference.

He's got us there; we haven't. Of course, we never heard of "the American group at Geneva" — admittedly not too well identified but presumably something pretty important to do with the conference.

Maybe, we reflected, after 32 years of conference work we're losing that old edge. Ah well, things can be quickly remedied. We reached for the 'phone, called the boys in Washington who deal with allocations and

(*Continued next page*)

[1] Well, most of the time.

[2] psssst . . . preferred spelling is dumfounded.

treaty work (these are the guys who head up frequency activities for the United States at conferences).

Give, pal, we said when we got the connection . . . huh? . . . you *haven't!* . . . well, thanks, anyway.

A fine situation! Most important agency in the government in the defense of our frequencies and it doesn't know about this "American group!" Things have come to a pretty pass, we fumed, and started to reach for the pen to draft a letter to our senator.

But wait a minute . . . we'll call the telecommunications folks at the Department of State (they head up all conference work, before and at the conference). Same question . . . and dog our cats, *they* don't know of any "American group at Geneva" either!

So there it is, mates. None of the pro's in the business — a group we like to think includes ourself — knows anything about "the American group in Geneva" referred to, so far as connection with the conference is concerned. Could be, of course, we're all just ignorant. On the other hand, perhaps pushing Porsches past police at 115 miles an hour gets a guy shook.

Real shook.

COMING A.R.R.L. CONVENTIONS

May 2–3 — Oregon State, Roseburg
June 19–21 — ARRL National Convention, Galveston, Texas
July 24–26 — Southwestern Division, Pasadena, California
August 15–16 — Pacific Division, Honolulu, Hawaii
September 5–6 — New England Division, Hartford, Conn.

Hamfest Calendar

Florida — The Orlando Amateur Radio Club will hold its annual hamfest on the Sunday following Easter, April 5, at Sanlando Springs. For further information contact Hal Shea, W4BKC, 7 West Columbia St., Orlando.

New York — The Sixth Annual RTTY Dinner will be held in New York on the evening of March 23, during the convention of the IRE. Reservations must be made in advance with Clay Cool, W2EBZ, 443 West 47 St., New York 36, N. Y., who will also supply additional information on the meeting place.

New York — The Eighth Annual Single Sideband Dinner will be held on Tuesday evening, March 24, at the Hotel Statler Hilton, 33 St. & 7 Ave., New York. An equipment display will be adjacent to the main ballroom, and will open at 10:00 A.M. The master of ceremonies will be Bill Leonard, W2SKE. Tickets in advance are $8.00, or $9.00 at the door. Make your reservations with Irv Binger, W2CMM, 1741 Andrews Ave., New York 53, N. Y.

Strays

When G3LWS (also ex-ZC4FB) was operating from the South Shetlands as VP8CZ several years ago, he discovered one day (after having successfully maintained schedules with the rest of the world for 12 months) that there was a six-inch gap in what were supposed to be feed-through insulators carrying the antenna through the wall of the building. So, except for some sort of capacity coupling through that gap, he was in effect operating with an antenna that consisted of about 18 inches of wire between the transmitter and the inside end of the feed-through insulator.

NATIONAL CONVENTION

The Convention Committee chairman, Norm Bach, W5DJD, asks us to remind all amateurs who are now making vacation plans to consider the island city of Galveston. The 11th National ARRL Convention will be held in Galveston June 19, 20 and 21.

Galveston, a semi-tropical island in the Gulf of Mexico, is among the favored resort cities of the Southwest. It presents attractions of tropical palms, miles of sandy beaches for surf and sun bathing, excellent fishing and all of the other usual attractions found at a seaside vacation spot. Climate in June will be excellent. Hotels and motels have excellent services and facilities with rates well below those charged in other well-known resort cities.

For more information write to Box 73, Route 1, Galveston, Texas.

Two Hundred Meters and Down, by the late Clinton B. DeSoto, is a 184-page history of early amateur radio (to 1936) which has been out of print for about ten years. There is not sufficient demand for the book today to make another press run economical, but the League occasionally receives inquiries concerning availability of the book and is contemplating reproducing a limited number of copies by a process similar to photocopying. Such copies would have a plain paper cover and be a simple reproduction of the text, full-size.

This process will produce individual copies for a price of around $7.50 each. However, if a substantial quantity is ordered at one time, the copies would be $2.50 or $3.00. We wish to determine just how much interest there is in this book. If you would like to purchase a reproduction copy of *Two Hundred Meters and Down* at a price not to exceed $3.00, please drop a postcard to Box 200, c/o ARRL, West Hartford 7, Conn., to register that interest.

A Multiband Antenna System for the Newcomer

Combination Antenna Coupler and Matching Indicator

BY LEWIS G. McCOY,* W1ICP

If you have been searching for a multiband antenna system this article should be of considerable interest to you. We will describe an antenna coupler for the 3.5- through 28.0-Mc. bands that has a built-in standing-wave ratio bridge. The s.w.r. bridge can be used for matching and as an output indicator. Also included in the article is the description of a multiband antenna. Whether you are a Novice or General this may be exactly what you have been looking for.

You may have read or heard that an antenna coupler is an unnecessary item in the ham station. Before going any farther let's see what a coupler is and what it can do for you.

Why An Antenna Coupler?

Many newcomers to amateur radio elect to use antenna systems that do not require antenna couplers. Such systems as multiple dipoles, trap-type antennas, and the off-center-fed type have become quite popular. The reason for the popularity of these systems is that they can normally be attached directly to the transmitter (with a feed line, of course), and be made to work. When an antenna system is used that requires a coupler, the coupler must be adjusted in order for the system to work. As the systems mentioned above do not require couplers it can be said that they offer "operating convenience." However, to mix a metaphor, you cannot have your cake and get it for nothing! There are many excellent reasons why a coupler should be used and they far outweigh any operating conveniences of the non-coupler type of installation.

First, and most important from the Novice's viewpoint, an antenna coupler usually eliminates the harmonic problem. We are speaking now of the common problem of second-harmonic radiation (7.4-Mc.) from 3.7-Mc. operation. We know that a large number of newcomers are cited by the FCC each month for harmonic radiation. With the system described in this article the Novice can be reasonably sure he isn't going to get into trouble with the FCC.

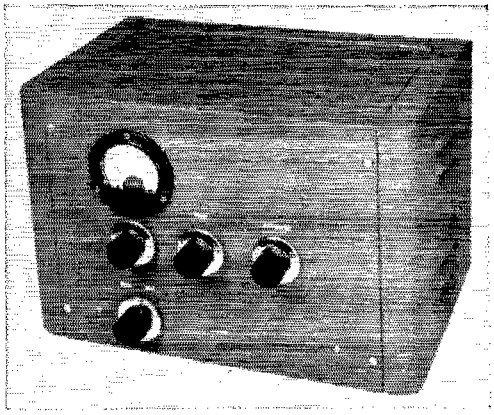
In many instances the use of a coupler will eliminate the harmonic TVI problem. If sufficient harmonic attenuation is not achieved with the coupler, a low-pass filter must be used; here again a coupler plays a very important role.

A low-pass filter is designed for a particular impedance of coaxial line, usually 50 or 75 ohms. This line must be reasonably flat (have a low standing-wave ratio), in order to prevent damage to the filter components. It is difficult to keep the s.w.r. low on feed lines used with the types of antennas mentioned earlier, at least on all the amateur bands and frequencies. However, it is a very simple matter to take care of this problem when using a coupler. The normal procedure is to connect the transmitter to the coupler via a short length of coax line. By adjusting the coupler the coax line can be kept perfectly flat on *any* frequency within the amateur bands. The ideal place to install the filter is in this length of line.

In many instances, it may become difficult or impossible to couple power from the transmitter to the antenna because the coupling circuit doesn't have enough range. This deficiency can be eliminated by the use of an antenna coupler. With the system described here it is possible to adjust the coupler so that the transmitter is always working into the best load for *its* coupling circuits.

The antenna system we will describe uses open-wire feeders and here is another advantage in using a coupler. Of all the types of lines used by amateurs, open-wire feeders have by far the least loss. Also, many other types of lines can be affected by moisture so that their characteristics change. Open-wire feeders are not affected by moisture, at least not as much as some other lines.

All too many amateurs think of an antenna coupler only in terms of transmitting. By installing the antenna change-over relay or switch between the transmitter and coupler the latter can be used on the receiver. If you don't think



At the right is the knob for C_1, the center knob is for C_2, and the sensitivity control is at the left. The knob at the lower left is for S_1.

* Technical Assistant, *QST*.

this can be a big help just ask any amateur who uses such a setup. The coupler provides, in many cases, additional selectivity for the receiver. Strong commercial signals outside the ham bands have a nasty habit of getting into the receiver, causing image troubles or cross modulation. A coupler helps to reduce this problem.

Before getting into the actual construction of the coupler let's take up one more point that the newcomer may not be familiar with — series- or parallel-tuned feed lines. The main purpose of a coupler is just what the name implies, to couple the power from the transmitter to the antenna feed line. The end of the feed line that is attached to the coupler presents a load to the coupler. With a high s.w.r. whether this load is high or low impedance depends on the electrical length of the feed line and antenna. If it is low it is easy to couple power from the transmitter if a series-tuned circuit is used in the coupler. When the load is a high impedance, parallel tuning should be used. We'll show you how to design your antenna and tell you what type of tuning is required in a moment but first let's take a look at the coupler.

The Antenna Coupler

At first glance, Fig. 1, the circuit of the antenna coupler, may appear complicated. However, don't be scared away: it is actually quite simple. The method of changing from series to parallel tuning while maintaining coupling at the center of the antenna coil is a novel one cooked up by W1DX. As you will find when you read the section of the article on the antenna, the use of series or parallel tuning will depend on the antenna and feeder lengths.

In order to show how the coupler is used for series or parallel connections, we have drawn two simple circuits in Fig. 1, B and C. For series tuning, the feed line is attached to terminals 1 and 2. This splits the antenna coil into two equal parts and puts them in series with the line. When parallel tuning is required terminals 1 and 2 are shorted with a jumper and the feed line is connected to 13 and 14.

Band-changing the coupler is accomplished by shorting out portions of the coils L_2 and L_3. The taps and leads from the coil are wired to pin jacks that can be connected together with shorting jumpers. Normally, the unused portion of the coil should be jumped with the shortest possible line. However, no ill effects were apparent in testing and using the coupler as shown. We had considered a switch for making the coil changes but a suitable switch, one that would fit the requirements of voltage breakdown and mechanical layout, was impossible to find — at least, at prices we were willing to pay. The pin jacks and plugs cost only a few cents each.

The coupler as described will easily handle the Novice 75-watt power limit. Any readers using transmitters in the popular 150-watt class can alter the coupler for this power level by using a variable capacitor with adequate voltage rating for C_2. The coil stock used for L_1, L_2 and L_3

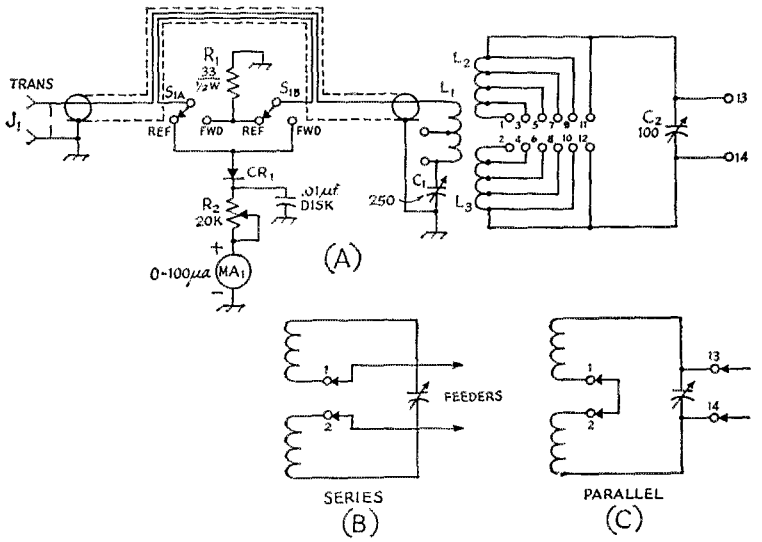


Fig. 1—(A) Circuit diagram of the antenna coupler and s.w.r. bridge. (B) Series tuning. (C) Parallel tuning.
C_1—250-$\mu\mu$f. variable capacitor (Hammarlund MC-250-M).
C_2—100-$\mu\mu$f. variable capacitor (Hammarlund MC-100-SX).
CR_1—1N34A germanium diode.
J_1—Coaxial chassis receptacle, SO-239.
L_1, L_2, L_3—See Fig. 2 and text.
MA_1—0-100 microammeter, or other range, depending on sensitivity required.
R_1—33 ohms, ½-watt carbon resistor.
R_2—20,000-ohm potentiometer.
S_1—D.p.d.t. "tone control" switch (Centralab 1462).

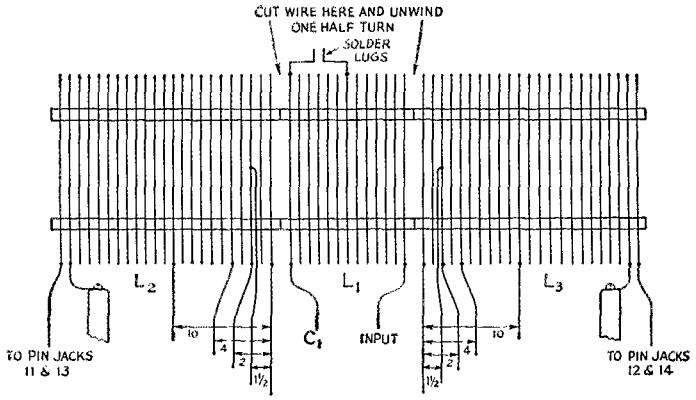


Fig. 2—Drawing of the antenna and link coils, L_1, L_2, and L_3. The numbers indicate the terminals to which the coil taps and leads are connected.

should safely handle about 300 watts without overheating so the controlling factor is the r.f. voltage rating of C_2.

The s.w.r. bridge utilizes a length of RG-58/U to house the pickup wire of the bridge.[1] A double-pole switch is required to switch the pickup lead ends so that either forward or reflected power can be fed to the indicating circuit.

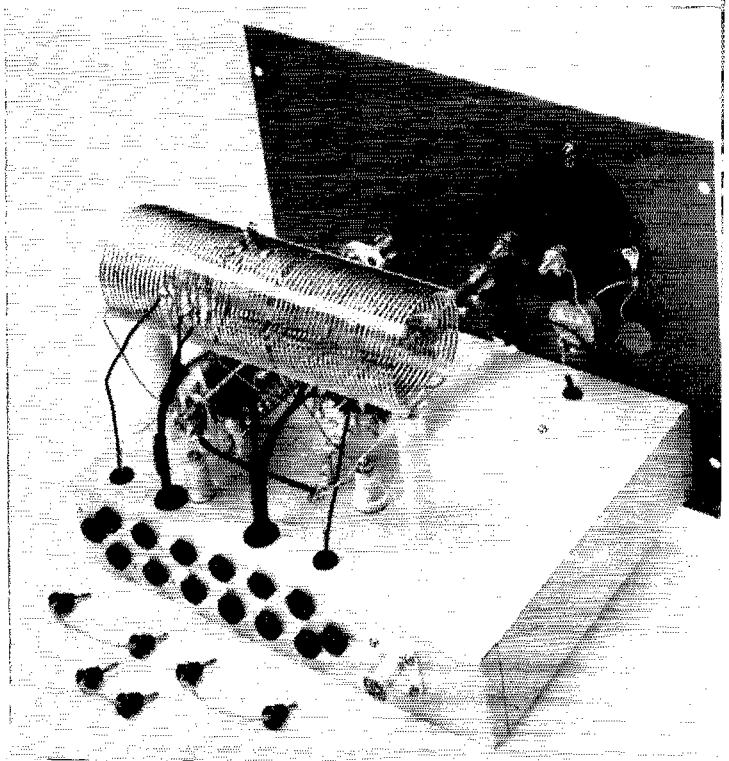
Construction

The unit shown here was built on a 2 × 7 × 9-inch aluminum chassis which is housed in a Premier H.T.C. 201 cabinet. If the reader elects to use a bigger capacitor (greater plate spacing) for C_2 a larger chassis than the one specified would be more suitable. Layout of the components is not critical but it is a good idea to use the photographs as a guide.

Fig. 2 is a drawing of the three coils, L_1, L_2, and L_3. These three coils are all part of a single length of B & W 3907-1 coil stock. This material is 2 inches in diameter, 10 turns per inch, No. 16 tinned wire. Before attempting to make the coils for the coupler, study Fig. 2 so that you are completely familiar with the drawing. With a ruler measure off 68 turns (6 13/16 inches) and cut this piece from the original stock. A hacksaw is a good tool for cutting the stock support bars. Unwind one turn from each end of the piece. This will leave a 66-turn coil. Count in from the end of the coil and cut the wire at the 26½ turn. Do this at each side. We used a pair of side cutters to make the cuts and slightly bent the adjoining turns away from the cutting point in order to get at the wire. Unwind a half turn from these points and this will leave you with three separate coils, all on the same support bars. Refer to Fig. 2 for the tap points. You'll find that if you bend the wires adjacent to the tap points in toward the axis of the coil you'll have plenty of room to solder the tap leads onto the coil.

The link, L_1, is too large for 14, 21 and 28 Mc., so part of it must be shorted out when using

[1] Bunce, "The 'Mickey-Match,'" *QST*, November, 1958.



Two steatite pillars are used to support the coil on the chassis. The bottom of the coil is high enough to clear the rotor of C_2 when it is open. Sensitivity control R_2 is mounted on the panel below M_1.

these bands. Two soldering lugs should be soldered to the 1st and 6th turns of the link counting from the C_1 end. The lugs are mounted at the top of the coil and bent so their ends are close together. An alligator clip can be used to short the two lugs. Use a copper clip as iron tends to heat up when used in r.f. power circuits. Incidentally, this is an important point to remember when doing any transmitter construction work involving r.f. circuits. Iron or steel will heat up and actually steal power from the circuits. Use nonmagnetic hardware for mechanical connections wherever possible.

Two steatite standoff insulators, $\frac{1}{2} \times 2\frac{1}{2}$ inches (Millen 31002), are used to support the coil. Soldering lugs should be soldered to the first turn on each of the two outside coils. The lugs are then mounted on the standoffs (see Fig. 2).

Steatite standoffs, $\frac{3}{4}$-inch high (Millen 31011), should be used to mount C_1 and C_2 on the chassis. Both the rotor and stator of C_2 must be insulated from the chassis and cabinet panel. An insulated coupling should be used on the rotor shaft (Millen 39006). A steatite through-chassis insulator (E. F. Johnson 135–40) is used for the input connection to bring the lead up to C_1.

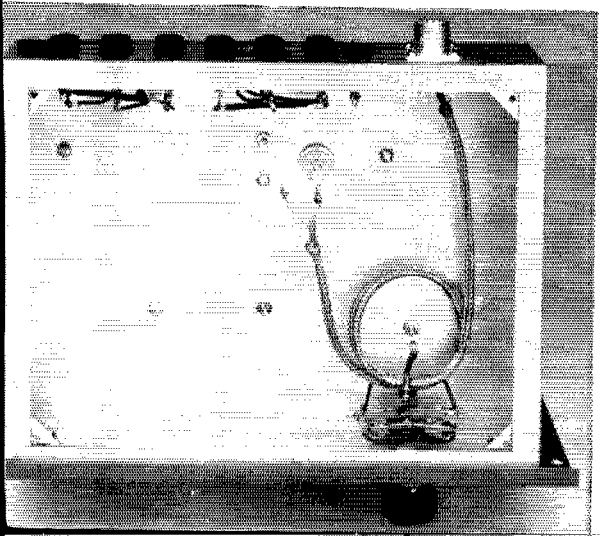
The coil taps and ends (terminals 1 through 14) are brought below chassis top through four rubber grommets, two $\frac{1}{4}$ and two $\frac{1}{2}$ inch. Sockets for terminals are Amphenol type 78-1L, 14 being required. The sockets mount in $\frac{3}{8}$-inch holes and are held in place by retaining rings. A simple method for mounting a socket is to place it in the hole, slip the retaining ring over the end and then use a short piece of $\frac{1}{2}$-inch diameter pipe to force the retaining ring over the socket. Six plugs, Amphenol 71-1L, are needed for the shorting plugs. The wires for the two longer shorting lines are 3 inches long and the short one is 2 inches long.

Matching Indicator Details

A 24-inch length of RG-58/U is needed for the s.w.r. bridge circuit. The first step is to remove the vinyl covering from the cable. If you score the covering with a knife blade the material can be peeled off. A 14-inch length of No. 20 solid tinned wire, plastic insulation (Belden 8529), is used for the bridge pickup wire. Mark the braid on the coax 6 inches from one end and 4 inches from the other. Next, bunch the cable together and with a sharp pointed tool make a small opening in the braid at the marked points. Feed the pickup wire under the braid, in one opening and out the other. Stretch the braid out along the cable until about one inch of the pickup wire projects from each opening. Look at the bottom view of the coupler and you will see how the coax is coiled up so that the two pickup wire ends are close to switch contacts. Once we found the correct configuration, a short length of tinned wire was wrapped around the braid and soldered. This holds the assembly in place and makes it easier to handle.

The terminating resistor of the bridge, R_7, is a half-watt carbon 33-ohm unit. Be sure to use a carbon resistor, not wire-wound. A rubber grommet should be installed in the chassis top directly over the switch. This opening is for the lead from the 1N34A diode that goes to R_2. When soldering the diode leads hold the wire with a pair of long-nose pliers between the body of the diode and the point being soldered. This will conduct the heat away from the diode, thereby preventing damage to the unit. The sensitivity control, R_2, should be mounted below the meter.

This view shows the method for connecting the coax input line and pickup wire. The terminal jacks for the coil leads and taps are mounted along the rear chassis wall.



The Antenna System

Before discussing adjustment procedures let's take a look at the antenna system. There are a few simple rules that should be followed (if possible) when installing an antenna. Try and get the antenna as high as possible. Also, keep it clear of nearby objects. In other words, don't run it alongside rain gutters or through branches. Dress the feed line away from the antenna at right angles, or as near so as possible. Many amateurs bring their feed line straight down from the antenna to a post or support and then into the shack.

However, if you cannot follow the above rules, it doesn't mean an antenna won't work. For example, if you are cramped for space you can drop the ends of the antenna down in order to increase the length. If the antenna must run near metal objects don't scrap your plans. Put the antenna up and try it; you may be pleasantly surprised.

How long should the antenna be? The answer to this question depends primarily on the lowest frequency band you plan on using and, of course, how much space is available. We will assume that you want the antenna for 3.5 Mc. as the lowest band. If it is long enough for this band it will be adequate for the higher bands.

Fig. 3 gives the information you'll need to find the antenna and feeder lengths. The length of the antenna, A, should be at least a quarter wavelength long at the lowest frequency band. Otherwise, the effectiveness of the antenna will suffer.

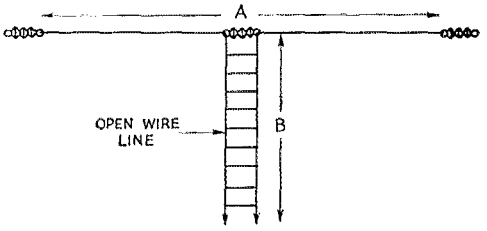


Fig. 3—The length *A* should be more than a quarter wavelength at the lowest operating frequency. When you determine the length of *A* to half the distance, add a sufficient length of feed line (B) to equal a quarter wavelength or multiple thereof. For example, let's assume you can put up an antenna 80 feet long and you plan to operate on the 3.7-Mc. Novice band as the lowest frequency. From the formula

$$\frac{246}{3.7} = 66.5 \text{ feet}$$

$$66.5 - 40 = 26.5 \text{ feet}$$

the feeder length, or

$$2 \times 66.5 = 133$$

$$133 - 40 = 93 \text{ feet.}$$

This can be carried out for greater feeder lengths, depending on the requirements of the installation.

When you make the system according to the formula $\frac{A}{2} + B$ equals a quarter wavelength, or multiple thereof, you will simplify the coupling problems. For an odd number of quarter wavelengths you will use series tuning at the coupler, and for an even number, parallel tuning.

A common problem is finding enough space for the antenna, the average city lot being too small for a half-wavelength antenna on 3.5 Mc. As mentioned earlier, the antenna can be shorter than a half wave and still work. The feed line can be lengthened or shortened to make the system fit the formula.

You can make your own open-wire feeders or use the TV-type open-wire line. Don't use solid-dielectric Twin-Lead for the feeders; this type of line is satisfactory for some types of feeders but not in tuned lines. You can use a short run of the transmitting type Twin-Lead to go from the coupler to the feed-through insulators on the wall of the shack. The insulated Twin-Lead will simplify your installation problems, but don't use any more than you have to. For the antenna, you can use No. 14 Copperweld or a similar type. (Electric fence wire makes good antenna material.) Use soft-drawn wire in a homemade feed line.

Getting the System Working

Connect the coupler to the transmitter with a length of 52-ohm coax, either RG-58/U or RG-8/U. If you are using a low-pass filter it should be installed in this length of line. Also, the antenna relay should be inserted at this point. Attach the feed line to the coupler and make the connections for series or parallel as required. (See Table I.) Set R_2 in the indicator circuit at maximum resistance and switch S_1 to reflected power. Tune up the transmitter and resonate the final amplifier for plate meter dip. If you have an output drive control it is a good idea to tune up with reduced output. Next, adjust C_1 and C_2 in the coupler for minimum reading on the s.w.r. indicator. You will probably have to decrease the resistance of the potentiometer, R_2, in order to get a reading. When C_1 and C_2 are adjusted for minimum reading (this is usually zero or close to it), switch S_1 for forward power and set R_2 for about half-scale meter reading. Now you can tune up the transmitter for full loading as indicated by your plate meter and the bridge meter. You may have to reduce the setting of R_2 to keep the needle on scale. Incidentally, once your coupler is adjusted for the minimum reading or matched condition you don't have to change the coupler adjustments for that particular frequency. All loading adjustments are made at the transmitter.

Table I

Tuning Information

Parallel	*Series*
Connect feeders to 13 and 14, jumper 1 and 2	Connect feeders to 1 and 2
Short following terminals with jumpers	
3.5 Mc.	—— ——
7.0 Mc.	11 and 9 — 12 and 10
14.0 Mc.	11 and 7 — 12 and 8
21.0 Mc.	11 and 5 — 12 and 6
28.0 Mc.	11 and 3 — 12 and 4

Mark down the control settings of the coupler for this particular frequency and then proceed to the next higher band. Keep a record of the settings and it will be a simple matter to set the coupler up in a hurry.

If you should find that you cannot get a matched condition on some band, you may have to try different tap points. However, be sure to try both series and parallel tuning first.

If you are looking for additional information on antenna masts, how to support the antenna, construction of feed lines, and so forth, we suggest you study *The Radio Amateur's Handbook* and *The A.R.R.L. Antenna Book.* QST

Strays

W2SAW is now in a position to supply foreign stamps for many of those countries from which you might like QSLs. The idea is, of course, that you supply the DX station with the return postage of his own country. For a bulletin on the stamps available, write to W2SAW at 466 Weaver Road, Webster, N. Y.

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K4THH called CQ and was answered simultaneously by VE5YW and VE6YW.

"Just like QST, Except . . . ."

Some Hints on Stabilization of Tetrode and Pentode Amplifiers

BY EDWARD P. TILTON,* W1HDQ

THE four words of our title are encountered almost daily in mail handled by the ARRL Technical Information Service. They are also voiced frequently by visitors to the ARRL Lab, who tell us their troubles with equipment they've been building. Often it turns out that instability trouble these fellows have is the result of common misconceptions as to right and wrong methods of bypassing and grounding in tetrode and pentode amplifiers.

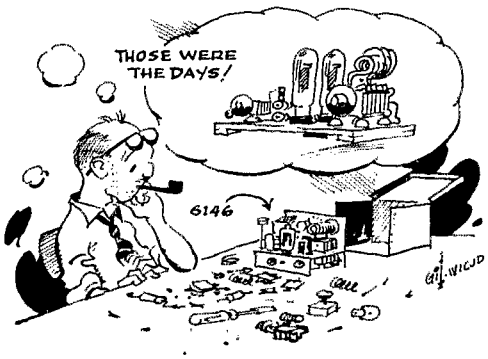
We neither expect nor want everything built from *QST* and *Handbook* information to be exact duplication of the original. To be of greatest value, equipment descriptions should be used for ideas to be incorporated in gear of your own design. If *QST* and *Handbook* articles were used only for exact duplication they would not be making the most of the time and money spent on them. The important thing is to know what to change, and what to leave as the original designer made it. Methods employed in bypassing and grounding should be in the latter category.

To some extent each new amplifier represents a design problem. We would not have you believe that every transmitter or converter built in the Headquarters lab is stable right from the start. But from long experience we have become well acquainted with some of the more common forms of instability. These have all been discussed at one time or another, but a summary may still be in order, especially in view of the fact that assembly details we'll be talking about often do not come through well in photographs. Even an experienced builder of ham gear may find it hard to know just where to put a bypass lead or a grounding lug, no matter how well the pictorial and descriptive details are set forth in print.

Certain tubes have a reputation of being hard to tame. The 807 was such a dog for many hams for years, and the evil reputation it built up, largely unjustified, is now inherited (with even less justification) by the 6146. It is true that tetrode and pentode tubes, having very high power sensitivity, may require neutralization, but more often than not the trickiness involved in getting an amplifier to operate stably is the result of violation, by the designer, of certain cardinal principles. If you yearn for the "good old days" of easily neutralized triode amplifiers it may be that you've been building in some troubles for yourself.

Put the Socket Above the Chassis!

Many a lab headache has been relieved like magic by the simple expedient of taking out a socket that was mounted below the chassis and putting it on the *tube* side of the chassis or mounting plate. This became really important when we started building transmitters that had to work on many bands without readjustment of neutralization. Cause of the oscillation trouble with



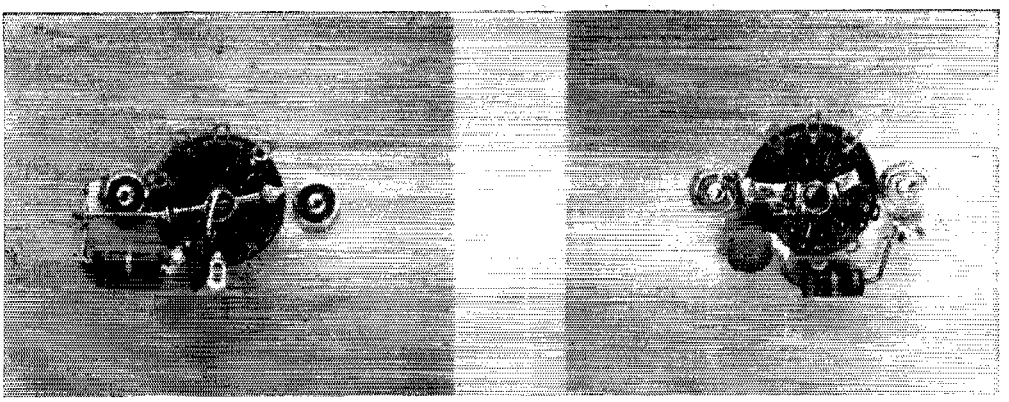
sockets mounted under the chassis is often the long plate-cathode return. This return cannot be made effectively via screws going through the chassis. The actual path (and you can often trace it by chassis "hot" spots) is around the edge of the chassis, or through some large hole. Some considerable portion of the chassis thus becomes common to both plate and grid circuits, and the resultant feedback is difficult to neutralize out.

This sort of thing may not be troublesome in an amplifier designed for a single band, though even here it may make the neutralization job fussier than it should be. But in an amplifier for several bands the effect of coupling through common ground paths varies with frequency. Your amplifier requires neutralization on some bands but not on others, or the degree of neutralization cannot be set up right for several different bands. Having gone through this with more amplifiers than we care to recall, we now put the socket atop the chassis *first*, instead of making ourselves an almost certain revamping job by mounting it in the "conventional" manner.

Cooling Down the Screen

Once the socket is mounted above the chassis, the method of bypassing is still important. The screen and cathode must be at zero r.f. potential or there's going to be trouble. The screen is the villain in some amplifiers that should be stable but aren't. To cool it off, bypass right at the screen terminal or terminals. If there is more than one screen pin, bypass each one separately, right to the chassis, with no leads. Forget the old precept of a common ground bus, or a common grounding point. The chassis is the place to go with bypasses, and without any wandering!

*V.H.F. Editor, *QST*.



Models illustrating right and wrong methods for bypassing and grounding terminals of a 9-pin miniature socket. Both show Pins 4 and 9 grounded, with a cathode resistor and associated bypass capacitor connected to Pin 3. In the wrong approach, left, a wire is run from Pin 9 through the center shield and Pin 4, to a grounding lug. The bypass is made from Pin 3 to the center shield, making its path to ground common with other circuits. In the example at the right, the pins to be grounded and the ground lug itself are bent tightly against the cylinder and soldered in place. Bypass is grounded at the bottom of the lug.

Ordinary bypassing may be ineffective in v.h.f. amplifiers, especially for 144 Mc. and higher. Then some form of screen tuning becomes necessary. Examples will be found in all recent editions of the *Handbook*. Such circuits usually involve series-resonating the screen circuit to ground, to provide a path of lowest possible impedance.

Occasionally you will find a circuit in *QST* or the *Handbook* in which no screen bypass is shown. These bring inquiries as to whether an error was made, and what value bypass should be used. Diagram readers are accustomed to seeing screens bypassed, and they can't imagine it not being done. Sometimes the circuit is a frequency multiplier, and in that case it doesn't make much difference whether the screen is cold or not. Why waste a capacitor, in that event? At 220 and 420 Mc. several factors come into play that may make screen bypassing unnecessary. The screen-to-ground capacitance within the tube may be enough to do the job at these frequencies. More important, degeneration due to cathode lead inductance, and loading of the tuned circuits by the tube, may cut the power sensitivity of the amplifier to the point where self-oscillation is not the problem it is on lower bands.

The Hot Cathode

Oscillation troubles are often built into tetrode or pentode amplifiers by inserting a keying jack in the cathode lead. The cathode has to be cold, too; perhaps even more so than the screen. In the 50- and 144-Mc. exciters in the *Handbook* you'll notice that the 50-Mc. job has cathode keying; the 144-Mc. one does not. That's because small disk ceramics (probably the best v.h.f. bypasses available at low cost) are effective at 50 but not at 144 Mc. That 144-Mc. cathode (2E26 or 6146) could probably be cooled down by some special circuit tricks, but we found it simpler to resort to some other method of keying, and left the cathode grounded by the shortest possible lead, in the rig for the higher band. Grounding each cathode lead separately may be desirable with the 2E26 and 6146.

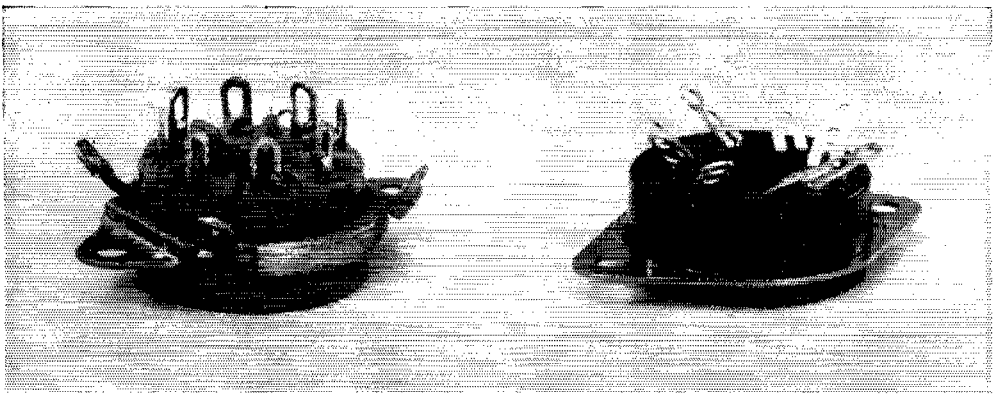
Bypasses That Don't Bypass

Oscillation troubles are not confined to transmitters, as any v.h.f. converter builder knows. And oscillation is not always where you'd expect to find it — in a pentode or neutralized-triode amplifier stage. We've seen quite a few "grounded-grid" stages that took off all over the place because the grid was not actually *grounded*. In several instances a wire lead was run from the cylindrical shield in the center of a miniature socket to a ground lug at one or both sides of the socket. Bypass capacitor leads were connected to the cylinder, or to some point along the wire, rather than to the lug, *right at the chassis*.

The effect of r.f. voltage building up on a ground lead, perhaps no more than a quarter inch long, can be observed by running the stage in an oscillating condition, and then probing for hot spots with a pencil lead. If the stage is in a receiver, you can listen for scratching sounds. If it is a transmitter, watch the grid current in the offending stage.

In a 50-Mc. transmitter built for the 1959 edition of the *ARRL Handbook* we ran into trouble with a 6146 stage that refused to neutralize. We tried several methods; each would come close, but not quite do the job. In this rig we had abandoned the principle discussed earlier and mounted the tube socket below the chassis, primarily to save over-all height. With just one band to worry about, we felt the calculated risk worth taking.

In this amplifier both the screen and cathode leads were hot. Touching the screen or cathode terminals caused a flicker in the small amount of grid current that persisted in the 6146 stage, when drive was removed. In desperation we pulled out the socket and put a different type in its place — and at once the capacity-bridge neutralization system we'd been wrestling with for



Tube socket with built-in grounding ring and four lugs (left) is an invitation to trouble due to common ground paths. Flange between lugs may not contact chassis, in which case connections made to lugs have long path to ground. Socket at the right necessitates grounding to chassis or to lugs under mounting nuts, making it possible to avoid common ground paths.

days neutralized the stage out as easily as anything we've ever worked with.

The cause of all the trouble was the same old bugaboo, common ground paths, in a somewhat different form. The socket was a popular make having a metal grounding ring in a slightly different plane from the ears that mount the socket to the chassis. There are four lugs extending from the ring that are intended for grounding points. They may be suitable for that purpose at lower frequencies, but in a v.h.f. amplifier the lugs and ring provide a built-in common path for the circuits grounded or bypassed thereto. We've had at least two hassles with sockets of this type in recent lab experience, but this writer will have no more!

Quite a bit of new manufactured gear employs a device that was all but discarded years ago, the so-called wafer socket. In the days of the "low-loss" insulation craze we looked down our noses at anything but ceramic insulation. Now we know that most other insulating materials are good enough, at least in low-voltage applications, and that the physical construction of the socket as to lead lengths may be more important. The flat wafer socket has a distinct advantage in this respect. If the chassis is a material that will take solder readily, socket terminals to be grounded can be soldered directly to the chassis, resulting in much lower lead inductance than is possible with bulkier ceramic or molded bakelite sockets.

From all this discussion it can be seen that there are more causes of instability than first meet the eye. With triodes the main cause of oscillation is the considerable grid-plate capacitance of the tube or tubes. We neutralize this out with a capacitance that is approximately the same as the tube grid-plate capacitance, feeding back energy 180 degrees out of phase with that fed through the tube, and the job is done. The power sensitivity of triode tubes is low, so the neutralization process is fairly routine. (We didn't think so back in the '30s, however!)

Tetrodes and pentodes have additional tube elements that keep their grid-plate capacitance at a very low value, usually under 0.1 $\mu\mu$f. This in itself is seldom enough to cause trouble, but our layouts usually add other kinds of feedback. If we don't shield or otherwise isolate the input and output circuits there may be fairly large values of coupling between them, by inductive or capacitive means. Power leads, unless carefully decoupled, may provide common coupling. But even a perfectly shielded amplifier with adequate lead filtering can still have common coupling between the input and output circuits through the ineffective bypassing and grounding techniques outlined above.

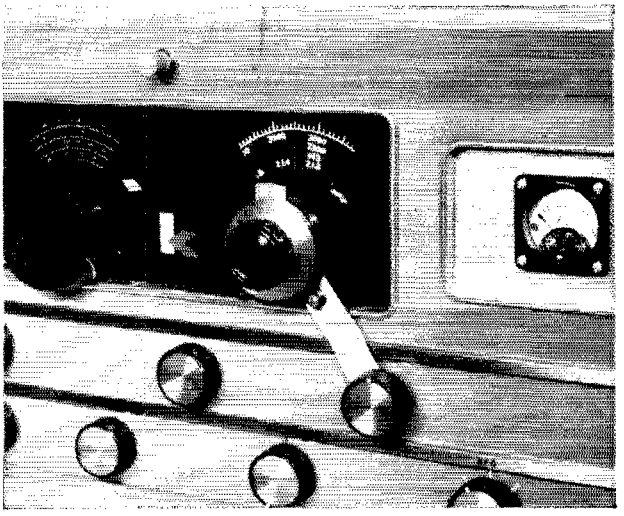
And when all these factors are taken care of we still have parasitic resonances — but this started out to be a discussion of bypassing and grounding techniques. Squelching parasitics is another story, and one that is already covered adequately in the *Handbook*. QST

Strays

KN4VUR, who likes to tap out a little code to some of his friends on his auto horn, found that the regular horn button was too difficult to manipulate. So, he has hooked up a bug in the horn circuit and is now able to toot a mean 20 w.p.m.

—...—

It was a brighter Christmas for a fatherless 14-year-old lad in San Diego as the result of the good offices of some of the local gang. Suspected of causing TVI with an ARC-5, the TVI Committee told him he would have to stay off the air until it was cleaned up. But because his experience and finances seemed insurmountable obstacles, the local hams came to his aid. They chipped in to buy him a home-made rig which *had* been cleaned up, kicked in with a few odds and ends of accessories, and the youngster now has a completely new transmitting setup. Thus, everyone is happy, thanks to some San Diego hams who observed Point Four of the Amateur's Code.



Front view of the receiver showing the new homemade band-spread dial and the added planetary drive. The small aluminum strip fastened under the knob below the dial is used to anchor the planetary drive. Together with the planetary on the capacitor drive shaft inside the panel, the total reduction is 25 to 1, giving a slow tuning rate for accurate tuning.

A Hybrid Communications Receiver

More Performance for Less Money

BY JOHN ISAACS,* W6PZV

Sorry if the title misled you — this receiver has no transistors, just vacuum tubes. It is a cross between a kit receiver and a homebrew job so that makes it a hybrid of sorts. But that's getting ahead of the story.

The ham that designs and builds his own receiver these days is a rare bird indeed. Most of us with a desire to build a receiver usually end up with some converted surplus or perhaps a modification of one of the older commercial receivers. The end results frequently leave a lot to be desired, especially with respect to drift and stability. There just isn't much that can be done to an existing tunable high-frequency oscillator to improve its stability, unless you are willing to replace the coils, tuning capacitor and band switch.

One solution to the problem is to make the oscillator crystal controlled. As usual, this introduces some problems that didn't exist before, but more about that later. With the high-frequency oscillator crystal controlled, the actual tuning is done in a tunable i.f. strip. This same arrangement is frequently used on the higher frequencies where a crystal-controlled converter is fed into a communications receiver. The receiver acts as the tunable i.f. strip. Here, the tuning is done at a much lower frequency where it is easier to get the desired stability. Percentage-wise, the drift is about the same as it would be if the oscillator were used directly on the higher frequency, but numerically it should be much less. The several models of Collins receivers use this scheme with obvious effectiveness.

For some time, the author had been planning to build a receiver of this type. The conversion of an existing receiver was also considered, but many of the less expensive ones did not have enough room for a new tunable i.f. strip, at least not without some major modifications. At about this time, Allied Radio Company introduced their new Knight-Kit receiver. It looked like a very good buy and had that very desirable commercial appearance. An inspection of the construction manual showed that room was available for the extra i.f. strip if the band-spread capacitor was omitted. After considerable planning the mechanical details were worked out, along with the circuit changes, and the kit was ordered.

Buying a new receiver with the immediate purpose of making major modifications in it may be a unique approach, but it offers one way to get what you want at moderate cost. Maybe you won't have to go to such a length, though; if your present receiver lacks the kind of selectivity and stability you'd like to have, it's more than possible that these ideas could be incorporated in it. The principal requisite is a little mechanical ingenuity.

* 1300 California Ave., Compton, Calif.

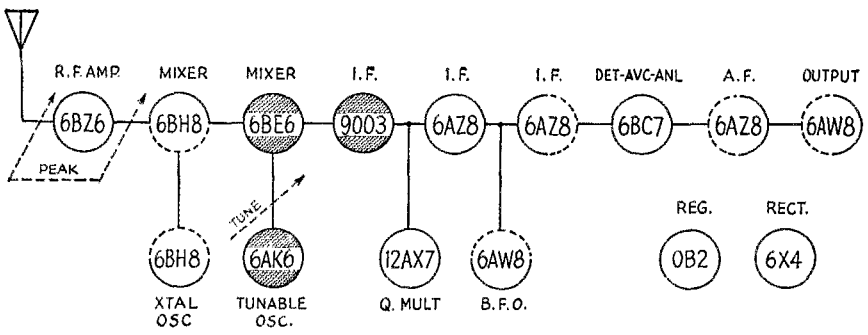


Fig. 1—Revised block diagram of the receiver. The additions, shown shaded, form a tunable i.f. covering the 80-meter band. The h.f. oscillator is changed to crystal control for ham-band reception.

Tunable I.F. Strip

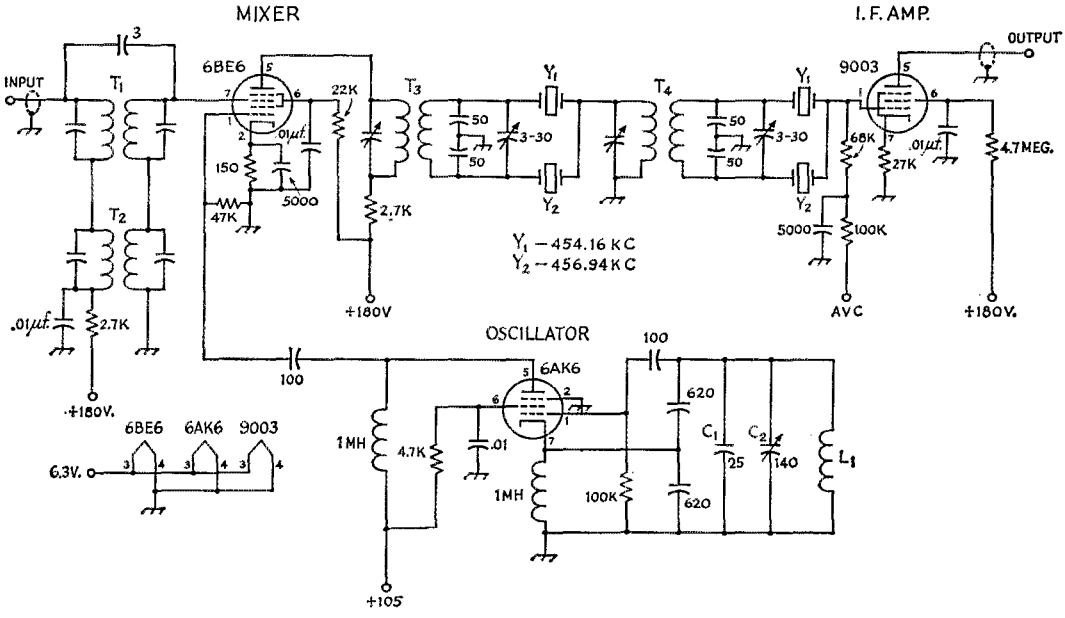
Before getting into the details, it would be well to get out the November, 1958 copy of *QST* and read the report on the Knight receiver.[1] The photographs there will serve as the "before." These show the printed circuit boards which greatly simplified the construction. Fig. 1 of that article shows the regular block diagram of the receiver. Fig. 1 of this article shows the block diagram of the modified receiver. The principal changes are the addition of the 6BE6 mixer, the 6AK6 tunable oscillator and the 9003 i.f. stage. (The 6AK6 and 9003 were used because they were on hand and also because they only take 0.15 amp. filament current.) These tubes, along with a broad-band input circuit, a two-stage half-lattice crystal filter, and miscellaneous parts, are mounted on a small subchassis. This subchassis is mounted on top of the receiver chassis in the location normally occupied by the two-gang bandspread capacitor. This is shown in one of the photographs.

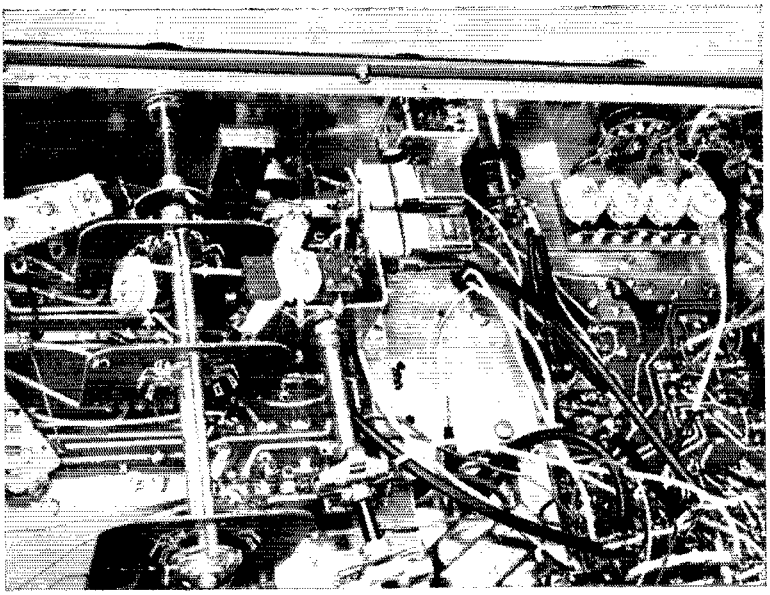
The circuit diagram of this tunable i.f. strip is shown in Fig. 2. The input is broad-banded by the use of two 4.5-Mc. TV sound i.f. transformers connected in series. These are stagger-tuned to provide a pass band of 3500 kc. to 4100 kc. No internal modification of the trans-

[1] "Recent Equipment," *QST*, November, 1958.

Fig. 2—Circuit of the tunable i.f. strip. This is built as a separate unit and can be tested and aligned independently of the receiver. Capacitances are in $\mu\mu$f. unless otherwise specified; resistances are in ohms, resistors are ½ watt.

C_1—25-$\mu\mu$f. N750 temperature-compensating capacitor.
C_2—140-$\mu\mu$f. variable; tuning capacitor.
L_1—4.3 μh., on slug-tuned form (see text).
T_1, T_2—4.5-Mc. TV sound-i.f. transformer (Miller 1466).
T_3, T_4—455-kc. i.f. transformer, interstage type, (from BC-745), with regular trimmer on secondary removed and replaced by series-connected 50-$\mu\mu$f. fixed silver-mica capacitors and a 3-30 padder as shown. Some transformers may require 100-$\mu\mu$f. capacitors plus a larger trimmer.
Y_1—454.16 kc. (surplus FT-241A, Channel 327).
Y_2—456.94 kc. (surplus FT-241A, Channel 329).





The h.f. oscillator crystals are mounted on an aluminum bracket installed alongside the oscillator section of the band switch. The shaft protruding from the bracket toward the rear of the chassis (toward the bottom in this view) is for the crystal seletcor switch on the rear chassis apron. The b.f.o. selector switch (replacing the variable capacitor in the original receiver circuit) and trimmers are to the right of the crystals. This picture may be directly compared with that on page 47, November *QST*, by turning the latter upside down.

formers is required. The tunable oscillator is designed to cover a range of 3955 kc. to 4555 kc. — just 455 kc. higher than the incoming signal. The 6BE6 mixer feeds a two-stage half-lattice crystal filter which uses surplus crystals. The 9003 provides a little gain to compensate for the losses in the crystal filter and acts as a termination for the filter. The cathode and screen resistors are made very large because not much gain is needed and too much gain would cause objectionable hiss.

Because of space requirements, the tunable oscillator coil is wound on a ⅜-inch o.d. ceramic slug-tuned coil form. The wire is No. 22 enameled and enough turns are used so that the slug barely enters the coil. The capacitors are silver mica except for the 25-$\mu\mu$f. negative-coefficient capacitor, which is ceramic. The tuning capacitor is mounted separately with only one wire (and ground) being needed to connect it to the oscillator tank.

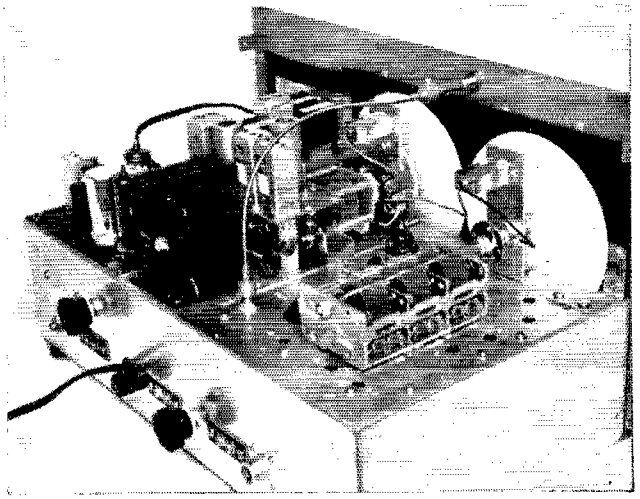
The new i.f. strip was constructed, tested and aligned[2] before being installed in the receiver.

Receiver Modifications

A new dial was made and is used in place of the original bandspread dial. The dial is calibrated from 3500 kc. to 4100 kc.

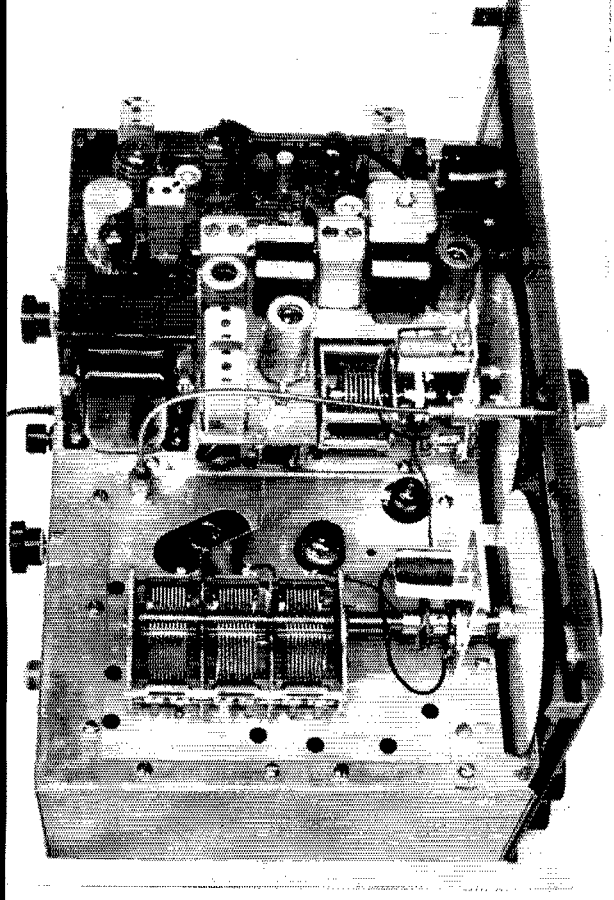
On the 75-meter band, the front-end oscillator is disabled and the r.f. and mixer stages act as preselectors for the tunable i.f. strip. On the higher frequencies, a crystal-controlled oscillator converts the signals to the 75-meter band so the tunable oscillator always covers the same range no matter what band is in use. This makes the

[2] See the ARRL *Single Sideband* book for several excellent articles on the alignment of half-lattice crystal filters.



This view from the rear of the chassis shows the new unit—mixer, oscillator, i.f. with cascade lattice filters—from the side. Installed in the space formerly occupied by the band-spread tuning capacitor, it fills the area between the power transformer and the band-spread dial. Small pillars are used to support the plate on which the components are mounted.

The two additional controls mentioned in the text can be seen on the rear apron of the chassis.



The new tunable-i.f. strip is shown in perspective in this photograph. The chassis for it, an L-shaped metal plate, contains the tubes and i.f. components. The internal reduction drive for the band-spread capacitor is the mechanism from a National "Velvet Vernier" dial; it is mounted on a bracket at the edge of the chassis in front of the capacitor.

receiver just about as stable on 10 meters as it is on 75 meters.

The i.f. and audio board was assembled without any modification. Printed circuits don't lend themselves too well to modifications. Actually, the performance on sideband proved to be excellent even without a product detector. The b.f.o. circuit was changed slightly as a matter of convenience. The b.f.o. tuning capacitor was replaced with a rotary switch and four ceramic trimmers. The first two positions are used for upper and lower sideband and the remaining two for normal and inverted RTTY. In changing sidebands it is, of course, necessary to retune slightly. However, the b.f.o. is always on the right frequency with respect to the i.f. pass band.

The output of the tunable i.f. strip is normally connected into the primary of the first i.f. transformer on the printed circuit board. The output of the 6BH8 first mixer is also normally connected to the input of the broad-banded i.f. transformers. These connections are made through a two-position selector switch mounted on the rear of the receiver. When the switch is turned to the second position, the output of the 6BH8 is connected directly to the i.f. transformer on the board. This permits normal operation in the broadcast-band position where the tuning is done on the general coverage dial. In this position the B+ voltage is also removed from the tunable i.f. strip. On all other bands, the general-coverage dial is used to peak the signal just as with a preselector. The antenna trimmer functions normally on all bands. A small filament transformer is mounted under the chassis and connected to the tubes on the tunable i.f. strip. The regular power transformer does not have enough capacity to handle this load in addition to the B+ requirements for the strip.

Most of the modifications in the kit itself are in the r.f.-mixer section. Above the broadcast band, the oscillator section of the tuning capacitor is not used. The oscillator is crystal controlled and a separate ceramic trimmer, plus some fixed mica capacitors in some cases, is used to tune the oscillator coil. Fig 3A shows a simplified drawing of the original tunable oscillator circuit, and Fig. 3B shows the simple modification used to convert to crystal control. This circuit works very well with the regular crystals as well as with the overtone crystals used on 10 and 15 meters. The original oscillator coils are used in all cases. The broadcast band, 80 meters and 40 meters are selected by means of the regular band switch. The 3500-kc. crystal is automatically switched in for 40 meters. On 20 meters and above, the band switch is turned to the fourth or "D" position and then the crystals for 20, 15 and 10 are selected by a switch mounted on the rear of the receiver. This is a five-position switch since three crystals are required to cover the 10-meter band. This switch, along with the one mentioned previously, could have been mounted on the front panel but this would have spoiled the appearance. The rear switches are a little inconvenient but they are not used too frequently.

Several changes were made in the r.f. and mixer stages. Originally, the cathode of the r.f. stage was connected to the r.f. gain control. On the broadcast band, the circuit remains connected this way, but the switch on the back of the receiver grounds the r.f. stage cathode through a 2200-ohm resistor on the higher bands. The mixer stage was modified to produce more gain, by decreasing the screen resistor from 820K to 470K, raising the cathode resistor from 150 to 400 ohms and removing a 10K resistor between the cathode and screen grid. The grid

resistor of the mixer was also increased from 82K to one megohm.

This just about covers the various circuit changes and additions. Except for the photographs, the mechanical details have not been covered to any extent. The omission is intentional since no attempt has been made to write a constructional article; it is not likely that anyone will want to duplicate the receiver exactly. Rather, this is an "idea" article, with some suggestions which can be applied to other receivers. Actually, nothing new has been mentioned. The broad-banded tunable i.f. strip, except for the crystal filter, is similar to the one used in the new Drake receiver.

How It Works

A few words on the performance of the receiver might be of interest. The operation on single sideband is very gratifying. The selectivity of the crystal filter, plus the *Q* multiplier, is very good. On a.m. it is necessary to tune to one side for best reception. The bandwidth is about 3.5 kc. at 6 db. down with the filter alone.

On the 20-meter band, the total receiver drift from all sources including the b.f.o. is less than 150 cycles at the end of the first half hour. A sharp blow on the top of the receiver cabinet has no noticeable effect on a sideband or c.w. signal.

As in most dual conversion receivers there are some spurious responses. The harmonics of the crystals do not fall within any band in use, but on 40 meters the second harmonic of the 3500-kc. crystal makes it impossible to copy a signal right on the low edge of the band. On 15 meters, the fifth harmonic of the tunable oscillator falls on about 21,305 kc. with an S9 signal. On 10 meters the seventh harmonic of the tunable oscillator comes in loud and clear at one point in each of the three segments of the band. The chances that these signals will cause trouble are low. QST

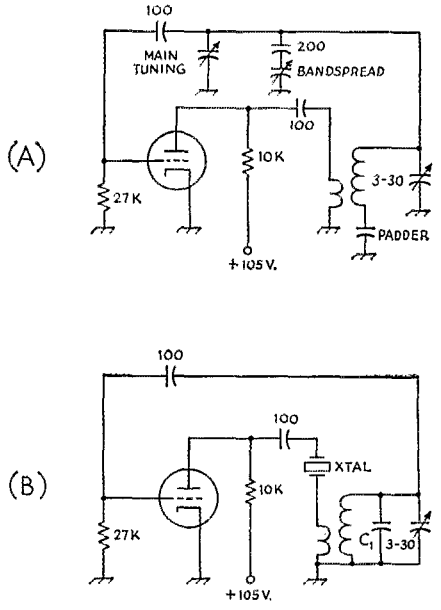


Fig. 3—Simplified circuit of original h.f. oscillator (A) and oscillator circuit as modified for crystal control (B). The same tank coils are used in the modified circuit. C_1 is a fixed mica capacitor to supply whatever fixed padding is necessary for proper functioning of the oscillator on each band. The capacitance required will vary with different receivers, the principal requirement being that C_1, in conjunction with the 3-30 μμf. trimmer, should be capable of tuning the oscillator circuit to the crystal frequency. Crystal frequencies used in W6PZV's receiver are

Band	*Crystal Freq.*
3.5 Mc.	none
7 Mc.	3500 kc.
14 Mc.	10.5 Mc.
21 Mc.	17.5 Mc.
28.0-28.6 Mc.	24.5 Mc.
28.5-29.1 Mc.	25.0 Mc.
29.1-29.7 Mc.	25.6 Mc.

Strays

A book that should be on every ham's operating table, be he DX man, traffic handler certificate chaser or rag chewer, is *Webster's Geographical Dictionary*. In it are listed alphabetically the countries, cities, towns and most villages (yes, even Podunk will be found) of the world. Included also are seas, bays, gulfs, rivers, lakes, and even dams and parks.

The political subdivisions (counties, regions, provinces, etc.) of most countries will be found in tabulated form. For those who are after "Worked All Counties" certificates, there is a list of the counties of every state, and an individual map of every state showing the county border lines. There are also reasonably detailed maps of every country, most of them with the political subdivisions tabulated and outlined.

Plenty of subject material for the rag chewer will be found, since town listings include such information as population, industries, date of settlement, colleges if any, and a brief history of the place. Listings of larger subdivisions include information on area, altitude, terrain and climate.

A quick reference to this book while you're going through the "rig hr" routine will give you a much better idea of your contact and his surroundings and furnish suggestions for topics of conversation.

There may be other geographical dictionaries, but the one referred to is published by G. & C. Merriam Co. of Springfield, Mass. If your local book dealer doesn't stock it, probably he will be glad to order it for you. — *D. H. M.*

The "K4HWY Special" Antenna

A Parasitic Beam with Hat-Loaded Driven Element

BY CHARLES H. STARN,* K4HWY

A considerable improvement in signal reports has been obtained by the author through end loading a full-length driven element in a 3-element parasitic beam to simulate collinear operation. Tests have shown that the 20-meter beam described will also do a good job on other bands from 6 to 40 meters.

A YEAR or so ago I built and put into operation a standard 3-element wide-spaced beam for 20 meters. The characteristics of the beam were good and the front-to-back ratio was about 25 db. But I didn't feel quite satisfied with it. I was getting knocked off the low end of the 20-meter phone band too consistently to suit me. I decided to try something different.

Each side of the driven element, which was split at the center for the feed line, was lengthened electrically by adding a loading coil plus a "carpet-beater" loop about 3 feet in length. The idea was to try to simulate a driven element with two half waves in phase.[1] The reflector and director were not touched. The driven element was fed with a tuned 600-ohm line.

The improvement in signal reports was amazing. As an example, the best signal reports I got from KG6CGA and VU2BK during the previous eight months had been S9 plus 30 db. from KG6CGA and S9 plus 2 db. from VU2BK. After making the change in the driven element, I received two reports of S9 plus 60 db., two reports of S9 plus 50 db., and two reports of S9 plus 40 db from KG6CGA, and one report of S9 plus 25 db and four reports of S9 plus 10 db. from VU2BK. The beam was 42 feet high and I was running 800 watts to a 304TL. Running 50 watts to an Elmac AF67 for one hour brought S9 plus from VK6KW, S8 from VS2DQ, S9 from KX6BT and S9 plus 10 db. from KG6CGA.

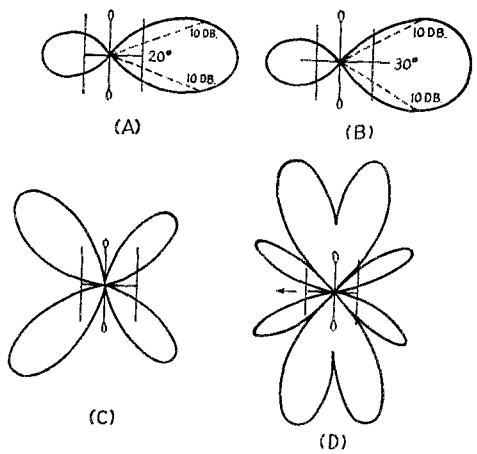


Fig. 1 — Approximate field patterns of the "K4HWY Special" beam antenna for 20 meters (A), 15 meters (B), 10 meters (C), and 6 meters (D).

Multiband Operation

The use of open-wire feeders fed from a standard antenna tuner permits feeding the beam on other bands without excessive losses in the line. S-meter checks with other hams at various distances indicate that the 15-meter pattern is essentially the same as on 20 meters (see Figs. 1A and 1B). The 10-meter pattern (Fig. 1C) is a clover

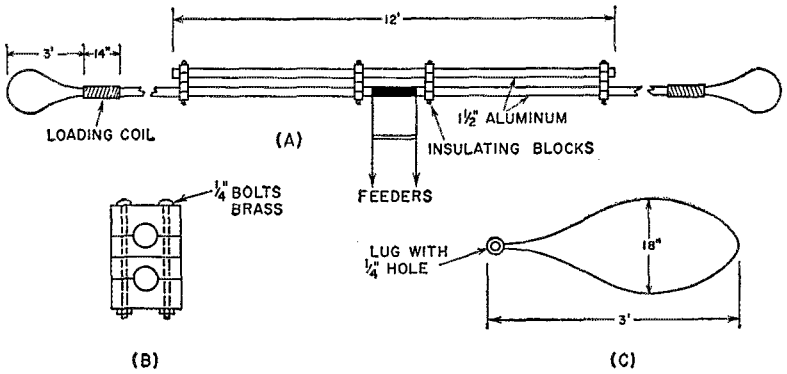


Fig. 2 — Constructional details of the driven element — (A) the complete assembly, (B) the mounting insulator and (C) the "carpet beaters".

* Starn & Grover, Inc., 2250 S.E. 17th St., Fort Lauderdale, Fla.

[1] While it is doubtful that this objective is achieved in full, the characteristic current-distribution having a maximum either side of some minimum at the feed point should be evident. — *Ed.*

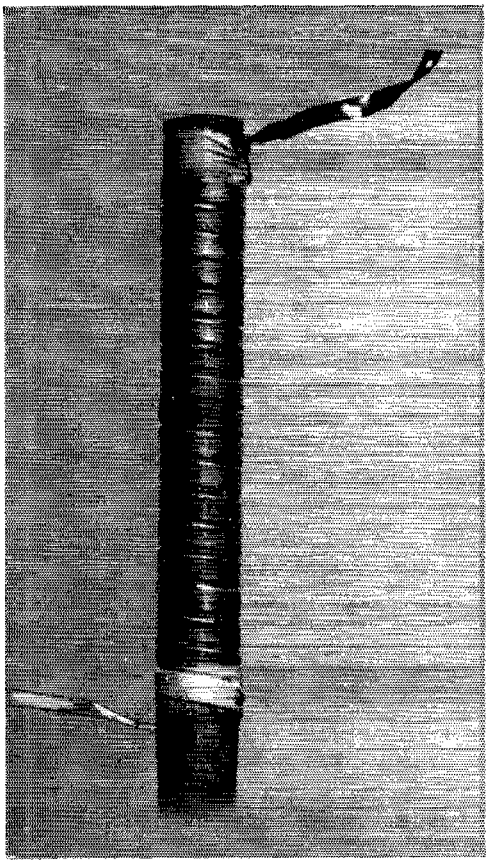
leaf. The driven element works well as a dipole on 40 meters and the array does a good job even on 6 meters, four main lobes appearing off the ends of the beam as shown in Fig 1D.

Construction

Fig. 2A shows a sketch of the driven element. A 12-foot section of 1½-inch aluminum tubing, insulated from and bridging the center portion, serves as a support. The supporting section is suspended from a triangular boom, using U bolts. The insulators between the driven element and the supporting section are in the form of clamping blocks. Each consists of four pieces of ¾-inch bakelite, 3 inches wide and 1¼ inches high, shaped to fit the aluminum tubing and clamped together with long ¼-inch stainless steel bolts.

Each of the loading coils is wound with 7 feet of ⅜-inch copper strip, turns spaced ⅛ inch. The form is a 14-inch length of bakelite tubing having an outside diameter of 1½ inches to fit into the end of the driven element which has an *inside* diameter of the same dimension. One-quarter inch stainless steel bolts are used to fasten the bakelite tubing and aluminum tubing together and to anchor one end of the coil winding. Similar screws are used at the other end of the loading-coil form to anchor that end of the winding and for attaching the "carpet beaters." The latter are made of 6-foot lengths of 1/16-inch brass wire (No. 12 or 14 copper-clad is also suitable) bent into the form shown in Fig. 2C.

For a design frequency of 14,200 kc., the original length of the driven element was 33 feet 8 inches, including a 6-inch insulator at the center. Adding the loading coil and the "carpet beaters" increases the over all length to 42 feet. The director is 31 feet 6 inches long and is spaced 13 feet from the driven element. The reflector is 34 feet 11 inches long and is spaced 11 feet from the driven element. The boom is 24 feet long.



The low-capacitance loading coils are wound with copper strip on a bakelite-tubing form.

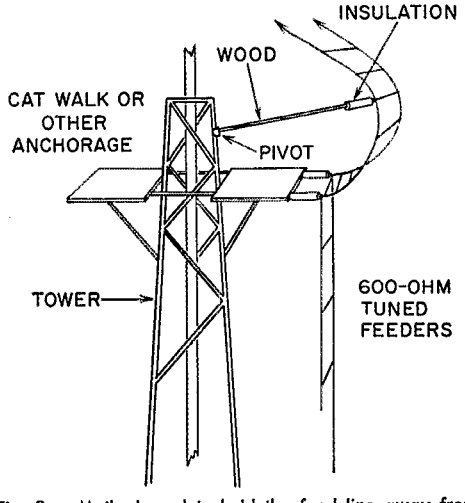


Fig. 3 — Method used to hold the feed line away from the tower as the beam is rotated. The pivot at the tower should permit movement of the arm in all directions. Flexible insulated neon-sign wire (G-TO-15) for the movable section of the line would simplify insulation.

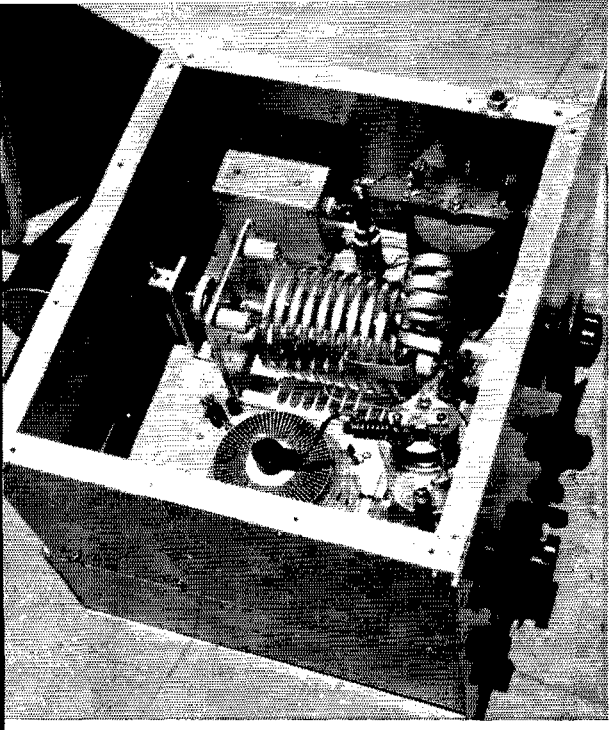
Fig. 3 shows the method used to keep the 600-ohm feeders clear of the tower for 360-degree rotation (180 degrees each side of the anchor point).

Checks on the bandwidth were made using the AF67 loaded to a reference plate current of 100 ma. Over the range of 28,550 to 29,000 kc., the loading remained constant within 5 ma. plus or minus. From 28,550 to 28,000 kc., the plate current gradually increased to 130 ma.; from 29,000 to 29,700 kc., it gradually decreased to 92 ma. On 15 meters, the loading was flat across the entire band, within the 5-ma. tolerance.

With the design frequency at 14,200 kc., the loading was flat within 5 ma. plus or minus over the range of 14,140 to 14,300 kc.; from 14,140 to 14,000 kc. the plate current gradually increased to 125 ma. On 7 Mc., the current was constant within plus or minus 5 ma. over the range of 7150 to 7300 kc., and gradually increased to 112 ma. from 7150 to 7000 kc.[2]

Over the years, I've used just about every type of antenna — 8JKs, Lazy-Hs, bisquares, rhombics and Vees, but this tops them all. QST

[2]Bandwidth will vary with feeder length. — *Ed.*



Inside the amplifier enclosure. The PL-172 anode is visible along the near wall of the enclosure, the vacuum tank capacitor is to its right, the tank coil is at about the center of the unit, and the loading capacitor is at the upper right. Two additional 500-uuf. units have been added to the blocking capacitor (C_1, Fig. 1) since this photo was taken. The aluminum box at the upper left contains the components for the r.f. voltmeter. The ceramic capacitors near the chassis between the tube and the rear end of the tank assembly are paralleled units bypassing the suppressor grid. The blower, mounted on the rear chassis wall, is partly visible at the left. (For a view of the amplifier from the opposite side, see cover of November, 1958 *QST*.)

Operating the PL-172 in Grounded Grid

Practical Pointers on Amplifier Design and Use

BY M. C. BARTLETT,* W9MC

Because the design of the r.f. circuits is generally the thing that catches the most interest, many amplifier descriptions leave such things as power-supply details as a "problem for the student." And such details often are a problem. So are many of the other points touched on in this article describing a Class AB_1 kilowatt linear.

WE HAD a nice new s.s.b. exciter (Hallicrafters HT-32) and had made a few contacts, but were invariably snowed under by the full-gallon rigs that are now fairly commonplace. This led to thoughts about linear amplifiers. But we wanted to avoid the problems associated with swamping devices, so some form of grounded-grid circuit requiring driving power of the same order as the output of the HT-32 was indicated. At about this time the March, 1958 issue of *QST* arrived, and we studied the possibilities offered by the rigs built by W9KPD and W2DP,[1] in which the new Penta PL-172 was employed. This jug offered 1-kw. plate dissipation with operation at relatively low plate voltage, which fitted our one-and-only high-voltage power supply. And so we started to work, lining up the required component parts, at the same time designing a chassis-housing for assembling them.

The Tube

When contemplating the component parts for any piece of electronic gear, the tube is the key to most of the other items required. The heater of the PL-172 is rated at 6.0 volts, not 6.3. Since only 6.3-volt transformers are available, some means of controlling and measuring the voltage had to be included in the design.

The cathode of the PL-172 is not connected to the heater but the two are pretty closely associated, and it became apparent that with the cathode isolated from ground the heater would require similar treatment.

As a Class AB_1 linear amplifier with 2500 volts on the plate and 500 volts on the screen the tube requires about 110 volts of negative bias. We

* 5201 Knollton Road, Indianapolis 8, Indiana.

[1] "Two Linear Amplifiers," *QST*, March, 1958.

wanted the voltage to be adjustable, yet reasonably well regulated, and guessed that a 15-volt range of bias adjustment would be satisfactory. The actual bias is the sum of the drops across an 0B2 voltage-regulator tube and a series resistor (R_1 in Fig. 3) the latter being adjusted to provide the exact required bias.

The screen of the PL-172 is rated to take an average current of less than 50 milliamperes, under excitation. Since tetrode and pentode power amplifiers are far more sensitive to variations in screen voltage than plate voltage, we needed a source of adjustable and regulated screen voltage, capable of up to 100 ma. or so peak current, at a maximum of 500 volts.

The suppressor grid of the PL-172 may be operated either at ground potential or with a 75-volt positive bias. If operated at zero volts the suppressor may simply be grounded at the socket, but if it is operated with positive bias (this, the manufacturer says, increases the overall efficiency of the tube) the r.f. impedance to ground should be 3 ohms or less. To satisfy this condition, we used a 5000-$\mu\mu$f. bypass right at the socket terminals.

The anode of the PL-172 is one of those external, multiple-fin-radiator affairs. We used a Millen type 36011, snap-on plate-cap connector, $^9/_{16}$-inch size. A blast of air must be blown up through orifices in the special socket (PL-184) and thence through the anode radiator fins for cooling. The blower must be capable of forcing about 56 cubic feet of room-temperature air per minute through the fins to cool the anode at 1-kw. dissipation. The blower specified in Fig. 1 functions very satisfactorily.

The PL-184 Socket

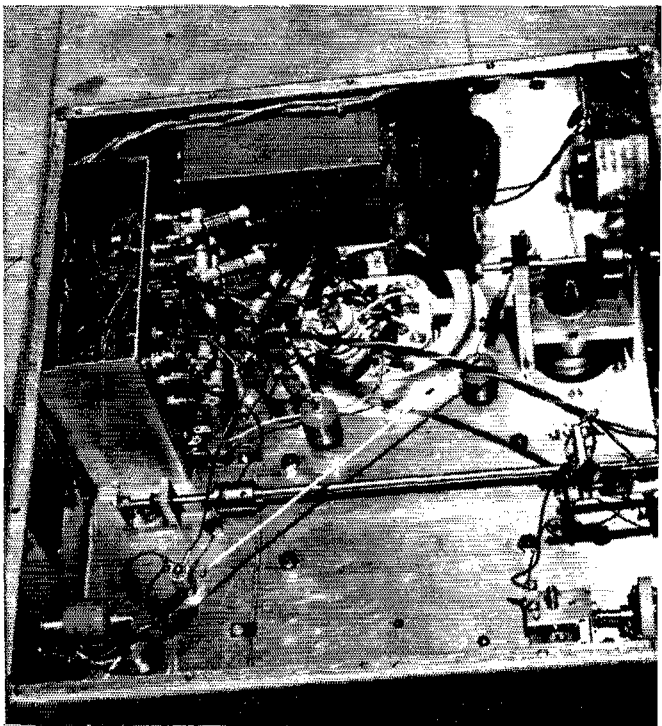
The heater, control grid and cathode of the PL-172 all connect to terminals of a 7-pin ceramic socket in the bottom of the PL-184 socket assembly. (This socket, especially designed for the PL-172, is essential for proper operation.) The screen and suppressor terminals are rings on the tube and make contact with spring contacts mounted on the body of the socket frame. The screen connection is below the chassis surface, while the suppressor is above. It is recommended that the added capacitance required to ground the suppressor for r.f. be located on the anode side of the chassis. There are also four spring clips on the top surface of the socket for holding a glass chimney (supplied as part of the socket) which guides the air-blast through the multiple-fin anode.

The PL-172 is a fairly heavy tube, and since the base pins are quite small there is nothing to prevent the tube from falling out of the socket when inverted. The same thing is true of the glass chimney. When building a piece of equipment of this kind, it is our experience that the rig is upside down about half the time. *Therefore, be sure to remove both the tube and the chimney before turning the chassis upside down, or risk a rather expensive alternative.*

The socket includes four built-in small doorknob type high-voltage capacitors of 500 $\mu\mu$f. each. In some installations this capacitance is sufficient to make the screen cold for r.f. But we took no chance on instability, and added another 1000 $\mu\mu$f. to be on the safe side.

The Tank Coil

The Barker & Williamson type 852 pi-network tank coil is designed for a 1500-ohm load center. We checked on the specifications for the PL-172 and estimated that this tank would be more suitable than the 851-A, and so included it in our plans. We did have to remove two turns from the 10-meter coil, and one turn each from the 15- and 20-meter sections by moving the taps. So



Underneath the amplifier chassis, showing bottom of tube socket and special mounting and drive for the vacuum capacitor. Along the far wall are the FC-30 heater choke, the filament transformer and, on the panel, the filament-voltage control. The TVI filters are clustered together at the upper left. The right-angle drive for the loading capacitor is at bottom right. The long shaft and associated components are not presently used.

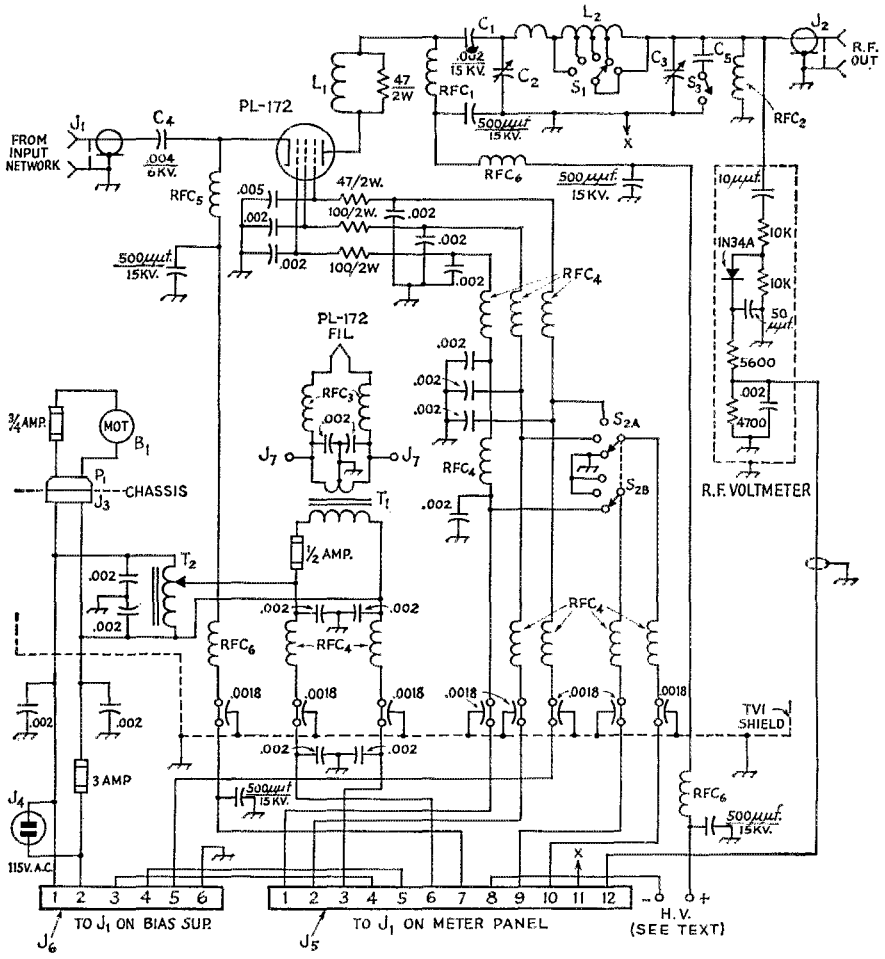


Fig. 1—Circuit diagram of the grounded-grid amplifier. Capacitances are in μf. unless otherwise indicated; resistances are in ohms, resistors are half watt except as shown. Feed-through capacitors (0.0018 μf.) are Centralab Hi-Kap, 1000 volts; all other fixed capacitors without voltage rating indicated are 1000-volt ceramic discs, using 0.001-μf. units in parallel as necessary; 15-kv capacitors are TV type "doorknob," Centralab TV-207.

B_1—Blower (Model 8472, No. 3, L-R Mfg. Co., Torrington, Conn.)
C_1—0.002 μf. (four 500-μμf. 15-kv. Centralab TV-207 in parallel).
C_2—400-μμf. vacuum variable (Jennings UCS-400).
C_3—1500-μμf. variable, 0.03-inch spacing (Cardwell PL-8013).
C_4—0.004-μf. ceramic, 3000 volts (four 0.001 units in parallel).
C_5—0.001-μf. ceramic, 3000 volts (for additional output capacitance on 3.5 Mc.)
J_1, J_2—Chassis-type coax connector.
J_3—2-conductor receptacle (Jones S-202-B).
J_4—115-volt chassis receptacle, male.
J_5—12-contact chassis-mounting connector, female (Jones S-312-AB).
J_6—6-contact male chassis-mounting connector (Jones P-406-DB).
J_7—Tip Jack.
L_1—7 turns No. 12 on ⅜-inch dia. form with 47-ohm 2-watt resistor inside.
L_2—Pi-network tank, with switch (B & W 852).
P_1—2-conductor plug (Jones P-202-CCT).
RFC_1, RFC_2—Transmitting r.f. choke (National R-175A).
RFC_3—Filament choke, dual (B & W FC-30).
RFC_4—21-μh. r.f. choke (Ohmite Z-28).
RFC_5—Transmitting r.f. choke (B & W 800).
RFC_6—7-μh. r.f. choke (Ohmite Z-50).
S_1—Part of tank coil assembly.
S_2—2-circuit 3-position non-shorting rotary switch.
S_3—Ceramic rotary ("band-switch" type).
T_1—Filament transformer, 6.3 volts, 10 amp. (Stancor P-6308).
T_2—Adjustable-voltage transformer, 1.25-amp. (Superior Model 10).

Note: Capacitances shown in diagram bypassing the screen and suppressor are in addition to capacitances built into the PL-184 socket.

far, we have not found it necessary to make any change in the 40-meter tap.

It takes a lot of torque to turn the band switch on this tank. We tried a couple of the commercial insulated shaft couplers, but these had crimped hubs and they slipped. So we made up a coupling from a 3-inch length of ¾-inch diameter nylon rod, drilling a ¼-inch hole through the center. Then we drilled and tapped radial holes 120 degrees apart near both ends, using ¼ by 20 Allen-type set screws. Flats were filed at the appropriate places on both the tank-switch shaft and the panel extension, and we now have a really solid coupling.

Plate Tank Capacitor

With 2500 volts on the plate a variable capacitor with fairly wide plate spacing is called for. And with a relatively high-C tank circuit, such a capacitor could well take on the physical dimensions of a baby-grand piano. Hence, we turned to the space-conserving vacuum variable capacitor. The Jennings type UCS-400 has about the right range (20 to 400 $\mu\mu$f.) and ample voltage rating (7500 volts). The base of this capacitor requires a special Jennings contact ring which, while excellent for electrical contact, is not in our opinion sufficiently rugged mechanically to hold the capacitor in a vertical position and withstand the torque of the drive. So we built a special mounting out of ½ by 1½-inch brass bar, as shown in Fig. 5, for the capacitor and gear drive. A gear size should be selected so that the hub of one gear can be bored out to ½ inch to fit the shaft of the Jennings capacitor. Two collars for ¼-inch shafts are required for positioning the gears and holding them in mesh. The mounting should be made secure before attempting to locate holes in the chassis for the base contact ring.

The Loading Capacitor

For loading adjustment we picked the Cardwell type PL-8013, which has sufficient capacitance to match a 52-ohm coax load on 80 meters with some additional padding. The spacing is ample to avoid arcing when feeding a 52-ohm load (only about 320 volts r.m.s. at 2 kw. p.e.p.). This capacitor is turned by a Millen 10012 right-angle drive working through an insulated flexible coupling and is mounted on small ceramic stand-off insulators. A ½-inch hole was drilled in the chassis and fitted with a rubber grommet having a ¼-inch hole; the capacitor shaft passes through the grommet, making the hole effectively air-tight. The frames of both capacitors are connected together through a heavy copper strip, and the strip is grounded to the chassis.

Metering

Although no grid current should flow in AB_1 operation, one needs to know that none *is* flowing. Hence the 0–10 milliammeter in the grid return. And with large tetrodes and pentodes the screen current is so important that we picked a zero-center meter, fearing that the PL-172 might be one of those temperamental bottles that develops a negative screen current. However, it never has, so any ordinary 0–100 ma. instrument will work just as well.

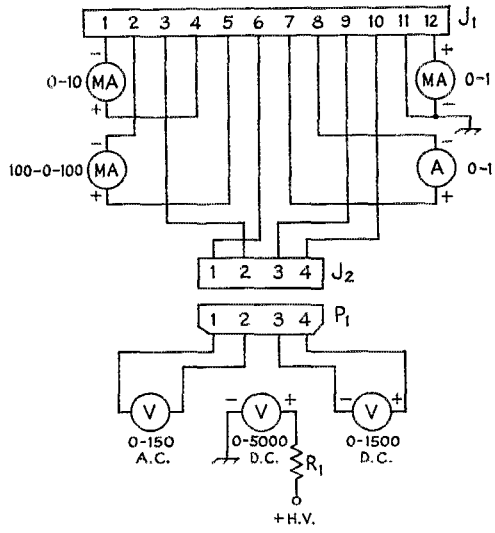


Fig. 2—Meter panel circuit diagram. R_1 is the multiplier resistor for the 5000-volt d.c. meter.
J_1—12-contact chassis-mounting connector, female (Jones S-312-AB).
J_2—4-contact chassis-mounting connector, female (Jones S-304-AB).
P_1—4-contact plug, male (Jones P-304-CCT).

We also considered a voltmeter, switched between screen, suppressor and control grid, to be necessary.

We elected to put the plate meter in the cathode return and thus avoid any exposed high-voltage points. Although this measures the sum of the plate and screen currents, the big part indicated is plate current. By setting the bias to provide a static cathode current at the stipulated plate current value, *plus screen current*, you get proper adjustment. Since the PL-172 cathode circuit should draw about 840 ma. on peaks during testing, a 0–1 ammeter is indicated.

Rectifying a sample of the r.f. output offers a sure means of checking on the accuracy of tuning. We made up a little aluminum box containing the resistors, capacitors, and the crystal diode (1N34), and connected the d.c. output, via shielded line, to a contact on the meter plug (see Fig. 1). The output meter is a 0–1 milliammeter.

An a.c. voltmeter (0–150 range) serves to measure the output voltage of T_2, giving a serviceable indication, when calibrated, of the voltage applied to the heater.

The Chassis

After measuring all components to be located above the chassis deck, we arrived at a size of 17 by 16 inches. Considering the shaft-center-to-bottom-edge measurement of the Groth T-3 turn-counting dial for the vacuum capacitor, a

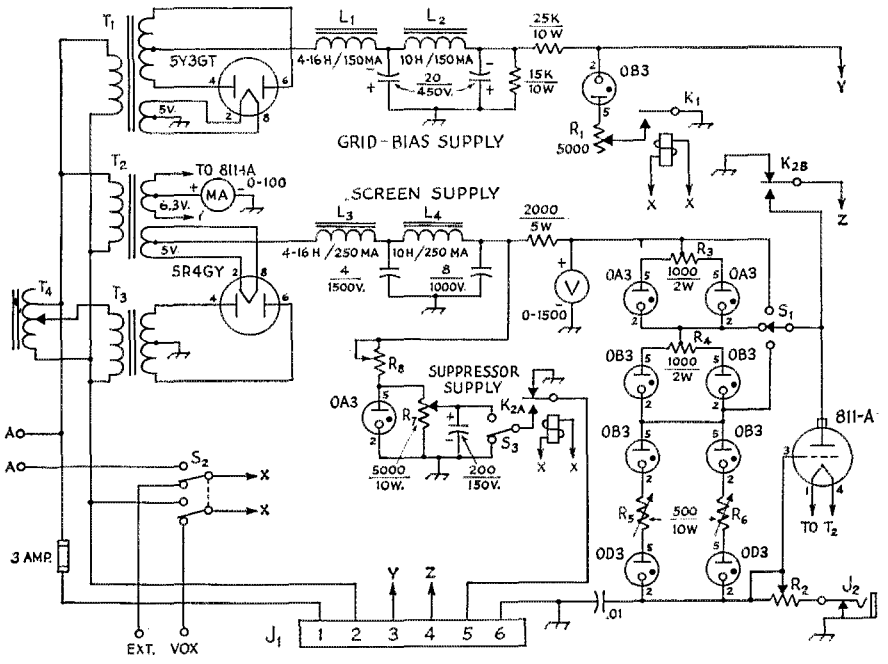


Fig. 3—Circuit of power supply for grid, screen, and suppressor. Capacitances are in μf.; capacitors with polarities marked are electrolytic, others are paper. Resistances are in ohms. Numbered terminals correspond to connections in J_6, Fig. 1, and terminate in a Jones P-406-DB connector.

J_1—6-contact female chassis-mounting connector (Jones S-406-DB).
J_2—Closed-circuit phone jack.
K_1—S.p.s.t. relay, 115-volt a.c. coil.
K_2—D.p.d.t. relay, 115-volt a.c. coil.
L_1—Swinging choke, 4/16 henrys, 150 ma. (Merit C-1718).
L_2—Smoothing choke, 10 henrys, 150 ma. (Merit C-2335).
L_3—Swinging choke, 4/16 henrys, 250 ma. (Merit C-3189).
L_4—Smoothing choke, 10 henrys, 250 ma. (Merit C-3182).
R_1—5000-ohm variable, 25 watt (Ohmite H-0162).
R_2—1000-ohm 25-watt adjustable.
R_3, R_4—1000 ohms, 2 watts center-tapped (two 500-ohm 1-watt resistors in series).
R_5, R_6—500-ohm, 10-watt adjustable.
R_7—5000-ohm adjustable, 10 watts.
R_8—20,000-ohm 25-watt adjustable.
S_1—3-position, 1-circuit rotary switch.
S_2—D.p.d.t. toggle.
S_3—S.p.d.t. toggle.
T_1—470 volts c.t., 40 ma.; 5 volts, 2 amp. (Stancor PC-8401).
T_2—Filament transformer, 5 volts, 4 amp.; 6.3 volts, 4 amp. (Merit P-3041).
T_3—660 v. each side c.t., 250 ma. (Merit P-3157).
T_4—Adjustable-voltage transformer, 3 amp. (Standard Electric Adjust-a-volt 300BU).

Note: Terminals A-A connect to the contacts of a normally-open relay having its coil in series with the bleeder resistor in the high-voltage plate supply, as described in the text, to ensure that screen and suppressor voltages cannot be applied to the tube until the plate voltage is also applied.

chassis depth of 6-inches appeared logical. We used aluminum stock ⅛-inch thick for the chassis; doing it again, we would use considerably lighter material.

As a means of making the chassis airtight, a bottom plate was mounted with machine screws on a ½-inch lip on the chassis. A gasket was used for sealing the chassis and plate as we were unable to make the assembly sufficiently airtight without one. Cork sheet, .030-inch thick, cut into strips ½-inch wide, works very well although any good gasketing material would do.[2]

The framework of the upper enclosure uses Reynolds do-it-yourself aluminum angles, ½ by ½ by .030-inch. The corners are held together by brass corner-angle pieces (luggage corners) bought at a local hardware store, and the sides are light (.010-inch) sheet aluminum, fastened in position by sheet-metal screws. The entire top is of perforated aluminum sheet with holes 3/16-inch in diameter, spaced on ½-inch centers. This provides plenty of exhaust area for the cooling air.

TVI-proofing, necessary on any modern transmitting equipment, involved a compartment in which all of the lines leading out of the chassis were concentrated. Every lead to the power pack and meters, and also the 115-volt a.c. and high-voltage leads, were filtered by heavily bypassed v.h.f. chokes.

[2] If electrical sealing to prevent escape of TV harmonics is essential, good contact between the chassis and bottom plate can be restored by a wrap of aluminum foil around the gasket material. — *Editor.*

The Power Package

The low-voltage power package, Fig. 3, contains two separate supplies, one of which is for negative control-grid bias. This supply puts out about 220 volts d.c. at 70 ma., which is dropped to usable values through a 25K resistor, an 0B3, and R_1, to provide a range of -90 to -120 volts. Relay K_1 disconnects the ground for the VR tube on stand-by, causing the voltage to rise to its maximum value, about 220 volts. This is well past plate and screen current cutoff.

The other rectifier-filter system provides up to 500 volts at 150 ma. for the screen and up to 75 volts for the suppressor grid. The voltage for the suppressor is dropped through R_8, which should be set to the point where not more than 25 ma. flows through the VR tube with T_4 in the full voltage position. R_7 is for setting the suppressor bias to exactly 75 volts.

The screen voltage is dropped slightly through a 2000-ohm resistor but the value of the voltage supplied to the parallel VR tube strings and the 811-A regulator tube is determined by the Adjust-a-volt autoformer, T_4, which supplies the primary of T_3 with adjustable a.c. voltage. The current through the two strings of VR tubes should be balanced, and should total 52 ma. J_2 is for a 0–100 milliammeter, to establish the proper balance between the currents taken by the 811-A and the VR strings. If the current is less than 50 ma. through the VR tubes, they may go out on current peaks. R_2 can be adjusted for optimum regulation by using the setting that results in the least screen-voltage variation when the amplifier is driven by an s.s.b. voice signal. The optimum 811-A plate current is in the vicinity of 80 ma. Relay K_2 grounds both the screen and suppressor of the PL-172 on stand-by.

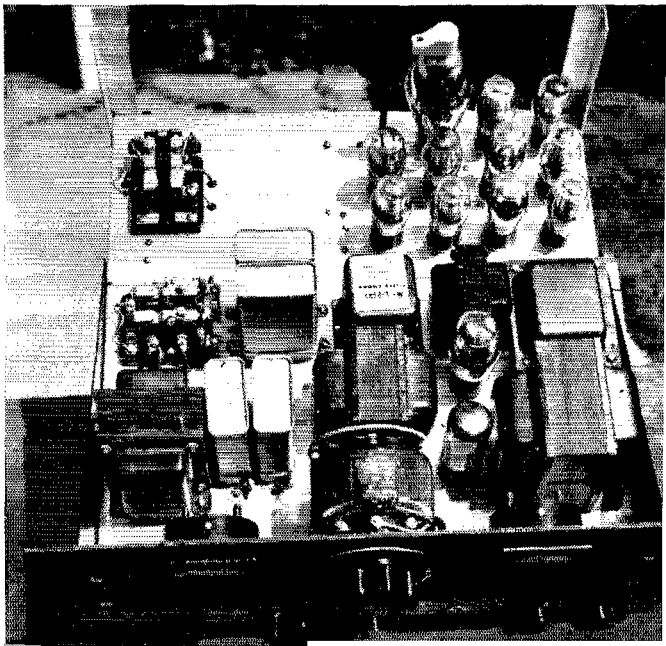
One position of S_2 energizes K_1 and K_2 manually. This is necessary for testing the control grid, screen and suppressor voltages without turning on the exciter. Always test screen voltage while plate voltage is applied. In the other position of S_2 the exciter VOX control turns the voltage on and off as required.

To preclude the possibility of accidentally applying screen voltage *without* plate voltage, a relay is connected between the cold end of the high-voltage bleeder and ground in the h.v. power supply unit (not shown). When there is no plate voltage, or insufficient voltage, the relay contacts remain open, and, since they are wired in series with the a.c. voltage actuating the two control relays in the low-voltage power package, it is impossible to go wrong. Also, the d.c. cathode return from the amplifier is not grounded in the amplifier unit, but is connected through an overload relay to ground inside the high-voltage power supply. The contacts of this relay are in series with the primary of the plate-supply transformer, and when the cathode current exceeds 900 milliamperes the whole rig goes dead. This requires a separate common ground wire between the amplifier and the high-voltage power supply chassis.

R. F. Excitation

In Class AB_1 operation of the PL-172 the source of r.f. excitation should provide a peak voltage equal to the negative grid bias. In the initial trial of the amplifier we simply connected the output of the HT-32 to the PL-172 through a piece of RG-8/U a couple of feet long. It worked, of course . . . that is to say, on 20 meters we were able to drive the cathode current up to about 550 ma., with 2500 volts on the plate and 500 on the screen. But we figured that this was hardly "enthusiastic" response.

The HT-32 requires a 52-ohm resistive load for full output, so not knowing what the average impedance of the PL-172 cathode input circuit might be, we wrote the manufacturer. A nice letter from W6CEM in reply pointed out that the average input impedance of the PL-172 in a grounded-grid circuit is in the neighborhood of 100 ohms, but that the exact value is a function of the cathode current, and since the plate and screen currents are variables at audio frequency it is impossible to obtain a perfect match between the exciter and amplifier at all excitation



The power package is built on two chassis, bolted together, to give enough room for the components. Component arrangement is relatively unimportant in this unit, except for weight distribution. Electrolytic capacitors and wire-wound resistors are underneath. (The vertical aluminum angle pieces at the rear corners are for helping to support the unit when it is upside down for under-chassis work.)

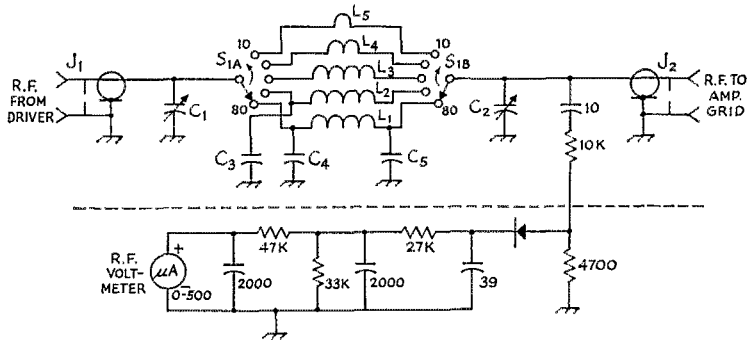


Fig. 4—Grid-input matching network. Capacitances are in $\mu\mu$f.; fixed capacitors are ceramic. Resistances are in ohms, resistors are ½ watt composition.

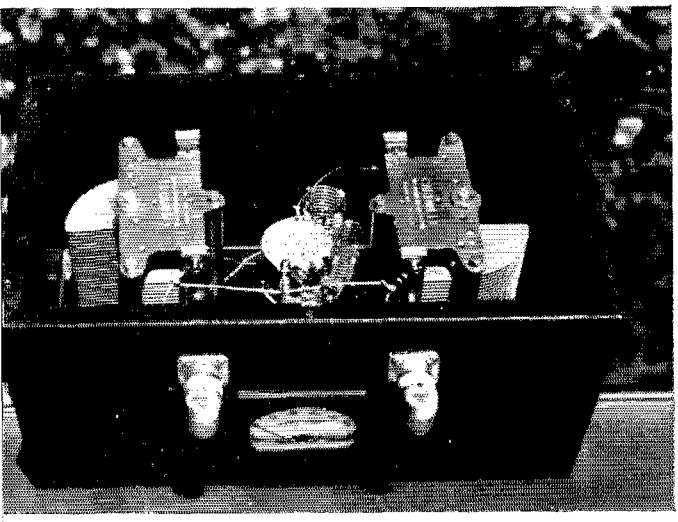
C_1, C_2—1500-$\mu\mu$f. variable, 0.03-inch spacing (Cardwell PL-8013).
C_3—1000 $\mu\mu$f., 400-volt ceramic.
C_4—2000 $\mu\mu$f., 400-volt ceramic.
C_5—1500 $\mu\mu$f., 400-volt ceramic.
J_1, J_2—Coax fittings, chassis-mounting type.
L_1—13 turns No. 20, 1-inch diameter, 16 turns/in. (Air-Dux 816).
L_2—8 turns No. 20, 1-inch diameter, 16 turns/in. (Air-Dux 816).
L_3—4 turns No. 18, ½-inch dia., 8 turns/in. (AirDux 408).
L_4—1½ turns No. 18, ½-inch dia. (Air Dux 408).
L_5—3-inch length of No. 16 wire.
S_1—2-circuit, 5-position switch (Mallory L-151).
Approximate capacitor settings (percent of total capacitance)

Band	C_1	C_2
3.5 Mc.	81	77
7 Mc.	72	64
14 Mc.	41	33
21 Mc.	28	19
28 Mc.	17	6

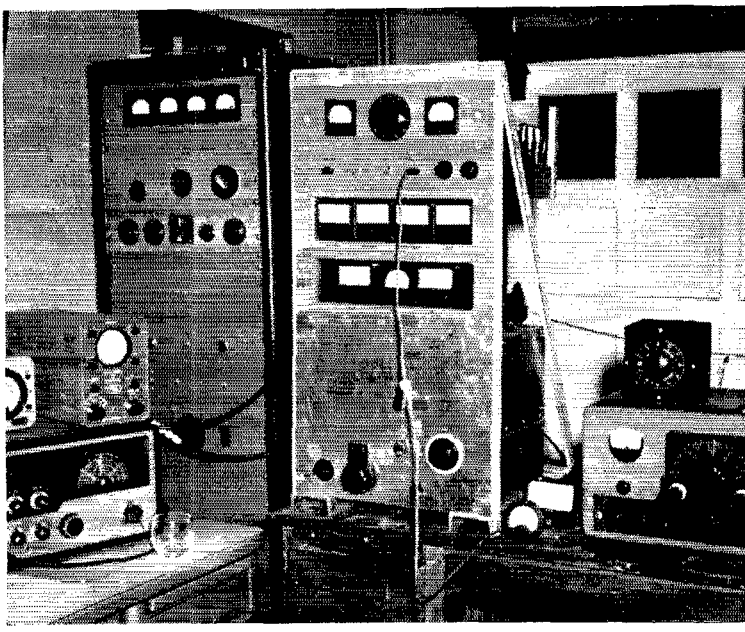
levels. He suggested either a link-coupled high-C tank circuit between cathode and ground or a properly designed pi network as a means of obtaining a fairly good match. He also suggested a pi-network design, so we built a "black box" rig along these lines.

After preliminary adjustment with a 150-ohm resistor as a load, the network was connected between the amplifier and the HT-32. The s.w.r. readings in the coax line from the HT-32 to the "black box" were pretty high but after some cut-and-try we finally achieved a set of coils (Fig. 4) that gave something less than a 2:1 s.w.r. We have the "black box" now located immediately adjacent to the amplifier, with approximately 13 feet of 52-ohm line between it and the exciter. The average impedance of the cathode input circuit appears to be between 75 and 150 ohms (both of which terminal impedances were tried) and we now use a few inches of 150-ohm Twin-Lead between the "black box" and the amplifier. The peak r.f. voltage at the cathode of the PL-172 runs a little over 100 volts, which is sufficient to get all the law will permit out of the tube. There is never any indication of grid current, and if the exciter is pushed with too much audio the flat-topping which occurs is of course transmitted to the amplifier.

The cathode current on c.w. or single-tone excitation can run well over 800 milliamperes. On two-tone, the cathode current can hit 750 ma. or better, and the "bow-tie" scope pattern shows nice straight sides.



The "black box" pi-network for matching the PL-172 input impedance to a coax line. In this view it is sitting on what is normally the control panel. The meter and coax connectors are actually on the top of the assembly.



The amplifier, low-voltage power pack, and meter panels are assembled in an aluminum frame. The amplifier occupies the lower half, the meter panels are immediately above, and the power supply is at the top. The input network does not appear in this view because it is mounted close to the r.f. input connector at the rear of the amplifier.

This means of achieving a better impedance match between the PL-172 and an exciter with fixed output impedance is certainly well worth the time and effort put into it. Without it, the HT-32 could not fully excite the PL-172 through a coax line some 8 feet long.

Tuning Up

A suitable test setup is shown in Fig. 6. Make the line between the impedance-matching network and the amplifier really short.

Set the screen voltage at about 300 volts, initially, so as not to damage the screen while establishing the proper control grid voltage. Ground the suppressor to start with (later on, one can adjust R_7 in the power package to give exactly +75 volts for the suppressor). Next, adjust R_1 to give 110 volts negative bias on the control grid. Then reset the screen voltage to 500 volts and apply plate voltage. The static screen current should be about 9 or 10 ma. and the cathode current should be about 230 ma., of which about 220 ma. is plate current.

Now turn off the plate power and set the input network and amplifier plate tank to the same band. Then turn on the power and using plain c.w. excitation, gradually increase the r.f. drive until the cathode current shows about 350 ma. Resonate the plate, and watch the screen-current meter. If the meter reads over 50 ma. tighten the coupling by reducing the plate-tank pi-network output capacitance (C_3 in Fig. 1) and re-resonate. Repeat until the excitation is raised to maximum.

At this point you can resonate the input network. Set C_1, Fig. 4, at the approximate capacitance shown under Fig. 4 and tune for resonance with C_2. You will probably find that the capacitances given are not exact, and some adjustment may be required. Tune for greatest cathode current (reducing the exciter output, if necessary, to keep the tube within ratings), and you should eventually be able to reach a maximum single-

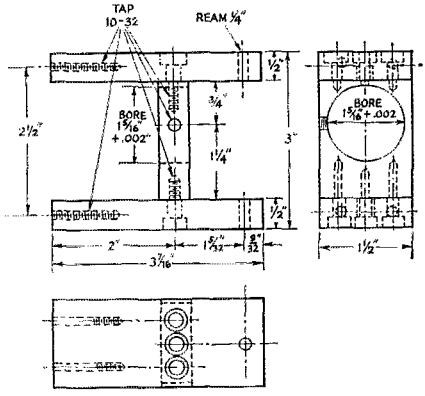


Fig. 5—Detail of vacuum capacitor mounting.

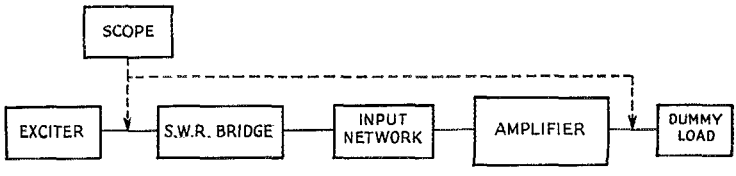


Fig. 6—Test setup. The dummy antenna can consist of nine 200-watt lamps, three parallel groups of three lamps in series. Scope may be connected to the two points indicated for checking input and output patterns.

tone cathode current of about 840 ma. with about 43 ma. of screen current and no control grid current (this assumes that the exciter is putting out its rated power). This is a plate power input of close to 2 kw., well over the legal limit, so the testing must be done with a husky dummy load.

Tuning for resonance can be done best with the r.f. output meter, but the screen meter is also a sensitive indicator. Tune for highest reading in both instances. The PL-172 when fully loaded shows very little plate current dip, and with the screen current rise superimposed on it little, if any, change in cathode current will be observed at resonance.

Those who use the HT-32 will find it easy to establish the proper conditions for a.m. Simply use enough r.f. excitation to give a cathode current of 400 milliamperes.[3] This will give a carrier input of some 950 watts (at 2500 volts) and allow for 100 per cent modulation. For c.w., set the r.f. excitation to give a cathode current of 400 ma. plus the screen current reading, which is about 20 ma. under these conditions; therefore, we set the cathode current at 420 ma. for a full "gallon" on c.w. On single sideband, depending on the characteristics of your voice and microphone, the p.e.p. may be close to 2 kw. when operating at full output, but in any case the plate current should not be allowed to swing up to more than 400 ma. or so on voice peaks. Better still, use a scope and hold the audio control to a point where nice full peaks show, and no flat-topping is evident.

[3] The current will of course depend on the plate voltage used, so these figures should be considered to be approximate. Also, FCC has interpreted its power-input rule, in the case of transmitters in which the driving stage contributes power to the antenna, to mean a total of one kilowatt input to all tubes which supply power to the antenna. — *Editor.*

In Conclusion

The use of a special impedance-matching network in the r.f. input circuit of a linear amplifier may seem to many to be a frill. We don't admit it. You can add this "frill" with all the confidence in the world that it will improve your signal, and enable you to get more out of one of these big bottles than you can squeeze out of a 100-watt p.e.p. fixed-load exciter in any other way.

We should add that by reducing the screen-grid voltage to about 410 volts, it is possible to operate at about 1 kw. p.e.p. input. Under these conditions, the control-grid bias should be set at 90–95 volts, or whatever it takes to make the cathode-current meter read 220 milliamperes plus the screen current. This tube should be adjusted to take about the same static cathode current regardless of the value of screen voltage used. However, considerably less excitation voltage is required at reduced screen voltages, and grid current will probably show up on applying full excitation.

Those who might be interested in this jug for Class C plate modulation should check the recommendations of the manufacturer. The conditions outlined here are not for Class C service.

Strays

Here are the March schedules for the various MARS technical nets.

First Army MARS

(Wednesday evenings 2100 EST, 4030 kc. upper sideband)

March 4 — Frequency Measurements.
March 11 — Principles of Radio Direction Finding.
March 18 — Some Aspects of Grounded Grid Amplifiers.
March 25 — Antennas.

AF-MARS Eastern

(Sundays 1400 EST; 3295, 7540, 15.715, 143,460 kc.)

March 1 — Advanced Developments in Information Processing.
March 8 — New Developments in Low-Noise Amplifiers.
March 15 — Evolution of Microwave Tubes.
March 22 — New Power Sources.
March 29 — R.F. and X-ray Measurements in the Field.

AF-MARS Western

(Sundays 1400 PST; 7832.5, 3295, 143,460 kc.)

March 1 — Environmental Testing of Electronics Equipment and Components.
March 8 — Microwave Radiometers.
March 15 — Navcom 100 V.H.F. Aircraft Navigation and Communication Radio System.
March 22 — Miniaturization of Amateur Equipment.
March 29 — Equipment Utilization, Conversion Information and Project Reports.

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FEEDBACK

A change in the base connections of the 7094 before regular production was started has resulted in errors in pin numbering in the circuits shown on page 23 of *QST* for February, 1959, page 13 of *QST* for February, 1958, page 212 of the 1958 (35th edition) *ARRL Handbook* and page 203 of the 1959 (36th edition). Connections shown in the tube tables of the current *Handbook* are correct, and are as follows:

Pins 1 and 2 — Heater
Pins 3, 5 and 7 — Grid No. 2 (Screen)
Pin 4 — Cathode
Pin 6 — Grid No. 1 (Control Grid)
Cap — Plate

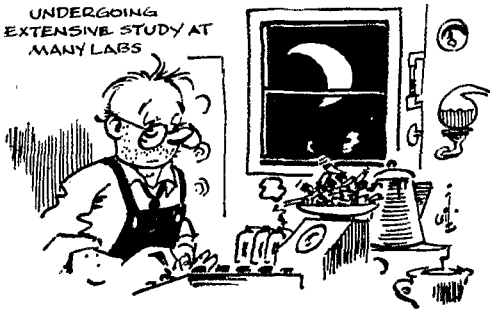
New Thresholds in VHF and UHF Reception

Practical Results

BY ROSS BATEMAN,* W4AO and WALTER F. BAIN,** W4LTU

FEBRUARY *QST* [1] discussed in general terms the merits of reactance devices such as the up-converter, the down-converter, and the straight-through amplifier. As the down-converter appears to suffer from a somewhat fundamental noise figure problem, and the up-converter is, at best, equal to the straight-through amplifier but with greater complexity, it would appear that the straight-through amplifier is the most likely candidate for experimental investigation.

Some work has been done at 50 Mc., but the majority has been carried out at 144 Mc., not only due to the greater application there, but because the test equipment was readily available. It might be mentioned that similar operations at other frequencies are being carried out in about fifty commercial and government labs around the country, where vast amounts of midnight oil are being burned and black coffee consumed in attempting to reduce to practice the concept of reactance amplification.



By way of review, Fig. 1 shows the generalized circuit for a reactance amplifier. The left-hand tank serves to couple in the signal frequency and to couple out the amplified signal. The only function of the pump tank is to couple in the pump voltage which excites the diode capacitor. However, in order to obtain any amplification at the signal frequency, it is necessary for the difference frequency between signal and pump, or idler, to be terminated in a high-Q circuit. This function is performed by the tank on the right, which is resonant at this idler frequency.

Tank Circuits

Some readers may have been wondering as to the kinds of tank circuits which are most applicable and what physical configurations are suitable. Since high tank Qs are desirable (their Qs should be much larger than the diode Qs) coaxial or cavity tanks are a natural. Also, the use of such a tank for the signal frequency allows us to pull a sneak play and slip the idler tank into the same physical structure. This is possible because of the higher order resonances which exist in this type of tuned circuit. Such behavior is illustrated in Fig. 2, which shows how a single coaxial resonator might be used for both the signal and idler tanks. In this example, the idler frequency is at $3f_s$. The diode and perhaps a small trimmer capacitor for fine tuning may be connected between the inner and outer conductors of the resonator near the end of the tank. A metal cap closing off the end would minimize radiation losses and give a somewhat higher unloaded Q.

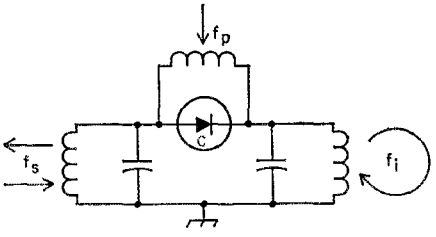


Fig. 1—Basic Two-Tank Amplifier.

Various means are available with this type of tank for introducing pump power and bias voltage. A simple technique would be to inject the pump where the diode joins the outer conductor

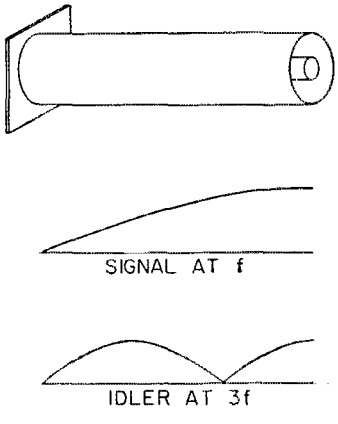
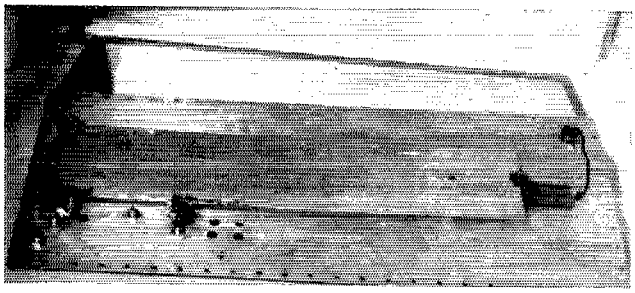


Fig. 2—Multi-mode resonator, showing how a single linear circuit may be simultaneously resonant at more than one frequency.

* 5720 El Nido Road, McLean, Virginia.
** Route 1, Box 27M, Springfield, Virginia.

[1] Bateman and Bain, "New Thresholds in VHF and UHF Reception — Circuit Theory and Diode Details," *QST*, February 1959.



The deluxe circuit, complete with custom made shield box, is constructed of silver-plated hard copper plate, with every precaution to insure maximum Q. The resonant tank is 4" wide, 19" long, and spaced ¾" from the main plate.

of the coaxial resonator. A coaxial cable may then be run over to the pump. If you have good judgment or are very lucky, a low impedance (low reactance and low resistance at the signal and idler frequencies) will result at the junction of the diode and coaxial connector from the addition of the pump in this manner. Otherwise, some fiddling with stubs and line lengths of the cable to the pump may be indicated. This matter will be discussed later in more detail. A series capacitor inserted at a convenient point in the circuit can be used to block the d.c. path. This will permit the bias to be applied to the diode through a resistor of high value. A ½ watt, one-megohm resistor will do. The bias supply should be variable, as it will be desirable to adjust the operating bias for optimum performance.

Do not be alarmed by the lack of similarity between the two-tank amplifier circuit of Fig. 1 and the physical arrangement described above. The coaxial circuitry actually behaves like the circuit of Fig. 1.

Construction and Results

Two radically different types of construction were used for the 144-Mc. circuits. The first is completely silver-plated, has a custom-made shield box, and is equipped with all the frills to insure ultra-deluxe type of operation. It was designed to "prove out" the principles of operation. This model may be seen in the above photograph. The other, or "cheap" circuit, shown in the photo below, might be considered to be the poor man's amplifier. It consists of not much more than a 3" × 4" × 17" aluminum box, two pieces of copper strap, a diode, and many man-hours of fiddling. It was built to determine the usefulness of junk-box construction for this application. It is of interest that there was no discernible difference in the noise figures obtained with these two circuits — a fortunate result indeed.

The results of noise figure measurements to date using various diodes in the device are given below. Note that the average of a number of measurements is given, this being much more meaningful than selecting the best measurement out of a number.

144-Mc. Noise Figures, 900-Mc. Pump

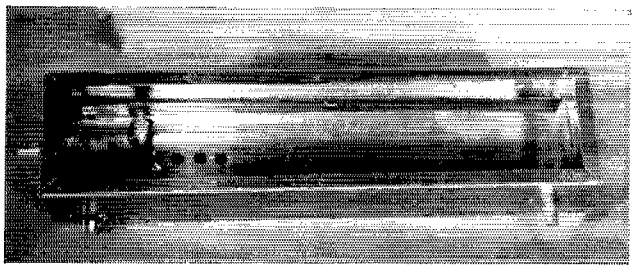
Diode	*Average Noise Figure*	*Number of Readings*
MA-460A	0.6 db	10
8266G	0.65 db	22
1N660	0.85 db	18
DR-303	0.85 db	23

Within the tolerances set by the temperature-limited-diode technique that was used, the results are in agreement with the theoretical limit of 0.75 db. imposed by the pump ratio. Once the region below 1 db. is reached, accurate measurement becomes quite difficult and several tenths of a decibel are not significant. For this reason no further attempts were made to optimize noise once this region had been reached!

Comprehensive on-the-air comparisons were not made; however, a brief test indicated that an improvement in received signal-to-noise ratios of the order expected was being realized. Rough checks of bandwidth made with the device adjusted for good gain and noise figure indicated values of about 100 kc.

A word might be in order here about some of the basic problems of measurement of noise figure. It is of utmost importance to maintain linearity throughout the receiving system under test. Otherwise, some rather startling negative noise figures can be obtained. Also, the a.v.c. must be turned off and gains run sufficiently low that no clipping of noise peaks occurs. This could result in indicated noise figures poorer than the true value. Considerable care was exercised in taking the measurements tabulated above. The noise generator used was home-built, but had been checked against a commercial standard.

A pitfall that may be considered to be peculiar to the reactance amplifier appears when it is attempted to pump at twice the signal frequency. This configuration may appear attractive in that the idler is equal to the signal frequency and a single, simple resonant circuit will suffice for both. Theory tells us, however, that such a pump ratio fundamentally limits us to a minimum noise figure of 3 db; nevertheless, measurements by the noise diode method may erroneously indicate



The junk-box reactance amplifier is built in a standard 3" by 4" by 17" aluminum box with the tuned circuits constructed of unplated copper strip. The small polystyrene insulator near the diode end of the box is to prevent vibration of the main tank and subsequent changes in regeneration.

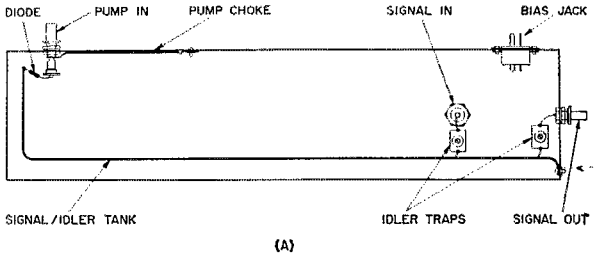
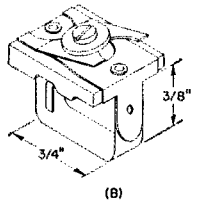


Fig. 3. (A)—Layout sketch of the junk-box amplifier, showing the L-shaped main tuner, the pump choke, and the positions of input and output terminals. For clarity, the d.c. bias lead and isolating resistor are not shown.

(B) Detail sketch of the idler trap. The 3-30-$\mu\mu$f. trimmer tunes with the 1½ inch strap to the 750-Mc. idler frequency.



a minimum noise figure of 0 db. The reason for this is that the noise diode is putting noise into *both* signal and idler channels (much as in an image response) for comparison with only the *one* channel of receiver noise. This means that the noise generator setting required to double the indicated output noise can be less by a factor of two; that is, it may read 0 db. instead of 3 db. This problem disappears, of course, when the idler is displaced from the vicinity of the signal and terminated in a separate tank not coupled to the input. Results when pumping at twice the signal frequency can indeed be deceptive.

Details of the "cheap" circuit are given in Fig. 3, and the circuit diagram in Fig. 4. The large, L-shaped piece of copper strap acts as the signal tank on its fundamental frequency and as the idler tank on a higher mode. The small copper strap, called the pump choke, is a quarter wave at the 900-Mc. pump frequency (high impedance), but a low impedance to the signal, thus allowing maximum signal voltage to appear across the diode rather than the pump terminal. (No tuning capacitance other than the diode was used across the main tank in order to realize the greatest effective capacitance swing $\left(\frac{\Delta C}{C}\right)$. Adjustment, however, might be simplified by the use of a trimmer.) The button-mica capacitor blocks d.c. and allows the diode back-bias voltage to be applied to the diode through the current-limiting resistor. The signal input jack is tapped relatively high on the tank (heavy loading), while the output is tapped low (lightly loaded). The small tuned circuits in series with both these terminals are idler-frequency traps, designed to prevent loading of the idler resonant mode by the signal terminals. (The idler tank must have a high Q for proper operation.) As shown in the detail of Figure 3(B), each consists simply of a small mica compression trimmer and a short copper strap that tune to the idler frequency, 750 Mc.

A few other necessary refinements include addition of a lid to prevent radiation from the line, and bypassing of the bias lead where it leaves the chassis. It might be noted that, in the experimental work, adjustable coaxial stubs were used to effect maximum transfer of pump power into the circuit. If such refinement is desired, this matching can also be done with a pi-network of trimmers and strap inductances. Tuning of these matching networks may be expected to slightly affect the idler resonant frequency.

One important factor to be considered in the design of the amplifier is that the circuit should be geared to the particular diode that is to be used. The tank circuit dimensions given here are for an operating diode capacitance of about 0.6 $\mu\mu$f. For diodes of lower capacitance, the tank must be lengthened slightly, while for higher capacitance, it must be shortened. If this is not taken into consideration, and it is attempted to force resonance by adjusting diode bias to extremes, the pump voltage will drive the diode into either forward conduction or back breakdown. Either of these conditions is to be avoided for low noise figure. Approximate alignment can be obtained by grid-dipping the tank with a properly biased diode in place. Some changes in resonant frequency should be expected, however, when the signal terminals are attached and the

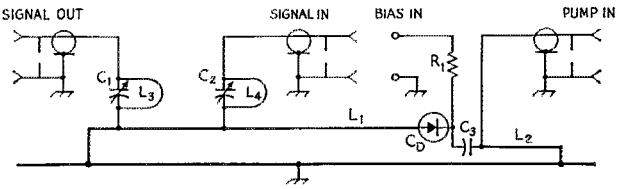


Fig. 4—Circuit diagram of the reactance amplifier.

C_1, C_2 — 3-30-$\mu\mu$f. mica compression trimmer (Arco 461).
C_3 — 150-$\mu\mu$f. silver-mica button bypass.
R_1 — 0.47 megohm resistor, ½ watt.
L_1 — 1/16 inch copper strap, 1 by 19 inches, spaced ½ inch. Input tapped 2½ inches, output tapped ¾ inch from cold end.
L_2 — 1/64 inch copper strap, ¾ by 4½ inches, spaced 1/16 inch.
L_3, L_4 — 1/64 inch copper strap, ¼ by 1½ inches, U-shaped to fit trimmer, as shown in Fig. 3B.
C_D — Reactance Diode.

pump turned on. It should also be noted that low-capacitance diodes may be paralleled to obtain the desired capacitance. However, the possibility of complex loop resonances within the parallel diodes should be kept in mind. Series operation of high capacitance diodes is also a possibility.

Pump Source

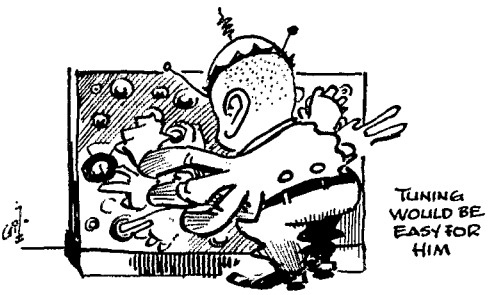
Before getting into the tuning up process of one of these devices, a few words might be in order concerning the accessories. The pump source need not be crystal-controlled, but it should have sufficient mechanical stability to hold frequency to perhaps 1.0 Mc. Its thermal drift should be within the same limit after a reasonable warm-up, and it should be powered by a regulated source to prevent line voltage fluctuations. It should be smoothly tunable over about 150 Mc. at 900 Mc., and should have an adjustable power output of perhaps ½ watt. Small tubes, such as the 955 and 6AF4, may be borderline for this frequency and power. A greater margin would be available with larger tubes, such as the 316A, 2C43, 8012, 5675, GL6442, etc.

Bias Supply

The main requirement on the bias supply is stability, and dry batteries appear to provide the simplest solution. As virtually no current is drawn, they will last their shelf life. Two high-resistance potentiometers should be used, one for coarse and one for fine tuning. Mercury cells might also be used if higher, long-term stability is desired.

Tuning Procedures

Tuning up one of the straight-through regenerative amplifiers can be a bit frustrating if you haven't done it before. There are a lot of variables and having a few extra hands would be convenient. The step-by-step procedures outlined below



will be helpful the first few times, after which you will probably be able to introduce some useful variations of your own.

It will be assumed that a straight-through amplifier along the lines of the device described above has been built and is ready for tune-up. In addition to the pump and bias supply, it will be assumed that a suitable signal generator is at hand. This item will be found to be extremely useful in getting the device working properly. Proceed as follows:

1. With the signal generator and converter connected to the device, set d.c. bias to a value of about half the peak-inverse value of the diode. At this point, the pump should be connected, but should not be supplying power (B+ off).

2. Adjust the signal generator to provide a moderately weak signal at the main receiver. Two or three S-units above the noise level will probably do.

3. Vary bias for maximum S-meter reading. If a maximum is not found, it might be well to disconnect the signal generator and converter, and recheck for resonance with a grid-dipper. It should be possible to tune the circuit over a considerable frequency range by varying bias.

4. Apply a small amount of pump power and slowly tune the pump oscillator over its frequency range. One or more pump frequencies may be found for which an increase in the S-meter reading occurs. If the device is working properly, an increase in S-meter reading means that the pump frequency is equal to the sum of the signal frequency and some idler resonant frequency — a desired condition.

5. If everything is O.K. through step 4, the next objective is to increase the gain of the device to approach the point of oscillation. This is done by slowly bringing up pump power and, in turn, adjusting pump frequency and tuning (bias control) to increase the S-meter reading. It will be found that the adjustments interact on each other. For example, a change in bias affects both signal and idler resonant frequencies. Similarly, a change in pump power will require readjustment of both pump frequency and bias for maximum signal strength. This may smack of black magic and witchcraft, but it is really not too bad once you get the hang of it.

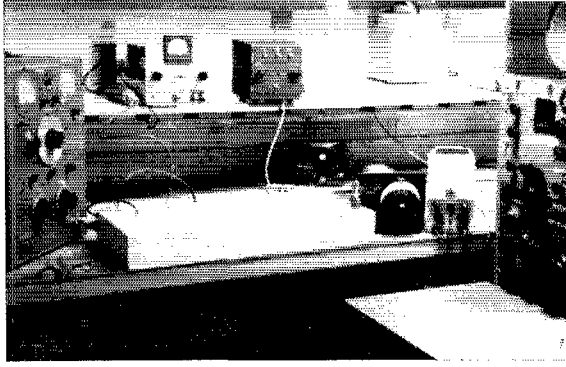
6. The idler traps should be adjusted for maximum gain with a given value of pump power. There is also interaction of the idler trap adjustment on the correct settings for the other controls. Best operation is obtained by retouching the other controls after each adjustment of an idler trap.

7. When the device can be made to oscillate or give very high gain, turn off the signal generator and make sure that the gain is sufficient so that an appreciable increase in the noise level results when the bias and pump frequency are tuned for maximum. A 15 to 20 db. increase in noise over that observed when the circuits are completely detuned will normally be adequate.

At this point, the device can be checked for low-noise performance using a noise diode or the signal generator. Some retuning will be necessary when a noise diode or an antenna is connected to the device if the new source impedance is appreciably different from that of the signal generator.

Miscellaneous Considerations

Some suggestions can be given for the (likely) event that the device doesn't work on the first attempt. If it is not possible to obtain adequate



Deluxe model of the 144-Mc. reactance amplifier, ready for tests on the basement workbench at W4AO. For a view of the way things looked a few hours later, when noise figures under 1 db. had been achieved, see page 71.

gain when carrying out step 5, it might be well to very loosely couple the signal generator to the device. With light coupling to the signal generator, it should be relatively easy to establish oscillation or high gain in the device. This will provide an indication that there is nothing drastically wrong with the device — such as an extremely sick diode or insufficient pump power. If you get a green light indication on this check, repeat using a lower value of bias or reduced coupling of receiver or signal generator (taps closer to ground). A reduction in bias allows the available pump voltage to provide a greater capacitance swing, $\triangle C$. This, however, is done at the expense of diode Q. Conversely, if plenty of pump is available, it may be possible to increase the bias and pick up a certain amount of Q. If carried too far this procedure will allow the peak of the pump voltage to swing the diode into the back-break-down region.

As a rule of thumb, for minimum noise figure the antenna or signal generator should be tightly coupled to the device and the converter loosely coupled. However, if the coupling to the converter is too loose, the device will have to be operated with high regeneration and it may be difficult to maintain stable operation. The best value of coupling will, therefore, be a compromise.

If poor noise figure results and the device appears to operate normally otherwise, try to establish gain and satisfactory performance using another pump frequency. In particular, pump frequencies should be avoided which are integral multiples or close to integral multiples of the signal frequency. This point was briefly touched on in the January article [2] in connection with the single tank amplifier. Another important point, however, is that additional noise along with the spurious signals mentioned is introduced by a pump frequency which is nearly an integral multiple of the signal frequency.

It is not possible to cover all possible problems which may arise. There is one difficulty, however, which may occur in the practical operation of the regenerative devices. Stable operation might be difficult with antenna impedance variations resulting from wind, rain, and other environmental factors. If this proves to be serious, the problem could be largely avoided by using the stable up-converter configuration.

Diode Hints

A few practical diode considerations might be mentioned at this point. All of the lower priced diodes have proven to be quite rugged mechanically and no appreciable change in characteristics has been observed after considerable handling. The units are known to be temperature sensitive and, if soldering is to be done within $\frac{1}{4}$ inch of the diode body, the needle-nose pliers should be used. The units are electrically stable so long as the junction dissipation is not exceeded. Safe junction dissipation ranges from 50 mw. to 500 mw. (Junction power is due largely to that fraction of the pump which is dissipated in the diode resistive component.) In order to prevent possible damage due to excessive back-bias, a current-limiting resistor is placed in series with the bias supply. It should also be noted that most junctions are photosensitive and, for this reason, the majority of glass diodes are coated with an opaque lacquer. For uncoated units, it is possible that sixty-cycle modulation could be experienced due to fluorescent or other lights near the device. Diodes are, to a limited extent, affected by strong magnetic fields and nuclear radiation, but this is not likely to present a problem. It might also be of interest to determine the usefulness of transistor junctions as reactance elements.

It might be mentioned at this time that reactance diodes have numerous applications other than in low-noise amplifiers. They may be used for tuning v.f.o.'s, receivers, remote-tuned antennas, as phase or frequency modulators, to f.s.k. an oscillator, as frequency multipliers, frequency dividers, tunable filter elements, for panoramic receiver tuning, a.f.c., etc.

For further discussion of both the theoretical and practical aspects of reactance diodes, the reader is referred to the articles by A. Uhlir and C. J. Spector, referenced in January and February *QST*, and to articles by McMahon and Straube [3] and Giacoletto and O'Connell.[4]

Conclusion

In the course of the experimental work no evidence was found indicating disagreement with the basic theory of the devices. Thus, it appears that further amateur development can be undertaken with reasonable assurance of satisfactory results.

This is the concluding article of a series which, it is hoped, will help in some way to improve amateur v.h.f. capabilities. In preparing these articles, haste has taken precedence over completeness, and much work remains particularly at higher frequencies, that could not be done because of deadline factors.

[2] Bateman and Bain, "New Thresholds in VHF and UHF Reception — Devices and Diodes," *QST*, January 1959.

[3] M. E. McMahon and G. F. Straube, "Voltage Sensitive Semiconductor Capacitors," paper presented at WESCON, Los Angeles, California, August 21, 1958.

[4] L. J. Giacoletto and John O'Connell, "A Variable Capacitance Germanium Junction Diode for UHF," *RCA Review*, Vol. XVII, No. 1, March 1956.

Bandswitching the Mobile Antenna

Remote System for 20, 15 and 10

BY E. A. ANDRADE,* WØDAN

This bandswitching mobile antenna has an outward appearance no different from that of a conventional single-band center-loaded whip. A simple system of relays tunes the antenna for each band. Control and transmission lines are fed through the base section. Although designed especially for use with the KWM-1, it is easily adapted to any other type of installation.

A NEWLY-ACQUIRED KWM-1 prompted a hasty search for a suitable mobile antenna for 20-, 15- and 10-meter operation. Although there are several commercially manufactured three-band mobile antennas available, they are either trap antennas which do not make maximum use of the available whip length on all bands, or they are manually switched center-loaded affairs, which are quite efficient but inconvenient when changing bands. The best solution seemed to be a home-brew job using the band-change information available from the KWM-1 to operate relays that would automatically switch loading-coil taps when the KWM-1 was tuned up. This arrangement combines the high efficiency of the center-loaded whip with the convenience of the trap antenna.

An examination of the KWM-1 schematic shows a switch wafer ganged to the exciter-tune knob, which grounds Pin 15 of the power plug (J_5) on 20 meters, Pin 16 on 15 meters and Pin 17 on ten meters. This switch is used to operate the relays for switching the loading-coil circuitry on the various bands. Twenty and fifteen meters are handled by changing taps on the loading coil. For ten meters, it is necessary to shorten the whip electrically. This is accomplished by switching in sufficient series capacitance to tune out the inductive reactance of the whip on this band. The arrangement is shown in Fig. 1. It may, of course, be applied to any installation by the substitution of a pair of s.p.s.t. toggle switches, or the equivalent in a rotary switch, for the KWM-1 control.

The antenna operates as a quarter-wave monopole with the automobile body as a counterpoise on all bands. An 8-foot whip is mounted on top of the loading coil, making the total length 9½ feet.

* Collins Radio Company, Cedar Rapids, Iowa.

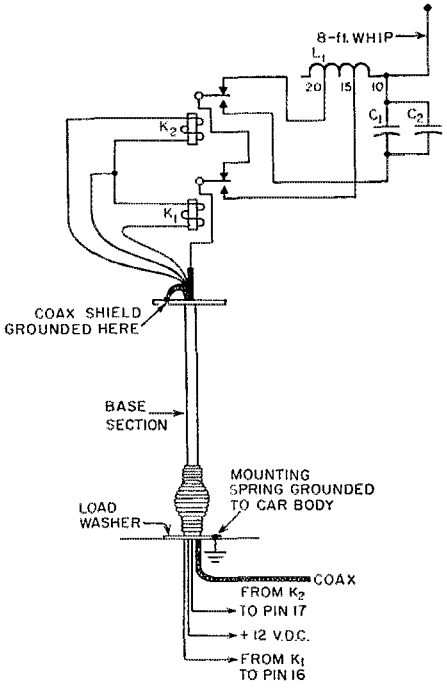


Fig. 1—Circuit of the three-band mobile antenna system. With both relays de-energized, as shown, the antenna is tuned for 20-meter operation. With K_1 energized, the antenna is tuned to 15 meters and, with K_2 energized, the system operates on 10 meters. Pin numbers refer to J_5 on the Collins KWM-1. Ordinary switches may be used for control as discussed in the text.

C_1, C_2—Approximately 20 $\mu\mu$f. mica (see text).
K_1, K_2—6- or 12-volt d.c. antenna-switching relay (Potter & Brumfield KT11D).
L_1—See text.

By grounding the coax at the top of the base pipe, a closer impedance match to the RG-58A/U coax line is obtained. With the bottom end of the base pipe at ground potential, the arrangement offers a distinct mechanical advantage. The mounting can be made stiffer and more secure. Previous insulated systems have shown a tendency to short at the base insulator as well as being generally unsatisfactory mechanically. By using a piece of tubing for the base section, the relay-control wires and the antenna feedline may be run inside, resulting in a very neat-appearing installation. The various wires running through the base pipe assume the r.f. potential

of the pipe. Therefore, by the time they reach the bottom end of the pipe, they are at ground potential and no bypassing or r.f. chokes are necessary in the control leads.

The photographs show the details of construction. Epoxy impregnated glass fiber material was used where insulating material is required because of its superior electrical and mechanical properties. Most of the larger cities have jobbers who deal in the various plastic materials, and it shouldn't be too difficult to locate the necessary tubing and sheet stock. In the event that it isn't readily available, a second choice would be fabric-base, Grade CE bakelite, although some loss in efficiency might occur with the poorer insulation.

All of the special fittings are simple but some of them would be rather difficult to turn out by hand. Therefore, it would be advisable to enlist the aid of a friend who owns a metal-turning lathe and a drill press, if possible.

Assembly

The assembly of the antenna is quite straightforward. Lockwashers should be used on all screws. Where plastic parts are held in compression by screws, it would be a good idea to put a drop of Glyptal or varnish over the threads of the screws as additional insurance against loosening.

Referring to the photographs, the top end plate of the coil enclosure is a 2¼-inch disk of ⅜-inch glass epoxy sheet, drilled at the center to pass a ⅜-inch bolt, and tapped at the edges for four 6-32 screws to fasten the tubular weather shield in place. This end plate is covered by a plastic drip cap to exclude rain. It is a lid from a 2½-inch plastic jar purchased at the local dime store. A ⅜-inch hole is cut at the center, and the lip is notched out to clear the weather-shield screws. The bottom end plate is a disk similar to the top end plate except that it is made of ½-inch aluminum. The center hole is drilled and tapped ½-24.

The two end plates are joined by a 6½-inch length of ⅛-inch epoxy glass sheet. This strip is used for mounting the loading coil and the switching relays. The edges should be beveled, and the width adjusted carefully to make a tight fit inside the coil, as shown in Fig. 2. The coil is a 16-turn section of No. 1206T Airdux inductor (No. 12 tinned wire, 1½ inches in diameter, 6 turns per inch). The taps should be set initially at 1¾ turns from the antenna end for 15 meters and at 11 turns for 20 meters. The 10-meter

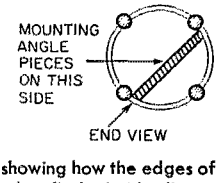
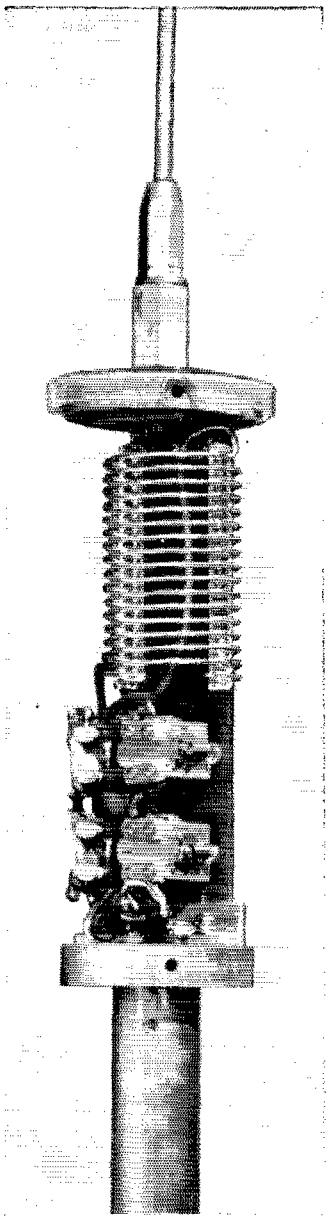


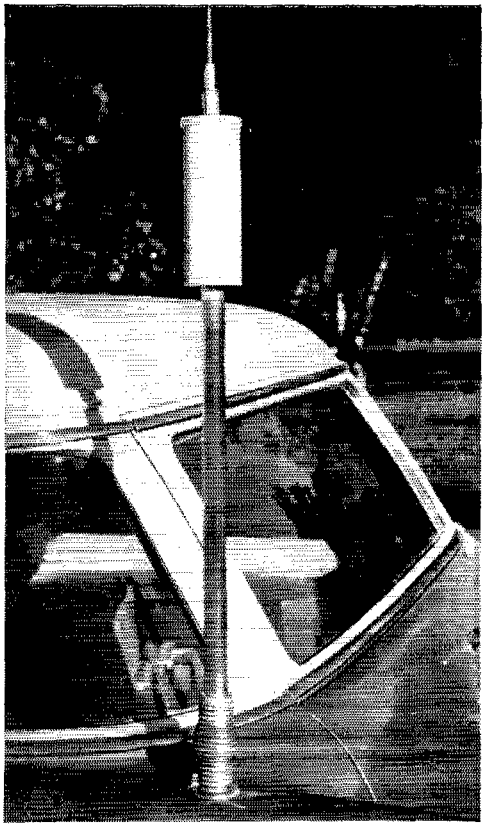
Fig. 2—Sketch showing how the edges of the coil-mounting strip are beveled to fit the inside diameter of the loading coil. The aluminum angle piece at each end of the strip should be placed on the left-hand side of the strip as indicated.



A three-band band-switching mobile antenna system. The switching relays and loading coil are mounted on an insulating strip between two circular end plates. Details will be found in the text.

series-tuning capacitors and the coil taps should not be soldered permanently in place, since values may need changing in the final adjustment.

A 1⅜-inch length of ¾ × ¾ × 1/16-inch aluminum angle is used at each end of the strip to join the strip and the end plates. The angle pieces are fastened to the strip using 6-32 screws and nuts. The screw holes in the strip side of the bottom angle piece should be slotted to permit adjusting the spacing of the end plates to make



Base section mounting and loading-coil unit with weather shield in place.

an accurate fit with the weather shield.

The upper end of the strip is fastened to the top end plate by a ⅜ - 24 stainless-steel bolt, 1⅛ inches long, that passes upward through a hole in the angle piece, the center holes in the top end plate and the plastic drip cap, and a lockwasher, to a clamping nut. (It may be necessary to cut away a portion of the vertical side of the angle piece to clear the head of the bolt.) The clamping nut is made by drilling through and tapping ⅜ - 24 a 1-inch length of ⅝-inch stainless-steel hexagon rod. A standard ⅜-inch whip fitting threads into the upper portion of the nut.

The bottom angle piece is fastened to the aluminum end plate by two 6-32 machine screws tapped into the aluminum. The angle piece should be oriented so that its mounting screws do not interfere with the shield-mounting screws.

The base section of the antenna is an 18-inch length of 1-inch (i.d.) 0.062-inch-wall aluminum tubing. Each end of this section is plugged with a 1-inch length of 1-inch aluminum rod drilled through, end to end, and tapped ½ - 24. Each plug is fastened in place with a pair of 3/16-inch 4-40 screws, diametrically spaced, passing through the wall of the tubing into tapped holes in the plugs.

The bottom plate of the coil mounting and the upper plug are fastened together by a threaded nipple. This nipple consists of a 1⅛-inch length of ½-inch stainless-steel tubing threaded ½-24. A similar nipple is used to join the bottom plug and the spring mount, and a third nipple is used to fasten the spring mount to the car body. If welding facilities are available, the bottom plug could be welded into the aluminum tubing, and the bottom end plate could be welded to the top end of the tubing as an alternative.

The cylindrical weather shield is a 7⅜-inch length of glass epoxy tubing, having an inside diameter of 2¼ inches and a 1/16-inch wall. If the shield is to be painted, be sure that the pigment in the paint doesn't lower the *Q* of the coil. Krylon Dove Grey, No. 1605, has been found satisfactory. Other colors should be checked before using.

The spring mount for the antenna is a Master Mobile type 100-X which was modified to permit feeding the coax line and control wires through it. Both end inserts were drilled through and retapped for ½ - 24 threads. The drilling operation removes the internal jumper braid that shorts out the inductance of the spring. No trouble has been encountered to date because of the removal of the braid, but it would be a simple matter to replace it if found necessary.

The feedline and control wires should be fished through the base section before mounting the antenna on the car. I used RG-58A/U for the transmission line and No. 22 wire for the switching relays.

Mounting

The location of the antenna on the car is more or less a matter of individual choice. However, for maximum efficiency a location should be selected which keeps the loading-coil assembly at least 24 inches from the car body. Fender or trunk-lid mounting has proved to be very satisfactory. Because of counterpoise effects of the automobile body, the strongest signal will be in the direction which has the most car body between the antenna and the receiving station; i.e., if the antenna is mounted on the left rear fender, the strongest signal will be off the right front corner.

Mounting the antenna requires a ½-inch hole in the car body to clear the mounting nipple. To distribute the load of the antenna over an area, a large washer, at least 2 inches in diameter, should be used on the exterior side of the hole. If there is any curvature at the point where the hole is drilled, the washer should be shaped to fit the contour of the car body. A cardboard template is helpful in determining what shape to make the washer. It may also be advisable to use a large reinforcing plate around the hole, on the inner side of the car body, to prevent crimping of the body metal by the sway of the whip. Paint should be thoroughly removed from the area under the washer so a good contact with the car body will be obtained. A lockwasher should be used under the ½ - 24 nut that threads onto the mounting nipple fastening the mounting spring in place.

Tuning

Before tuning up, be sure that your car is parked in a clear area away from other cars and metal objects which could cause detuning.

An s.w.r. meter or reflectometer should be used for best results in tuning the antenna. With the unit completely assembled, except for the coil cover, fire up the rig on 10 meters and check the s.w.r. If it is more than the chart in Fig. 3 indicates it should be, select new values for C_1 and C_2 and try again. The 15-meter band is adjusted next by selecting the tap on L_1 for lowest s.w.r. These results may be compared against the 15-meter curve in Fig. 3. The 20-meter band is adjusted last by again selecting the tap for lowest s.w.r. Replace the coil-assembly cover, recheck the s.w.r. on all bands, and you are ready to call "CQ DX." Excellent signal reports on all three bands have been obtained while using the KWM-1 and this antenna. The convenience of automatic bandswitching is especially enjoyable on a long trip where it is quite a nuisance to stop and change bands.

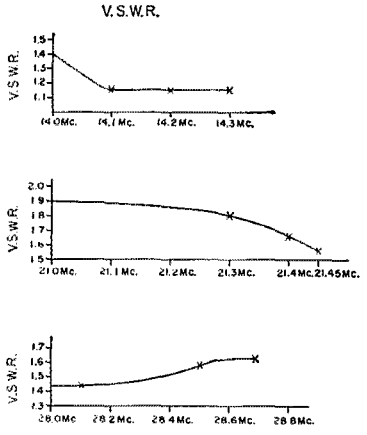


Fig. 3—Curves showing typical s.w.r. across the 20-, 15- and 10-meter bands.

Shorter Antenna

In the event that the 8-foot whip proves to be too long physically, it is possible to substitute a 6-foot whip by shorting out C_1 and C_2, and shifting the loading-coil taps to approximately 5⅛ turns for 15 meters, and 15¼ turns for 20 meters. It will be necessary, of course, to repeat the full tuning procedure if this is done. The shorter antenna will not be quite as efficient on 15 and 20 meters as the 8-foot whip, but excellent results have been obtained with it in spite of its slightly lower efficiency. It might be well to mention that comparative tests showed an increase in radiated output of about 14 per cent when a brass whip was substituted for the original stainless-steel antenna. Therefore, it might be worthwhile to consider the use of lower-resistance whip material.

QST

Silent Keys

IT IS with deep regret that we record the *passing* of these amateurs:

K1CRF, Bernie W. Simpson, Essex Junction, Vt.
W1RE, Harry R. Broadley, Needham, Mass.
K2DJU, Michael J. Sammer, Elizabeth, N. J.
K2EB, Alden G. Sanford, sr., Morris Plains, N. J.
K2OLW, George Stoerzer, Plainfield, N. J.
W3AFQ, Gerald F. Wilson, Philadelphia, Pa.
W3BXD, William J. Harold, jr., Swarthmore, Pa.
W3CCB, Robert Fairlamb, Media, Pa.
K4BV, Emery Lee, Ormond Beach, Fla.
W5HEJ, Ernest S. Wells, West Monroe, La.
W5HMV, Jesse W. Waller, Baton Rouge, La.
W6CFF, Glen F. Bean, San Francisco, Calif.
W6DGY, Charles M. Morrison, Long Beach, Calif.
W6GCW, William F. Reimers, San Francisco, Calif.
W6SAC, Theodore I. Fuhrig, Lafayette, Calif.
W7MGI, Roy D. Gisse, Portland, Oreg.
W7OHW, R. Harry Ubil, Oak Harbor, Wash.
W7ZA, Donald E. McGee, Hoquiam, Wash.
W8TCK, Robert Besser, Sturgis, Mich.
K9BZU, Lulu A. Perrine, Washington, Ind.
W9CXO, Maurice B. May, Evansville, Ind.
W9EXO, John F. Melody, Peoria, Ill.
W9GUE, Harold O. Walch, Green Bay, Wis.
W9WWI, George E. Nunemacher, Clarksville, Ind.
W0CK, Ray J. Palmer, Mitchellville, Iowa
KØDKY, Leslie G. Stullken, Lakin, Kans.
KØEXR, Allan Moorhouse, Minot, N. Dak.

25 Years Ago *this month*

March 1934

. . . The lead technical article featured a one-tube two-band transmitter using but a single crystal — made possible by the Tri-tet oscillator. A '59 was the tube in this one.

. . . Then there were articles on a practical cathode-ray oscillograph for the amateur station, on suppressor-grid modulation, on tuned r.f. for the beginner's receiver, and on getting power from the winds.

. . . Indeed, there was a great deal of technical material (as always). There was dope on using triple-purpose dual tubes in 5- and 10-meter gear, on using power packs for amplifier C bias, and on using light bulbs as resistors.

. . . The departments included the customary notes for the experimenter, descriptions of outstanding amateur stations, brief biographies of well-known amateurs, correspondence from the members, and the IARU News.

. . . This issue also saw the inauguration of a one-page editorial-type ad by the National Company that ran regularly until 1954.

. . . And we note that even 25 years ago the readers were being treated to "coincidence" Strays!

Strays

KL7GV says he finds it easier to use a log book starting from the last page and working forward.

Feedback

W1JLN informs us that he has discovered that L_2 in the circuit of his "Simple Low-Power Multiband Rig," page 18 of the January issue was wound on a brass-slug form. An iron-slug form would require about 10 turns less, or 25 turns instead of 35.

The Apache (TX-1) Transmitter Kit

ANYONE walking into a ham station equipped with the Heath Mohawk receiver[1] and Apache transmitter might have difficulty in convincing himself that he was not seeing double. The Apache uses the same dial mechanism as the Mohawk, the milliammeter replaces the S meter, and all other Mohawk panel controls have been put to use — a cute trick in mechanical design. The identical outward appearance of the two units is, of course, intentional, not only for the sake of uniformity but also for economy in mass production.

The Apache covers all bands, 80 through 10 meters, with either v.f.o. or crystal control. The final power-input ratings are 180 watts c.w. or s.s.b. p.e.p. (when used with an external s.s.b. adapter), and 150 watts Class C a.m. (modulator included). The output circuit is designed to feed loads ranging from 50 to 600 ohms (nonreactive).

C.w. keying with the v.f.o. in use is by the differential or time-sequence method. The audio section includes a speech clipper and filter. Frequency response is limited essentially to the range of 300 to 3000 cycles. There are two gain controls. One in the speech amplifier sets the level fed to the clipper while the other, following the clipper, sets the modulation level.

One position of the mode switch transfers the output of the driver and the input of the final amplifier to connectors at the rear of the unit so that an s.s.b. adapter may be inserted between the two stages.

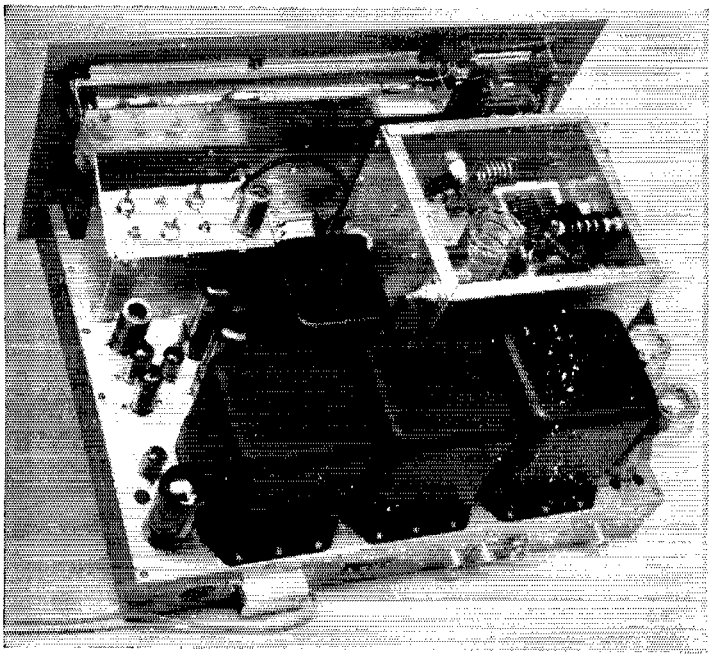
Fig. 1 shows the tube line-up. In the r.f. circuit a 6AU6 v.f.o./doubler drives a 6CL6 buffer/doubler that also serves as the oscillator when crystal-controlled operation is preferred. A 5763 buffer/multiplier following the 6CL6 drives a parallel pair of 6146s in the final amplifier.

The Clapp v.f.o. has four frequency ranges — 1.75 to 2 Mc. for 80 meters, 7000 to 7425 kc. for 40 meters, 7000 to 7175 for 20- and 15-meter operation, and 7000 to 7425 for 10-meter coverage. The appropriate tuning range is selected by an auxiliary switch linked mechanically to the exciter band switch.

With any of the 7-Mc. ranges, an inductor approximately resonant at 7 Mc. is used in the plate circuit. On 80 meters, the band switch connects a fixed capacitor across this inductor, resonating it in the vicinity of the 80-meter band.

Plate voltage for the 6AU6 is regulated by an 0A2 and the screen operates through a dropping resistor from this source. A separate fila-

[1] "The Heath Mohawk Receiver Kit," *QST*, December, 1958.



The v.f.o. at the upper left is a separate subassembly. The compartment at the upper right houses the final amplifer. The ventilating fan is mounted in the cover (removed in this photograph) of this compartment. Buffer and driver tubes are at the upper center, partially hidden by the modulator driver transformer. Audio tubes are to the rear of the v.f.o. unit. Modulation transformer and power-supply components occupy the rear portion of the chassis.

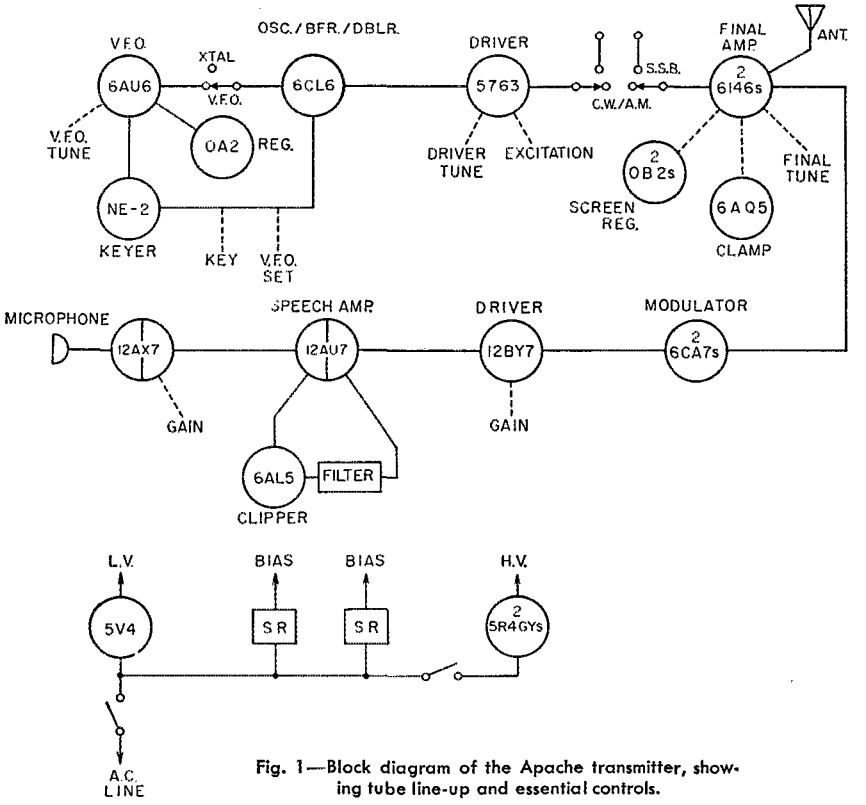


Fig. 1—Block diagram of the Apache transmitter, showing tube line-up and essential controls.

ment transformer connected ahead of the power switch keeps the v.f.o. heater in operation continuously so long as the fused power-input cord is plugged in.

On 80 meters, the plate circuit of the 6CL6 is nonresonant. A slug-tuned coil is used to resonate the plate circuit to 7 Mc. for operation in all higher-frequency bands except 10 meters where a second slug-tuned coil resonates the circuit to 14 Mc. In the crystal position, the crystal/v.f.o. switch removes plate and screen voltage from the v.f.o. tube, disconnects the v.f.o. excitation lead and connects in a crystal socket. The 6CL6 circuit is then of the modified-Pierce variety. A 47-$\mu\mu$f. feedback capacitor from screen to ground in this circuit has apparently been found adequate as a screen bypass when the 6CL6 is used as an amplifier. In crystal-controlled operation, the keying circuit controls the 6CL6 by the blocked-grid method.

The output circuit of the 5763 driver stage is in the form of a pi network with a fixed output capacitance of 47 $\mu\mu$f. connected directly from grid to ground across the input of the final amplifier. The tank coil is in two decoupled sections with appropriate shorting taps for the various bands. The driver triples to 21 Mc. and doubles to 28 Mc. On all other bands it operates as a straight amplifier. A potentiometer controlling screen voltage in this stage serves as an excitation control.

The pi network in the final amplifier departs a little from the most conventional form in that the loading capacitance is continuously variable — there are no fixed capacitors to switch. The loading capacitor is a three-section variable having 450 $\mu\mu$f. per section. The inductor in this circuit is also made up of two decoupled sections with shorting taps.

Keying

A simple differential keying circuit, shown in Fig. 2, is applied to the v.f.o. and the 6CL6 buffer/doubler. With the key open, the neon

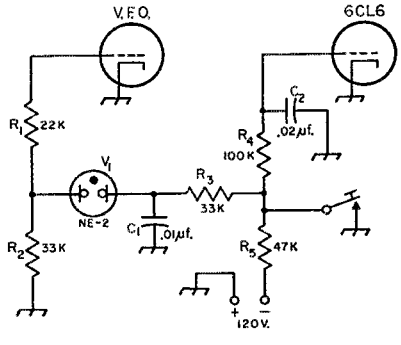


Fig. 2—Circuit of the neon-tube differential keying system used in the Apache.

bulb V_1 is ignited and current from the 120-volt bias supply flows through the circuit consisting of R_2, V_1, R_3 and R_5. The v.f.o. tube is cut off by the voltage drop across R_2, and the 6CL6 is cut off by the drop across R_2, V_1 and R_3. C_1 is charged to a value equal to the drop across R_2 and V_1, while C_2 is charged to a value equal to the drop across R_2, V_1 and R_3. When the key is closed, the bias source is shorted through R_5, C_1 discharges through R_3, and V_1 ceases to conduct. This removes the blocking voltage from the v.f.o. grid, and the oscillator functions with R_1 plus R_2 as the grid-leak resistance. Closing the key also grounds the grid return of the 6CL6 and this stage operates with R_4 as the grid leak. The v.f.o. is turned on almost immediately when the key is closed not only because of the relatively small time constant of C_1 and R_3, but also because the voltage of C_1 need fall only to the point where V_1 extinguishes. The bias on the grid of the amplifier falls to operating value at the much slower rate determined by the time constant of R_4 and C_2. R_4 and C_2 also determine the shape of the "make" side of the keying characteristic.

When the key is opened, the v.f.o. is not turned off immediately because C_1 must charge first through R_3 and R_5 to the point where V_1 will ignite. This should be a longer period than the period required for the amplifier to cut off through the C_2R_4 network so that the "break" characteristic can be shaped by the C_2R_4 network.

A push-button switch in parallel with the key is provided for setting the v.f.o. to frequency. (As with some other transmitters and kits on the market, the convenience of a v.f.o. spotting switch is largely lost because it is necessary to turn off the high voltage as a separate operation to avoid swooping the transmitter signal across the band when setting frequency. It doesn't seem that it would be too difficult to include this function in the v.f.o.-set switch.) The 5763 driver is protected during keying intervals by fixed bias, and the final has a combination of fixed bias and clamp-tube (6AQ5) protection. Fig. 3 shows the method used to offset the fixed bias in the clamp-tube circuit. The bucking voltage is taken from a tap on the high-voltage bleeder resistor. The 500K potentiometer is set so that the grid of the 6AQ5 clamper is at zero voltage with respect to its cathode with no excitation applied to the final amplifier. When excitation is applied, the negative drop across the grid leak R_1 biases the clamp tube to cut off.

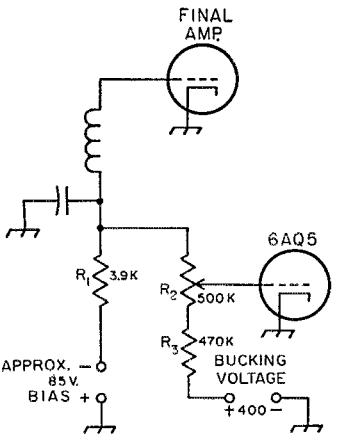
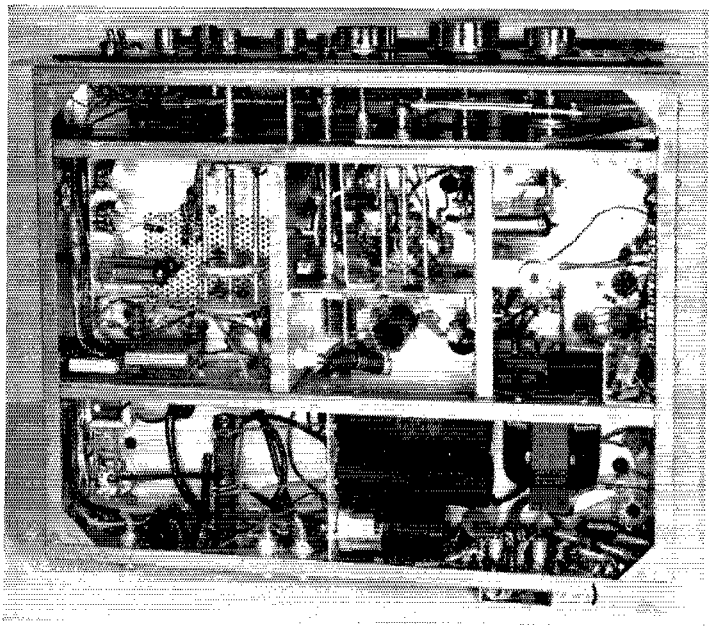


Fig. 3—Clamp-tube circuit used in the Apache to offset the fixed bias used on the final amplifier.



Bottom view of the Apache. The compartment at the upper left contains the mode switch, screen regulators and screwdriver-adjusted potentiometers for final bias and clamp-tube bucking voltage. Perforations in the chassis cover plate provide ventilation for the final amplifier above. The divided compartment at the upper center includes the crystal/v.f.o. switch, the exciter bandswitch (linked mechanically to both the final band switch above deck and the bandswitch control shaft to the right), and driver tank components. Principal components in the compartment at the upper right are the cam mechanism by which the v.f.o. band switch is operated from the band-switch control shaft, the v.f.o. voltage regulator and the separate v.f.o. filament transformer. The two compartments at the bottom enclose power-supply filter components.

Modulator

In the audio section, five stages (three tubes) of amplification are used to drive the two 6CA7, EL34 Class AB_2 modulators from a dynamic or crystal microphone. A single 12AX7 serves in the first two stages with the first gain control between stages. Similarly, a single 12AU7 is used in the following two stages. A 6AL5 clipper and a filter network are inserted between these two stages. The driver for the modulator is a 12BY7, and the second gain control is in its grid circuit. If no clipping is desired, the first gain control can be adjusted to bring the signal below clipping level, and the loss in gain compensated by the second gain control. The rated output of the modulator is 100 watts, and a 500-ohm output tap is provided for auxiliary use.

Power Supply

The power supply is in two sections. The high-voltage section supplying plate voltage for the final amplifier and modulator uses a pair of 5R4GYs in parallel in a full-wave circuit. An output capacitance of 62 μf. (two 125-μf. electrolytics in series) is provided in the single-section choke-input filter to assure good dynamic regulation. Screen voltage for the final is also obtained from this supply through a dropping resistor terminating in a pair of 0B2 regulators in series. In c.w. or a.m. service, the drop across the screen resistor is sufficient to keep the VR tubes from firing. With s.s.b. operation, the screen current is less and the VR tubes take control of the screen voltage.

A single transformer in the low-voltage supply feeds three rectifiers. A full-wave rectifier (5V4G) followed by a capacitive-input filter supplies approximately 350 volts for the plates of the buffer and driver and for all tubes in the audio section except the modulators. Taps on the same transformer secondary feed a selenium full-wave rectifier with a resistance-capacitance filter furnishing 120 volts of bias for the keying circuit and, through a voltage divider, fixed bias for the final amplifier. A half-wave selenium rectifier fed by half of the secondary winding supplies adjustable bias for the modulators through a potentiometer. This supply also furnishes filament power for all tubes except the v.f.o.

Control System

Closing the power switch turns on the low-voltage/bias/filament supply. So long as this switch is closed, closing the plate switch (or a duplicate remote switch that may be connected at the accessory socket) turns on the high-voltage supply. When the mode switch is in the a.m. position, a second pole of the plate switch shorts the key jack, turning on the exciter. Turning on the high-voltage supply also actuates a d.p.s.t. relay. One pole of this relay applies screen voltage to the modulators when the mode switch is in the a.m. position. The terminals of the other pole are brought to the rear of the chassis and may be used for muting the receiver.

In the c.w. and s.s.b. positions, the mode switch shorts the modulation transformer secondary and removes screen voltage from the modulators. In the s.s.b. position, the clamp tube is disconnected and the grounded end of the voltage divider supplying fixed bias to the driver and final amplifier is opened up so that the full voltage of the supply is applied to these two stages cutting them off. A connection brought out to the accessory socket permits connecting a voice-operated relay to be used to ground the voltage divider during transmitting periods. It is not necessary, therefore, to remove plate voltage during receiving periods.

Also available at the accessory socket are 110 v. a.c. for an antenna relay that may be connected so as to be controlled by the plate power switch, 350 volts d.c. at 85 ma., and 6.3 volts at 3.5 amp. A separate tune/operate switch permits a reduction in final screen voltage during tune-up. A single meter may be switched to read driver cathode current, final grid current, final cathode current, modulator cathode current or the voltage output of the high-voltage supply.

Assembly

A job of this size is, of course, a major project, requiring a total of 60 hours or more. However, the precut power cable and unitized construction help to simplify the assembly.

The step-by-step procedure is covered in Heath's usual complete manner in the instruction book. The few bugs that were encountered by some of those who purchased the first few kits have been overcome by modification kits which are now included as standard equipment. The mechanical design is rugged. About the only improvement that might be suggested is the substitution of a lever-type control for the band switch so that it would be a little easier to turn. — *D. H. M.* QST

Strays

In January *QST* (p. 53) we blithely recorded that K9MIQ was 87 years young. Tain't so! He's just 27, still going strong, and handing out lots of sketches of his console.

—···—

K9PDS, XYL of K9INV, confined to the hospital for her 11th child in 10 years, was loaned a Gonset Communicator by Allied Radio so she could keep in touch with the OM and the other ten kids. K9INV, who sends in the item, doubts that this situation has occured anywhere else previously!

Complete Civil Defense System at Low Cost

10-Meter F.M. Units for Local Net Operation

BY EMERY H. WHITE, SR.,* W4TQD

This article describes a low-cost 10-meter f.m. communications system for emergency or c.d. work. Simple conversions of available surplus units make provision both for mobile installations and a control station that will operate from either a.c. or a 12-volt car system.

HERE in Barren County, Kentucky, we had a problem common to many other communities, namely, how to be able to place in operation a system of radio communication for AREC and civil defense purposes. The problem of "outside" communication was not difficult to solve, as several local hams had equipment that could be used for that purpose. However, it was necessary to provide, in addition, a system that could be used over a distance of 20 to 30 miles in each direction from a central station which would control both local and long-distance communica-

* Emergency Coordinator, Box 5, Glasgow, Ky.

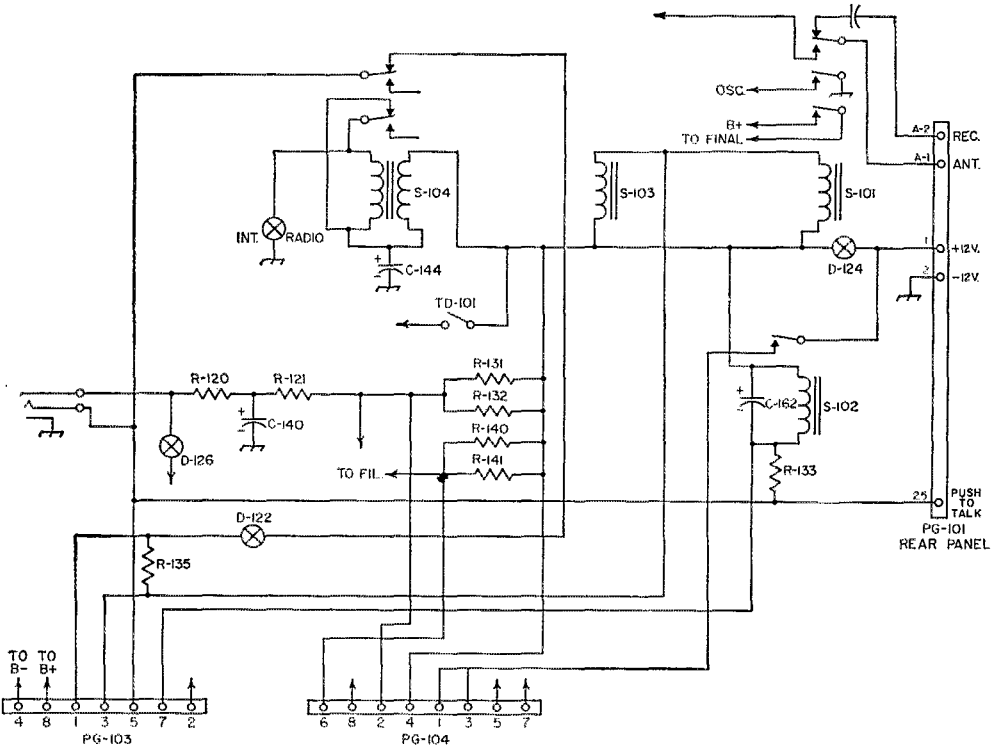


Fig. 1—Original filament and control wiring of the BC-604 transmitter.

C_{140}—30-μf. electrolytic.
C_{162}—4-μf. electrolytic.
D_{122}—Receiver Tune-Operate switch.
D_{121}—Transmitter On-Off switch.
D_{126}—Microphone Tank-Other switch.
R_{120}—200 ohms.
R_{131}—12 ohms.
R_{132}—12 ohms.
R_{133}—80 ohms.
R_{135}—30 ohms.
S_{101}—Antenna relay (located at top right-hand corner).
S_{102}—Dynamotor relay (front corner, under dynamotor).
S_{103}—Relay near end of variable capacitor gang.
S_{104}—Relay for interphone use, disconnected but left in unit.

tions. For this local network it was no problem to decide on a ground-plane antenna placed as high as possible. As many articles have appeared in *QST* on such antennas, that part will not be discussed here.

It was necessary to decide, then:

1) What frequency to use.

2) What equipment was available. There were no outside funds available. Each ham would have to contribute. Naturally, this meant surplus equipment.

3) How easily could such equipment be converted? Was it cheap? Could it be used from power lines? Permanently installed in a car? Temporarily installed in a car? Used as portable equipment? Operated from other available sources in the event of a power failure?

There was also the question of whether to use f.m. or a.m. type of transmission. It was also desired to operate on a frequency where QRM would be at a minimum.

Mobile Units

After examining all available equipment, it was decided to use the BC-1335 unit for all operations except the control station. The BC-1335 is an f.m. transmitter-receiver with a 6/12-volt supply, all in a case 10 × 11 × 6 inches. Except for frequency deviation, it can be operated in the 10-meter band without modification. It has two channels (crystal controlled) so that it can be used to operate on a MARS frequency also, or to monitor local police or power-company circuits. The unit is selling on the local market at $35.00 to $40.00, and is available at lower cost in some localities through civil defense or to MARS members. It consists of a 13-tube, crystal-controlled receiver, a 5-tube transmitter, and testing equipment for alignment, all within the one case. It uses standard parts. As each unit has an alignment chart and diagram fastened to the top cover, this part will not be discussed in detail. The transmitter is held on receiver frequency by an a.f.c. circuit.

The unit will operate anywhere 6 or 12 volts is available, will mount under the dash of most cars, or it can be placed in the front seat any time it is used. If it is used as a portable unit, a plug-in cord to fit the cigarette-lighter socket will enable the operator to make fast connections. It should be noted that this unit has a negative ground that cannot be changed easily. For this reason, the unit is kept insulated from ground, as far as direct current is concerned, so it can be used on any car. Don't forget the shield of your coax — break the coax shield and connect a 500-$\mu\mu$f. capacitor across the break. There are two antenna connections. The large connection is designed for a 56-inch whip or 27 feet of wire. The coax connector is designed for 52-ohm coax and matching antenna.

This unit operates with a frequency deviation of plus or minus 20 kc. when modulated. This will, of course, have to be changed for n.f.m. Methods of measuring deviation are described in the *Handbook* but to be safe it might be well to find a person who services two-way communications equipment and have him check it with equipment approved by the FCC. This transmitter may be made either wide-band or narrow-band by simply changing the audio input. If you want to go narrow-band f.m., change resistor R_{10} (330 ohms) to 3000 ohms. For wide-band (15-kc. deviation), this same resistor should be changed to 750 ohms.[1] While there is no question that narrow-band is desirable, there is a tremendous loss of "voice" or "communication" power. Because the discriminator is designed for plus or minus 20 kc., the only safe way to change it would be to replace the coil with one with a higher Q which, of course, is not available. If there were room, the situation could be helped by the addition of an audio voltage amplifier. No serious trouble was encountered using wide-band f.m.

For permanent installations, it may be desired to use a speaker instead of headphones. The output transformer has two taps, 250 and 4000 ohms. Connect to the one that fits your needs — they are marked. For speaker operation, use the 4000 tap into a small 4000-ohm-to-voice-coil transformer which may be mounted on the speaker.

Increasing Power Output

The rated r.f. output of these units is 1.5 watts. However, no unit has been found with an output above 1.4 watts without modification. If you wish to increase power, here is the dope:

The final uses a pair of 3A5s. On resonance, the final has a plate voltage of 125 volts, a plate current of 40 ma., a grid current of 4 ma., and a grid voltage of 20 volts. Checking the tube characteristic chart shows that this is nearer Class B than Class C. R_3 is 4700 ohms. This should be replaced with a 3300-ohm resistor, or the original resistor may be left in and shunted with a 10,000-ohm resistor. It was also found that the 3A5 tube driving the final was running Class AB_2, and R_4 was changed from 59,000 to 6500 ohms. A 10,000-ohm resistor shunted across the original 59,000 is close enough. It was then found that the unit was running with the final Class C and the output was more than doubled. With this low power you need all you can get.

The antenna pick-up link is one half turn. Output can be increased by increasing this to 1¼ turns. If you really want all the power you can get in a permanent installation, adjust this link with your antenna connected and an absorption wavemeter near the antenna. In bench testing these units, an r.f. milliammeter in series with a 50-ohm noninductive resistor is a handy gadget.

Control Station

While it is possible to work 20 miles mobile to mobile, it was felt that it was necessary to have a better receiver and more power at the control station. The BC-603 is available for $15.00 or less. It is a 10-tube receiver of good

[1] No maximum deviation is specified in FCC regulations covering wide-band f.m. permitted in the 29.0–29.7-Mc. range. — *Ed.*

design using standard parts. Get one with a 12-volt dynamotor rather than the 24-volt dynamotor. This receiver is equipped with squelch, has 10 push buttons, mechanically set, as well as a dial. It operates from 20 to 28 Mc. By running the oscillator-coil slug all the way out and realigning the r.f. coils, it will operate at full efficiency from 21 to 29.7 Mc. No other modifications are necessary.

It was decided here to operate it with an a.c. power supply, or from 12 volts in case of a power failure. Here are the necessary connections:

You will need an ordinary full-wave power supply with reasonably good regulation and an output voltage of 200 to 250 volts at 80 ma. or more, and 12 volts a.c. at 3 amperes or more. No lead at the power supply should be grounded. Run 12 volts to Pin 1 at rear of set; the other 12-volt lead to Pin 2; B plus to Pin 20; and B minus to Pin 22. Run a wire internally from Pin 20 of the output plug to Pin 13 of the dynamotor plug. It is necessary to jumper some of the pins of the dynamotor plug after removing the dynamotor. If a spare plug such as is mounted on the dynamotor is available, it is best to use it and place jumper wires on it. Then the plug may be pulled off without removing wires. If no such connector is available, it will be necessary to solder to the pins of the male plug mounted on the set. Connect Pins 1 and 2 together; Pins 3, 9, 12, 15 together; Pins 10 and 13 together. You are now finished. To change to 12-volt operation, remove all jumpers from the dynamotor plug and plug in the 12-volt dynamotor. Connect 12 volts plus to Pin 1 at rear of set. Connect 12 volts minus to Pin 2. This set is also designed for the 12-volt minus to be grounded. If you have a car with a positive ground, insulate the unit as mentioned before.

For the transmitter, it was decided to use the BC-604. There was some question here because it requires considerable revision but it is cheap. It is now advertised for less than $10.00. It is an 8-tube transmitter of conventional design. It tunes from 20 to 28 Mc. and uses low-frequency crystals. For use here, only one frequency, 29.6 Mc., was needed. Ten channels are provided but only Channel 10 was used. Normally, the first frequency multiplying is 9 times in the plate circuit of the third stage. In order to use a standard crystal, a Channel 22 (411.111 kc.) crystal was used and it was multiplied 12 times. To accomplish this, set Push Button 10 so that the variable capacitor (ganged) is at minimum capacitance or all the way open. Connect a 200-$\mu\mu$f. fixed capacitor of good quality across the largest section of this capacitor gang in order to resonate at the crystal frequency.

Filaments and Control Circuit

All of the original tubes have directly-heated filaments and as it was desired to operate on either a.c. or d.c., they had to be discarded. 12A6s were used for most replacements — they are cheap. Change socket connections as follows: On tubes V_{101}, V_{102}, V_{105}, V_{106}, V_{108}, disconnect all connections from Pins 2 and 7 and make new connections as shown in Fig. 2. Tube V_{103} was replaced with a 6L6 and V_{104} with an 807. Disconnect wires from Pins 2 and 7 of V_{103} and the wires from Pin 1 of V_{104}. Make new connections as shown in Fig. 2. Pin 5 of V_{104} is originally ground.

A decision must now be made. When operating from an a.c. power, a d.c. voltage is needed for the antenna relay and for the microphone. You may either rectify 12 volts for each or, in order to avoid high current, change the antenna relay to an a.c. relay, as I did, and use a 50-ma. selenium rectifier for the microphone voltage. Note the "before" and "after" diagrams, Figs. 1 and 2. Complete diagrams may be found under the case of both the BC-603 and the BC-604. It should be noted that in both units B minus is *not* grounded.

All parts are marked by number on the unit. Clip leads and remove R_{133}, R_{140}, and R_{141}. A 50-ma. selenium rectifier is mounted in this space. D_{124} is the transmitter on-off switch on the front panel. With an ohmmeter determine which side of the switch is connected to Pin 1 on rear panel. Remove connection from the *other* terminal of the switch. Connect the hot side of the heater string (rewired) to this terminal of the switch.

There are two Jones plugs for the dynamotor connections: PG_{103} is to the rear of the unit and PG_{104} is next to it. On PG_{103} disconnect any and all wires from Terminals 1, 2, 6, 7, 3, and 5. Leave 4 and 8 connected. On PG_{104} remove wires from Terminals 2, 4, 6, 7, and 8. Leave 1, 3, and 5 connected. Connect Terminal 6 of PG_{104} to Pins 1 and 6 of PG_{103} and to the hot side of heater at nearest tube socket. Remove leads from R_{131} and R_{132} and connect these resistors in parallel. These resistors may be moved to make room for the small low-resistance iron-core choke used in the microphone circuit if desired. Connect R_{131} and R_{132} to Terminals 1 and 2, respectively, of PG_{103}.

S_{101} is the antenna relay. It was replaced with a 16-volt a.c. relay, K_1, as shown in the diagram. The one I used is an Advance Type 1000-1A miniature antenna relay with a coil for 16-v.a.c. or 6-v.d.c. operation. The purpose of R_{131} and R_{132} is to lower the voltage when using d.c. They have a net resistance of 6 ohms. If a 12-v.a.c. relay is used, the series resistor must be correspondingly larger. Note also that the new relay grounds the receiver input while transmitting and that the B plus leads are tied together at the relay but not *to* the relay. Relay S_{103} may be used to completely quiet the speaker during transmitting if desired. Connect a new wire from Terminal 2 of PG_{103} to one side of the coil of the new antenna relay. Ground Terminal 7 of PG_{103}. TD_{101} represents the thermostat contacts in the crystal compartment. These contacts were disconnected inside the enclosure.

Disconnect coil wires from relays S_{102}, S_{103}, and S_{104}. (S_{104} is not used, but was not removed, since its contacts X — X carry the circuit from

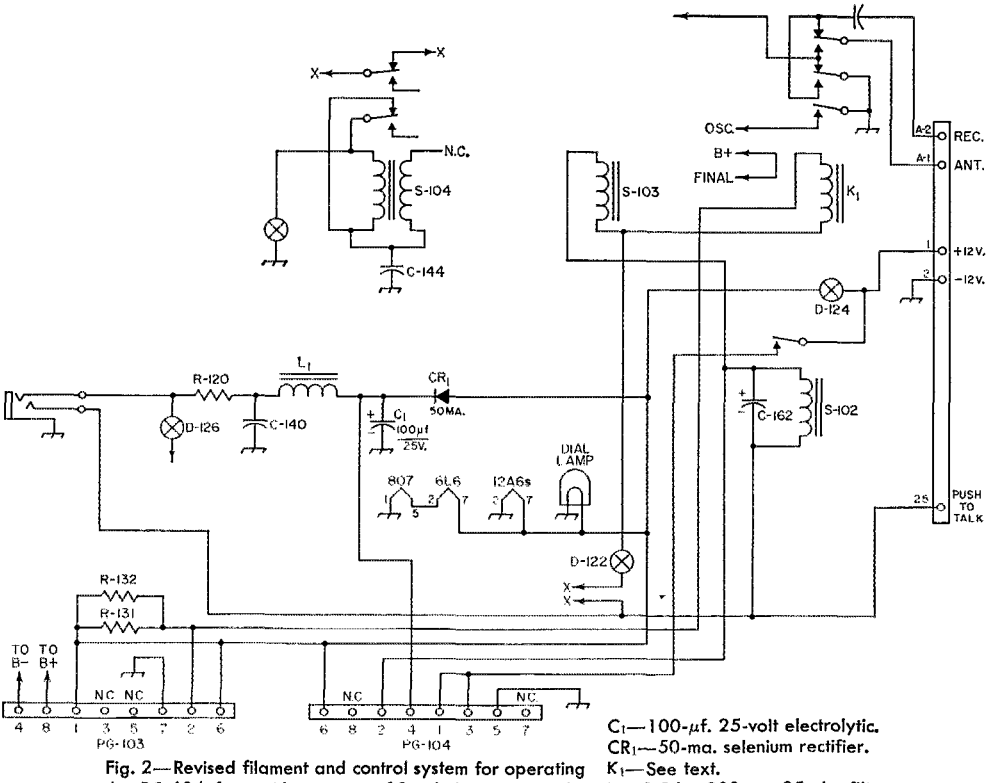


Fig. 2—Revised filament and control system for operating the BC-604 from either a.c. or 12-volt battery supply. All components, except those listed here are the original.

C_1—100-μf. 25-volt electrolytic.
CR_1—50-ma. selenium rectifier.
K_1—See text.
L_1—1.5-hy. 200-ma. 85-ohm filter choke (Stancor C2327).

D_{122}. If desired, these leads can be shorted and S_{104} removed.) Connect the remaining coil terminal of the antenna relay to one coil terminal of S_{103} and to D_{122}. D_{122} is a d.p.d.t. switch marked OPERATE-TUNE. At one end, the two terminals are tied together. At the other end, one terminal is unused. Disconnect the wire from the one used terminal at this end and connect as above. Connect the remaining terminal of S_{103} to a coil terminal of S_{102} and to Terminal 2 of PG_{104}. Connect the remaining terminal of S_{102} to Terminal 25 on PG_{101}. Do not remove the wire originally on Terminal 25. Find C_{162} and reconnect it across S_{102}. Be certain the polarity is correct. Remove R_{121}. Connect the added choke L_1 to the junction of R_{120} and C_{140}. The other end of the choke should be connected to an added capacitor of 100 μf. or greater with a voltage rating of 15 volts or greater. The other end of the capacitor is grounded.

Connect a wire from the junction of the new capacitor and choke to the selenium rectifier and to Terminal 4 of PG_{104}. The other side of the selenium rectifier goes to the nearest hot heater lead. Be certain that the rectifier is correctly polarized. If you desire to feed with coax, a coax connector may be added on the top of the case, just above the antenna post and connected to it. Be careful not to disconnect your antenna meter.

Power Supply

An advantage of this equipment is that it is adaptable to almost any type of power source. If an a.c. line or gas-engine alternator is not available, power can be supplied by any car with a 12-volt system, provided that the motor can be kept running without interference to reception.

For a.c. operation, use a Jones plug to connect with PG_{103} as follows: 12 volts between Terminals 6 and 7, 600 volts plus to 8, and 600 volts minus to 4; connect 1 and 2 together. (The power unit should deliver 500 to 700 volts at 200 ma.) If you desire to operate from 12v. d.c., simply plug in the 12-volt dynamotor (no modification necessary), connect 12 volts plus to Terminal 1 and 12 volts minus to Terminal 2 at the rear plug (PH_{101}). For a.c. operation, the on-off switch on the transmitter is not in the circuit and power is controlled at the power supply.

Adjustment

For operation on 29.6 Mc., insert the 411.111-kc. crystal. Set the ANT. CURRENT–TUNE switch to TUNE. Set the meter switch (on side) to 3. Apply power. For a.c. operation, the RECEIVER TUNE-OPERATE switch should be in RECEIVER TUNE position. For d.c. operation, this switch turns on dynamotor and protects the final in

(*Continued on page 154*)

Hints and Kinks For the Experimenter

FREQUENCY-SHIFT KEYING WITH THE JOHNSON MODEL 122 V.F.O.

HERE is a circuit and information compiled by W4CVU, W4RRH and W4RVH which will modify the Johnson Model 122 v.f.o. for use as a frequency-shift keyer for RTTY. Mount a miniature 7-pin tube socket on the v.f.o. chassis near the back left corner. This socket will be used for the 6AL5 diode modulator tube shown in Fig. 1. Now mount a 1-megohm potentiometer between the two controls on the front panel and about ¾ inch up from the bottom. This control will be used to adjust the amount of frequency shift. Remove the key jack from the rear of the v.f.o. and enlarge its mounting hole so an insulated jack can be installed. The original jack may be used if an insulating washer is inserted between the jack and panel.

The 6AL5 diodes in Fig. 1 act to switch the 20-$\mu\mu$f. capacitor in and out of the circuit. The switching is controlled by the amount of positive bias applied to one cathode (pin 1) through a voltage divider from a regulated source. During f.s.k. operation, the bias on the diode changes with keying. When the key is open the diodes conduct and add the capacity to the oscillator circuit. When the key is closed the diodes cut off and the oscillator shifts to the new frequency.

The wiring diagram for the unit is shown in Fig. 1. The 47,000-ohm 1-watt resistor can be soldered to either Pin 1 or Pin 5 of the 0A2 voltage-regulator tube. Pin 4 of the 6AL5 is connected to the "hot" side of the 6AU6 heater circuit. Be sure that no ground appears in the circuit of jack J_1. If spark suppressor filters are connected across the external keyboard circuit, the filters should be removed.

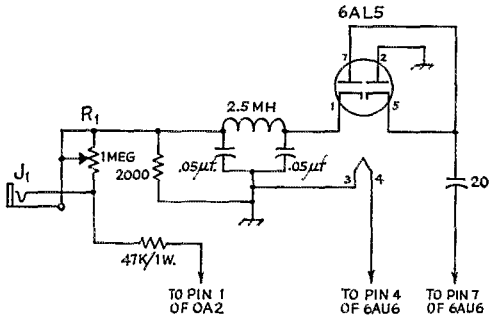


Fig. 1—Diagram of the frequency-shift circuit. Unless otherwise indicated, capacitances are in $\mu\mu$f., resistances are in ohms, resistors are ½ watt.

J_1—Insulated phone jack.
R_1—1-megohm potentiometer, linear taper.

After installation, merely adjust the variable resistor R_1 on the front panel of the v.f.o. to get the desired amount of frequency shift. Installation of the new circuit may upset the existing calibration on the v.f.o., but this may be corrected by resetting the padder capacitors in the v.f.o. calibration circuit. It is possible to obtain reverse shift if excessive voltage is applied to the circuit from the 0A2 so be careful when adjusting the voltage control R_1.

— *B. Riley Fowler, W4RRH*

DRILLING HINT

WHEN modification of a unit includes drilling holes in its steel chassis, the following trick can often save trouble that might follow after the modification is made. Insert a small magnet under the area to be drilled and, if possible, inside the chassis. The magnet will catch the steel shavings which might otherwise collect in spots and endanger the original circuitry.

— *J. Wimmer, W6RPX*

HOLE-DRILLING AID

SOMETIMES, while constructing or revising equipment, it is necessary to drill a hole in the chassis from the bottom since parts already mounted on the top side are in the way of the drill. I have found that a sharp hand awl or ice pick, when pressed down and rotated from the top of the chassis, will easily pierce the aluminum so that the hole can be positioned and drilled from the opposite side. This method is especially useful when a drill press is used and such components as i.f. transformers and tube sockets have already been mounted.

— *Mel Hart, W0IBZ*

KNOBS FOR APC TYPE CAPACITORS

FOR years I have been looking for a method of adding knobs to the small APC variable capacitors that normally require screwdriver adjustment. A method was finally found. I cut off a ¾-inch piece of ¼-inch o.d. copper tubing and slipped it over the screwdriver adjustment shaft. After it was soldered in place, a knob could be added.

— *Stanley O. Andrews, W4AHW*

GLYPTAL SOLVENT

GLYPTAL, the notorious "gunk" used to paint the hardware in military equipment, can be

dissolved with butyl acetate. This solvent is flammable so it should be used only in well-ventilated areas.

— *William A. Smith, W9UQP*

RECEIVER INPUT IMPEDANCE MATCHING

AFTER purchasing a new t.r. switch I realized it would be a problem to couple the switch to the receiver, since the receiver has a 300-ohm input and the switch has a low-impedance output.

Several methods of solving the problem were considered. I thought of using transmitting-type balun coils, building a matching device, or using antenna coils from an old junk-box receiver. It suddenly dawned on me that TV front-end tuners use a pair of balun coils to match a balanced 300-ohm line to a low-impedance unbalanced line. After purchasing a pair of these coils from a surplus store I installed them between the switch and receiver and found an increase in signal strength of at least two S units over the previously mismatched condition.

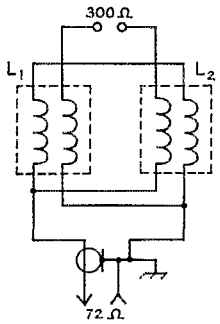


Fig. 2—Diagram showing connections when using TV front-end baluns for receiver impedance matching. L_1L_2—TV front-end balun coils.

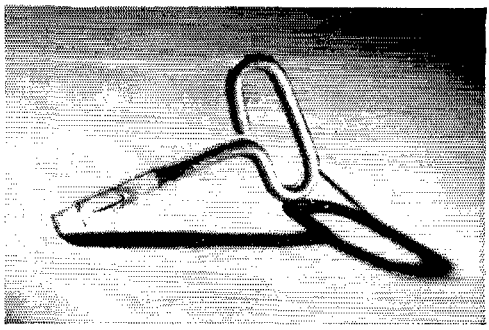
These balun coils are available from most surplus stores and measure about ⅜ × 1½ inches. They are bifilar-wound, one being a dark color and the other shiny in appearance. Close examination will identify the proper leads or an ohmmeter can be used to find the correct leads. The diagram in Fig. 2 shows the proper connections.

— *Clark A. Chamberlain, W5RSH*

[The table below shows measured impedance at the 72 ohm side with a 330-ohm resistive load connected to the 300-ohm terminals. — *Ed.*]

Frequency (Mc.)	Input Resistance (ohms)	Equivalent Shunt Capacity ($\mu\mu$f.)*
7	100	− 86.5
14	90	− .1
21	80	+ 10.4
28	70	+ 10.5
30	68	+ 10.4
50	50	+ 4.5
100	109	− 4.0
145	53	+ 2.5
220	160	− 1.5

* Shunt capacitance required to be added (−) or subtracted (+) to resonate the circuit at the given frequency.



CAN-OPENER SCREWDRIVER

ARE you constantly hunting for a small screwdriver? Try making one: Take an opening key that comes with sardine or coffee cans, file or pound it flat to the desired thickness and width to fit the screw head. The result, shown in the photograph, is a miniature screwdriver.

— *Stuart M. Mulne, KN8LEA*

LOW-FREQUENCY CRYSTALS FOR THE 6-METER GONSET III

WHILE the manufacturer recommends the use of 8-Mc. crystals in the 6-meter Gonset Communicator III, I have found that 6-, 5-, 4-, and 3-Mc. crystals, having harmonics between 50 and 54 Mc., can be used successfully. An approximate check on harmonic frequency can be made by using the Communicator receiver with the meter switch in "Spot" position.

Grid drive may be low while using these crystals, so tune-up is a little more critical than with 8-Mc. crystals. Output may be down 20 or 30 per cent but signal reports from local contacts should not suffer. Performance of individual transmitters varies, therefore it would be well to have a friend check on his receiver to verify that unwanted harmonics are not present.

— *Phares W. Calliham, W4ZIO*

BOLT ASSEMBLY HINT

HERE's a convenient way to hold a nut in position to thread it on an out-of-reach bolt. Wrap the end of a length of lead solder around the nut. Using the free end of the solder as a handle, place the nut over the bolt and start the threading. The job can be finished by tightening up from the opposite side with a screwdriver. This method allows positioning of the nut while the thread is started, but will not grip the nut so tight that the solder can't be removed for the final tightening.

— *Charles J. Boutell, W5YSC/9*

MOBILE ANTENNA MOUNT

THE following method of mobile antenna mounting that I use may be helpful to others. Remove one of the rear bumper guards and cut off the top of it with a hacksaw. This cut is made so

that a flat plate welded over the cut will provide sufficient area for mounting the antenna base mount. After the plate is cut and welded in place, the guard should be filed smooth. Drill the mounting holes for the base mount in the plate. The guard is then rechromed (this cost me $3.35) and mounted on the bumper. The modified guard can always be replaced with a standard one whenever desired.

— *Vincent N. Capasso, jr., K6ECV*

VOLTAGE CHANGE NOMOGRAPH FOR ELECTROMAGNET COILS

Those who like to rewind d.c. relays, solenoids, transformers, motors, or generators to operate on a new voltage and current will find the nomograph in Fig. 3 a time saver.

The first three columns are for dividing the present operating voltage by the desired voltage. The right-hand three columns are for multiplying the cross-sectional area of the present wire by the voltage ratio to give cross-sectional area of the desired wire. By choice, the scales on the wire columns are given in AWG gauge and inches diameter rather than in cross-sectional area.

Example:

On hand —

24-volt relay wound with No. 26 wire.

Problem —

To find wire size to rewind relay for 12 volts.

Procedure —

1) Under present volts, mark 24 volts.

2) Under desired volts, mark 12 volts.

3) Draw line through 24 and 12 volts to ratio column.

4) Under present wire, mark No. 26 wire.

5) Draw line through ratio and No. 26 wire to desired wire column. Read No. 23 AWG gauge, or .023-inch diameter wire.

With this change in wire and voltage we get: one half the voltage, twice the current, one fourth the resistance, two times the cross-section area of wire and one half the turns (assuming same winding space filled).

— *Guy Buckner, W5VGK*

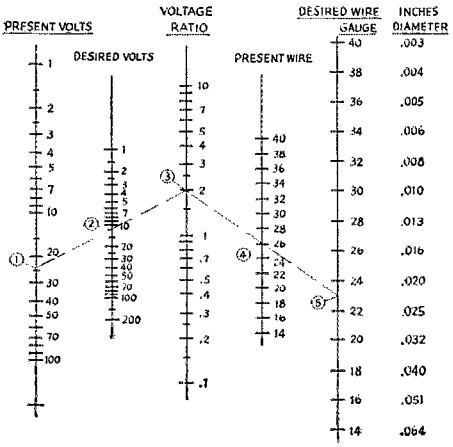


Fig. 3—Voltage Change nomograph for electromagnetic coils.

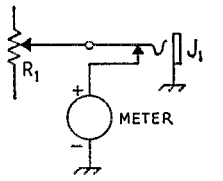


Fig. 4—Circuit showing modifications to the power meter. The meter and R_1 are components already existing in the unit. J_1 is a closed-circuit jack.

USING THE HEATHKIT AM-2 REFLECTED POWER METER AS A MODULATION MONITOR

This simple modification to the Heathkit Reflected Power Meter makes it possible to use the instrument as a modulation monitor. The only additional part required is a closed-circuit jack. The modification consists of inserting the closed-circuit jack in the lead that comes from the center lug of the potentiometer, as shown in Fig. 4. This lead should go to the contact on the jack that mates with the tip of the headset plug. The switch terminal of the jack goes to the plus side of the meter. When the headset is removed from the jack, operation of the power meter returns to normal. When the meter is used for a modulation monitor, the potentiometer controls the audio level in the headphones.

— *Emil P. Sulkosky, K1HSR*

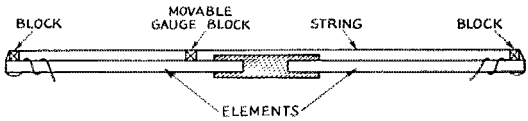


Fig. 5—A method of lining up beam elements.

CARPENTER'S TRICK

Fig. 5 shows a carpenter's trick that is applicable when trying to line up elements of a beam. Stretch a piece of fish line or string taut along the side of the elements from the end of one to the end of the other. Place a block of wood approximately ¾ inch square under the string at either end. Take a third block of wood of the same thickness and using it as a gauge, move elements from side to side until the gauge blocks shows the string to be equidistant from elements at all points. Secure the elements in place.

— *Edward P. Foster, jr., K4BZL*

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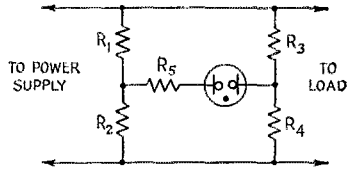


Fig. 6—Power supply bleeder circuit with burn-out indicator.

BLEEDER SAFETY LIGHT

POWER-supply bleeder resistors sometimes do burn out despite conservative ratings. One method of insuring against burnout is to use two bleeders in parallel, each one having a higher value than the original single one. It is rather unlikely that both resistors will open up during the normal life of a power supply.

Another solution, shown in Fig. 6, gives a visual warning whenever a bleeder resistor opens up. Four resistors, R_1, R_2, R_3, R_4, each of the same resistance but rated one-quarter of the power of a single bleeder resistor, are used in a bridge along with a neon bulb connected between the two junctions. When any one of the four resistors opens up, a voltage difference will appear across the neon bulb, causing it to ignite and thus giving indication of a burnout. In most power supplies, additional current limiting resistance, R_5, will be needed to protect the neon bulb; the value of R_5 can be calculated or found experimentally. If a $\frac{1}{25}$-watt neon bulb is used, try a value around 500,000 ohms for each kilovolt of total power-supply voltage.

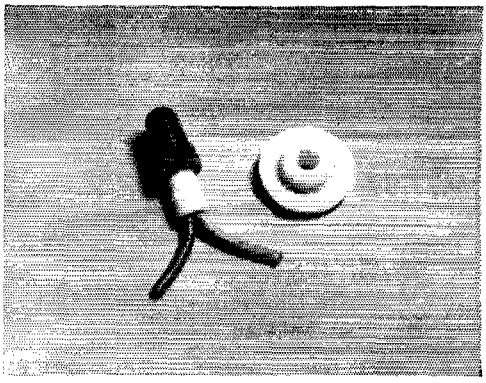
— *Harry L. Cox, jr., W3MJC*

REMOVING STUCK BEAM ELEMENTS

THERE are numerous methods for removing "frozen" telescoping beam elements and they range from the application of a blowtorch to the brute-force method of gas pliers. The following way was found most effective: Firmly clamp the end of the frozen member with a pair of vise-grip pliers as shown in Fig. 7. Using a hammer, tap the end of a chisel until the joint comes loose.

To prevent future freezing of telescoped elements, I coat the joint with grease and bind up with plastic tape.

— *Katashi Nose, KH6IJ*



Wire splice and grommet made with spray can parts.

MAKESHIFT RADIO PARTS

THERE are not many radio supply houses in our vicinity so I've learned to make use of many odd items around the house. The photograph above shows how the tops of various spray cans come in handy for wire-splicers, and the lower portion of the spout makes a dandy grommet for insulating leads coming up through a chassis.

The tops of large plastic bottles make excellent knobs when fitted with cork inserts and drilled to make a tight fit on a shaft.

— *Russ Miller, K4VEJ*

READING FADED TUBE TYPE NUMBERS

THIS is far from being a new idea but is presented for the benefit of the newcomers. The number stamped on the glass of old tubes is sometimes almost impossible to read. Wipe the tube clean with a soft cloth, then breathe on it as you would to clean a pair of glasses. The condensation of the moisture from the breath on the cold glass of the tube should make the number stand out plainly.

— *John McMullen W9VJS*

RESTORING BLACK CRACKLE FINISHES

BLACK crackle finishes can be restored to their original factory appearance by first washing with a mild soap and warm water. Apply a light coating of liquid furniture polish; let dry for a few minutes and then wipe off with a clean, soft cloth. The old panel will look as good as new. The same cleaning process works well on bakelite meter cases and knobs.

— *Sol Davis, W3WPN*

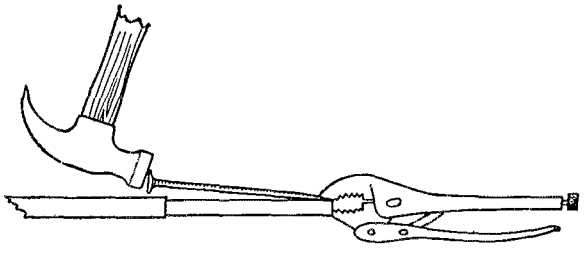


Fig. 7—KH6IJ's method of removing stuck beam elements.

Magic Mountain to Malibu

A Summary of RACES Operation During the California Fires

BY HOWARD F. SHEPHERD, JR.,* W6QJW

If we must have disastrous fires, no amateur group in the country is better prepared to cope with emergency communications problems than the Los Angeles County RACES group. This review hits the highlights of their operation.

With no rain since early spring, the mountain areas bordering the Los Angeles basin were tinder dry by October 30, 1958. Many small brush fires had occupied the efforts of various fire departments but had been contained before serious damage resulted. This good fortune played out on the above date when the Los Angeles County Fire Department reported a major blaze in the Mint-Soledad Canyon area, the route traversed by U. S. Highway 6 from Newhall to Palmdale Calif.

Los Angeles County RACES staff members were placed on "alert" by the Disaster Communications Service and this was followed by a request for assistance from the Pacific Telephone and Telegraph Co. which reported all wire service disrupted to a Nike installation at Lang, Calif. Within minutes W6LVX and W6SVU, RACES officers of the Montrose district, were rolling to activate a permanent radio facility near Newhall. With them were K6OVF and other RACES members. K6EFU, RACES officer for the Hollywood district, was dispatched to the Nike site with K6BEQ, mobile. Staff Radio Officer W6UQL assumed control of the RACES control center in East Los Angeles and was soon joined by W6AEJ and the operator group.

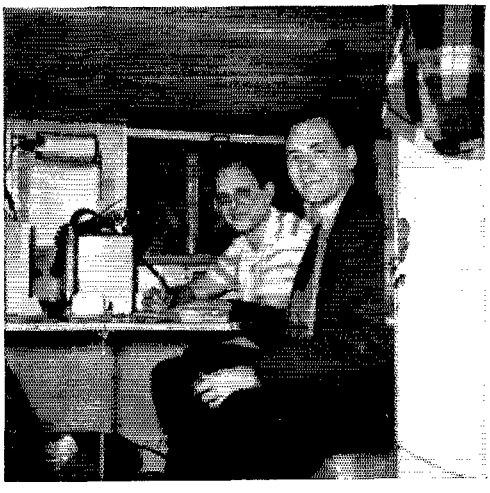
In response to a request from K6AXC, who had reached the scene of the fire in a special RACES-equipped sheriff's car, Deputy Chief Radio Officer W6QJW and W6PCO mobiled to the area and set up a link to the control center on 3995 kc. K6QAY, W6PFF and many others assisted greatly by relaying traffic and clearing the frequency.

The commanding officer of the Nike-Hercules battery at once utilized this link to report to his battalion commander that communications had been effected. Thereafter, assisted by W6HX, W6PNN and K6ZCN, the link was held open until 0025 Oct. 31, when land line communication was restored. K6VJU, who had been coordinating the operation, secured the RACES nets. Shortly thereafter the fire, which consumed 4070 acres, was controlled.

Attempts to supplement the 3995-kc. link with 2- or 6-meter operation were totally unsuccessful, even though portable beam antennas were placed in service. Time and time again, the L. A. County RACES has been forced to use 75 or 160 meters to ram traffic over the long distances and mountainous terrain associated with the San Gabriel and Santa Monica mountain areas. All but a very few amateurs quickly cleared the RACES frequency for emergency traffic when requested to do so.

The embers of the Magic Mountain blaze were

* Deputy Chief Radio Officer, Los Angeles County Disaster Authority, 458 South Spring St., Los Angeles 13, Calif.



The L.A. County Sheriff's Department had this mobile communications unit at the scene of most of the fires. It used the designation "Station Easy." On the right are W6KWW and W6POP operating a two-meter circuit from inside the van.

Fire Department companies, police and Forestry Department officials combine efforts to hold the fire at Malibu Canyon Road. This was close to the RACES station set up at the Malibu Sheriff's Station, operating under the tactical call BJ30. (Official Los Angeles County Fire Dept. photo.)

scarcely cool when, on Nov. 28, the L. A. County Disaster Authority called RACES to duty again, this time in the Malibu area. The new fire was actually made up of two fires which joined together. One of these started on 20th Century Fox Studio property and was to the east of the location of the blaze two years earlier.[1] This new disaster was destined to roar over nearly 4,040 acres and was the first of three fires to strike this coastal area in a month's time.

As in the 1956 fire, W6PNN, now a staff radio officer of L. A. County RACES, was active at the first alarm and with the aid of K6PCX, Malibu District RACES Officer, W6EVL, K6AYJ and other veterans of the former fire, set up a portable unit at the Malibu Sheriff's Station under the unit tactical call BJ30.[2] Chief Radio Officer W6ONC placed a mobile sheriff's radio transmitter in operation on a high ridge overlooking the Piuma Road area and in sight of the blaze to the north. With RACES gear aboard to provide traffic dispatch, the mobile took control of all sheriff's vehicles in the area and provided liaison to the fire departments. Those hams who monitored this operation know the sheriff's portable transmitter by the name "Station Easy." It is equipped with two large gasoline motor-driven 120-v.a.c. generators and contains a galley and sleeping accommodations which make it an ideal base for extended activity. W6SRE and W6POP, RACES officers from the Temple City District, along with several others, manned this unit.

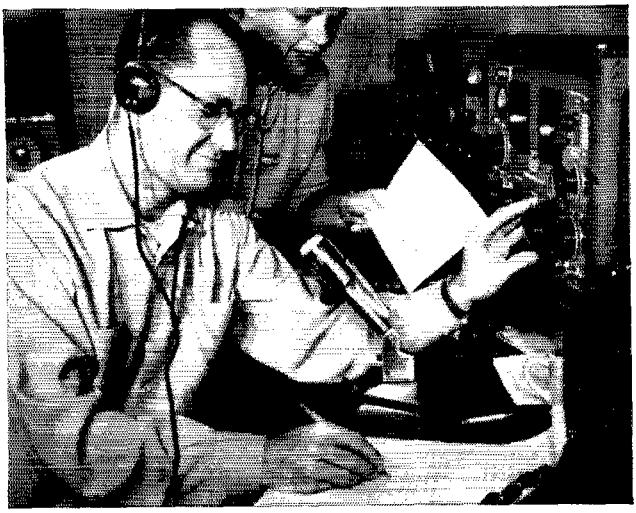
In all, some 70 RACES members participated in this Malibu operation, both in the field and at the County Disaster Center or at relay stations. W6QJW, using the tactical call CPT19, manned in shifts by W6PCO, W6KOS, K6ILY and K6NAA, again acted as NCS on 3995 kc to provide a vital link and to assist in clearing the channel for low power mobiles operating in the fire area; for in addition to the main traffic circuits on 1995 kc., 145.46 Mc. and 50.64 Mc., 3995 kc. was used for liaison to the fire chief's camp at Cornell Corners and other necessary locations as well as for urgent relay traffic. These circuits were busy for 36 hours and the message totals ran over 1000. Staff RACES officers W6ONC, W6QJW, W6UQL, W6AEJ, W6QYY, W6PNN and W6VZA worked multiple shifts to organize circuits and to keep relief operators moving in steadily to replace weary hams who had been hard pressed. Many district RACES officers also put in duty in the fire zone in addition to keeping their own local control station activated. K6OVG, chief operator at County Disaster HQ, W6BVG and others at the control center group did yeoman jobs as did non-RACES relay stations such as W6PCX, W6NTE, K6NCG, K6IQ and many more during the operation.

More at Malibu

The time for rest was brought abruptly to an end on Dec. 2 when still another fire developed in the beleaguered Malibu Mountains. This one was destined to burn 17,860 acres in its four-day existence. Once again the L. A. County RACES group responded with over 125 members actually standing shifts of duty in the disaster zone. The mode of operation closely paralleled that of the

[1] "Malibu and Morrill's Landing," *QST*, April, 1957.

[2] This and other similar call designations appearing in the article are RACES tactical calls as actually used on the air.



CPT19 was net control on 3995 kc., serving as relay between mobile-portable units in the Malibu-Topanga Canyon areas and L.A. Disaster Control Center. That's Deputy Chief Radio Officer W6QJW at the mike, with his assistant (XYL) W6PCO lending a hand.

previous fires mentioned above. The County Disaster Center in East Los Angeles operated on 160, 75, 10, 6, 2 and 1¼ meters as before, handling administrative traffic and some direct disaster work. W6QJW acted as NCS on 3995 kc. for relay purposes and also operated on 145.46 Mc. as liaison to Station Easy.

Due to the prolonged operation, an effort to shorten the shifts, particularly those of mobile units, was made. However, it became necessary in some instances to inter-connect the mobiles' electrical system to that of a sheriff's vehicle that had a Leece-Neville alternator in order to keep the traffic moving. In this way over 1800 messages were cleared

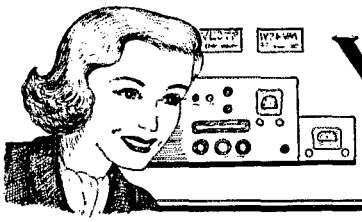
The L. A. City RACES group offered the use of their fixed 2-meter repeater station on Mt. Lee near Hollywood, and City RO W6LIP was on hand to direct this phase of the operation. Other RACES members from surrounding jurisdictions volunteered equipment and their services and were assigned duty where needed.

When the smoke cleared, another "job well done" was echoed by civic officials, and RACES groups turned their attention toward reassembling gear and catching up on sleep. Again, however, the respite was all too short, for at 1000 PST on Dec. 31 the L. A. County Disaster Group once more went on alert in the same general area. Controls were activated and within minutes were working 3995 kc. in contact with BJ6, operated by W6CAR and K6OQI in Topanga Canyon at the east and south of Malibu, where fire again was ravaging the countryside. "Station Easy" was rolled to the scene but because of the rapid shifting of the fire it could not be placed on the hilltop location needed for v.h.f. coverage until nearly New Year's Eve. Its chosen site was in the driveway of a still-burning ranch home. Sheriff's Deputy K6AXC and W6QJW put the unit in operation and were joined by W6PNN and W6POP. The latter took over the "Station Easy" RACES operation. As in previous fires, all sheriff's vehicles were dispatched via the ham radio links to Disaster Control Center and the Malibu sheriff's substation.

The 3995-kc. and 50.64-Mc. links were used for fire reporting and for Salvation Army supporting traffic in the immediate fire area and to provide communications to another smaller fire which concurrently plagued the hill area north of Beverly Hills.

At this writing the traffic totals are still uncompiled but will run many thousands for the total networks involved. A majority of all the veterans of the earlier fire disasters served again and were supplemented by other RACES members who had been previously held in reserve. W6TDW, Deputy RO for Burbank, was among those operating the 3995-kc. and 145.46-Mc. relay at CPT19 in Hollywood. While the 4982-acre Topanga Canyon blaze was not so extensive as the early December fire in Malibu, the area was more heavily populated, with the tragic result that 81 homes were lost. RACES can well be proud that its part in alleviating these disasters was credited with the saving of life and property. However, the need for constant readiness and perfecting of plans is clearly outlined.

It is obvious that proper commendation cannot be given to all who worked to prove that amateur radio can be so effective in the public interest, necessity and convenience. Many more than those mentioned above appeared in the official logs. Among them were the following: *W6s* BIP CTH DQO EIH EXB FIY GHZ GOG GTE HDN HRM IFW JLO JNG JYP KLZ KQ LHO LHQ MDI MLZ MZB NTN NXW NYZ ODV PFR PGV QCV PIF PNS QDD SKT SRE TLI TVH UDE UJC WPF WSO WWY ZPN, WA6AKP, *K6s* AYS AZE BAW BAY BFA BZZ CUK DMP EDO GRB GRS GCT GTE HHV HKI IFW KDK JVH KHG KWW KYK LAT LFT LOX NPS OFS OQD QLN RAN RGW TVO UGZ UJG VEO VPX VVT YDQ ZCN ZUS, W7YLO. QST



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

WHEN a girl or woman (we like to think of ourselves eternally as girls, regardless of age) gets her own amateur license, usually a ham in the family has provided the inspiration to said neophyte and often has helped a bit with the code and theory end of things. Occasionally a girl has never even heard of a ham, save for the baked Virginia kind, before the bug hits her, by some devious means.

What does a girl do in such a predicament? To this question there are varied answers, of course. From time to time we like to recount in a YL's own words just how she became a ham, especially when she received little or no help from others, so that her story may inspire other would-be YLs to proceed on their own toward a ham ticket.

Here is Alice Hawes, K5OKR's story:

"I wonder if I am the only YL or XYL who took up ham radio without knowing any hams or having someone in the family who is a ham? I did not know any ham operators nor anyone even interested in being a ham until I took my novice exam and met the OM who was kind enough to give me my test. (My OM had hunted until he found a ham to give the test. Hams are very scarce here in the area around Jackson, Louisiana.)

"I had never studied electronics, not even the basic study of electricity. I did not know anyone who knew code so I bought an Instructograph. While I progressed very slowly, I was determined to learn. I had listened to hams talk and had envied them so long. It took me almost a year to find what was needed and to learn enough to get my novice ticket. I then started building my transmitter from a kit and studying for my general ticket.

"Building equipment is one of the things I enjoy most in my hobby and I learned much from it. I had never even seen a transmitter until a few months after I took my novice exam. In seven months I got my general ticket, and two months later on Sept. 28, 1958, I was on the air for the first time. What a thrill to answer KN4YPT's call and have my first QSO.

"I am using a Heathkit DX-40 transmitter on c.w. only, with an NC-109 receiver and 40-meter dipole antenna. I have worked 25 states in two months and have made many enjoyable contacts. Soon I hope to be on other bands and attempt a bit of DXing."

—•••—

For Louise Wright, W1GWF, Christmas came early last December. Santa Claus, personified by the three OMs shown in the photo below, arrived on Dec. 7 laden with shiny new ham equipment, which would make any YL happy under any circumstances. But for W1GWF, blind since birth, the gifts meant that she could continue her beloved hamming with stable, reliable equipment.

An article about Louise which appeared in the July '58 issue prompted Ed Hale, W1TZ, Arthur Bullukian, K1BRE, and Robert Landry, members of the Franklin, Mass. ARC., to spearhead a drive to raise funds for the YL in Clinton, Maine. Contributions from hams in the 49 states, Canada and Europe built up until there was enough to purchase several hundred dollars worth of gear, including a Harvey-Wells receiver, a DX-100 transmitter, a mike, speaker, and a beam antenna.

In four-degree cold the three OMs from Massachusetts arrived in rural Clinton and speedily installed the equipment, to the surprised delight and complete gratitude of W1GWF. That same day Louise contacted many of her friends all over New England, and she continues to operate several hours daily (mainly on 75-meter phone), thanks to the benevolent hams who saw a need and went out of their way to do something about it.

*YL Editor, *QST:* Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

HOW YLs QSL
(According to W4SGD)

Katherine Johnson, W4SGD, of Fuquay Springs, North Carolina, says that although she hears others lament that YLs are slow to QSL, she has no complaints. A very active ham since 1950 and currently custodian of the YL Century Certificate, Katherine has worked 807 YLs. Of this number 772 have confirmed by QSL — 35 have not. Of the 35, Katherine expects to receive a QSL from 25 — she has given up on 10 completely. She has tabulated her YL QSL information for us as follows:

District	*Worked*	*Confirmed*	*Hope to Get*	*Lost Cause*
1	54	53	1	0
2	56	56	0	0
3	58	57	0	1
4	148	146	0	2
5	101	99	2	0
6	65	62	3	0
7	62	47	5	0
8	55	54	1	0
9	46	43	2	1
10	84	77	4	3
DX	78	68	7	3
	807	772	25	10

Coming YL Get-Togethers

Ninth Midwest YL Convention
May 22-24, Milwaukee, Wisconsin, at the Polly Valley Motel. Mary Meyer, W9RUJ, Chairman.

Eleventh ARRL National Convention — YL Program June 19-21, Galveston, Texas. Program for licensed YLs will be handled by members of the Gulf Area YLARK, W5EGD. Lillian Beebe, President. Program for XYLs will be arranged by Mrs. Mary Bess Sherrod, XYL of the General Manager of the Convention Committee, and YLs W5DJC, JSV, and K5GNC. Watch for further details.

In answer to many hams who wonder what has happened to the "Dew Drop of Texas", Mary Palmer W5DEW, brings us up-to-date about herself. The fourth YL in Texas to become an amateur, Mary was licensed 27 years ago. Before World War II she claims she was a permanent fixture on the 20-meter band, where she contacted hundreds of hams and acquired her affectionate nickname. Today Mary still resides in Port Arthur, Texas, and is on 75 meters daily and on 40 meters on Sunday. Before going to work in a bank in the morning Mary reports into the Army MARS net. Hoping to be on hand at the National Convention in Galveston in June, the "Dew Drop of Texas" is looking forward to seeing many of her old friends there.

In behalf of the members of the Young Ladies Radio League, 1958 President Beth Taylor, W7NJS, sent congratulations to Dr. Lee De Forest on the occasion of the illustrious gentleman's 85th birthday. Dr. De Forest expressed his appreciation to W7NJS and said that it was a joy to him to learn about the YLRL and to realize that his work in radio paved the way for an organization of women amateurs

And Mamma is the first Canadian YL to make DXCC too! Maybe VE3DKY's charming youngsters don't quite understand yet what DXing is all about, but someday they may appreciate the fact that in less than three years their mother worked 195 countries (mainly on c.w.), and that she has WAC, WAS, WBE, WASM, DUF#4 awards, with WAZ, BERTA, and OHA worked but not yet confirmed. At her Agincourt, Ontario QTH Jean Robinson uses a KWS-1 and 75A-4 with a Quad tri-bander for 14, 21, and 28 Mc. Rex, Rosanne's, and "QRM Richard's" mother is a nurse, and daddy, VE3DIF, is a doctor. *(Photo by VE3DIF.)*

The Franklin Smith family of Sycamore, Ohio issues a certificate to anyone who contacts four of the growing clan of Smith hams. Mother is W8SPU, Dad, W8QOV, son W8KGL, daughter, W8OSD. New son-in-law is K8BYT. Three nephews and a cousin are possible "Worked-All-Smith" contacts too.

KØLVU helps a young Coffeyville, Kansas neighbor with his c.w. practice. Mildred Frazier's own three sons are WØKLK, WØRLK, and WØPJN. Now that she has her general class license (March, 1958), Millie is pretty pleased about the schedules she is able to maintain with her sons in various parts of the state. Millie says that she "had to prove to (my) family that I could do it", and she's doing it quite nicely on 40 c.w. with a new DX-100 and HQ-110 receiver.

Proud Dad W8SLV submitted this photo of his two daughters taken when the girls were judged Michigan Junior 4-H "electrical champions" for their demonstration on learning the code. Nancy (left), age 13, is now K8JXX and Sally (right), age 12, is KN8JXY.

Lillian Byrne, K2JYZ, of Freeport, N. Y. was the third place c.w. winner in the 19th YLRL A.P. (scores reported last month). Lillian holds several YLRL awards, including YLCC-250, DX-YL, and second district certificates for the 1957 and '58 YL-OM Phone Contest and the '57 AP for both phone and c.w. Lillian's OM is K2JYM, and two of her six children are technicians—15 year-old Maureen, K2ZUX, and John, K2UNO.

The Corcoran Award

A handsome copper plaque has been given by Marie Corcoran, W8TPZ, and her OM, to the YLRL to be awarded to the club member who makes the highest combined score in the phone and c.w. sections of the Anniversary Party each year. The vice president will be in charge of the plaque, seeing to it that it is engraved each year with the name and call of the YL who wins it for each contest. Any member who wins the plaque three times, not necessarily in succession, will be awarded permanent possession.

DX-YL Awards

President of the YLRL, Kay Anderson, W4BLR, has released the following list of YLs who received the new DX-YL award in 1958. Effective April 1, 1958, the award is issued to any YL who works 25 other licensed women operators outside of her own country. Award custodian during 1959 is YLRL Vice President Gladys Eastman, W6DXI, 735 Glen Ave., Glendale 6, California.

The number following a name indicates the number of stickers earned — one sticker for each 10 additional YLs worked.

1 — ZE1JE
2 — CR7LU
3 — W5DRI (1)
4 — W4VCB/3 (2)
5 — G2YL
6 — W5JCY (1)
7 — OH5SM
8 — KH6AUJ
9 — K6EXQ
10 — KH6BTX (2)
11 — OE2YL(1)
12 — VP1OLY
13 — W3GEN
14 — K2JYZ
15 — KA2HA (3)
16 — W4KYI
17 — W8HWX
18 — KP4APX(3)
19 — G8LY
20 — W4SGD
21 — W6GGX
22 — ZS5OB (2)

Appeal for YLs to Assist with AWTAR

Last month introductory information concerning the 1959 All-Woman Transcontinental Air Race appeared here. Summarizing briefly, the derby will start at Lawrence, Mass. on July 4 and will terminate at Spokane, Wash. on July 8. The race route will be via Binghamton, N. Y.; Youngstown, O.; Kokomo, Ind.; West Chicago, Ill.; Rochester, Minn.; Fargo, No. Dakota; Bismarck, No. Dakota; Miles City, Mont.; Helena, Mont.; and Spokane. Mrs. Betty Gillies, W6QPI, will again serve as Chairman of the AWTAR Board.

Carolyn Currens, W3GTC, of Norristown, Pa., has volunteered to serve as chairman of amateur operations again this year as she did for the '58 race. Carolyn sends an urgent plea for more YL operators to lend their operating talents to the amateur network, which for the past several years has been set up to assist the women pilots by the relaying of such information as take-off and arrival times, weather conditions, progress reports, and personal messages.

Pointing out that the famed air race is a race of women pilots, W3GTC suggests that we could have much heavier YL participation in the amateur net than there has been. Assistance from OM operators is much appreciated and is still cordially requested, to be sure, but Carolyn queries, "How about making it more of a woman's traffic net?"

Operating frequencies will be 7210 kc and 3953 kc. Please contact Carolyn Currens, W3GTC, P. O. Box 523, Norristown, Pa., if you would like to be of service to an outstanding group of women in a project which is sure to be satisfying and exciting.

Quist Quiz

Here's a practical radio problem, given to us by John Hondema, K8EVW of Grand Rapids, Mich., that you may run into any day. You're pretty good if you get it right off the bat.

A certain length of insulating tape 0.05-inch thick is rolled up on a core 1 inch in diameter. The diameter of the finished roll is 6 inches. What is the length of the tape?

—•••—

If you didn't see in last month's quiz that the voltmeter would have to read zero, you would probably have been transferred to the advertising department.

My First SS

BY JAMES FLYNN,* KØMRS

If you've never taken part in a Sweepstakes contest, it's kind of hard for us to convince you of the fun and excitement that can be yours. Maybe this story, written by 13-year-old KØMRS, will whet your appetite. Jim has been a ham since March of 1958. His dad is WØMHV.

AFTER struggling through two weeks of the 1958 Novice Roundup, I felt I was ready for the big test — the SS. In the NR, while still toting that extra letter (N) in my call, I scraped together a whole one hundred and thirty-four contacts in forty-four sections. This I thought was really something until I took a look at the 1957 SS reports in good old *QST*. Gee, they get one thousand contacts in two week ends and I get one hundred and thirty-four in two weeks. Just to sooth my feelings, I tried to think of excuses as to why I had such a lousy score. Doggone it, I couldn't think of a blasted thing except that maybe there weren't as many stations in the NR. (I certainly learned in a hurry that this was true . . . Hi!)

So for a while I just forgot contests and was content to chase G's on fifteen meters. But then, with the usual browsing around in *QST*, I ran across the announcement for the 1958 SS in the October issue. It hit me again and, being quite dense after a hard day of the three R's, I began thinking of how I could go to school, do homework, watch my schedule of TV programs, go to a dance Saturday, and still win the SS for Nebraska. Oh well, I decided if I could get my homework done at school, skip my favorite TV programs, and stand up my date, I could get by at least the first week end.

My troubles started very early with my pulling too many pages off the calendar about a week before the big test. That same day, the November issue of *QST* came saying the contest would begin at 1700 on November eight. So, with me being a mathematical genius, after half an hour of scribbling figures and filling the wastebasket with wads of costly notebook paper, I deduced that the contest would begin on a Friday. This I did while checking into the Nebraska Slow-speed Net and listening to the local "ten minutes of news every five minutes" station in town blasting Elvis Presley through the shack at Q5 S9.

Along comes Friday, 1700, and I blast out my first CQ SS (which is now a habit). No luck, so I tried again. Oh boy, a nice loud WØ shoots back at me twenty w.p.m. I came back to him at twenty-five w.p.m. giving my nr etc. and shot it back to him with a beautifully maneuvered BK. The rest of that QSO can be quite easily imagined, I'm sure. Oh well, that just means an extra night's sleep, so I went down to eighty meters and had a nice evening chatting with WØMAO and KØKUA.

For some strange reason, just before I went to bed I looked out the window. Ah, a good clear night, FB CNDX tomorrow! As I was pulling my head back in the window I noticed something on the ground below. Oh no! It was a thirty-foot pole which had been up for fifteen years and was supporting my one and only antenna. Funny, I hadn't even been on fifteen meters today. Darn those neighbors, couldn't they wait till Monday at least?

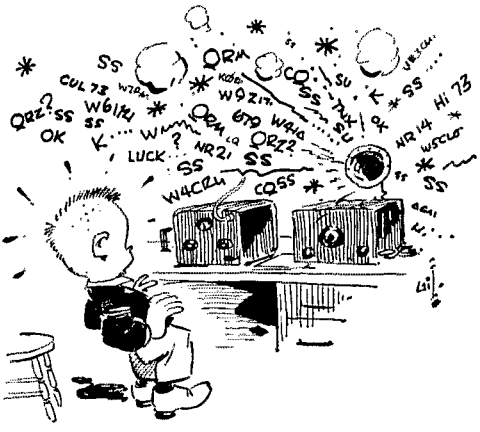
I slept on it Friday night, then woke up earlier than usual Saturday morning because of a faulty electric blanket. I stumbled out of bed feeling half dead and nearly fell down stairs to see what I could do to fix my antenna before five P.M.

After clearing my head with a bit of food and a glass of milk, I discovered that all wasn't lost. Only the top ten feet of the pole had broken and I soon discovered it had been the wind (please pardon me, dear neighbors) that did the work of almost taking me out of the SS, which neither my homework, the TV nor the dance could do.

After nearly breaking my neck twice, I put up a temporary section, hooked and tightened the guys again, and finally the antenna was back in the air about five feet lower but good enough.

About four P.M. Saturday I began preparations for the five o'clock start . . . oiled the bug, took out the log sheets, filled a couple of fountain pens, sharpened a few pencils, found a check list of sections and warmed up the rig.

After a forty-five minute warm-up, I tuned the lil' peanut whistle up on forty meters and waited. It was a reasonably peaceful afternoon on forty . . . that is, until five o'clock. My gosh, things were so piled up in five minutes you'd think AC4RF was calling "CQ stateside" all across the whole band. I timidly attempted a CQ but ended



*3335 Summit St., Omaha, Nebr.

up with about half the stations in the midwest doing the same thing right on my frequency. Of course, with a BC-348-Q you have no trouble hearing most all of forty meters any place on the dial between 7.0 Mc. and 7.4 Mc. at one time.

After several minutes of fighting, I landed WØVXO in Iowa, who was knocking off stations faster than I could count with an adding machine. Being in a glorious mood because of receiving an unusual 599 report, I set out to really give this thing all I had, and all my Adventurer had three years ago when it was new and before it had been rewired twice. All went fine through the early hours of the contest until I spilled cocoa all over my log sheets, this slowing me up another twenty-five minutes.

I gave up then and went down stairs to thaw out and get some well-deserved food.

Upon returning to the shack which was by now a fitting name for my usually fairly neat station, I changed bands and loaded up on eighty meters which was, as yet, not in too superb shape.

As I am not a coffee drinking late-late show watcher, staying awake was somewhat of a problem. After an eleven o'clock cocoa break, I returned to the now-exceedingly cool shack to knock out a dozen or more contacts before calling it a night.

After my sixth hour on the air, my heating problem was solved. The three-year-old 807 was running a cheery red color and the top of the rig was hot enough to keep my cocoa warm besides keeping half the shack at a nice temperature. This was my excuse for throwing the switch at an hour as early as 12:00. However, I think if I had stayed up another minute I would have fallen asleep at the rig.

I plopped out of bed at eight and, tripping over a chair, stumbled into the shack. Here I dug through the mass of papers and found my poor over-worked bug and the log sheets and stumbled down two flights of stairs to the fifteen-meter shack. I was well equipped here with the exciter stage of an eight hundred watt rack-mounted home-brew job sporting one lowly rock and ninety watts, the rock proving to be on the deadest spot in the band. This was quickly taken care of with a rush order to a hurry-up-delivery crystal dealer who sent the crystals back in a hurry-up effort which proved quite useless, as the crystals arrived on Monday, the seventeenth, a day late.

Monday morning was quite a nightmare as I chugged off to school at eight. That morning two plus two seemed to always come out five, and I couldn't remember whether it was Columbus or George Washington who discovered America.

By the next week end, I was all set up again; after watching beloved Nebraska get trounced on TV, I set my clock by WWV and sat down to await the green flag which in this case was a noisy alarm clock.

Saturday night went just fine except that I averaged fifteen QSOs per hour instead of the hoped-for thirty. At ten I took off two hours to watch a worthless horror movie and catch up on FCC logging which had become quite a paper consuming thing after a few hundred contacts.

After the movie was over, I flopped back into my chair and once more awoke the household with a poorly-sent CQ SS. After working NR 300 I gave up and went to bed, this being about 0200 Sunday morning.

Getting up at 0730 I again stumbled to the fifteen-meter shack and was on the air at 0820, which was quite speedy for me on a Sunday morning.

Things were going along fine again until on forty meters Sunday afternoon I worked a WØ in the western part of Nebraska with a score that made my NR 370 look like my Novice Roundup score again. As the day drew to a close eighty meters slowed up considerably, so I grabbed the bug and went back to the fifteen-meter shack where the sixes and sevens were rolling in.

I worked my last section of my first SS at 2100 Sunday night. A K7 in Idaho for my sixtieth section and my forty-fourth state. I still needed Wyoming, Utah, Vermont and, believe it or not, South Carolina. Although I learned a great deal and had a lot of fun, I was disappointed in not working Wyoming, the one state I needed to complete my WAS.

However, as the old saying goes, just wait 'til next year! QST

Strays

From the FCC interference case files we excerpt the following anecdotes.

A "popping" sound which blacked out TV reception over a four-block area in Denver was first blamed by a set owner on neighborhood amateur radio operation. But investigation showed that it came from the complainant's own TV receiver, which had been "souped up" with higher voltage to take care of a larger picture tube, with resultant breakdown of equipment. The abashed set owner agreed to remedy his set to satisfy his neighbors.

—•••—

Interference to amateur operation revealed that members of a military reserve unit in Texas were using their official walkie-talkies for private use. One reservist "walkie-talkied" the transfer of groceries from the stockroom to the supermarket in which he was employed. Another used his set to cover a golf tournament.

Ham-Ads Pull!

BY ALBERT PRATT *

I AM in trouble. Deep trouble. About two feet deep, that is. At least, the pile of letters looks about two feet deep when I try to look over the top.

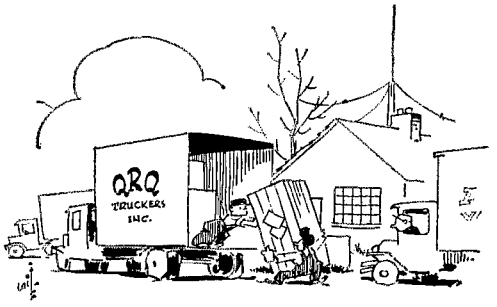
It's all because of a small Ham-Ad I had in the November issue that I wince every time the phone rings and I try to avoid the cold stare from the mailman when he hands me more letters every day. The response I've had from this small ad is amazing, because so far I have had over 600 replies and (as I write this in late December) I'm still getting 3 to 5 letters a day.

In all fairness to the *QST* readers who have written or phoned or telegraphed me in response to the ad, I think I should explain the situation to all these good fellows. Actually, I didn't anticipate such a response to my ad or, more accurately, I didn't realize that there was such a market for good surplus equipment at decent prices.

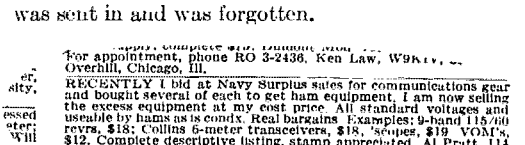
It all started last summer when I got the brilliant idea (brilliant for me, that is) "Why can't I buy surplus material direct?" With a glint in my little beady eyes, I proceeded to find out. And I did find out. I found out that I could bid directly and I have done so at several sales although the red tape, the boondoggling, and my new gray hairs, all make me wonder if it's worth it. Believe me, you gotta be a little batty to get into this racket!

In my bidding, I was primarily interested in finding electronic gear for myself, but Uncle Sam's surplus disposal officials had something to say about that angle. I soon found that practically all equipment was sold in *lots*, which meant that several different kinds and types of equipment would be found in a *lot*, or that there were several pieces of one kind of gear in a *lot*. Ol' Uncle Al wasn't to be fooled, however, so I bid on some of the smaller lots. Lo and behold, I was awarded some of these lots and this is where *QST* begins to enter the picture.

With trucks rolling up to the house and with the raised eyebrows of the neighbors when they saw the big wooden boxes on my lawn, I began to accumulate a tidy little stock of radio and electronic gear. The basement was soon full, with little trails and pathways between the stacks of TBS, RAO, BC, SCR, and what-have-you equipment. Any ham would have gone bug-eyed, with such an array of dials, knobs, meters, and all the other radio gadgets that warm the cockles of our hearts. Here also I began to develop the strains on the family ties, particularly when a truck drive would say to the Little Weaver "That'll be $636 c.o.d., lady." Like a female dog, I soon found that my place was a mecca for hams and they began to seek me out and word passed to their friends and some wampum was traded. Yet I still had that basement full and the back yard looked like a Pacific beach-head. So one day I thought of *QST* and I figured that an ad in the Ham-Ad section just might bring some prospects for the items I had that I couldn't use. The ad was sent in and was forgotten.



* 114 West Lake View Ave., Milwaukee 17, Wis.


For appointment, phone RO 3-2436, Ken Law, W9KLV, ... Overhill, Chicago, Ill.

RECENTLY I bid at Navy Surplus sales for communications gear and bought several of each to get ham equipment. I am now selling the excess equipment at my cost price. All standard voltages and useable by hams as is condx. Real bargains. Examples: 9-band 115/60 revrs, $18; Collins 6-meter transceivers, $18, 'scopes, $19 VOM's, $12. Complete descriptive listing, stamp appreciated. Al Pratt, 114 West Lake View Ave., Milwaukee 17, Wis.

...BROPLEX Original Deluxe key, $17; ...

Then one evening in October the phone rang — long distance call from New York. Probably just Uncle Bill in jail again, but no, a customer it was and he gave me an order over the phone. I tell you I was mighty pleased with myself. There were two more calls that night, more the next day, plus a telegraphic order, and then the roof fell in. With several phone calls and 25 to 60 letters every day, I began to realize that I was in deep water. I knew I couldn't fill all the orders!

In the ad I had the notation that I would send a descriptive listing, but with only 250-odd pieces of equipment I made up only 250 lists — not near enough to go around. It's to the fellows who didn't get a list that I owe an explanation.

I also had the notation "stamp appreciated" and the response I have had from the fellows on this makes me feel real good inside. Here are some of the statistics and facts on the replies I had, and I believe they are interesting:

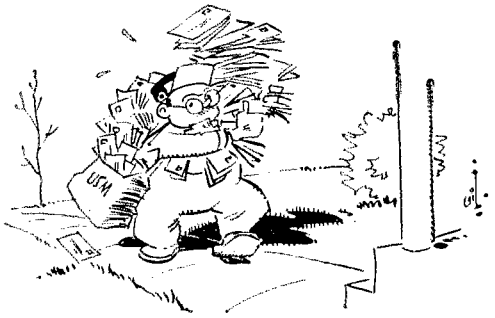
Over 60% sent stamped, self-addressed envelopes, with many airmail envelopes.

Most of the balance sent stamps, mostly 4¢; about 50 3¢ stamps; about 50 airmail stamps or postage; other postage stamps from 6¢ to 20¢, plus some coins.

About 3% included no stamp. A couple stated "stamp enclosed", but forgot it.

About 20 postcards were received, several of these had stamps attached to the card.

Most of the stamps were either loose or carefully affixed by one small corner.



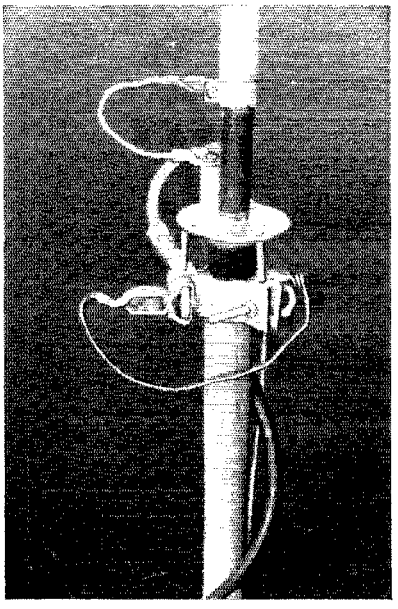
Several were so thoughtful as to wrap the stamp in waxed paper.

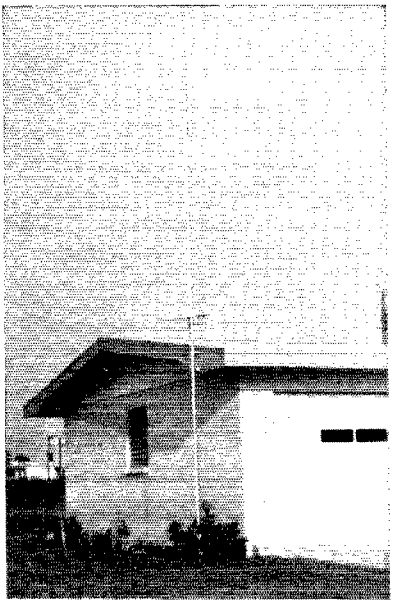
Most of the replies asked for the listing only, but about 25% ordered from the very skimpy description in the ad. Forty-five fellows sent checks or money orders in advance. Two of these checks were in blank and asked me to fill in the amount.

Forty of the replies were from physicians. All of these were, without exception, very courteous and friendly in tone. I think I had better treat these guys pretty good. After my experiences in this surplus business, I may need some expert psychiatric attention and it might be I can swap a transmitter or two for it! I was genuinely surprised at the uniformly high quality of the responses I have had. This proves quite conclusively that hams are in general an above-average group and I hope this will continue. This is quite a contrast to my experiences in advertising in a certain free publication. I received some weird correspondence from quite an assortment of plain "characters." One of these boys wrote me "Send me everything you have and I will return what I don't want." Another said "Send me a sample of each item you have on approval." It's a real pleasure and makes me feel proud to correspond with the *QST* readers.

I'm certainly sorry that I don't have the time to write a personal letter to everyone of the fellows who wrote me, but I want to thank each and every one just as sincerely as if I had written to him or her personally. QST

Strays





When W4GEI and his wife decided to build a new home last year, one of their first conclusions was that *this* time the shack was going to be neat. So, the operating room was designed with plenty of a.c. outlets and with a good water-pipe ground. Coax from the rig runs out through the wall via a Mosley fitting and thence through some plastic pipe buried underground. This keeps the coax out of sight until it reaches the base of the vertical, which is at the opposite end of the house. The photographs above show (at the right) how unobtrusive the vertical antenna is alongside the house and (at the left) the construction of the loading coil at the base of the antenna. As set up in the photograph, the upper clip is shorting out the loading coil. The lower clip is not in use when in the position shown in the photo. When released from the position shown and clipped up above the loading coil (where the first clip is already) the antenna is grounded for lightning protection.

Technicians on 144 Mc.?
RTTY Rules Changed
C.W. V.H.F. Subbands Postponed
What Bands Available?

TECHNICIANS ON 144 MC.?

FCC has issued a notice of proposed rule making to permit Technician Class amateurs to use the band 144–148 Mc. The text of the notice is published below, and indicates March 31 as the final date for receiving comment. At its meeting in late January the Executive Committee examined the proposal and solicited the views of individual League directors so that the official position of the League might thus be formulated.

FEDERAL COMMUNICATIONS COMMISSION

Washington 25, D. C.

In the Matter of Amendment of Part 12 of the Commission's Rules, Amateur Radio Service, to permit operating privileges for the Technician Class amateur-operator in the 144–148 Mc. band	Docket No. 12728

NOTICE OF PROPOSED RULE MAKING

1. Notice is hereby given of proposed rule making in the above-entitled matter.

2. The Commission has before it for consideration the petition of Mr. Robert K. Wallace, R.R. 1, Box 7, Bellbrook, Ohio, licensee of amateur station K8BYQ, for amendment of Part 12 of the Commission's Rules to permit operating privileges for Technician Class amateur operators[1] in the 144–148 Mc. amateur band.

3. In support of the request, petitioner states:

> The occupancy of the 144 Mc. band has decreased steadily since the 50–54 Mc. band has enjoyed such phenomenal growth and definitely needs more activity to prevent the steady exodus of all V.h.f. minded amateurs to more populated bands. The Technician Class licensee could most certainly make emergency communication nets on the 144 Mc. band much more effective. Since the efficiency with which any emergency communication group can operate is admittedly directly related to operator availability, it therefore, should stand to reason that the greater number of people operating on the 144 Mc. band (if it were opened to the Tech.) would mean a greater number would be available to provide emergency communications at any given time. The ARRL's primary reason for opposition to 144 Mc. occupation by the Technician was the desire to concentrate the Technician in 50 Mc. band and therefore populate a band which up to that time was occupied by only a "handful" of hardy pioneers. This concentration would in effect "save the 6-meter band." The Technician has performed his job well by flocking to the 50–54 Mc. band literally by the hundreds and with the increase in activity the bands population continued and is continuing to "mushroom." Many General Class amateurs have returned to the 6-meter band simply because of the increase in activity caused by the Technician influence.

In addition, petitioner states that by being given access to the 144–148 Mc. band, the Technician would be enabled to experiment in an additional area of the spectrum and contribute to the general knowledge of radio propagation characteristics of that region.

[1] Hereinafter referred to as "Technicians."

4. As stated by the petitioner, the Commission, on September 1, 1954, adopted a Notice of Proposed Rule Making in Docket Number 11157 which proposed to permit "Technicians" to operate in the 50–54 and 144–148 Mc. amateur bands. On March 9, 1955, the Commission issued a Report and Order in this proceeding by which Section 12.23(d) of the Rules was amended so as to aid only the 50–54 Mc. band to those bands in which "Technicians" are permitted to operate. In this Report and Order the Commission gave the following explanation for not amending the Rule so as to include the 144–148 Mc. band among those in which "Technicians" are permitted to operate:

> As evidenced by the comment received, there appears to be considerable controversy as to whether technicians should be allowed to operate in the 144 Mc. band. Because of the opposition expressed by the American Radio Relay League, and because it does not find the arguments expressed in the comments otherwise decisive, the commission is hereby dismissing that portion of the proposed amendment having to do with technician privileges in the 144 Mc. amateur frequency band.

5. The opposition of the American Radio Relay League, Inc. (ARRL) referred to by the Commission in the above quoted excerpt from the Decision in Docket Number 11157, included the following: that, since the war, the 144 Mc. band has had its proportionate share of amateur use, and, with the opening of a substantial segment of it for use by Novice Class licensees in 1951, occupancy has increased to more than adequate level; that, "obtaining equipment for the 144 Mc. band is a much simpler problem than for the 50 Mc.;" and that "the only result would be greatly increased occupancy of the already-populated 144 Mc band and little — or, more likely, no — increase in 50 Mc. activity." The League concluded: "Thus we see no immediate need for regulatory action to promote usage of the band."

6. In view of the large growth of the amateur service and the fact that almost four years have passed since that action was taken, for several reasons it appears that a re-examination of the proposition is appropriate at this time. Among these reasons are: *First*, the Commission is aware that since the opening of the 50–54 Mc. band to "Technicians," equipment for operating in that band has become more readily available and that activity in the 50–54 Mc. band has increased at a greater rate than in the 144–148 Mc. band. It would therefore appear that opening the 144–148 Mc. band for "Technicians" would result in a more nearly even distribution of activity in the v.h.f. amateur bands; *Second*, it would provide an additional band in which "Technicians" could experiment, thereby contributing to the general knowledge concerning this portion of the spectrum; *Third*, it would broaden the area in which "Technicians" could participate in civil defense activities since their activities in the band would increase the total amount of available equipment capable of operating in the 144 Mc. band; and, *Fourth*, subsequent to the Commission's action in Docket 11157, operation by "Technicians" in the bands between 200 and 10,500 Mc. has been made subject to the requirement that such operation "shall not cause harmful interference to the Government Radiopositioning Service." In view of the foregoing, it is believed to be appropriate at this time to re-examine the question of Technician Class amateur operator occupancy of the 144–148 Mc. amateur band.

7. Accordingly, the Commission proposes to amend Section 12.23(d), Amateur Radio Service as shown in the Appendix attached thereto.

8. The proposed amendments are issued pursuant to the authority contained in Section 4(i) and 303 of the Communications Act of 1934, (47USC 154, 303).

9. Any interested person who is of the opinion that the proposed amendments should not be adopted or should not be adopted in the form set forth herein, may file with the Commission on or before March 31, 1959 written data, views or briefs setting forth his comments. Comments in support of the proposed amendments may also be filed on or before the same date. Comments in reply to the original comments may be filed within ten days from the last day for filing said original data, views or briefs. The Commission will consider all such comments prior to taking final action in this matter.

10. In accordance with the provisions of Section 1.54 of the Commission's Rules and Regulations, an original and fourteen copies of all statements, briefs, or comments filed shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION
Mary Jane Morris
Secretary

Adopted: January 7, 1959
Released: January 13, 1959

APPENDIX

IT IS PROPOSED TO AMEND SECTION 12.23(d), AMATEUR RADIO SERVICE, TO READ AS FOLLOWS:

(d) *Technician Class.* All authorized amateur privileges in the amateur frequency bands above 50 Megacycles.

RTTY RULES CHANGED

Late last year FCC proposed, on request of Boyd Phelps, WØBP, to authorize unlicensed persons to communicate by amateur radio using radio teleprinter equipment under the control and supervision of the station licensee — in much the same manner that unlicensed persons are permitted to speak over the microphone of an amateur voice station. ARRL's filing endorsed the proposal as meritorious. The Commission has now amended our rules to this end, effective February 28, with the same language as proposed (see p. 55, January *QST*).

C.W. V.H.F. SUBBANDS POSTPONED

As reported in this department last month, in December the Federal Communications Commission finally adopted the League's proposal to establish c.w.-only segments in the 6- and 2-meter bands but rather surprisingly located these subbands at spots far different from those requested. A preliminary study by the League staff indicated that the action would not permit the amateur service to accomplish intended objectives in the field of propagation research, and so ARRL filed a request for postponement of the effective date (which had been January 10). Responsive to this and other petitions from individual amateurs similarly concerned, FCC has now postponed the effective date indefinitely and announced that up to March 10 it will receive requests and arguments for reconsideration of its action. The League's presentation will appear in the next issue of *QST*. The texts of the ARRL request and FCC's action follow:

FEDERAL COMMUNICATIONS COMMISSION

In the matter of

Amendment of Section 12.111 of the Commission's Rules, Amateur Radio Service, to provide that only A1 emission may be used in the lower 100 kc of the 50 and 144 Mc. amateur band. — Docket 12485

(*Continued on page 158*)

WHAT BANDS AVAILABLE?

Below is a summary of the U. S. amateur bands on which operation is permitted *as of February 10*. Changes will, as usual, be announced by W1AW bulletins. Figures are megacycles. AØ means an unmodulated carrier; A1 means c.w. telegraphy; A2 is m.c.w.; A3 is a.m. phone (n.f.m. may also be used in such bands); A4 is facsimile; A5 is television; F1 is frequency-shift keying; and f.m. means frequency modulation, phone (including n.f.m.) or telegraphy.

80 meters	3.500–4.000	— A1
	3.500–3.800	— F1
	3.800–4.000	— A3
40 m.	7.000–7.300	— A1
	7.000–7.200	— F1
	7.200–7.300	— A3
20 m.	14.000–14.350	— A1
	14.000–14.200	— F1
	14.200–14.300	— A3
	14.300–14.350	— F1
15 m.	21.000–21.450	— A1
	21.000–21.250	— F1
	21.250–21.450	— A3
10 m.	28.000–29.700	— A1
	28.500–29.700	— A3
	29.000–29.700	— f.m.
6 m.	50–54	— A1, A2, A3, A4.
	51–54	— AØ
	52.5–54	— f.m.
2 m.	144–148, 220–225, 420–450[1]	AØ, A1, A2, A3, A4, f.m.
	1,215–1,300	AØ, A1, A2, A3, A4, A5, f.m.
	2,300–2,450, 3,500–3,700, 5,650–5,925, 10,000–10,500[2], 21,000–22,000, All above 30,000	AØ, A1, A2, A3, A4, A5, f.m., pulse

[1] *Input power must not exceed 50 watts.*
[2] No pulse permitted in this band.
NOTE: The bands 220 through 10,500 Mc. are shared with the Government Radio Positioning Service, which has priority.

In addition, A1 and A3 on portions of 1.800–2.000, as follows:

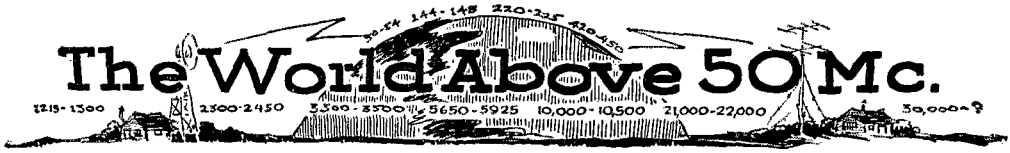
Area	*Band, kc.*	*Power (watts) Day*	*Night*
Minn., Iowa, Wis., Mich., Pa., Md., Del. and states to north	1800–1825	500	200
N.D., S.D., Nebr., Colo., N. Mex., and states west, including Hawaiian Ids.	1975–2000	500*	200*
Okla., Kans., Mo., Ark., Ill., Ind., Ky., Tenn., Ohio, W. Va., Va., N. C., S. C., and Texas (west of 99° W *or* north of 32° N)	1800–1825	200	50

No operation elsewhere.
* Except in state of Washington, 200 watts day, 50 watts night.

Novice licensees may use the following frequencies, transmitters to be crystal-controlled and have a maximum power input of 75 watts.

3.700–3.750	A1	21.100–21.250	A1
7.150–7.200	A1	145–147	A1, A2, A3, f.m.

Technician licensees are permitted all amateur privileges in 50 Mc. and in the bands 220 Mc. and above.



CONDUCTED BY EDWARD P. TILTON,* W1HDQ

With the deadline for mailing entries still a few days away as we write, logs for the 1959 V.H.F. Sweepstakes have already built up to a sizeable pile in the Communications Department. We're not going to attempt to report on the contest results at this time, but we would like to mention some of the comments that came in with the logs.

As usual, there are not a few ideas for revamping the contest format. We hasten to make it clear that suggestions are always welcome, and the rules and scoring methods are reviewed regularly in the light of these suggestions. You've seen two changes of some importance in the past couple of years, aimed at reducing inequities of various kinds.

There was a common complaint that only clubs in Northeastern U.S.A. had a chance at the gavel award. To help equalize scores the country over, the section multiplier system was revised last year to give everyone a 10-section start. This revision has been on trial through two V.H.F. SS contests now, and while there is some complaint from the top scorers the reaction has been largely favorable.

Last year we had a big F_2 opening on 50 Mc. at 2 P.M. Eastern Time. Atlantic Seaboard operators were in the contest, but West Coast fellows weren't. We heard plenty about that! This bad effect of a common starting time (by each man's clock) was a calculated risk that we'd been taking for years, in the interest of simple rules, but this year the rules were revised so that contacts were allowed only if the contest had begun for both ends of the circuit. The problem did not show up this year, but it is believed that the new arrangement is generally satisfactory.

We cite these changes to show that our contest rule-makers are sensitive to legitimate gripes, and that changes are made whenever it can be shown that over-all good can be done. We also reserve the right to turn down suggestions, and there are plenty that have to be turned down. One is the oft-repeated plea for separation of entries by bands used.

This hardy perennial violates a cardinal aim of our contest program: to promote versatility and to encourage v.h.f. men to avoid dropping too deeply into a one-band rut. It is true that awards are won now and then by operators who work only one band or the other, but using both 6 and 2 pays off, and it is good for v.h.f. enthusiasm generally that it does. Greatest good for the greatest number is vital, and we feel that it is well served by the present multiband format. How,

* V.H.F. Editor, *QST*.

1	W0ZJB	17	W0OGW	33	W0PFP	49	W0FKY
2	W0BJV	18	W7ERA	34	W6BJI	50	W8LPD
3	W0CJS	19	W3OJU	35	W2MEU	51	W0ZTW
4	W5AJG	20	W6TMI*	36	W1CLS	52	W6GCG
5	W9ZHL	21	K6EDX	37	W6PUZ	53	W2RGV
6	W9OCA	22	W5SFW	38	W7ILL	54	W1DEI
7	W6OB	23	W0ORE	39	W0DDX	55	W1HOY
8	W0INI	24	W9ALU	40	W0DO	56	W6ANN
9	W1HDQ	25	W8CMS	41	K9DXT	57	W1SUZ
10	W5MJD	26	W0MVG	42	W6ABN	58	W1AEP*
11	W2IDZ	27	W0CNM	43	W6BAZ	59	W5LFH
12	W1LLL	28	W1VNH	44	VE3AET	60	W6NLZ
13	W0DZM	29	W0OLY	45	W9JFP	61	W7MAH
14	W0HVW	30	W7HEA	46	W0QIN	62	W8ESZ
15	W0WKB	31	K0GQG	47	W0WWN	63	W2BYM
16	W0SMJ	32	W7FFE	48	K9ETD		

*49

W1FOS	48	K4JMF	46	W7RT	47	W0EDM	47
W1LSN	47	W4EQR	46	W7JPA	46	W0IHL	46
W1CGY	46	W4LNG	45	K7AMW	45	W0JOL	46
W1RFU	45	W4RFR	45	W7CAM	45	W0JHS	46
W1LGE	45	W4ZBQ	45	W7BOC	45	W0OFZ	46
W1FZ	45	W4GJO	45	W7GRA	42	W0YZV	46
W1ELP	44	W4FNR	44	W7JRG	41	W0QVZ	45
W1KHL	44	W4AKX	44	W7MKW	40	W0WNU	45
W1IKO	44	W4MS	44	W7UFB	39	K0DXS	44
W1CLH	44	K4DNG	44			K0GKR	43
W1TAM	42	W4HHK	43	W8SSD	47	W0BTG	43
		K4GYZ	43	W8HXT	47	W0PKD	43
W2FHJ	48	K4AGM	40	W8WPD	47	K0CLJ	41
K2ITP	47	K4KYL	40	W8HJR	47		
K2CBA	47			W8RFW	47	VE7CN	45
K2ITQ	46	W5VY	48	W8NOH	47	KL7AUV	44
W2SHV	45	W5LFQ	47	W8SYU	47	VE1EF	42
K2HPN	44	W5ONS	46	W8SQU	46	VE7AQQ	40
K2YWH	43	W5VV	45	W8OJN	46	VE3AIB	39
K2AXQ	43	W5EXZ	45	K8CIC	46	VE2AOM	38
W2EIF	43	W5FSC	45	K8ACC	46	KH6UK	37
K2CEH	42	W5BXA	45	W8NQD	46	EI2W	37
K2VIX	42	W5KTD	44	W8UZ	45	VE3BHQ	36
K2LTW	42	W5FXN	44	W8INQ	43	VE3OJ	34
W2ORA	40	W5ML	44	K8BDT	43	VE3DER	33
		K5ABW	42	W8EVH	42	VE1PQ	32
W3TIF	47	W5HEZ	42			VE4HS	31
W3KKN	45	W5JME	42	W9AAG	48	XE1GE	30
W3KMV	45	W5CVW	42	W9BRN	48	KH6CTC	28
W3RUE	45	W5VVW	42	W9BRN	48	SM7ZN	29
W3MXW	44			W9ZHB	48	PZ1AE	28
W3BGI	44	W6UXN	48	W9QUV	48	VE1WL	28
W3OTC	42	W6WNN	48	W9RQM	47	VE1ZR	28
W3FPH	42	W6IWS	48	W9MHP	47	CO2ZX	27
W3NKM	42	K6RNQ	48	W9DSP	46	ZE2JV	26
W3HCW	42	K6JCA	47	W9EPT	46	LU9MA	26
W3ZYK	42	K6GTG	47	W9JCI	45	ZS3G	26
W3LFC	41	K6HYY	47	W9UIA	45	CT1CO	24
		W6JKN	46	K9EID	45	SM6ANR	24
W4KKU	48	K6KXR	46	W9SWH	44	SM6BTT	23
K4DJO	47	W6AJF	45	K9GFQ	43	CO6WW	21
W4UMF	47	K6ERG	44	W9KLR	43	LA9T	21
W4AZC	47	W6CAN	44	W9IMG	42	SM5CHH	20
W4UCH	47	W6NIT	43			LA7Y	20
W4EQM	47	W6BWG	43	KØAKJ	49	VQ2PL	18
W4IKK	47	K6UJL	43	WØAEH	47	JA8AO	18
W4ZZ	46	K6ZEH	41	WØNFM	47	JA1AUH	16
W4CPZ	46	W7ACD	48	KØDTA	47	JA8BU	14
W4FBH	46	W7DYD	47	KØJJA	47	JA1BIR	14
W4FLW	46	W7INX	47	WØDGE	47	ZE2JV	12

otherwise, could use of 220 Mc. and higher bands be encouraged? How many awards can a given contest support? We already have awards in each ARRL Section for top Novice, leading Technician, and high-scoring multiop and single-op stations. Going to single-band scoring and awards would complicate the contest checking tremendously, and bring the total number of awards above the point where they would have much significance.

Another chestnut is the power multiplier. Give the Communicators a chance to win, this suggestion says, in effect. Here again we run into a complication that would make only a slight dent in what is a universal problem. If you set up a power multiplier, you might just as well add one for number of elements in the antenna, noise figure of the receiver, height of the operator's location above sea level, nearness to areas of high v.h.f. activity, or any of the other dozen or so factors that affect the ability of one ham to run up a higher score than another. It must be remembered that every multiplier adds to the complexity of the system as far as checking goes, and getting the checking out of the way quickly and accurately is mighty important in contests as large as the V.H.F. Sweepstakes has become.

Geographical inequities come in for discussion after every contest. Here we have a problem for which we know no real solution, despite a lot of time having been devoted to thinking about it. Individual participants should remember that there is no national competition. Awards on a national basis have been avoided for exactly that reason. We report outstanding work on a national scale, but as an individual entrant you compete only against other operators in your ARRL Section.

The gavel award for the country's leading club is another matter. Certainly it is easier for a club that can draw on the concentrated v.h.f. activity of the Atlantic Seaboard to post a high score than it is for a group in, for instance, Denver. But how can the differences be equalized so that a given amount of effort will produce a comparable result in all sections of the country? We know of no way — but, with the phenomenal drive that a club incentive puts behind a contest, we don't want to discontinue the gavel award.

Being realists, we accept the fact that nothing in the way of contest formats is going to be wholly satisfactory to everyone. Being, to some extent at least, idealists as well, we keep on trying to improve the over-all contest picture. Any reasonable suggestion to this end will be given consideration. Meanwhile, it should be kept in mind that the present forms didn't just "happen." They have evolved through many years of experience. They are popular, and they are getting more so. They have helped mightily to build v.h.f. interest, and we feel that they have contributed to the advancement of the art in other ways, too. Certainly they build operating skill, and provide week ends of operating fun well spread over the v.h.f. man's year. They could do worse.

RECORDS

Two-Way Work

50 Mc.: LU3EX — JA6FR
12,000 Miles — March 24, 1956

144 Mc.: W6NLZ — KH6UK
2540 Miles — July 8, 1957

220 Mc.: W9EQC — W2DWJ
740 Miles — September 17, 1957

420 Mc.: G3HAZ — DL3YBA
500 Miles — June 19, 1957

1215 Mc.: W6MMU/6 — K6AXN/6
270 Miles — Sept. 21, 1958

2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947

***3300 Mc.: W6IFE/6 — W6VIX/6**
190 Miles — June 9, 1956

5650 Mc.: W6VIX/6 — K6MBL
34 Miles — October 12, 1957

10,000 Mc.: W6VIX/6 — W6BGK/6
124 Miles — June 23, 1957

21,000 Mc.: W2UKL/2 — W2RDL/2
14 Miles — Oct. 18, 1958

***Band now 3500–3700 Mc.**

50-Mc. DX News

The IGY having ended, a number of the special authorizations for 50-Mc. work ran out at the end of 1958. Fortunately most of those have been renewed temporarily. LA9T reports that Norwegian hams will have the use of the 50-Mc. band through the end of 1959. Swedish amateurs are set on 50 Mc. only through March, 1959. Use of the 50-Mc. band is continued on a temporary basis in Australia, but New Zealand amateurs have apparently lost the first megacycle of the band, and are now limited to 51 Mc. and higher. Remember the ZLs, and keep a look above 51!

CT1CO sends word that his permit, which ran out at the end of December, has been renewed for the balance of 1959. Manuel's health is poor, however, and he was confined to his bed at the time this was written. He has made arrangements to have his automatic keyer running, meanwhile, and hopes to be back in business for two-way work soon. CT1CO would like it known that he has sent cards to every station worked on 50 Mc. Where International Reply Coupons were sent, he has QSLed direct, but in other instances cards have been sent via the ARRL QSL Bureau. With some fellows writing him repeatedly for cards, he wonders if American hams know how their own QSL Bureau works. Have you filed an envelope with your QSL Manager? If you've worked 50-Mc. DX you just might have some cards there! (See p. 164, this issue.)

We've had several reports of Italian stations heard on 50 Mc. K6MIZN reports reception of I1AB on 50.19 Mc., but he was unable to raise him. Does anyone have QSL proof of a 50-Mc. QSO with an Italian station?

The 50-Mc. band seemed to run down during December, and DX was far below that of December, 1957. There were signs of a comeback in January, though DX activity generally was well below last year. Auroras were frequent and widespread, however, and they are expected to be more so in the next two or three years. Work with South America should increase also. Observers in northern U. S. A. should watch for South American DX particularly on mornings after auroral displays.

It's often hard to tell when the band is open to the south, as there are vast areas where there are no hams at all, let alone 50-Mc. hams. The several NBS stations operated in South America were a big help during the IGY. Here is the latest info on their fate, now that the IGY is over: OA3AAF and CE8AE went off the air Nov. 30. OA3AAE is being moved to Lima, and will operate henceforth on 49.96 Mc., the frequency formerly used by CE8AE. OA3AAF is to resume operation on 49.92 Mc. on low power.

2-METER STANDINGS

Figures are states, U.S. call areas, and mileage to most distant station worked.

W1REZ	29	8	1175	W5CVW	11	5	1180
W1AZK	24	7	1205	W5NDE	11	5	625
W1KCS	24	7	1150	W5VY	10	3	1200
W1RFU	23	7	1120	W5SWV	10	3	600
W1AJR	23	7	1130	W5ONS	9	3	950
W1HDQ	20	6	1020	W5FEK	8	2	560
W1MMN	20	6	900				
W1IZY	19	6	875	W6NLZ	12	5	2540
K1CRQ	18	6	800	W6WSQ	12	5	1390
W1AFO	17	6	920	W6DNG	9	5	1040
W1ZJQ	17	6	860	W6AJF	6	3	800
W1CLH	17	5	450	W6ZI	5	3	1400
K1ABR	16	6	810	W6NMU	3	2	950
W1PHR	16	6	780				
K1AFR	16	6	675	W7VMP	15	5	1280
W1RCN	16	5	650	W7JRG	9	4	1040
W1KHL	16	5	570	W7LHL	4	2	1050
				W7JIP	4	2	900
W2NLY	37	8	1390	W7JU	4	2	353
W2CXY	37	8	1360				
W2ORI	37	8	1250	W8KAY	38	8	1020
K2GQI	30	8	1200	W8WXV	35	8	1200
W2AZL	29	8	1050	W8PF	34	8	985
W2BLV	27	8	1020	W8LOF	33	8	1060
K2IEJ	25	7	1060	W8RMH	32	8	910
W2AMJ	25	6	960	W8SVI	30	8	1080
W2DWJ	23	6	860	W8SFG	30	8	1000
K2HOD	23	7	950	W8LPD	29	8	850
W2PAU	23	6	753	W8EHW	28	8	860
W2SMX	22	6	940	W8WRN	28	8	680
K2CEH	22	8	910	W8BAX	27	8	960
W2LWI	21	6	700	W8DX	26	8	720
W2RXG	20	6	700	W8ILC	25	8	800
W2UTH	19	7	880	W8JWV	25	8	940
W2RGV	19	6	720	W8GFN	23	8	540
W2WZR	18	7	1040	W8NOH	21	8	975
W2ESK	18	5	850	W8LCY	21	7	610
K2RLG	17	6	980	W8BLN	21	7	610
				K8AXU	19	6	750
W3RUE	30	8	975	W8GTK	18	7	550
W3GKP	29	8	1020				
W3KCA	28	8	1110	W9WOK	40	9	1150
W3TDF	28	8	915	W9KLR	41	9	1160
W3SGA	26	7	700	W9GAB	33	9	1075
W3FPH	22	8	1000	W9AAG	32	8	1050
W3NKM	20	7	730	W9REM	31	8	850
W3LNA	20	7	720	W9ZIH	30	8	830
W3LZD	20	7	650	W9LVC	27	8	950
				W9EQC	26	8	820
W4HJQ	38	8	1150	W9ZHL	25	8	700
W4HHK	35	9	1280	W9BPV	25	7	1030
W4ZXI	34	8	950	K9AQP	24	7	900
W4AO	30	8	1120	W9PBP	23	8	820
W4MKJ	28	8	850	W9LF	22	7	825
W4UMF	28	8	1110	W9KPS	22	6	690
W4VLA	26	8	1000	W9PMN	19	6	800
W4EQM	25	8	1040	W9ALU	18	7	800
W4WNH	24	8	850	W9JLY	17	8	790
W4JCJ	23	6	725	W9LEE	16	6	780
K4EUS	23	6	765	W9DDG	13	6	700
W4VVE	21	6	720	W9DSP	15	6	720
W4IKZ	20	6	720				
W4OLK	20	6	720	W0SMJ	29	9	1075
W4AIB	19	7	840	KØEMQ	29	7	1110
W4CPZ	18	6	650	W0IID	27	7	890
W4TLV	18	7	1000	W0BFB	27	8	1060
W4RFR	18	7	820	W0CUD	25	7	1065
W4MDA	17	6	650	W0RUF	23	7	900
K4YUX	16	8	830	W0INI	21	6	830
W4LNG	15	6	1080	W0UOP	21	7	900
W4CLY	15	5	720	W0TGC	21	7	875
W4RMU	13	6	920	W0ZJB	18	7	1180
W4KCQ	10	4	860	W0RYG	17	6	925
W4GIS	9	2	335	W0IFS	16	6	1100
				W0JHS	13	5	700
W5RCI	33	9	1215	W0IC	12	6	1240
W5DFU	25	9	1300	VE3DIR	28	8	1100
W5LPG	25	7	1000	VE3AIB	26	8	910
W5AJG	23	8	1360	VE3BQN	19	7	790
W5KTD	22	8	1200	VE3AQG	17	7	800
W5JWL	21	7	1150	VE3DER	16	7	820
W5PZ	16	8	1300	VE2AOK	13	5	550
W5YEH	15	5	720	VE3RPB	14	6	715
W5MIL	15	5	700	VE7FJ	2	1	365
W5FSC	12	5	1390				
W5HEZ	12	5	1250	KH6UK	1	2	2540

What is believed to be the first 49-state 50-Mc. WAS was made by W6TMI, Oxnard, Cal. Orin worked KL7AUV just minutes after President Eisenhower's proclamation of statehood for Alaska. The QSL from KL7AUV labels the contact the first 50-Mc. WAS with Alaska included, and it just might be the first 49-state WAS for any band. W6TMI added further 50-Mc. laurels Jan. 20, when he qualified for 50-Mc. WAC.

Here's as good a place as any to answer that most-asked question. No — contacts with Alaska prior to the actual proclamation of statehood Jan. 3 do not count for WAS, 50-Mc. variety or any other kind. WAS awards for 48 states will be issued up to July 4, if all contacts were made prior to Jan. 3. For work after Jan. 3, or for applicants filing after July 4, it takes 49 cards for WAS, on any band.

The first Easterner we know of to make 49-state WAS on 50 Mc. was W1AEP, Springfield, Mass. Chellis, v.h.f. old-timer from away back, worked KL7AUV Jan. 14. He already holds 50-Mc. WAS No. 58.

The marked drop off in 50-Mc. DX after November is evident from the day-to-day record of KH6UK. Tommy worked Mainland stations 16 different days during November. Up to the middle of December he had caught only one opening in this direction, that on the 14th. JAs were worked on the 5th. The one U. S. opening was nothing compared with the frequent widespread sessions in November.

KH6CTC, Kailua, Hawaii, caught her first 50-Mc. opening of 1959 Jan. 7, when KL7AUV was heard. California stations came through Jan. 10, for a half hour beginning at 0915 HST, and were followed by W7CJN.

Japan has perhaps the liveliest group of 50-Mc. enthusiasts of any country in the world, if we think in terms of the percentage of the total amateur population engaged in 6-meter work. JA1AN, V.H.F. Manager for JARL, reports that about 600 JAs are active on 6, or about 10 per cent of the ham population of the country. Of these about 400 have worked into the United States. Up to December, JAs had worked into Florida, Ohio, Michigan, Wisconsin, Illinois, and all states west of the Mississippi except New Mexico, Arkansas and Louisiana. Japanese 50-Mc. men hold the world DX record (they recognize JA6FR to PY3BW as the best DX) and the long-path record, JA3CE to CT3AE. Some 22 countries have been worked from Japan on 6. A beacon station, JA1IGY, is operated on 50.5 Mc. continuously. Its 3-element Yagi has been aimed at U. S. A. since October, having been on Australia previously.

JAs were in for more than an hour after 1300 on the 10th, and for about 15 minutes the following day at 1330. KL7AUV was heard again on the 12th, at 1148. On the 13th Esther worked W7BVH W7DVI W7HAD W7RDY and WØWVR. JAs were in from 1430 to 1520 on the 14th. Stations in New York, New Jersey and Pennsylvania came through briefly at Kailua, Jan. 17.

Here and There on 6 and 2

Club awards of various kinds for working their members continue to be popular with v.h.f. club groups. The Oklahoma Central 6-Meter Net has issued certificates to applicants in 26 states and 3 foreign countries since July, 1957. The certificate is being replaced by a gold pennant, to be awarded to anyone outside the normal groundwave range from Oklahoma City who works 6 or more of the net members. A list of contacts (QSLs not needed) should be sent to W5CZA, P.O. Box 7171, Oklahoma City. Certificates will be continued for contacts prior to Jan. 1, and for itinerant mobiles in the Oklahoma City area.

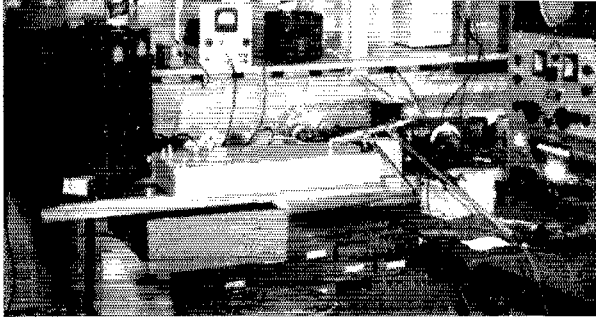
The 51.30 Club of the Framingham, Mass., area (November, 1958, *QST*, p. 80) has dispensed 52 of its certificates, including 8 to stations on the West Coast. You have to tune above 51 Mc. to qualify for this one!

The Royal Order of Hootowls, organized by W7YJE and W7TMU as a gag back in 1954, has grown to some 300 members, spread all over the country. Primary requirement for membership in this august society is that you operate on 6 during the late evening hours, and work either of these two charter members. Because of the large response, W7YJE has found it necessary to make a 25-cent charge for certificates of membership. Lee would like it known that the 5th annual ROHO picnic will be held June 14, at Lake Wilderness Resort, near Renton, Wash. with an all-day program beginning at 0900.

The SPARKS of Pittsburgh (October, 1958, *QST*, p. 83) were overwhelmed by the response to their offer to send information on their portable 6-meter gear. More copies of the brochure are being run off and all requests will be filled shortly.

The Midwest V.H.F. Club is accepting nominations for its V.H.F. Man-of-the-Year Award for 1959, to be presented to an outstanding v.h.f. enthusiast some time this summer, possibly at the ARRL National Convention in Galveston in June. Anyone can make a nomination for this award, merely by sending a name and suitable reasons for the nomination to David Sher, W9LYA, 5555 Woodlawn, Chicago 37, Ill.

The nominee must have made some outstanding contribution to the advancement of the art of v.h.f. communication, or performed significant public service using frequencies above 50 Mc. The first award, made at the National Convention in Chicago in 1957, went to Arthur Paradis, W8KAY, for his efforts in behalf of 144-Mc. DX enthusi-



In the article on reactance amplifiers by W4AO and W4LTU appearing elsewhere in this issue you will see a nice neat layout showing a reactance amplifier under test in the basement shack of W4AO. That's how it looked when the testing started. Here's how the place looked a few hours later. It took a little midnight oil (see cylinders of familiar shape and marking at upper center and left) and some fairly typical ham haywire, but eventually a noise figure well under 1 db. was achieved.

asts. The 1958 award went to John Chambers, W6NLZ, and Ralph Thomas, KH6UK, for their achievement in working between the West Coast and the Hawaiian Islands on 144 Mc.

1959? Send your suggestions to W9LYA.

Anyone for moonbounce on 50 Mc.? VE7AIZ thinks that 50 offers a more likely prospect for moonbounce work than 144, and would like to hear from anyone who is interested in trying it on the lower band. Though the 50-Mc. band has given us worldwide DX of late, it will not always be that way. Lunar reflection offers the possibility of world-wide DX at any part of the solar cycle, and might give us experience that would be useful in going for the admittedly harder shot on 144 Mc. Alan has some interesting ideas and would be glad to hash them over with anyone genuinely interested in the proposition. Address Alan Goodacre, Fort Camp, U.B.C., Vancouver, B. C.

The New Year came in auspiciously for W4ISS, Augusta, Ga. He found tropospheric conditions excellent on 144 Mc., and after 2200 worked W4ACY and W4ZXI, Jamestown and Greensboro, N. C. These are not phenomenal distances (just over 200 miles) but the terrain is irregular and hops are not ordinarily made on 144 Mc. Tropospheric openings in the winter months are not as rare as many v.h.f. men think. Though distances involved seldom match the sessions enjoyed in spring and fall, signals over paths somewhat beyond the normal range often reach very high levels. Favorable winter conditions may result in highly stable signals that sound as if they should be in there every night.

Every so often we get reports of extreme DX heard on the commercial frequencies near the 2-meter band. W8WRN, Columbus, Ohio says that a local fire department operator called him Dec. 2 to say that stations in the Los Angeles area were coming through in Columbus on 152 Mc. Several of the local 2-meter gang were alerted, but they heard no identifiable 2-meter DX. We've had enough reports of commercial v.h.f. DX of this magnitude to indicate that it does happen now and then. Since the frequencies involved are higher than the 144-Mc. band, it would appear that such DX is not ionospheric in origin. Just why commercial installations, with relatively low-gain antenna systems, should be getting out when amateurs observe no 144-Mc. DX is a major mystery. Any ideas or observations along this line would be welcome.

A 144-Mc. WAS is creeping up on us. Adding Alaska as a state has helped protect your conductor for a while from being in the middle of a controversy over what is or is not acceptable as a 144-Mc. contact for WAS claims, but the possibility of even KL7 contacts on 144 cannot be ruled out. Meanwhile, W9KLR, a man to beat in the 144-Mc. WAS race, has pulled out in front again. Bill worked W7UFB, Casper, Wyoming, via meteor scatter Jan. 5. Tests over this path in December had been promising, and the bare essentials of a QSO were exchanged in 5½ hours of trying on Jan. 3. Skeds kept from Dec. 31 on, beginning at 0430 CST, indicated that an earlier starting time would help, so tests were started at 0330 Jan. 5. Bursts were longer and stronger, with several of more than 20 seconds duration. In addition to having pushed a states-worked total to a new high, this contact is of special interest in other respects. People who have felt that m.s. is a high-power man's game will be heartened to learn that W7UFB was running only 22 watts output. W9KLR feels that he could have been another 3 db. down and still made it.

What is left now for W9KLR? Bill has three more states within a 1400-mile circle: Utah, Arizona and Idaho — but there are no known 2-meter men in the parts of these states inside the presently-indicated limit for m.s. work. Any takers? Bill feels that expedition planners should allow some leeway on dates of major meteor showers. He has observed peaks several days before and after the predicted optimum times for showers.

OES Notes

K1CKZ, Hartford, Conn. — Built 50-Mc. transmitter with 2E26 in final and have been operating with 2 watts input or less. Worked several West Coast stations with good reports.

W1KLK, Meriden, Conn. — Changed 50-Mc. beam over from folded dipole radiator and 300-ohm line to gamma match and coax. Unexpected result: greatly increased TVI on Channels 2 and 3. S.w.r. was low, and could not find reason. Changed back to original arrangement and all is well.

W1LGE, Windsor Locks, Conn. — PZ1AE, heard Dec. 18, first South American in many months. Now have 17 countries and all continents but Asia on 50 Mc.

(Continued on page 156)

Weak Spot in the 220-Mc. Array

In describing the 66-element array for 220 Mc. in January *QST*, we promised to report on how it withstood the ravages of a New England winter.

It didn't! Prospective builders will want to know why. The weak spot was the steel tubing used for the main center support. In a January windstorm that broke all local records for sustained high velocity (48 hours of winds in excess of 40 m.p.h., with gusts to over 90) the steel masting collapsed and broke off at the bearing. The array and its aluminum framework were intact until the coaxial line broke and allowed the entire assembly to fall 60 feet to the frozen ground.

The array survived the first 24 hours of the big blow, but the constant buffeting was too much for the steel support. Conditions at the writer's hilltop location are exceptionally severe, but something more rugged in the way of a center support is probably desirable in any windy spot. Thick-wall dural tubing of larger diameter than the 1¼-inch steel used might have been better. A wood core inside the tubing (round stock of various diameters is available from most lumber yards) adds considerable strength without greatly increasing the weight.

In many years' experience with various stacked arrays in this exceptionally windy location, the most rugged support we've yet tried is iron pipe, just under 1½ inches o.d., with about ⅛-inch wall thickness. This is the strongest material we know of that will fit the 1½-inch bearings that many towers provide, but it is heavy: probably too much so for use with TV-type rotators. It will stand up under heavy wind loading at points 8 to 10 feet above the tower bearing. — *E. P. T.*

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

This should find you in the eerie eye of a DX hurricane, smackdab between the opening and closing week ends of this year's ARRL International DX Competition. How goes it so far with you? Ummm — perhaps we shouldn't have brought that up. But the rest of the test may well be the best. Hang on!

Anyway, having mentioned the matter, we might as well do a little superficial snooping into the history of the thing. What kind of an acorn produced such a towering oak? W1DX, one-time proprietor and virtual founder of these very DX pages, makes research quite easy. We merely need quote his prose of a decade ago, part of an editorial in the February 1949 *QST*:

> . . . The annual League contest has gone through quite a few evolutionary stages. . . . The first, held in 1927, bore little resemblance to the present pattern. Long messages, complete with text and coded preamble, had to be sent, and a reply routed via a different station. The contest ran for two solid weeks, and W and VE stations ("nu" and "nc" in those days) had to enter their stations officially before the contest started. The 7- and 14-Mc. bands took the entire load of the contest, with a leaning of the majority toward the former. By 1930 the rules had been revised a little, and a lot of presently well-known DX men were beginning to show up in the final results. The most foreign contacts were made by a W who "exchanged messages with 83 stations" and, to demonstrate how peachy conditions were, "17 Ws and VEs worked five continents."
>
> In 1932, the "Calls Heard" department of *QST* was quite popular, and it seemed logical that a giant calling-and-listening contest would be well received. Times were split up around the world, with some continents transmitting while others listened. All calls heard were to be reported. While new DX was heard for the first time by many Ws and VEs (70 different countries, all told), and Ws and VEs got into spots they never expected to, the old thrill of a two-way contact was lacking, and the 1933 contest began to take the present form, with its exchanges of self-assigned serial numbers. W8CRA worked 42 countries in that shindig, and a lot of Ws finagled their WACs out of it. In 1936 the country quotas and band multipliers were introduced, to provide more DX for everyone and to encourage multiband operation. Participation continued to increase each year, only to be interrupted by the war. Since that time, however, the contests have been bigger than ever, and in 1948, as you know if you read the report, W2GWE and W4FU worked over 100 countries during the two week ends, enough to qualify for DXCC!
>
> The history has been an interesting one, as we are sure you will agree if you dig back through your dusty files of *QST* and recapture the enthusiasm of those earlier days. . . .

How true, BG. On behalf of DXdom's Niagara of new blood, thanks for that flash back.[1] We'll probably be re-rerunning it ten years hence for the edification of several new DX-chasing generations.

What:

History's curious habit of repeating itself is nowhere more clearly demonstrated than where high-frequency DX conditions are concerned. Those DXers who were first licensed in the current hush propagational period, since about 1956, and who are going through their first sunspot cycle as amateurs, have quite a shock in store. It's an insidiously gradual sort of thing, this sliding toward a sunspot minimum, but the early weeks of 1959 provided small samples of just how frightfully unfruitful 10, 15 and 20 meters can become when the Kennelly-Heaviside canopy wears thin overhead. Oh, we have another generally good year or so ahead, to be sure. But the happy days of quick 807-and-dipole DXCCs are undoubtedly numbered — gather ye rosebuds while ye may. . . . Enough, Cassandra! Hams are born optimists, anyway, ever pitting 6L6s against 807s, 807s against 813s, 813s against 4-250As, and 4-250As against the XYL. Right now our lower-frequency bands bear close watching as a trend unfolds. .

75 phone gives a glimmer of things to come. KP4TP throws open a brand new front for extensive s.s.b. DX in reporting solid 3804-kc. QSOs with **ZL**s 1AAX 2AHV and 2AVA around 0800 GMT . . . . . K1BCS keeps the a.m. lads in the running with **G**s 3MPN 6BQ, DL1MQ, YU1FX, **ZP**9AY and other catches off 75's low edge.

80 c.w. makes great DX strides with W1s MBX YIS, K2UBW, W3AXT, W8IBX and K8GWT reporting such results as **CN**8JX, **DM**3KIN, **EA**8BF, **FO**8AC, **GM**3s GQQ IAA, **HC**1HM 11 GMT, **LA**6U, **LZ**1KSP, **PJ**2s AE DW, **SP**s 2CO 5AR 5IA, **UA**1DZ, **UO**5AA, **UQ**2AB, **VP**7BT, **YU**1s BKL HYZ MV and other assorted European and Caribbean delights . . . . . Correlated comment by W3AXT: "My 80-meter stuff is worked between 3500 and 3535 kc. during evening hours from 0200 to 0700 GMT. Now have a 95/80 total on the band — gonna hit 100 yet!" And from W1YIS: "Eighty is a very lively DX band, beautiful early in the A.M. with no noise and QRM at all." At least for the present!

40 c.w. is getting up a good head of DX steam, by golly, and W1MBX, K1s CDN DPB, K2UBW, K3ASH, W4WRY, K4s HPR IGD, K5JVF, W6VUS,

*4822 West Berteau Avenue, Chicago 41, Ill.

[1] No revolutionary ARRL DX Test rules innovations have come about since '49, but overseas ops interested in working all United States were delighted by the recent W/K switch from power input figure to State indicator in serial exchanges.

W7DJU (91/82 worked/confirmed), W8GKB (115 on 7 Mc.), W9JJN, K9s ICG and JIN joined the low-edge fun for **CO7**RV, **DU7**SV (20) 9, **FA8**RJ (8) 7, **FO8**AC (10) 9, **FU5**AB (4) 1, **HA5**KFR (8), **HC**s 1LE (35) 5, 2EM (2) 1, **IS1**MIM (4) 7, **JA**s 1ACA 1BF 1BLM 1BLY 1BRK 1BTC 1BZ 1BZE 1CJF 1DY 1EF 1LR 1PS 1VX 1ZP 2AAQ 2AG 2AQ 2BP 2FG 2JW 2MR 2OE 2ZM 3AA 3AIW 3AJX 3ARZ 3BJ 3UI 3ZY 4HM 4LL/mm 4PI 4QL 6AK 9MD 0BR 0JJ, **JZ0**AO (10) 9, **KA**s 2RB **0**KZ, KH6SS/**KS6** (3) 5, **KM6**BK (20) 8, **KV4**BO (11) 5, **LA**2TD/**p** (6) 10 of Spitzbergen, **LZ**1KRU, **OY**1J, **PJ**2CJ, **PI**1NTB (8) 1 of Holland, **SL5**CZ (15) 9 of the Swedish forces, **SPs** 7JX (8) 4, 9EK (26) 10, **UA0**KFG, **UB5**UW (12) 5, **UO5**AA (2) 4, **UQ2**AB (7) 7, **VP4**RL (4) 7–10, one VQ2W, **VR2**DK (2) 23, XE3BN, **YOs** 3JS 7DI (15) 3, oodles of YUs, **ZDs** 2GUP (8) 6 and **7S**A (12) 3 . . . . . "The most pleasant surprise of the month was trying 40 meters as a DX band for the first time," enthuses K1CDN. "At two in the morning the QRM level is down to a fantastically low 40 db. over S9 and DX is really easy to find." . . . . . On 7-Mc. **phone** **KG1**FR (221) 5 and **VP2**DJ were appropriated **by** W2KKT and K4UTI, respectively.

10 phone goes blithely along, hot enough to keep W1MBX, K1s ADH, BEB (78/37), CDN, W3QIR (105/85), W4ZSH, K4s HPR IEX QLJ SXR ZCP, W5KNE, W8s IBX ISH NOH, K**0**LEQ, GC2RS and HK7LX (155/130) busy with **CE0**ZG (380), **CN**s 2FW 8FV 8HU 15, 8JX, **CR**s 4AS 6AO 23, 6CA 16, 6CK 7AP (430) 16, **CT**s 2AI 3AF (300) 19, **CX**s 2CS 3BH 4BC, **EA**s 9AI 0AC, **EL**s 3A 18, 8D, **FA**8RJ, **FF8**AJ, **FQ8**AT, **GC**2RS, GD3UB, **HA**5BW, **HH**2s CL Y Z, **HI**8s BE GA, **HK**7AB (310) 1, **HP**s 1AC 1GA 1LB/m 2ON, **HR**2HA, **JA**s 3GM 0AQ, K6QPG/**KW6**, **KA**s 2CB 2EB **0**IJ, **KG4**AY, **KJ6**BV, **KM6**BL, **KR6**s BF CJ SS, **KX6**s AF BP (650) 21, CW (625) 17, **LZ**1WD (320), **MP4**BCK (480), **OA**s 4FO 6Q 8B, **OQ**s 5FH 5IG 5IP 0DM, **PJ**s 2AZ 3AE, **SP5**AR, **SV0**WP, **TF**s 2WCY (499) 20, 3AB, **TI2**s CME IT OE WD, **UA**s 1KAQ 9OI (350), **UB5**FG 13, **UC2**AA, **UN1**AB, **UQ2**s AB AN, VE3EGD/**SU** (480) 14, **VK9**CP, **VPs** 1EK 1OLY 2AY 3HAG 14, 6KL 6TR 7NA 8AQ 8CC (480), 8DW (360) 22, 9DV, **VQs** 2DC 16, 2IV 18, 3HH (380), 3PBD 4ASC, **VRs** 2AG 6AC (280), **VU2**CQ (300) 18, XE0JD (K6JD), **YN**s 1BS 1CJ 4CB, **YS1**s IM (370) 15, 0 23, **YU2**DB, **YV5**s ABH ED, **ZB2**A (440), **ZDs** 3E 18, 7SA 7SE, **ZE1**s JC JQ JV, **ZK1**BS, **ZS3**AB, **4X4**s BD, GB, **5As** 1TG 3TO (725) 17, **9G1**s AB and CP 22.

10 c.w. does almost as well for K1GUD, K2s TBU UYG, W3QYG (109/82), K3CUI, W4ZSH, K4HPR, W5KNE, W6QQW, W7CNL, W8s CSK DPX IBX NOH YGR, W9s MAK PJT (66/40), YYG and K9ELT. The bag: **CR6**CK, **CX**3BH, **DM**s 2AMM (40) 14, 2AQB, 3KHL 3KML 3LBH 5BBB, **EL2**B (30) 16, **ET2**HM, **GC8**DO (110) 15, **GD3**UB, **HA8**CZ (28) 15, **HH**2LD, **HZ1**AB, **IT1**PA, **JA**s 2YT 3AB 3ALQ 22, 3IS 4HM (85) 1, 6AK 7JQ, **KA2**s RB KS, **KM6**BK, **KW6**CO (200) 19, LU0AC on shipboard, **MP4**BBE (56) 15, **OA1**FA, **OQ5**IG 18, **PI1**KMA (60), **PJ2**CE, **SPs** 2DX 7HX 9DN (67) 18, 9DT, **SV0s** WP WR (50) 16, **TI2**LA, **UA0s** AZ 18, GF OD KIA, **UB5**s DE FG (15) 15, FI WF, **UC2**s AX (73) 15, KAB, **UQ2**s AB (100) 14, BA, VE8SI (400), **VP9**DO (120) 20–21, **VQs** 2RB (140) 18, 6LQ, **VR2**DG, **VS5**BS (400), **YO3**UA (60) 15, **ZG4**AM (12) 14–17, **ZDs** 2JM 7SE, **ZE1**JV, **4X4**s IH IO IX (160) 14 and KK.

15 c.w.'s mood is caught by K6LAE: "The year started slowly on 21 Mc. — at least for me. So slowly, in fact, that I've been forced to put up a combined 10/20 ground-plane à la the concept in February, 1958, *QST*." But Dick, W1MBX, K1DPB, W2ETU, WA2AYM (18/9), W3QYG, K3CXC, K4s HPR IGD (97/66), OTG PHY QIJ SXR ZCP, K5LMJ, W0s JQB KG QQW, K6LXS, WA6CIJ, W7s CNL DJU QNI, W8s CSK IBX NOH YGR, K8WBL, K9s ELT GSG and K0LEQ accumulated **AP5**B, **BV1**USB, **CF3**AG, **CN**s 2BK 8JX, **CR**s 5AR (80) 21, 6CK 6CS 7IZ, **CT1**ID, **CX**s 1FB 2BT 2CO 3BH (86), **DM2**AEB, **EA**s 6AF 8BF, **EL**s 1K (38), 2O, F2CB/**FC**, **FA**s 8TT 8XS/sh in the Sahara, 9UO, England's **GB2**SM, **GM6**UC/m's mighty 8-ft. whip job, **HA**s 1KSA (80) 18, 5DU, **HC1**s GC LE, IT1GO (117), **KA2**s BE FF KS RB (30), **KC4**USV, **KG**s 1CK (42) 0, 1EG 1FR 4AI, **KM6**BL, **KR6**AK, **KW6**CO, **KX6**CW, **LZ**2KDO, **OA4**s AGI BP FA FM, **OH0**NC (92) of the Alands, **OQ5**HC (70) 18–20, **OR4**VN of the Belgian Antarctic, **OY2**Z (80) 20–21, **PJ2**MI, **SL3**AG (70), SM5WN/**LA/p** (42) 15 of Svalbard, **SPs** in number, **SV0**WP, **TF3**s CC (44) 1, SF, **TI2**AB, **UA**s 2KAW 9CL 9OI 0GF (108) 1–4, 0KAR (60) 21, **UB5**s DW WF, **UC2**s AA AX (68) 15–16, CB, **UF6**s AB (55) 15, CC (50) 14–15, **UO5**AA (10) 16, **UQ2**s AB BA, **UR2**BU, **VK9**XK, **VPs** 1EE 2LO 2SI 4LA 6BG 6GC 6RG (18), 7BT 9EB 9EO, **VQs** 3CF (50) 22, 4EZ 4FK (78), 4KRL, **VR2**s AZ DG, **VS9**AS, **WH6**CXF, **WL7**CRZ, **WP4**ANH, **YOs** 3RI (60) 15, 6KBA (22) 15, YV2BE, **ZB1**AQ, **ZDs** 1FG (58) 22, 1GM (14) 15, 7SA (75) 15, **ZEs** 3JO 5JE 8JN, **ZK1**BS, **ZP9**AY, **4X4**s IL RE, **9G1**CX 17 and JA colleagues in every Japanese call area.

15 phone finds new DX and s.s.b. convert W2IIE "nothing less than amazed!" at the results of his KWM-1 and triband beam. Competitors W2ETU, K2UTI,

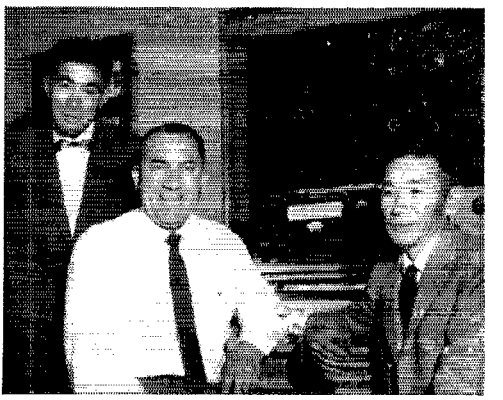
YO2BU of Timisoara is one of the more active DXers among Roumania's home-station gang and Constantin favors 21-Mc. c.w. when the skip is right *(Photo via K2POO)*

WA2AYM, W4ZSH*, K4s HPR PHY SXR UTI ZCP, K5LMJ (73/46), W6KG, K6s CQF JGS LAE, W8YGR, K8CFU, K9GSG, W0JYW and K0LEQ second Ken's motion by fingering **CE**6DW, **CN8**s EU FV GX HZ IG JO, **CO3**IGY, **CP**ICJ, **CR7**CO (220) 3, CX3AA, **EL2**G, **FM7**WU, **HC**s 1FV 2FS 5MT 7FD, **HH**s 2HH 2Z 5RL, **HI8**s CJY GA, **HK**s 1GF 3OK 4AQ, **HL9**KS (310) 4–5, **HP**s 1LB 1LM 1SB 2ON 3FL, **HR3**AC, **KC4**s USA* USB* USK* USV* USW*, **KG**s 1FO* (404) 22, 1FR* (440) 17, 4AO 4AU 4AZ*, **KR6**s DR* LP, **KX6**s AF BP* (419) 2, BT, **OA**s 2A 4FV* 4GB* 4IGY 4V 5N, **OQ5**s AV EW IK JF, **PJ**s 2AP 2AW 3AD, **PZ1**AC, **SV0**WT of Crete, **TG9**US, **TI2**s AB VMB, **VK9**BS (244) 5, **VPs** 1EE (230) 0, 1OLY 1RL 1SD* 2AB (212) 1, 2DA 2DJ 2DX 2GT 2GV (242) 0, 2LS 1, 2SI* 2SL (225) 2, 3MC 4LF 4LP 5AB (242) 2 of the Caicos, 5AR 5DM 5EM 5MC 6KL 6LT* 6ZX 7NA 9DL 9DM, **VQ4**KRL, **YNs** 1AA 1ARM 1BS 4CB, **YS1**s LA 0, **YVs** 2BE (225) 1, 3BD 5FH*, **ZC4**BE, **ZD9**AH (263) 2–4, **ZE4**JH, **ZP5**MN, **ZS3**G, 5A1FF and **9G1**CW, the asterisks denoting sidebanders.

15 Novice gamesters KNs 1MIP 4VUR (15/8), 4VWS 6OQT (now Generalized) and WV6CPI await colorful QSLs from **DU7**SV, **JA**s 1ACB 5AI, KN4TTP/**KG4**, **KZ5**LHN, **OK1**MG, **SPs** 1KAA, 7HB, **TI2**s LA WD (phone to c.w.), **UA0**s CI GF (108) 1–4, **WL7**CUS and YU3PN. Future Novices of leaner DX years to come will wonder how they did it!

20 c.w. sags sadly in occasional wee-hours stretches but more than makes up for this deficiency with dandy daylight dispensations. Reporters W1s AZW

Reformed DX scribe W1DX unwittingly contributed a guest editorial to this month's "How's" so it's not unfitting that we call upon W6QD, another who wrote and made DX history in less QRM-ridden days, to supply some snappy shack scenery. Here Herb and W6CXW (right) entertain visitor ex-J2GX upon the latter's Stateside tour last year—three DX patriarchs in spades.



(141/134), CPS MBX (80/50), K1s CDN GUD (32/11), W2s EQS HMJ (280/273), JBL, K2s AYC (95/59), OZV TBU (67/40), UYG, WA2CCC (101/8), W3s LOS QYG, W4ZSH, K4s IEX JOS PHY (116/87), QIJ (137/118), SXR ZCP (98/40), W6s JQB KG, K6CQF (128/88), W7s CNL (74/40), DJU (91/82), QNI, W8s CSK IBX (161/131), KX (140/120), NOH (170), YGR, K8WBL, W9s JJN MAK (107/66), UBI (100), K9ELT, KØPFF and VE3EIL patronized such exotics as **AC4AX** (100), **AP5B**, **BV1s** A (22) 14, USB (59) 13–14, **CEs** 9AR (8) 1–2, ØAC (62), **CM2US**, **CN8s** BK FJ HI JX LM 0, **CRs** 5AR (24) 22, **6AP** (65) 22, **7AD** 7CI 7CS (58) 3, 7IZ (62) 21, 9AH, **CT2BO** (1) 0, CXs in profusion [New one on the List. Boss? — *Jeeves*], **DUs** 1RTI (19) 22, 6IV (95) 13, **EAs** 8BF 8BK (15), 8CP, 9AP 9AQ, EL1K (30) 22, **ETs** 2US 3VB (30) 23, **Fs** 7JD (see "Whence"), 9QV/FC, **FAs** 3AF 22, 8RJ 8TT 8XS/sh (65) 22, **FB8ZZ** (28) 17, **FF8s** AC AJ BX CC, **FP8AP**, **FQ8AP** (30), **FS7RT** 1, **FY7s** YE (92) 11, YF YI, **GC2FMV** (77) 18, **GD3FBS**, **HA5KFR** (32) 13–14, **HGs** 1KD 4IM, **HHs** 2LR (15), 3SC (75), **HKs** 3KG 5CR 5SG ØAI (74), **HP1s** AO SB, **HR2s** EX (5) 23, FG (4), **HS1s** C (21) 2, E (62) 14, **HZ1AB** 1, IT1TAI, **JAs** 1AA 1VE/8 2ABB 5AI 8AA 8AH, **KA8s** AB KW, **KC4s** USC (55) 3, USG USK USV USX (45) 2, **KM6BL** (11) 4, **KR6s** AK CG QW RP (52) 13, SS, **KV4AA** (83) 22–0, **KX6CW**, **LA2JE/p** (100) 12–13 of Svalbard, **LU2ZA** (20) 2, **LZ1s** AF (42), KNB UR (94) 17, **OA4s** FA FT, **OQ5IE**, **OR4VN**, **OX3RH**, **OY8RJ** (10), **PJs** 2CE 2ME 3AB, **PZ1s** AH I, AP (44), S18AY/mm, SM5WN/LA/p, **SU1IM** (46) 20, **SVØs** WC WP 0, **TFs** 2WDR 2WDS 3AP 3KG 3PI, **UA1KAE/4** (90) 16, **UA9s** AA AK (20), KCA KCC KQA (57) 23, KYB OI (4) 22, **UA0s** CN JB KAB 14. KAR KFG KJA KQB KSA OM, scads of UB5s, **UC2s** AA (55) 3, AD AF (42) 16, **UF6s** FB KPA, **UH8KAA** (35) 13, **UJ8s** AF KAA (57) 43, **UL7s** FB HB JA (43) 14, **UM8s** DX KAB, **UN1s** AE AH BF, **UO5PK** (58) 3–4, **UP2AT**, **UQ2s** AJ AW KBR, **UR2s** AK AO AR AT BU (1), **VEØNI**, **VPs** 2GD 2SH 2SX 3FM (98) 0, 5FP (24) 1, 5WF 20, 6LN (80), 6PJ 6RG 7BH 7BT 8DN (30), 8CC 9EB 9EP, **VQs** 2AB 2RB (40) 15, 3CF, **VR2DG**, **VSs** 1HU 6DV (2) 14, 6DX (18) 13, 9MA 9MI (65) 13, **VU2s** BK (103) 12–13, GE (59) 12–13, JG (24) 12–13, RA (4) 12, RM SW, **XZ2s** AD (25) 16, TH (10) 6–15, **YOs** 3AQ (5) 18, 3RI 6KBA (45) 17, 8KAN, **YS1O** (10–13, **YV5s** ADE HL (10), **ZB2Z** (30) 0, **ZC4AM**, **ZDs** 1GM 2GUP (70) 1, 2GWS 7SE (70) 22, 7SD, **ZK1AK**, **ZL5AC** (47) 12 of the *deep* south, **ZP6FA**, **ZS5RP/7** (77) 16, 4X4s DH and JR.

20 phone's cantankerousness is felt most severely in northerly latitudes at this time. Up VE1PQ way, "Conditions have been the worst that I've experienced in many moons. The band has been *rotten* after dark, and my schedule with ZM6AF hasn't panned out since October." But Doug is up to 85 worked on s.s.b. so he and K1CDN, K2OZV, WA2CCC*, K4s HPR IEX QIJ* ZCP, K6CQF, W8s IBX YIN*, W9UBI*, KØPFF, HK7LX (155/130) and VE3EIL do the best they can with quarry like **AC4AX** (100), **BV1US** (165), **CEs** 9AN (150), ØZG (155), **CN8GD*** (340) 22, **CRs** 6AK 9AH* (310) 14, **CT1s** IQ, 0 IR, **FA8CF** (152) 5–6, **FS7RT** (180), **HH2s** JT* (310) 2, Z, **HI8GA** 3, **HL9KR*** (340) 12, **HR3HH** (340) 3, **HV1CN** (130), **HZ1-AB***, **KCs** 4USB* 6CG (200), **KG4AO**, **KR6KS**, **OK1HZ*** (310) 20–21, **OY7ML*** (305) 18–19, **PJ2CE**, **TF2WCY** (185), **UAØLA** (140), **UB5AI** (155), **UF6FB** (165), **VE3-EGD/SU** (185), **VK9s** AD* LE*, **VPs** 1HA (155) 4, 5AB (180) 4 of the Caicos, 6LJ* (310) 21, one **VS5AT** (170), **XZ2SY*** (305) 12, **YS1MS*** (300) 22, **YV5CE** 1, **4X4DK*** (310) 22, **5A2s** TW* (305) 18, TZ*, **9G1CB** and **9K2AZ** (178) 2, asterisks for s.s.b.

160 c.w.'s never-say-die contingent struck pay dirt on January 11th when W1PPN clicked with G3PU at 0515 GMT. W1BB reports this event immediately followed by QSOs between W1BB/G6BQ, W9PNE/G6BQ-G3PU-**VP7BT** and W2GGL/G3ERN. G5AQ, DL7DZ, KH6IJ, VPs 3AD 9DM and9EP also were in there pitching from the DX end as one of the stingiest 160-Meter Transatlantic Tests seasons in the history of these events swung into its home stretch.

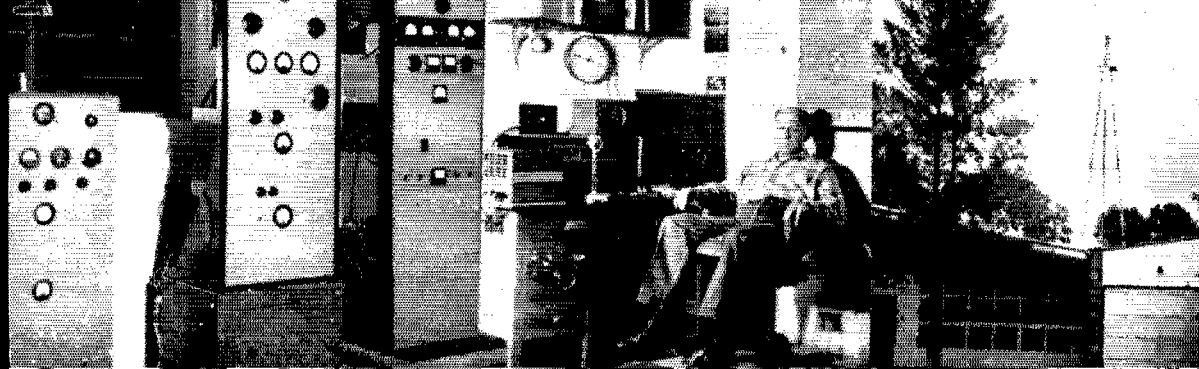
Where:

Hereabouts — K2QXG, doing QSL chores for VKs 2VK 9VM and JA5AI, makes a key consideration clear: "The practice of having Stateside QSL managers for DX boys is growing by leaps and bounds and works very well. However, too many of the fellows are most inconsiderate in expecting us to play Santa and pay their postage costs. Only in the past week, of eleven cards received for JA5AI, just *one* sent a self-addressed stamped envelope. So far I have paid the postage but in the future such cards must go via bureaus." Fair enough, we think. Unless specifically instructed to the contrary, always be good enough to supply transportation. Your ARRL QSL Bureau faces the same problem on a vast scale. *Always* keep a stock of s.a.s.e. on file with your call area QSL manager . . . . . K2s TBU UYG, K6EOK and the Hampton Roads Radio Club (W4PRO, secretary) volunteer their services as QSL agents for overseas DX in bona-fide need. Candidates? . . . . . Confirmation commentary from Dependency areas by W3s GRF QIR and W8KX: VP8CO suggests patience and more patience regarding his verifications. Only one boat per year down his way. . . . Seventeen-watter VP8CC departs the fur south this month and will call upon RSGB to disseminate outstanding QSLs. . . . All mail reaches VP8DW by steamer from Uruguay. The same goes for certain other VP8s so, when the route is indicated, don't fail to inscribe "via Montevideo" on your outbound post . . . . . "I will have logged close to 1500 21-Mc. c.w. QSOs prior to leaving Greenland. My original intention was to QSL every QSO with KG1CK but, due to extreme difficulty in getting cards printed and delivered, QSLing everyone immediately was an impossibility. Three hundred cards were sent out on a card-for-card basis and now W6TNS has taken over the task. Don has my log extracts up to and including December 15, 1958, and will shortly receive my complete log extracts. Any station still in need of a KG1CK QSL can contact me at WØUBT and a card will be returned as soon as possible." . . . . . St. Pierre patter, first from K2DQD/FP8BB: "The only legal FP8BB contacts were made between August 23 and August 30, 1958." . . . Indications to the contrary notwithstanding, W2QQ informs that W2OXC neither handles QSL matters for FP8 stations nor operates 40 meters . . . . . Even HK7LX has troubles attracting wall paper. "QSL arrivals very slow here. I must send some stations two or more cards in order to pull out their QSLs." . . . . . OA7I, now closing, states, "QSLs can continue to go through RCP and will be answered after my return from Europe. I'm now up to date on outgoing cards but, as I was the only active OA7, there may be difficulty with strays."

Oceania — ZL2ACV, manning ZL5AC 'way down on frigid Cape Hallet, Antarctica, tells W6KG "no QSLs until spring." . . . . . VK9NT, Rabaul, now has QSL chores handled by W2CTN. Jack stresses the s.a.s.e. requirement . . . . . Erstwhile KX6BP operator Gene — T/Sgt. E. Mroz — informs W7DJU of his own new address: 1971st AACS Sqdn., Box 202, APO 81, New York, N. Y. . . . . K7AAW got a kick out of "VR7AA, Yessup Island, 400 miles west of the Solomons." In the same vein VK4HK declines responsibility for some "VK4HK/VR4" nonsense on 20. He expresses a preference for 7-Mc. local work in lines to W9PIO.

Europe — "LA2TD, Spitzbergen, says he cannot QSL before May or June and requests all W/K stations to be patient," advises WGDXC's *DX Bulletin* . . . . . "I have learned the hard way that IS1MM is the only Sardinia contact for an astonishing number of DXers in this country," communicates K4EHA. "I already have distributed hundreds of cards representing Tullio's 1956 and '57 contacts, plus a smattering of 1958 QSOs. I receive cards from him at the rate of only 100 or so per month, so tell the boys to hold down the criticism. IS1MM still persists in working

HK7AB's Andes ham hideaway at Bucaramanga produced phone QSOs with all States and over 100 countries within sixty days after his move from HK3AB, Bogota, early last year. Licensed since 1932, Hector is active "every early morning, noon and evening on whichever band is open for best DX." *That's* the spirit!



Oil-hunter 5A1FF (K4GTZ, ex-F7DD) roughs it in the sizzling Sahara some 350 miles south of Tripoli where field-day-type conditions prevail. Charles likes 10, 15 and 20 phone, sideband as a rule, with his 10B, Valiant, NC-183D and multiband trap vertical.

the contests, so I'm afraid we're not gaining much on the backlog! '. _ . _ . _ Note from K3CUI: "The gang may expect to get a somewhat better QSL response on future Russian QSOs. Russia's *Radio* magazine recently chastised 'U' hams for not QSLing, naming as an example one prominent UA3 DX man who 'received about 800 cards in 1958, yet sent out none.'" And did you know that U.S.S.R. hams on frequencies above 38 Mc. employ the "R" prefix? That is, on v.h.f. UA3KAE becomes *RA3KAE*. _ . _ . _ Ex-ZB1SS, now back at G3IBB, declares: "For the benefit of the lads who have given up hope for their one and only ZB1 confirmation, I *do* fully intend to answer all cards received just as soon as time permits." _ . _ . _ DL7AH/LX vows via K9ELT to have his 1958 QSL pile-up liquidated in a jiff.

Asia — W2CTN advises that W1DWH now acts as CR9AH's Stateside QSLs handler. _ . _ . _ Ex-HZ1AB operative Jeff is available at the home stand, W6GCO, according to W8NOH. _ . _ . _ W6BSY enlightens: "I now act as QSL manager for VS9AS (Brian) and, if the gang will send along the usual s.a.s. envelopes, I'll see that they get their deserved Aden cards. VS9AS sends his QSLs along to me by surface mail so you might warn all to be patient." . _ . _ . _ Dong-In Cho, Korean listener HL1002, confirms the HL bureau address as KARL, Box 162, Seoul. Cho serves as editor for the society's organ and states, "There now are HL2s AA AB AC AE AF AG AH AI AJ AK AL AO, HL9s KR KS and KT. Soon [more] will be privately licensed." . _ . _ . _ MP4DAA of Das, Trucial Oman, tells W7QNI that those IRCs really help a lot. Paul received his card by fast airmail direct. _ . _ . _ "I handle QSLs for AP5HQ," affirms W4ANE, "and that station went QRT as of the 20th of December. Send s.a.s.e. with QSLs. I also do the job for XZ2SY — no envelopes needed but stamps appreciated." _ . _ . _ WGDXC has it that VS9AT, closed in December, now is reachable at GI3MUS. Also that VS9MA requisitioned another big batch of blanks from Ceylon, pleading, "*Please* be patient." . _ . _ . _ Earlier HL9KT communications might be confirmable through W6TWF, hints VERON. _ . _ . _ In QSO with W0JYQ, ZC4BE brands ZC4s QL and YL as fakers.

Africa — "FF8AJ QRTd for good on the 28th of January and returned to France following the completion of his third three-year hitch in Africa," informs W2AYJ. "I have his complete logs and will QSL 100 per cent. Self-addressed stamped envelopes, *please*." _ . _ . _ From ET2KY via W8KX: "I'd appreciate it if you would give the boys the usual story about stamped self-addressed envelopes if they want their cards in a hurry. During September and October I QSLd every contact and went through 750 QSLs in less than six weeks. The returns to date have been only about 25 per cent; so I now wait until they send me cards — except for the rare ones, of course. I maintain a 'black list' here which has become rather extensive although, surprisingly enough, there are only five U. S. stations on it." . _ . _ . _ W1TUW relays comment from ex-9G1CR: "I received a great many QSLs 'direct' while in Ghana and, though I answered most in the same way, I could not accommodate all. However, every station worked has been sent a card either direct or via bureau. If anyone still needs my deserved QSL, a line to the address [following] will obtain one direct." _ . _ . _ ZD9AH (ZD9SCA) identifies himself as W6YLI and tells K8CFU he will QSL all contacts direct "via the first boat." _ . _ . _ From ZD2JM via K9EAB: "In the long run I will get cards off to all stations who have QSLd me. Patience and understanding are asked for." Shopping in the high-priced local QSLs market is a formidable undertaking there. _ . _ . _ K9ELT reports receipt of a CN8IF pasteboard from the address to follow. _ . _ . _ Hint-hint from WGDXC: FB8CJ, formerly FK8AO, still collects stamps. _ . _ . _ The individual specifications to follow are necessarily neither accurate nor "official" and are sent your way in the hope that some DXCC projects may thereby be expedited. Your benefactors: W1s CPS TS VG WPO, K1s ADH CDN, W2s EQS KKT JBL, K2s AYC TBU UTC, WA2CCC, W3s QIR QYG, K3CUI, K4s EGD IEX QIJ, W5KNE, K5JVF, W6KG, K6s CQF LAE, WV6CPI, W7s DJU QNI, W8s CSK ISH KX NOH YGR YIN, K8CFU, W9s JJN MAK, K9s EAB ELT, GC2RS, VE3EIL, International Short Wave League, Newark News Radio Club, Northern California DX Club, Ohio Valley Amateur Radio Association, VERON (Netherlands) and West Gulf DX Club. Glom at will:

AP5B, E. Elkington, P.O. Box 496, Lahore, W. Pakistan
CM2US, G. Mestre, P.O. Box 63, Marianao, Havana, Cuba
ex-CN8IF, E. Richie, Sunset Trail, Medford Pines, N. J.
CN9CJ, J. L. Rodrigo, Ave. Hospital Militar, C. Rabida 19, Tetuan, Spanish Morocco
CP4MT, Box 101, Las Piedreas, P.R., Bolivia
CR6AC, P.O. Box 2121, Luanda, Angola, P.W.A.
CR6BI, P.O. Box 2163, Luanda, Angola, P.W.A.
CR9AH (via W1DWH)
DU1RTI (via W2APF)
EA6AZ, L. M. Pons, Box 303, Palma de Mallorca, Balearics
F7FD, ex-KA9AA-KR6AA-W4VE-W5MY, Col. F. B. Westervelt, USMC, 28th Hospital Gp., APO 219, New York, N. Y.
FA8XS/sh (via FA9RW)
FB8CJ, G. Birepinte, ex-FK8AO, Box 730, Tananarive, Madagascar
FD8DZ (via W2KUW)
FF8BX (via REF)
FO8AX, c/o SS *Monterey*, Pier 35, San Francisco, Calif.
G3JNX, G. Green, 12 The Circle, Davyhulme, Manchester, England
HH2Z, P.O. Box 72, Port-au-Prince, Haiti
HH3SC (via W4HYW)
HK3KG, A. Garcia-Herreros, P.O. Box 3009, Bogota, Colombia
HK5XBX, Calle 32, No. 2964, Palmira, Colombia
HP1AO, Box 3463, Panama City, R.P.
HRs 1EXP 2EXP (to W4CXA)
HS1E, Box 6, APO 74, San Francisco, Calif.
HZ1AB (see preceding text)
HZ1SN, Prince Saud, Djedda, Saudi Arabia
K6QPG/KW6 (via KW6CQ)
KA2JA, Lt. Col. J. D. Andrew (W4EFG), Hq. Sqdn. Section, Box 4, 6000th Support Wing, APO 925, San Francisco, Calif.
KA7AB, A. K. Bloom, HMC, Box 120, Navy 3912, FPO, San Francisco, Calif.
KA7DM, Box 120, Navy 3912, FPO, San Francisco, Calif.
KC4USG, USS *Glacier*, FPO, New York, N. Y.
KC4USX, Navy 20, Box 911, FPO, San Francisco, Calif.
KG4AN, Box 55, Navy 115, FPO, New York, N. Y.
KH6SS/KS6 (via K6LKV)
KR6SS, CO, 6927th RMS, ARC USAF, Box 35, APO 92, San Francisco, Calif.
KX6BP (see preceding text)
KZ5RR, Box 302, Albrook AFB, C.Z.
LU3DOJ, Agote, FNGSM, Buenos Aires, Argentina
LU0FAU (to LU7FAU)
OK1ZL, Zdenek Mensik, Pardubice, Czechoslovakia
OQ0DM, P.O. Box 42, Usumbura, Ruanda-Urundi, Belgian Congo
ex-PK1AD-PK4DM, H. Diemont, JZ0DA, Sentani Airstrip, Hollandia, N.N.G.
PY2TT, Box 970, Santos, Sao Paulo, Brazil
VE3EGD/SU, R. C. Dennet, P.O. Box 59, Camp Borden, Ont., Canada — or, 56th Sig. Sqdn., UNEF P.O., Beirut, Lebanon

KC6JC, a Jesuit teacher in the Eastern Carolines, uses a 75A-1, 50-watt 6146 sender, supplementary Navy gear and doublets to good DX effect on Truk. Joe closes a three-year Pacific stint this summer but expects colleague KC6TM to continue ham activities on the island. *(Photo v'a W2RDD)*

VE0NI, HMCS *St. Laurent*, Amateur Radio Club, Halifax, N. S., Canada
VK9NT (via W2CTN)
VK0AT, E. Trigwell, 125 Dawlish St., Wembley, Perth, W.A., Australia
VP2AB, J. Brown, jr., P.O. Box 29, St. John's, Antigua
VP2DW (via KV4AA)
VP2DX (to W8VDJ)
VP2LW (via KV4AA)
VP2SK (via W2LSX)
VP2SW (via KV4AA)
VP5AB, % PAA Communications, South Caicos
VP5CP (via VP5AK)
ex-VP5DC (to W4NMO)
VP6LT (via K2JFV)
VP8AQ, G. Davis, P.O. Box 188, Port Stanley, Falklands
VP8DW, T. Hardy, P.O. Box 185, Port Stanley, Falklands
VQ1RET, R. Tester, Box 3004, Dar-es-Salaam, Tanganyika
VQ1SSB, Box 8001, Dar-es-Salaam, Tanganyika
VQ2SB, S. Bekker, P.O. Box 424, Mufulira, No. Rhodesia
VQ3GX, P.O. Box 1313, Nairobi, Kenya
ex-VS5AT, A. Tipple, Peakside Cottage, Ravenscar nr. Scarborough, E. Yorks., England
VS5BY, % BSPB Co., Seria, Brunei
ex-VS6CO, B. Pallett, 127 Northumberland Pk., Tottenham, London N. 17, England
VS9AS (via W6BSY)
ex-VS9AT (to GI3MUS)
ex-XW8AG, R. Maspimby, 15 rue des Anges, Toulouse (H.-G.), France
XZ2SY (via W4ANE)
YN1ARM, U. S. Army Mission, % U. S. Embassy, Managua, Nicaragua
YS1IM, J. Giammattei, P.O. Box 517, San Salvador, El Salvador
ex-ZB1SS, R. Walmsley, G3IBB, 31 Wensleydale Rd., Catterick Camp, Yorkshire, England
ZC4AM (via RSGB)
ZD1GM, Box 67, Freetown, Sierra Leone
ZD2JM, J. Macintyre, % P&T, Airport, Kano, Nigeria
ZD2KH, P.O. Box 38, Jos, Nigeria
ZD6FX, F. Clark, P.O. Box 434, Limbe, Nyasaland
ZP5LS (via RCP)
ZS5PR/7, D. Vahl, Umbubo Ranches, Swaziland
ZS8M, Box 44, Leribe, Basutoland
5A1TK, S/Sgt. J. Raley (K4YJM), Box 44, 7272nd Supply Sqdn., APO 231, New York, N. Y.
5A3TO, Box 324, Tripoli, Libya
ex-9G1CR, E. Forbes, % WAAC Opns., Ikeja Airport, Lagos, Nigeria
9M2DB (to VS2DB)

Whence:

Europe — Now dig this: The popular and annual USKA (Switzerland) *Helvetia-22 DX Contest* looms on next month's DX agenda, beginning 1500 GMT on the 4th and terminating at 1700 on the 5th. "Stations outside Switzerland will try to work as many amateurs in each of the 22 Swiss cantons (states) as possible, c.w. to c.w. and phone to phone." The serial swap consists of the usual five-digit (phone) and six-digit (c.w.) figures — RST001, RST002, etc. — and each QSO per band with a given HB station nets you three points, these to be multiplied for final score by the number of band-cantons worked (maximum possible by combined c.w. and phone effort, 44 per band). Swiss stations usually tie canton indicators to their calls as follows: *AG*, Argovie; *AP*, Appenzell; *BE*, Berne; *BS*, Basle; *FR*, Fribourg, *GE*, Geneva; *GL*, Glarus; *GR*, Grisons; *LU*, Lucerne; *NE*, Neuchatel; *NW*, Unterwald; *SG*, St. Gall; *SH*, Schaffhouse; *SO*, Soleure; *SZ*, Schwyz; *TG*, Thurgovie; *TI*, Tessin; *UR*, Uri; *VD*, Vaud; *VS*, Valais; *ZG*, Zoug; and *ZH*, Zurich. For a shot at flashy H-22 Test merit certifications offered to the two highest scorers in each W/K/VE/VO call area (and each DXCC country) shoot a copy of your log off to USKA Communications Manager HB9NL postmarked no later than April 20, 1959. "Entries will only be accepted if submitted on separate sheets for each band, using only one side of the paper, and with the [signed] declaration: 'I certify that my station was operated strictly in accordance with the rules and spirit of the contest, and I agree that decisions of the council of the USKA will be final in all cases of dispute.'" Check with HB9NL, too, for details on qualifying for the coveted Helvetia-XXII certification, one of Europe's most difficult "WAS" achievements . . . . WGDXC relays grapevine word that UA1KEC is back at it from Franz Joe Land on 20 c.w. . . . . SM5WN/LA/p declares himself to be one-fourth of Svalbard's current ham inhabitants. W7QNI finds Ivar on c.w. just above the 14,100-kc. mark around 1900 GMT . . . . . K3CUI confirms the outcome of last May's Russia-sponsored world-wide DX test: UA9DN swiped home-station laurels with 341 QSOs in 61 countries, while club-collective outfit UB5KCA copped its division's honors on 274 contacts, 65 countries. W8JIN filed the top score among 164 U. S. entrants. Other K3CUI gleanings from Soviet *Radio*: UM8KAA continues as the only Kirghiz station active on h.f. . . . USFA of Russia's antarctic whaling fleet attempts contact with amateurs on DX bands at 0400-0500 and 1300-1400 GMT on Thursdays, Saturdays and Sundays . . . . . Via W9UZC, SSA Diploma Manager SM5CCE emphasizes that the fee for WASM certification now is 10 Swedish crowns (25 IRCs or two U. S. dollars). By the way, W9QGR offers info on WASM-II certifications concerning the lan (county) locations of given SMs. Self-addressed stamped envelopes, please . . . . . TF3PI, licensed last August, tells W8KX he intends to add 10 and 15 meters to his radiational repertoire after inaugurating his DX career on 20 c.w. Writing of shack-warming through the chill Icelandic winters, Pall brings back an interesting item in grammar-school geography: "Houses in Reykjavik are warmed with central heating, most of them with 90° C. water conveyed by insulated pipes from springs located ten miles from the city." Neat, eh? . . . . . F7FD, ex-W4VE-W5MY-etc., fired up his Navigator, 75A-3 and ground-plane in mid-December to rejoin his many DX buddies on 20 c.w. W1CPS participated in Fred's Gallic-styled band-warming celebration . . . . . K9ELT confirms that DL7AH/LX piled up some 1600 QSOs in his Luxembourg DXcursion of last November and naturally wants to try it again this year, possibly as LX1RK. "It's very tough to get an LX license and his was valid only for an eight-day period." . . . . . OK1HZ, managing a KWM-1 from traction in a Czech hospital, tells W8YIN he still plans to participate in that world-wide Czechoslovakian geographical DXpedition scheduled for early departure . . . . . W6KG found neighbor K6CKD pushing the buttons at DL4UX . . . . . K2TBU reports consistent signals from Bratislava club station OK3KAB on 50 watts, long-wire and 14-tube inhaler . . . . . Yank hams based in Seville, Spain, have organized the Sevilla American Radio Amateurs of which KØLIU is president and K1ECT, secretary-treasurer. SARA membership includes Ks 1BVT 5I8X 5QKV, W7s EIT IINT and UUW . . . . . After writing a note to DL6HW, W4ZSH chanced upon DL6YH who turned out to be the feller who translated Bill's missive to 'HW . . . . . GM3MCH, ardent 28-Mc. booster, writes on his favorite theme: "Been quite amazed at strengths from W7/K7 areas this season. *Some* barrage from that section when skip is right! I run a mere 10 watts just for the fun in doing so but I have it hooked to a new quad beam. Recently told WØQGI of Iowa that his high-powered 2E26 (30 watts) really wasn't necessary — 10 watts is plenty on ten. Nearly WAS here after years of operating; Nevada and Wyoming were the hard ones next to 'impossible' Utah. A special hand goes to WØPHR who spends much time on 28 Mc. passing out South Dakota to hungry DX. Those previously elusive ones, Vermont and Delaware, are becoming as fish in a barrel these days. I note many of your ex-Novices prospecting 28 Mc. for DX after graduating from 15 meters." . . . . . Hey, grab this one *fast* if the dates haven't passed for you: MARS (Malta) is throwing a ZB1 Activity Week End on DX bands from 1200 GMT, February 28th, to 2300 on the 1st of March. We hope ZB1BF can tip us off earlier on such doings in the future . . . . GC2RS reports an eruption of 3.8- and 14-Mc. sideband activity on the part of GC2LXK's 1625s and *QST*-modified BC-458. Frank also notes that ex-G2WD has retired to Barbados as VP6WD . . . . . Moderating weather shortly will set the stage for Continental DXpeditionary doings. Stand by for action on the HV MI PX 3A2 and ZA fronts.

W2ZXM recently put his *Flying Enterprise II* into Bombay and triggered a lively hamfest on the premises of VU2CQ Guests (faces left to right) are Capt. Carlsen, VU2EH, W2EE, WV2CFY, VU2MD, VU2SX and Fr. Conn of near-by St. Xavier's college. Host VU2CQ appears alone at right amid apparatus capable of QSOs on all bands 3.5 through 420 Mc. *(Photos via E. Collins)*

Oceania — There's a WAKI diploma (Worked All Kwajalein Island) awaiting you if you've worked five different Kwajalein KX6s since July 1, 1958, YL KX6CM writes. "Applications should be made in letter form and must include name, call and address of applicant plus call, date, band and name of the operator of each of the five KX6 stations claimed worked. QSLs are not required, logs being available for checking purposes." Applications and inquiries go to Secretary, Kwajalein Amateur Radio Club, KX6AF, Box 11, Navy 824, FPO, San Francisco, Calif. . . . . W2RDD's Truk friend KC6JC has a shack nestled amid a robust set of 140-foot Japanese WW-II radio towers. Maddeningly, no can use . . . . . Norfolk's VK9AD tells W8YIN he expects to remain on the island till October and then head for VK2 environs. Stan is in the middle of Lord Howe scuttle and hears of another imminent sideband DXcursion to that outpost . . . . . Famed Australian DX hunter VK3YL tells W4CYY she's breaking in a new QTH not far from her old location. Jury-rigged antennae indicate a promising signals-to-noise ratio . . . . . One of KM6BL's favorite projects is a Yank two-letter-call WAS, so he was pleased to hook W8KX. Mac writes Walt, "I usually work 10 through 40 meters but now remain on 20 and 40 because of receiving difficulties on 15 and 10. I use a Valiant, SX-101, triband 3-element beam, 40-meter dipole and I'm busy constructing a 15-meter wire beam with two reflectors and *five* directors. KM6BK and I are about the only ones on c.w. here. I have 151 countries worked, 94 confirmed, and I'm ready to apply for WAC, WAS and WBE. Very close to WASM, WOH and BERTA, too." . . . . . VR2BC, settling down for long-haul 15-meter doings after returning from his recent world-wide holiday, finds stiff new 21-Mc. local competition from neighbor VR2AZ. VR2s AS CC DA DC and DI also are active, mainly on 20, "the strong man's band." Greg states, "We are losing VR2DG who helped put Fiji on the 15-meter map in the past few months. He arrived early this year as ex-VE7AFP and has fallen for the seafaring life with KN4TJI, the latter cruising around the world in yacht *Dirigo II*. VR2AG has returned to New Zealand. We had a hurricane in December whose eye passed over Suva and which took away several antennas including the beams of VR2s AP and BJ. Much to my surprise, my own withstood the storm. I intend a trip to Rotuma Island later this year and also will be pitching my share in the 1959 ARRL DX Test's phone week ends. Meanwhile my new Ranger has pushed me up to 135 countries on phone." K6LAE confirms that bit about VR2DG joining forces with yachtsman KN4TJI, hamming intentions unspecified . . . . . From ex-VS5AT via W1WPO of the League's DXCC desk: "I'm now on vacation in the U.K. prior to my next assignment with Shell as communications engineer. I have handed most of my VS5 equipment over to an ex-ZL who may keep Brunei available on c.w., a.m. and s.s.b." . . . . . FK8AS, fresh from his FW8AS probe, now meditates an operational assault on remote Chesterfield, according to WGDXC informants . . . . . NCDXC lists CR1ØAA's occasional whereabouts as 14,160 kc. around 1400 GMT.

Asia — Mainland China? W8NOH hears one C3AC near 14,110 kc. on phone who, like recent BY1PK of Peiping, seems to restrict his ham activities to the Curtain realm . . . . . Ex-XW8AH-KL7YT-W4CCK, now W8UTQ back in Michigan, tells W2EQS of his Laos sojourn: "Worked for the International Cooperation Administration as police communications advisor. We start in radio from the ground floor on up to installations and such. After home leave at W8UTQ I hope to sign the YI prefix. Really looking forward to Iraq and I intend to use the limit in power on sideband. S.s.b. strikes me as the only way to get along when trying to work phone from the DX end." . . . . . K6DLV reminds us of Japan's tricky Double-Call Club certification. QSLs from 25 double- or triple-letter-suffixed JAs — JA1AA, JA2AAA, JA5CC, etc. — for QSOs dating since July 30, 1952, will qualify you for application. Check specs with JA1CC . . . . . Through W8KX, operator K5IUO of HZ1AB brings us up to date on the Saudi situation. "There are ten of us on the base here and our only operational restriction is prohibition of 4X4 contacts. Four of us are quite active but the rest don't go for the odd hours required for good DX results. I'm the c.w. man and the others fight for the s.s.b. mike. I also have a Globe Scout in my quarters and have *had* great success with it so far. In eleven days of operation I worked 25 countries and 21 States with 50 watts to a long-wire. U.S.S.R. QRM is a problem; five or six of 'em answer my every 'CQ USA.' Fifteen meters seems dead for us so we stick with 20, plus occasional 10-meter a.m. and s.s.b." . . . . . WGDXC understands that VU2CQ is hard at work completing construction of a sideband sender in Bombay . . . . . OVARA has it that Iwo Jima's KAØIJ now is operated by W9CAE frequently from 2300 to 0200 GMT between 28,415 and 28,480 kc., a.m. with s.s.b. in prospect.

Africa — ET2KY, formerly W6MHP, W2EAL, W2EAL/-KL7, W7ZHS and K4LUI, writes W8KX: "Since August, when I finished my present rig, I've worked my way up to 118 countries with 59 confirmed. I'm jammed into a four-by-six room, and I do mean 'jammed.' Rig is a 7-ft. relay rack next to a small table which holds two receivers, monitor and control unit, v.f.o. and mill. By entering the shack sideways I contrive to get in and sit down. My antenna is a ground-plane and appears to be particularly effective in this location, the highest hill in Asmara with a sharp drop-off on all sides. I'll be here probably for another year, at the end of which I hope to get an assignment near my home on the West Coast prior to retiring from the service. My outfit, ASCEA, is the Army Signal Communications Engineering Agency which does fixed plant installation, radio and large landwire exchanges, throughout the world with headquarters in Washington. By the way, ET2TO has been in the States and I expect him back around the middle of the year. Right now ET2s KY and VB are the only consistently active ET2s on c.w." . . . . . "I left Ghana last October," writes ex-9G1CR, "and after completing my leave I'll be based in Nigeria with a ZD2 call. I shall be trying hard for that WAS award!" . . . . . ZD9AH (W6YLI) shakes up K8CFU and the 15-meter voice crowd with operators John and Mary at the helm. The station's 50-watter also signed ZD9SCA for a time . . . . . Gaza's VE3EGD/SU, supplanting VE3BQL/SU, likes to rag-chew with 250 watts and a rhombic beamed on Canada. W3QIR finds Bob booming in regularly around 28,480 kc. . . . . K9EAB tells us that ZD2JM is due back in Kano from Scotland leave around this time. "John operates a lot of 28 Mc., mostly week ends from 0800 to 1300 GMT. He also works near 14,100 kc. between 1800 and 2300, using a homemade c.w. rig running from 80 to 100 watts. ZD2JM expects to visit GM-land again sometime in June." . . . . . OQØDM, chatting with W8ISH, states he represents fully half the Ruanda-Urundi 28-Mc. ham population . . . . . Ex-VQ4EO (9G1CX) put W2KUW's KWM-1 to task in Togoland as FD8DZ in mid-January. W6KG observed Paul

(Continued on page 152)

Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

YOUR TICKET

67 Russell Avenue
Rahway, New Jersey

Editor, *QST*:

I don't believe I'll ever know what prompts brother amateurs to complain as they do. It's a disgrace to read the letters that have been printed in *QST*. I'm glad that the ARRL does print these, though. It brings to the attention of thousands the foolishness of a few. Through our ARRL we get new amateur bands, segments, and amendments by the FCC. We now have the Novice and Technician classes of licenses — what wonderful things. But, some hams have the nerve to complain about minor technicalities, and have even rebuked the Novice and Technician!

Amateur radio is a hobby. It is something that we use for enjoyment, and for relaxation. We have been given an amateur radio license. With it we hold the key to the world in communication. The FCC doesn't even ask for a fee — the license is free! All we have to do is stay within the bands allotted to us, obey the rules, and have fun. What do we give, in return? Complaints!

It's a shame more don't realize what a good thing we have and stop complaining!

— *R. M. Brown, K2ZSQ*

THE *L. M.*

3499 Edison Road
Cleveland Heights 21, Ohio

Editor, *QST*:

You give the reader the idea that the only place to find the FCC regulations is in the *License Manual*. One does not need to spend 50¢ for only a condensed version of the regulations. Just send 15¢ to the Superintendent of Documents, Government Printing Office, Washington 25, D. C. and ask for FCC Rules and Regulations, Part 12. Amendments are sent free by the FCC if you remember to fill out the blank in the back and send it in. Maybe if everyone had a copy there would be fewer pink tickets.

— *Rick Albrecht, K8BFH*

[The *License Manual* is not a "condensed version"; it contains the complete rules. It also includes detailed discussion of the application of the rules and their interpretation as well as the current FCC examination schedule, specific procedure in applying for licenses, and sample questions and answers — none of which is in Part 12 — *Ed.*]

ILL MANNERS?

2104 Dawn Way, Apt. 4
Sacramento 25, Calif.

Editor, *QST*:

. . . I cannot question the value of nets, having indeed helped organize some, but certain aspects in this feature of hamdom require agonizing reappraisal by the participants, specifically phone adherents. This matter of nets assuming control of a frequency at a specific time by virtue of previous use under common agreement of 20 or 30 individuals is increasingly irritating. Despite common knowledge about frequency utilization in the ham bands (see important note, para 3, p. 89, Jan. *QST*) NCS still force an operator in QSO from a net frequency. This is ill-mannered, at the least.

In the same issue of *QST* (p. 150), an ARRL official desires all to avoid interference with nets, which he states are a public service. This "public" service statement applied unqualified to all nets is far from realistic, for more often than not the service is for Joe who desires an informal with Bill while NCS frantically searches for "anyone with traffic for the N. Smorgasbord Ragchew Net." A stranger who desires service from the net either can't get in with a shoehorn or is advised to "move up 10" and QRM someone else.

Those sincerely interested in net operation might try MARS, limber up the brass, or go v.h.f. where more activity is needed. If an area ragchew is in order, why not wait 5 until the OM unknowingly occupying your frequency finishes his QSO. And be nice, Jack. Don't be a nasty because it's 1900; it's a hobby, remember?

— *Bud Martin, K5RPB/6*

MOBILE OR GALVESTON?

6503-C Military Hwy
Norfolk, Virginia

Editor, *QST*:

I was greatly distressed to read in the January issue of *QST* that the 1959 11th National Convention was to be held in Galveston, Texas. I sincerely think a much better location for this convention would be Mobile, Ala. My reason for thinking the Mobile location would be a better one is that it would allow a great number of hams who have wanted to do so all their lives to go mobile — har, har!

— *Lane Beamer, W4UTA*

D. S. B.

9302 N.W. 2nd Place
Miami 50, Florida

Editor, *QST*:

I was quite surprised to see the reference made of my d.s.b. activities while YN1WC in Managua some six years ago, in the December *QST*. I had thought it was long since forgotten. When the boys speak a little disparagingly of d.s.b., I mention that is how I got started on s.s.b. and it will probably be an easy step for the d.s.b. boys to get on s.s.b. as both systems require improved receivers and tuning thereof, for one thing. It should be encouraged. Regarding this recent "discovery" of the d.s.b. by the boys at GE, I thought it was old stuff! I had long since carried George Grammer's "Double-Side-Band-Reduced-Carrier" transmitter one step further!

— *Wayne W. Cooper, K4ZZV*

A CATALOG

Bethlehem, Pa.

Editor, *QST*:

Referring to Mr. Dunbar's letter in which he says "*QST* is nothing more than a commercial catalog" — we are inclined to disagree. We would like him to find any magazine serving a hobby without advertisements. *QST* cannot survive on membership dues alone.

— *Tom Brosnahan, KN3GVP*
— *Jim Fitzpatrick, KN3EXV*

GOSPEL QSLs?

P. O. Box 218
Holland, Michigan

Editor, *QST*:

I would very much like to hear from all hams who are interested in obtaining a free copy of a gospel tract that is suitable for mailing in with QSL cards and letters to other hams. Title of tract is "Your Best Contact."

— *Russ Sakkers, W8DED*

Box 139
Cananea, Sonora, Mexico

Editor, *QST*:

Quoting from the Atlantic City Documents:

"A service of self-training, intercommunication and technical investigations carried on by amateurs, that is, by duly authorized persons interested in radio techniques only with a personal aim. . . ."

What makes all radio hams in the world friends is the fact that the only thing we have in common is radio prob-

lems and once in a while rag chewing on personal experiences. We never discuss politics, religion; we do not ever try to force our personal opinions on anyone. Recently I have been getting QSL cards with religious inscriptions on them and pamphlets which to me are nothing but religious propaganda. Even on the back of the envelope is written: "ETERNITY — WHERE?" I consider this bad taste and a misuse of the privilege of being a radio ham, which we certainly do not want to have endangered by careless ham operators anywhere in the world.

— *Rodolfo Michels, Jr., XE2GR*

ACHIEVEMENT

513 N. Central
Olympia, Wash.

Editor, *QST:*

. . . After about ten years of on-the-air-code practice I had to give it up but I am at it again, for a short while, for a very particular friend. He is a professional man who had a stroke about seven or eight years ago completely paralyzing him. He slowly pulled out of it until now he is able to practice his profession part time. However, many scars of that stroke remain with him. After some thought, I encouraged him to take up amateur radio. He was interested but thought it impossible to take a written examination. He can only write two or three words at a time before he loses control of his hand, writing above and below the line with letters so poorly formed that they are not readable. In discussing the matter we decided to try it and now, as I said, I'm on the air with "code for the Novice." We got to three words per minute, then five, now eight. He came in the other morning and I asked "How did you do last night?" "Pretty good," was the answer and he handed me his copy as he exclaimed with exuberance: "Tate, I can write again!" Sure enough, he had solid copy written on the line with nicely formed letters and words spaced properly. He was so elated that he said that he was going to write to his son. The next day he came in and I asked: "Did you write to Bob?" His answer was: "Sure, and I can read it." The only thing we can figure out of all this is that there was apparently a mental block that was offset or removed when he was concentrating on the code. We intend to continue for a while to see if we can bring up the writing speed with the code speed. . . .

— *O. U. Tatro, W7FWD*

ANYONE FOR 11 METERS?

6 Berkshire Street
Worcester 9, Mass.

Editor, *QST:*

All hams know that 11 meters is no longer an amateur band, but few know what its new use is or how it might be an even better "ham-band" than it used to be.

The major portion of the band was divided into 22 channels for two-way communications use under the new Class D Citizens' Rules. Basically the rules are as follows: no operator's license is needed; a station license is necessary, but it may be obtained by filling out a simple form; the license is for equipment only and all units are classified mobile; 0.005% frequence tolerance; 5 watts maximum power, a.m. only; lead-in 25 feet maximum.

Most hams don't see the possibilities that this presents. First of all, equipment can be home-built. As five watts is the power limit, there can't be any "millionaire stations" drowning you out. All units will be on the same basis. Furthermore, since no operator's license is needed, the wife can use the rig and so can the kids.

As for crowded channels, tone-modulation is permitted to operate squelch systems; you can't do this on the ham bands. There will be a good deal of experimenting to get a receiver that will dig down for the weak signals. Conversations are allowed with all stations and there isn't any law stopping you from having channel switching. In the real ham spirit, there will be many more chances for helping out the other guy in both relaying messages when he is out of range with his home station and in giving help with repairs. A second class phone license will be needed for servicing or aligning the equipment, but any ham should have little trouble passing this test.

Just imagine: no more kilowatt interference, no more multi-kilobuck rigs and no more swishing v.f.o.s! I don't know about the rest of hamdom, but I've filed for my Class D License and have started on the new rig.

For the full rules and regulations drop a dime in an envelope along with a request for a copy of FCC Rules, Part 19, to the Superintendent of Documents, Government Printing Office, Washington 25, D. C. See you on 11.

— *Arthur Human, W2HQQ/1*

GRATEFUL

Broad Run Drive
Sterling, Va.

Editor, *QST:*

Bob Seals, K9AHK, author of "The Perils of Six Meters" (Dec. 58 *QST*) deserves an award from *most* of the v.h.f. gang for his contribution to the art. Those who did not appreciate this marvelous satire only recognized themselves — finally!

— *Bob Richardson, W4UCH*

116 Aberdeen Dr.
Greenville, S. C.

Editor, *QST:*

I could not help taking offense at such an unwarranted attack on *QST* as appeared in the January issue from W8-land.

I like to build as well as anyone, though my knowledge is limited, but I also enjoy the ads that appear in *QST*. The new equipment is a joy to look at and the Ham-Ads is one of the first items I look for when receiving my issue of *QST*, though I am not in the market for any gear, and most of the new gear I cannot afford. In the January issue I could not find a single ad between pages 9 and 90 and anyone wanting more technical information should subscribe to an engineering magazine. I doubt that more than a handful of men in the U.S. including W8-land could compile such technical information month after month as appears in *QST*, and those ads are the means of keeping the *QST* subscription so low.

My congrats to the staff of *QST* for a job well done in 1958 and if another ad or two could produce enough revenue for some well-earned salary increases of the staff I would surely approve.

— *A. Jack Hendrix, K4QIK*

5511 El Jardin St.
Long Beach 15, Calif.

Editor, *QST:*

While nearly all the letters written to you, are condemning one thing and another, mostly Novices and Technicians, I should like to tell you I'm grateful to FCC and ARRL for ham radio just the way it is run.

Then too as long as we are mentioning gratitude, I'd like to thank W1AW, K6USN and the station at 4.043 Mc. on my receiver. These stations provide excellent code practice, and a great many of us are grateful.

— *Ray Carter, K6OBA*

Wooster, Ohio

Editor, *QST:*

The October 1958 issue of *QST* carried an article, "A Versatile 50-Mc. Transmitter," in the beginner section. Beginner or no beginner, this is a hook-up well worth anybody's time, and I recommend it very highly. This is one of the choice 50-Mc. transmitter circuits to come out for a long time and I personally want to thank everyone who had anything to do with its publication.

I wish to add that two other old timers have also constructed this rig and both are enjoying the same success that I am. Of course, we have modulated the r.f. section and therefore are also enjoying fone as well as c.w.

— *R. P. Steigerwald, K8ENX*

Route 4, Box 4357
Mesa, Arizona

Editor, *QST:*

I write to express my satisfaction with two good articles in the last two issues of *QST*.

First: The "Moderate Power Dummy Loads" by WA2-ANU on page 18 of the December issue. I duplicated the zero-to-30 Mc. unit in about ninety minutes and find it most

(*Continued on page 148*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
ROBERT L. WHITE, W1WPO, DXCC Awards
PHIL SIMMONS, W1ZDP, Asst. Comm. Mgr., C.W.
LILLIAN M. SALTER, W1ZJE, Administrative Aide
RONALD GANN, W1FGF, Club Training Aids
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., Phone

High Speed Code Runs. Code practice at really high speeds has become almost nonexistent on the air. As you know, our ARRL code proficiency program stops at 35 w.p.m., a practical limit of code proficiency for most amateurs. A few amateurs would like to qualify at higher speeds but the number has not justified the extensive tape-punching job required or permitted sacrificing W1AW service in other directions to make this possible.

For the benefit of these and anyone else interested, George Hart, W1NJM, has announced his intention to put on a qualifying run, entirely on his own and without any connection with the ARRL W1AW-W6OWP program, at speeds of 40, 45, 50 and 55 w.p.m., *on March 15, 1959*. Frequency is 7120 kc. (approx.), time 2030 EST. There will be a five-minute transmission of plain English text at each speed. Copy should be submitted to George Hart, W1NJM, 66 Highland St., Newington 11, Conn., accompanied by a signed certification stating that copy was made direct over the air, by ear, without any slow-down assistance of any kind. Connecticut Wireless Assn., Inc. is sponsoring issuance of club code proficiency certificates for those who "qualify" at one minute or more solid copy at each speed.

Here's an opportunity for some of you "hot rock" c.w. men, and newer amateurs who have come right along in code proficiency, to test your mettle. Future runs will depend on the response and the work involved. Meanwhile, W1NJM continues to transmit high speed code practice *each Sunday night* on the above schedule. We at ARRL hope you find fun and personal value (if you can do 25 w.p.m. or more) in following this to see how high you can go.

Preparing for the June Field Day. Our first Affiliated Club Bulletin of the year will, as usual, include the FD rules and act as a reminder to over a thousand club affiliates that a Field Day is coming. The dates this year will be the usual fourth week end, June 27–28. Advance FD planning and efforts to make the most of ARRL's Field Day are of course discretionary both for clubs and individuals. For all amateurs *not* connected with active clubs, we invite attention to the fact that you also may enter. We have a special score grouping for portable stations manned by one or two operators.

A lot of clubs use the committee approach. It makes both for progress and interesting club meetings to have a general FD chairman and committees with definite different FD responsibilities. Few clubs that had the best showing (See FD reports, last December *QST*) left all their details helter-skelter until the last three or four weeks. So why not more *advance planning* this year? A commissary committee can wait until late in the day to report. But the charting of plans for operation, and selection of persons to head groups for each band should not be delayed too long. You will very likely need an antenna committee, an equipment committee and of course a location committee working right from the start. If FDs are new to your club, some surveying of what each person can supply and his operating ability and favorite band may be needed. Your whole club will want to pass on such matters as the transmitter-class and the place you will set up for FD. But many details are best intrusted to your experienced operators.

Emergency Equipment; Pre-FD Tests. ARRL urges every individual amateur (as well as clubs) to have provisions for emergency-power. Such should be capable of running home station equipment, if possible, as well as mobiles and portables. Are your emergency capabilities for now or June better than they were in '58? The time to make them so is the present. You have until June to devise, test, rebuild, repair, purchase or assemble new control and operating set ups for flexible, effective FD or emergency operating. The FD itself will be upon us all too soon. Some clubs always have a "dry run" before the June activity. New equipment often gets a test by appointees in the April CD parties and by everyone in the June v.h.f. contest just two weeks ahead of FD.

While speaking of your provisions for eventualities, we have one other thought to leave with you. Gas-electric generators and batteries supplying the emergency equipment should not be left *unused* the year around. Whether personal or club gear, right now is a good time to haul it out and give it an operating test — to make sure that if spring floods or other unexpected need comes along you will be able to play a full part. For clubs, a review of operator ability between now and the Field Day (not too much time) may help improve the level of operating procedures, code ability, and familiarity with the formulation and handling of record traffic, such as the FD message. Every alert amateur ought to have his own emergency gear and be registered with the Amateur Radio Emergency Corps, also where there are plans that make it possible, be identified with RACES.

Two More FCC Suspensions. With liberal licensing provisions and such highly adequate means for study of amateur techniques as available today, it seems surprising that any individual is tempted to follow other than straightforward means to secure an amateur radio license. FCC has its penalties for any present licensees who would be a party to such a fraud, however!

FCC ordered (May 28, 1958) that the General Class amateur radio operator license (K6VCI) of Michael A. Kaufman, Sherman Oaks, California BE SUSPENDED until Aug. 5, 1962, normal date of license expiration, under authority contained in Sec. 303(m) (1) (F) of the Communications Act and Sec. 0.292(f) of FCC Rules, his amateur license to be mailed to the office of FCC, Washington, D. C., *it appearing that the licensee* had willfully and knowingly assisted Anthony D. Goodman in obtaining a General Class Amateur Radio Operator License by fraudulent means, in violation of Sec. 12.162 of Part 12, FCC Rules. The FCC report indicates that the written examination and code test purported to have been taken by Goodman was in fact taken for him by Michael Kaufman. Later, the FCC Hearing Examiner acted, Nov. 13, to modify this above (earlier) FCC Order, and to provide that the General Class Operator License (K6VCI) be suspended *for six months*, this effective from Jan. 9, 1959.

FCC ordered (Oct. 2, 1958) that the Novice Class Amateur Radio Operator License (KN3CWO) of Arthur Kenneth Cook, Pittsburgh, Penna. BE SUSPENDED until January 27, 1959, *it appearing that* on August 19, '58 it was discovered during a license examination that he was in possession of and using certain reference material during the examination, contrary to printed instructions on the examination material and in violation of Sec. 12.162 of FCC Rules. Licensee was required to mail his amateur authorization to the FCC at Washington and this order of suspension became effective October 23, 1958.

FCC Suspension for International Third Party Communications. A crack-down against any amateur work in violation of Article 42 of the International Telecommunications Convention provisions is certainly quite in order to keep amateur radio clean as we look to a 1959 international conference where our frequencies and behaviors as a service are again subject to scrutiny. Relaying informal remarks by third parties, voice or c.w., as well as any formal third party traffic is subject to the general prohibition, stated in the Article, as follows. "*It is absolutely forbidden for amateur stations to be used for transmitting international communications on behalf of third parties.*"

There is indeed a provision in the Article for modifying this "by special arrangements between the countries concerned" but it must be recorded that there are only nine countries where special third-party agreements between them and the U. S. A. exist: Canada, Chile, Peru, Ecuador, Liberia, Cuba, Panama, Costa Rica and Nicaragua. This is a subject on which full data are available, so we here and now suggest that all amateurs review carefully Chapter 9 of the *Radio Amateur's License Manual* for what it has to say on the international and pertinent regulations.

FCC ordered (Oct. 22, 1958) that the General Class Amateur Radio Operator License of Milton H. Meinwald (K2JSO) BE SUSPENDED for a period of two months, the license to be turned in to FCC, *it appearing that the licensee* on June 13, '58 (first citation) and July, 25, '58 (second citation) and on other occasions, operated K2JSO, exchanging international radio communications which emanated from third persons, with radio stations 4X4HK and 4X4FV, located in a foreign country with which the United States has not concluded any convention or treaty to permit the transmissions of international amateur communications on behalf of third parties. Such is a violation of Article 42, Sec. 1001, General Radio Regulations, Atlantic City, 1949, ratified by Article 23 of the International Telecommunications Convention, Buenos Aires, 1952. This suspension was effective from November 14, 1958.

On Topping Up That DX Contest Score. Did you find the 10-, 15- and 20-meter bands your high producers for the ARRL DX Competition, so-far . . .? We do hope you got at least one or two new ones during the fray. If you were unlucky and your boss sent you off on a trip during the first part of the DX classic, you still have, in March, a good chance to enjoy participation and DX. We hope you had good conditions and success in February and that now you can extend the multipliers for an already good basic DX score. Any new participants will find full information (rules) with the contest time table on pages 78–79 of January '59 *QST*. The concluding chance to add to scores in the phone section comes March 6–8, for the c.w. section March 20–22. Complete your log forms carefully, soon as the contest is over. Be sure to mail in your DX results, large or small. Even postal cards confirming individual contacts are in the right spirit and are fully welcome. Happy hunting. —*F. E. H.*

W1AW OPERATING SCHEDULE

(All times given are Eastern Standard Time)

General operation covers all amateur bands on which W1AW has equipment. Novice periods include operation on 3.5, 7 and 21 Mc. (see footnote 2 in box on p. 89, last November *QST*). Master schedules showing complete W1AW operation in EST, CST or PST will be sent to anyone on request.

Operating-Visiting Hours:

Monday through Friday: 1500-0300 (following day).

Saturday: 1900–0230 (Sunday).

Sunday: 1500–2230.

Exceptions: W1AW will be closed from 0300 Mar. 27 to 1900 Mar. 28 in observance of Good Friday.

General Operation: Use the chart (p. 89, last November *QST*) for determining times during which W1AW engages in general operation on various frequencies, phone and c.w. Note that since the schedule is organized in EST, certain morning operating periods may fall on the evening of the previous days in western time zones. W1AW will participate in all official ARRL operating activities, using scheduled general operating periods for this purpose if necessary.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules.

Frequencies (kc.):

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,900, 145,600.

Phone: 1820, 3945, 7255, 14,280, 21,330, 29,000, 50,900, 145,600.

Frequencies may vary slightly from round figures given: they are to assist in finding the W1AW signal, not for exact calibration purposes.

Times:

Sunday through Friday: 2000 by c.w., 2100 by phone.

Monday through Saturday: 2330 by phone, 2400 by c.w.

Code Proficiency Program: Practice transmissions are made on the above listed c.w. frequencies (except 1820 kc.) starting at 2130 daily. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately ten minutes of practice is given at each speed. *Exceptions:* On March 19 and April 20 W1AW will transmit ARRL Code Proficiency Qualifying Runs instead of the regular code practice.

NEW NET DIRECTORY AVAILABLE

The annual cross-indexed Net Directory should be available by the time you read this. In fact, it should have been available weeks ago. Just how much an unusually busy season has delayed us is not certain at this writing.

The directory is in three sections: (1) Nets are listed alphabetically by name, giving coverage, frequency, days, time (in both local standard and Greenwich), call of net manager, purpose (traffic or emergency) and approximate maximum time in session; (2) Alphabetically by state; (3) By frequency, from low to high. Thus, a net can be located by its name, the state within which its coverage area falls, or its operating frequency. Copies are available without charge from the ARRL Communications Department. Nets that do not serve a traffic or emergency purpose have been omitted. Direct mailing is to be or has been accomplished to those who registered nets and a selected list of "net control stations."

Over 500 nets were registered up to the deadline date of the directory, Dec. 5. Nets registered subsequent to that date will appear in net lists in May *QST*.

Your Amateur Radio Emergency Corps has certain procedures which appear not to be clearly understood by all concerned. Although the matter has been discussed before in this column, we think it is time for another splurge on the subject.

Let's assume that you are an amateur who decides it is time you registered your availability for emergency communication. About 35,000 have already done so, so why not you? How do you do it? Well, first you get two copies of the AREC registration form, either from headquarters or from your EC, SEC or SCM. You fill them out in duplicate, keep one for your own records (so you will be able to submit a new one when the data on this one have become obsolete) and hand the other one to your local ARRL emergency coordinator. He will issue your membership card, a copy of the emergency communications manual and give you any other literature or information you need to take part in the local setup; for AREC is primarily a local organization. You work with other amateurs in your own locality in preparing for emergency work.

If everything is in order, that's all there is to it. Unfortunately, everything isn't always in order, and some well-intentioned amateurs (bless their hearts!) will find that there *is* no EC appointed in their locality, or the one appointed isn't doing his job. This makes for a number of "what-ifs" that have to be answered.

For example, what if there is no EC, or you don't know who he is? The thing to do in that case is to send your application to your *section* emergency coordinator. If you don't know who he is either, send it to your section communications manager; he is listed on page 6 of any recent issue of *QST*. And then what happens? Well, if he's on the ball (we have a pretty good crop of SCMs now), he'll send it to his SEC, who will issue your membership card and booklet and keep your registration on file until or unless an EC is appointed in your neck of the woods. At that time, he'll send the new EC your registration and that of anyone else in your area who similarly registered, so the new EC will have some recruits to start with. If you find that there is no EC serving your area, and you are a League member, you might give serious consideration to taking on the job yourself. Stop shaking your head! Being EC is every bit as important as being active in any other community organization, be it a men's (or women's) club, the church, the Boy (or Girl) Scouts, the Little League, or what-all; and besides serving your community, you are serving amateur radio and your country — because the AREC is a national as well as a local organization.

If you send your registration to ARRL headquarters, we'll send it to your EC, SEC or SCM, in that order of preference. We don't mind doing this at all — in fact we're glad to — but the headquarters does not issue AREC membership cards. This must be done by your EC or SEC.

What if you aren't a League member? Makes no difference; AREC registration is open to all amateurs — yes, that includes novices and technicians.

What if your time is limited? (As whose isn't?) Then sign up in the "Supporting Division" of the AREC. You can indicate this on your registration form. We urge you to sign up as a full member if you possibly can; an EC can't build a good organization on a foundation of "maybe's."

What if you have no emergency equipment? You don't need any. AREC units nowadays are signed up in civil defense and operate under RACES, in which case equipment is usually supplied by c.d. But even if it is not, your skill as an operator and technician is what you are pledging, not necessarily your equipment.

What if you are a youngster? There is no age minimum for AREC. If you are old enough to be a ham, you are old enough to be in AREC.

Now let's make one qualification to all the above: the boss-man of the local AREC is the emergency coordinator. Nine out of ten of them will welcome all comers with open arms; but sometimes a circumstance arises in which the EC has to use his judgment. That's one of the things he is appointed for. Whatever he does in the exercise of his judgment, he must answer to his SEC, who is his superior in the section organization, and to his SCM, who appoints him. We want to point out that being a volunteer in charge of a lot of volunteers is not an easy job and is usually a pretty thankless one; your cue is to *help* your EC, not fight him. Your EC will be glad to have your registration, but just how he uses you in the setup is up to him.

Just a word about clubs in this connection. While a local amateur radio club is a good vehicle for implementing the AREC program, emergency communication is a function of *all* community amateurs, and *no* amateur should be excluded from participating because he is not a member of any particular club or group. Emergency coordinators are appointed to serve whole communities — cities, towns, or counties, as the case may be — not particular clubs.

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On Nov. 15 a hysterical boy scout stumbled into Santa Rita Lodge in Madera Canyon in the Santa Rita Mountains near Tucson, Arizona, and reported three of his companions lost overnight in a snowstorm atop Old Baldy, highest and most rugged peak in the mountains. Telephone lines were down, but W7FWP, at the Canyon, contacted W7SMZ in Tucson on 3865 kc., and within minutes amateurs were active throughout the area. W7MWD in Phoenix alerted the highway patrol, W7SMZ contacted the Pima County sheriff, another amateur got hold of civil defense authorities, and the search was on. When a sheriff's deputy arrived at the lodge, W7FWP turned communication over to him and went out on the search himself, but had to come back when the sheriff's radio would not get through. In fact, communicationswise, that was pretty much the story. With sheriff's cars from the north and south both battling the elements to get into the canyon, the amateurs had to do the communicating. Sheriff's radio and military radio could not get through. W7GFQ tried to establish communication through the Catalina Emergency Net, but coverage was not adequate, and 3865 kc. was used throughout with very good success. W7LHM flew over the area for five hours in his own plane equipped with ham radio and had perfect communication. By Tuesday (Nov. 18) the boys still had not been found and the amateurs were still in action, operating in shifts on a 24-hour basis. In the rugged country, with snow piled high, there was just no trace of them until the bodies were finally found on Dec. 4 in a sad ending to a story of extensive effort on the part of the amateurs.

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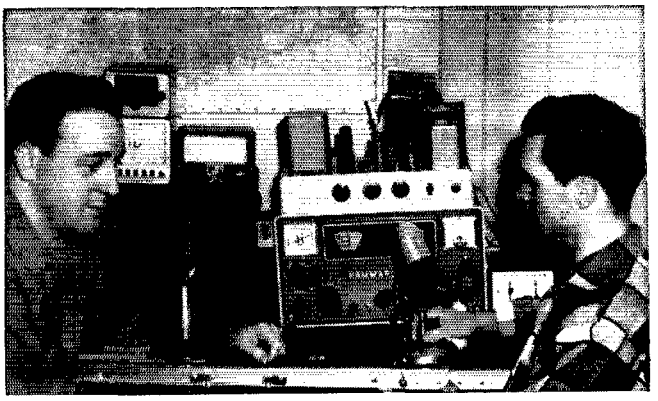
Cuyahoga County (Ohio) RACES went into action on Nov. 17 in setting up communications along an 8-mile stretch of the Chagrin River to help in the search for the body of a drowned boy. Seven mobiles converged on the scene of the disaster and K8DQL, acting as control center, send hand-carried units along the shores while mobiles were dispatched to strategic bridges crossing the river. In this manner, the search was continued until midnight and resumed the following day. However, it was not until the rain-swollen river had subsided on Nov. 22 that skin-divers located the body. A hand-carried RACES unit operating from a Coast Guard boat radioed the mobile base station, which in turn notified the local police. Cuyahoga County



There may not be much of a resemblance, but W7QWC, left, was "Santa Claus" to children at a number of children's hospitals in the Portland area. Portland amateurs and AREC members cooperated in this exercise on Dec. 20, with "communication with Santa Claus" as the theme. That's W7SAO on the right.

main control RACES and Zones 6 and 10 participated, represented by the following amateurs: *W8s* BPN ITR MMO NZD OKE GMS, *K8s* DQB GQL.

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On Nov. 23, while the Chittenden County AREC (Vt.) was involved in an all-day exercise, the organized net was suddenly pressed into service to supply communications in connection with two serious automobile accidents. Mobiles and fixed stations were able to notify state police, assist in notifying a doctor and in dispatching a call for a wrecker. EC W1VSA, who was himself active, reports the following other amateurs responsible for a most successful operation: *W1s* EOY HRG DAP EIB, *K1s* CEG CCR DQB BXV, KN1JCF and W4EBD.

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On Nov. 30, after losing all other communications at Saglek Air Station, Labrador, KØHWW/VO2 contacted K4USM in Washington and informed him of extreme high wind conditions destroying buildings and antennas. K4USM tried to contact K4JPO/VO1 at Pepperrell AFB in St. Johns, Newfoundland, by telephone, and at the same time KØHWW/VO2 contacted K4IWR/VO1 at Harmon AFB. K4IWR/VO1 checked in on 21,440 kc. at 1900Z and K4JPO/VO1 at 1925Z to restore communications to the Saglek area. WØAGO cleared the frequency of QRM. W2ZRX/VO1 relieved K4JPO/VO1 at 2045Z after obtaining permission from the chief R.I. to handle official military and commercial traffic on the amateur bands. Running a kilowatt on a "V" antenna pointed at Saglek, W2ZRX/VO1 was able to handle the traffic with ease while K4JPO/VO1 had been having difficulty with his lower power. At 2125Z frequency was shifted to 21,447 kc. to avoid the QRM that was building up on the band, and K8KNB and K9PKC assisted at W2ZRX/VO1. Later, when the 15-meter band folded up, operation was shifted to 20 meters and was assisted by K9CRS in Indiana. When QRM hampered operation on 20, frequency was shifted to MARS frequency 14,305 kc. Other operators at the Pepperrell military station were K9LYF and K3CSD; the officer in charge was W6LOQ.

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On Dec. 13 at 1205, mobiles K4HKD/5 and K5PAT/5 were in QSO with K5DKX when K4HKD/5 saw two young boys loosening guy wires on a utility pole along a highway near El Paso, Texas. Pulling off to watch the mischiefmakers through binoculars he requested K5KDX to notify police headquarters. It turned out that the pole supported a high-voltage feeder line crossing the highway to a sandpit, and that when the pole came down the wires would fall across the heavy Saturday noon-hour traffic. K5PAT/5 was routed to an intercept point so that the boys' escape could be prevented. Police arrived just as K4HKD was leaving his car, and he and the two police officers chased the youngsters down into the sand hills. Examination of the pole showed that in ten more minutes the boys would have caused the wires to fall over the highway with resulting crackups as the high speed traffic hit the hot wires. Prompt action by K4HKD and his cohorts prevented this.

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The Tusco Radio Club of Dover, Ohio, handled election returns last election day on behalf of a local broadcast station. Mobile stations were sent out to approximately 110 precincts within a radius of 25 miles of Dover. Returns were collected by the mobile operators at the polls and relayed to fixed stations, one at the club rooms and one at W8BIM in New Philadelphia, both on ten meters. A six-meter link was used to relay all reports from W8BIM to the club station, at which point the broadcast station picked them up by remote line. Twenty-one amateurs took part in this operation. The club operated a similar setup in the May primaries.

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On November 1, when K4AX undertook a job as communications officer aboard the Race Committee boat in a yacht race sponsored by the Royal Palm Yacht Club of Fort

A.R.R.L. ACTIVITIES CALENDAR

Feb. 20–22: DX Competition (c.w.)
Mar. 5: CP Qualifying Run — W6OWP
Mar. 6–8: DX Competition (phone)
Mar. 19: CP Qualifying Run — W1AW
Mar. 20–22: DX Competition (c.w)
Apr. 1: CP Qualifying Run — W6OWP
Apr. 11–12: CD Party (c.w)
Apr. 18–19: CD Party (phone)
Apr. 20: CP Qualifying Run — W1AW
May 7: CP Qualifying Run — W6OWP
May 19: CP Qualifying Run — W1AW
June 3: CP Qualifying Run — W6OWP
June 13–14: V.H.F. QSO Party
June 17: CP Qualifying Run — W1AW
June 27–28: Field Day
July 2: CP Qualifying Run — W6OWP
July 23: CP Qualifying Run — W1AW

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Feb. 28–Mar. 1: YL-OM Phone Contest, YLRL (p. 65, last month).

Mar. 13–15: QCWA QSO Party, QCWA Northwest Chapter (p. 128, this issue).

Mar. 14–15: YL-OM C.W. Contest, YLRL (p. 65, last month).

Mar. 14–15: Minnesota QSO Party, St. Paul RC (p. 106, this issue).

Mar. 15: W1NJM High Speed Code Test, Connecticut Wireless Assn. (p. 80, this issue).

Apr. 4–5: Helvetia-22 Contest, USKA (p. 76, this issue).

Apr. 4–11: Goose Bay QSO Party, Goose Bay ARC (p. 144, this issue).

Myers, Fla., he soon found out that the marine frequencies being utilized were incapable of doing the job required, so he enlisted the aid of the Fort Myers Amateur Radio Club. A transmitter was set up on the committee boat using 3945 kc., and the greater portion of the reports from the Race Committee found their way via K4IGG, K4GEW or W4KPO, all of Fort Myers. In addition to race reports, this circuit also handled reports from a yacht in distress (which was not in the race) and a call for a doctor for the captain of the committee boat, who was suddenly taken ill.

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For the fifth successive year, the AREC of Cuyahoga County, Ohio, took part in the annual Christmas Parade in Cleveland. The parade control was handled by ten-meter mobiles and a six meter link was used to tie the parade in with the police dispatchers for emergencies. Eighteen AREC members took part. — *W8AEU, EC Cuyahoga County, Ohio.*

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Twenty-six SECs reported November activities on behalf of 6291 AREC members, a record high for the month. One new section, Maine, found its way into the "heard from" column for 1958. Other sections reporting for November: WNY, NYC-LI, N. Dak., E. Fla., Okla., Ind., N. Mex., Santa Barbara, San Joaquin Valley, Ga., Nevada, Minn., W. Va., Ala., Colo., Santa Clara Valley, Vt., E. Bay, Mont., Sask., S. Texas, Mich., Mo., Wis., Wash.

RACES News

A release from OCDM shows that as of the end of 1958 there were 1122 RACES plans in existence, an increase of 84 plans since the last figures reported at the end of June. Massachusetts has added 8 plans since then, increasing its total to an amazing 253, and California has added 9 to make its figure 97. Other states in the high-plans bracket include Connecticut with 93, New York with 84, Pennsylvania and Illinois each with 55, and North Carolina with 48. All states have a state plan except Texas, and in the new list Hawaii is included with a territorial plan.

In October *QST* we ran OCDM's first-of-July figures and also presented a complete list of state radio officers, for the information of all concerned. The following changes have been made since then (all states not listed have the same RO as listed in October *QST*):

State	*Radio Officer*	*Call*
Alaska	Jack M. Walden	KL7BK
Arkansas	George N. Jewett	W5TIE
Connecticut	John L. Henley	W1EOR
Louisiana	Kenneth J. Jumonville	K5BES
Maryland	Harry Boone	W3NPL
Michigan	(None at present)	
Mississippi	(None at present)	
Montana	Ray Woods	W7SFK
Oklahoma	Ed P. Burns	K5KFS
Pennsylvania	Paul D. Mercado	W3FBF
Vermont	Manual Renasco	W1UCU
Wisconsin	Chet Horton	W9YQH

SUPPLEMENT TO NET DIRECTORY

The following list of nets will supplement and correct the listings on page 91, Nov. *QST* and page 89, Jan. *QST*. Please inform us of any errors or omissions so that they can be indicated in the final May *QST* installment. An asterisk (*) indicates correction from previous listing. These nets, or corrections thereof, may be used to bring up to date or correct the cross-indexed master ARRL Net Directory. With the above two listings, this brings the registry up to date as of January 16, 1959.

Important Note: ARRL lists of nets are for *information only*. They do not carry any official significance. Nets are registered as closely as possible in accordance with information given by the registrant. Certain common abbreviations are used to conserve space.

Name of Net	*Freq.*	*Time*		*Days*
After School Net (Fla.) (ASN)*	7100	1800	EST	Mon.-Sat.
After-The-Net Net (ATNN)	3910	1900	CST	Wed.
American Legion Net Inc. (Calif.)*	3975	1900	PST	Daily
Beehive Net (Utah)*	7272	1230	MST	Sun.
The Boise Valley Emerg. 2 meter net (Idaho)	145,440	1930	MST	Sun.
Breakfast Club	3873	0400	CST	Daily
Butler Co. V.H.F. Assn. Net	50,550	1930	EST	Thu.
Cambridge AREC Net (Mass.)	29,470	2030	EST	Wed.
Carbon Co. (Pa.) RACES Net*	145,380	2000	EST	Thu.
Central Kans. Phone Net*	3930	0730	CST	Sat.
City of Akron Ohio CD and Disaster Net*	50,700	1900	EST	Mon.
Clermont Co. Emerg. Net (Ohio)	29,600	2030	EST	Sun.
Eastern Mass. 2 Meter Net*	145,800	2000	EST	Mon.-Fri.
Erie Co. Emerg. Net (New York)*	3915	1230	EST	Sun.
Erie Co. 2 Meter Net (N. Y.)	145,180 145,500 146,250	1600 1600 1600	EST EST EST	Sun. Wed. Fri.
Everett CD Emerg. Net (Mass.)	29,560 146,900	1930	EST	1/3 Mon.
Evergreen Emerg. Net (Wash.)	29,400 51,000	1930 1930	PST PST	Tue. Thu.
Hampton Roads Emerg. Net (Va.)*	29,000 145,800	2000	EST	Mon.
Keep Minnesota Green Net (KMG)*	3810	1900	CST	Daily
Kentucky Korn Krakers Net	3932	0600	CST	Daily
Kentucky Phone Net (KPN)*	3960	1930	CST	Daily
N. J. 6 Emerg. & Tfc Net	51,150	2300	EST	Wed., Sat.
N. Y. State Phone Traffic & Emerg. Net (NYP)*	3925	1800	EST	Daily
Northern Calif. Traffic Net (NCTN)	3905	1830	PST	Daily
Rome "Charlie Dog" Net (CD) (N. Y.)	50,600	2100	EST	Mon.
Satsuma Valley Emerg. Net (SVEN) (Texas)*	3845	1815	CST	Wed.
Sector 2-D Stoughton, Mass. Net*	29,490 147,325	1930	EST	Mon.
Sundown Novice Net (SNN)*	7152	1700	CST	Sat., Sun.
SWANI Emerg. Net (Ill.)*	29,100	2000	CST	Mon.
Tri-County Assn. Net (T-CAN) (Ohio)	50,500	1900	EST	Thu.
Turlock Amateur Radio Club Alternate Tue. Nite Net (Calif.)	145,350	2000	PST	Alt. Tue.
"Twin City Emerg. Net" (Champaign-Urbana) Ill.	28,600	2100	GMT	Tue., Thu.
UTL East West*	7093	2100	CST	Daily
Vanderburgh Co. AREC & RACES Emerg. Net (Ind.)*	29,600	1930	CST	Mon.
Virginia Overflow Net (VON)	29,100	2000	EST	Mon.-Thu.
Wash. Section Net (WSN)*	3535	1900	PST	Mon.-Fri.
Westlake Amateur Radio Net	3950	1000	EST	Sun.
Whittier CD and Emerg. Communication Net (Calif.)*	3885	2015	PST	Thu.

TRAFFIC TOPICS

Once in a while a traffic net tangles with an ARRL-sponsored contest and we receive complaints that contesters ought to be requested to avoid operating on frequencies being used by nets. This problem becomes more acute now that most traffic nets are operating on Saturdays and Sundays as well as during the week.

We've heard it happen. A NCS will be conducting a directed net when all of a sudden a contest man, eyes glittering, bug smoking, will swoop onto the net frequency, give the NCS a call and say "BK." The NCS will acknowledge, whereupon the contest man will reel off an exchange of some kind at a fast clip. The NCS may then do one of several things. He may just ignore the intruder, in which case the latter will probably call a contest CQ right on the net frequency — and get answers there, too! Or, he may patiently try to explain that this is a traffic net and that they are not taking part in the contest; usually the contest man won't take the time to listen to this. Or he may tell the guy to get his blankety-blank contest QSOing off the net frequency, in which case he will get the same kind of language in return. Or, he may put up with the QRM as best he is able and then write to ARRL saying that if we must have contests we should keep them off net frequencies. In the same mail, we'll probably get letters from contest men saying if we must have traffic nets we shouldn't have them on

contest week ends, or else get them off the low end of the bands.

We'll admit that trying to work in a net on the low end of 80 meters when there's a contest going on is a frustrating experience. But fellows, let's face it, QRM is as much a part of amateur radio as is the QSL card, and we're just beating our heads against the wall when we complain about it. You and I may consider what we are doing as traffic men of paramount importance, but the DXers, contesters, rag-chewers, experimenters and certificate-acquirers aren't much impressed; some even have the gall to think that what they are doing is just as important as what we are doing. Imagine! But they are right about one thing: they have as much right to the use of any frequency as we have and don't deserve castigation for exercising that right. Let's not get "het up" about this, boys. Let's maintain a dignified aplomb, as befitting our status of public servants. If the 80-meter QRM is too bad during the nine week ends per year on which contests are held, let's quietly move out from under it and say no more. Either that, or put up with it and do the best we can — which can be pretty good if we tackle it with determination!

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Net Reports. Early Bird Transcon Net reports 31 sessions, 1664 messages handled in December. Hudson Traffic Net had 31 sessions, 306 check-ins, handled 579 messages. Interstate SSB Net 75-meter section had 31 sessions, 1922 check-ins, 2131 messages; the 20-meter section had 17 sessions, 296 check-ins, handled 641 messages; total traffic for both sessions, 2772. The 7290 Traffic Net handled 42 sessions and 979 messages with 1632 check-ins. Transcontinental Phone Net reports: first call area, 1630; second call area, 2340; 4th, 9th and 0th call areas, 776; total, 4746.

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National Traffic System. Early in January, all regional and area net managers and the three TCC directors were informed that as of January 1, 1959, NTS was considered to have been officially on a daily basis. This is to inform all concerned of that fact. So far, opinion has been unanimous that this was a progressive step, even though some have admitted that carrying it out will be difficult. Anyway, from now on the daily NTS net at any level will be considered standard, and all nets are urged to bring themselves up to it.

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We have just concluded some correspondence with Bob, K6HLR, RN6 Manager, concerning a standard form to be used by NTS net control stations in keeping track of the traffic being handled during the course of a directed net. Bob's suggested form is excellent, but is designed specifically to serve RN6; other nets, operating under different circumstances, would find its use impracticable, for the most part. Some time ago, W4CDA had a proposed form which he made available on request to anyone who thought they might be able to use it. We have visited quite a number of NTS net control stations and have found that each operator uses a form of his own devising; no two of them have been exactly alike, although some are very similar.

New NCS quite often inquire the best method to use in keeping track of stations and traffic in a directed NTS net. Actually, what is "best" is a matter of opinion; ordinarily each NCS considers *his* method the best, but nine out of ten of the methods used are applicable only to one particular net. Combining logic with a lot of suggestions received from the field, we'd like to suggest the following:

On the left-hand edge of a piece of standard 8½ × 11" paper, rule columns headed "Down 5," "Down 10," or however you dispatch your QNY stations on the net; rule one column for each QNY frequency ordinarily used, with those farthest away from the net frequency nearest the edge of the paper. On the right-hand edge, rule a similar number of columns headed "Up 5," "Up 10," etc. This will leave quite a band of white space in the middle of the sheet. On the left of this space, rule another column headed "Net Frequency," then progressing toward the right rule columns headed "Station," "Rep" and "Traffic." The "Net Frequency" column can be quite narrow (heading can be abbreviated), the "Station" column just wide enough for call letters. The "Rep" column is used to show what area that station will take traffic for; in most cases this indicator, if used, can be abbreviated so that this column too can be kept quite narrow. This will leave quite a wide space for the "Traffic" column, which shows how many and the destinations of traffic the reporting station has on the hook.

Now rule horizontal lines across the page to accommodate as many stations as ordinarily report into the net. Incidentally, you should be doing all this *before* the net starts. Also, you should have on hand a number of small, movable objects which can be placed in the "net frequency" column and moved to any of the QNY frequency columns; small hex nuts can be used conveniently for this purpose.

Okay, we're all ready to start the net. You make the customary net call-up. The first station reports in; you enter his call in the "Station" column, enter in the "Rep" column what coverage area he represents, list his traffic in the "traffic" column, put a hex nut next to his call in the "net frequency" column, tell him to stand by. Another station reports in, and you repeat the process for him. If these two stations have traffic for each other, you tell them to move to a QNY frequency, let's say "down 5." You then move their hex nuts horizontally so they will be in the column headed by that frequency, and cross out the traffic they are sent there to clear. When they come back to the net frequency, you return their hex nuts to the "net frequency" column and maybe pair them up with someone else to clear other traffic on the same or another QNY frequency. Just by glancing down the "net frequency" column you can see who is still on the net frequency awaiting your instructions, and the traffic each has for whom (from the "traffic" column). If a station is not on net frequency, you can see immediately just where he is by noting the location of his hex nut. As stations are QNXed or as they QNO, you cross them off the list and return the hex nut to your hardware box.

There is only one disadvantage to this system; don't bump the table or sneeze too hard on your sheet. If you do, you'll be in a mess! Of course you can get around this difficulty by using a steel plate for backing and small magnets instead of hex nuts.

If there is sufficient demand for forms of this kind, we may some day get up something like this for you; but first we'd like your comments. Do you see any other disadvantages that we may have missed, or is there a better method we haven't heard about? Remember, now, any proposed form has to apply to *all* nets, not just to yours.

December reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
1RN	21	918	.510	29.6	94.8[1]
2RN	62	999	.530	16.1	98.9
3RN	46	937	.451	20.4	92.0
4RN	58	1440	.506	24.8	68.2
RN5	62	1944	.836	31.4	95.0
RN6	62	2085	.639	33.6	87.3
RN7	40	649	.281	16.3	....
8RN	56	517	.250	9.2	83.3
9RN	58	2280	.882	39.3	80.6
TEN	93	2795	1.270	30.5	72.6
ECN	28	138	.230	4.9	71.4[1]
TWN	31	790	.392	25.3	71.6[1]
EAN	29	2317	1.350	79.9	98.8
CAN	31	2619	1.380	84.5	100.0
PAN	31	2730	1.069	88.1	100.0
Sections[2]	972	11620		12.0	
TCC East	81[3]	399			
TCC Central	62[3]	1953			
TCC Pacific	112[3]	2021			
Summary	1690	39151	CAN	20.6	CAN/PAN
Record	1394	28049	1.257	23.5	100.0
Late report:					
8RN (Nov.)	51	258	.035	5.0	87.6

[1] Regional net representation based on one session per night. Other regional nets are based on two or more sessions.
[2] Section nets reporting: SMN (Md.); NJN (N. J.); SCN (S. C.); WIN & WSSN (Wis.); Iowa 75 Phone; TLCN (Iowa); SCN (Calif.); Gator, FN, FPTN, FMTN & NWFN (Fla.); VN (Va.); S. Dak. 40 Phone, S. Dak. 75 Phone & SDN (S. Dak.); CN & CPN (Conn.); Tenn. C. W.; MSPN (Noon), MSPN (Eve), MJN, MSN, KMG (Minn.); QMN (2 Mich. nets); KYN, KPN Morning, KPN, KSN (Ky.); WVN (W. Va.); AENP Morning, AENP, AENB & AENT (Ala.).
[3] TCC functions reported, not counted as net sessions.

Phew! What a December! No wonder traffic becomes so light so suddenly in January. All the traffic men are pooped out. The above stupendous totals of net sessions and total traffic not only surpassed all previous December records,

but did so by a wide margin. Most NTS nets were working to capacity most of the time, especially toward the end of the month, and no doubt the traffic total would have been even higher had it not been necessary to divert much of our overload to other nets. The main lesson learned is that as more traffic men participate in NTS the greater our capacity becomes. If this is still not great enough to handle the terrific holiday season load, there's nothing to get excited about. The increased capacity will allow us to handle any normal load with greater ease, and therefore with greater accuracy. A splendid performance, fellows!

Regarding NTS daily operation, all but two regional nets (Seventh & Eastern Canada) are now operating daily, and these two are endeavoring to come up to standard. All three area nets and all three TCC areas are also operating daily. Of the above section nets reporting December traffic (36 altogether), 18 are operating daily, 11 are on a six-day schedule, five on a five-day schedule and two less than five. Of course this will probably decrease during the tough summer months, and as propagation conditions start to deteriorate as we progress into the low sunspot cycle we may find that our 1958–59 activity will be an all-time peak. Right now we are riding high and it looks as though we may go still higher.

Transcontinental Corps. WØBDR, Central TCC Director, says that the figures shown in his report do not include a lot of traffic handled by some his boys directly into PAN, but is nevertheless a fine showing. W6BPT congratulates his crew on a wonderful job in 1958.

December reports:

Area	*Functions*	*Successful*	*Traffic Out-Of-Net*	*Traffic*
Eastern	81	88.9	3256	399
Central	62	96.8	2457	1953
Pacific	112	91.1	3956	2021
Summary	255	91.8	9669	4373

The TCC Roster: Central Area (WØBDR, Dir.) — W9CXY, *WØs* BDR LCX LGG SCA. Pacific Area (W6BPT, Dir.) — W5DWB *W6s* ADB PLG BPT EOT VZT UTV HC ELQ ZRJ YHM, *K6s* DYX EWY ORT LVR HLR GES GID. *W7s* VIU GMC ZB. WØKOD.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for December traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W2KEB	422	2478	2088	481	5469
WØSCA	62	1799	1796	2	3659
W7BA	19	1611	1568	38	3236
WØBDR	149	1380	1261	5	2795
W8UPH	20	1276	1206	67	2569
K6HLR	126	958	806	112	2002
W3CUL	148	937	620	296	2001
WØLGG	44	964	869	46	1923
W7PGY	35	901	832	63	1831
WØPZO	3	916	899	9	1827
K4PZL	117	827	580	208	1732
WØLCX	107	809	755	54	1725
K6YBV	31	830	790	16	1667
W9DO	19	807	84	742	1652
WØBLI	3	789	777	7	1576
W6EOT	6	688	644	67	1405
K1BCS	468	456	397	48	1369
WØCPI	16	637	591	46	1290
K2SIL	31	614	608	28	1281
WØIA	42	637	582	4	1265
KØGYA	66	589	562	3	1220
K2UTV	11	585	585	0	1181
W6GYH	250	468	452	11	1181
KØIDV	42	562	524	21	1149
W5RCF	16	554	531	23	1124
K4SJH	88	538	429	57	1112
KØONK	158	466	456	6	1086
K1CLF	192	462	394	20	1068
W9NZZ	308	380	0	379	1067
K4QES	333	367	339	17	1056
KØKBD	21	516	508	4	1049
K2MES	48	505	479	13	1045
K5OEA	67	486	441	38	1032
K4ELG	21	514	449	38	1022
K4KNP	9	519	487	0	1015
W9JOZ	26	468	488	10	992
W5CEZ	55	473	423	40	991
W9ZYK	17	474	391	100	982
WØOHJ	6	480	472	8	966
K6IBPI	102	423	186	237	948
K8BPX	36	421	390	26	873
WØGXQ	150	357	336	13	856
K2QBW	62	397	276	109	844
W3LXU	9	419	394	15	837
W1AWA	22	473	321	17	833
W1EMG	4	432	343	53	832
W7QLH	17	411	384	13	825
W3PZW	36	403	287	94	820
K6OJV	21	412	371	11	815
W9IDA	22	393	388	10	813
W7ZB	29	382	355	27	793
W2RUF	39	395	189	165	788
W4SHJ	570	133	48	34	785
W4GXR	14	376	331	39	760
WØOME/5	113	321	319	2	755
W9DYG	70	334	247	78	729
W7DZX	2	367	329	30	728
W4PFC	51	310	333	33	727
W3UE	23	367	320	16	726
WØKQD	108	321	279	14	722
K4AIS	71	365	274	6	716
K2OOK	221	261	214	19	715
K4JKK	20	353	287	43	703
K6DYX	64	319	314	1	698
WØSCT	29	342	325	2	698
K4AET	5	344	338	9	696
K1BYL	37	349	305	3	694
W5DRZ	35	331	317	5	688
K5MBK	64	322	271	30	687
W9VAY	5	354	311	13	683
W1EFW	15	327	305	14	661
W5DXI	34	313	306	7	660
W1KYQ	10	347	293	7	657
WØWMK	2	327	324	2	655
W3CUL/4	116	293	221	23	653
W9MAK	90	285	251	26	652
W4OGG	4	325	295	27	651
WØFNS	16	325	254	25	620
W5DWB	18	304	219	77	618
K4GPL	16	307	288	4	615
W1UEQ	29	293	221	66	609
W4RLG	24	300	246	39	609
W8FNI	87	266	246	5	604
K6OZJ	3	300	280	20	603
K5CAY	8	334	256	4	602
K6GK	30	285	140	145	600
K4PFM	82	256	230	26	594
W5SMK	53	270	260	10	593
KØHHQ	102	243	235	6	586
W7BDU	4	293	280	6	583
W1NJL	136	222	185	37	580
K2VCO	44	286	217	24	571
W4PJU	12	279	233	46	570
K8FDK	36	271	241	22	570
K4OAH	56	258	240	2	556
K2YBC	73	251	155	69	548
KL7BJD	50	224	125	149	548
W6BPT	10	268	267	1	546
W8OCC	7	263	262	2	534
KØDCW	24	255	14	240	533
W2OPB	46	241	215	24	526
W3BUD	98	197	106	106	507
K2YTD	81	222	167	36	506
K4RZQ	86	213	196	9	504
K2GWN	49	239	214	1	503
Late Reports:					
WØDO (Oct.)	18	391	62	347	818
K4ELG (Nov.)	26	347	325	14	712

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
K5WSP	486	1598	1518	113	3715
K4WCZ	378	248	120	21	767
KGIDT	185	187	26	161	559
W1AW	15	247	98	146	506

BPL for 100 or more *originations-plus-deliveries*

W3CVE....357	K1JAD....130	K2MIG....107
K3WBJ....287	KØBLJ....129	K5DNQ....107
W4QDY....219	W9TT....124	KØIRL....107
W9DGA....180	K2AGJ....123	K2PTS....105
K6GZ....179	K4PIA....122	K4PVU....105
K9GDQ....176	W7APS....121	W8WXO....104
W1OMC....175	K9ESN....119	WØZWL....104
W6BHG....172	K8JLF....118	K9IXD....103
KØORK....168	K9ISP....116	K9JIN....103
W8DAE....162	W9CC....115	W3TN....102
W8IBX....162	WØANA....115	K4DRO....102
W2KFR....153	WA6BAQ...114	WØFAW....102
WØIFR....149	W6QMO....113	KN6QVU....102
K9GDF....135	W1YBH....112	K4QIX....101
W1YAP....134	K3AHT....112	K4IWK....101
W4CJD....134	K2YBJ....111	K1DWQ....100
W4BYZ....133	WØJPJ....111	K2MFF....100
K4CZQ....132	K4HQK....109	Late Report:
K4QER....132	W4BVE....108	K2YBJ (Nov.)
K4OID....131	K4LEM....108	108
	W4SRK....108	

More-Than-One-Operator Stations

K2OKZ 353 W2DSC 128 K5USA 113

BPL medallions (see Aug. 1945 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W1AWA, W5CEZ.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on March 19 at 2130 Eastern Standard Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted March 5 at 2100 PST on 3590 and 7128 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date	Subject of Practice Text from January *QST*
Mar. 3:	"*It Seems to Us* . . .", p. 9
Mar. 9:	*A Simple* . . . *Rig*, p. 16
Mar. 12:	*The Impromptu Ground Plane*, p. 20
Mar. 16:	*Bell Break*, p. 44
Mar. 18:	*September V.H.F. Party Summary*, p. 48
Mar. 24:	*VQ1 DXpedition*, p. 50
Mar. 31:	*Space Station* . . ., p. 53

BRIEF

It was 'way back on January 8, 1936, that the first Worked All States award was issued to Miles W. Weeks, W1WV, presently W6ZZ. Now the Communications Department happily announces issuance of the *10,000th* WAS on December 5, 1958, to Dave J. Cook, K4UKO.

DX CENTURY CLUB AWARDS

From December 1, 1958 to January 1, 1959 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

HONOR ROLL

W1FH.....292
Z12GX.....290
W6AM.....289
PY2CK.....289
W3GHD.....288
KV4AA.....287
W3JNN.....286
W5ASG.....285
W8BRA.....284
W8JIN.....284
W6SYG.....284
ZL1HY.....284
W9RBI.....283
W3KT.....283
G2PL.....283
W2BXA.....283
W2AGW.....283
W8HGW.....282
W2HUQ.....282
W6CUQ.....282
W8DMD.....282

Radiotelephone

PY2CK.....289
W8GZ.....280
W1FH.....279
ZS6BW.....278
VQ4ERR.....276
W3JNN.....275
W8BF.....273
ZL1HY.....272
W9RBI.....270
W8HGW.....267
CX2CO.....267
W8KML.....267

NEW MEMBERS

ZL1PV.....177
G2HAP.....152
W1MDO.....150
DL3ZI.....150
OZ8U.....122
SM5BO.....121
SP8AG.....120
W4NT.....117
K2MGR.....110
W8BQV.....110
F9GB.....110
G3KZI.....110
KP4VUH.....110
W2AAU.....108
K6LSG.....108
K2QHL.....107
W5LBC.....107
HB9PM.....107
K2IXP.....106
W7LEV.....105
K9BLY.....105
K0HGB.....105
F3QJ.....105
OH3SE.....105
ON4LB.....105
SP5HS.....105
W2FZY.....104
K9CTX.....104
G2DUP.....104
SP9CU.....104
W1NVB.....103
W1YWV.....103
K4QIJ.....103
K5GUT.....103
W8OG.....103
W9KQD.....103
CN8FW.....103
K2DBN.....102
W4ZQK.....102
W0CVZ.....102
LA4ND.....102
W1AZU.....101
K4DKE.....101
W5BUK.....101
K6SXA.....101
W8ZCQ.....101
DJ3FW.....101
DL1PA.....101
OK1KLV.....101
VP5RR.....101
VE7YE.....101
K1CJV.....100
K2IRO.....100
K2TCD.....100
K4TJL.....100
W6EUV.....100
K6IAP.....100
W7IAM.....100
K8CVQ.....100
W8ETU.....100
W8QZA.....100
W0QDP.....100
KH6EQ.....100
OE1HZ.....100
SP5AA.....100

Radiotelephone

W6RCD.....149
ZL1PV.....134
MP4BBW.....130
W4PDL.....125
W4QCW.....123
W1BKT.....120
W2QHH.....114
W6YMD.....111
K9COS.....111
W1AJV.....109
W9CMC.....107
W1SIO.....106
K0CTL.....106
ZL1VY.....106
W6YK.....105
W3ERW.....104
W6UPP.....103
W8MG.....103
CT1HF.....103
W2EGQ.....102
I1CKV.....102
SM5BO.....102
CT1EX.....101
W1NVB.....100
W2TP.....100
HK4AQ.....100

Endorsements

W8BKP.....281
W9YFV.....261
W6MUR.....273
W8UAS.....272
W1BIH.....270
W8KML.....270
W8DAW.....270
G6ZO.....270
W5KC.....263
W7PHO.....263
W3ECR.....261
W7EZA.....261
W7GXA.....261
W7KTN.....261
W9QVZ.....261
W1AXA.....260
W9FKC.....260
W4QCW.....256
W2LV.....252
K6ENX.....250
KH6IJ.....250
W6YMD.....247
W2BRV.....243
W6KSM.....243
W9WHM.....240
W9VIN.....239
W3ALB.....237
W2CR.....232
W5PZL.....231
K2OEA.....230
W6YK.....230
W3MFW.....227
ON4PA.....224
W1FZ.....223
W3FYS.....222
W7HKT.....221
W9SFR.....221
G8KS.....220
SM7MS.....220
W2IRV.....217
I1TTAI.....216
W1RD.....212
W4AZK.....212
G6XL.....212
W8LGG.....211
CN8JX.....211
YU1AG.....211
W2FBS.....210
W6BIL.....210
W6LTX.....210
W6RLP.....210
W6SQP.....210
K4BVQ.....207
W9TQL.....207
W7BGH.....205
W4VYP.....203
W9DYG.....203
W3AYS.....202
JA1AG.....202
W1KXU.....201
W8HMI.....201
W9RKP.....201
W1BGA.....200
W3SOH.....200
TG9AD.....200
VS6AE.....200
VE7SB.....199
CE3HL.....196
EA1BC.....196
W6SUQ.....194
W2OBX.....190
W9VP.....190
ON4DH.....190
ZL1AJU.....190
W6OBH.....185
W1IJB.....183
W8WT.....183
W2PZI.....182
ZS1RM.....182
W2OTC.....181
W8WFB.....181
W9QNO.....181
ZL4BO.....181
W2BUI.....180
W3DBX.....180
K4PDV.....180
DL1YA.....180
PY1ANR.....180
W1ELR.....175
SM3EP.....175
W8TUO.....173
K9EAB.....173
W3ARK.....171
YV5FK.....171
W2FXA.....170
W5DA.....170
W6FHR.....170
W7CSW.....170
W9PQA.....170
W4CYR.....169
W3RPG.....165
W2AXR.....164
W6AGO.....164
W2CGJ.....161
K4HFS.....161
W4HKJ.....161
G2FYT.....161
KP4WN.....161
W1AW.....160
W2PDB.....160
W3EEB.....160
W6GSL.....160
DL1HA.....160
W9IRH.....158
W8RVU.....156
W8SZS.....156
W0YPQ.....156
DL3TS.....155
G3JKF.....155
W1OTX.....154
K4DRO.....154
SP7HX.....154
W1YPK.....153
W4VCB/3.....153
W4QT.....153
W9GFF.....153
4X4CJ.....153
I1UA.....151
W3AYD.....150
K5DGI.....150
W9PIO.....150
K1HRG.....149
W9QGR.....142
W0EWH.....142
W1ACB.....141
K2DSV.....141
W2PTD.....140
W7IAA.....140
OH2VZ.....140
SP3PL.....140
W4FZO.....137
NZ2TH.....137
W8CJ.....136
K4CLT.....135
W1GET.....134
W3QMG.....133
F3TP.....132
K4LTA.....131
W4WSJ.....131
W5AUJ.....131
UB5DW.....131
W3CDG.....130
K6OXU.....130
W8IBX.....130
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K9ALP.....125
W2IVS.....124
K6GLC.....124
K2HXL.....123
W6MUM.....123
W2QQQ.....122
K2SHZ.....122
W3IPO.....122
K2IAD.....121
K6CTV.....119
W0DRG.....117
W3HVM.....116
W3YPI.....116
G3JHZ.....116
W2KIR.....113
W1FQA.....111
W2BYN.....110
W2QDY.....110
K2ZAU.....110
W3OJW.....110

Radiotelephone

W6YY.....263
ZL2GX.....262
W8BKP.....250
W6GVM.....242
W3GHM.....224
W7PHO.....219
W6MBD.....211
PY1NC.....211
ZL1KG.....210
ON4SZ.....204
W4JGO.....200
W2HTI.....197
CE3HL.....193
CX2AX.....193
W4TFB.....193
W1GOU.....191
OZ7FG.....190
W2BQM.....180
W6OBH.....180
W6AED.....179
W8WT.....179
W1BPZ.....171
ZL1PA.....165
W6FHR.....163
W4VYP.....162
W6CHY.....161
I1KDB.....156
W2BYP.....153
DL3TJ.....151
W1YPK.....150
W2LV.....150
I1UA.....150
ZL4BO.....142
W1KRS.....140
W1VAN.....140
SM3EP.....136
W5HAD.....134
W3RPG.....133
W4WSJ.....131
W2TXB.....130
W4VCB/3.....130
W8HOY.....130
W0IGL.....130
G5LN.....130
YU1AG.....129
W8RVU.....127
VE7SB.....123
W9UZC.....121
DL6PC.....121
W2DSU.....120
K2QQQ.....120
W7SFK.....120
W3ROA.....119
W8SZS.....118
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W8RDX.....110
SP7HX.....110

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W4TM.....274
W7GUV.....268
W0ELA.....267
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VE1EP.....217
VE2WW.....237
VE3DIF.....212
VE4XO.....180
VE5RU.....163
VE6NX.....214
VE7ZM.....257
VE8AW.....195
VO1DX.....199
ZS6BW.....278
4X4DK.....267

Radiotelephone

W2BXA.....241
W4HA.....235
W5BGP.....241
W6AM.....265
W7PHO.....219
W0AIW.....233
KL7AFR.....190
VE1NH.....122
VE2WW.....172
VE3KF.....224
VE4RP.....102
VE5RU.....156
VE6NX.....115
VE7ZM.....224
G2PL.....257
4X4DK.....260

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Richard B. Mesirov, W3JNQ—SEC: DVB. RM: AXA. PAM: TEJ. New appointments for the month: MFW and K3DZB as OOs; FKE and ZLP as ORSs. HNK is on 160-meter phone and pleads for more W3 activity. K3ANS has a new Valiant. K3AOX has a new Ranger. K3CUY is wiring an Apache transmitter. K3DVK passed the General Class exam and is going on s.s.b. K3BLC has a new harmonic. The Lancaster RTS is making plans for its annual banquet to be held Apr. 18. FCI looks forward to a June high school graduation and plans to take up meteorology. CUL makes the BPL from Fla. as well as from E. Pa. EPL has been QRT because of basketball. The Hazleton ARC reports into the Luzurne Co. C.D. Net with its club station SJI. K3AHT made the BPL on deliveries and has applied for ORS appointment. FYR is building his Viking II and S-85 into a console. FEY has a 4X150A on 220 Mc. and is building a parametric amplifier for 144 Mc. K3ASH is busy with traffic and school work. EAN is busy keeping a New Year's resolution to answer 100 QSLs. UIU and BQA received W-Conn. awards. KN3DTL has a new SX-99. K3ALD made WAC. KGA made WAC on phone after 13 years. AXA still needs a Philadelphia traffic outlet. Anyone interested, please contact him or the SCM. CMN has a new Globe Scout and 300-watt linear amplifier. New officers of the Pocono ARK are JTI, pres.; KMD, vice-pres.; KN3DNT, secy.; KAK, treas. MGP worked his first DX. LLR has a new Apache. YAZ is teaching school in Perkasie. UCY is now on s.s.b. KJ received a 40-ft. tower for Christmas. QZT also received a 40-ft. tower, plus a triband beam. NWJ was showered with Heathkits including an s.s.b. generator. GTQ has returned to Philadelphia. VZC has a new triband beam. K3ACO uses his mobile rig from his home set-up FYD has a new Ranger. KCL is a Silent Key. TEJ traded in his NC-183D for a new NC-300 and claims he can copy s.s.b. K3AAX applied for OES appointment. New officers of the Philmont Mobile RC are AWH, pres.; VVS, vice-pres.; IVD, secy.; OEC, treas. New officers of the Frankford RC are DRD, pres.; DHM, vice-pres.; IYE, secy.; WJD, treas. RCE and GSB received new beams for Christmas. K3DUC has a second YL jr. operator. AUF has a new 10-meter mobile rig in operation, designed and built by OM QV. K3AUS is a new Asst. EC for Juniata Co. Traffic: W3CUL 2001, K3AHT 336, W3AXA 188, WHK 185, UIU 172, FKE 162, BUR 149, TEJ 141, ZRQ 139, K3ANS 130, ASH 102, ALD 101, W3HNK 66, AMR 65, BNR 59, ZLP 56, BFF 30, K3CVH 28, W3AMC 26, NNL 22, FYR 21, NQB 21, MET 12, MJM 12, ADE 10, K3AFW 8, W3ELI 4, ID 2, PVY 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Louis T. Croneberger, W3UCR—Asst. SCM for Delaware: Ray deCourcelle, 3DQZ. SEC: YYB. New appointees: BUD as RM and AHQ as OO (v.h.f.). Section nets: MDD, 3650 kc. M-S 1915; MEPN 3820 kc. MWF 1800, SS 1300; Del. EN 3905 kc. Sat. 1830; Maryland Six-Meter Emergency Net 50.25 Mc. Wed. 2100. GA, Chief of the Public Safety & Amateur Dvision of the FCC, a member of the MEPN since its beginning, a member of the RCARA and a friend of every amateur, passed away suddenly on Dec. 17. A full military funeral was held at Arlington National Cemetery on Dec. 22. His counsel and fellowship will be missed by all. BARC had LO as the guest speaker on Dec. 15. Charlie spoke on his "Experiences with the new Parametric Amplifiers." BVL informs us that the B&O R.R. RAC is offering an FB certificate to any station working 10 members. QSLs go to GJY. RCARA had W4CIZ, FCC Engineer of District 24, as guest speaker to start off the New Year. He spoke on "The Amateur and Public Relations." PZW is back on the air with his old call after returning from KB6 and was tops in traffic in the MDD in December. BPLers for December were PZW, UE, BUD, CVE, TN and K3WBJ. UE reports that 3RN is on daily schedule (Mon. through Sun. 1945/2130 on 3590 kc.). The District Heights Radio Club has received the call K3HDQ. EEB received his 160 sticker for DXCC. AYS reports receiving his WAZ and cards from VS9 and ZD2 to give him 203 confirmed. ALD, ex-TF3WCZ, is in Davidsonville. KN3s GNQ and GMC can be found on 80/40 meters and KN3HAE is new in Germantown. K3DIF has dropped the "N" and is now General Class. KN3GJC, Marie, is looking for some help to get on the air. SSB is now on 6 meters. GRF is reported to be installing an 80-meter full-size two-element beam atop an 85-ft. tower. This is in addition to his full-size three-element on 40 meters already in operation. GNQ has a new KWM-1 and K3DOQ has his 75A-3 and also a kw. on s.s.b. MTU has gone to d.s.b. and has a new Globe Champion. K3GPN, ex-K1AXZ, ex-W2KJE, is now in Rockville. By the time you read this your SCM will be on six weeks ATD with the Navy in Cuba and the Carribean and expects to operate 6 meters from KG4-Land. BUD has started a slow-speed net (15 w.p.m.) on 3650 kc. at 2045 Mon.-Thurs., to train c.w. operators. Correspondence is slowly getting caught up because of a new assignment in Norfolk, Va., and some time at sea with a destroyer division. Every effort will be made to have all correspondence and appointments current at an early date. Traffic: (Dec.) W3PZW 820, UE 726, BUD 507, CVE 378, K3WBJ 356, W3PQ 241, TN 181, NNM 144, AHQ 143, QCW 127, MCG 98, CN 47, EEB 25, WV 3, JZY 2. (Nov.) K3GPN 88, W3QCW 79.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. RMs: W2BZJ, W2HDW, W2YRW and W2ZI. The Burlington Short Wave Radio Club reports the following officers: K2PPT, pres.; W2KUU, vice-pres.; K2QIJ, secy.-treas.; and K2BNS, act. mgr. K2MXN is the club call. K2DEI continues to handle traffic on sked from Cape Christian, Baffin Island. NJN had a total attendance of 496 and a traffic total of 608. K2OOK took top traffic honors again this month. W2RXL has taken over the leadership of NJN. K2CPR, Pennsauken, has received the WAZ certificate. His DX totals are now 240/231. K2EWR, now in the USAF, was home on leave over the Holidays. W2EXB, K2UFE, K2OOK, W2DAJ and W2SDB were the SJRA leaders in the 1958 Sweepstakes Contest. K2HOD, W2LBX, K2SEI, K2UQD, W2KFC, W2BLV and W2BAY are the newly-elected SJRA directors. The Delaware Twp. High School Radio Club's new officers are K2ZJD, pres.; K2VQH, vice-pres.; K2UFE, secy.-treas. Atlantic Division Director Crossley again has appointed your SCM an Assistant Director for '59. W2UA, Moorestown, has retired from the RCA after 46 years' service. We wish him many years of good health. K2SOL, Sewell, and K2JGU, Glassboro, are heard regularly on the NJ Fone Net and TCPN. No reports were received from Mercer, Atlantic or Cumberland Counties. Traffic: (Dec.) K2OOK 715, K2DEI 252, K2JGU 181, W2BZJ 162, W2HDW 155, K2SOL 47, K2EWR 15. (Nov.) K2DEL/K3DTT 139, K2CPR 6.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2GBX. RMs: W2RUF and W2ZRC. PAMs: W2PVI and W2LXE (v.h.f.). NYS C.W. meets on 3615 kc. at 1800, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800. NYS C.D. on 3509.5 and 3993 kc. at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900. LSN on 3970 kc. at 1900. W2PPY has moved to Ft. Worth. WE is pleased to announce the appointment of W2GBX as SEC. NYSPTEN officers for '59 are K2RTN, mgr.; K2DXE, 1st asst. mgr.; W2PGA, 2nd asst. mgr.; K2KQC, secy.-treas. W2ROL has been appointed contact for Erie Co. The NYS C.W. Net reports 356 sessions in '58 with a total of 5590 messages. K2SIL won the award as the most valuable member of the net. The WNY 6-Meter Traffic Net meets on 50.3 Mc. at 2200 on Tue., Thurs. and Sun., reports Net Mgr. K2KYT. K2SIL, K2MES,

(Continued on page 102)

A FABLE FOR 1959

MANY YEARS AGO there were two small kingdoms, Transylchusia and Pantukia, both of which bordered the larger kingdom of Slobovia. King Alexis of Transylchusia and King Boris of Pantukia were friends of many years' standing, as were their fathers before them. Peaceful relations had existed between the two countries for centuries. As far back as man could remember, a mutual defense treaty had existed between Transylchusia and Pantukia. This bond had been a strong deterrent to the predatory policies of Slobovia, whose rulers had long cherished the dream of gobbling up the two smaller countries, thus adding to their domain.

ALEXIS and Boris had for many years enjoyed the same hobby, the raising of white rabbits with pink eyes. The avocation had become popular among their subjects, and new and better methods of improving the breed were constantly exchanged between the two countries.

BUT IT CAME to pass that a bright young man in Pantukia developed a new strain of white rabbits — with green eyes. The Pantukian king soon disposed of his pink-eyed rabbits and devoted his efforts to the improvement of the green-eyed breed, as did his subjects. Soon this difference in concepts led to a bitter feud between the two kings — and the two kingdoms. As the rivalry increased, friendships crumbled. There was name calling, and border incidents became numerous. Soon the armies of both countries were massed along the frontier, poised for attack. The mutual defense treaty was forgotten.

TODAY, Transylchusia and Pantukia are no more. Adolph, Emperor of Slobovia, had no difficulty in defeating the divided armies of the two tiny kingdoms and annexing their lands. The raising of rabbits *is now forbidden* in these areas.

PERHAPS the foregoing may have a parallel in a situation which has come into existence in *our* hobby — amateur radio. Commercial interests have long coveted our amateur frequencies. Certainly, feuding between sidebanders and AM phone operators, or between CW operators and RTTY enthusiasts, does little to ensure the safety of our "Borders." Let's not tear up our "Mutual Defense Pact" over pink and green-eyed rabbits.

— TOM STUART, WØREP

Bill Halligan Jr. W. J. Halligan W9AC for hallicrafters

XYL OR OM...THEY'LL ALL TELL YOU...

Viking transmitters outsell all others!

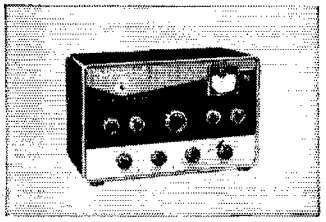
Yes, dollar-for-dollar and feature-for-feature you'll get more of everything in a Viking transmitter . . . that's why Viking transmitters outsell all others! Write for your free Viking Amateur Catalog and you'll soon see why your best transmitter buy is a Viking!

...NEW! "6N2" CONVERTER

This compact, new Viking "6N2" Converter provides instant front panel bandswitching from normal receiver operation to either 6 or 2 meters. Designed for maximum sensitivity and low noise figure... offers excellent image and I. F. rejection. With tubes.

Cat. No.	Amateur Net
250-43-1, or -2, or -3..Kit	$59.95
250-43-12, or -22, or -32..Wired, tested	$89.95

NOTE: Specify either Kit or Wired plus your choice of the following ranges: 26 to 30 mcs.; 28 to 30 mcs.; 14 to 18 mcs.



"6N2" TRANSMITTER

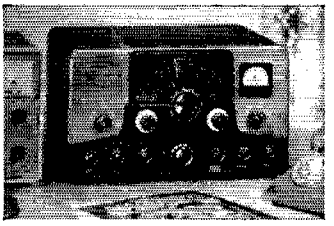
Instant bandswitching 6 and 2 meters. Rated 150 watts CW; 100 watts AM phone. Use with "Ranger", "Viking I", "Viking II", or similar power supply/modulator combinations. With tubes, less crystals.

Cat. No.	Amateur Net
240-201-1..Kit	$129.50
240-201-2..Wired, tested	$169.50

"6N2" VFO

Compact—stable! Replaces 8 to 9 mc. crystals in frequency multiplying 6 and 2 meter transmitters. With tubes and pre-calibrated dial.

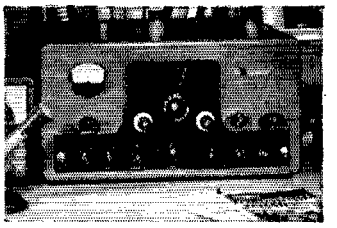
Cat. No.	Amateur Net
240-133-1..Kit	$34.95
240-133-2..Wired, tested	$54.95



"RANGER" TRANSMITTER/EXCITER

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

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



"VALIANT" TRANSMITTER

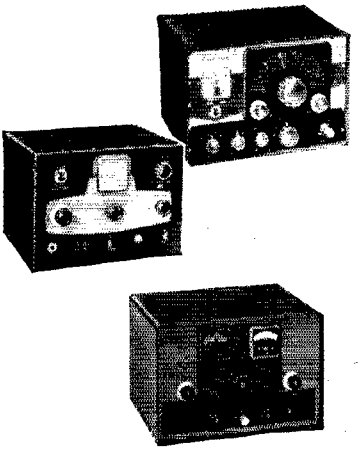
Here's effective power, wide flexibility, and many unique operating features combined in a compact desk-top transmitter! 275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) and 200 watts phone. Bandswitching 160 through 10. Built-in VFO or crystal control. Final amplifier utilizes three 6146 tubes in parallel—wide range pi-network output. With tubes, less crystals.

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

E. F. JOHNSON COMPANY

2901 SECOND AVENUE S.W.

Don't forget the New York SSB Dinner and Hamfest—Mar. 24—Hotel Statler Hilton, N.Y.C.



"NAVIGATOR" TRANSMITTER/EXCITER

More than a novice transmitter—serves as a flexible VFO-Exciter with 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. Timed sequence keying. TVI suppressed. With tubes, less crystals.

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

"ADVENTURER" TRANSMITTER

Perfect for novice or experienced amateur! 50 watts CW input—instant bandswitching 80 through 10 meters. Crystal or external VFO control. With tubes, less crystals.

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

"CHALLENGER" TRANSMITTER

Ideal for fixed station or portable use! Fast, easy tuning—excellent stability and plenty of reserve drive. 70 watts phone input 80 through 6; 120 watts CW input 80 through 10 . . . 85 watts CW input on 6 meters. Wide-range pi-network output—effectively TVI suppressed—excellent keying system. For crystal or external VFO control. With tubes.

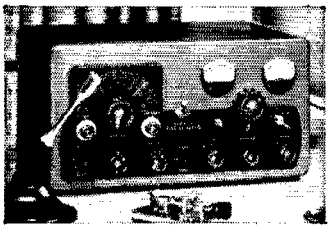
Cat. No.	Amateur Net
240-182-1..Kit	$114.75
240-182-2..Wired	$154.75

"KILOWATT" AMPLIFIER

Here's the most exciting unit you've ever seen . . . the unit that puts the whole world at your fingertips! Brilliantly designed and engineered, the Viking "Kilowatt" is the only power amplifier available which will deliver full 2000 watts SSB* input and 1000 watts CW and AM! Continuous coverage 3.5 to 30 mc. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

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

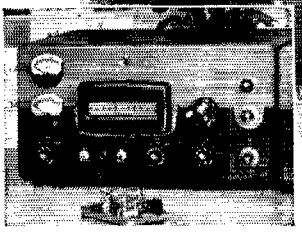
The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.



"FIVE HUNDRED" TRANSMITTER

More than one-half kilowatt of power and operating convenience! 600 watts CW input . . . 500 watts phone and SSB (P.E.P. with auxiliary SSB exciter)—instant bandswitching 80 through 10 meters! All exciter stages ganged to VFO tuning. High gain push-to-talk audio system. Highly stable, built-in VFO or crystal control. Wide range pi-network output. Low level audio clipping—effectively TVI suppressed. With tubes, less crystals.

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



"THUNDERBOLT" AMPLIFIER

Here's real power and peak performance in a compact desk-top amplifier. Rated 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 "Ranger", "Pacemaker" or other unit of comparable output. 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

"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. Highly stable built-in VFO. 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.	Amateur Net
240-301-2..Wired	$495.00

Viking

FIRST CHOICE AMONG THE NATION'S AMATEURS

WASECA, MINNESOTA

BUILD YOUR OWN HEATHKIT® HAM GEAR

"SENECA" VHF HAM TRANSMITTER KIT

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

HEATHKIT VHF-1 **$159.95**

HEATHKIT DX-20 **$35.95**

DX-20 CW TRANSMITTER KIT

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

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

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

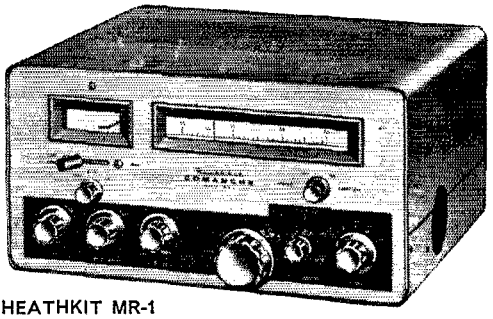
"CHEYENNE" MOBILE HAM TRANSMITTER KIT

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

HEATHKIT MT-1
$99.95

"COMANCHE" MOBILE HAM RECEIVER KIT

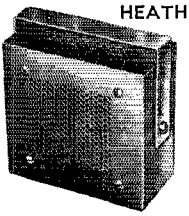
Everything you could ask for in modern design mobile gear is provided in the "Comanche" . . . handsome styling, rugged construction, top quality components . . . and, best of all, a price you can afford. The "Comanche" is an 8-tube superheterodyne ham band receiver operating AM, CW and SSB on the 80,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



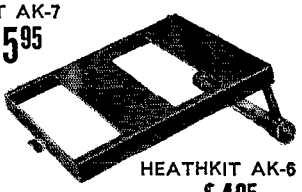
HEATHKIT MR-1
$119.95

MOBILE SPEAKER KIT

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



HEATHKIT AK-7
$5.95

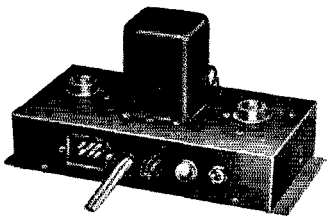


HEATHKIT AK-6
$4.95

MOBILE BASE MOUNT KIT

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

HEATHKIT MP-1
$44.95



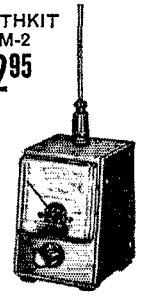
MOBILE POWER SUPPLY KIT

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

POWER METER KIT

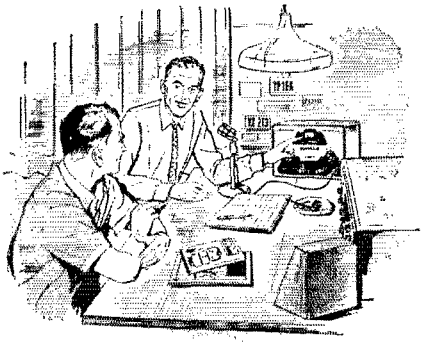
HEATHKIT PM-2
$12.95

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



HEATHKIT

COMPANION UNITS

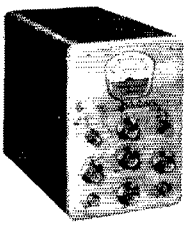


HEATHKIT TX-1 $234.95

"APACHE" HAM TRANSMITTER KIT

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

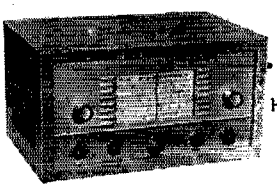
HEATHKIT SB-10 $89.95



SINGLE SIDEBAND ADAPTER KIT

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

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



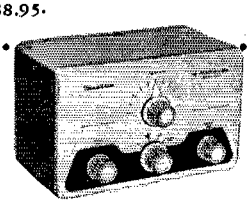
HEATHKIT AR-3 $29.95

(less cabinet)

ALL-BAND RECEIVER KIT

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

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



HEATHKIT QF-1 $9.95

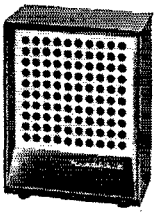
"Q" MULTIPLIER KIT

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

OF DISTINCTIVE QUALITY

ACCESSORY SPEAKER KIT

Handsomely designed and color styled to match the "Mohawk" receiver this heavy duty 8" speaker with 4.7 ounce magnet provides excellent tone quality. Housed in attractive ⅜" plywood cabinet with perforated metal grille. Speaker impedance is 8 ohms. Shpg. Wt. 7 lbs.

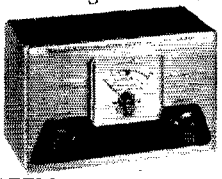


HEATHKIT AK-5
$9.95

HEATHKIT RX-1 $274.95

"MOHAWK" HAM RECEIVER KIT

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



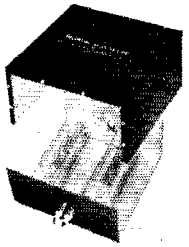
HEATHKIT AM-2
$15.95

REFLECTED POWER METER KIT

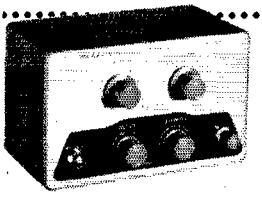
The AM-2 measures forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt of energy and covers 160 through 6 meters. Input and output impedance provided for 50 or 75 ohm lines. No external power required for operation. Use it also to match impedances between exciters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

BALUN COIL KIT

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



HEATHKIT B-1
$8.95



HEATHKIT VX-1
$23.95

ELECTRONIC VOICE CONTROL KIT

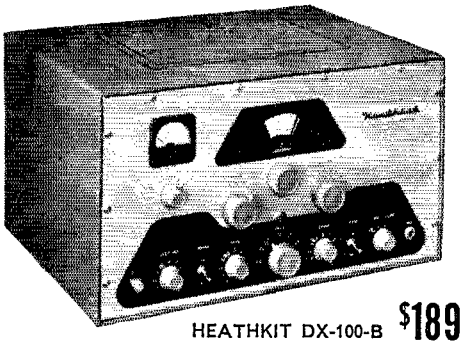
Eliminate hand switching with this convenient kit. Switch from receiver to transmitter by merely talking into your microphone. Sensitivity controls allow adjustment to all conditions. Power supply is built in and terminal strip on the rear of the chassis accommodates receiver and speaker connections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

HEATHKIT VF-1
$19.50

VFO KIT

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

Save 1/2 or more...with Heathkits



HEATHKIT DX-100-B $189.50

DX-100-B PHONE AND CW TRANSMITTER KIT

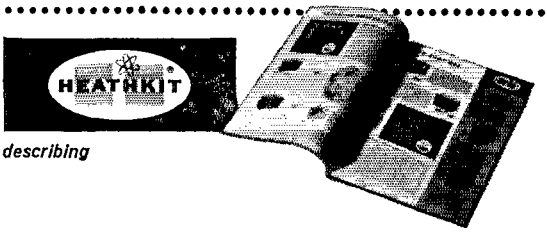
A long standing favorite in the Heathkit line, the DX-100-B combines modern styling and circuit ingenuity to bring you an exceptionally fine transmitter at an economical price. Panel controls allow VFO or crystal control, phone or CW operation on all amateur bands up to 30 mc. The rugged one-piece formed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

HEATHKIT DX-40 $64.95

DX-40 PHONE AND CW TRANSMITTER KIT

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

Free *specification sheets are available on all Heathkits. Simply ask for spec sheet by model no. of kit in which you are interested, or write for latest catalog describing over 100 easy-to-build electronic kits in HI-FI— TEST—MARINE and HAM RADIO fields.*



HEATH COMPANY BENTON HARBOR 9, MICH.

pioneer in do-it-yourself electronics

a subsidiary of Daystrom, Inc.

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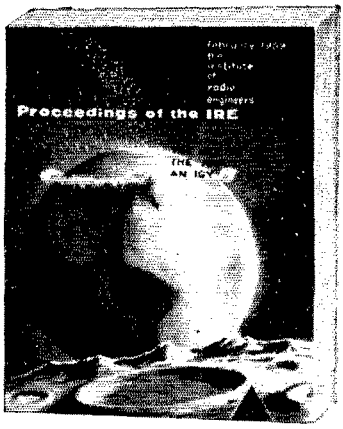
NAME

ADDRESS

CITY ZONE STATE

QUANTITY	KIT NAME	MODEL NO.	PRICE



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"The Constitution and Composition of the Upper Atmosphere" by M. Nicolet, Radio and Meteorology Institute, Belgium

"The Normal F-Region of the Ionosphere" by D. F. Martyn, Radio Research Labs. CSIRO, Australia

"The Normal E-Region of the Ionosphere" by E. V. Appleton, U of Edinburgh, Scotland

"The D-Region of the Undisturbed Ionosphere" by J. J. Gibbons & A. H. Waynick, Penn State U

"The Distribution of Electrons in the Ionosphere" by J. O. Thomas, U of Cambridge, England

"Motions in the Ionosphere" by C. O. Hines, Defense Research Board, Canada

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GOTHAM ON ANTENNAS • • • • • • • SOME QUESTIONS AND ANSWERS

As one of the oldest antenna manufacturers consistently advertising in *QST*, we think it is a good idea to sum up our activities, comment on the antenna industry, and answer questions that arise year after year.

We have seen scores of antenna manufacturers come along with new designs, run an ad or two, perhaps linger longer, then disappear. Almost always the pattern ran: A new super antenna that could be made for pennies was advertised at fantastically high prices, accompanied by fantastic blurbs for its performance. A few antennas would be sold, and the manufacturer would sadly discover that only antennas that had stood the test of time could sell in sufficient quantities to cover all costs. As a result of these scores of failures, 'orphan' antennas still pop up plaintively in 'Used Equipment' bargain columns.

From the moment Gotham made its first antenna, there has always been continued acceptance of Gotham antennas as the standard of the amateur radio field. We are very proud of the fact that every one of our beams is a full half-wave in element size, justifying the hams' faith in our basic design.

To sum up our present plans, Gotham will continue to manufacture fifty ham antennas at low, low prices. Our only new venture for the foreseeable future is a new low-cost marine radio-telephone antenna, which will bring an added measure of safety to mariners, due to a new efficient design. Literature is available.

And now to answer some questions: Why is the Gotham price so very low? Doesn't the low price mean a lack of quality? Answer: The Gotham price is low because we sell in quantities and make only a fair profit on each antenna. We do not add on a tremendous overhead and engineering charge. As for quality, we have always used the best materials, and every antenna is doubly inspected before shipment. Thousands of Gotham antennas are in use the world over.

Why are all Gotham beams of the Yagi type, all metal, and grounded at the center? Answer: To get the maximum strength for the minimum weight, to get maximum efficiency, and to avoid the use of wood, tuning stubs, traps, or other substitute devices, all of which are undesirable and unnecessary. In addition, grounded beams are lightning-proof and protect your home.

How do Gotham beams gain compare with higher priced antennas? Answer: No beam, regardless of price, can give more gain, for a given boom size, than a Gotham beam. Obviously, the more elements, the more gain. Our gain figures are published in our literature, and are available, free, on request.

What matching systems are available in Gotham beams? Answer: We use both the Gamma match for 52 and 72 ohm coaxial feed, and the T match for 300 ohm feed. These are tried and true matching systems, proven by thousands of hams, and extremely simple. No electronic equipment or measuring devices are needed. Everything is furnished.

How difficult is it to put a Gotham beam together? Answer: It's easy, and it takes only a few moments. No special tools are required for assembly and installation. Full, simple instructions are given, and all machining and cutting is done at the factory. Thousands of novices have successfully assembled and installed our antennas.

What is the difference between the Standard and the DeLuxe beams? Answer: The Standard beams in the 6, 10, and 15 meter bands used 5/8" and 3/4" tubing elements; the DeLuxe models for these bands use 7/8" and 1" tubing. In the 20 meter beams, the Standard beams have a single boom, while the DeLuxe beams use twin booms. All 20 meter beams use full 12 foot booms. In the 20 meter beams and in the Twobanders and Tribanders, only 7/8" and 1" tubing are used.

Is the Gotham aluminum tubing corrosion-proof? Is is strong? Answer: Yes, our aluminum has an 'aluminized' finish, both on the inside and outside surfaces, and is corrosion-proof. As for strength, our 6063T832 alloy has a yield strength of 40,000 lbs/sq. in.

Is it advantageous to use a Gotham Twobander or Tribander beam? Answer: Hundreds of these beams are in daily use. They are compromise beams, but by having each element a full half-wave, their gain figures are more than reasonably good. Of course a single three element beam on a single band will outperform a Tribander on that band, but the Tribander permits beam operation on three bands.

Are Gotham beams complete? Answer: Yes, we furnish everything — all tubing, fittings, castings where required, instructions — nothing extra to buy. We do not price an antenna piecemeal.

Do any Gotham antennas require guying? Answer: No. Our antennas have been designed to be self-supporting, due to the combination of tremendous strength and light weight. Whereas thin-walled or trapped verticals must be guyed, our 23 foot vertical antenna has come through hurricane winds without damage.

Do the Gotham verticals perform well on all bands? Answer: Yes, thousands of ham users attest to their efficiency on all bands from 6 to 160 meters. Reports of tremendous DX on low power are common.

Are mounts supplied with the vertical antenna? Answer: Yes, four mounting straps for side mounting are furnished with each vertical.

Are radials needed with a Gotham vertical? Answer: No, except in a few rare locations. 99% of the installations are done without radials.

Must a vertical antenna be mounted at any particular height? Answer: No, any convenient height will do. The higher, the better.

How do you change bands on a Gotham vertical? Answer: For 20, 15, 10, and 6 meters, the loading coil is not used. For 40, 80, and 160 meters, the proper portion of the loading coil is used.

Do you need a separate loading coil for each band? Answer: No, a V160 loading coil will cover 160, 80, 40, 20, 15, 10 and 6; a V80 loading coil will cover 80, 40, 20, 15, 10, and 6; a V40 loading coil will cover 40, 20, 15, 10, and 6 meters.

How much power can be used with a Gotham vertical? Answer: Anything up to the legal limit.

Is much space required for installing a vertical? Answer: No, only a few square inches are needed.

Can you give details on the loading coil used in the Gotham verticals? Answer: Yes, it is made for us by Barker and Williamson. It is 3" in diameter and exceptionally rugged. No other loading coil in the antenna industry has a higher Q.

Which do you recommend buying, a vertical or a beam? Answer: A beam is always preferable for use on any particular band. The beam cuts down QRM and amplifies the transmitted and received signal. The vertical has the advantages of small space, low cost, no rotator required, and multi-band coverage.

Why does Gotham make so many different antennas? Answer: To meet the needs of hams everywhere for a wide variety of antennas, on all bands.

What antennas are best for a novice? Answer: The V80 vertical and the S153N beam are the most popular choices.

Why should a ham buy a Gotham antenna? Answer: The tremendous progress of the amateur radio art makes it imperative that hams graduate from the antiquated antennas of years past to a modern antenna system. We will be glad to send, free of charge, our technical literature on our 50 antennas, or you can order for immediate shipment.

73,
GOTHAM

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TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6–10 TWO BANDER.....	☐	$29.95
10–15 TWO BANDER.....	☐	34.95
10–20 TWO BANDER.....	☐	36.95
15–20 TWO BANDER.....	☐	38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

☐ 6-10-15 $39.95 ☐ 10-15-20 $49.95

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

☐ Deluxe 6-Element 9.95 ☐ 12-El 16.95

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

☐ Std. 3-El Gamma match	12.95	☐ T match	14.95
☐ Deluxe 3-El Gamma match	21.95	☐ T match	24.95
☐ Std. 4-El Gamma match	16.95	☐ T match	19.95
☐ Deluxe 4-El Gamma match	25.95	☐ T match	28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30–50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

☐ Std. 2-El Gamma match	11.95	☐ T match	14.95
☐ Deluxe 2-El Gamma match	18.95	☐ T match	21.95
☐ Std. 3-El Gamma match	16.95	☐ T match	18.95
☐ Deluxe 3-El Gamma match	22.95	☐ T match	25.95
☐ Std. 4-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 4-El Gamma match	27.95	☐ T match	30.95

New! Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

☐ Beam #R6 (6 Meters, 4-El)....$38.95
☐ Beam #R10 (10 Meters, 4-El).. 40.95
☐ Beam #R15 (15 Meters, 3-El).. 49.95

15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

15 METER BEAMS

☐ Std. 2-El Gamma match	19.95	☐ T match	22.95
☐ Deluxe 2-El Gamma match	29.95	☐ T match	32.95
☐ Std. 3-El Gamma match	26.95	☐ T match	29.95
☐ Deluxe 3-El Gamma match	36.95	☐ T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

☐ Std. 2-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 2-El Gamma match	31.95	☐ T match	34.95
☐ Std. 3-El Gamma match	34.95	☐ T match	37.95
☐ Deluxe 3-El Gamma match	46.95	☐ T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

You could work the whole world, and get fantastic reports, with a Gotham vertical and only 55 watts, like VP1SD.

You could work tremendous skip and DX, and be surprised at the way your Gotham vertical brings them in, as R. E. C. of Washington, D. C., found out.

You could have a simple, easy-to-install-and-operate vertical antenna, and switch from band to band, as thousands of Gotham customers have done.

☐ **V40 vertical for 40, 20, 15, 10, 6 meters. $14.95**

☐ **V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters.....$16.95**

☐ **V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters.....$18.95**

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

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Address.....

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

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20% BONUS!

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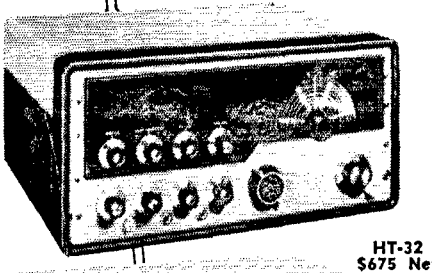
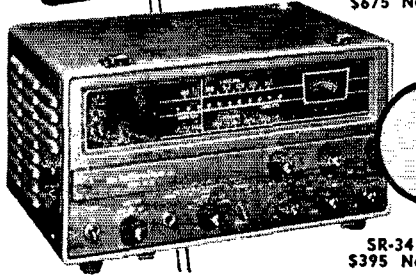
$295 Net

SX-101
$395 Net



HT-32
$675 Net

HT-32
$675 Net



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SX-101: 13 tubes, voltage regulator, rectifier. Power-line fuse. Covers 7 ham bands — 160, 80, 40, 20, 15, 11-10 meters.

SR-34: 2 & 6 Meter receiver/transmitter. Complete fixed, portable or mobile. AM or CW. 49-54 & 143.5-148.2 mc range.

HT-32: New amateur band transmitter. S.S.B. AM or CW output on 80, 40, 20, 15, 11 and 10 meter bands.

HT-33A: Linear amplifier. Complete coverage of amateur bands; 80, 40, 20, 15 and 10 meters.

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In the limitless world of communications, new ideas are the real measure of leadership. In the past quarter-century, Hallicrafters engineers have brought to amateurs, novices and listeners more than 100 major communications designs. That is why Hallicrafters is a leader in this field . . . acknowledged by over a million satisfied users.

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Al Coe

Radio Shack Manager of Amateur Sales

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Please quote me an allowance on my present equipment:

Model _____

I would like to trade for the following Hallicrafters

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W2RUF and K2GWN made BPL in December. NYS C.W. certificates went to K2QHR, K2BDO and K2DWR; NYSPTEN certificates to K2CEU, K2JPM, K2RIT, K2TDV, K2YJN, K2ZWB, WA2ABL, W2RTG, W2PGA, K2UFB and K2PBK. K2UZJ received WAS and WFRC certificates. K2EQB received a Green Mt. Net certificate. He runs a Globe Scout, an NC-109 and a Mosley all-band vertical. W2ZDL has a new Heath 'Scope. K2CUQ earned a Gaylark certificate. K2MWS put up a Hy-Gain vertical. K2CBD is now KX6CP in Marshall Island. K2RTN has been appointed ARC Coordinator and ARC Representative Station (for Chenango Co.). W2IDM is now on 6 meters. W2ATO and K2SAC are in c.d. and have 2-meter Gonsets. K2BFO is building a *QST* receiver. W2PVC is on d.s.b. with WRL gear. K2SSX has a Ranger and an SX-101. W2IIE has a KWM-1 and is on 15-meter s.s.b. K2MXA is now an OO and K2KQC is an OPS. Endorsements: K2CUQ and K2ECL as OOs. W2RSL has a 20A-pr. 811A combo and runs c.w. and s.s.b. all bands. He also has home-brew rigs on 6 and 2 meters. The RARA had a v.h.f. equipment meeting in January. W2ICZ and W2VZV are enjoying the new 75S1-32S1 equipment. K2RAA is getting HT-32 reports with his home-brew DXB exciter. K2UIU works 15-meter s.s.b. with his new Vantron final. I would like to receive your club bulletins and/or meeting notices if possible. Traffic: (Dec.) K2SIL 1281, K2MES 1045, W2RUF 788, K2GWN 503, K2RYH 339, K2AOQ 185, K2RTN 182, W2RUT 170, W2TTV 144, K2YJN 144, W2PGA 136, K2TQC 118, K2DXV 102, W2GSJ 101, W2FEB 79, K2JBX 70, W2OE 65, W2COB 62, W2PVI 56, K2IYP 50, K2UZJ 47, W2ATC 42, K2TDV 40, W2BKC 35, K2SSX 31, K2JPM 27, K2JDD 25, K2QDT 20, K2EQB 16, W2ZDL 15, K2RWV 13, K2MWS 12, W2QCI 11, W2BLO 8, K2HUK 6, K2UCP 6, K2CEU 5, K2BBJ 3, K2QPC 2. (Nov.) K2CEU 26.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: GJY, GEG and NUG. PAMs: AER and TOC. The WPA Tfc. Net meets Mon. through Fri. at 1900 EST on 3585 kc. A new appointee is RFX as OO. KN3GSG is a new Novice in Glenshaw. JWZ received his 25-w.p.m. CP sticker. K3BKX received his General Class license. K3AJB worked WAC. K3AGF is having antenna trouble. Congratulations to LXU on making BPL. JOQ is active on 6 meters. WDK moved to a new QTH. AOH is having great success in the DX Contests. The Steel City RC reports through *Kilo Watt Harmonics* that RUZ has gone mobile; KTM has a new Elmac AF-67; RYC has a new Apache; FML has a new VHF-126 converter. The Etna RC reports, via *Oscillator*, the following new officers: TOC, pres.; OVM, vice-pres.; E. Zenk, secy.; NSQ, treas.; D. Jones, director; KZF is home from the hospital and recuperating; KSI is retiring to a life of no problems; young Jimmy Walker has received the call KN3GZR. The Somerset County ARC reports that the club meets the 1st Tue. of the month in the Eagles Bldg. in Somerset. New officers are WDZ, pres.; VWA, vice-pres.; PVG, Secy.-Treas. LMM has new Collins S-Line gear. PVG is a disc jockey on WVSC. With the coming of spring, I will be making club visitations and will be looking forward to meeting each of you personally at your club. Club secretaries, please pass along your meeting dates and addresses. LXU has received his EAN and TCC certificates. Traffic: W3LXU 837, KUN 202, UHN 118, LSS 100, K3AGF 66, W3TOC 10, WRE 8.

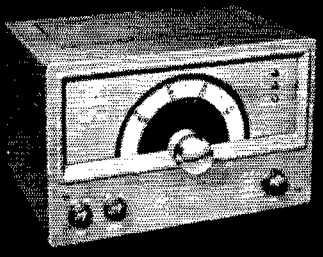
CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: HOA. RM: PCQ. PAM: RYU. EC Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. Announcement has been made and plans are being readied for the combined Central and Midwest Division Convention to be held over the Labor Day week end in St. Louis, Mo. The SARA gang has announced that its picnic will be held the 3rd Sun. in July at DuQuoin. The S.S.B. Dinner there will be held the night before. K9JIO is now operating in W4-Land. IDA reports that his s.s.b. net is doing FB on DX. Western Illinois University has received its old call, YOL. K9LLU, K9LLT and K8BIV are busy building new Senecas and UYP is constructing an Apache. This column's sincere sympathy goes to the family and friends of GA, Mr. George K. Rollins, of the FCC, who passed away Dec. 17. He was a good friend of all the hams and will be greatly missed by the amateur fraternity. MAK and UBI made DXCC. ISP is pulling in the hard-to-get ones with a new RME. K9HCP is now the proud owner of a WAS certificate. SXL reports that the Bloomington gang is very c.d. conscious and has many members signed in with the Peoria gang while waiting for a c.d. set-up of its own. New Novices heard were KN9QCU and KN9QAD. New officers of the following clubs were recently elected: Prairie Amateur Radio Club (Galesburg), LTI, K9MVF and K9LYV; SARA Amateur Radio Society, RKV, BJ K9JJE and ATL; the Communicators (Pontiac), NGG, ZGS and CZP; the Skeds Amateur Radio Club (Chicago); K9BBC, K9ICY, K9IEB and K9EMO. IRH is back from c.d. assignments and awaiting the Army assignment. K9AMG is now on s.s.b. and trying to go for his DXCC. K9CSS and KN9MYD have their Globe Highbanders Christmas gifts on the air. CSW and his North Central Phone Net had a traffic score of 662 during December with 26 sessions. The Joliet Amateur Radio Club has paid off the mortgage on its club house and had a mortgage-burning ceremony at the club shack on Dec. 14. K9KEJ is on the networks with a Globe Chief 90A. K9KIJ is on 6 meters and doing an FB job with 10 watts and a five-element beam. K9GZF is sporting a new two-element Mosley beam. The Sangamon Valley Radio Club (Springfield) graduated 18 new Novices from its recent class. New calls will be heard shortly from them. New ECs are PMN, RKV, RMN, K9AZU, GJN and K9GCQ. LNQ reports that the Hamfesters (Chicago) scored very high in the recent Sweepstakes and he wants the gang to know that the club meets in larger quarters to accommodate the large increased membership. I would like to take this opportunity to thank everyone for the fine greeting cards during the Christmas holidays. This is the last report of my first year as your SCM and I wish to express my sincere gratitude to all the gang and especially all the appointees for their fine cooperation in reporting news so that this column can be successful. Traffic: (Dec.) W9DO 1652, IDA 813, MAK 652, K9MHW 360, ISP 246, GDQ 230, W9FAW 212, K9JIN 189, W9SXL 165, K9ERH 90, W9CSW 55, K9IXK 29, W9TZN 26, K9GVD 24, GSR 20, HCP 9, W9SKR 6, K9BIV 3, W9PRN 2, YYG 2. (Nov.) W9MAK 115. (Oct.) W9DO 818.

INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM: Seth Lew Baker, 9NTA. SEC: SNQ. PAMs: BKJ, KOY and UXK. RMs: DGA, TT and VAY. Net schedules: IFN (a.m.) 0800 daily and 1800 M-F on 3910 kc.; ISN (s.s.b.) 1830 daily on 3920 kc.; QIN 1900 daily and RFN 0700 Sun. on 3656 kc. Two new ECs are K9GCE for Floyd Co. and GQD for Wayne Co. K9JWJ is the newest OBS and JQO has been appointed as OO. RTH reports new officers of the Seymour ARC are BXP, pres.; K9GEN, vice-pres.; and KN9MAC, secy.-treas. K9IUH was elected president of the Indianapolis RC. Other officers are JZV, vice-pres.; PSE, secy.; K9EUQ, treas.; SWD, chief op.; MNA and K9GEE, directors. The Kokomo Club put on radio classes which have resulted in 11 new calls in that area. The new club is K9QDE. K9LZJ and OYK are new Gen. Cl. licensees in Indianapolis. DGA received a 130 sticker for DXCC. URR has a new job and is on his way to Dallas, Tex. DDT is operating s.s.b. with a Valiant. SVZ has his 813 rig on the air now. PPV made RCC the hard way, via Paris, France. VQP is busy putting together an RX-1. A new father-and-son combination in Kokomo is K9MXG and MXE. The Lilly ARC has purchased a Communicator for 6 meters to lend its members to promote interest in 6 meters and the club. Other clubs might consider something along this line. IFN traffic was 694 as reported by SWD, who is resigning as PAM after more than two years of doing an excellent job with the net. BDG, of South Bend, is the new PAM as of Feb. 1. VAY reports QIN handled 459 messages this month. KOY gives the ISN traffic as 237. TT reports 106 messages handled on RFN. Six meters is still picking up as indicated by K9GLL, who reports IMO traffic as 222. CC, DGA, K9IXD, JOZ, NZZ, TT, VAY and ZYK made BPL. Traffic: (Dec.) W9NZZ 1067, JOZ 992, ZYK 982, VAY 683, TT 392, K9IXD 357, W9TQC 312, K9AYI 269, W9JBQ 247, DGA 191, UQP 160, KOY 158, CC 152, SWD 139, SVL 133, K9DGO 105, W9RTH 103, AB 82, EHZ 77, ETM 75, ZSL 69, EGV 68, SNQ 65, MEK 64, NTI 56, K9GBB 52, W9DOK 48, K9BSU 40, W9GFQ 37, K9NBK 36, W9QWI 36, K9GJS 35, W9BDG 34, RVM 33, EJW 30, K9JKK 27, W9QYQ 24, BUQ 21, ENU 21, IMU 21, K9GSV 20, W9DDT 18, K9KBW 17, W9PMT 16, MEU 12, MHP 10, YYX 10, HUF 9, QR 8, K9IGH 7, W9BDP 6, VQP 6, KN9MAF 2. (Nov.) W9MEK 40, DDT 18, WTY 9, K9NBK 2.

WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH. PAM: NRP. Northern Wis. V.H.F. PAM: GFL. Southern Wis. V.H.F. PAM: K9IQO. RMs: K9AEQ, K9ELT and SAA. NQW is a new ORS. NLJ is DXing on 3.5 Mc. with up to 99 confirmed on all bands. The Wis. Traffic Net (WTN) now operates Sun. at 8 P.M. CST on 51.1 Mc. The WSSN has changed frequency to 3617 kc. to avoid RTTY QRM. PJT has a new Mon-Key and K9GYG a DSB-100. K9LCA received his new General Class license Christmas Eve. IKY is on with RTTY. K9PDJ is new at Sturgeon Bay. FDX's DX totals are 257/251: DYG's 217/208. The MRAC will hold its traffic night Mar. 18. All Wisconsin traffic opera-

(Continued on page 104)



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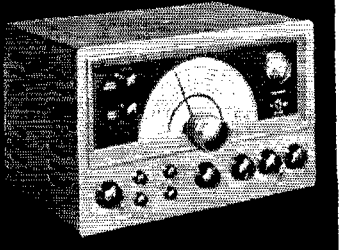

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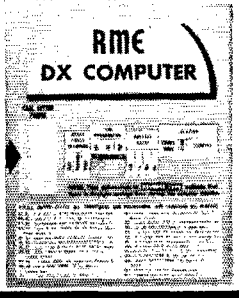
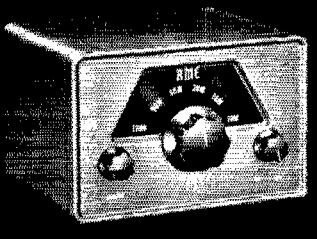
an operating aid designed to make available DX information about all countries recognized officially by the amateur societies of the world. This unusual computer is a complete DX guide to the ham operator in a handy, compact form. It gives all call letter prefixes; time differentials; international postage rates; continent, zone, and country; in addition to an address listing of all the QSL Bureaus of the World. By sliding the center plate to the desired prefix, you can read all the above mentioned guides at one setting. The call letter prefix column has extra spaces to fill in your own QSL record, sent and received. Size: 13¼" x 4¾" **$1.00** Amateur Net.





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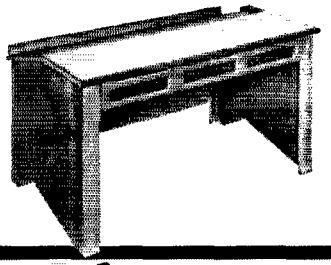

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Station Activities

(Continued from page 102)

tors are welcome. Traffic for Fond du Lac is being taken by the OM-XYL team of VHP and VIK on three NTS nets. Sixty members of the Green Bay Mike & Key Club elected 1KY, pres.; FWO and KN9PSW, vice-pres.; KN9ORR secy.; AHH, treas. The club call is K9EAM. YQH has a new 6- and 2-meter station. K9EBO and K9LFW are new General Class operators. There is a new Ranger at K9JZE, a B&W5100 at K9CTZ and a 6146, 6-meter mobile rig at K9KSA. The BEN had 359 sessions in 1958, operated a total of 575 hours and cleared 4016 messages. WIN had 358 sessions, 228 total hours and cleared 2087 messages. WSSN had 141 sessions, 116 total hours and cleared 199 pieces of traffic. Twenty-nine BPL cards were issued and 31 clubs were registered in 1958. Our section has 43 ECs, 5 PAMs, 3 RMs, 8 OPSs, 25 ORSs, 10 OOs, 6 OESs and 5 OBSs. Mailing cards for the "Talk Wis." project now are available from the SCM. Nominations for SCM for the next two years must reach ARRL by Mar. 10. Thanks to all who sent in news during 1958. Traffic: (Dec.) W9DYG 729, K9GDF 402, W9NQW 388, K9ELT 326, W9KQB 277, VHP 164, K9ESN 122, W9SAA 111, NRP 92, K9GYG 33, W9CCO 31, VIK 29, K9LMX 24, W9IKY 22, MWQ 20, CBE 16, K9ALP 15, IQO 14, GSC 10, W9NLJ 9, K9CEF 8, W9LHY 8, GFL 7, PJT 7, SZR 4, VCH 3. (Nov.) W9GIL 5, K9GSC 2.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: KØJLW. PAM: YCL. The N.D. 75-Meter Phone Net reports 27 sessions, with a total of 818 check-ins; the highest number of check-ins reported was 41, the lowest 15 and an average of 30. Bert Wick, Devils Lake, inactive since 1923, is now KØSOE. Bert may be remembered by many of the old-timers who were active in 1914 as 9AEJ. KØPZN put up a new Hy-Gain Triband beam and is busy on the high bands. KØJLW also has a new beam on 40, 20 and 15 meters. Traffic: KØADI 77, CNC 63, JLW 48, GRM 33, PZN 24, GGL 20, JLU 17, AZX 12, GGI 11, WØYCL 10, KØATK 5, AJW 3, HLT 3, MHB 2, OUD 1.

SOUTH DAKOTA—SCM, Les Price, WØFLP—Asst. SCM: Gerald F. Lee, ØYKY. SCM assistants: FKE and NEQ. SECs: YOB and GDE. PAM: SCT. The South Dakota C.W. Net meets Mon.-Wed.-Fri. at 7 P.M. CST on 3645 kc. and reports 14 sessions, SCT 4, KØBMQ 5, KØDYR 5; QNI 105, high 14, low 3, average 7.857; traffic 9; informals 6. The South Dakota 40-Meter Phone Net meets Mon.-Sat. on 7225 kc. at 12:15 P.M. CST and reports 27 sessions, KØLXF 15, SCT 6, KØBMQ 6; QNI 530, high 28, low 10, average 19.63; traffic 181, high 20, low 0, average 6.7; informals 47, high 5, low 0, average 1.74. The South Dakota 75-Meter Phone Net meets daily at 6:30 P.M. CST (and 9:30 A.M. CST) on 3870 kc. and reports 35 sessions, KØBQR 1, GWA 4, KØDUR 5, EXX 5, YVF 3, SCT 17; QNI 1031, high 38, low 14, average 29.457; traffic 105, high 10, low 0, average 3; informals 119, high 13, low 0, average 3.4. The South Dakota S.S.B. 75-Meter Net meets on 3870 kc. seven nights a week at 8 P.M. MST with FKE, NEQ, IEI and NIW as NCSs and reports 31 sessions; QNI 605, high 26, low 13, average 20+; QTC 38, high 5, low 0; informals, high 59, low 0. KØDZG moved to Mitchell from Scottsbluff, Neb. in May. He has a Globe scout, an LA-1 amplifier, an NC-57B and a Heath Q-multiplier. KNØSEJ, a new ham in Harrison, has a DX-40 and an S-38. KØDUR's daughter, Betty, has had to take it easy on license study to maintain A grades in high school. New at Clearfield is TZT, formerly of Rapid City. He has a DX-100. SCT has broken insulated coupling in the final inductor of the Viking II and tunes it with his finger when changing bands. KØDIH was home at Lead for the year-end holiday. KØGDS's job took him to Rapid City at the year-end. KØIAW has an LA-1 on a.m. with his Scout. KØBMP brought his DX-100 up to KØBMQ, where they found one of two condensers wired wrong in a low-voltage supply. UFL, of the post office at Sioux City, has requested a list of net stations from me for use during storms with reference to locating highway post offices. SCT visited KØDYR in Sioux Falls recently. A number of Redfield hams journeyed to Watertown in quest of Viking Matchboxes. KØLXF was ill with chicken-pox. TQE was in Centerville for the Christmas vacation. KØBQR is having transmitter troubles. Traffic: WØSCT 698, ZWL 281, KØARF 180, BMQ 160, WØDVB 93, KØDGG 54, WØNEO 45, KØBYV 32, AIE 28, WØZLB 27, CTZ 26, KØKLR 20, WØFJZ 19, NNX 15. WØRKJ 9, DHA 7, WØOFP 6, RWM 6, KØCMX/Ø 4, WØFLP 4, IAW 4, KØMHF 4, WØVQC 3, DUR 2, KØINZ 2, LXH 2, WØOMP 2, YVF 2, KØOXU 1, WØRWX 1.

(Continued on page 106)

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MINNESOTA—SCM, Robert M. Nelson, WØKLG—SEC: TUS. The Minnesota State Phone Nets held their annual NCS election. Those elected are ALW, OET, OPX, QVQ, TCK and UMX for Noon Session; and KØEPT, IKU, MNY, WØQVR, TUS and WVO for Evening Session. KØCPW was winner of a $100 Gift Certificate in the Hallicrafters S.S.B./V.H.F. Contest. URQ has been hospitalized, suffering from a slipped disc. BUO and family took an extended trip, visiting relatives in Texas and California. RNY had 50-Mc. contacts with Japan and South Africa, but needs North and South Dakota for 50-Mc. WAS! A new amateur radio club has been formed at Mankato State College. KØHNY was elected pres.; KØJCF, secy.-treas.; and OFS, trustee. Santa brought the following new receivers: DZZ and THY, HQ-170s; GCR, a GPR90; and KLG, a Mohawk RX-1. KØPML got a Heath VFO, and KØHJC got a new Challenger transmitter. VBD has a new 40-ft. tower topped with a Mosley Tribander. BEI's XYL is now licensed with the call KØRYN. QVR and TCK have been endorsed as PAMs. KØORK is now ORS. New OPS appointees include UMX, KØEPT, KØMAH and KØMPG. KCP and SLD have been appointed as OOs. The MJN now meets daily, Mon. through Fri., at 1700 CST. Interested Novices may write KØKYK, Jasper, Minn., for details. MJN net controls are KØIZD, KYK, MIJ, ORK and QBA. KØCUO has a new 8½-lb. jr. operator—another boy. KØMNY operated portable Ø at Rochester during Christmas. En route he visited KØJNX, KLG and KØBDD. All future station activity reports should be sent to our new SCM, KJZ. Traffic: (Dec.) KØIDV 1149, ORK 375, GCN 123, WØPET 114, KØKYK 108, IZD 91, WØUMX 80, KØJCF 78, WØOJK 77, KLG 67, OPX 67, KØHJC 51, MIJ 45, WØKFN 43, KØMAH 43, WØTCK 41, KØEPT 38, QBA 36, WØALW 34, FGP 33, LST 33, OJG 32, RIQ 27, KØMPG 26, MGT 23, WØQVQ 23, KØAEE 19, MNY 13, WØQVR 13, KØPML 11, WØWCD 6, WMA 6, DQL 4, YAC 4, BUO 3, KØGKI 2, LBA 2. (Nov.) KØPML 4.

1959 MINNESOTA QSO PARTY

March 14-15

The Minnesota QSO Party, open to licensed amateurs the world over, will run from 4:00 P.M. March 14 until 11:59 P.M. March 15, times Central Standard. A station may operate as much of the 32-hour period as desired. All types of emisson and all bands may be used. C.w.-to-phone contacts are permitted but crossband work is not allowed. The same station may be worked once per band regardless of emission (75 and 80 meters count as one band).

Minnesota amateurs work any other amateur while out-of-staters work Minnesotans only. Information to be exchanged is as follows: Minnesotans send QSO number, RS or RST, and county; others send QSO number, RS or RST, and state, province, or country. The general call will be "CQ Minn." Minnesota c.w. stations will identify themselves by signing *"de Minn (call) K."* Phone stations say "Minnesota calling." Suggested congregating frequencies are 3595, 3820, 7050, 7240, 14,100 kc. and 20 kc. inside the lower edge of other bands and phone subbands.

Scoring: Each preamble sent and acknowledged counts one point and each preamble received counts one point. The sum of the total number of Minnesota counties, states, provinces, and countries worked is the multiplier. It is not necessary for preambles to be sent both ways before a contact counts, but one must be received or sent and acknowledged before credit is claimed for either point(s) or multiplier. The final score is the number of contact points multiplied by the total multiplier.

Certificates will be awarded to the highest-scoring amateur in each state, province, and country, and the highest scoring amateurs in Minnesota using c.w., phone, c.w. and phone, and to the top Novice. Logs should be sent to the St. Paul Radio Club, P.O. Box 512, St. Paul, Minnesota, and postmarked not later than March 31, 1959, and received not later than April 10, 1959. Logs should include QSO numbers, RS or RST reports, county, state, province, or country, as well as type of emission, bands, time, and date. Decisions of the contest committee of the St. Paul Radio Club will be final.

(Continued on page 108)

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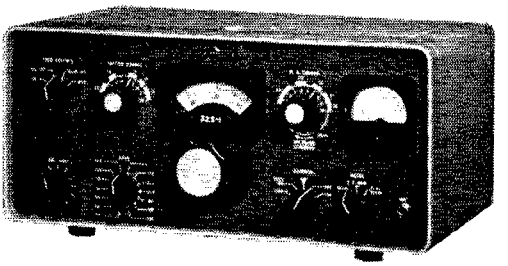

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516E-1 12V DC Power Supply	262.00
75S-1 Receiver	495.00
312B-3 Speaker	27.50
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DELTA DIVISION

ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR. PAM: DYL. BYJ has gone to college again. The traffic nets already are missing him. The club station at Fayetteville, YM, is transmitting code practice on 80 meters at 8 P.M. Tue. through Fri. and WPX is on 10 meters at the same time. WRR and K5ITX are now on 6 meters in Blytheville. KN5TKJ is a new ham in Osceola, K5CRK has a new Drake receiver. We are glad to welcome W6BMM/6 to the Arkansas section. He is running 30 watts to an AT-1. K5LNN, at Russellville, has up a new quad on 20 meters. He scored 82,500 points in the SS and recently got his WAC and WAS certificates. ØJHY/5 has made radioman 2nd class, USN. Two new hams in Blytheville are KN5TNL and KN5TJS. K5HOL has been visiting hams in Florida. We are very happy to see new faces showing up on the various traffic nets. K5HSJ has returned to the air with a DX-40, having been off for the past year. Traffic: K5IPS 179, W5BYJ 75, SJI 58, K5PYD 15, W5WZN 14, K5KAC 8, W5DYL 4, CAF 2, WEC 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Sad news in January was the passing away of HEJ and HMV. Good news was the highest traffic count ever turned in by a Louisiana ham in many a year. CEZ turned in a traffic count of 991, thereby making BPL 4 times in the last 6 months. Close behind CEZ was MXQ, who bemoans the fact that participation in LAN is low. How about you c.w. men meeting that net and putting Louisiana on the traffic map? The Nitwit Net Christmas Party was held with K5MKE and K5OAV, K5RKH and AAX acquired XYLs in December. K5DMA reports the Carville Project is coming along fine. The Baton Rouge ARC, sponsor of the project, held its regular meeting Jan. 19 at Carville. K5KQG, who operated in Houma, is now operating in Columbus, Ga., under the call 4CMG. K5JQC has been appointed Official Observer Class I. K5KLA worked over the rig. An impromptu hamfest was held at the home of FYZ and TEB in December when a business chore brought your SCM to Minden for an overnight trip. Those attending came from in and around Minden and as far as Cotton Valley and Springhill and included FYZ, TEB, his XYL, 1ST, BMD, UNY, DJU, MTR, KTJ, K5TON, SNA and a prospective licensee, Steve Barnard. FMO nearly had FYZ tearing his rig apart after using the SCM's Mickey-Match on his s.s.b. rig. Please check the expiration date of your ARRL appointment and send it in for endorsement. Send reports in at the end of the month. Traffic: W5CEZ 991, MXQ 294, EA 25, K5KLC 11, DMA 4, KLA 4.

MISSISSIPPI—SCM, J. Adrian Houston, sr., W5EHH—K5QDM, QXF, ANE and other teen-agers wish to announce they are starting a Tri-State Net on 3975 kc. soon. Any teen-ager interested in joining, please contact your Mississippi SCM for further information. K5ANE is the proud owner of a new 50-watt transmitter. K5HYO has a new Gonset receiver in his car. EHH and family visited with ØGG and friends in Council Bluffs, Iowa, at Christmas. UXJ, K5HYO and K5EEC delivered 11 emergency power units to Cleveland amateurs for Christmas from the AF MARS. K5LWQ is now mobile in his new Cadillac. His son, K5LWP, also is mobile in his new Buick. K5QNF would like very much to get a c.w. net started in the State. Anyone interested in handling c.w. traffic, please contact K5QNF, Ed Russell, 1322 Chambers, Vicksburg, Miss. WMR has been in the hospital in Vicksburg. We wish you a speedy recovery, Roland. JHS has been in the hospital. We are glad to hear you back on the net, Norm. Traffic: K5BKK 53, W5NRU 46, K5HAR 43, MFY 13, W5VME 9.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: RRV. RM: NHT. PAMs: PAH, UOT, VQE and ZZ. The Oak Ridge and Kingsport Clubs report much interest in talks made by Ed Tilton, W1HDQ. Welcome to the Amateur Radio Club of the Frye Institute in Chattanooga as one of our reporting clubs. K4JUC reports building a v.f.o. and a trip to Florida with ham radio contact back home through station K4DSC. Congratulations to the Nashville amateurs who presented PQP with an HQ-160 for Christmas. Welcome to DLK, a new ham in Chattanooga. Glad to hear TZB on the section nets during the school holidays. Six-meter stations report DX: K4KYL with EI2W and YRM with HC1FS. W5RCF reports 2-meter plans with a 522. Hats off to the following c.w. net members with better than 75 per cent attendance: W5RCF, VJ, NHT and EET. Thanks to NHT and K4JNK for net reports, to K4KYL for the OES report, and to PVD and K4KYO for OO reports. Traffic: (Dec.) W5RCF 1124, W4OGG 651, IGW 130, K4JNK 130, W4NHT 120, CXY 92, VJ 90, UIO 58, UVL 35, K4OUK 30, W4PQP 25, TYV 20, K4LTA 19, W4TDZ 18, PAH 17, K4JUC 16, W4DTI 15, TZB 11, PVD 7, JVM 6, K4KYL 4, W4YRM 1. (Nov.) W4OGG 391, PQP 29.

(Continued on page 112)

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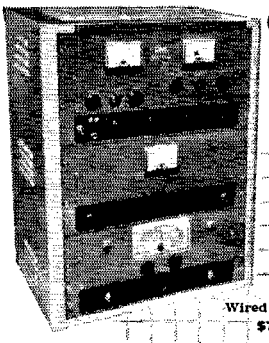


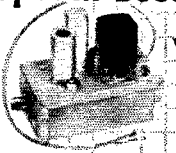
Globe King 500C

Built-in antenna relay, built-in VFO, separate power supply for modulator. Commercial type compression circuit. Grid block keying for signal clarity. Pi-Net matches most antennas 52-300 ohms. Optional crystal operation. SSB input & operation with 15-20w external exciter. 31x22x14¾" cabinet designed for TVI-suppression.

Wired & Tested: **$795.00**

Completely Bandswitching, 10-160M. 540w AM & CW; 700w max. on DSB or SSB (PEP), with 15-20w external exciter.

Speech Booster FCL-1



Wired & Tested: **$24.95**

In Kit Form: **$15.95**

Peak limiting audio preamplifier that clips and filters speech frequencies exceeding pre-set amplitude. Increases modulation intensity for most penetrating audio. Includes harmonic suppression. Plugs directly into Scout & Hi-Bander. Adaptable to other Xmttrs.

Power Attenuator PA-1

Wired & Tested: **$10.95**

General purpose attenuator for exciters up to 70 watts input. Suitable to attenuate drive between many exciter-amplifier combinations. Standard coax input and outut connectors. Tap switch to select any of three attenuation positions or straight through.

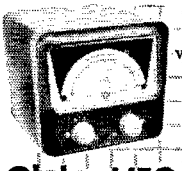
Tops on 6 and 2M

Wired & Tested: **$149.95**

In Kit Form: **$129.95**

Globe Hi-Bander

60w CW, 55w AM input on both 6 & 2M. Single control bandswitching. 4-stage RF section allowing straight through operation. Good harmonic and TVI-suppression. RF stages metered. Provisions for mobile use. 52-72 ohm coax output. New duo-band final tank circuit eliminates switching. Variable antenna loading control. Reserve power socket on rear chassis apron for accessories.

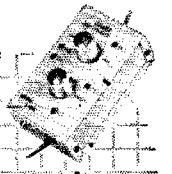


Wired & Tested: **$59.95**

In Kit Form: **$49.95**

Globe VFO 6-2

Perfect zero beat. Built-in power supply with voltage regulation. Ideal for driving 6 and 2 meter transmitters. Temperature compensated for utmost stability. Excellent for use with Hi-Bander. Approx. 50V RF output in 8-9 mc. range. 13:1 tuning ratio, king-size tuning scale. Sideband stability.



Wired & Tested: **$29.95**

In Kit Form: **$21.95**

Model 6PMC

6M Converter

New, improved circuit for higher gain, greater signal/noise ratio. Printed circuit for ease in kit assembly. Models for fixed or mobile stations or 12 volt filaments. I.F. output of 10-14 mc. on fixed, 600-1600 kc. on mobile model. Highly stable, completely shielded, crystal controlled, complete with tubes, crystal, cables. 3x5½x4½".

90w CW

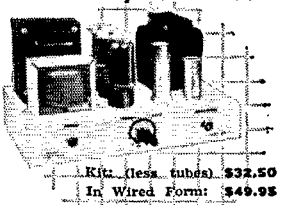
Wired & Tested: **$74.50**

In Kit Form: **$59.95**

Globe Chief 90A

Completely bandswitching 10-160M. Compact (8x14x9"), well-filtered, with built-in power supply. Pi-Net matches most antennas 52-600 ohms. Modified Grid-Block keying. Provisions for VFO input & operation. Can be converted to fone with Globe Models UM-1 or SM-90 Modulators. Shielded for TVI-reduction. Kit contains all tubes, pre-punched chassis, etc.

Modulates RF inputs to 100w

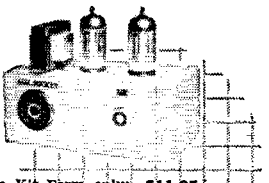


Kit: (less tubes) **$32.50**

In Wired Form: **$49.95**

Universal Modulator UM-1

Class A or AB-2 modulator, driver for higher power modulator, or PA amplifier. Matches output impedances 500-20,000 ohms. Carbon or crystal mike usable. Supplies up to 45w audio with proper output tubes. Provisions for addition of external meter for monitoring modulator cathode currents; for remote control of modulator. Perforated steel cover, $3.00 extra.



In Kit Form only: **$11.95.**

Screen Modulator SM-90

Ideal for use with Chief, but instructions for use with similar CW Xmttrs. Permits radio-telephone operation at minimum cost. Self-contained. Printed circuit board, all parts and complete instructions.

Visit Your Favorite Distributor for Details!

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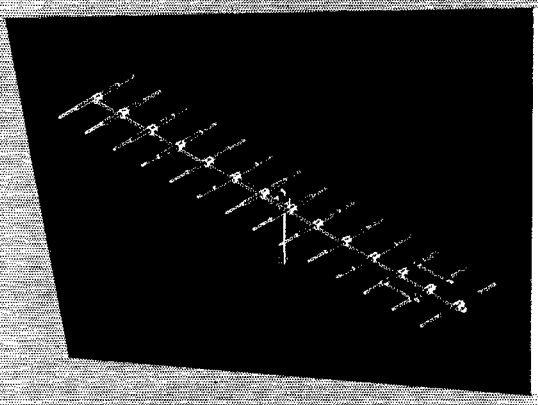
STRENGTH AND *PERFORMANCE !!*

Here are *NEW CONCEPTS* in VHF antenna design. Advanced Mosley POWERMASTER VHF antennas are ruggedly built to withstand the fury of gale winds and the relentless weight of snow or ice!

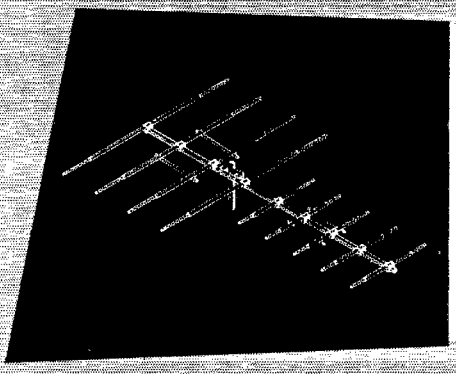


Model A-142
14 element, two meter beam.
Fwd. gain 13db. F/B 20db.
SWR 1.1 res. frequency

$48.75 net

Model SK-2
Stacking kit for A-142

$23.75 net



Model A-2N6
5 element, two meter, plus 4 element, six meter beam.

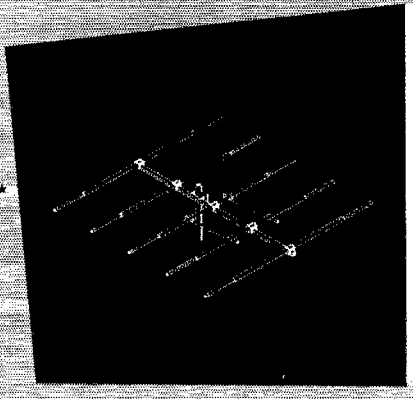
	2 meter	6 meter
Fwd. gain	11.4db	9.6db
F/B	11.5db	16.3db
SWR	1.1	1.1 res. freq.

$67.05 net

100% RUST PROOF

100% CORROSION PROOF*

5 YEAR GUARANTEE



Model A-56
5 element, six meter beam.
Fwd. gain 11db. F/B 20db.
SWR 1.1 res. frequency

$41.95 net

Model SK-6
Stacking kit for A-56

$32.75 net

If you are a "dyed-in-the-wool" VHF Ham, you'll want the antenna that stays on the job.....regardless of weather!
Mosley POWERMASTER VHF antennas.....
The only VHF antennas with a *five year guarantee*.

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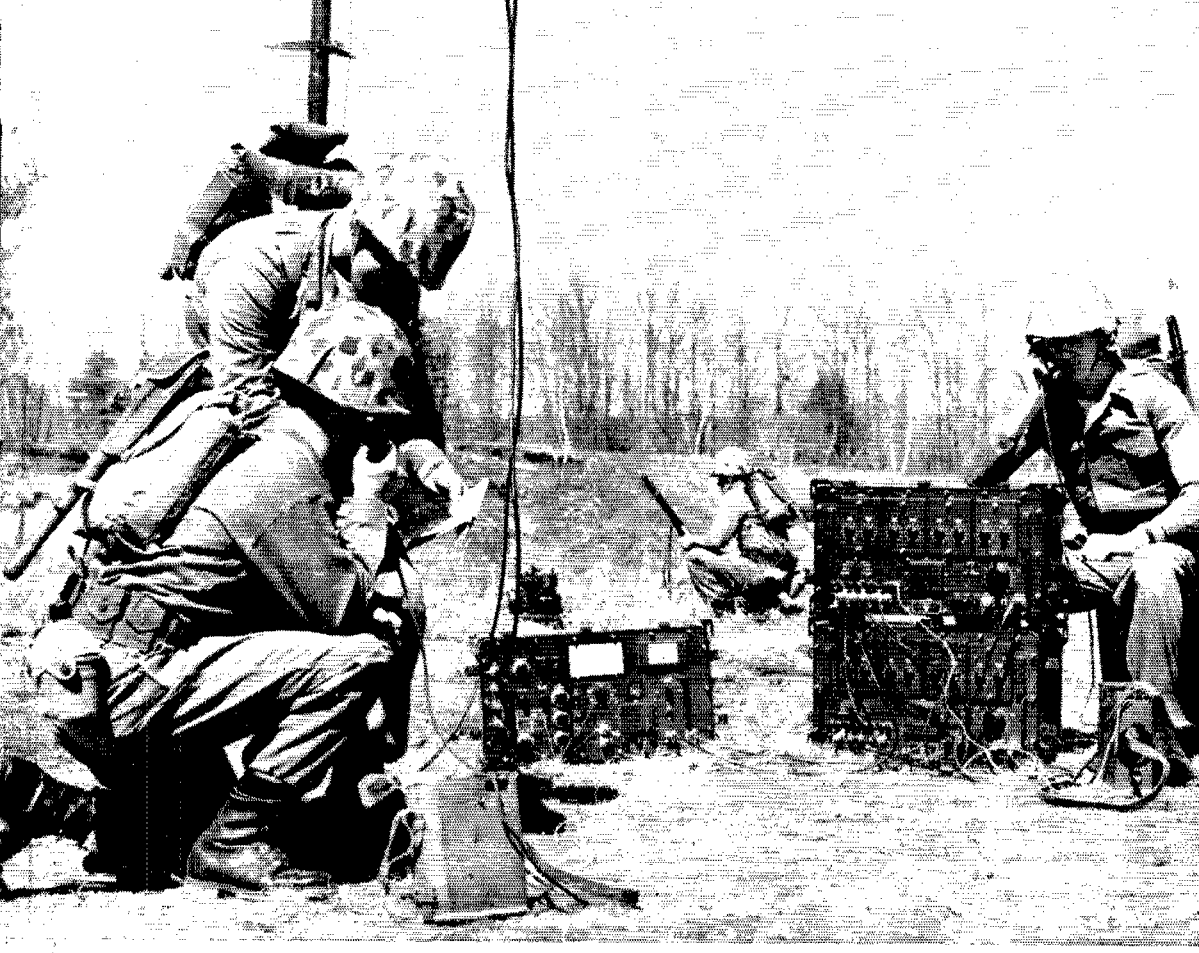
NEW for VHF by Mosley



MARINE CORPS' new multichannel microwave radio relay equipment—Raytheon's AN/TRC27.

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Another example of Field Engineering with a Future

Former field engineer to be Washington Representative

Fred Browning, K1IGQ—former field engineer and Marine Corps Field Project Supervisor—has recently been appointed Raytheon's Government Services Division Washington (D.C.) Representative. Fred's rapid advancement during the past eight years is typical of what the company means by field engineering with a future.

You may qualify as a Raytheon field engineer if you have field experience plus an E.E. degree or the equivalent in practical experience in communications, missiles, fire control, ground and bombing radar, sonar or radar countermeasures.

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GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: William C. Alcock, 4CDA. SEC: BAZ. RMs: K4AIS and LHQ. PAMs: GTC and K4MMW. S.S.B. PAMs: NGN and K4HBF. V.H.F. PAM: K4LOA. GTC has expanded KPN to include an early session at 1630 CST. It is hoped this net will help route traffic to KYN and 9RN better, and relieve the heavy traffic on the late session. BAZ is working on an EC net which will meet each month. This net is to exchange emergency communication preparedness ideas and stimulate EC activity. BAZ RPF, SUD, K4MMW and AIS met with State c.d. officials in Louisville to plan future action for better emergency communications in Kentucky. A full report of this meeting appeared in the *Kentucky Ether Chippings*. K4LHQ, new RM, is working with K4AIS on KYN and other section c.w. activities. Another Kentucky QSO Party is planned for June. K2UTI/M (Dick, K4WBG) is active in the Kentucky nets. New OOs are ELG and K4URX. OES WNH is running some interesting meteor scatter schedules at UK. CDA reports *Kentucky Ether Chippings* is out of another financial hole because of your contributions. The "Northern Kentucky" club now has 55 members. VLC is president. K4LOA reports 6-meter ground wave has been 200 miles with regular schedules. More activity is urged by Hanks on KY6M. Traffic: K4AIS 716, W4ZDB 408, K4LHQ 264, SBL 232, CSH 181, IFB 154, W4SUD 152, GTC 151, JSH 132, BAZ 108, RHZ 92, K4WBG 92, QCQ 83, W4CDA 77, HTD 60, NUQ 50, K4MMW 45, VTY 45, W4NGN 44, K4SBZ 42, KIS 39, W4KKG 38, K4JOP 35, W4YY1 35, K4HKB 32, W4OGY 32, K4PNA 26, HOJ 23, W4KKW 23, K4QHZ 23, W4SZB 21, K4JHC 18, W4MWX 14, SZL 14, ELG 11, K4HCK 11, W4MKJ 10, K4HOE 9, QCR 8, EMR 4, KYZ 4, W4JUI 2, NGZ 2, KN4YCB 1.

MICHIGAN—SCM, Thomas G. Mitchell, W8RAE—SEC: YAN. RMs: FWQ, OCC and QQO. OCC and WXO both earned BPL certificates for their December traffic totals. The following stations earned 8RN net certificates for their work during 1957-58: FWQ, GKT, OCC, ILP, QQO and ELW. These are the fellows who represented us in the Eighth Regional Net sufficiently to warrant the awards. Congratulations to all for the work done. According to our SEC, the Michigan AREC organization has a membership of 1835. Included in this total are 517 mobile units and 24 local emergency nets in the State. The EC-4 Net operates on 3663 kc. at 0830 Sun. for the purpose of clearing traffic between the County ECs and the SEC. The Mason County Radio Club has elected the following slate of officers: K8DTI, pres.; UMN, vice-pres.; KN8JED, secy.; K8BNK, treas.; and K8CKD, act. mgr. The new officers of the Saginaw Valley Amateur Radio Association are SXY, pres.; HMM, vice-pres.; LNE, treas.; K8JLD, secy.; QPO and KNB, trustees. The Central Michigan Amateur Radio Club (Lansing) will be guided by this new slate during the coming year: K8AEV, pres.; FSZ, vice-pres.; CPV, secy.; WKO, treas.; and GJK, director. K8EXE is having good results with his HBR-14 receiver built from the article in July '57 *QST*. HKT is building a 21-Mc. transistor transmitter. QQO and QOT are making ground-plane beads for 10-meter antennas to be used by the Berrien County emergency net members. EC UCG left his well-organized AREC organization behind for a Florida vacation. Chuck has the Muskegon County gang going strong. Traffic: (Dec.) W8OCC 534, K8BQD 302, W8YAN 291, QQO 258, NOH 223, FWQ 192, K8AEM 172, W8JKX 169, WXO 141, K8NAW 114, W8FX 100, RTN 93, TBP 72, K8HVQ 71, GJD 56, W8AUD 49, ILP 46, K8EXE 43, IYN 37, GUM 26, W8HKT 23, PXA 13, SJN 12, FSZ 11, SCW 10, DSE 8, WVL 6, EGI 3, (Nov.) W8QQO 206, K8HZU 52, GUM 44, W8DDN 34, NUL 3, K8CKD 3.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: UPB. RMs: DAE and VTP. PAMs: HPP, HUX and HZJ. New appointments are K8DEY as OES; ZRL, K8CKY and K8EEB as OOs; and OVJ as EC. FBM joined the Silent Keys. K8BXT received WAS. WTO and WAM certificates. EEQ has a new SX-101. GKB has a new Globe King 500-B and an HQ-170. K8CAG returned from six month's active duty in the Marine Corps. DMR reports that Columbus has six stations on 432 Mc., three on TV, and is looking for schedules with Dayton, Canton, Akron and Youngstown, Ohio 432-Mc. stations should be on the lookout for BAX, DAU, DMR, RRJ, TYY and WRN. BZX reports that anyone needing Shelby County should look for KN8MGF on 7180 kc. The Indian Hills RC's 1959 officers are USP, pres.; MJO, vice-pres.; K8LXI, treas.; and K8BFH, secy. UEA is the proud papa of a YL harmonic. The Cuyahoga County AREC assisted in the Annual Christmas Parade with AEU, AVU, BAH, LHX, OHA, PVC, TFW, TTL, VFU, ZEP. K8s AAG, ABA, GJW, JHZ, KNG, MBW and LMF taking part. NUY has another harmonic. K8MHJ

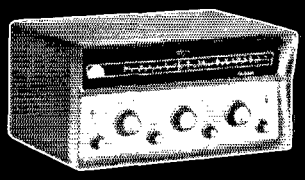
(Continued on page 114)

All-band communications receivers.

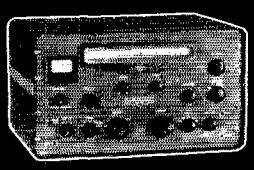
GONSET

G-33

G-43



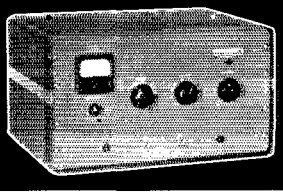
Single-sideband transmitters, linear amplifiers.



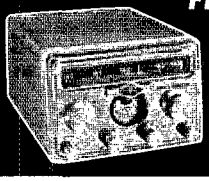
GONSET

GSB-100

GSB-101



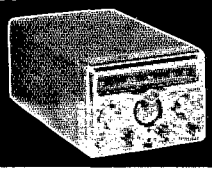
Fixed/mobile receivers, transmitters.



GONSET

G-66B

G-77A



Gonset's feature-packed equipment . . .

for fixed and mobile applications

G-33 ALL-BAND RECEIVER...

G-33, Gonset's new all-band receiver represents an outstanding value. Excellent for novice and short wave listener, general usage. G-33 reflects big value, modern functional styling. Ideal for ham shack, den, living room.

Printed circuit techniques and unique design give good sensitivity and signal to noise ratio even on the highest frequency bands. Receiver has 6 tubes, is transformer powered NOT AC/DC! Other features: Hi-Q permeability tuned coils, good image and spurious response rejection by use of high frequency, single conversion I-F system. Has audio gain and sensitivity control important to CW and SSB reception. Also antenna trimmer, built-in speaker, provisions for connection of external speaker, (optionally available) or earphones.

Receiver provides continuous coverage 540 kcs to 34 mcs in 4 bands. Has bandspread dial calibrated for amateur bands. Vernier dial has counterweight for smooth, non-critical short wave tuning. Design features handsome die cast front panel assembly and formed metal cabinet finished in metallic gray.

Model number 3222... ..... 89.95

G-43 ALL-BAND RECEIVER...

G-43 utilizes special printed circuit techniques and unique tuner design for excellent sensitivity and signal-noise ratio even on highest bands. Receiver covers frequency range of 540 kcs to 30 mcs, spread over 6 bands to give highest stability and great ease of tuning. G-43 features a full-vision drum dial which exposes only the band in use. Has provision for VHF converter.

Features include: Low noise, single conversion 1650 kc I-F section gives high image rejection, has 6, double-tuned hi-Q transformers for selectivity of 6 kcs at 6 db down, 24 kcs at 60 db down. Receiver has 8 tubes, is transformer powered NOT AC/DC! Speaker is built in, jack provided for external speaker, earphones. Also signal strength meter. Controls: Bandswitch, audio volume, sensitivity, antenna trimmer, ANL on-off. Crystal calibrator on-off. (Crystal calibrator separately available as an accessory.)

Model number 3241.....159.50

GSB-100 SINGLE SIDEBAND TRANSMITTER...

GSB-100 is a complete, self-contained SSB transmitter for operation on 80, 40, 20, 15 and 10 meter bands, rated at 100 watts P.E.P. Operates on SSB with selectable sidebands, phase modulation, amplitude modulation and C.W.

Output circuit utilizes pi network. Gonset exclusive Filter Phasing Network gives high sideband rejection, uses quartz crystal band-elimination filter for carrier suppression of more than 60 db, avoids need for critical balancing.

Frequency control is by fixed quartz crystal and built-in VFO which features exceptional stability. Unit gives full 600 kcs within all amateur bands, 80 through 10. Highly effective VOX system provided. Built in 115V AC supply.

Model number 3233.. . .. .479.50

SSB LINEAR AMPLIFIER...

Grounded grid Linear Amplifier is rated at 1000 watts P.E.P. Amplifier is designed to operate with GSB-100, or similar SSB transmitters supplying 75-100 watts peak power drive. Unit is self-contained, includes power supply, pi network output, antenna changeover relay. Bandswitched operation on 80, 40, 20, 15 and 10 meters. Same size and general appearance as GSB-100.

Similar to G-33 in general appearance, G-43 has a number of refinements that recommend its use by radio amateurs and the advanced short wave listener.

Model number 3262.....439.50

G-66B FIXED/MOBILE RECEIVER...

A highly flexible receiver, well suited for fixed station use, without equal for superior mobile reception. 6 band coverage: .54 to 2 mcs. 3.54-7.73 mcs. 14-14.35 mcs. 21-21.45 mcs. AM, CW, SSB reception. Highly stable HF and BF oscillators and crystal controlled second conversion oscillator. Steep skirt selectivity by 265 kc 2nd I-F with 8 tuned circuits. Double conversion all bands. AVC and famous Gonset noise limiter, antenna trimmer, "S" meter. Slide rule dial exposes only band in use. 40:1 tuning ratio. Universal power supply is separate unit for 6/12V DC and 115V AC, has built-in loudspeaker.

G-66B receiver with 6/12V DC and 115V AC power supply...#3213-12.....259.00

"Thin pack", 12V DC only, power supply also available. Is only 2½" thick, plugs into rear of G-66B receiver or connected with cable. No speaker.

G-66B receiver with "Thin pack" power supply, 12V DC only. No speaker.
Less patch cable...#3214.....239.00

G-77A FIXED/MOBILE TRANSMITTER.

Fixed/mobile transmitter with every desirable feature. Companion unit to the G-66B, same size and appearance. Covers 80-40-20-15-10 meters, has built-in stable, calibrated VFO with crystal control optional. Power input 50-60 watts, modulated. Pi network output. Full press-to-talk with built-in antenna relay. Power supply and modulator are in separate housing. Output voltage is 500-600 volts full load. Silicon rectifiers avoid rectifier filament standby drain. Power supply is universal for 6/12V DC and 115V AC.

G-77A transmitter with universal 6/12V DC and 115V AC power supply and installation kit...#3203 . . ..299.00

Write for further information and name of your nearest Gonset dealer.

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

has a new HQ-110. K8DEC has a new HQ-170. K8BPY has a new Collins KW. The Tusco RO *Bulletin* tells us that KN8LVM is a new ham in Dennison, the Teen-Age Net operates Mon., Wed. and Fri. at 0700 on 3835 kc., GAC's XYL presented him with a baby boy, LWK has a new Viking II, UUA was on a hunting trip in Pennsylvania and Knucklehead certificates were issued to W6OP, K6PIZ, UUA and K8s, BNR, CEH and HGY. Toledo's *Shack Gossip* nominated RZN as the "Ham of the Month." Henry County is forming a club and the stork brought a baby girl to the ham family of OFG and VJO. The Greater Cincinnati ARA's *The Mike and Key* states that EI6W visited and spoke to the club. Columbus ARA's *Carascope* informs us that the club held a Christmas Party and Swiss Steak Dinner, the V.H.F. Club held its meeting over the air with Police Inspector Alston as the main speaker (this may be the first time such a meeting has been held this way). K8DEU worked ZE2JE on 6 meters, WAB has a 24-element beam on 144 Mc., the stork delivered a baby girl to UHZ, IBX received WACAN and worked UO5AA on 40 meters. GZ was made Adj. General of Ohio. YGR has UA9KAR for a new one. Traffic was heavy in December with DAE, IBX, UPH, K8BPX and K8FDK making BPL. I had a wonderful surprise for a Christmas present from the 6-meter boys in Stark and surrounding counties. They built and put up a four-element beam with a rotator, installed a BC-1158 rig and 6-meter converter. So now I am on 6 meters also and enjoying every minute. Those known to have had a hand in this project were PXX, GNO, YO, K8s AHI, BXU, CAG, CHI, CMI, ECK, KTM, MZS, MZT and NLI. I want to thank them all very much for I thought the old ham spirit where all the amateurs in a city would turn out to help put up a mast, tower, antenna, beam or major station construction had died, but these 6-meter boys have revived this. Don't forget that the Ohio Phone Net and the Buckeye Net need more outlets for complete coverage in Ohio. K8EML has built a W6TC HBR-14 receiver described in the July 1957 issue of *QST*. He would like to hear from anyone who has built or is building this receiver to compare notes. K8HGD wants to welcome everyone to check in on the No Name Phone Net on 7275 kc. every day at 0800. Traffic: (Dec.) W8UPH 2569, K8BPX 873, FDK 570, W8DAE 489, IBX 334, QLJ 213, YGR 97, GKB 93, PMJ 88, IFX 85, K8DHJ 62, W8AL 60, WE 31, K8EJL 30, W8EAJ 29, BEW 24, K8HGD 21, W8RO 15, QIE 13, STR 13, BZX 10, K8HDO 10, W8OWP 9, K8MHO 8, W8PXX 8, LMB 6, EEQ 5, WYS 4, STF 2, K8BXT 1, W8QLG 1. (Nov.) K8FDK 380. (Oct.) K8FDK 336.

HUDSON DIVISION

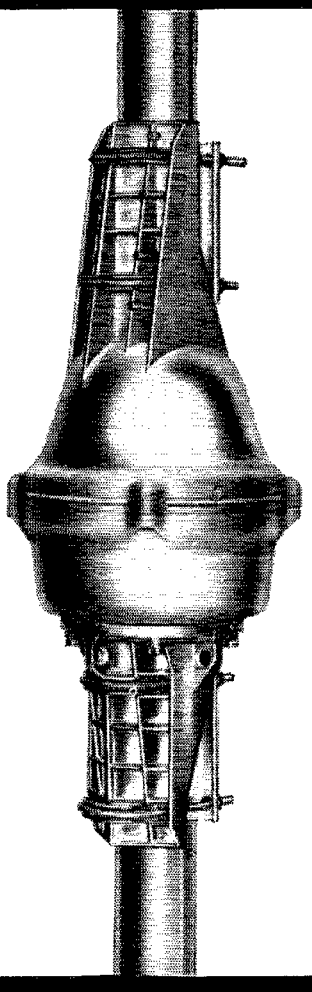
EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: W2PHX. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900, NYSPTEN on 3925 kc. at 1800, IPN on 3980 kc. at 1530, ESS on 3590 kc. at 1800, ENY (emerg.) on 29.490 (Thurs.) and 144.35 Mc. (Fri.) at 2100, MHT (Novice) on 3716 kc. Sat. at 1300. Congrats to our three December BPLers: K2OKZ, K2UTV and K2YTD. New appointment: W2CEV as ORS. With 15 watts to a 6360, K2CVG is looking for skeds on 220 Mc. K2ZAU received his DXCC with first endorsement. K2YJL is building a 300-watt amplifier for 20 meters. A new traffic man in Watervliet is K2KUA. A nice news *Bulletin* is published by the Ellenville Club; K2KRP is editor. WA2BMB has his General Class license. W2QPV is teaching high school in Peru, N. Y. K2UTV, with new amplifier is NCS on EAN and has his 2RN certificate. After 4 years, K2EIU worked Nevada for his WAS. K2ZLX has a triode on 5700 Mc. and will attempt DX work soon. The IBM Club auction in November attracted over 200 persons. WA2ANX is on the air with a new homemade rig. Among those reporting on the September Frequency Measuring Test were W2AZO, W2DIN, W2ZBS and K2TIY. The ENY (emerg.) Net averages 15 stations on both drill nights. Among the sports-car enthusiasts are K2YZA with a Volvo and K2EOC with a new Saab. W2UKL described his experiences on 21,000 Mc. at the Schenectady Club's December meeting. Included with the December beam fatalities was the one at K2LUS. It was nice to see traffic take an upturn in December with the largest number of stations reporting to date. Traffic: (Dec.) K2UTV 1181, K2YTD 506, K2OKZ 421, K2YZI 402, K2UYK 159, W2ATA 138, K2LKI 114, K2CWX 100, K2AYB 65, W2EFU 62, K2UXY 42, WV2AKK 35, K2QJL 28, K2KUA 22, W2SZ 21, K2CKG 15, WA2BMB 11, K2VCZ 10, K2CVG 4, W2TYC 4. (Nov.) K2YZI 184, K2TYD 158, K2CWX 114, K2VCZ 98.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: W2VDT. PAM: W2UGF. V.H.F. PAM: K2EQH. Section nets: NLI, 3630 kc. nightly at 1930 EST and Sat.

(Continued on page 116)

"HAM-M" BY CDR

America's most popular ham antenna rotor



Preferred because:

EXTRA HEAVY-DUTY

Holds heaviest commercial arrays — ice-proof, wind-proof, moisture-proof!

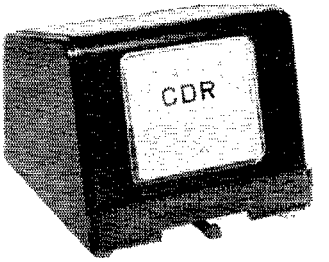
WON'T DRIFT

Provides 3500 in.-lb. resistance to lateral thrust.

EASIEST TO INSTALL

It's complete! Mounts on shaft or flat on plate in 30-minutes.

CONTROL CABINET: Pin-point calibrated in 5° units. Needle operates without activating rotor. Built for 8-wire cable.



ROTOR MECHANISM streamlined to resist moisture, "ice-lock." Actually stronger than your antenna itself. 98 ball bearings for smooth action. Positive brake ends drift.

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CDR

HAM ANTENNA ROTOR

Cornell-Dubilier Electric Corp., South Plainfield, N. J.

The Radiart Corporation, Indianapolis, Ind.

and Sun. at 1915 EST. NYC-LIPN, 3908 kc. Mon., through Sat. from 1730 to 1830 EST. NYC-LI AREC, 3908 kc. Sun. at 1730 EST. V.H.F. Traffic Net, 145.8 Mc. Tue. through Sun. at 2000 EST. Holiday traffic earned BPL cards for W2KEB, K2QBW, K2VCO, K2YBJ, W2DSC, K2PTS and K2MIG, the latter four on originations plus deliveries. NYC-LIPN attendance has averaged 22 stations per session. NLI Manager, W2VDT, urges all section members interested in traffic to join NLI. Additional coverage is needed throughout the section. K2EOF, now a Navy ensign, is stationed aboard the USS *Chataqua* in the Pacific. K2TEJ dropped the "N." A new HQ-160 is in operation at K2CQK. K2DEM is approaching DXCC with 90 countries snagged to date. W2JGV is operating temporarily from Vermont. K2MEM installed a Mosley triband vertical. K2KKT joined the traffic group with his Globe 65A and HQ-100. W2LGK, the new Emergency Coordinator for Queens, would like to hear from all Queens operators in order to build up activity in Queens AREC nets. K2ADL is beginning to work DX with his DX-100. A new Johnson Challenger came as a Christmas present for K2AAW. The station at K2YQK is a Valiant and an SX-101. A new triband quad is in use at W2HQL. The section lost another fine content man with the departure of W2PZE to Texas. K2DGT has reached DXCC-175. K2IBJ is using a Lettine 242 on 6 meters with WRL v.f.o. and International Crystal converter. The recent SS Contest made WAS a reality for K2OGJ. K2SJP is now using an S-53A and a 6-meter halo antenna. A new 6-meter four-element beam at 40 feet is in operation at K2SVY. K2TPU added a 6-meter v.f.o. to his station. W2AEE went s.s.b. with an HT-32. K2JWT increased his v.h.f. coverage with equipment built for 50 to 220 Mc. K2PTS is starting on 2 meters with a new Tecraft converter. K2QZS completed a 500-watt modulator for his planned kw. rig. W2SCA, K2RDP and K2VDR journeyed to Del., Md., D.D. and Va. to try 50 Mc. away from home—no DX, but local QSOs were plentiful. New officers of the Lake Success RC are W2CWD, pres.; W2KDC, vice-pres.; and K2IDB, secy.-treas. K2RDP installed a new fifteen-element 144-Mc. "Long John." K2RRW mobiled to Texas with his new Gonset "twins." Officers of the newly-formed Brooklyn Band Jammers ARC are K2UBC, pres.; K2QAA, vice-pres.; K2VQM, treas.; KN2OSL, treas. and K2RHA, activities. A new member of the 6-Meter LI Emergency Net is WA2BRY. W2JYA has a new 90-watt rig on 50 Mc. W2QFF is using a Pacemaker and an SX-101. New officers of the Amateur U.H.F. Club are K2RKL, pres.; W2MNX, vice-pres.; W2HLL, rec. secy.; W2QPQ, corr. secy. and K2BBO, treas. WA2AQE is now mobile on 10 meters. W2JKF added an all-band vertical. An electronic key is in use at W2PRU. New officers of the Levittown ARC are K2YOZ, Pres.; W2COR, vice-pres.; K2EYK, secy.; and K2YHD, treas. K2MQV returned to New England, where he resumed operation again at W1RTV. Are you keeping those New Year's resolutions? Did you join a net? AREC? Switch to safety? Traffic: (Dec.) W2KEB 5469, K2QBW 844, K2VCO 571, K2YBJ 302, W2DSC 281, K2PTS 166, K2MIG 146, W2AEE 139, W2EW 106, W2GP 102, K2HVY 77, K2BH 62, K2CQK 57, K2DEM 56, KN2KVL 55, K2RDP 49, W2DUS 46, W2JGV 42, K2MYS 37, W2TUK 37, K2MFM 35, K2PHF 35, K2GB 27, K2IRS 26, K2KXT 25, K2GFZ 23, K2TSW 18, K2LVS 16, W2HU 14, W2IVN 13, W2HNG 12, W2LGK 12, K2QZS 11, K2ADL 10, W2EC 10, KN2RBW 9, K2AAW 8, W2PF 8, K2CMJ 6, W2IGH 7, KN2RBW 4, K2YQK 4, K2AZT 3, WV2BST 3, K2QQH 3, K2GKT 2, K2IFZ 2, W2MDM 2, WV2BVW 1. (Nov.) K2YVJ 179, W2AEE 35, W2IGK 14, K2LCM 6, K2SJP 4.

NORTHERN NEW JERSEY—SCM, Edward Hart, jr., W2ZVW—SEC: W2IIN. PAM: K2KVR. RM: W2RXL. NJN meets daily on 3695 kc. at 1900. The New Jersey Phone Net meets on 3900 kc. week days at 1800, Sun. at 0900. NJ6 meets Wed. and Sat. on 51 Mc. at 2300. NJN held 31 sessions with an attendance of 496 and traffic 608. K2VAB was tops in QNI with a total of 26. K2MFF worked hard on Christmas traffic, filling for missing NCSs and taking extra 2RN duties. NJ6 held 9 sessions and handled 200 messages. K2VVL has a new tower. W2CVW likes contests. W2ABL made DXCC. W2NIY is busy with OO duties. K2GIF is rebuilding the final to reduce TVI. W2EWZ received the WWCNY Award. K2OOK returned to Drexel. K2ZSQ is all tied up with channel A (50.25 Mc.) and getting out an FB bulletin. W2GVU completed the filter-type s.s.b. rig for 75 meters. The rig went west at W2ADE when W2ANG tried to use it on phone. WA2BCX is working 80 through 10 meters and on nets. W2RZO tried being representative to EAN and lived through it. K2UKQ is working hard on DX. K2ZHK reports on the New Jersey Slow Speed Net, which meets on 3748 kc. at 1830. NJSS met 23 times with an attendance of 54 and handled 50 messages. K2AGJ is teaching code to Novices on 2 meters. W2COT says that W2AXJ's miniaturized

(Continued on page 118)

On the Hy-gain Beam . . .

Element length and spacing of the 3-Element Trap Tribander

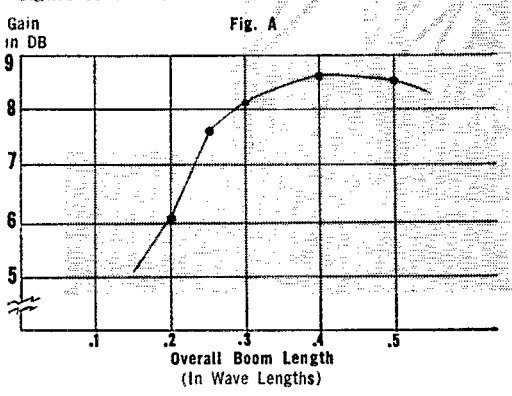
ONE OF A SERIES

Two extremely important factors in the design of any parasitic array must be more carefully considered in the design of a three element three band antenna system. ELEMENT SPACING is the distance between the parasitic reflector, driven element and parasitic director in the antenna. It is usually expressed in terms of wave length. ELEMENT LENGTH in this particular context, refers to the over all length of an element which is electrically loaded through the insertion of a series inductance. Many values of series inductance may be introduced into an element to shorten it physically while maintaining its electrical length or resonance. Our analysis in this discussion concerns the relative efficiency of an antenna thus loaded as compared to one using no loading or natural length elements.

Element Spacing

The forward gain of a three element array varies over a range of plus or minus ½ of 1 DB at over all boom length between .25 and .5 wave lengths. Above .5 wave lengths over all boom length, the forward gain begins to drop rather slowly. At spacings closer than .25 wave length over all boom length, the forward gain drops very abruptly. See figure A below.

Fig. A



As a result of this conclusive evidence, Hy-Gain's engineers use an over all boom length of 18 feet for our full size trap tribander antenna. This boom length falls in the region of maximum forward gain on the graph, since it is equivalent to .25 wave length on 20 meters and .5 wave length on 10 meters. This makes possible the development of the following gains: 20 meters — approximately 7.6 DB, 15 meters — approximately 8.5 DB, and on 10 meters — approximately 8.4 DB. NO CLOSER SPACED TRIBANDER CAN ACTUALLY DEVELOP THESE FORWARD GAINS. It was also found that at over all boom lengths in the .5 wave length region, the front to back ratio deteriorates rather severely. In order to improve the front to back ratio on 10 meters in the Hy-Gain 3-Element full size trap tribander, Hy-Gain's engineers choose to insert an interlaced, more closely spaced, 10 meter reflector. This greatly improves the front to back ratio on 10 meters without affecting the forward gain appreciably.

Element Length

Any reduction in the physical length of an element in an antenna system reduces its efficiency. This is evidenced by a reduction in forward gain and operational band width. In a tribander antenna system using lumped constant parallel resonant traps, some reduction in overall element length occurs due to the incidental inductive loading of the traps. The 10 meter traps are effectively in series in the 15 meter element and both the 10 and 15 meter traps are effectively in series with the 20 meter element thus reducing their physical length in the tribander system. Shorter elements result in a less efficient antenna system because part of the active element that would normally contribute to the radiated field is wound up into a loading coil whose radiation field is quite small. In addition, certain extra RF losses in the loading coil further reduce the efficiency of the element. In order to keep from reducing the element length any more than was absolutely necessary (and thus maintain the highest degree of efficiency) Hy-Gain's engineers chose the lowest value of inductance consistant with efficient trap action for use in our full size tribander series. This results in a tribander which is only slightly reduced in size. The longest element of the Hy-Gain full size tribander series is 32 feet as compared with approximately 35 feet for a natural length element on 20 meters. TRIBANDERS USING HIGH VALUES OF INDUCTANCE IN THEIR TRAP CIRCUITS END UP WITH SHORTER ELEMENTS AND A TREMENDOUS LOSS IN EFFICIENCY.

Full Sized Tribander

Hy-Gain's full size three element trap tribander with an 18 foot boom and longest element of approximately 32 feet makes possible a three band beam with high efficiency developing approximately 8 db gain on 10, 15 and 20 meters. No smaller three band beam can develop this gain. And remember, Hy-Gain's full size tribander with the triaxial gamma match system sells for only $99.75 ham net.

Miniature Tribander

If you have a space problem, buy Hy-Gain's miniature tribander. In this case, a shorter boom spacing (approximately 12 feet) was chosen together with a higher value of inductive loading in the traps. This results in a small sized tribander which still develops approximately 5 db forward gain. (Somewhat higher on 10 meters). Hy-Gain's miniature tribander which will handle the maximum legal power sells for only $69.50. No other reduced size tribander regardless of price can develop more gain.

VY 73

Andrew A. Andros

Andrew A. Andros, WØLTE
President
Hy-Gain Antenna Products Co.

s.s.b. exciter is cute and that W2FBR has an s.s.b.-kw. The Livingston Amateur Radio Club is busy on a panoramic adapter project. Traffic: (Dec.) K2YBC 548, W2OPB 526, K2ZHK 324, W2ZVW 238, W2MLW 234, W2KFR 226, K2VAB 215, K2AGJ 185, K2MFF 178, W2RXL 140, K2VN, 120, K2GIF 113, W2BVE 103, W2ADE 68, W2EBG 66, K2VVL 56, W2CQB 48, W2EWZ 27, K2QGG 24, W2CVW 21, W2BRC 20, K6RCO/2 11, K2JTU 9, W2CJX 4, W2NIY 4, K2ZSQ 3, W2TSQ 1. (Nov.) W2RZO 79, W2ADE 30, WA2BCX 4, W2WOJ 2. (Oct.) WA2BCX 7. (Sept.) W2ADE 70, WA2BCX 7. (Aug.) W2ADE 12.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—SCA reports a 3659 traffic total. This is the highest report ever made in the Midwest Division by a single operator station. KØBLJ made BPL on originations and deliveries. CLI received an EC appointment and AFN renewed his. JFF is the new president of the Waterloo Club. BTX is back from the South. NTB and KØEXN both have Valiants on the air now. CLI is using a Globe Scout and a Bandmaster. YDV received an HT-32 for Christmas. K4IBR is operating portable at Panora. IGU reports that her mother is now KNØSLY. KØLHH, QVZ and NYU recently joined TLCN. KØIQB is visiting in California. IBX went out for the Rose Bowl. BDR visited the Cedar Rapids Club. KØAPL reports that an element on his 15-meter beam hooked him on the jaw and nearly made a c.w. man of him. NGS reports that the 75-Meter Phone Net had its best year so far. Traffic: (Dec.) WØSCA 3659, BDR 2795, LGG 1923, PZO 1827, LCX 1725, GXQ 856, KØCLS 366, BLJ 247, WØSLC 143, VWF 104, QVA 83, KØAUU 67, CYF 66, WØNGS 64, UTD 62, NYX 49, KØMMZ 46, GXP 42, WØNTB 37, BTR 28, UHO 28, CGL 25, KØHIC 25, WØVQX 25, KØBRE 21, WØLSE 21, KØAPL 19, LHH 19, EXN 18, WØHTP 15, KØHBD 13, KNØQKF 13, WØADB 11, 111 11, KØDBW 10, JGM 10, WØPTL 10, COD 9, EEG 9, KØJMA 8, WØJPJ 8, FDM 7, KØHFQ 7, JTL 7, KAQ 7, WØVKY 7, YDV 7, FMZ 6, BQJ 5, KØKCZ 5, OFK 5, KNØPTO 5, KØBKL 4, KBX 4, LKE 4, QWM 4, GOQ 3, MFX 3, WØZMU 3, CYL 2. (Nov.) WØVQX 15.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: IFR. RM: QGG. PAM: LEW, V.H.F. PAM: HAJ. As of Jan. 1 WIZ turned the NCS job of the Topeka Ten-Meter Emergency Net over to TTG. Roy has done a splendid job since June 1956, and we feel that Curley also will do a good job. BIX reports "activity." He married KØLJH. He also reports receiving the Extra Amateur Class license. KØJWT is building a TV transmitter and hopes to obtain a TV camera. ETX has a TV transmitter on 432 Mc. JAS now is running a new transmitter with one kw. input on 2 meters. KØMRW, TSY and HLG did a fine job working with the State Highway Patrol on road conditions during a recent blizzard. ZJB has left Kansas and moved to Missouri. Many thanks, Vince, for the excellent job as V.H.F. PAM. HAJ takes over and will, I am sure, keep the higher frequencies going. All of the Kansas nets really did a nice job in handling the yearly traffic rush. Traffic: (Dec.) WØBLI 1576, KØGYA 1220, WØOHJ 966, FNS 620, IFR 422, TOL 379, QGG 349, KØIRL 154, WØIRE 148, KØHVD 133, WØSAF 121, SYZ 117, UOL 103, KØBXF 82, WØABJ 70, KØKMZ 68, EFL 58, WØUTO 48, KØBIX 43, IQA 43, MRW 42, JID 30, WØVUI 22, TTG 21, FHT 20, DRB 19, GIG 19, KØAWO 16, WØFDJ 13, WIZ 10, KØMMF 8, WØASY 4. (Nov.) KØIQA 42, WØLOW 1.

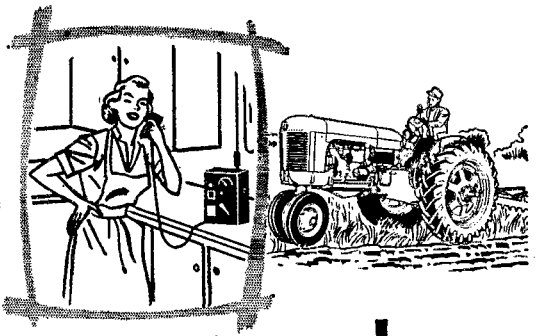
MISSOURI—SCM, James W. Hoover, WØGEP—Net Reports: MON; 53 sessions, QNI 224, QTC 325; NCS, OUD 27, ONK 11, ARO 5, KBD 5, RTW 4, GBJ 1. MEN; 13 sessions, QNI 480, QTC 228; NCS, VPQ 5, OMM 4, OHC 4, DWX 1. CPI reports that he is planning to move to Texas by June 1. KØQDJ and KØQCI, West Plains, were recently licensed. KØLGZ received a WAS ceritficate. KØINN is on s.s.b. with a new SB-10. ARO has a new three-element triband beam. KN8QVU has a new SX-71. KØJPH has a new Globe Chief and a Viking 122 v.f.o. A new radio club, the Riverside Amateur Radio Club of Greater St. Louis, has been formed with KØs JPL, IKB, ECK, GSV, LRW, ODR, CHE, GJD and K9MMS/Ø as charter members. KØSGJ, Ironton, has a new Communicator III and is looking for skeds with the 9th district on 6 meters. Former Midwest Division Director, Len Collett, is KZ5LC. CKQ has 39 states confirmed on 6 meters. New officers of the Heart of America Radio Club are KØEJB, pres.; RDI, vice-pres.; UHB, secy.; KØAWT, treas.; WHK, tech. chairman; QIZ, act. chairman. New officers of the Bandhoppers Radio Club are JHH, pres.; TPB, vice-pres.; CZI, secy.; EXN, treas. KØABK received his General Class license recently. New officers of the Northwest St. Louis Amateur Radio Club are GYL, pres.; KØCRR, vice-

(Continued on page 120)

INTERNATIONAL'S NEW

TRANSCEIVER

at home...work...or play here is



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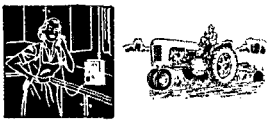
DELUXE, 117V AC or 6/12V DC **124.50**
COMMAND, 117V AC or 6/12V DC
fixed channel receiver **149.95**

FOR BUSINESS

Ideal for office-to-field communication. Also for office to trucks operating within restricted area or for office and factory liaison.

FOR THE FARM



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FOR SPORTS

From ship-to-shore or from base camp to the scene of the hunt . . . an enjoyable accessory to any sport!

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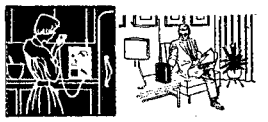

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pres.; PUV, secy.; KØGDI, treas.; WEQ, act. mgr. Traffic: (Dec.) WØCPI 1290, KØONK 1086, KBD 1049, HHQ 586, WØBVL 343, VPQ 279, KØLGZ 256, WØARO 233, KØOJC 174, WØOUD 146, KØJPJ 126, WØKIK 105, KNØQVU 102, WØRTW 86, OVV 74, KØPFF 73, WØOMM 52, KØLRG 37, WØEPI 32, GEP 27, BUL 22, KØJPH 21, JPL 21, IFM 9, SGJ 8, WØGBJ 7, KA 7, VFP 7. (Nov.) KØHIM 14, OJC 11, PFF 4.

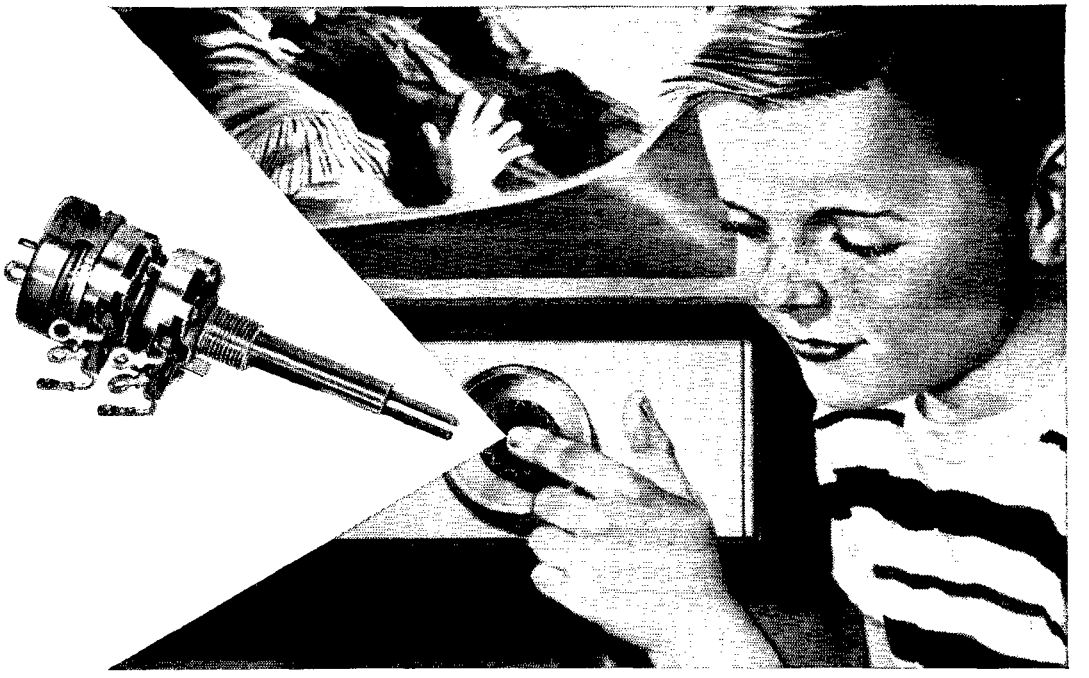
NEBRASKA—SCM, Charles E. McNeel, WØEXP—The Nebraska Morning Phone Net meets on 3980 kc. daily at 0730 CST. KØDGW NC reports QNI 593, QTC 357. Those reporting 100 per cent were KØBDF, SCT and KØDGW, with KØDGW making BPL. The Western Nebraska Phone Net, NIK NC, reports for December QNI 629, QTC 120. The Nebraska C.W. Net, reported by ZWG, had QNI 251, QTC 146. The Nebraska 75-Meter Emergency Phone Net on 3983 kc. daily at 1230 CST reports QNI 542, QTC 105. KØBDF missed only one session and KLB missed only two. MAO, our PAM, has been on the sick list but at this time is feeling better and is on the air some. We all hope Jerry is well and back on the band again soon. OFW, Council Bluffs, has passed along traffic for the Nebraska nets. LJO reports RACES activity is growing in Hastings. KØMRS is sending code practice on Tue. and Wed. in place of EGQ. Traffic counts from some of the nets failed to reach me in time for this report. Traffic: KØDGW 251, WØZJF 231, NYU 196, KØIJW 152, KUA 109, BDF 108, WØNIK 102, KØMRS 59, WØUOV 48, KØBRS 45, WØFTQ 43, ZOU 43, VZJ 41, KØHKI 37, WØKDW 33, KØBRQ 20, ELQ 17, WØLJO 17, OCU 14, RRL 12, URC 11, KØELU 10, WØAFG 9, HOP 9, SPK 7, VEA 7, KØMMS 5, WØATU 4, KØQLN 4, KJP 3, CYN 2, WØQKR 2, WZR 2.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—SEC: EOR, RM: KYQ, H.F. PAM: YBH, V.H.F. PAM: FHP. Traffic nets: CPN, Mon.-Sat. 1800, Sun. 1000 on 3880 kc.; CN, daily 1800 and 2130 on 3640 kc.; CVN, Mon., Wed. and Fri. 2030 on 145.98 Mc.; CTN, Sun. 0900 on 3640 kc. K1JAD, AW, EFW, KYQ and YBH made BPL. NJM is running high-speed code (15-55 w.p.m.) practice each Sun. at 2030 EST on 7120 kc. K1DZI received his Conditional Class license. CPN handled 419 messages during 31 sessions with an average daily attendance of 26 stations. QNI honors go to MDB, DHP, TVU, YBH, 30; K1BEN, 29; K1CRQ, 28; K1ACC, FHP, VIY, 27. Section Net certificates have been awarded to K1ACC, K1DHU, K1JAD and OQC for their support of CN and CPN. K1CKZ received a new Globe Scout 680A. EJH has a new HQ-100. FHP reports that CVN handled 45 messages during 12 sessions with a total of 123 stations reporting in. High QNI goes to FHP, 12; JZA, 11; K1BML, K1BMM, 9; K1DDY, 7. LAS, the Waterbury AREC station, is active on 6 and 2 meters. ECH now has a 117/93 country score. Recent awards are S6S, WAMC and WANE-67. K1AOX is busy on a 416B grounded-grid converter for 2 meters. HRK received a Viking 509 for Christmas. While showing amateur radio to 20 4-H Club members he contacted California and all had a chance to talk over the air. KYQ reports CN handled 704 messages, including 122 on the second session, during 31 sessions, averaging 23 per session. Average attendance was 12 stations. QNI honors go to RFJ, OBR and K1JAD. ZTT has converted a BC-455 for use with a crystal converter to monitor 2 meters. MWB is well satisfied with his new QTH. MDB reports activity in CPN, TCRN, DSDN, R1PN and NYC-LIPN. K1CAK soon will be on 2 meters with home-built gear. AW worked CR5AR to make it 173/161. K1BOI and KAC have a new jr. operator. VSE, of New Britain, is on 2-meter s.s.b. with a 4X150 rig. K1AOX is a new OES. Appointments renewed: FHP as V.H.F. PAM; WHR as EC. GVJ as OPS. ECH as OBS and OO. Reports received: OES from K1AOX, K1CKZ, FVV, KLK, LGE, MWB, VWP, YOL, ZTT; OO from CDM, GIX, MWB. Traffic: W1EFW 661, KYQ 657, AW 506, YBH 467, K1BEN 365, AQB 276, W1MDB 275, TYQ 250, NJM 236, FYF 187, K1ACC 168, W1OBR 150, K1DHU 147, JAD 146, W1FHP 124, K1CRQ 116, W1KLK 85, RFJ 61, QJM 58, VIY 43, OQC 37, BDI 31, CUH 31, HAT 27, ZUQ 26, KAM 24, MWB 23, K1CAK 18, W1GVJ 17, K1HMU 15, DDY 12, W1JZA 11, GIX 7, ECH 6, EJH 6, YOL 6, YBI 4, K1BFJ 2, BML 2, BMM 2, CEC 2, W1FPF 1.

MAINE—Acting SCM, Charles F. Lander, W1QJA—SEC: QJA. PAM: VYA. V.H.F. PAM: JMN. RM: EFR. Traffic nets: The Sea Gull Net meets on 3940 kc. Mon.-Sat. at 1700. The Tree Net meets on 3596 kc. Mon.-Fri. at 1900. The Barnyard Net meets on 3960 kc. Mon.-Sat. at 0800. The Maine C.D. Net meets every Sun. on 3993 kc. from 1100-1200. BBE, Kay, net mgr. of the Barnyard Net, reports 705 stations calling in and 28 pieces of traffic handled. Back on the air after 23 years and now report-

(Continued on page 122)



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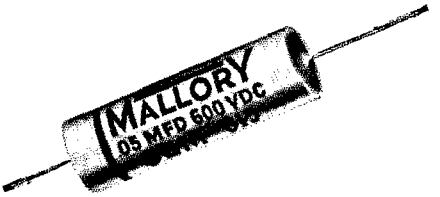

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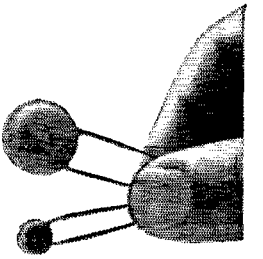

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ing into the Pine Tree Net in order to brush up on traffic-handling comes ISO, from Waldoboro. EHR reports that PTN needs c.w. operators, especially in the northern section of the State, if the net is to continue efficiently the complete coverage that is so necessary for complete traffic-handling. Let's have some of you good c.w. brasspounders up there report in and grab off some of the Aroostook County traffic. Hap, "The Hermit of Heartbreak Ridge," gets hundreds of letters annually telling of the joy he spreads to the shut-ins with his continuous modulation of the ether. This time Hap has succeeded in making a shut-in write his first letter in 20 years to tell him how much enjoyment he gets from listening to Hap's interesting yarns. Lester W. Carnes of Henniker, N. H., is one of the many SWLs who listen to the "Ole Buzzard of the Backwoods." GKJ reports major activity on 50 Mc. and also a new ham in Scarboro, K1JDA. Many thanks to all for the holiday greetings. Traffic: W1GPY 362, K1DWQ 198, W1QJA 160, K1DPM 156, W1CEV 102, UDD 80, FV 76, K1AKO 47, BDQ 25, W1OTQ 23, K-1VG 13, KYE 9, W1KFY 8, K1BAY 7, BZD 5, DLP 5.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointment: K1AQI Burlington as EC. Appointments endorsed: OLP Walpole as EC, BHD and LMZ as OBSs, BHD as OES. The T-9 Club met at KON's. ZSJ reports that the Cape Cod and Islands Club is filing a license plate bill and UMC says he filed one to keep the idea alive. KBS/6, San Diego, will be on 10 meters looking for the gang. RE, PWI and Crocker Mann, of Holliston, are Silent Keys. Our sympathy to DOM on the loss of his father. WFQ has a baby girl. Heard on 2 meters: KEK, IIB, K1DFD, K2QXG/1 and K2JNJ/1. Heard on 75 meters: ME, MMQ, LAV, QWI. RXJ, EU, DXM, LHY/1 Marion, SKP, K1ABQ and BID. RXJ has a new SX-170. K1BTF has moved to Bennington, Vt. HXR is feeling better after a stay in the hospital. The Braintree and South Shore Clubs held meetings. WXC has to fix up his antennas. FMW will be back on 2 meters. BW has his mast up again. MD got the Asian on 10 meters. ZXG has an Apache. BIY is mobile. Lots of traffic is being handled on all nets. AWA, EMG, K1BYL and NJL made BPL in December. AWA is going to California for a month. K1DWR is on 6 meters. K1DIO made BPL in November. K1BIL is working DX. K1CMS has a "Cat Laundry." Aog is active on nets. K1BUF has break-in now for the rig. RCQ handled Christmas messages for KG1CK in Thule, also new DX. K1CMS will be acting manager for the 6-Meter Crossband Net. K1CEH is on 15-meter c.w. WAJ is building a frequency standard. Officers of the Burlington Amateur Radio Assn. are 3GHY, pres.; WIY, vice-pres.; NTJ, secy.; MNL, corr. secy.; K1AQI, comm. mgr.; CB, asst. comm. mgr.; CAK, TVI. K1AII has a transmitter for 220 Mc. K1BSM has an E12W on 6 meters. YFQ says he is going to school outside Boston. New officers of the Cape Cod and Islands ARA are MKW, pres.; DVS, vice-pres.; EGZ, secy.-treas.; QWI, OQT, EUE and BCN, directors. On 6 meters: BCN, WHC, MQG, PX, EUE and K1BIF. The Cape gang gets on 3912 kc. Sun. A.M. The Quannapowitt Radio Assn. held its 10th anniversary celebration and had the Telephone Company's film "Dew Line!" The Winthrop gang still holds drills. The Framingham Club held a meeting. The T-9 club met at Ed Maguire's QTH. K2KIR IS GOING TO M.I.T. MBA is on 6 meters. K1GNR is on several bands. K1HSV has a Gonset one- and four-element beam. The Eastern Mass. 2-Meter Net has changed frequency to 145.8 Mc. (8100-kc. crystal). EAE came across a large amount of them at a very small cost and they can be purchased from him. ALP or UIR. Traffic: (Dec.) W1AWA 833, EMG 832, K1BYL 694, W1NJL 580, K1GRP 276, W1EAE 256, K1DGI 211, W1UKO 117, K1DIO 104, W1UIR 90, SS 76, AOG 69, K1BUF 57, W1LMZ 55, TY 51, RCQ 48, KYC 45, K1CMS 44, W1OFK 35, K1DJG 19, HSV 19, USA 7, IKX 6, W1WAJ 4, K1AII 3, W1BGW 3, AKN 2, K1CEH 2, W1GEK 2, K1DEY 1. (Nov.) K1BUF 41, K1DJG 10, W1BB 8, K1HSV 5. (Oct.) K1BUF 103.

WESTERN MASSACHUSETTS—SCM, John F. Lindholm, W1DGL—Asst. SCM: Richard J. Kalagher, 1KGJ. SEC: BYH. RM: BVR. PAM: MNG. The West Mass. C.W. Net meets on 3560 kc. at 1900 EST Mon. through Sat. The Mass. Phone Net meets daily on 3870 kc. at 1800 EST. The West Mass. Novice and Slow-Speed Net meets Tue., Thurs., and Sat. on 3744 kc. at 1830 EST. KGJ has been endorsed as OBS. Phone Net certificates have been issued to K1AEC, FGV, FOX, JSH, KZS, MNG, QKC, UV, VBG and VBT. BVR reports the WMN is going along very smoothly. The WMNN has started out well with a good turnout. All West Mass. Novices are urged to report in. EKO has new beams for 15 and 6 meters. DHA has 37 states on 6 meters and has been active in MARS. QSLs from HSIC and BV1USB were found under the Christmas tree of DGT. New officers at the Podunk Radio Club are YQA, pres.; K1CBW, vice-pres.; and GKO, secy. QKC is working on a small

(Continued on page 124)

two for the show

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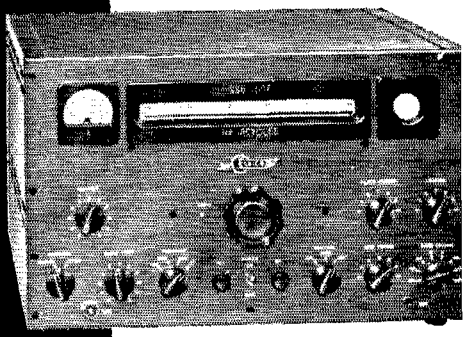

SSB-1000F
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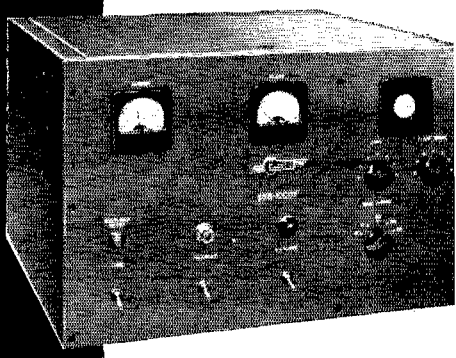

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portable transmitter. Officers of the Pioneer Valley Radio Club are ZWZ, pres.; TDO, vice-pres.; and AKB, secy.-treas. Several West Mass. stations were active in the Mass. QSO Party; EZD compiled a good score from Hampshire County. New Novices are JNC, of Ludlow, and JHC, of Leominster. K1HTS, of Westfield, has dropped the "N" and is active on the WMN. DGL has a new Viking VFO. As can readily be seen by the traffic count, West Mass. stations were quite active in handling holiday traffic; UEQ kept his 1958 record intact, making BPL every month. Your new SCM thanks all for the well wishes extended to him upon taking over the SCM duties. Traffic: (Dec.) W1UEQ 609, K1CAU 306, W1KGJ 206, LDE 182, BVR 179, DZV 161, DGL 105, QKC 84, ZPB 29, AGM 19, OSK 6, HRV 4, EKO 2. (Nov.) W1TAY 27, OSK 5.

NEW HAMPSHIRE—SCM, Robert H. Wright, W1RMH—SEC: BXU. RMs: COC and K1BCS. PAM: HQ. V.H.F. PAM: TA. The GSPN meets at 1900 Mon. through Fri. and at 0900 Sun. on 3842 kc. The NHN meets nightly at 1845 on 3685 kc. The Northeast V.H.F. Net convenes nightly at 1930 on 145.0 Mc. The N.H. RACES Net meets Sun at 1300 on 3993 kc. K1BOO advises that the Manchester High School Radio Club has reorganized. Officers are K1GGJ, pres.; K1BOO, vice-pres.; K1IOL, secy., and KGZ, treas. QHS is working at Sander's Associates in Nashua. KOC has moved to Durham. VBX is on 6 meters with an 829-B. DUB is operating s.s.b. on 2 meters. The Concord Brasspounders has a 6-meter transmitter-receiver club project in the works. K1CFX has moved to Nashua. UGV is representing the Nashua Area on the 6-Meter Crossband Net. RMH has a new KWS-1. Endorsement: BYS as OPS. GSPN certificates went to K1CIF and K1DKD. Reports from all active amateurs in the section are invited for this column. How about dropping me a line? My address is on page 6 of this issue. Traffic: (Dec.) K1BSC 1369, CIF 1068, AHE 195, W1TA 170, HKA 47, IIQ 44, JFJ 41, MOI 39, YMJ 30, AIJ 29, K1BHD 20, W1MTX 16, RMH 9, K1CSJ 8, W1CUE 4. (Nov.) W1EVN 10, K1BOO 6.

RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ. PAMs: KCS and YRC. RM: BBN. SMU has been appointed ORD. Endorsed this month were WED as OBS and YRC as OPS. OMC has earned a BPL award for his December traffic total and also has been awarded a Section Net certificate for his work with the RISPN. SMU is the new president of the ARESNE. Other officers are JXI, vice-pres.; KUQ, secy.; and K1CZB, treas. EJ was reelected trustee. The ARESNE now holds a weekly net on 29,200 kc. at 2100 on Wed. CMH has modified his beam by putting a gamma match on it and has also built an antenna tuner. The RISPN will now run Fri. as well as Tues., Thurs. and Sat. This net meets at 1830 on 3915 kc. LQJ reports that K1IKF is a new General Class license in the Westerly Area. It is good to be hearing from this part of the State regularly from LQJ. TXL is using a new CDR ham rotater and three-element Mosley Tribander. Any club or group in this section ow offering a certificate is requested to send complete information about the award to the SCM. By compiling this data, out-of-section queries can be more easily answered. Traffic: (Dec.) W1YRC 363, YAP 308, CMH 234, OMC 209, TXL 128, SMU 109, BBN 28, LQJ 23, DDD 16, WED 4, K1CBR 4. (Nov.) W1SMU 58.

VERMONT—SCM, Mrs. Ann L. Chandler, W1OAK—K1BGC is a new OES on 50 Mc. FPS is on 3.5 Mc. with an 813. K1HKI contacted 190 stations while home on vacation. MH participated in the November F.M.T. KJG rebuilt a modulation indicator unit. K1BUE is on 50 Mc. from Waterford. EXZ sent his usual fine OES report. K1BOL is busy with OO duties. 2YIK/1 visited in Mendon. K1BVH completed a preamplifier ahead of his SX-71 on 50 Mc. MMV contacted FG7WE toward DX on 15 meters. K1AUE operates a TBS-50D and an SX-25 from Burlington. K1s HDB, HKI and KN1HMS are enjoying their one element on 15 meters. Sorry to report the passing away of K1CRF. DWR is active on 50 Mc. New in Plainfield is KN1JER. Congrats to KN1s HYJ and HYK on their recent marriage. TLP/MM manages to work DX aboard his ship, the SS *Mankato Victory*. KN1LPH operates a Gonset Commander Model 2C approximately three hours per day on 80 meters. My term as SCM comes to a close, and I have sincerely enjoyed and appreciated all the fine reports received from each of you, and indeed it has been an added pleasure to serve Vermont amateurs in this capacity. Best of luck to you all and let's continue our cooperation with VSA, our new SCM. Traffic: (Dec.) W1OAK 344, KRV 115, VSA 71, K1BOL 65, BGC 45, W1EIB 45, KJG 24, K1AUE 21, HKI 5. (Nov.) K1BGC 33, W1KRV 6. (Oct.) W1KRV 52.

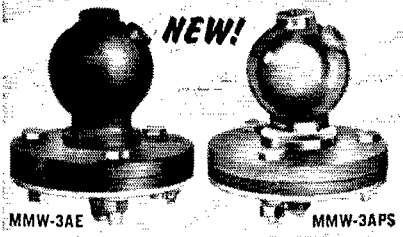
NORTHWESTERN DIVISION

ALASKA—SCM, Eugene N. Berato, KL7DZ—New appointments: BES as SEC; BWR as RM and PAM. GJ is the proud owner of the first 32S-1 and 75S-1 and

(Continued on page 126)

HEAVY DUTY
MOBILE BASE MOUNTS

NEW!



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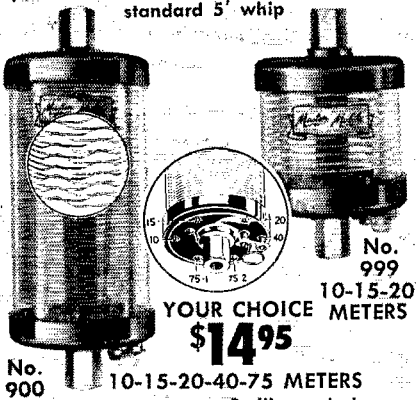

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YOUR CHOICE $14.95

NEW! SLIM-JIM ALL-BAND BASE LOADING ANTENNA COIL

96" WHIP

FOR 10, 11, 12, 15, 20, 40, 80 METERS

SIZE 1⅜"x 19"

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Positive action, just slide whip in or out to loading point and lock nut into position.

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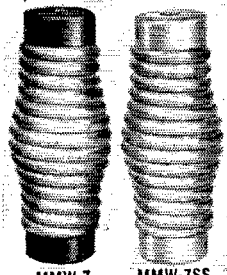

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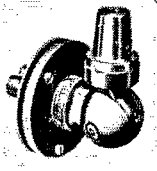

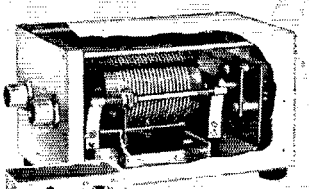

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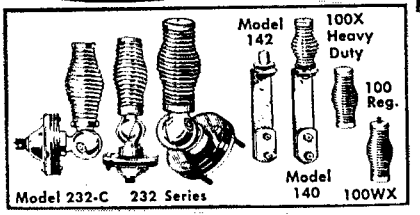

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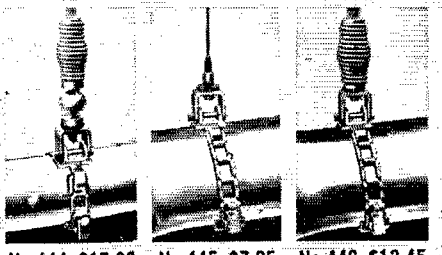

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can be on 15- and 20-meter s.s.b. AEQ's new QTH is Fairbanks. AH is devoting lots of time these days to learning to fly. CKB is the owner of a new Thunderbolt. AUV is the proud recipient of a 6-meter SWL card from Sweden. CAK, AH, CRB and CJN are active on 6 meters. CLA has a new Globe linear. AMH changed to an NC-303. CQS decided to work some DX and put up a new Tribander. CUQ is on 15-meter s.s.b. with all home-brew equipment. CP, your QSL Manager, needs stamps and QTHs in order to mail QSLs which are piling up. Do not send envelopes. CDF is back home in W9-Land after a very good tour of the Arctic Coast. He can be heard at W9KLD. CNE has a new Valiant. CDE is proud of his new Navigator. Traffic: KG1DT 559, KL7BJD 548, MF 3, BLL 2.

IDAHO—SCM, Rev. Francis A. Peterson, W7RKI—HSV is the new Net Control on the FARM Net. The Shoshone County Club is getting good publicity in the papers. Is your club doing it? It's important. ARRL has good information on how to do it. VQX still is faithfully working traffic and reports no TVI on 15 meters. The Pocatello Club's new officers are K7ALA, pres.; KN7CXP, vice-pres.; K7GQE, secy.; and CDA, treas. Congratulations and keep up the good work. Some "N"s were dropped from various calls the day before Christmas. GHT actually broke down and wrote about his tremendous activities on the ham bands). Why don't you? The Boise Club is working hard to organize c.d. units throughout the State. Try to cooperate with them and help them become ARRL members so they can receive the excellent help and suggestions from Headquarters for their important work. Traffic: W7VQC 71.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WXI—SEC: KUH. PAM: EOI. The Montana Phone Net meets Mon.-Wed.-Fri. at 1730 MST on 3910 kc. K7BON has a new jr. operator, 5BGF moved to Livingston from New Mexico and is with the CAA. WIB left Bozeman for Boeing in Seattle. IBG mobiled to Guyman, Okla., and maintained schedules with home on 75 meters. New calls: AIN in Havre; KNZCQG in Bozeman; KN7s, GVZ, GWA, GWB and GWD in Lewistown. New Conditionals are K7CTI in Columbia Falls and K7DFR in Great Falls. DL1IB became the first DX station to earn the Brady Award. Fifty people attended the Ham Dinner at Ulm in spite of bad weather. TPE reports the following tally of Montana calls in the Winter *Call Book*: 118 Novices, 850 Conditional (or higher) and 55 Club (or MARS) for a total of 1023. JHL is mobile with the Gonset Twins. Does anyone know the whereabouts of K7AXD? The Central Montana Hamfest will be held at the Fairgrounds in Lewistown June 6 and 7. Traffic: K7EWZ 158, W7YHS 132, K7AEZ 72, W7SFK 56, K7BYC 47, BVO 44, W7DEO 21, TPE 14, NPV 13, K7DGR 10, DVZ 10, CFA 9, CTI 7, W7YUB 6, ZUK 5, ZUJ 2.

OREGON—SCM, Hubert R. McNally, W7JDX—OSN really is going to town now and traffic reports from the ORSs are very gratifying. ZB and BDU both made BPL, AJN, ZFH and BVH made BRAT. AJN was reelected net mgr. so OSN should have another good year. OMO was in the hospital but is on the mend now. YKT made a good score in the SS. JCJ again is active on the OARS Net, which has been reactivated. RHX finally got his new beam up but has been too busy with other things to use it. A nice report was received from BLN on the Coos County gang. NJS has been stirring up the OPS gang and more reports now are coming in. Beth also is quite busy with her YLRL gang. DIC has subscribed to *PANN*, so must be getting ready to check in on OSN. We regret to announce the passing of K7AWW in Japan while making repairs to a radio antenna tower; Also, MGI, of Portland, an old-timer on 10 meters. PQJ had a perfect score in the recent Frequency Measuring Test. K7EPA is a new OES. GNC and MW are now ECs. RVN is a new OPS. The Portland gang put on "Operation Santa Claus" at Christmas time, in local children's hospitals. Those participating were AZD, RVN, DGE, CHN, ADH, EJO, LI, DRZ, IFA, WAA, ZQQ, QWE, QFY, WHE, YZP, UJF, SAO, ALG, HNW, BJJ, JCJ NGW, JDX, DJX, YQJ, HHD, KCK and K7ADX. Traffic: (Dec.) W7ZB 793, BDU 583, AMF 221, RVN 91, ZFH 91, K7CLL 35, W7AJN 27, LT 25, RHX 20, BLN 16, JDX 10, DEM 6, JCJ 3. (Nov.) W7BDU 168, ZFH 77, DIC 63, K7CLL 62, W7LT 32, YKT 30, AJN 29, RHX 15, JDX 11, DEM 5.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—Washington nets: WSN, 3575 kc. at 1900 PST Mon. through Fri.; WARTS, 3970 kc. at 1800 Mon. through Sat.; NSN, 3700 kc. at 2100 PST Mon. through Sat. The second Northwest Chapter QCWA-QSO Party will be held starting Mar. 13, 1959 and ending Mar. 15, 1959. New officers of this chapter are ER, chairman; LQ, vice-chairman; OS, secy.-treas. OEB was elected new manager for WSN. The Clark county Amateur Radio Club and the Portland Oregon Club (OARS) combined their facilities and handled the Christmas traffic for the patients at Barnes Veterans Hospital at Vancouver. USO and ZDQ used a 2-meter link with the hospital. K7AEJ

(Continued on page 128)

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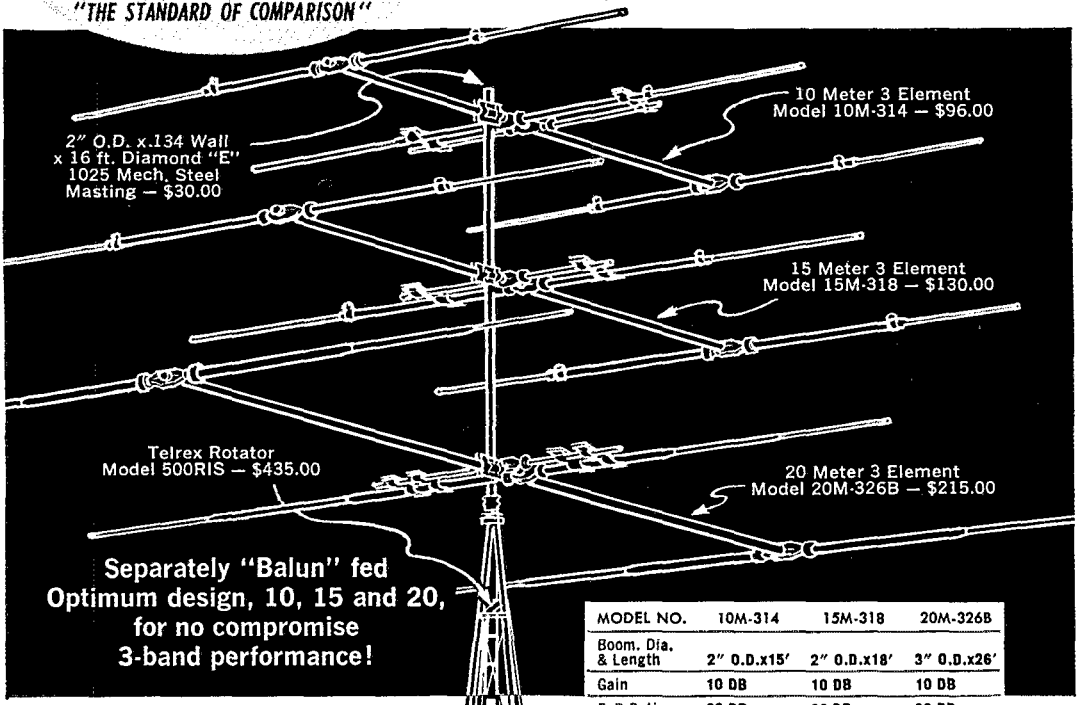

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joined Airforce MARS. EOL is on s.s.b. ZA joined Silent Keys Dec. 18, 1958. LVB was QRL the Post Office and had no time for hamming. AMC has a new Johnson Courier. QHR is the new Walla Walla Area EC. K7CHR is using a DX-40 and working DX on 40-meter c.w. The following renewed their ORS appointments: ETO, USO, JEY, TH and FWD. New officers of the North Seattle Amateur Radio Club are JPH, pres.; IRA, vice-pres.; CNU, secy.; YQS, treas.; CO, IAA, LWB, OEX and PGY, trustees. The following renewed their appointments: AMC as OPS, AIB as RM, FWD as OBS and K7ASY as OO. BDK is busy building a new 150-watt transmitter. EQU is working DX on 10-meter phone. NV was appointed communication director for 4th Dist. for State C.D. BRG is recovering from major heart surgery. K7DNX works 80 meters using a Collins 32 and an S-77A receiver. KN7GDR is a new Novice in North Seattle. AIB reports the new beam is doing very well and he worked 18 new countries the first month of use. ETO has a new all-band vertical. ZGH and WEV are QRL converting the ART-13. ZIX is building a new 813 final. EVB is back on the air from a new QTH and working portable. JPH and PGY were visitors at the January meeting of the Skagit Radio Club in Everett. VI has a model 15 teletype machine and is building the power supply for same. OEX has a new 4-400-A final. CAM has a new Tribander. DZX made BPL for the first time. The Puyallup Radio Club (VARC) started code and theory classes on Jan. 12 in conjunction with the High School Adult Education Program. The Pierce County RACES drills are on 10-6-2 meters with an average of fourteen check-ins each drill. Washington State Net (WSN) changed frequency to 3535 kc. as of Jan. 12. FQD entered the armed forces Dec. 30 for 3 years. All appointees are requested to check the expiration date of their certificates and to please make their reports as soon after the first of each month as possible. BPL cards went to BA, DZX, PGY and QLH. Traffic: (Dec.) W7BA 3236, PGY 1831, QLH 825, DZX 728, APS 255, KZ 228, AMC 109, IEU 103, USO 68, LFA 61, EHH 56, AIB 33, UWT 29, HUT 28, LVB 23, REC 10, CQK 9, EKQ 5, EVW 3. (Nov.) W7WQD 22.

QCWA QSO PARTY

March 13-15

The Northwest Chapter of Quarter Century Wireless Assn., comprising the area of Washington, Oregon, Idaho, and British Columbia, is sponsoring a second QSO party in which QCWA members all over the world are invited to participate. Purposes of the party are to stimulate interest in Chapter endeavors by exchange of ideas and to encourage members to renew friendships and meet new members on the air.

The party runs from 1400 PST March 13 to 1400 PST March 15. The general call will be "CQ QCWA." Logs should show contact number, date, time, station worked, QTH, frequency, name, and National QCWA Number for each contact. Northwest Chapter members will monitor the following frequencies for calls during the party: *c.w.:* 3655, 7125, 14,110, 21,100, 28,100; *a.m.:* 3950, 7210, 14,240, 21,340, 28,900, 50,200; *s.s.b.:* 14,280, 21,415, 28,675 kc. Mail entries to Dr. F. Clifford J. Spike, W7OS, Secretary Northwest Chapter, 1412 Medical Arts Building, Tacoma 2, Washington.

PACIFIC DIVISION

HAWAII—SCM, Samuel H. Lewbel, KH6AED—All hams in the Pacific Division, which extends to the Marianas and south of the Equator, are asked to submit their activity reports to the SCM. His address always appears on page 6 of every *QST*. If these reports are mailed to the SCM in time to beat the 7th of the month deadline the news will be included in that report. Our two OOs, ARL and KS, are picking up a lot of business and reports are getting heavier. Because of the pressure of business, KC has resigned as Emergency Coordinator for the Honolulu Mobile Club and AWG has been appointed to replace him. KG6AAY has ordered a KWS1, a 75A-4 and a Telrex beam. K2ILQ/KG6 made WAS on 50 watts; he will be /W3 soon. New officers of the Marianas Amateur Radio Club are KG6AHV, pres.; Mr. Pomenzael, vice-pres.; Jim Wene, secy.-treas. KØGRW is the new MARS Director. KG6AD is back on the air with a 4-1000. The U.S. Third Marine Division in Okinawa has undertaken an extensive amateur radio program involving eleven stations and KR6GH at the Okinawa General Hospital.

(Continued on page 130)

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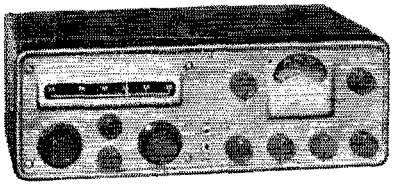

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Features turret-type, hooded, illuminated dial. Covers 80-40-20-15 and 10 meters, VFO or crystal controlled. 60 watts input. PI network final operates into 50 to 75 ohm antenna or antenna tuner. Size: 4⅛"x11⅞"x7¼". Ship. wt. 14 lbs.

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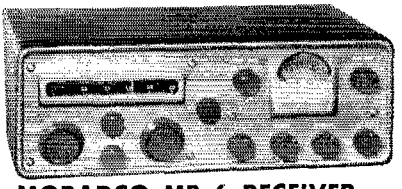

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Matches MB-565 Transmitter. 13 tubes – 20-tube performance. 100 kc calibrator, "S" meter that converts to an F. S. meter for transmitter tune-up. 1 microvolt sensitivity. Noise limiter and very sensitive noise-balanced squelch. Size: 4⅛"x11⅞"x7¼". Ship. wt. 12 lbs.

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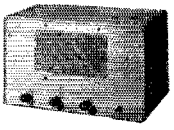

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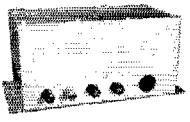

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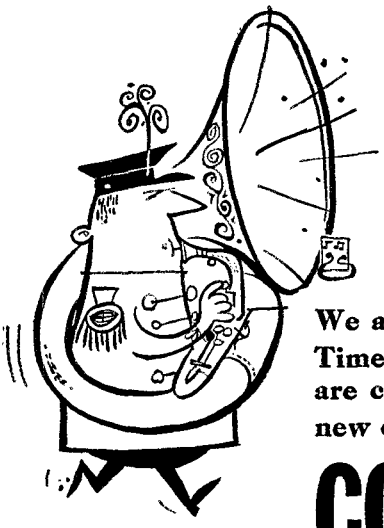
NEVADA—SCM, Charles A. Rhines, W7VIU—We have had some response in regard to a Nevada Net but can use more. We ought to be operating on a trial basis by the time you read this. New appointments: AZF as OO, IWT as Churchill County EC. Your SCM spent a very enjoyable time meeting the Reno gang and attending the December meeting of the NARA. Activity in Southern Nevada is reported low. JU still is keeping 2-meter skeds with the Coast. The AREC still is holding at 33 members. How about getting some more in on this very worthwhile aspect of amateur radio? V1U got his DUF-III and 6S6 awards. UPS is QRL work. K7AHA is planning to move to Reno. If this is loaded with Elko news it's your fault for not getting the dope in to me by the sixth of each month. How about some of you other spots dropping me a line? Traffic: W7VIU 356.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—SEC: W6NVO, PAM: W6ZLO, RM: W6PLG. Twenty-two station activity reports were received for December. The San Mateo RC's officers are K6KRS, pres.; K6ZPM, vice-pres.; VE2AGF/6, secy.-treas.; K6IXS, corr. secy. SCARS C.D. drills are going great. The recently-appointed c.d. committee is composed of W6ACF, K6AOQ, K6JUU and W6CQK, custodian of gear. The SCARS also has a code and theory class going well. W6DEF, Radio Officer for Southern San Mateo Red Cross, got some good publicity for emergency communications in the local papers. W6PLG, QRL PAN Mgr., got a nice write-up in *PULSE*, the Sylvania publication, with a plug for amateur traffic. W6ZRJ is working with the High School radio club. Chronic bronchitis put Doc back on c.w. after DXing like mad on phone. W6PBC is looking for QSOs on 10,000 Mc. He reports vertical polarization effective on 1296 Mc. and lists 33 stations worked on 432 Mc. with the new final. W6YHM is assembling an RTTY tuning unit. W6OII has a cubical quad. K6LSG works 20-meter c.w. before school in the morning. K6CQM reports 214 countries worked in 10 months. W6WAI is rebuilding on 6 and 2 meters. W6RSY/6 is back on the air from the new QTH in Palo Alto. W6QMO, former NCN mgr., is planning to move again. Among those Santa was good to: W6YZE, S.S.B. exciter; WA6CLT, TR switch; K6HGV, HQ-110. Your SCM would like to know if there is any interest in a section QSO party in 1959. Traffic: (Dec.) K6DYX 608, W6BPT 546, W6QMO 408, W6YBV 224, K6GZ 223, W6PLG 202, W6YHM 189, W6YZE 158, K6HGV 129, W6HC 114, K6GID 93, W6AIT 85, W6ZXS 58, W6OII 50, W6DEF 44, K6YKG 33, W6ZLO 28, W6ZRJ 11, WURFF 8. (Nov.) W6PLG 120, W6HC 74, W6ZRJ 10.

EAST BAY—SCM, B. W. Southwell, W6OJW—Asst. SCM: Mary E. Lorenz, W6PIR. SEC: W6CAN. ECs: W6LGW, W6ZZF, W6UIZ, K6EDN, K6JNW and K6QZG. W6LSC and W6QPY are QRL work. W6UHY keeps skeds on MARS frequencies. K6RZR has gone mobile. W6CAN was mobile in Grass Valley but was QRMed out. K6QXY visited W6AJF in Sonoma. K6OKK is in W5-Land, Arkansas, attending radar classes. K6DMW is on s.s.b. with a 10B exciter and an LA-1 linear amplifier. WV6BKQ has a new QF-1 and tape recorder and hooked KL7AIZ; only 99 more to go for DXCC. The EBRC has a special Christmas meeting Dec. 12. The MDARC had its annual Christmas Dinner and program for kids on Dec. 18. The Eighth NCN Dinner was held at Uncle Tom's Cabin, San Bruno, Dec. 14. The NCDXC and SCDXC held their 10th Annual DX Conference on Jan. 24-25. New officers of the Hayward Radio Club are K6TKL, pres.; K6QLF, vice-pres.; W6IPY, secy.; and K6SWY, treas. K6JNW has a new Heath Apache. K6PQH has resigned as NCN manager and W6QMO has taken over as acting net manager. The MDARC's new officers for 1959 are K6KRF, pres.; W6CXP, vice-pres.; W6FKX, secy.; K6IMV, treas. W6AIL and K6IYX celebrated their 15th wedding anniversary. K6ILH is building a 50-Mc. rig with 50 watts. WV6CSK is bicycle mobile on c.w.! Good hunting for 1959, gang. Traffic: K6GK 600, K6DMW 162, W6JOH 131.

SAN FRANCISCO—SCM, Fred H. Laubscher, W5OPL—Asst. SCM: Edward L. Olmstead, K6LCF. SEC: W6FEA. W6YC received the W-Conn Award at a noon luncheon of the S.F. Jaycees; also the Finnish ward, OHA. He worked two new ones, Formosa and Luxembourg. His friend PY2AJK has left for home in Sao Paulo. W6GPB and K6SFI are sporting new NC-303 receivers. W6SP is the proud possessor of a new HT-32, a Viking Ranger, and has put up a new 15-meter beam. W6PVC is sweating out the arrival of his superduper Tribander beam. W6ZUB erected his 10-meter beam but forgot to unroll the feedline. Any suggestions? K6HIP claims he ran up the highest score in the Bay Area in the Sweepstakes. W6ZQK is eagerly awaiting his commercial "phone" license. K6END had to resign as secretary of the Tam RC because of a heavy work load as chaplain at the veterans' home. (Sorry to lose you, Dean, but first things first!) W6MQQ is struggling under the handicap of horizontal antenna poles. W6YME gave six

(Continued on page 132)



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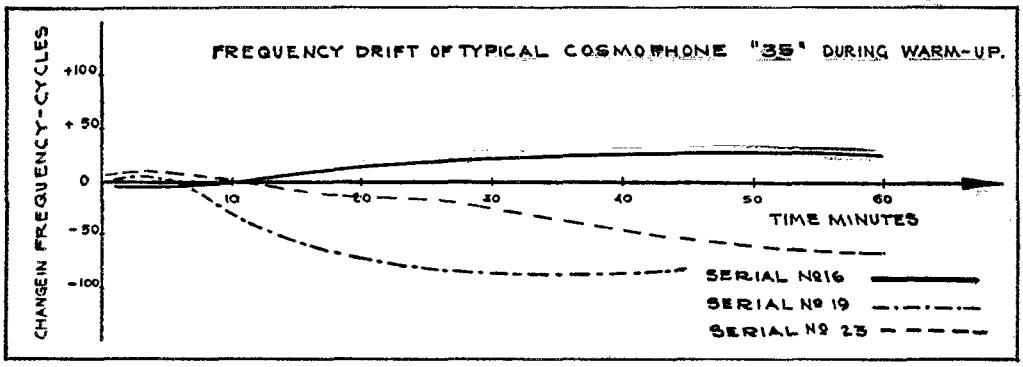

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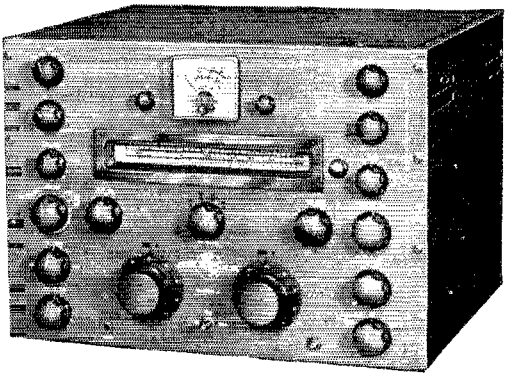

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Novice and Technician Class examinations. K6OHJ, a new OO in San Francisco, has been very busy getting his Leece-Neville and the mobile gear in top working order in the new Corvette. K6LRN has his Pacemaker running again and doing FB on 10, 15 and 20 meters. K6KTP married a sweet little miss by the name of Mary Anne. Congrats, Marty! K6ANP has been doing a terrific job as chairman of the San Francisco TVI Committee. His very able assistant is K6MUZ. W6OKR will be a new OES and Class IV OO for Marin County. W6SLX, our ever-faithful voice of Eureka, is still in there pitching for the Humboldt RC. W6ZSE is convalescing at home. WV6BPS, 15 years old, is watching the mailman waiting for his Conditional Class ticket. W6JWF is PAM for this section. The January issue of *QST* had him listed as RM which was incorrect. W6GQA certainly has gone all out to help your SCM and at this time I would like to express my appreciation, Al. The Golden Garbage Can is the new president of the HAMS RC, W6GGC that is! Elections are now in progress in several radio clubs. Traffic: W6FEA 24, W6GCV 19, W6OPL 17, K6LCF 12, WA6ASW 9, W6GGC 8, K6BAQ 4, K6OVV 4, K6BMW 2, K6ETG 2, W6IFO 2, W6MIY 2, W6CYO 1, W6JEU 1, K6JID 1.

SACRAMENTO VALLEY—SCM, LeVaughn Shipley, K6CFF—Congratulations and best wishes to our new SCM, W6GDO. Although Jay is not an "old-timer" in years, he certainly is no new-comer to amateur radio. He was licensed some 10 years ago at the age of 14. His XYL is K6HHD, his mother is W6HTS and his father W6HSB. Jay is an active operator and has done much RTTY development and pioneering in Sacramento. The gals elected to guide the Camellia Capital Chirps for 1959 are K6PWH, pres.; K6TYJ, vice-pres.; K6KCK, secy.; K6GKR, treas. All amateurs who contact one of the "Chirps" on Mar. 6 will receive a special certificate commemorating the opening of the Sacramento 1959 Camellia Festival. The RAMS still are rambling along with W6QPX as the new pres.; W6QHP, vice-pres.; K6VUZ, sec. and W6OPY, K6RGN and W6GTG directors-at-large. W6AF is really "poking" through the QRM on 14.1 Mc. with ARRL Official Bulletins daily at 2045 PST. He has been copied in Sweden, Zanzibar, Karelo-Finnish Republic, Norway and Germany. Your SCM can vouch for the new Collins 32S-1. It is typically Collins, if you know what I mean. All amateurs in the Sacramento Valley section should endeavor to attend a meeting of the McClellan Amateur Radio Society in Sacramento. Here is a fast-moving group with tremendous activity. Monthly meetings always attract more than 125 people. Thanks to the leadership of W6ASI, W6AVK and W6HTS and the unbelievable support of the membership, Sacramento has "the" outstanding MARS organization in the country. Newly-elected officers are W6ZF, pres.; K6DJE, vice-pres.; K6HOI, sec. The new MARS RTTY Net on 2 meters is terrific! Traffic: K6YBV 1667, W6ODV 51, K6SXX 48.

SAN JOAQUIN VALLEY—SCM, Rayph Sarovan, W6JPU—The new officers of the Delta Amateur Radio Club are K6HMK, pres.; K6GDB, vice-pres.; WV6BTK, secy.-treas. W6RRN is building a new receiver. K6AXV is looking for Vermont on 6 meters. W6ONK has a brand-new Navigator to push his 4-250 final. W6PXP put his W3DZZ beam up 75 feet in the air with good results on 20-meter DX. K6KOZ has a 10B s.s.b. exciter. K6ZCD is working out very well on 75 meter s.s.b. K6LKJ has a 75S-1 and a 32S-1 and is working out well on all bands. K6SWR is building a 10-meter rig, and is experimenting with ground-plane antennas. K6GOX and W6BJI are working JA stations on 6 meters like mad. W6BJI broke down and got a 75A-4. New calls in the Hanford Area are WV6BXD and WV6CUZ. W6EUH is tied up with school work. The Turlock Radio Club has reactivated its 2-meter net and meets on alternate Tue. at 2000 on 145.35 Mc. The Fresno Radio Club helped the Motorcycle Club with communications using both 6 and 75 meters with excellent results. Those assisting were W6NKZ, W6DUD, K6GOX, K6OGX, W6PZC, W6BAN, K6BGK, W6OUX, K6JGH, K6LRQ, W6JPU, W6SWO, W6QOS, W6JXY, W6OWL, W6SMS and W6UBJ. W6NKZ is on 75 meters with 60 watts. K6BKZ is building a pair of 837s in GG. New calls in Fresno are WA6DRH and WA6DPH. K6BP is building a kw. in self defense. W6CPT has a new S-40. W6GQZ has a new Valiant. K6RIU is working out on 75 meters. Traffic: W6ADB 224, W6USV 36, W6ARE 6, K6SNA 4, K6SWR 1.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: HUL. PAM: DRC. V.H.F. PAM: ACY. All members of this section are invited to send in items of interest to the section. Too, we are interested in receiving reports from those who hold official appointments. Inactivity on your part will cause cancellation of the appointment. Let me know what you are doing in clubs, AREC, RACES, nets etc. We are glad to report

(Continued on page 134)

Transistor Power Supplies* and Components

*Complete Units

D SERIES (Standard)

Continuous operation at 30 watts. Selective taps at 200, 250 and 300 volts; intermediate voltage at ½ selective taps. Both voltages can be drawn simultaneously if total power does not exceed continuous ratings. Positive or negative ground operation. Input and output filtering included except for intermediate tap.

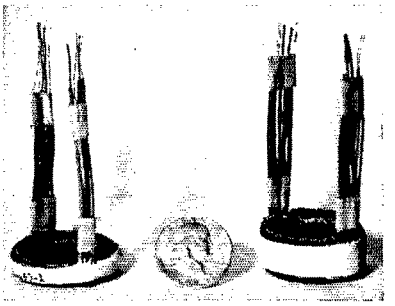
Size: 4⅜" x 3¼" x 1⅛" Wt.: 10 oz. 6- or 12-V Input: **$39.95** 24-V Input: **$61.95**

DA SERIES

Continuous operation at 45 watts. 450 volts and 225 volts simultaneous if total power does not exceed continuous ratings. Intermittent duty to 90 watts, 450 volts at 150 MA; 225 volts at 100 MA (5 min. on, 20 min. off). Positive or negative ground operation. Input (primary voltage) filtering; partial high voltage filtering provided.

Size: 4⅜" x 3¼" x 1⅛" Wt.: 14 oz 12-V Input: **$37.50** 24-V Input: **$79.50**

Toroid Transformers for Transistor Power Supply Application



H SERIES

H-6-450-1	Input: 6-VDC. Output: 450-VAC center tapped...450 and 225 VDC from bridge rectifier...45 watts.
H-14-450-12	Input: 12/14-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...55 watts.
H-28-450-15	Input: 24/28-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...65 watts.
H-6-100-125-150-D	Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA.
H-12-100-125-150-D	Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 125 MA.
H-24-100-125-150-D	Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA.

Without Encapsulation (2 ozs.). 1-10 units: **$16.00** ea. With Encapsulation (3 ozs.). 1-10 units: **$18.50** ea.

HD SERIES — 2000 CPS

HD-14-225-300-2-D	Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.
HD-28-225-300-2-D	Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$18.50** ea.
With Encapsulation (4½ ozs.). 1-10 units: **$21.50** ea.

HDS SERIES — 2000 CPS

HDS-14-225-300-3-D	Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.
HDS-28-225-300-3-D	Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$21.50** ea.
With Encapsulation (4½ ozs.). 1-10 units: **$24.50** ea.

400 CYCLE SERIES

14-115-1.5-400	Input: 12/14-VDC. Output: 115-V at 1.5 amp.
24-115-1.5-400	Input: 24/28-VDC. Output: 115-V at 1.5 amp. Dim: 3" dia. x 1" thick. Without Encapsulation (12 ozs.), With Encapsulation (16 ozs.). Per Unit: **$76.00.**

Matched Pair HD Transistors:
12/14-V operation—**$11.00** per pr.
24/28-V operation—**$21.00** per pr.

OEM *Prices on Request*

All fully performance tested, 100% guaranteed. Manufactured by makers of world-famous SUNAIR H.F. Aviation Transceivers.

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much activity on 2 meters, Catawba, Forsyth, Lincoln, Guilford, Wake, Rowan and Burke Counties have a definite AREC-RACES net on 2 meters. I am sure there are others. Possibly Nash-Edgecomb-Wilson information is hard to come by from amateurs. How about telling me what you are doing? K2JCS/4 is on 40 meters and is working for WAS. District One MARS has 10 active members in its 2-meter net. The State RACES 2-Meter Net is on 147.3 Mc. Plug in that crystal and operate mobile and you will get a call. GXR has a new Viking 500. BAW reports new activity on the NCN, 3509.5 kc., and weekly drills with his AREC-RACES setup. DSO activated the AREC-RACES Net for Burke County on 145.35 Mc. We need more local activity on 2 meters. How about it? Keep plugging away, fellows, and we really will have something when all local emergencies can be handled on 2 meters. Traffic: W4GXR 760, BAW 174, DSO 130, RRH 42, BBZ 9, ZWF 8.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE. PAM: YOS. The appointment of a new RM is now pending to succeed AKC, who is now vice-director. New officers of the Augusta Velvedere Club are K4JEN, pres.; IVI, secy.-treas.; QCC, act. mgr.; and K4MQG, pub. dir. There are two "Mike and Key" radio clubs in South Carolina, one at Greenville and one at Barnwell. New officers of the Spartanburg RC are ZEQ, pres.; K4LEI, vice-pres.; INO, secy.-treas.; HDX, act. mgr.; SSQ, pub. W4PHS was 1st prize winner with a TR switch in the "Gimmick" Contest. K4AVX was chosen "Amateur of the Month" by the Dreher ARC. WIS radio commends the amateurs for their excellent cooperation and assistance during a recent snow emergency. HDR is sorely missed on 3930 kc. since he started working. BHR is an old-timer with a great sense of humor and a dependable net member. All clubs should list dates of forthcoming activities with *Scarab* as soon as possible to avoid conflicts. Congratulations to CJD, K4HQK, PIA and WCZ on making BPL. Traffic: K4WCZ 767, GAT 334, BVX 266, AVU 203, HQK 168, W4CJD 166, K4PIA 158, W4PED 150, AKC 146, DAW 145, K4BLF 115, W4CHD 44, K4HJK 43, W4HMG 40, K4IVI 29, W4HDR 27, KVF 19, K4PIK 19, W4CNZ 17, ZAP 17, K4IIE 15, IOE 6.

VIRGINIA—SCM, John Carl Morgan, W4KX—Thirteen made BPL in December, with 32 stations reporting an all-time record month's total of 10,601 messages handled. If you'd like one more statistic, Virginia stations reported a grand total for the year of 51,707—a 50 per cent increase over last year. Congrats to all, not only for a proud traffic record, but for the section's participation and success in other operating activities. K4MJZ's Arlington bunch is the hottest AREC group in the State. Members are taking c.d. lessons and II is giving them square dance lessons. The Old Dominion ARC had its Annual Dinner at So. Boston with XYLs and all five college members there. OOL reports the Shenandoah Valley Club's Christmas card and candy sale was successful. CVO mobiled by air all over the Caribbean and South America operating KWM-1. K4MSG pulls a net trick, gets out on 75 meters with only 15 watts. YVG says there is not much microphone because of too much saxophone and night school. Veteran contester JUJ was active in the W. Va., Vt. and Mass. QSO Parties. QER/QES failed to get the new 75-A4, but did get a new mill for Christmas. BRF was on active duty recently, attending the National Resources Conference in Washington. K4QER has put out the first issue of a new *VSN Bulletin* and a fine job it is. Traffic: (Dec.) K4EZL 1732, QES 1056, ELG 1022, KNP 1015, W4SHJ 785, PFC 727, K4JKK 703, AET 696, W4QDY 454, K4QIX 364, EIG 230, QER 209, W4BYZ 176, BZE 101, KX 90, K4MEV 90, JRE 76, W4BGP 61, OOL 55, K4MSG 53, W4RHA 49, K4IIP 36, W4PVA 25, ATQ 24, YVG 15, CVO 14, AAD 12, K4ZGS 10, W4JUJ 8, K4DSD 4, ARO 3, OAQ 2. (Nov.) K4ELG 712, W4JUJ 1.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—Asst. SCM: Festus R. Greathouse, 8PZT. SEC: HZA. PAM: GAD. V.H.F. PAM: K8IYU. RMs: GBF, FNI, PBO, VYR. We all wish HTU a rapid recovery. Here is a list of ECs and counties: K8GAG Braxton, FUM Cabell, HNR Greenbrier, CLX Kanawha, JZO Lewis, QR Marion, KXD Marshall, NEM Mason, YPN, Jackson, NYH McDowell, DFC Mercer, FMU Monongahela, K8GWV Monroe, EIT Ohio, K8BUX Summers, GWR Wood and SHA Wyoming. Your assistance is needed in getting additional ECs, etc. The father of SSA is now active as KN8NHB. SSA is getting back on CSG/KLI and K4CQA/8 are doing fine OO jobs. New officers of the Kanawha Radio Club are K8CSG, pres.; VYI, vice-pres.; VMP, secy.-treas.; ADD, act. mgr. KN-8LQT is a new ham at Renick. AZD is back on the air after a 8-year lay-off. BUX is doing a fine job with his new rig. CRM is building a 100-watt 2-meter rig. BKI continues 6- and 2-meter activity. K8BLR has been having rig trouble. ESH gave a good report of v.h.f. activity. K8DDB is active on 75 meters. K4POF is attending school at Institute. New stations on 6 meters

(Continued on page 136)

are K8LNM and K8NHM. K8GMV is handling lots of traffic on 6 meters. Don't forget to start planning for the big hamfest at Jackson Mills to be held in July. Traffic: W8FNI 604, K8JLF 330, W8PBO 228, VYR 139, K8CNB 108, W8IHY 103, HZA 55, NYS 38, BWK 39, SNP 31, K8HRO 24, CSG 11, W8CCR 8, K8CRM 3, K4CQA/8 2, K8DDB 2.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, B. Eugene Spoonemore, W0DML—SEC:NIT. PAMs: IJR and CXW. OOs: OTR and RRV. OBS: KØBTU. The Denver Radio Club is compiling a cross index of amateurs in Colorado. BWJ, KØKKY and KØDCW are handling the movement. KØEBV and the Denver boys also are working on a QSL card deal for the Colorado hams on the Centennial Celebration "Rush to the Rockies." The past summer during the Denver transmitter hunts SBE had 7 wins; LO 4; VDY 3; WYX, SIN, EXR and KØHPF 2 each; RQI and KØMWD one each. ERR, KØBCQ and CNK have been hospitalized; also HHR and MMT's mother in Ft. Collins. ANA, Denver University, and ENA, Pueblo College, were very active during the Christmas Holidays. WMK made BPL in four days' activities. By this time KØKGB, KØCFA and KNØRPA should be residents of Grand Forks, N. D. KØGBS and KØLZF are new mobiles in operation in Colorado Springs. The following mobiles handled communications during the Colorado Springs fire: KØKGB, KØCFA, HHR and CVG. New officers of the Pueblo Radio Club are KØGMK, pres.; KØEIP, vice-pres.; NCB, secy. and KØDND, treas. Traffic: WØIA 1265, KQD 722, WMK 655, KØDCW 533, WØANA 191, KØEDH 160, EDK 156, WØTVI 149, KØDXF 124, WØDQN 78, KØEVG 53, ALH 45, WØNIT 31, QOT 31, ENA 19.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, 7OCX. SEC: FSC. PAM: BBN. V.H.F. PAM: SP. RM: JBV. K7BHE has been off the air temporarily while building up his new Viking Ranger. The Ogden ARC had its annual installation banquet for the new club officers. The new officers are SAZ, pres.; ZJI, vice-pres.; KN7ECX, secy.-treas.; LRP and OCX, directors. The new officers of the Salt Lake Club are IMD, pres.; QAH, exec. vice-pres.; VFY, vice-pres.; K7COM, secy.-treas.; CTI, editor; BLE and JSS, program chairman. AREC membership now stands at 25, 17 active memberships and 8 supporting. The SEC is attempting to organize a state-wide emergency net. Traffic: (Dec.) W7OCX 225, ZWJ 6, QWH 3, K7BHE 2. (Nov.) K7BHE 3.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAM: ZU. V.H.F. PAM: FPB. The NMEPN meets each Sun. at 0730 MST on 3838 kc. and Tue. and Thurs. at 1800 MST on 3838 kc. The Breakfast Club meets Mon. through Sat. at 0700 on 3838 kc. TWN meets Mon. through Fri. at 1900 MST on 3570 kc. The V.H.F. Net in Albuquerque met 4 times with a total check-in of 32. The RACES Net in Albuquerque met 3 times with a total check-in of 24. The northern part of New Mexico, especially Albuquerque, had its share of snow in December with mobiles aiding whenever possible. At the time of this writing my first year as SCM of New Mexico is in the log books and I would like to thank one and all for the kind help and cooperation. It is very gratifying to me that everyone was so quick and willing to help when needed. Let's all make New Mexico a state with plenty of active nets, good traffic handling, etc., in 1959. I would like traffic reports from all stations with lots of news items. Traffic: (Dec.) K5ESP 3715, WØOME/5 755, W5DWB 618, K5IPK 257, K5LWN 13, W5VC 10, K5CXN 9, W5ZU 9, K5GYA 7, DAB 6. (Nov.) K5LFE 42.

WYOMING—SCM, Lial D. Branson, W7AMU—The Pony Express Net meets Sun. at 0830 MST on 3920 kc.; the YO Net, a c.w. net, Mon., Wed. and Fri. at 1830 MST on 3610 kc.; the Wyoming Jackalope Net Mon. through Fri. at 2100 MST on 7255 kc. for traffic. UFB and 9KLR succeeded in establishing and confirming two-way contact on 144-Mc. meteor scatter. BHH reports the next project is to learn to run and use a mill and the YO Net needs more check-ins. DTD is getting many DX contacts on 10 meters. K7GNO has his rig on 75 meters. LKQ reports a nice trip to Phoenix and Los Angeles and he got a new Q multiplier for Christmas. The Casper Radio Club meets the 1st and 3rd Tue. of each month and is starting instruction classes on theory and code. K7BMT is a new Pony Express Net member. Correction: The Worland High School station call is *KN7GBX*. LVU and UFB are new OESs. Traffic: W7AXG 50, BFL 27, DTD 12, CQL 10, AMU 7, YWW 7, K7CSW 6, W7ABO 4, BHH 4, LKQ 4, NMW 3, BKI 2.

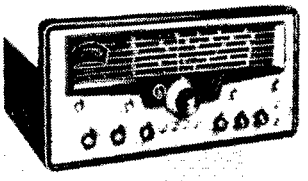
SOUTHEASTERN DIVISION

ALABAMA—SCM, Clarke A. Simms, jr., W4HKK—

(Continued on page 138)

See the NEW HALLICRAFTERS SSB LINE at HARVEY

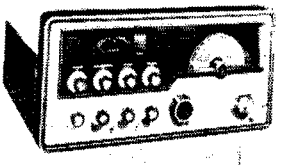
HALLICRAFTERS SX-101 mark IIIA Receiver



This receiver is setting new standards for dependability and ruggedness throughout the amateur world. Provides full frequency coverage of five ham bands plus a 2 and 6 meter converter band — 80, 40, 20, 15, 10 meters. Every technical advantage and feature needed for years to come.

$395.00

HALLICRAFTERS HT-32A Transmitter



Acclaimed by the most critical as the world's cleanest signal — provided by a 5.0 mc quartz crystal filter system for rejection of unwanted sideband — 50 db or more. Bridged-Tee modulator, temperature stabilized and compensated. Five band operation (80, 40, 20, 15, 10 meters). All modes of transmission — CW, AM, SSB.

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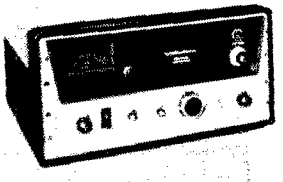
HALLICRAFTERS HT-33A Linear Amplifier



Completely engineered with extra-heavy duty components, the HT-33A is conservatively rated at the maximum legal limit. It guarantees you one of the big signals on the band and effortless performance. Complete efficient coverage of amateur bands: 80, 40, 20, 15, 10 meters. Third and fifth order distortion products down in excess of 30 db. Built-in rf output meter simplifies tune-up.

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SEC: EBD. PAMs: DGH and K4BTO. RM: RLG. Our congratulations go to K4PHH, who was elected by the AENP as the outstanding net control station for the last quarter of 1958. Records indicate operators handled 12,293 messages during the past year. While this is an excellent total I feel sure that at least that much more went unreported. Please submit your Form 1 so that we can get credit. Welcome to new appointees—K4SSB as ORS and K4QJF as OO Class I. New stations to listen for are K4VJL, the XYL of YFN; K4YGQ, Goodwater; K4TLN and K4KUP, Athens. BRE has moved to No. 1 Francis Ave., Cambridge, Mass., and is now K1JOK. Also ex-W5ONL/4 now is KØHEM in Denver, Colo. K4BTO is hearing better on a new HQ-160. EBD reports the TV transmitter is working fine. K4APF earned WAS certificate No. 9990. The Montgomery Club is trying to acquire the call WOO as a memorial to Frank Thielan, who formerly held it. The Alabama section bulletin went on subscription basis in January. Contact WAZ for your copies. Traffic: W4RLG 609, K4PFM 594, SSB 176, CXC 107, W4PVG 91, KIX 85, CIU 68, K4BTO 60, W4YRO 55, DGH 46, K4GOW 45, JDA 43, AOZ 38, W4CEF 33, K4KAK 33, PHH 29, W4MI 23, K4SAV 14, KJD 11, KQN 10, W4HKK 6, CRY 4, EBD 4.

EASTERN FLORIDA—SCM, John F. Porter, W4KGJ—SEC: IYT. RM: K4SJH. PAMs: TAS and RMU. Section nets: FPTN 3945 kc. 0700 Mon. through Sat.; FMTN, 7230 kc. 12 noon Mon. through Sat.; TPTN, 3945 kc. 1730 daily; FN 3675 kc. 1900 Mon. through Sat.; GN, 7105 kc. 1000 Mon. through Sat.; FEPN, 3910 kc. 1830 Tue. only. There are several local AREC nets in our section and you are urged to check in and lend your support. We now have 933 AREC members, consisting of 645 full and 288 supporting. If you are not already signed up and wish to add your support, a request to your local EC will be appreciated. If he is unknown to you, send your request to me and ask for Form 7. K4RZQ's demonstration of ham radio at Anthony High School was a big success. K4LDR is a new OO and has received his WAS and WAC certificates. LDM is off to the "deep freeze country" for a year of duty with Uncle Sam's Air Force. K4DRO received his DXCC-150 sticker and also his 25-w.p.m. certificate. BWR received the first WAFC certificate issued by the Dade Radio Club. Congratulations, Ruth. A new ham in Naples is KN4CBM. The Dade c.d. radio classes still are turning out new hams by the dozens. Twenty-seven more obtained their licenses during the past month. ZIR secured aid by radio for a crew member of the Columbia University Research Boat who had suffered a heart attack. The boat was located off the coast of Panama in the Atlantic Ocean. Your SCM and SEC enjoyed a visit with the Sarasota Radio Club in December. The club's new officers are K4EGG, pres.; K4LIH, treas.; WHF, act. mgr. Don't forget your Form 1 activities reports, fellows. Traffic: (Dec.) K4SJH 1112, W3CUL/4 653, K4GPI 615, W4PJU 570, K4RZQ 504, KDN 294, W4LDM 244, K4BR 230, DRO 230, ILB 213, W4IYT 192, K4BLM 127, W4TAS 111, K4COO 96, BNE 75, W4FJE 75, BIL 71, MBO 53, K4RNS 49, PAD 48, W4SGY 42, K4AX 38, AHW 37, BY 30, JJZ 27, LCF 20, MTP 17, TDN 12, W4PZT 10, BWR 4. (Nov.) K4RZQ 36, W4DFU 16.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: PQW. RMs: AXP and BVE. Tallahassee: 1HDQ. V.H.F. Editor of *QST*, spoke at a meeting of local hams in December through the efforts of YUU. K4PVU is experimenting with new break-in techniques. LVF/4 is a new ham in town. Panama City: Installation of new officers of the PCARC was held at a dinner meeting in December. K4COH is the new president. K4CEF and K4OID had OPS and OO appointments renewed. OID made BPL. CEF worked Dominica and Roumania, making 95 toward DXCC. Ex-K4CVN, from Panama City, is now KØMDX in Iowa, Ft. Walton: The Eglin Radio Society began classes in radio code and theory. The instructor is K4JUA, assisted by K4AAK. For further information contact your SCM. The new president of the EARS is BPJ. BVE reports the NWFN is doing FB. A NWFN certificate has been issued to K4GPI for regular participation. Pensacola: K4HYL is a new OBS. SRK made BPL. HBK, using JLW's rig, made 750 contacts in the SS. K4SOI, K4ZXW and K4YMG are new General Class. SOI does FB with low power on 10-meter mobile. AXP reports a new club is being formed at the Naval Air Station. He has a lot of code practice material available at NAS for anyone interested. HIZ arranged tour of CAA facilities at the Pensacola Airport for the December meeting of the PARC. A number of mobile and fixed stations provided communications for a Sports Car Rally covering about 100 miles. K4PIQ and OOW are racing to win the transmitter hunts! Pensacola V.H.F. Club is sponsoring a v.h.f. club at Escambia H.S. EQR has a new RME/VHF-126. Traffic: (Dec.) K4OID 381, W4BVE 330, SRK 281, K4PVU 215, UBR 116, CEF 54. (Nov.) W4SRK 299.

(Continued on page 140)

DESIGN OF TRANSISTORIZED CIRCUITS FOR DIGITAL COMPUTERS *by Abraham Pressman, M.S.* Any circuit design engineer can acquire a firm knowledge of the principles and practices of designing transistorized digital computer circuits from this new, authoritative text. The book is primarily concerned with design of computer building blocks using transistors. Because of the nature of digital computers, "worst casing" is an absolutely essential part of this type of design. Therefore, all design of building blocks analyzed in this book employ "worst case" design calculations and show how to make them. Particular stress has been placed on the most important building blocks . . . "And" gates, "Or" gates, Flip Flops, and interconnecting chains of such blocks.

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EXPERIMENTAL ELECTRICITY FOR BOYS *by Willard Doan.* Youth between 12 and 16 all over the world has displayed a tremendous inquisitiveness for the workings of electricity. The fountainhead of all modern technology is an understanding of electricity. Here is a book that teaches the marvels of electricity through demonstration. It not only satisfies the inquisitiveness, but also teaches. Although elementary in level and completely understandable by this age group, it does not take license with the technical truth. Written in an interesting and absorbing style the author treats the young reader as an intelligent being.

The mystery of magnetism and electricity are unmasked in dramatic style, yet with complete accuracy. The book will help the youngster in his future associations with, and possible studies of electricity in high school. It is written to maintain interest and to generate enthusiasm for studying. The reader is shown how to build numerous electrical devices—a compass, a telegraph system—a Tesla coil, a Wimshurst machine, and other exciting electrical equipments. Many of the items needed are available in the average home "junk-box". The rest can be acquired easily at very low cost.

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BUILDING THE AMATEUR RADIO STATION *by Julius Berens, W2PIK.* If you intend to buy the equipment for an amateur radio station, or build one, you will find this volume indispensable. This book is the next step for the amateur radio enthusiast who has earned his operating license. In his sequel to GETTING STARTED IN AMATEUR RADIO, the author, W2PIK, has written an all-inclusive guide for construction of the novice and general ham stations. Every tool and its use is mentioned. Chassis layouts are provided and text instructions are reinforced with diagrams and illustrations. Also includes instructions for receiver and transmitter on-the-air operation.
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VIDEO AMPLIFIERS (Electronics Technology Series) *edited by Alexander A. Schure, Ph.D.* Provides a thorough understanding of the design and application of video amplifiers. It shows how design problems are solved. It utilizes examples that are easily applied to radar, television, and pulse amplification where many video amplifiers are used.
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FUNDAMENTALS OF HIGH FIDELITY *by Herman Burstein.* How to select the best hi-fi equipment for the money you have to spend—and how to achieve the best performance and realize the most pleasure from your equipment—are the purposes of this book. The emphasis is not so much on what an amplifier is, rather than on what an amplifier (and the rest of your high fidelity system) should provide, and how you can choose the best equipment to fit your pocketbook. The book also deals with aspects of high fidelity and with technical terms with which the hi-fi enthusiast must be familiar. #226 **$2.95**

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GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: K4AUM. PAMs: LXE and ACH. RM: PIM. The GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 on Sun.; the ATLCW on 7150 kc. at 2100 EST Sun.; the GSN Mon. through Sat. at 1900 EST on 3595 kc. with PIM as NC; the 75-Meter Mobile Phone Net each Sun. at 1330 EST on 3995 kc. with MV as NC; the Atl. Ten-Meter Phone Net each Sun. at 2200 EST on 29.6 Mc. with VHW as NC; the GTAN Sat. at 1000 EST on 7290, kc.; the GPYL Net Thurs. on 7260 kc. at 0900 EST with K4CYV as NC; the GAN on 7105 kc. at 1800 EST Mon. through Fri. with K4KZP as net mgr. The Atlanta Teen-Age Radio Club met Jan. 2 in its new location at St. Lukes Church. We attended and spoke to about 47 members. Members in RACES drills are increasing at each drill session. RACES drills in Georgia are held beginning at 6 P.M. to 7 P.M. Each member can call in each week and get participation credit. K4LEM has a MARS call now. K4BAI is doing a wonderful job as net control of GCEN on Thurs. nights. K4CZQ is back in Marietta. Santa left an Apache kit for K4CZQ. BXV is now a member of Air Force MARS. The Middle Georgia Amateur Radio Club held its annual election and RZX was elected pres.; K4AT, vice-pres.; K4DNB, secy.; K4DXX, treas.; K4ARL, act. mgr. K4LVE hopes to have a permanent address soon. KWC sold his amplifier and is building another. K4PDT put on a pair of 813s to help his DX-100. The east zone of AMACD issued commendation certificates to all who participated in civil defense activities. The certificates were awarded by C.D. Director Jackson at a meeting Jan 15. K4YID passed the General Class exam. FBH has a new Mosley Triband and five-element 6-meter beam. K4TJL, who was licensed as a Novice Jan. 3, '58, received his DXCC Dec. 29, '58. K4KKV has a new rotator for his Triband beam. SER has returned to the air with a new 500-watt transmitter. UKY has a new beam and rotator for 15 and 20 meters. BOC has a new final and is working s.s.b. New Novices are KN4BKJ, KN4BKN and KN4BKR. Traffic: K4BAI 449, LEM 383, CZQ 195, W4DDY 153, K4LVE 77, W4BXV 66.

CANAL ZONE—SCM, Ralph E. Harvey, KZ5RV—WA was absent from the Canal Zone from Dec. 18 to 31. During this time he visited with TI2RL, in Costa Rica. TI2RL talks quite frequently with El Volcan in Panama on 2 meters. WA arranged to hold 40-meter skeds with TI2RL. Ex-WJ, now W8PNF, had a heart attack on Dec. 20 but is coming along fine now. Daily skeds with W8EPN keep us informed on Bill's condition. RM holds daily skeds with K4AEE and passes traffic to Dave for the TCN. The Canal Zone Amateur Radio Assn. elected the following: CC, pres.; RM, vice-pres.; VR, secy.; RV, treas.; RU, act. mgr. New hams: AI, CT, CV, GR, GW, HQ, JV, KC, LG, OB, RP, RS, RR, SG, SW, VF and WS. Novices: CFN and JNN. Traffic: KZ5JJ 99 SW 93, OB 92, WA 40, CD 39, KA 35, RM 33, VR 32, CC 12, LC 12, HO 6, RV 5, EL 3.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6HLR. PAMs: K6BWD and W6ORS. The following stations made BPL in December: W6BHG, K6OZJ, W6GYH, K6HLR, WA6BAQ and K6OJV. Congrats, fellows! WA6BAQ is the new asst. manager of SCN. Congrats, Gary! W6GYH reports that UTL now is on 7093 kc. at 2100 CST. The Inter-County Net now covers San Diego on 221.5 Mc., K6GKX reports. K6ZQS has a new HQ-100 receiver. K6YKI is going strong mobile with Gonset Twins and expects to be in traffic soon. W6AM is on 6 meters with a VHF-126 and a Viking 6N2. K6JSD is one of our teenagers on SCN. Glad to see you, Walt. W6BRO is back on the air with a VF-1 and a DX-40. W6NKR broke the DXCC "200 Barrier." W6OYM and K6PBI report some good E layer openings on 6 meters. K6YNB received a DX-100 for Christmas and reports renewed activity of K6SVY, the Mira Costa High School Amateur Radio Club. W6UFJ reports a nice SS score with 28 watts! Looks like W6YMD hit the jackpot in the SS. Congrats, Bill! The San Gabriel Valley Radio Club and the Ramona Radio Club are planning the 1959 Southwestern Division Convention with W6VZA as general chairman. Support your section nets: Phone, SoCal 6 Net on 50.4 Mc. at 1900 PST and C.W. SCN on 3600 kc. at 1930 PST. Traffic: (Dec.) K6HLR 2002, W6GYH 1181, K6OJV 815, K6OZY 603, WA6BAQ 428, W6BHG 397, K6JSD 351, K6GKX 161, K6GGS 137, K6KYJ 86, K6PBI 61, W6NKR 42, W6JQB 37, W6USY 36, W6HJY 23, K2HNW/6 16, W6BUK 10, W6ORZ 10, W6SRE 7, K6COP 2, K6GLS 2, K6IYJ 2, K6PLW 2, W6BRO 1. (Nov.) K6OJV 76, K6GGS 58, W6NKR 30.

ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: YWF. PAM CSN, 3880 kc.: FMZ. YAT is running regular skeds with the islands and Alaska and is moving a lot of traffic into the State. FMZ has a new NC-303 receiver.

(Continued on page 142)

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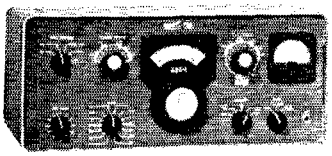

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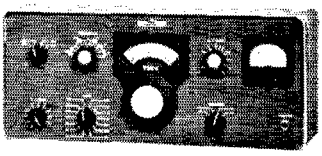

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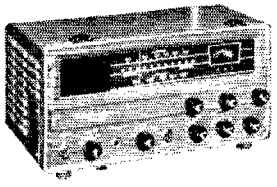

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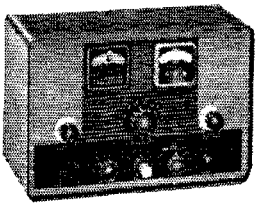

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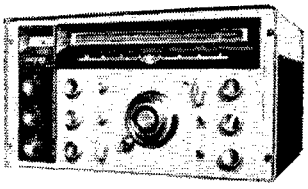

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The AARC held its regular Christmas Party with a nice turnout. The Mesa Club is quite active. A new club is getting started in Scottsdale. The TVI Committee in the Phoenix Area has been very busy lately but has cured almost all the cases that have come up. Traffic: W7YAT 84, LLO 60, CAF 28, OIF 19, FMZ 12, K7AWI 11, W7EED 8.

SAN DIEGO—SCM, Don Stanisfer, W6LRU—New officers of the Imperial Beach Amateur Radio Club are K6SVO, pres.; K6ZRP, vice-pres.; K6HQZ, secy. KVB is now in San Diego and on the air with a Ranger, HQ-110 and long wire. K6BPI and W6EOT both made BPL on December traffic handled. Your SCM had a very nice trip to the Fullerton Radio Club in January. Many interested in appointments were contacted and a return trip is planned. The Dana Junior High Radio Club now has two General Class licensees and eight working for Novice Class tickets. K6DNO was home on leave from the Coast Guard Academy. K6BEC will graduate from M.I.T. in Boston this coming summer. The Convair Astronautics Club is the newest in the area, and has not only excellent equipment but a super location on Kearney Mesa. K6PGO was home from college in Kentucky for the holidays. K6ZCR is now an ORS in Fullerton with a DX-100 and a 75A-4. She operates 20, 40 and 80 meters, both phone and c.w. I met MBA at the Fullerton Club meeting; I worked him in 1946 when he was on Tinian. He is quite a DXer now and experiments with receivers on noise levels and filters. Traffic: W6EOT 1405, K6BPI 948, WDL 210, W6ELQ 148, K6ZCR 134, W6KVB 2, WA6ATB 2.

SANTA BARBARA—SCM, Robert Hemke, K6CVR—SEC: K6EAQ. OPSs: W6KLR, W6JPP, W6YCF, W6IHD, W6MSG. OOs: W6BE, W6QIW, W6MSG, W6YCF and W6ENR. ORSs: W6DTY, W6YCF, and W6FYW. PAMs: W6IHD and W6MSG. OBSs: W6NTF, W6DTY and W6PWK. W6FYW and W6ZND who have lived in the Paso Robles Area many years, had their first QSO Dec. 28. W6OXJ is now W3JBY in Washington, D. C. The Paso Robles Radio Club had an FB Christmas Party at W6BRY's Rumpus Roof. The new president of the Paso Robles Radio Club is K6THH; WA6BLM is vice-pres. W6OUL reports working HC4IM on 40-meter c.w. and also mentions that since the Gonset Tribander is up he has worked some choice DX such as CO2GR, CX2BT and KC4USX. W6DTY helped K6VBC take some SWR measurements and was real "shook" at what he found. There are several new hams in the Ventura and Oxnard Area. We welcome W2WMS, K5HIL, K5HIK, K5BNI, K5BNH, K5BWB, W5GSE, W5MJE, WØWEU and W6GAC. K6QBF has a vertical up at his new QTH but had trap troubles. Traffic: W6YCF 11, W6KLR 8, W6FYW 5, W6BE 4, W6DTY 3, W6OUL 1.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX. PAMs: BOO and IWQ. RM: ACK. Brownfield came into the news in December with a Butane tank truck and pickup accident. K5GEC, a funeral home operator, was injured by the explosion. The Police Radio was disabled and CZW alerted NFO, the EC, and emergency power was furnished by the Brownfield AREC unit. Another unit was set up at the Funeral Home and welfare traffic was handled by K5EVU and K5LFI. The Brownfield group is to be commended on its preparedness and ability to handle almost any emergency. K5MBS expresses her appreciation to the 7290 Traffic Net for its assistance in handling messages during the illness and passing of her mother in December. YIJ is running code and instruction classes for the Boy Scouts in Marlin. CZY and EZZ are moving back to Brownfield. AAO is now on s.s.b. KL7ATR was a visitor during the holidays with PVT. TFP has moved to Parsons, Kans. K5AEX has moved to Denton to accept a position with civil defense as RACES Coordinator. K5ASZ has moved to Pennsylvania and is now K3GKV. Look for him on 29,640 kc. The Abilene Amateur Radio Club will hold its annual swapfest May 3, 1959. Now is the time to start making plans to attend the 29th West Gulf Division Annual Convention, this year in conjunction with the 11th National ARRL Convention in Galveston, June 19-21. I will be looking forward to meeting you there. Traffic: W5SMK 593, K5HGL 278, PXV 234, W5GY 184, BKH 178, K5DNQ 177, KBH 148, W5GON 147, K5JSN 104, W5BOO 103, BTH 101, K5IDZ 71, IBB 69, W5GSN 60, K5IJN 46, DQI 42, W5LR 27, VEZ 24, K5ACD 15, OCV 6, K5JZK 5.

OKLAHOMA—SCM, Richard L. Hawkins, W5FEC—SEC: K5KFS. RM: W5JXM. PAMs: DRZ and MFX. The Northeast Oklahoma Radio Amateurs received its charter from the ARRL. New Novice graduates of the Bartlesville classes are KN5TJN, TJR, TJS, TJT, TJV and TJX. New officers of the Bartlesville Club are K5HZF, pres.; K5OVI, vice-pres.; K5EZZ, secy.-treas. VAX is now an electronic technician at the Aeronautical

(Continued on page 144)

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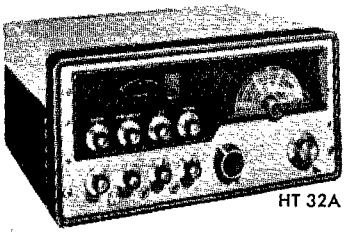
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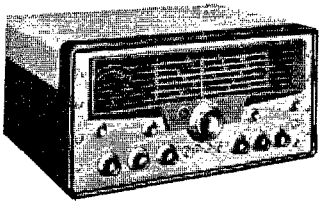
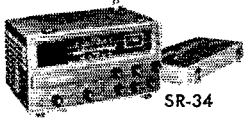
HT 33A

and the SX-101 III A



and all the other fine gear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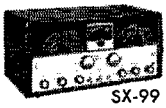
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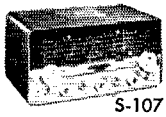
S-107

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Center. Quite a number of the MARS are happy with new Super-Pros. KN5PBE passed the Technician Class test. HFN advises that 9 P.M. is monitoring time for all Oklahoma hams on 2 meters. GIQ/ET2 will be home in August. K5CAY holds a sked with KR6AF. K5KTW has graduated to a kw. on s.s.b. The Enid Hamfest was a big success this year with a new approach—no prizes were given. I enjoyed meeting all the guys and gals. Several new A1-Operator certificates will be gracing the walls by the time this is read. Congratulations to the deserving fellows who earned them. Oklahoma's Ham of the Month: EHC for his many years' service to the ARRL and the hams. Traffic: W5DRZ 688, K5MBK 687, W5DXI 660, K5CAY 602, USA 396, JGZ 215, W5VVQ 193, JXM 189, K5IWK 101, W5KY 86, FKL 84, CCK 74, FEC 73, K5JTW 50, W6MGK 47, K5DUJ 40, KTW 40, W5MFX 40, K5CBA 34, INC 31, W5VLW 27, GOL 24, K5CVU 22, HIV 21, BPV 17, RXP 16, JOA 11, W5WAF 9, EHC 7.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF. PAM: ZIN. RM: K5BSZ. ZPD is the new net control station of the Houston Amateur Radio Club Emergency Net. ZPD and EOD are Assistant ECs for the Houston Area. K5OEA is now c.w., a.m. and s.s.b. with a new SB-10. K5BSZ is the proud possessor of a new Viking Courier. The 7290 Net had 1042 sessions, 1632 check-ins and 979 messages handled. Congratulations to K5OEA on making BPL for the second time. One more, Chuck, and you will have the BPL Medallion. The STS C.W. Net meets on 3770 kc. at 2030 CST during the winter months. There is a new teen-age net on 40 meters. It is called the YL Chasers Net and meets each Sat. from 1000 to 1130 CST on 7235 kc. Any teen-ager is welcome to check in. I would like to make a correction in the name of the Alamo Heights High School Amateur Radio Club. It is the "Alamo" and not the "Alame." K5CRU had his Amateur Extra Class license while a junior in high school. Sorry about these mistakes. DIW and EGD spent Christmas in W6-Land. I got an EGD activity report mailed from Arizona. KN5TIZ is a new ham in Corpus Christi. Traffic: K5OEA 1032, W5EGD 285, K5BSZ 167, W5LVC 122, DYV 98, ZIN 53, HKE 48, K5MWH 47, W5URW 25.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. A. Solomon, 1OC; H. C. Hillyard, 1CZ. SEC: BL. All Provinces in the VE1 call area (P.E.I., N.S., and N.B.) are issuing call letter license plates to their amateurs this year. KY is active again after a long layoff and is using a Johnson Ranger. ADU has a pipeline to the Gaza Strip for those who may have Armed Forces traffic. Newly-elected officers of the St. Croix Valley Club are WIFJP, pres.; WB, vice-pres.; CL, secy.; LT, treas. Bill Krogel (ex-DG) is now located at Ottawa. Former WX is now 3CLG and operates from Barriefield, Ont. ML is active on 28 Mc. DB has a new Johnson Courier final. UY is on vacation after a spell at sea as Radio Officer. LZ has a new KWM-1. Holders of ARRL appointments who desire renewal certificates are requested to contact this office. ABV has a new five-element beam for 6 meters. Are Field Day plans under way yet? How about some real tough competition for the repeat-winner AEP/1, Sydney. You can bet they will be planning to make it three-in-a-row! Traffic: VE1VN 154, ABJ 50, ADH 38, OM 38, W2ZRX/VO1 31, VE1ADM 28, AEB 12.

GOOSE BAY AMATEUR RADIO CLUB QSO PARTY

April 4-11

All amateurs are invited to participate in the annual GBARC QSO Party which commences at 0400 GMT April 4 and ends at 0400 GMT April 11. All bands and either phone, c.w., or both may be used. The exchange will consist of RS or RST, name, and QTH. A WAG (Worked All Goose) Certificate will be awarded to all U.S.A. and Canadian stations reporting QSOs with four GBARC members during the contest period, and to all other stations reporting QSOs with three GBARC members. Logs showing dates, times, signal reports exchanged, and stations worked should be submitted to Ted Harvey, VO2AB, Awards Manager, Atradio, Dept. of Transport, Goose Bay, Labrador, Canada. No QSL cards need be submitted for WAG as logs can be checked locally.

(Continued on page 146)

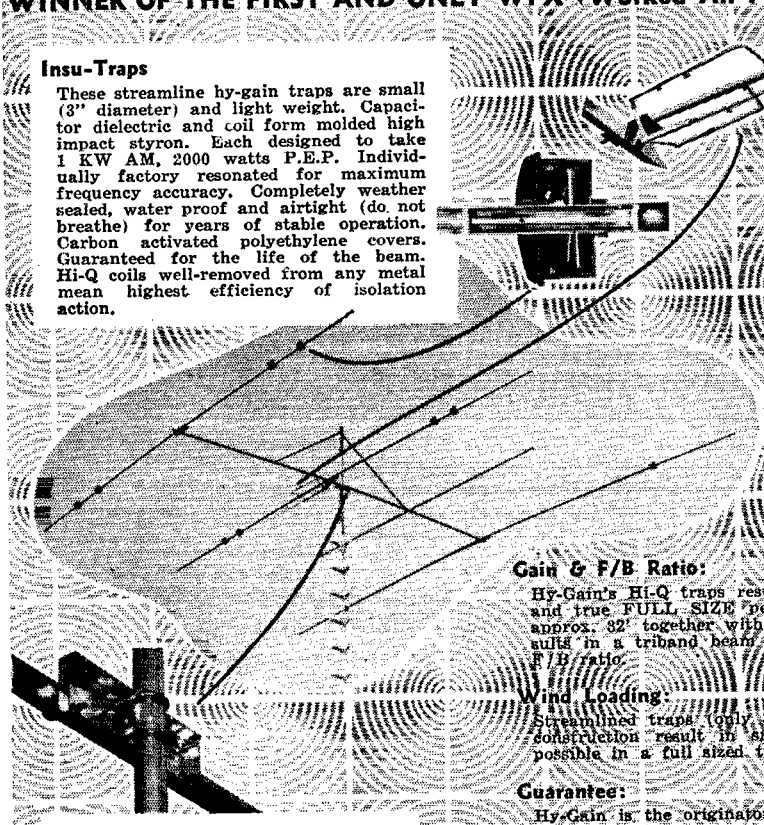
DX Champion of the World

the hy-gain FULL SIZED trap tribanders

WINNER OF THE FIRST AND ONLY WPX (Worked All Prefixes) CERTIFICATE

Insu-Traps

These streamline hy-gain traps are small (3" diameter) and light weight. Capacitor dielectric and coil form molded high impact styron. Each designed to take 1 KW AM, 2000 watts P.E.P. Individually factory resonated for maximum frequency accuracy. Completely weather sealed, water proof and airtight (do not breathe) for years of stable operation. Carbon activated polyethylene covers. Guaranteed for the life of the beam. Hi-Q coils well-removed from any metal mean highest efficiency of isolation action.



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Gain & F/B Ratio:

Hy-Gain's Hi-Q traps result in minimum element loading and true FULL SIZE performance. Longest element of approx. 32' together with full sized 18' boom spacing results in a triband beam with full 8 db gain and 25 db F/B ratio.

Wind Loading:

Streamlined traps (only 4"x2") together with steel boom construction result in smallest total wind loading area possible in a full sized tribander.

Guarantee:

Hy-Gain is the originator of the One Full Year Written Guarantee.

Construction

Hot dipped galvanized steel boom 1½" in dia. for maximum strength with lowest possible wind loading. Boom braces form rigid angular boom/mast assembly. Heavily plated 10 Ga. steel channels attach all elements to boom and boom/mast with positive grip. Elements are 6061T6 high strength aluminum alloy. 1⅛", 1", ⅞" and ¾" sizes are used. All hardware galvanized and iridite treated.

Two-Element, Full Size Trap Tribander

Top full-size performance in limited space with one transmission line on 10, 15 and 20M. Boom length 6'. Longest element 32'.

5.8 db gain
18 db F/B Ratio

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25 db F/B Ratio

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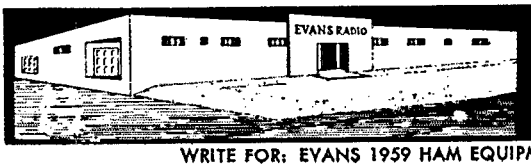

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WRITE FOR: EVANS 1959 HAM EQUIPMENT CATALOG • FREE CALL DISTRICT MAP.

ONTARIO—SCM, Richard W. Roberts, VE3NG—My sincere thanks to all of you who sent cards and radio greetings to my XYL and myself during the holidays. NF was speaker at the Quinte meeting in January. Our cousins, the VE6s, are blessed with call plates for their autos. Your SCM is still working on this problem and notes that a few clubs and other individuals are attempting the same. It is my contention that we should ALL cooperate under one committee. A word of caution. The DOT monitors our bands, as well as the FCC. Bad language or jokes in poor taste are among the offenses listed recently. DQL was visitor to Toronto. DMI has recovered from an operation. AES is s.s.b. OD was heard at Wilberforce during the Christmas holidays. EMA is the new Windsor Club president. CNB, DXQ, CJF and Derrick Baines are other members of the committee. The West Side RC is making plans for Field Day. The Norquebont ARA's '59 officers are DMI, pres.; AKL, vice-pres.; DVT, secy.-treas.; DVU, net mgr.; 2AMY, EAW, AVS and AUD, directors. NZ is at Stroud. EII visited VE1-Land. DTO and his XYL, DXZ, have returned from KH6-Land. DPO edits a terrific net paper. AML is QSL Mgr. for YS1MS, El Salvador. AHL is a new call at Grimsby. AYS is on 10 meters. AGB has a new receiver and a new tower. NW is hot on 6 meters. IV is on 2 meters, also CAB and NG. WM is back home and has recovered. AAO likewise is in FB health again. The Nortown RC Old Timers Assn. will hold a get-together in March. AMN/MM, of the Valley-Camp, is now shore-based at Sta.ner. VD is on 75 meters. DMT is Ottawa Valley Mobile Radio Club secretary. QE, QSL Mgr., requests that VE3s send in envelopes and stamps. He has over 1000 QSLs waiting for same. Traffic: (Dec.) VE3DCX 211, TM 149, BUR 147, NG 135, BZB 113, DPO 100, GI 90, NO 89, AML 77, EII 64, BH 46, KM 46, EIK 45, DUU 41, EIH 40, AUS 39, CHF 33, DWN 28, DH 26, CFR 22, BJV 21, AVS 20, RW 15, DQL 13, ANS 8, CE 6. (Nov.) VE3BJV 41.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Many VE2s were heard in friendly ragchews during Christmas and New Year. GE returned from a civil defense course at Arnprior, Ont., and was most enthusiastic over the splendid work being carried out there. BAN operates a DX-40 and an S-53 in Quebec City. AI likes his Trio preselector. Mysterious strong carriers without modulation persist around 3775 kc. ATL acquired a British frequency meter, Model D, No. 2. AAT is active at Chicoutimi while DM's QTH is St. Raymond. AWK visited Georgia during Christmas. GO was heard mobiling in VE2-Land. A well-known DX hound, W3BTQ/VE2, now signs plain IL. JK monitors satellites. EA is ex-AWP and VE3CKI. ABE is tenaciously striving for DXCC; he now has 78 countries. ACP used to sign IACY. UZ, with DS, chases DX on 20 meters. CA is QRL week ends on phone. MO will be heard from James Bay in the spring. Welcome to newcomers ADE, APP and ARB. The MARC station, ARC, is active on all bands and welcomes operators. A new French Club, "Le Club des Jeunes Operateurs" (C.J.O.) has been formed and probably is unique in its structure. Members must be under 27 years, be interested in ham radio as operators or SWLs and must speak French. The club station call is JC. Monthly meetings are held at 7400 St. Lawrence Blvd., Montreal. Future meetings will be held Mar. 1 and Apr. 5 at 1345 EST. Traffic: VE2DR 134, CA 66, BG 33.

ALBERTA—SCM, Gordon W. Hollingshead, VE6VM—PAM: OD. HM reports logging his 18,000th QSO since starting in 1926. Far northern stations will be thankful for this score since Charlie handles much of their traffic. VM is presently assembling a DX-100B and rumpus room to put it in. SF is now sponsoring a fancy beam atop the old QTH. OM, SF and MJ, a charter member, recently were issued Section Net certificates. MF is now on the staff of the Provincial Institute of Technology as a radio instructor and no doubt will be a big voice on IT. WK is sporting a new Tribander beam and Valiant transmitter so the DXCC shouldn't be far away. MI is back on 40-meter c.w. after a long absence. Traffic: (Nov. and Dec.) VE6HM 254, OO 52, TT 43, SF 13, PS 9, YE 8, PV 6, SE 6, YM 4, PZ 3, BL 2, EO 2, JP 2, IB 1.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—SEC: KX. Sorry there was no column last month, the flu bug got me just when the report should have been mailed, so this is a composite of two months' reports. Sorry to hear from DH that his activities are slowed up a bit because of a heart condition. AIO has spent many hours with the Air Force Cadets at Chapman Camp only to have the brass say the attendance does not warrant any more help. Jim is rather discouraged after trying so hard and long. Congrats to JB, who has worked hard to bring out a *Canadian Amateur Radio Magazine*. The first copy is just off the press and if the following issues come up to the first it has the potential of a real good magazine for the Canadian radio enthusiasts. TX has been transferred to VE2-Land. His help will be missed by the VARC where Derry's technical help was considerable. KX is showing his heels to a lot

(Continued on page 148)

FASTEST, EASIEST WAY TO LEARN CODE EVER DEVELOPED

NEW *RIDER 'SOUND-N-SIGHT' CODE COURSE*

by Lewis Robins & Reed Harris

W2RID **Combines sound and sight plus an imaginary instructor to speed code learning.**

Now you can learn code faster, easier than ever before thanks to a scientific breakthrough in learning called REINFORCED LEARNING. The psychological principle behind this new method of learning code has already proved successful by the Armed Forces in teaching Morse and Blinker Code and typing.

REINFORCED LEARNING

. . . a dramatic step forward to faster learning

REINFORCED LEARNING is a form of training without memory —requiring no conscious effort to memorize. It teaches communications skills such as code by applying the psychological principle that people learn more quickly when the act they are trying to learn is immediately given some reinforcement or reward, like a pat on the back or a word of praise. It holds that a correct guess immediately followed by the instructor's approval will remain more firmly embedded in the student's memory than if he learned the signals by memory alone.

The 'Sound-N-Sight' course applies the REINFORCED LEARNING approach. It is the first code training course that *combines sound and sight and actually puts an imaginary instructor* at your side to speed your learning of three separate abilities necessary to learn code:

1. Hearing the signal correctly or sound perception—telling the difference between the **dits** and the **dahs.**
2. Identifying the correct letter for each signal pattern, or sight identification.
3. Combining sound and sight to recognize the signal and immediately identify it.

EXPERTS SAY . . .

"REINFORCED LEARNING—AN OUTSTANDING SUCCESS"

In the Armed Forces and industry, the REINFORCED LEARNING method has produced astoundingly successful results:

From the Educational Review, November, 1958: *"The Lewis Robins-Reed Harris reinforced learning system . . . is achieving almost incredible results in shortening training time. The original tests conducted in the Navy . . . showed that if the reinforced learning system were used, typing and code could be learned in about half the time formerly required. Tests then conducted by an unofficial organization, the staff of Navy Times in Washington, quickly proved the validity of the conclusions. Now IBM, RCA and the Chrysler Corporation are trying the method."*

From William Haddad, The New York Post, November 14, 1957: *"Dr. Harry J. Carman, world-famous historian, Dean Emeritus of Columbia College and Co-chairman of the President's Committee on the Arts & Sciences, said that Lewis Robins had adopted a 'brilliant approach' . . ."* In a later article, November 22, Mr. Haddad reported: *". . . Captain Philip Winston, commander of the Fleet Training School . . . said . . . 'The group is learning faster than any other group we've ever had . . .' "*

From Richard M. Mansfield, military writer of the Norfolk Virginian-Pilot: *"Professor Fred S. Keller . . . one of the nation's top psychologists, has been quoted as citing Robins 'as one of the five or six persons who really have seen what the learning process is all about, and have really brought any fresh thought to bear upon it'. . ."*

MOST COMPLETE, MOST UNIQUE COURSE EVER OFFERED

The course combines sound (clearly transmitted signal patterns on records with the instructor's voice *immediately* informing you if you are correct) with sight (47 identification cards with individual signal patterns and the letter number or punctuation mark for which they stand). A clearly written book tells you how to apply the course, increase your speed, practice with someone else, transmit and provides charts to check your day-by-day progress.

The records start by giving signal patterns and an imaginary instructor at your side tells you immediately if you have recognized the correct pattern of dits and dahs, teaching you to hear and recognize signals correctly. Next, by using the identification cards you learn the correct letter associated with each signal pattern. Finally, the records tie together your ability to hear the signal correctly and identify the letter for which it stands. You can learn to receive as rapidly as you learn to send—proof positive of the effectiveness of this method. The instructor's voice is on hand at all times to give you the correct answer immediately. From this point on it's a matter of increasing speed. With the 'Sound-N-Sight' course many people have learned to receive 5 words per minute within 9½ hours!

THREE INDIVIDUAL COURSES

COMPLETE COURSE—*covers all licenses up to commercial (0 to 20 words per minute)*
Six 10" LP records (192 minutes of recording. 46 recordings), 47 identification cards and book train you to receive up to 20 words per minute. Also trains you to transmit. #REC-020, **$15.95.**

NOVICE COURSE *(0 to 8 words per minute)*
Three 10" LP records (96 minutes of recording, 28 recordings), 47 identification cards and book train you to receive up to 8 words per minute and how to transmit. #REC-08, **$9.50.**

ADVANCED COURSE *for general, amateur extra or commercial license (9 to 20 words per minute)*
Three 10" LP records (96 minutes of recording, 18 recordings) and the book train you to receive up to 20 words per minute and provide a firm foundation for receiving at even greater speeds. #REC-920, **$8.95.**

These records have been prepared in collaboration with the New York Institute of Technology and manufactured by Decca Records.

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This exciting code course plus many other titles that spell more amateur radio enjoyment (Getting Started In Amateur Radio; Building The Amateur Radio Station; Radio Operator's License Q & A Manual—6th edition—to name just a few) are available at book stores or electronic distributors. Use convenient coupon below to order direct.

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of fellows on RTTY, topping the last RTTY contest. The Vancouver Amateur Radio Club, with XW handling the code classes and AQW handling the theory classes, has about 30 students learning the intricacies of radio.

MANITOBA—SCM, James A. Elliott, VE4IF—Congratulations to VP9DC on being the first DX station to win the Worked All Winnipeg Award. WD is away with his XYL visiting ZL- and VK-Land. MI is back on the air with a DX-40. Don't crowd me, Mark. Santa brought me one, too. HB has been having trouble with the 813 on high frequencies so is working his DX on 75 meters. BR and CB, Bris and Ethel, are competing for DX on 10, 20 and 75 meters. XW was in Winnipeg for a few days and is leaving for Montreal. Congratulations to John and Fran, JQ and SQ, on the arrival of a jr. operator. The antenna is down again at the KL and LO shack and it's too cold to put up another these days. Traffic: VE4GE 28, EF 27, MW 19, KN 17, SL 12, EG 8, EN 8, QD 8, AN 6, IF 6, RR 6, IW 5, MN 4, PA 4, TE 4, NW 3, MM 2, EQ 1.

SASKATCHEWAN—SCM, Lionel O'Byrne, VE5LU —The Regina Amateur Radio Club filled vacancies and the present officers are Dave Smith, pres.; Ernie Green, vice-pres.; Danny Lazar, secy.; Val Pestick, treas.; Jim Whetherly, activities; Ted Odling, sick committee. BL has a new Mohawk receiver. MA is active on 10 meters. WG's new tower looks pretty nifty. Traffic: VE5IJ 26, HB 22, DR 16, LM 16, RE 16, QL 8, BF 7, HF 2, PQ 2.

Correspondence

(*Continued from page 79*)

useful, especially for short tests.

Second: The "Mickey Match" by K6QHZ, on page 26 of the November issue. I built one of these using a little larger 3 × 5 × 7-inch box I had on hand and found it much easier to construct than earlier bridges and "Monimatches" I had built. I used 15 inches of RG-8/U with about 11 inches of #28 enameled pickup wire. In the larger box it was not necessary to coil it. With this combination and a 50-microammeter I needed a 50K-ohm sensitivity control. Not being able to obtain a 200- to 250-ohm potentiometer for R_1 I used a 500-ohm carbon control paralleled by a 470-ohm fixed resistor.

If a surplus meter is available one can build this outfit for less than the cost of a good r.f. ammeter and it will serve as the output indicator as well as s.w.r. meter. Yes, I like it, and the only change I would make if I were building another would be to slip a fine spaghetti over the pickup wire as insurance against shorts.

— *Charles H. Vincent, W7RG*

STILL NOT OBSOLETE

210 Central Avenue
Newark 3, N. J.

Editor, *QST*:

I'm glad to see that there are hams around who still recognize the value of c.w.

As Communications Officer for the First Engineer Arctic Task Force on the Greenland ice cap in 1956 I saw a couple of guys' lives saved because of c.w. and in general the mission of the communications section could not have been accomplished without it.

On c.w. we ran 95% reliability, while on voice 30% was good. While s.s.b. is a great improvement over a.m. it still only approaches c.w. C.w. uses simpler, more dependable equipment, takes less spectrum space, can be copied by a good operator under any conditions — and besides, it's fun!

I do not plan ever to go to any isolated region without c.w. equipment and hope I am never forced to assume responsibility for communications under such conditions without some good c.w. oprators around.

— *David L. Wiesen, W2WHB*

77 Karland Dr. N.W.
Atlanta, Georgia

Editor, *QST*:

I have read with great interest the comments of recent months concerning the use of radiotelegraphy as a means of communication. Most of the letters pointed to the fact that c.w. was being replaced by teletype and more efficient machine methods of communication, particularly in the Armed Forces. This fact was used as an argument against the code requirement in an amateur license exam. I note also that

(*Continued on page 150*)

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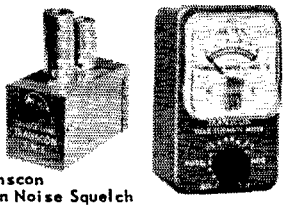
For The Best In Ham Equipment

Central Electronics 100V Exciter-Transmitter

NO TUNING (except VFO), uses famous CE BROADBAND system. PRECISION LINEAR VFO – 1 kc calibration. Single knob bandswitch 80 thru 10. SSB–DSB–AM–PM–CW and FSK. RF output adjustable 10 to 100 watts PEP. Meter reads Watts Input, Amps Output and Carrier Suppression. 2" RF scope. Speech level & load mismatch indicators. Audio filter – Inverse feedback – 50 db Carrier and Sideband Suppression.
Amateur Net **$595.00**



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Can be installed in any car radio rapidly. Tubes: 6AK5 & 12AX7. DC power input: 150 V. DC to 225 V. DC. Filament: 6 or 12 V. Noise Level Attenuator: S2. Size: 2¼" x 2¼" x 4".
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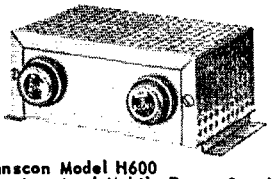

Transcon Model H600 Transistorized Mobile Power Supply

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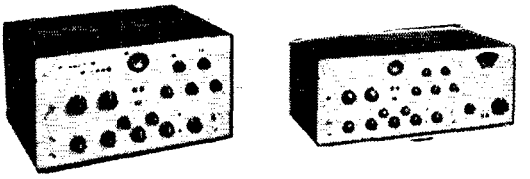
Amateur Net (Wired & tested)... **$68.95**

"Wonder Bar" 10 Meter Antenna

As featured in Nov. 1956 QST. Complete with B&W 3013 Miniductor. Only 8 ft. long for 10 meters.
Amateur Net **$7.85**



Lakeshore Phasemaster Models II-A and II-B

Band Switching: 160, 80, 40, 20, 15 & 10 meters. 65 watts PEP output from 6146 power amplifier giving sufficient power to drive nearly all types of linear amplifiers including grounded grid finals. SSB or DSB: Suppressed carrier, narrow band phase modulation or break in CW. Voice control and anti-trip circuits built in. Talk-on-frequency or Zero beat. Pi-Network Output: Matches 50-600 ohms impedance coax or balanced antenna output connectors. Voltage regulation of VFO, 9 mc oscillator and 6146 screen. Low pass filter in audio section gives speech cut-off of 40 db at 3800 cps. Temperature compensation in critical 9 mc circuits for improved stability. Novice or CW operation on 160, 80 and 40 meters with direct frequency crystals.
***Built-in VFO** – 100:1 precision dial tuning, anti-backlash gears, no string or cable drives. Frequency stability and reset accuracy better than 100 cyc. Completely independent of Exciter section. Built-in regulated power supply. Individual AC power switch allows VFO to be left on if desired.
*Applies to Model II-B only.
Amateur Net Model II-A ..... **$329.50** **Amateur Net** Model II-B **$459.00**

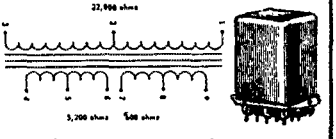
Sub-Miniature 0-200 Microampere Meter

A high quality instrument made by International Instrument Co. (Model 100). Only 1" in diam. Ideal for limited space applications & transistorized circuits. A natural for transistorized grid dip oscillator as described in June '58 QST.
Amateur Net $3.95 ea. **2 for $7.50**

2" round 0-500 microamperes. Bakelite case. Made by G.E. and Dejur.
Amateur Net $2.95 ea. **2 for $5.50**

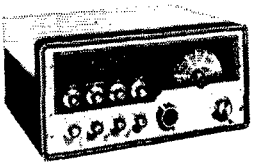
Weston 2" 0-4 amp RF meter Model 507. A giveaway at **$2.95 ea.** **2 for $5.50**

1½" sq. (ruggedized) 0-100 microamps. **$3.95 each** **2 for $7.00**



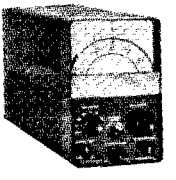
Versatile Miniature Transformer

Same as used in W2EWL SSB Rig – March '56 QST. 3 sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22,000 ohms. (By using the centertaps the impedances are quartered). The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. Brand new. Fully shielded.
Amateur Net, each **$1.39**
3 for **$3.49** 10 for **$10.75**



Hallicrafters HT-32A

5.0 mc quartz crystal filter – cuts unwanted sideband 50 db or more. Bridged-tee modulator, temperature-stabilized, compensated network provides carrier suppression in excess of 50 db. SSB, AM or CW output on 80, 40, 20, 15 & 10 meters. High-stability gear-driven V.F.O. 144 watts peak input. Ideal CW keying & break-in operation.
Amateur Net **$675.00**



Drake Sideband Receiver 1A

Tops for SSB & CW – plus Crystal Calibrator with front panel control; switch position for WWV for accuracy; AVC tube changed to 6BJ8 for improved TR switch operation.
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there are some who would allow the low code requirement Technicians to have *all* privileges above 50 Mc. This would make Extra Class and Technicians have the same privileges on the frequencies of the future, 50 Mc. and up.

The main point I want to make is not this complete removal of all incentive, but is the fact that all the propagation modes of the future that will make the v.h.f.-u.h.f. region the most popular among *all* amateur bands are practical on *c.w. only*! I refer to ionospheric scatter, tropospheric scatter, aurora reflection, meteor scatter, satellite trail reflection, reflection from passive satellites, and moon reflection. These and others yet to be discovered will increase the use of c.w. Some modes like meteor scatter require very high code speeds, whereas in the case of moon reflection using post detection integration for very narrow bandwidths, it may be necessary to develop some new techniques of very *low* code speeds — who knows? Let's not bury c.w. yet!

— *Ruddy Ellis, Jr. W4LNG*

SKILL OR SHEKELS

Box 178 — 9th A&E Sqdn.
Mountain Home AFB, Idaho

Editor, *QST*:

There were several letters in the November issue, about Superpower. I read them with a larger relish than normally stirs me, and must put in my four-bits worth, cause two bits won't quite handle what I have to say.

It has always been my feeling and even contention, that amateur radio is a hobby devoted to the advancing of the art, broadening one's knowledge of a fascinating subject, and sharing a bond with other amateurs, not common to everyone. It has been and is a challenge. Since when is using a kw. a challenge, as compared with some DX with 200 watts? 100 watts on sideband gets you nearly as good a signal report as a kw., if it is well engineered. It won't bother your neighbor across town on a near frequency. Yet there are many of the kw. boys who use full power just to talk across the block. It would please me very much if the FCC made the maximum power allowable 200 or 300 watts. Why? Because the average ham, interested in building a good clean rig, and being a smooth operator, would be able to point with pride to the QSL cards on his shack wall, as a symbol of hard work, much listening and skillful operating. They would not have been bought by his power; they would have been bought by his skill which comes from the inborn spirit and desire to advance the art. Do you know where to find the majority of that spirit now? Just tune up on the Novice bands and batter away at your key. Certainly, there are some chowderheads, but rather than fight the clutter of the California "kilowatts". I would prefer the "cheep, cheep" of the Novice. To him, it's an art, and he is giving it a ruddy go.

I think a reduction in power would certainly help our international relations. It would also separate the men from the boys. It would make the value of a stateside QSL go up like a rocket, and increase the average operator's probability of working a rare DX station, making it a matter of skill rather than who had more money to buy his power supply, or station.

— *Rufus D. Palmer, Jr., K4LVH*

EXCLUSIVE!

3135 Rorer Street
Philadelphia 34, Pa.

Editor, *QST*:

During the past year and a half, I've shipped a certain DX station a quantity of IRCs that would have enabled him to air mail me at least a dozen of his cards. Since I've never received the courtesy of a reply, I was beginning to scan "Silent Keys," and expected to find his call listed therein.

But in the October '58 *QST*, I found it . . . listed as a new member of the A-1 Operator Club. This man truly deserves to belong to such an exclusive group. Evidently the boys who voted him in received their QSLs, . . . but I wish they would tell me how they managed to do it.

Amen . . . to the letter by W9HCR, in the January '59 *QST*.

— *Edward M. Blaszczyk, W3KVG*

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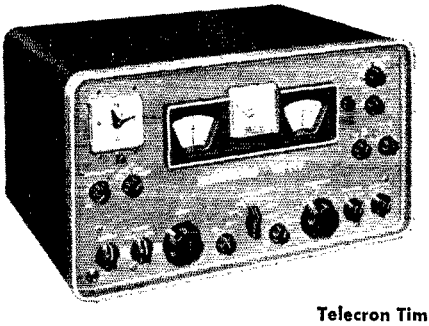

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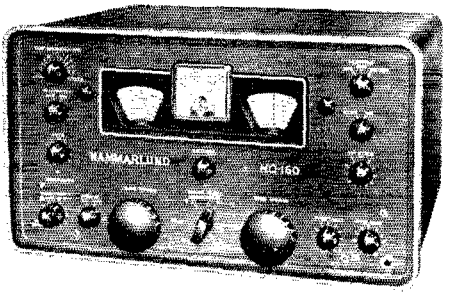

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How's DX?

(*Continued from page 77*)

whacking off six or eight stations at a swipe on 20 c.w. S.s.b. work around 14,305 kc. also went off well . . . . From GC2RS: "Had a visit from VQ4GM who is on a six-month leave in Durham while awaiting a new assignment and another lush prefix. Meanwhile he will be signing a G call." . . . . QRP s.s.b. is the forte of 5A1TK (K4YJM) who already has 70 countries on 14 Mc. by way of a shoeless 20A exciter . . . . Other African items courtesy WGDXC's ample organ: The ZD9AF operational routine includes 14,070-kc. forays from 1700 to 1800 GMT on Tuesdays and Fridays; also a 0730-0800 session when opportunity arises . . . Sao Thome's CR5AR often hits 20 meters around 0800 GMT in search of several western United States needed for WAS . . . . NCDXC mentions one 14-Mc. FB8UU, "QSL via F3JU," who claims Amsterdam Island as QTH. Not *Jamie* again?

South America — "This season the 10-meter band has been in very poor shape down here," pens HK7LX. "All my new countries now come from 20 meters between two and four A.M. local time. As soon as I reach the 200 mark on phone I'll start all over again on c.w.!" . . . . The W1ZDs undertook a January-February steamer cruise into VP8 and LU-"Z" regions with intentions of visiting DX ops all along the route . . . . K1ADH reports VP8AQ back in the Falklands, and W8KX finds VP8DN doing very well with his potent 14-watter around 14,030 kc. . . . . W4-CYY claims a superjinx: "After 25 years and 25 QSOs with ZP stations, *still* no QSL from Paraguay." . . . . "OA7I will close down for six months in Europe, then return to Lima as an OA4 and try for a third DXCC (I also hold membership as PA0XE). So I leave the honor of World's Highest Hamshack — 13,000 feet a.s.l. — to some other station, possibly a CP1 at La Paz."

Hereabouts — PJ2AZ can supply details concerning the Worked All Netherlands Antilles certification now offered by the Aruba Amateur Radio Club. "This is the first award originated in the Netherlands Antilles for world-wide radio amateurs." The certification concerns PJ contacts recorded *after* January 1, 1959 . . . . KP4KD checked his massive QSL files and found confirmations from DXCC members in 105 countries. "I keep a 3-by-5 card index in which I have a filing for every DX station worked by KP4KD. Dunno what the new year has done to me, OM, but I'm having myself a ball working DX on phone, 21 and 28 Mc." . . . . WA2CCC threatens to score the first new-style-U.S.-prefix DXCC with over 100 countries already logged . . . . Ohio Valley Amateur Radio Association's new slate of officers for 1959 lists W4OMW president, W8IFX veep, W8HNX secretary and W8TJM treasurer. Prexy Bob writes, "OVARA hopes to make another DXpedition this year, possibly to Guadeloupe or Martinique. So far we've had no luck obtaining a license for either place, however." . . . . K4TJL, ticketed as a Novice in early '58, became a General in June and has just drawn DXCC registration from W1WPO's good offices, all within his first year of hamming . . . . Switch sworn to by W8KX: Walt supplied a *c.w.*-patch between KL7FBC and the latter's XYL in Grand Rapids . . . . "Regarding our previous announcement concerning the Hampton Roads Radio Club's Half-Century Novice DX certification, we have not been exactly swamped with applications. Perhaps there just aren't many Novices around with 50 countries confirmed." True — most Novices quickly grab General licenses when they find out how much fun DXing really is, long before they reach the 50-country mark on 15 meters . . . . Frequent "How's" contributor W6RLP signs W6RLP/5 for a spell down at White Sands, according to W6KG . . . . Via the grapevine's long path we hear of connivery by Ws 3KA and 4KFC regarding a joint Swan Island effort this summer . . . . Following VP2KFA action at St. Kitts, VP2VB/mm and *Yasme II*, abetted by W8VDJ, fetched Dominica, St. Lucia and St. Vincent in early January for sizzling multiband sessions as VP2DW, VP2LW and VP2SW, respectively and in that order. Danny is now QRX for Yasme repairs.

Ten Years Ago in "How's DX?" — Your March 1949 column reports the return of an interesting phenomenon to DX circles: daylight 7-Mc. DX. Even 80 meters sees North Africans crashing across the pond around dusk on the East Coast . . . . Active on 3.5 Mc. are CN8MI, CT3AB, FA8IH, KV4AA, VP2LA and ZC8PM (W2AIS) . . . . Forty's favorites appear to be D5AA, HP2X, NY4DD, YK1AB, ZCs 1CL and 6UNJ . . . . The cream on 20 c.w.: C1MY, curious CZ2AC, EK1GW, KH6VP/VR4, LU1ZA, MI3AB, TA3AA, VR5PL, W7KPA/VP2, ZC1s AZ CL, ZC6UN and ZD9AA . . . . C3EA on Formosa, PJ5KO and Nepal's delicious VU7AF fascinate 14-Mc. phone specialists . . . . Ten c.w. comes across with EA1W, HE1EL and YR5A . . . . A3 DX doings on 28 Mc. center on AG2AD, AR8AB, EK1CG, KG6AW/VK9, MF2AA, MI3LZ, TA3FAS and VQ8AE . . . . In "Tidbits" we note several prefix changes: KA becomes DU (and Yanks go QRT in the Philippines); J becomes JA; J9, KR6; D4, DL4; and J8, HL1.

QST

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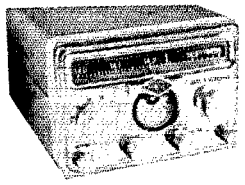

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G-66B (less power supply)..... ***$209.50***

"3-way" (6V-12V-115V AC) universal power supply and speaker unit..... ***$44.50***

"Thin Pack" power supply (12V DC only. No speaker)..... ***$29.50***

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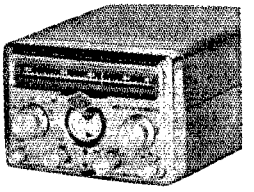
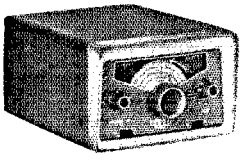


Heavy-duty vibrator power supply ensures exceptionally low current drain, both standby and transmit. Operate from 6 and 12V DC or 115V AC.

FREQUENCY RANGE: 80-40-20-15-10 meters. **FREQUENCY CONTROL:** VFO or crystal. (Switchable) Drum dial exposes only band in use. **POWER INPUT:** 50-60 watts. (Modulated) Provision for CW. **OUTPUT CIRCUIT:** Pi network. Type 6146 tube. **CONTROL SYSTEM:** Full press-to-talk, built-in antenna relay. No heavy-duty DC required.

Complete..... ***$299.00***



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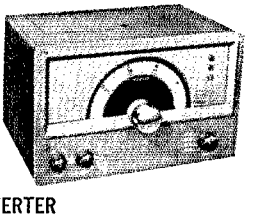

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RANGE: 48.4-54.2 mc. 143.4-149.2 mc. 219.4-225.2 mc. **NOISE FIGURE:** 50 mc-2.5 db. 144 mc-4.0 db. 220 mc-6.0 db. **CALIBRATION:** Direct, mc subdivided in 100 kc divisions.

Amateur Net..... ***$239.00***

GONSET
G-28 10-METER COMMUNICATOR

- Complete 10 meter station. 50 watts input.
- Type 6146 tube with Pi Network output.
- Highly stable, calibrated VFO with spotting switch to aid tuning.
- Highly selective, sensitive receiver.
- Adjustable squelch; noise limiter; "S" meter; panel mounted loudspeaker.
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Civil Defense System

(*Continued from page 61*)

RECEIVER TUNE position. Note the reading on meter and rock the gang tuning capacitor (on side) for maximum reading. Lock capacitor in place. Turn off the high voltage.

Move meter switch to 4 and turn on the high voltage. Adjust L_{118} and L_{119}, C_{153} and C_{157} for maximum reading. You are tuning for the 12th harmonic — 4933.33 kc. It will be necessary to use a wavemeter, grid-dip meter, or couple to a receiver to be certain that you have the correct harmonic. Remember that you will have a peak every 411.111 kc.

Turn off high voltage and set the meter switch to 1. Turn on the high voltage and adjust L_{106} and L_{107}, C_{114} and C_{116} for a maximum meter reading at 9866.67 kc.

Turn off high voltage and set meter switch to 5. Turn on high voltage and adjust L_{108} and C_{120} for maximum reading at 29,600 kc.

Turn off the high voltage and set the meter switch to 6. Throw the RECEIVER TUNE-OPERATE switch to OPERATE. Connect the output to a dummy load or antenna. Adjust the loading (at side of case) until the top of antenna coil is near the top of plate coil. Turn on the high voltage. Press the microphone button and adjust C_{126} (inside, next to the antenna relay) at once for minimum reading. Turn off the high voltage and unlock the push-button assembly by loosening the screw on the gear, through the hole just above the handle on the right side. You will have to move the gang capacitor to the closed position to do this. Push in Button 10 and move capacitor back to the open position and gently release the button. Move the capacitor back to the closed position and tighten the screw. Push Button 10 and check to see that the capacitor is pushed entirely open. Recheck all readings for all stages as listed above.

With transmitter on, and the TUNE-ANT. CURRENT switch in ANT. CURRENT position, tune C_{136} (No. 10 on side) for maximum reading. Adjust ANT. COUPLING (on side) for the desired reading, usually maximum. Check with wavemeter or receiver to be certain you have the correct harmonic and are on 29.6 Mc.

You are now ready to place or mount your equipment and go in business. No doubt you will make slight changes to fit your exact needs. Here are a few thoughts that you might consider: With the BC-604 here, the frequency deviation produced by modulation was within tolerance, but check it or have it checked. R_{120} may be changed to correct it if you are not in tolerance. The BC-603 is broad; it may be sharpened by removing the shunt resistors in the i.f. cans, but be certain that you get the correct resistors.

Both the BC-1335 and the BC-603 are very sensitive and receive a.m. signals as well as f.m. signals. If you do not like f.m. a simple modulator could be added to both the BC-1335 and the BC-604 for a.m. operation. In such a case, just ground the original microphone connection with a 0.005-μf. capacitor. QST

World Above 50 Mc.

(*Continued from page 71*)

W1UHE, N. Tiverton, R. I. — In building a parametric amplifier a source of power at 1296 Mc. was needed, so a cavity oscillator using a 2C39 was built. The problem then was to check its frequency with reasonable accuracy. A quick and easy method was to insert an s.w.r. bridge between the cavity and the lecher wires. When the short was moved along the wires the peaks and nulls were easily read on the meter of the bridge.

W1ZTT, Harwinton, Conn. — Will be glad to keep 220-Mc. skeds with stations within reliable local radius.

K2JWT, E. Northport, N. Y. — 220 and 50 Mc. make fine combination for duplex operation. With moderate power, at least, having the transmitter running has little or no effect on reception on the other hand. (Operation must be above 51 Mc. for this; duplex below 51 Mc. is illegal — EPT.)

K4EUS, Chester, Va. — M.s. skeds with WØMOX and WØTGC, Dec. 10–23, produced only bursts and partial identification; no QSOs.

W4FNR, Ft. Lauderdale, Fla. — December very poor month on 50 Mc., compared with November. Band open for F_2-layer DX only 9 days, though several E-layer openings helped to fill out the month.

K4KYL, Knoxville, Tenn. — Testing on 220 Mc. with W4VSN, Oak Ridge.

W6PBC, Belmont, Cal. — Use of vertical polarization on 1296 Mc. helps to cut down interference from radar equipment operating in the band. Stations on 1296 Mc. in Bay area now include K6AXN W6AJF K6BAT W6HPH W6OHQ K6ONM W6PBC and W6VSV. Have worked 32 different stations on 432 Mc. W6VSV is on 10,000 Mc.

K6PBI, Sherman Oaks, Cal. — This may not be the best way to put a Viking II on 50 Mc., but it is undoubtedly the simplest: (1) Remove one 6146 plate cap. (2) Short out entire series inductor, L_S, with an alligator clip lead. (3) Install 6-Mc. crystal, or detune v.f.o. in 11-meter position, and tune up in usual manner, checking output frequency to be sure that final is doubling to 50 Mc. Plate dip shows at about 95 on dial. Output is about 30 watts. Have worked 14 states with this temporary lash-up thus far.

W7EPZ, Billings, Mont. — Worked VP9EI, Bermuda, for latter's first 50-Mc. QSO. His frequency about 50.69 Mc.

World Above 10,000 Mc.

Away back in 1946, two hams decided that a claim should be staked out for amateur radio in the highest band assigned to our service, 21,000 to 22,000 Mc. Harry Sharbaugh, W1NVL, and Bob Watters, W9SAD (still using their prewar calls at that time) put together gear later described in *QST* for August, 1946. They wheeled it out onto rooftops of the GE Laboratories in Schenectady and worked one another over a distance of 800 feet. This was just a little more than too far to shout against a high wind, but it was a record made in the name of amateur radio, and it stood longer than any other we've listed for the frequencies above 50 Mc., before or since.

Getting on 21,000 Mc. is not easy, and though perhaps a few other hams have done it over the years (W6MMU, for one) the 800-foot record eventually was broken by the two men who made it. Feeling that it was time to show that 21,000 Mc. could be used for something definitely out of shouting range, Sharbaugh and Watters, now W2UKL and W2RDL, have refined and improved their gear. Last fall, with the help of several Schenectady area hams, they organized an expedition to extend the record. A site 14 miles from the GE Laboratory building was selected for the remote station, and after some trials and tribulations contact was established on 21,000 Mc. and maintained for several hours.

W2UKL and W2RDL have gone further, venturing into the unassigned territory above 30,000 Mc. to see what could be done in the way of communication. They now have two stations operating on 50,000 Mc., the highest frequency known to have been used for communication of any sort. This turned out to be something of a project. It was a real trick to cover a distance of 25 feet in their first tests, and the present limit of detectable signals is about 150 feet.

The problems involved include factors that most of us have never even dreamed of. We had Dr. Sharbaugh as

guest speaker at a recent meeting of the Hartford County Amateur Radio Association, and though probably not one ham in the audience ever had the slightest inclination to try microwave pioneering, W2UKL stirred their interest to the point where a lively discussion followed the talk and slide show, the session breaking up just before midnight. We think that you, too, will be intrigued by the report on this outstanding bit of amateur pioneering when it appears soon in *QST*.

W2UKL and W2RDL recognized that it takes two to work microwave radio, so they built two stations for each project they've undertaken. A single station for a microwave band is usually of no more than academic interest. K2EXD is finding that this applies to operation on 10,000 Mc. George has one working station ready to go on 10,000 Mc., and he would like to hear of anyone in the Boston area who would like to work with him. His address: George M. Walsh, Crufts 302, Box 132, MIT, Cambridge, Mass.

Happenings

(*Continued from page 67*)

PETITION

The American Radio Relay League, Inc., petitions the FCC to postpone until March 10, 1959, the effective date of the report and order of the FCC adopted in this docket on December 3, 1958, released December 5, 1958 (17 Pike & Fischer RR 1742). In support, the League shows:

1. Pursuant to the provisions of the report and order, the rule change would become effective on January 10, 1959. Because of the substantial question of whether or not the proposal adopted by the FCC will accomplish the objectives of the League in filing the original petition for rule-making, the League has had under study the question of whether or not a petition for rehearing and reconsideration should be filed. The League has not been able to make an informed judgment on the matter because completion of the study of propagation characteristics in the 100 kc. segments selected by the FCC requires additional time. It is understood by the League that another party is filing a petition for rehearing and reconsideration at this time.

2. It is respectfully submitted that the Commission recognizes the great amount of interest in the rule-making matter. In paragraph two of the report and order, the FCC recognized that the proposal has "elicited an extremely large number of comments from individual amateurs and organizations representing groups of amateurs." The League will proceed with all dispatch to complete its staff study of the questions and present to the Commission at an early date a statement based upon the considerations developed in the study now in process.

The American Radio Relay League, Inc.
BY PAUL M. SEGAL
Its General Counsel

A. L. BUDLONG
Its General Manager
January 5, 1959

ORDER

At a session of the Federal Communications Commission held at its offices in Washington, D. C. on the 9th day of January, 1959;

The Commission having under consideration a petition, filed by the American Radio Relay League, Inc., 38 La Salle Road, West Hartford 7, Connecticut, on January 6, 1959, requesting postponement of the effective date from January 10, 1959 until March 10, 1959, of amendments of Section 12.111 of the Commission's Rules ordered by the Report and Order in the above-captioned proceeding; a petition, filed by James D. Ahlgran, Route 2, Box 27A, Herndon, Virginia, on January 6, 1959, requesting that the above-captioned proceeding be reopened "in order that new evidence may be introduced"; a petition, filed by Arthur J. Swanick, 4629 North Henderson, Arlington 3, Virginia, Ross Bateman, 5720 El Nido Road, Falls Church, Virginia, and Walter F. Bain, RFD 1, Box 27-M, Springfield, Virginia, on January 5, 1959, requesting that "the effective date of said Report and Order, now set for January 10, 1959, be indefinitely stayed and postponed pending further rule-

(*Continued from page 160*)

making herein" and that the Commission reconsider its Report and Order issued in this proceeding;

IT APPEARING, That there is insufficient time to properly consider the aforementioned petitions for reconsideration and/or reopening prior to January 10, 1959, the scheduled effective date of rule amendments ordered by the Report and Order issued in his proceeding on December 3, 1958; and

IT FURTHER APPEARING, That this proceeding was initiated pursuant to a petition for rule-making filed by the American Radio Relay League, one of the petitioners now requesting postponement of the effective date of the previously ordered rule amendments;

IT IS ORDERED, That the effective date of the amendments of Section 12.111 of the Commission's Rules, presently scheduled to become effective January 10, 1959, is postponed until further order of the Commission;

IT IS FURTHER ORDERED, That the time for filing petitions for reopening or reconsideration is hereby extended to March 10, 1959.

FEDERAL COMMUNICATIONS COMMISSION
Mary Jane Morris, *Secretary*

Released: January 9, 1959

Strays

VOA AMATEUR RADIO PROGRAM SCHEDULE

The Voice of America amateur radio program continues on a weekly basis, written and voiced by Bill Leonard, W2SKE, and produced by Gene Kern, W2BAK. Distinctive QSLs are available to listeners who will address their requests to Bill Leonard, Post Office Box 29, Geneva 12, Switzerland, or to Amateur Radio, Box 922, Washington 4, D. C. The amateur program is a 15-minute feature of the Sunday Report From America broadcasts, a half-hour program devoted to late world-wide news and Americana feature items. It is transmitted each Sunday on the following schedules.

Time (GMT)	*Frequency*	*Transmitted from*	*Beamed to*
0600–0630	15,165	USA	North Africa
	11,970	USA	North Africa
	11,810	USA	West Africa
	9700	USA	West Africa
	9530	Greece	Middle East
	7125	Greece	Middle East
	1259	Greece	Middle East
	15,210	Germany	Middle East
	11,960	Germany	E. Africa/Mid. East
	6140	Germany	Europe
	1196	Germany	Europe
	11,765	Morocco	Europe
	9740	Morocco	Europe
	9585	Morocco	Middle East
	7205	Morocco	Middle East
0700–0730	11,810	USA	West Africa
	9700	USA	West Africa
	15,210	Germany	West Africa
	17,845	Morocco	Europe
	15,380	Morocco	Europe
	15,295	Morocco	Middle East
0800–0830	21,705	Morocco	Middle East
	15,295	Morocco	Middle East
	17,845	Morocco	Europe
	15,380	Morocco	Europe
1200–1230	25,950	USA	Europe
	21,735	USA	North Africa
	17,795	USA	North Africa
	11,875	Ceylon	South Asia
	7110	Ceylon	South Asia
	25,880	Morocco	Mid. East/South Asia
	21,455	Morocco	Mid. East/South Asia
	11,900	USA	East Asia
	9515	USA	East Asia

	6145	USA	East Asia
	6020	USA	Hawaii/Australia
	11,775	Honolulu	East Asia
	9650	Honolulu	East Asia
	11,790	Philippines	East Asia
	920	Philippines	China
	15,330	Philippines	South East Asia
	9745	Okinawa	East Asia
	7160	Okinawa	East Asia
1700–1730	21,610	USA	West Africa
	17,740	USA	West Africa
	21,500	USA	Europe
	15,210	USA	Europe
	11,875	Ceylon	South Asia
	7110	Ceylon	South Asia
	6140	Germany	Europe
* Sat. and Sun. only	*3980	Germany	Europe
	1196	Germany	Europe
	173	Germany	Europe
	15,200	Germany	Middle East
	11,760	Germany	E. Africa/Mid. East
	9520	Greece	Europe
	21,455	Morocco	Mid. East/South Asia
	9615	Morocco	Europe
2300–2330	21,730	USA	North Africa
	17,880	USA	North Africa
	15,150	USA	North Africa
	11,900	USA	Europe
	17,830	USA	Europe
	173	Germany	Europe
	11,875	Morocco	Europe
	9615	Morocco	Europe
	15,330	USA	Brazil/West Indies
	15,210	USA	W. Indies/E. So. America
	25,630	USA	East Asia
	21,740	USA	East Asia
	17,770	USA	East Asia
	15,275	Philippines	East Asia
	15,200	Philippines	South East Asia
	11,895	Philippines	South East Asia
	11,790	Philippines	South East Asia
	7160	Okinawa	East Asia
0000–0030	17,830	USA	W. So. America/C. America
	15,290	USA	W. So. America/C. America
	15,330	USA	Brazil/West Indies
	15,210	USA	E. So. America/W. Indies
	17,750	Philippines	South East Asia
	15,250	Philippines	Indonesia
	15,275	Philippines	East Asia
	15,215	Okinawa	East Asia

Strays

The seven-year-old girl called out to her mother, "Mom, you'll have to shut off that food mixer because you're bothering Mr. Moody's (K4VFM) short-wave radio. I just heard him say so on the television." — *K4VMT.*

—•••—

The Roosevelt High School Amateur Radio Club makes a plea for old parts or units. The boys say thay have no funds and would like donations of old gear to build up their station. Get in touch with acting president Ken McCullock, W2TMJ, 4 Burbank St., Yonkers, N. Y.

—•••—

W9UBI wonders how many other hams there are who, like himself, are obtaining extra college credits by being enrolled in NBC-TV's "Continental Classroom." What, you haven't heard of this before? See page 10 of February, *QST*.

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.

W2, K2 — North Jersey DX Association, Box 55, Arlington, New Jersey.

W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.

W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.

W5, K5 — Robert Stark, W5OLG, P.O. Box 261, Grapevine, Texas.

W6, K6 — Horace R. Greer, W6TI, 414 Fairmount Avenue, Oakland, Calif.

W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.

W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.

W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive, Flossmoor, Ill.

WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.

VE2 — George C. Goode, VE2YA, 188 Lakeview Ave., Pointe Claire, Montreal 33, Que.

VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.

VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 833 10th St., North Lethbridge, Atla.

VE7 — H. R. Hough, VE7HR, 1684 Freeman Rd., Victoria, B. C.

VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.

VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf.

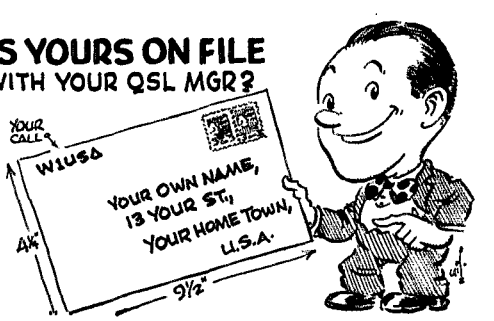
VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.

KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.

KH6 — Andy H. Fuchikami, KH6BA, 2543 Namanu Dr., Honolulu, T. H.

KL7 — KL7CP, 310-10th Ave., Anchorage, Alaska.

KZ5 — Catherine How, KZ5KA, Box 407, Balboa, C. Z.



The Big Thrill

The other day while with a group on a trip to meet with our SCM, the conversation in the car drifted to the "good old days." The days of lugging water from the well, wrestling up two flights of steps with a couple of scuttles of coal each night, down with the ashes in the morning, the Saturday night bath in the galvanized wash tub, standing in front of the fire place burning your shins while the other end froze. As I listened, I got to thinking about some of the old days and thrills of hamming. Back to the days of stretching out on the floor, winding coils, digging through the pantry for an oatmeal or salt box of just the right size, admiring the hunk of wire picked up on the last trip to the junk yard, the weekly trips through the alleys of the old factories which might have thrown away an old piece of wire or bent piece of metal, through the yards of the auto assembly plants for bolts and nuts, the thrill of finding an old junked radio, the pride and joy of dismantling said radio, each bolt and nut, each piece of wire, regardless of size, straightened out and all neatly put away in real honest-to-goodness wooden cigar boxes. The thrill of hearing something on that bread-board pile of tenderly handled equipment. The thrill of at last working up enough nerve to climb that tall pine tree and getting the sky wire up to the top. The thrill of getting back to mother earth all in one piece. The thrill of getting a crick in your neck looking up at that antenna. The thrill of the first QSO with the bread-board one-tuber and the copper tubing. The thrill of your first QSL. Now, as I slump back in a nice easy chair, sipping my coffee and looking over the ham shack with all the store-bought equipment, all waxed and shiney, with nothing to do but throw a few switches to work 'em far and wide, I was wondering just where the big thrills are now. All of a sudden it struck me — the big thrill now-a-days is in making the final payment on the last piece of equipment you bought so as to have still a bigger thrill of going to town and trading it in on the very latest super-duper which they have been advertising for the past two years and if you are lucky, you may expect delivery in the next six to eight months; then the big thrill of the arrival, the unpacking, plugging in the line cord and connecting the coax. Oh yes, and the real big thrill of the first QSO with no switches to throw — just sit back, relax and talk.

Well, it has been a long day and it is getting early into tomorrow. The bands don't seem too good tonight so guess I had better start that long, long trip up the stairs and hit those cold sheets — I forgot to hook up the electric blanket today! — *W4DFE*

WORLD'S MOST PERSONALIZED RADIO SUPPLY HOUSE

World Radio LABORATORIES

ELECTRONIC HEADQUARTERS

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

Dear Leo:

Enclosed is my check or money order for the Hy-Gain

- ☐ 2-Element Mini-Tribander
- ☐ 3-Element Mini-Tribander

Please also send:

- ☐ Complete Hy-Gain Brochure
- ☐ Free World Radio Catalog

Name: _____

Address: _____

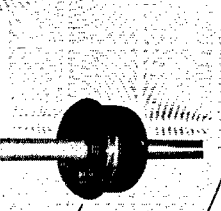
City & State: _____

Compare with 3-Band Beams Selling for $30 More

the hy-gain Mini-Tribander ... takes Maximum Legal Power

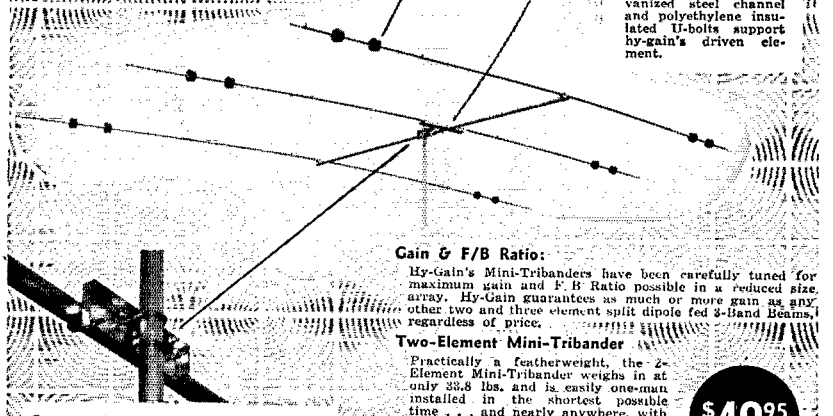
Insutraps

These streamline hy-gain traps are small (3" diameter) and light weight. Capacitor dielectric and coil form molded high impact styron. Each designed to take 1 KW A.M. 2000 watts P.E.P. (as much as higher priced tribanders; more than 4-times the power handling capabilities of others. No need to limit your present or future power to 300 watts!) Individually factory resonated for maximum frequency accuracy. Completely weather sealed, water proof and airtight (do not breathe) for years of stable operation. Carbon activated polyethylene covers. Guaranteed for the life of the beam. Hi-Q coils well-removed from any metal mean highest efficiency of isolation action.



Split Insulated Dipole

Split Insulated Dipole Feed with coaxial choke results in SWR of less than 1½:1 on all bands with exceptional bandwidth. 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.



Construction

Boom is 1¼" dia. by .065" wall thickness, hot dipped galvanized steel. Elements are 6061T6 high strength aluminum alloy. Telescoping sections of 1", ⅞", ¾" sizes are used. Heavily plated 10 Ga. steel channels attach all elements to boom and boom/mast with positive grip. High quality, galvanized and iridite treated hardware used throughout.

Gain & F/B Ratio:

Hy-Gain's Mini-Tribanders have been carefully tuned for maximum gain and F/B Ratio possible in a reduced size array. Hy-Gain guarantees as much or more gain as any other two and three element split dipole fed 3-Band Beams, regardless of price.

Two-Element Mini-Tribander

Practically a featherweight, the 2-Element Mini-Tribander weighs in at only 33.8 lbs. and is easily one-man installed in the shortest possible time . . . and nearly anywhere, with its turning radius of only 12'- 11". Boom length 6'. Longest element 27'.

$49.95

Three-Element Mini-Tribander

The 3-Element Mini-Tribander is extremely lightweight, only 39.8 lbs. With a turning radius of 18', 10", this space-saving beam may be installed almost anywhere, yet boasts most of the features of the hy-gain full-sized trap tribanders. Boom length 12'. Longest element 28'.

$69.95

AND WHEN YOU BUY FROM

WORLD RADIO

YOU CAN BE SURE OF

★ **PERSONALIZED SERVICE**

★ **HIGHEST TRADE-INS**

★ **IMMEDIATE SHIPMENT**

★ **LATE SERIAL NUMBERS**

★ **AND EASY PAY TERMS**

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) **A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 7¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used FM communications equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YIY, Troy, Ill.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

WANTED: All types aircraft & ground transmitters, receivers ART-13, RT/ARN7, BC610E, ARN6, BC7883, ARC3, BC342. Highest prices possible paid. FOR Action we will buy immediately for cash all types amateur equipment or trade against new amateur gear. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system alternator, regulator & rectifier, $45.00. Also Leece-Neville 12-volt 100 amp. system, alternator, regulator & rectifier, $85.00. Good condition. H. A. Zimmerman Jr , K2PAT, 115 Willow St., Brooklyn 1, N. Y. Ulster 2-3472.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lysco Master Mobile Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

SAN FRANCISCO and vicinity. Communication receivers repaired and realigned. Guaranteed work. Factory methods. Special problem, invited, any equipment. Associated Electronics, 58 South P St., Livermore, Calif. W6KF, Skipper.

RECEIVERS: Repaired and aligned by competent engineers, using factory standard instruments. Authorized Factory Service Station for Collins, Hallicrafters, Hammarlund, National. Our twenty-second year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19 Mass.

TECHNICAL Manuals TM11-273, 120 pages covering BC-312 receivers and BC-191 transmitters, $2.50. ID-60/APA-10 Panadaptor maintenance manuals, $2.75. Both postpaid in U. S. A. Electronicraft, Bronxville, N. Y.

"PIG-IN-A-Poke"? Not if you visit Ham Headquarters, USA, and pick your choice from the hundreds of "Like-New" bargains in the world-famous Harrison Trade-in Center. Greater values, because tremendous turnover means lower overhead! Terms, Trade. Send us postcard for mouth-watering photograph and price-list. For the best in used and new equipment it pays to come to Ham Headquarters, USA! BCNU. Bill Harrison, W2AVA, 225 Greenwich St., New York City.

S.S.B. xfrmrs. exact set for W2EWL exciter (hermetically-sealed) set of 3 brand new $4 postpaid. New compact Stancor bias or screen supply xfrmrs 55v to 550v @ 600 Ma. to 60 Ma. tapped pri (12 lbs.) $6.50. New compact G.E. 100-watt modulation xfrmrs. multi-impedance (10 lbs.), $6.25; new Elmac vacuum condensers 12 $\mu\mu$fd @ 32 kilovolts, $5.50. Please include postage No c.o.d. S. Tucker W2HLT, 51-10 Little Neck Parkway, Little Neck 62, L. I., N. Y.

TRANSFORMERS (3) W2EWL Special, $3.00 postpaid. SSB, latest diagram, template, 3 xfrmrs, disc ceramic Emica condensers, coils L1 thru L7 for W2EWL Special (Mar. 1956 *QST*), $10.95 postpaid. Vitale, W2EWL, Denville, N. J.

BARGAINS: Reconditioned & guaranteed. 32V-2, $349. 32V-3, $495. B &W 5100, $299. Viking 1, $145, Ranger, $199.50, HQ-129X, $159; HQ-140XA, $199.95, HQ-100C, $159.50; HQ-110C, $215; SX-96, $199; NC-300, $319.50; NC-125, $139; NC-173, $139.50; NC-109 w/calibrator, $179.95. Write for complete list. We trade. Complete stock of new gear. Terms with only 10% down. Write Ken, W9ZCN or Glen, W9ZKD for deal. Ken-Els Radio Supply Co., 428 Central Ave., Fort Dodge, Iowa.

QSLS? SWLS? Finest and largest variety samples 25¢ (refunded). Callbooks Spring), $5.00 postpaid. Ham fellowship club. Details free. "Religious" QSL samples 25c. "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Michigan

PICTURE QSL cards of your shack, home, etc. Made from your photograph. 1000 for $12.00. Raum's. 4154 Fifth St., Phila. 40, Penna.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢ with catalogue. 25¢.

QSLS-SWLS. Samples 10¢. Maigo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSLS: Twenty exclusive designs in 3 colors. Rush $3.85 for 100 (ten different kinds) or $6.25 for 200 (20 different kinds) and get surprise of your life. Satisfaction guaranteed. Five days service. Constantine Press. Bladensburg, Maryland.

QSLs. Samples, dime. Printer, Corwith, Iowa.

QSLS, Sharp! 200 one color, glossy. $4.75 Multi-color samples dime, K9DAS QSL Factory, Edward Green & Sons, 4422 Marquette Dr., Ft. Wayne, Ind.

COLOR Glamor, scenic & nature. Custom sketch and photo. Samples 25¢ refunded. K4LFZ QSLS, Summerfield, Fla.

QSLS: 4 colors, glossy, 100, $3.00. Samples 10¢. Dick, W8VXK, 1018 Arthur, Mt. Pleasant, Mich.

QSLS. Reasonable, 3 weeks delivery. Catalog dime (coin). Dick, K6GJM, Box 294, Temple City, Calif.

QSLS-SWLS that are different! Colored embossed card stock, and "Kromkote." Samples 10¢. Turner, K8AIA, Box 953, Hamilton, Ohio.

QSLS: Cartoons, colors, something different. Samples 25¢. Chris. W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

QSLS-SWLS, 100, $2.50. Samples 10¢. QSO file cards, $1.00 per 100, Rusprint, Box 7507, Kansas City 16, Mo.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., KN5ZMT, Creative Printing. P. O. Box 1064-C Atascadero, Calif.

QSLS Samples dime. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS: New designs reasonable. Paye, W4ZKK, 824 Avondale, Cocoa, Florida.

QSLS-SWLS. High Quality. Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

QSLS SWLS: 100, $2.00; Samples dime, Bob Garra, Lehighton, Penna.

QSLSs, SWL's VHF's XYL-OM's. (Sample assortment approximately 9¾¢). Covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fatabulous. DX-attract ng, prototypal, snazzy, unparagoned, cards. Rogers, KØAAB, 737 Lincoln Ave., St. Paul 5, Minn. Also glamorous, pulsating (Wow!)

QSLS, OM-YL, AM-FM-SSB-CW, VHF-UHF, MARS. Special offer. Samples 10¢. Onondaga Press, Onondaga, Michigan.

QSLS, Taprint, Union, Miss.

QSL-SWL samples free. Bartinoski W2CVE Press, Williamstown, New Jersey.

SEND $3.00 for 200 two color QSLs. Samples 25¢. Bolles, 810 Morrow, Austin 5, Texas.

QSLS: Send 25¢ (refundable) for samples. W6CMN, Schuch, 6707 Beck Ave., No. Hollywood, Calif.

QSLS. Plain or fancy, samples dime. QSL printing, Box 12351, Houston 17, Texas.

QSL'S, stamp brings samples. Eddie W. Scott, W3CSX, Fairplay, Maryland.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSL-SWLS, 100, $2.85 up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS: Outstanding — Original — Fast service — Reasonable prices. Samples 10¢. Super quantity, 25¢. Refundable. VYS QSLs. 1704-Q Hale Avenue, Ft. Wayne, Indiana.

QSLS: Rubber stamps, reasonable, nice designs. Samples, dime. Stan, W2DJH Press, 19 Elm, Warrensburg, N. Y.

QSLs? SWLs? In '59 try mine! Samples 25¢ deductible. C. Fritz, 1213 Briargate, Joliet, Ill.

QSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLs, 3-color glossy, 100 — $4.50. Rutgers Vari-Typing Service, 7 Fairfield Rd., New Brunswick, N. J.

QSLS Neat. Attractive. Samples 10¢. Woody's. Box 164, Asher Sta. Little Rock, Ark.

DISC Tuning and neutralizing capacitors, and heat radiating plate caps: any size. W4UCH, Richardson, Sterling, Va.

QSLS samples, quarter. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLS, High gloss, 2 colors, samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSLS, Lapel pins, samples dime, Kephart W2SPV, 4309 Willis, Merchantville, N. J.

RUBBER stamps for hams, sample immpressions W9UNY, Hamm, 542 North 93, Milwaukee, Wisconsin.

WANTED: Receivers, transmitters and accessories. Nehf Enterprises, 118 S. Clinton, Chicago 6, Ill.

PERFECT Condition. For Sale; Sacrifice; Collins 51-J4 communications receiver. Used short time. Sam Kantor, 295 Glenwood Ave., Bloomfield, N. J.

AUTHORIZED factory distributors for Adjustavolt, B&W, Elmac, Geloso, General Electronics, Glas-Line, Gonset, Hammarlund, Hexacon, Johnson, National, Penta, TMC, Tobe & Vocaline. Wanted: xmtg. and special-purpose tubes and lab equipment. Trade-ins accepted. Open Monday through Saturday. Barry Electronics Corp., 512 Broadway, N. Y. 12, N. Y. Phone WAlker 5-7000.

SAVE time, Save money! DX QSL's forwarded. 2¢ each after membership. Free flyer. "DX QSL Co-op," Box 5938, Kansas City 11, Mo.

FOR Sale: Valiant. Factory-wired, $325. W3ARI, 912 So. 57th St., Philadelphia 43, Penna.

GLOBE Champ 300A, little used, and less than 1 year old; 280W phone, 300 w., c.w. bandswitching 160-10 M. Built-in VFO, $300 cash and carry. Also, Collins 75A2, very good condx, $200. Cash and carry. Don Kilgus, 345 Columbus Ave., Valhalla, N. Y. Call W.H. 6-8764.

JOHNSON Kilowatt and desk, in excellent condition: $1150; Johnson Audio Amplifier, $60; Johnson power divider, $17.50. Will buy or take Thunderbolt in on trade. Lewis West, WØAIO, 3414 West St. Louis, Wichita 12, Kansas.

SELL: Collins 32V3 transmitter, in excellent condx, with spare 4D32, $450. FM-3, tuner, $25. M. H. Klapp, 17 Kenosha St., Albany 9, N. Y.

WANTED: Battery receivers of 1920s, Erla, Acme, Radiola, Grebe, etc. Also UV199 thru UV206 tubes for electrical test. Buy or borrow. Grote Reber, Green Bank, West Virginia.

AIRCRAFT radio man wanted for installation and service to corporation aircraft. Modern, fully equipped shop. Excellent salary and finest working and living conditions. All replies confidential. Page Airways, Inc., Rochester Airport, Rochester 11, N. Y.

HAM Licenses, resident courses, 3 evenings weekly. Prepare for Novice Class in 4 weeks. General Class in 2 months. Delehanty Institute, 117 East 11th St., New York 3, GR 3-6900.

WANTED: Gonset Communicator III, 6 meters, will consider a 12-volt model II. Either must be in top condition. For shipment New York City. Send description and price your first airmail letter. All replies answered. T. H. Nicholls, K2IHU, Apartado 45, Barcelona, Venezuela, S. A.

AT last! Custom frame to fit ham license. Two-week delivery. $1.50 includes mailing. Choose black, green, red, gold. Money order or check to Farmil Crafts Co., Box 461, Warner Robins, Ga. (W4UZS).

KWM-1 Wanted. Also few high plate dissipation tubes. W2KUW, 64 Grand Place, Arlington, N. J.

COAXIAL Cable, New surplus, RG-54A/U, 58 ohms impedance — 30 ft. prepaid, $1.00. Radio magazines, buy, sell, trade. R. Farmer, 3009 No. Columbia, Plainview, Texas.

KNOX Electronic Supply, Inc. "Where your Trade-In is always worth more!" 67 N. Cherry St., Galesburg, Ill.

ANTENNA 80-40-20-15-10, $21.95. Patented. Lattin, W4JRW, Box 44, Owensboro, Ky.

COMPLETE File *QST*s, 1915-1951 for sale. Lauda, Clayton 2, Georgia.

HALLICRAFTERS, Drake, Central Electronics, Gonset, Ham gear, Jerry W8EPI, Swartzlander Radio Limited, 1220 Stilwell Avenue, Fremont, Ohio.

FIFTH Annual Syracuse VHF Roundup, October 10, 1959.

PARTS For BC-348 Models H, K, L, R. Write for list. Panoramic Adapter ID-60/APA maintenance manuals, $2.75; BC-312 and BC-191 maintenance manuals, $2.50. Electronicraft, Box 269, Bronxville 8, N. Y.

304TL transmitting tubes needed. Contact W2KUW, 64 Grand Place, Arlington, N. J.

SELL 1.7 KVA Amertran 115/230 primary 4730 VCT secondary cased, 500 MA swing and filter chokes cased, two GE pyranol 2 MFD 4,000 volt, two Aerovox 1 MFD 2500 volt. All for $50 if picked up. For shipping add $10 for crating. N. E. Handel, 1609 Barrington Road, Columbus 21, Ohio.

KWMI. Exc. cond. W/AC pwr supply and matching speaker. $750.00. F.o.b. Jim Baron, W9TVP, 5025 N. Pulaski Rd., Chicago 30, Ill.

FOR Sale $70.00. Complete rack and cable to mount KWM-1 in car. New in factory box. W4AD, Box 793, Rome, Ga.

MEISSNER radio phono disc recorder, $100. Heath WA-P2 preamp, $19. Both perfect. Don Wilson, West Marshall Dr., RD #1, Poughkeepsie, N. Y.

SWAP. Polaroid "800" camera, case, accessories, brand new for Viking or DX100. W4BIR, 3611 Wimberly, East Ridge 11, Tennessee.

ELDICO SSB100A 150W Exciter/Transmitter. Most versatile equipment on the air. A complete all Band AM SSB Transmitter, only $425.00. F.o.b. New York. In perfect condition, K2MQO, 130 East End Ave., N. Y. C. 28.

SACRIFICE. Meissner 150-B with VFO-300 watts input AM or CW $125. Complete Mobile for 10 meters, Motorola 807 final, Gonset Converter, whip and mike, $50. W2CW, 106 Ravine Ave., West Caldwell, N. J.

FOR Sale: Latest model KWS-1 complete condx on air less than twenty hours. R. M. Walker, W2ZOL.

ECKER Lampkin freq. meter. Pls contact EDC de ARRL!

MAKE offer for complete volumes of *QST*: 1930, '36 thru '40, '44 thru '56, Incomplete 1922 thru '35, send for list. Handbooks '31-'35-'41-'44-49. Sell separate, July and Aug. 1917 *QST*, perfect, cond. R. Dennis, 400 Beaver Valley Road, Wilmington 3, Del.

CANADIANS: For sale, Morrow mobile-fixed portable station. Consists of MBR-5 receiver MB-560A Transmitter, with all Morrow 110v a.c. and 12v d.c. supplies and all necessary factory-made interconnecting cables. Positively like-new condition, $480. Will send photos. VE4CP, Blair MacAulay, 1125 Wellington Crescent, Winnipeg.

SELL: AR-3, $30 and 25 watt Hdbk xmtr., $30. Both, $55. KN9PDD, 1507 Collingwood, Indianapolis 8, Ind.

TREASURE. Privateer Jean LaFitte buried his treasure on Galveston Island south of the Republic of Texas. Treasure hunters will gather on June 19. Data and information available Box 73, Rte 1, Galveston.

SELL: Immaculate Hammarlund HQ140XA with RME 4302 speaker, $210. Factory wired Globe Scout 65A in perfect condition, $65. Meissner Signal Shifter EX in good condition, $25. John D. Whitney, W8FNV, 23624 Wilson, Dearborn 7, Michigan.

WANTED: Hammarlund HQ-110 Receiver. Must be in good condition. Cheap for cash. J. M. Fraser, Binscarth, Manitoba, Canada.

NC300, speaker, calibrator, new condx, $285, Viking II with VFO, perfect, $195, new RCA AVT-112A 75 mobile xmttr with 12v. Vibrapack, $19, E-V Cardex mike, $5.00. W8TOV, 22861 Edgewood, St. Clair Shores, Michigan.

FOR Sale: 1 Hallicrafters SX-62 receiver. 1 Harvey-Wells TBS-50D Bandmaster De luxe transmitter with APS-50 power supply. Both used very little. Best offer. W2YLR.

VIBROPLEX Zephyr, $10.00. Caracena, 5442 Wayne Ave., Phila. 44, Penna.

WANT Tri-band 3 El beam. 10-15-20. Please state condition and price. W9SER, 4421 E. 11th Ave., Gary, Indiana.

FOR Sale: RME VHF 152A converter for 2, 6, Ø, & 11 meters, complete, $45. K2SCX, Bruce Lazarus, 144-36 78 Ave., Flushing 67, New York.

FOR Sale: National NC 173 like new speaker to match and Heath "Q" Multiplier new unused, $115 for all. Chas. Judd, W2LZW.

VIKING Valiant factory wired, excellent condition, $325. SX101 Perfect, $275. AR22 Rotator, like new, $20. PK103 Dynamotor, $20. Shure 505C Mobile Mike with Pt Plug, $12. Hallicrafter Receiver S 38, good condition, $30. New Mallory VP557 Vibrapack 400 volts at 150 mils, $20. Will assume contract or pay cash for KWS1 and 75A4 deal. Must be near new. Ray Jarrett, W7RXN, Deer Park, Wash.

FOR Sale: NC-88 and 6J6 Six Meter Convert, $80. Also Globe Scout 680, $80. Bill Meyer, K9DGC, 211 North Third Avenue, Cedarburg, Wisconsin.

WILL trade large model railroad in vy gud condition, worth $330 new, for SX-28 or equivalent revr. K9PQG, 225 Lorraine Rd., Glen Ellyn, Ill.

WANTED: Used Collins 75A4 or HRO60 also Johnson Ranger. K4YVL, 5033 — 17th Ave., N. St. Petersburg, Florida.

WANTED: Service Manual for Karl Pierson — KP-81 Communication Receiver. Borrow or buy. Harold Feldman, 719 East 6th St., Duluth, Minn.

FOR Sale: New HQ-110 in original carton, $209. KØCXS, Peter Rosenbaum, 2962 S. Vrain, Denver 19.

SELL or Trade: KW xformer, parts K2GBH.

SELLING out: NC-300 w/x-tal calibrator, 6M converter, $300; HV, MV and LV regulated power supply for KW S.S.B. rig, similar to those in KWS-1, w/42" relay rack and blower, $200; thousands of resistors, condensers, meters, test equipment and miscellaneous parts. W8NVT, 3708 Mt. Pleasant Drive, Midwest City, Oklahoma.

FOR Sale: Elmac A-54 mobile transmitter, $70.00. W1VKY, Box 321, Hampden, Mass.

HRO-50T, A-1 condition, looks new — all coils. Also NC-300, A-1 condition. Best price on each over $250.00 gets 'em. Meck Brazelton, W4JSH.

10-METER Converterette, $8.50; 10-meter 10W mobile xmtr $12.50; 10- or 15-meter preselector, $5.00; SWR bridge, $5.00; 15-meter 200w GG Linear final, $9.50; Heath Q Multiplier, $8.50; Combination 10-meter xmtr and converter, $22.50; F.o.b., W6RET, 8831 Sovereign Rd., San Diego 11, Calif.

FIRST check will take two Elmac 4-250A tubes, $20 each. Also two RCA 813 at $10 each. New, never used. W8EAB, Fred Porter, 305 Kirkwood, Chesterland, Ohio.

FOR Sale: Complete station, RCVR SX96, VFO WRL 755, D-104 mike, HT-20 xmtr. Xmtr ideal for Mars frequencies, Works frequencies between ham bands as well as ham bands. Has complete coverage between 1700 kc and 31 mc. Also 4D32 spare final tube. Reason for selling, going two meters all the way. Price complete station, $400.00. Write W4DSO, P.O. Box 444, Morganton, N. C.

CLEANING house! 1 KW rig, ½ KW rig, 6 and 11 meter converters, modulator, dynamotor. All items cheap! Local sale (Chicago, area) only. Call A. R. Martin, HI 6-4506.

NATIONAL NC-173, speaker & manual, Excellent, $122, Percy C. Noble, W1BVR, V/P, ARRL, 37 Broad St., Westfield, Mass.

SIX-meter Gonset Communicator III with Gonset VHF Power Amp for six meters and D-104 mike for sale. Asking $400. 2 months old, excellent condx. Jay Sewell, 301 East 14th, Belton, Texas.

OPERATE mobile with Gonset 66-Stancor 203A, VFO, PE 103, whip, mounts, all cables, for 10-meter operation, 6 or 12 volts, $220.00. K2VMD, 19 Old Farm, No. Caldwell, N. J.

FOR Sale: Hammarlund HQ100, used one month, original carton, $130.00. Express charges C.O.D. John Ottinger, 814-62 St., Brooklyn, N. Y., Terrace 6-7105.

SELL or Trade: BC-654-A, complete with PE-103 and cable, also BC-745 complete with power supply PE-157. Need Globe Scout, 6v, Leece Neville 100 amp, and BC-348. Whatcha got? Rod Hogg, 715 N. Sheridan, Minneapolis, Kansas, KØEQH.

JOHNSON "Matchstick" ant. complete with motor driven coupler, control wire, radials, relays, nylon guys, etc. Used only two months. Perfect condition. Cost me $135.00, yours for only $75.00 or swap for gud 400 watt or better home brew xmtr. Can't ship. Tie to roof or side of your car. Wally Haines, K8IWF, 630 Erie St., South Haven, Mich., Phone 1454.

WANTED: BC-348, B. A. Thunman, 120 Pelham Rd., New Rochelle, N. Y.

RECEIVERS: All Hallicrafters, Hammarlund, National. Big trade allowance. Jim Stout, W3VGZ, J. V. Stout Co., 4640 York Rd., Baltimore 12, Maryland.

WANTED: Collins 2.1 KC and 500 cycle or 800 cycle mechanical filter for 75A-4. Write stating condition and price to W2HYS, 401 Lansdowne Road, Dewitt 14, New York.

BARGAINS: Reconditioned and guaranteed. Shipped on trial. National SW54 $35.00; NC57 $59.00; NC300 $279.00; HROs; Hallicrafters S38 $29.00; S40B $69.00; S85 $89.00; SX99 $119.00; SX71, SX96, SX100, SX101; Hammarlund HQ100 $139.00; HQ129X $159.00, HQ110 $189.00; HQ140, HQ150, HQ160, HQ170; Johnson Ranger $179.00; Viking 11 $179.00; Courier $199.00; Valiant $329.00; Thunderbolt $399.00; Pacemaker $349.00; Collins 75A1, 75A2, 75A3, 75A4, 32Vs, KWM1, KWS1; Globe, Gonset, Heath; Elmac; complete stock of reconditioned and new gear. Write for list. Henry Radio, Butler, Missouri.

DX-100 Transmitter, mike, coax switch and spare tubes. Wired by holder of amateur extra and first class radio telephone licenses. $200.00 complete. J. B. Wallace, 701 Ginger, Sulphur, Louisiana.

FOR Sale: SX-100, like new, $210.00; 12v. Johnson mobile (factory wired), $90.00; DM-35, $10.00; PE103, $10.00; Hy-gain traps all band, $10.00. John Chooljian, K2KRF, 5301 Palisade Ave., West New York, N. J.

BC-348Q for sale. Built in Q5-ER, S-meter, ANL, low-noise front end. Neatly labeled. $85 includes loudspeaker and power supply. F.o.b. Alen Gordon W3RCD/2, 86-11 Whitney Ave., Elmhurst 73, Long Island, N. Y.

MORROW Twins: MB560A xmtr, MBR5 revr. Complete with James power supply, matching mike and speaker, whip loading coils and bumper mount, instrux manuals. Like new condition. First $300.00 takes all. E. A. Winter, 981-3A St., New Brighton 12, Minn.

SELL: Collins 32V2, perfect condition. Spare 4D32 and coax relay. $295.00. Tagart, 554 Irvington Avenue, Maplewood, N. J.

SELL: Globe Scout transmitter, good condition, $65; Heathkit VFO, very good condition and accurately calibrated on all bands, $20; Astatic model DN-HZ dynamic microphone, high or low impedance, with stand, $18. Will sell all of above for $95. Also: Harmon-Kardon Hi-Fi AM-FM tuner, $45; Hallicrafters "S" meter kit, $9; pair earphones, $2.50; homebrew grid-dip oscillator, $18. Burt Colt, Box 4576, Clemson College, Clemson, South Carolina.

SELL: Pair BC-611 Handie-Talkies on 3885 Kc. With batteries, $85.00. KØKKM, 809 N. Burl. Ave., Hastings, Nebr.

SELL: 25-44 mc used FM Receivers 25 to 42 mc, $16.00 each with 13 tubes and power supply. Have hard to get 12 volt low voltage input brushes for DM 34 DM 35, DY 88 12 volt Dynamotors. Ralph Villers, P.O. Box 1, Steubenville, Ohio.

KODIAK Island, Alaska — Part of 49th state — Engineering and Technician employment prospects. Qualified home seekers to build Alaska, may learn bona fide details by writing J. B. Trent, KL7DG, P.O. 82, Kodiak, Alaska.

DX-100B, brand-new, in perfect condition. Works perfect on all bands. Six extra tubes. Highest offer gets it. Also Hy-gain 10-meter beam and CDR rotor. Also six novice xtals. Tom McFarland, KØOMP, Armour, South Dakota.

SELL: Johnson Viking 2 transmitter, Model 122 VFO both excellent condition with instructions. W4BLX, 8907 Tolman Road, Richmond 29, Va.

WANTED: 2.1 kc. filter for 75A-4. Swap or sell either of new 75A-4 filters: 1.5 kc. $37; 6 kc. $30. Pair new 100TH, $9 each. Also prop-pitch motor with transformer. W6TOT, 15450 Pepper Lane, Saratoga, Calif. Phone EL4-4565.

SWAP Leica 3C, f/3.5 lens, like new, with Rapid Advance, case, for ham gear. Paul Giganti, W6GVY.

HQ129X Receiver, Model A Slicer with API, 10A Exciter with QTI, 457 VFO, Variac controlled 2000V Power Supply, 811A Linear, 26" Steel Cabinet, $250.00. W1RKA.

FOR Sale or Trade for sideband equipment late model three element High Gain Tribander, PE75AB 2500 watt A.C. generator. Vernon Robertson, W5JJA, Columbus, Mississippi.

FOR Sale: Telemetry rec and space display unit 53-260 Mc. rec. $400. Special disp. unit, $150, both $500. Senco, 4506 Furnam Rd., Silver Spring, Md.

JOHNSON Viking II and Johnson VFO for sale. Excellent condition, with instruction books. No alterations, nothing damaged. Also D104 mike and coaxial relay. All for $195.00. WØMVO, Laurel A. Dirks, Route #1, Pawnee Rock, Kansas.

JOHNSON 6N2, perfect, $115. Extra 5894 for final, $15. 420 Mc. BC 645 Transceiver, stripped for conversion, $15. PE 101 Dyn. $7. Six Meter 6146 transmitter, $45, with ps and mod., $65. K6RFS, 1126 Garfield Ave., San Jose, Calif.

TRANSFORMERS, tubes, chokes, command transmitters, variable inductors, 4D32, 813, Millen GDO. Send stamp for list. W5SZB, W5SZB, Box 330, Edinburg, Texas.

HEATH AR-3, $24, plus shipping. Don Felgenhauer, K7BFL, Fairfield, Washington.

SALE: BC-794 Super-prowl power supply, $50. Unused WRL *VFO, $40. HF-10-20 Converter, $45; BC-312, $35; SCR-522 Trans*-Revr, $10; Makay 167BV Transmitter, $50 (pr. of 813). W3SVF, 163 E. Brown, Blairsville, Pa.

TRADE: Communicator III, 6 meter. Want HQ-110-C or $200. K9HUU, 2651 W. George St., Chicago, Illinois.

ABSOLUTELY perfect NC-300 and speaker, $300; Heathkit VFO, $15; Heathkit C-3, Condenser Checker, $15; Heathkit Conerad Alarm (Are you operating legally?), $10; Ferret U239 Geiger Counter, $10; Thordarson xformer 1560-1250-0-1250-1560 @ 300 ma., $15; new xformer 2.5 v. @ 10 A., $3.50; new choke 8 H @ 300 ma., $2.75; new 50 ma. 3½" meter, $3.00; 15-meter 2-element beam and rotator, $30; $5 or $10 assortment of parts. Satisfaction guaranteed. Include postage. Joe Morgan, Lovington, Ill.

GLOBE King 500B Transmitter. Extra 4-250A. Excellent condition, $45.00. Les Galloway, W9TQX, 249-173rd Place, Hammond, Indiana.

WANTED: Johnson Navigator Transmitter. Ehrhardt, Wieland 16, Wiesbaden, Germany.

SELL — trade: Two Heathkit QF-1 "Q" Multipliers, new, $7 each. S-38C, good condition, $30. All prices include postage-insurance. Need 813's, blower, electronic key. Whit, W4CXQ, Box 3161, Va. Tech, Blacksburg, Virginia.

LOS Angeles Area hams: must sell complete station. B&W 5100B with Balun coils; HRO5OT with crystal calibrator and coils AA, B, C, D. Above with D-104 mike, push-to-talk stand and relay; 4½ inch "Precise" VTVM; misc. tubes, crystals, condensers, etc. Deliver within 300 miles. All letters answered. Make an offer. Gerald Gumaer, WA6BAP, 1017½ North New Hampshire, Los Angeles, 29, Calif. Phone NOrmandy 11872.

MORROW MBR-5 receiver for sale, with RVP-250 12VDC supply and nice homebuilt AC supply. All, in very good condition, $155. W7VMP/6, 3207 Alma St., Palo Alto, Calif.

FOR Sale: Elmac PMR-7 and AF-67. SX-100 receiver. Very good condx. Highest offer received 30 days after publication. Send no money. K2GVQ, J. F. Olsson, Floyd Road, MTD. Rt., Rome, N. Y.

WANTED: 90800 Millen Exciter with std, 10M coils. Bill Myers, 926 East North St., Kokomo, Ind.

WANTED: Radios BC348, ARN14, ARN30, ARC34 51 Series Gear 51J, 51R, etc. Large plate dissipation tubes 304TL, 4-1000, etc. Communication receivers, transmitters. Ted Dames, W2KUW, 308 Hickory, Arlington, N. J.

SELL: Viking II and VFO factory wired with grid block keying, RME speech clipper, $225. Deliver 50 miles, W1WTF.

BEAUTIFUL 500 watt PEP S.S.B. transmitter — Central Electronics factory wired 20-A with QT-1 and BC 458 VFO for 15-20-40-80 meters. 500 watt PEP AB-1 linear amplifier. Final tube is 4X250B, regulated screen supply, pi-network output, built in SWR. Amplifier contained with power supply in grey 33" par metal cabinet built commercially by Erco Radio Co., Garden City, L. I. All schematics and instruction manual, $450.00. E. S. Grainger, Box 186, Brightwaters, L. I., or phone evenings to Bay Shore 7-4452, W2NXZ.

PRICED for quick sale homebrew 700 watt xmitter in steel cabinet. $75. Will not ship, for further dope, call W2DCA, FL 3-9779. Hvy duty pwr supply alone worth more.

GOING SSB: Sell excellent Viking Ranger SEQ Keyer PTT, $175. Howard Robb, WØBHA, Bird Island, Minn.

FOR Sale: Complete transmitter, 540 watts input, enclosed in 6 inch Par Metal Rack. Final is Globe King 500B completely shielded and TVI suppressed. 300 watt class B modulator. Separate power supplies for modulator, final high and final low voltages. Harvey-Wells VFO and spearate speech ampifier with separate power supplies. Dollie furnished for movability. All lines filtered. Complete transmitter with diagrams and instructions, $550.00, or best offer. Want cash to pay new Viking Kilowatt transmitter. Free delivery up to 150 miles. Arthur Terrien, W1QKC, 15 Gardner St., Worcester 10, Mass.

COMMUNICATOR III 6 meters, xtals Shure carbon mike, $200. K. C. Glaser, 2502 Dwenger Ave., Fort Wayne, Ind.

SELL: Heath DX40, $60.00; VFI, $15.00; QFI, $8.00; FM3-A Tuner, $18.00. All 1958, excellent condx; Wilcox Gay 750 Recorder, $55.00; Navy receiver RBL-3, 15-600 kc, brand new, $22.00; Federal Power xformer 2000v. and 1500v.-c.t. 300 M.A., $10.00; Simpson Model 27 meter 0-100μ amp., $7.00. WØBPA, 1902 Indiana, Joplin, Mo.

FOR Sale or Trade: Leeds & Northrup Type S Wheatstone Bridge. Excellent condition. Make offer. J. R. Godward, 1624 Boulder (Box 937), Helena, Montana.

WANT: Viking Ranger; 4-400A; National MB-150. Sell: Shure carbon mike with coiled coard, model 102C, $14; power supply for Stancor STP-203A or Elmac, very well built, write for details. Shakespeare fiberglass top whip, Bassett helium filled 75 coil, chrome bottom rod, Master heavy bass mount, all like new, $20; National MB40sl, multiband grid circuit, $10; 2 250th, one new, $17; 3 new 100th, $14; Fairchild Hi-Fi cartridge with diamond stylus, exc., $17; PE-103 dynamotor, $20. Sam Thompson, 602 Pacific Terrace, Klamath Falls, Oregon.

WILL pay $450.00 cash for factory wired Johnson 500 in top condition. C. Herring, 1306 West 8th St., Plainview, Tex.

VIKING II with push-to-talk, Viking VFO, Low Pass Filter, Match Box, D104 with push-to-talk stand, HQ-140-X, Matching Speaker, RME DB-23 Preselector, $350. Will ship. John E. Bagwell, Pearson, Georgia.

WANTED: DB-23 Preselector. W5DA, 4425 Bordeaux, Dallas, Texas.

GONSET Commander and V.F.D. Latest model, 115 V.A.C. power supply, 160 — 6 meters, 6146 final, phone/cw., $100. Delivered within 100 miles of Boston. W1WXC, 24 Monument Street, Concord, Massachusetts. Tel. EM 9-3919.

ELMAC mobile station. PMR 6A, AF67, power supplies, Master Mobile all band antenna, relays and cables ready to operate push-to-talk. $225 or trade for fixed station receiver. Also Heath Q-multiplier, $7. David Dennis, 221 E. Beecher, Adrian, Michigan.

PAIR 6 meter Gonset III's. 1 Brand spanking in the box, other slightly used. $200 each. W. J. Futch, R.D. 3, Wyoming, Pa.

SELL: Johnson Viking Adventurer; completely assembled with crystals, $40.00. KN4ZVO, Mason Karon Edwards; 112 Cannon St., Greer, South Carolina.

NC300 with three UHF converters in cabinet; Viking Ranger. First check for $425 takes outfit. Victor Komow, 335 Spencer Place, Paramus, New Jersey.

FOR Sale: Pacemaker, latest model, mint condition, $335. Collins 32V3 (factory converted, 32V2). Built in N.B.F.M. Coax relay and low pass filter. Excellent cond., $350. Want Measurement's Corp. Sig. Gen. Model 82 or 65B or G.D.O. W2FUR, Sidney Gogel, 1096 Laux Pl., No. Bellmore, L. I., N. Y. Sunset 5-6876.

FOR sale or trade for RTTY printer. RDO receiver covers 38 to 1000 mc. Tuning units included. W5KQJ, Lilburn Smith, 3004 Second Pl., Lubbock, Texas.

SELLING out. VFO-813 xmitter with 1500V & 400V power supplies, $100.00. 40 watt modulator, $25.00. 25 watt modulator, $20.00. All in 1958 Handbook. Novice 30 watt xmitter using single 6146, $25.00. 125 watt modulator including speech amp. less HV supply, $40.00. John Henninger, 9001 Verree Rd., Philadelphia, Pa.

SX-101 Mark III almost new with matching speaker used only 10 hours and perfect, $310. W2SIK, Rye Colony, Apt. 224A, Rye, N. Y. RYE 7-5520.

SELL or trade for Johnson 6N2 plus Tecraft 6 or 2M Converter; Elmac A54H, Shure Dyn. Mobile Mike, Gonset Super-six & noise limiter, Master Mobile Ant. Model 666 Allband Coil, Flex-R spring, 60" stainless whip, 36" base section, Model 232XXSSC stainless base mount, plus 21' coax and power cable for Elmac. All in exc. shape with manuals. You pay shipping on above, $135.00. Also have photographic darkroom equipment for sale or trade: for Ham gear. 311 Federal Enlarger, plus case, GE automatic timer and ect. Pat Miller, K5DXQ/5, 809 Hazel Street, Kilgore, Texas.

WANTED: Harvey-Wells APS-90A/C Power Supply. W5UKD, 7327 Southway, Houston, Texas.

DB23 Preselector, $38.00 Bud FCC90A 100 kc marker, $15.00. Both like new, ship in original cartons. Electric instructograph with tapes, $22.00. Fine condition. All postpaid. W7HLH, Route 2, Billings, Montana.

SELL, New: Six 304TL, $9.00 each; four VT127A, $4.00 each, four 829B, $5.00 each, Modulation Transformer VM3 UTC, $15.00. Excellent VHF152A, $40.00; Instructograph, 10 tapes, $25.00; SW3 with coils, $25.00. W9DFW, 101 Fairview, Jeffersonville, Indiana.

HEATH DX-35 and VFO for sale. Excellent condition, $65. E. Sharpe, K1CWQ, 260 Soundview Ave., Shelton, Conn.

SELL Old Dictaphones. AR-3 receiver, $25; Q-Multiplier, $7; 100 watt phone transmitter, all-band with VFO, $95. Write Alec Jones, 609 North 22 Street, Fort Smith, Arkansas.

ATTENTION: Don't miss the opportunity of a lifetime. As result of job relocation and moving, must sell beautiful RCA type Commercial Broadcast 1 KW transmitter, operates all bands. Will sacrifice for $750 plus shipping or will consider even trade for 32V3, Viking 500 or what have you. Need something more portable. Write for picture and details. Also have Dumont oscilloscope 208-B, $50. Ferris signal generator, $125. PE103 new, $18. W3FSW, 1042 Pine Heights Ave., Baltimore 29, Md.

SELL SX-99 used few hours. Bug didn't bite son. $100 F.o.b. Amos Bateman, 524 Circle Drive, Havertown, Pa.

FOR Sale: Globe Chief, 50 watt Modulator, W.R.L. VFO, SX-24. Sell separately or all for $145. Wanted: 3 filament xfmrs for S66A's, 400 mmf 8kv Variable, 300-300 mmf 2kv Dual variable. K4ODC, Linda Lane, Madison, Tenn.

DX-35, For sale, good condx. First $40, F.o.b. Indianapolis; Ricky Hibbs, K9KSP; 7411 North Pennsylvania St.; Indianapolis 20, Indiana.

CANADIAN: Complete ham station Hallicrafter Transmitter model HT-9, 150 watts; Receiver S-19R, perfect condition. Price for quick sale. VE2OQ, P.O. Box 355, Riviere du Loup, Quebec.

PACEMAKER — $395. Absolutely perfect, used only 12 hours. Save $100 on this one in original carton. Going high-power A.M. Harold Greene, West Hanover, Mass.

FOR Sale: Globe King 500, excellent condition, $425.00; NC300, like new, $295.00; WRL VFO Model 755, $45.00; Viking 6N2, $125.00; Viking 2 meter VFO, $35.00; 807 Modulator, beautiful job real bargain at $50.00; Five power supplies to power above 2 meter rig, $30.00; National 2 meter converter, $27.00; Telrex 6 meter beam 4 elements, $14.00; will deliver to 70 miles. Reason for sale — XYL needs washing machine and dryer, and I am going S.S.B. Les Babcock, W2EGM, 22 Melrose Drive, Toms River, New Jersey.

FOR Sale: HQ-110 & spkr, $200; HC-10, $110; 20A & QT-1, $175; LA-1, $70. M. J. Stansell, P.O. Box 8347, Gunter AFB, Alabama.

SALE: Globe Scout 65A, Heath VFO, Dow-Key keying and antenna relays, new tubes and parts, $90, send for list of other extras; SX-28, excellent condition, factory realigned, new S-meter, paint and decals, 12" speaker, $145; Plate transformer 4200V 400Ma, $75; 0-500 milliammeter, $5; new 1629 electron-ray tubes, 90¢; Cleaning shack; need money for college. Write for list of parts and tubes Make package offer. Will ship. W3CNQ, 14 Northview Drive, Glenside, Penna.

FOR Sale: Heavy Duty RCA Plate Power Transformer Primary 115 volts, tapped, Secondary 1500 or 2000 volts each side, 1½ KVA Output, also 12 oil condensers 2Mfd at 5000 volts and UTC S71 Filament Transformer suitable for bridge or center tap use, all items, $145.00. W9UE, Ben Woodruff, 6140 N. Harding Ave., Chicago 45.

300 WATT transmitter PP813 with 811A Mod. in 42 inch cabinet de-TVI Hunter Cyclemaster VFO-driver and Antenna relay, $250; 75 watt two-meter transmitter, 3I29 final, 815 Mod. AM-CW with spare tubes and coax relay, $90; 80 watt six-meter transmitter, 6146 final, CW only, rack mounting, $35; Thordarson Plate transformer 2500-ct-2500 at 400 Ma ICAS, $25; PE-103 Dyna-motor and base, $20; BC-684 35 watt mobile rig, converted to AM with complete set of crystals and DM-35, $35; Millen S.W.R. Bridge Model 90671, $10; Hi-Lite 10 meter 3 element wide spaced beam, $15. Jim Ellis, W4MBR, 1825 42nd Ave, Vero Beach, Florida.

SELL: Tecraft 220me. Converter and Telrex 5 elements, $35; LW-61 2 meter Converter, $14; 20 watt 2 meter xmtr with modulator, $28; 80-10 mtr 100 watt xmtr, $65; Heath VFO, $14. Want — 6 mtr Communicator or 2 mtr Gonset linear amplifier. Light, K2OOY, 640 Riverside Drive, New York City.

BARGAIN: Heathkit QF-1, condition — tops, $5.50. David Cleaver, W1NQZ, Westerly Drive, Mount Carmel, Connecticut.

WANTED: Technicians to service marine radio-radar. Immediate openings radiotelephone specialists. Manasquan, N. J.

SELL: Viking Navigator F/W very good condition, $135.00. F.o.b. W9LOC, 1503 South Anderson, Urbana, Illinois.

DX-20 For sale. Like new. $32 or highest offer. Jerry Schoepflin, W7HVR, Milo, Oregon.

WANTED: Ranger late model, reasonable. W1DYV, Center St., Raynham, Mass.

SALE: Tecraft six-meter converter, $31.25; VHF152, $28.25; B&W BVL coils, $11.25; B&W 350, $4.00. W3IHF.

SELL: NC 300 w/matching spkr, spotless. $275; Vibroplex, Blue Racer Deluxe Model — never used, $17. W9NLL, 552 Powell, Waukegan, Illinois.

COLLINS: 75A3, $375: 20A QT1, $175, 20 meter Beam with Rotator for sale. W2KKF, 37 Lee Avenue, Scarsdale, N. Y. 8c 3-1046.

VIKING I, Johnson TVI — suppressed, $130; HQ 129-X with speaker, $125; Johnson VFO, $30; 20AI full size Telrex beam, $35. All equipment in excellent condition. K2YEJ, 889 Grand Terrace, Baldwin, L. I., N. Y., Tel. Ba 3-9162.

SELL: A-54 portable xmtr w/500v power supply, best offer over $85. AT-1, $16, QF-1, $5; Space Spanner, $7. All have manuals! Also 6v car radio (4 x 9 x 7) excellent tone, $20. David Austin, Box 947, New Canaan, Conn.

WANTED: Coil set "A" for HRO-50T. W7MMC, 575 Superior Sq., Salem, Oregon.

SELL HT-30, $300. HQ-129-X with speaker and crystal calibrator, $125. HC-10, $120. BC-221 with AC supply and calibration book, $50. Gonset 10 meter converter, $10. Phone Temple 8-0958. Titcomb, Nathan Hale Rd., South Norwalk, Conn.

EXCELLENT Viking Ranger, $179, also Eico 232 VTVM, $16.50. Chas. Kunde, 5770 Gary Ave., Roselle, Ill.

SELL Matchstick antenna, excellent condition, $10; NC-125 receiver, like new, $115; W2AEV, R. Jones, 111 Hillside Road, Farmingdale, New York.

FOR Sale: Globe Scout 65A, perfect condition, factory wired, $65.00 Kent Bowron, 210 Roosevelt Ave., York, Pa.

SELL: Stancor 110C xmitter — 100 watts CW, 90 watts fone plate modulated — now in use — only $47 F.o.b., W2PHA, 64 Morrow Ave., Lockport, N. Y.

TUBES: 829B, $10.00; 4X150A, $25.00; 4X500A, $75.00, used 200 hrs. I have two of each. R. N. LaPlante, 827 Gross Court, Green Bay, Wis.

EARLY issues *QST* with complete indexes, buckram bindings, new condition. R. H. Winchester, ex-8BNY, 196 Rosemont Ave., Trenton, N. J.

SELL: B&W 5100 and 51SB, excellent condition, $425, F.o.b. W9OWG, Dr. R. G. Bunge, 829 Kirkwood, Iowa City, Iowa.

SALE: Excellent new DX-20 and untuned all-band trap. Both $45 or best offer. Will sell separately. Write Richard Newport, R.R. 5, Shelbyville, Ky.

FOR sale: Hallicrafters SX99 used about ten hours. New condition, $100. W8WQC, 6739 Robinson, Allen Park, Michigan.

WANTED: 2M or 6M converter. K6SBE, 934 W. Harvard Pl., Ontario, Calif.

DX-100: Carefully wired. Modified for SB-10 if desired. First $175. K4GYO, 702 Jackson, Williamsburg, Va.

KWM-1 serial #775, all modifications, like new with custom exact duplicate supply, complete, $1200, or sell just top with accessories. W2EDF, Geo. Orgera, 8 Bayview Avenue, Islip, N. Y.

BARGAINS — New Guarantee: SX-88, $449.00 Rotobrake, $49.50; Lecce-Neville 6 volt, $35.00; Gonset 30-40 mc FM tuner, $39.50; P400GG linear, $159.00; BC610 with tuner, $425.00; Gonset 500W linear, $199.50; Elenco 77 S.S.B. $475.00; Elenco PA400 linear, $99.00; KWM-1, $650.00; BC-221, $49.50; James C1450, $49.50; DX-35, $55.00; Scout 680, $84.50; LA-1 linear $89.95; NC183D, $319.00; NC300, $299.00; Globe Chief 90, $44 50; Globe Champ 300A, $399.00; King 500, $425.00; HT33 linear new Demo, $595.00; HT-30 S.S.B., $339.00; HT-31 linear, $289.00; test and audio equipment, inquire. Trial, Terms. Write Leo, W9GFQ, Box 811, World Radio Laboratories, Co. Bluffs, Iowa.

WANTED: 4-1000A tube, socket, chimney, transformer. J. E. Shutt, W4JBN, Sturgis, Ky.

75A2 and speaker. Good condition, $285. Thomas Crow, W6HGW, 901 Robertson Way, Sacramento 18, California.

WANTED: NC 183 in mint condition; K4QIK.

WANTED: Cash — 4x150a-4x250B tubes. Write K4BAB, Marion Ward, Horse Cave, Ky.

DRAKE — 1A Receiver for sale: Brand new. Late Serial No. with xtal calibrator and newest features. Very hot, selective, stable on all bands. Perfect in appearance and performance. Factory shipping carton and warranty, $257.50. C. Brooner, P.O. Box 261, Morton, Illinois.

HAVE a surplus of excellent gear at bargain prices. Send for list. Box 575, New York 8, N. Y.

KWM owners: Use that fine receiver on 75 and 40. One dollar brings technical data. Metro-Verter Products, Box 575, Church Street Station, New York, N. Y.

SELL or trade Leica Camera III F body toward 75A4, absolutely perfect, $95. D. Bassett, 4140 Renwood Dr., Dayton 29, Ohio.

SELL: DX35, good condx, has WAS, WAC and others. Also seldom used Heath VX 1. Best offers. K5JEH, Box 457, West Columbia, Tex.

CLEANING house, all items are in good condition: HRO5TA1, $100.00; HRO7, $125.00; BC779 Super Pro with power supply, $75.00; Gonset Commander, $75.00; Gonset VFO, $15.00; Gonset 10 meter converter, $15.00; Gonset 3-30 converter, $25.00; Gonset super six, $30.00; Components for 3,000 volt DC 500MA Power supply, $50.00; RA62 Rectifier, $35.00; pair URC-4 (will easily work on two meters), $50.00 for both; BC221, $50.00; T47A/ART13, $75.00. Wanted Gonset G66B and plate transformer that will deliver approximately 5,000v DC. M. D. Haines, W5QCB, 1316 S. W. Military Drive, San Antonio 21, Texas.

FOR Sale: 275 watt CW-AM transmitter. Bandswitching, VFO, 813 final, $175. No TVI. Cannot be shipped. U.P. and northern Wisconsin inquiries invited. W8HMX, Don Baker, 613 Copper, Houghton, Michigan.

ESTATE Settlement: SX100, $199.50; BC610E complete, including BC939A antenna tuner, $300 or make offer; VHF152A, $25.00; Meissner VFO, $20.00. W7NSO, R.F.D. #1, Ridgefield, Wn. All queries answered.

WANTED: Navy RAO receiver. Must be top condition and appearance. J. Peiffer, R.F.D. Southampton Cove, Southampton, N. Y.

200 NEW Boxed Receiving Tubes, Two T40, One T20. Rider Service Manuals XX and XXI. NRI Manuals Vol. One and Two. Want ham equip. Inquiries answered. Dick Hahn, Willows, Calif.

FOR sale: Hallicrafters 3 way Portable. 200 k.c. to 18 m.c. 5 Band. Like new condition. Mellin, K2TLG, Phone P.O. 7-4077.

FOR Sale: Morrow SBR Converter, $28.00; BC454, $5.00; BC457, $4.00; SCR522 Trans, $8.50; BC Band ARC5 Rec, $12.50; Shure Mike 510C on Stand, $8.00; Rotary Inductance and turns counter dial, $9.50. Al Rae, 5 Oakbrook Road, Ossining, N. Y.

TOROIDS: Unceased 88 mhy like new. Dollar each, Five, $4.00 P.P. DaPaul, 101 Starview, San Francisco.

JOHNSON 500: Beautiful condx; write for detail, or can sked any band. Bob, K2GXI, 48 Thatcher, Buffalo 15.

CLEANING House! HRO50T1, Coils & spkr, $225; Telrad T18, loads of parts, tubes, capacitors, resistors, etc. List available. Send stamp. M. Marshall, 455 Washington Ave., Dumont, N. J.

NC240CS w/s, $135; RME70, $69; RME84, $65; HQ129X w/s $165; SX71, $159. All excellent. Electronic Labs, 2444 "D," Lincoln, Nebr.

CLEANING House: SX-28 W/speaker mint condition; HQ-129X W/speaker like new; 2 meter gear — Tecraft Converter 14 mcs. output; Sonar MB26 Transmitter with Power Supply; W2CNN, F. Chiofaro, 19 Terrace Drive, Great Neck, L. I., N. Y. Pioneer 7-8484.

SELL Hammarlund HQ100 like new, $139. W5DA, 4425 Bordeaux, Dallas 5, Texas.

WANT: SX-88. PRO-310 or ?? Poor student, EAL, 8007 Cooke Rd., Elkins Park, Penna.

KWM-1, AC and DC power supplies, car mounting with cables, 15 and 20 meter Hellwhips with mount, $1200. Also DX-100, $175. Jack Karp, R.F.D. #1, Millville, N. J.

SELL: HQ-100C with speaker & Manual, excellent condx, $130. Charles Lachterman, 3 Archer Lane, Scarsdale, N. Y.

BEST offer over $60.00 takes National HFS receiver. Tunes 27 to 250 Mc. W2WV, 12 Midland Drive, Morristown, N. J.

RG8U Coax: Special — 100' $8.95. Write for list of bargains. Amateur Electronic Supply, 3832 West Lisbon Avenue, Milwaukee 8, Wisconsin. West 3-3262.

FOR Sale: WRL three element tri-bander (10–15–20). Carton has never been opened. I need the money for college. K2JSS, Kenneth E. Warner, 110–49–68th Drive, Forest Hills 75, N. Y.

TUBES: Brand new 4D32's, $22.50; 5894, $10.00; 5933/807w, $1.00; 5654/6AK5, $1.00; V-70D, $9.50; 802, $6.00; 805, $4.75; 810, $9.00; 811, $2.50; 812, $5.00; 813, $8.50; 814, $3.00; 815, $3.50; 829B, $6.50; 832A, $4.75; 866A, $2.00; 872A, $1.50; 4-65A, $13.50; 4-250A, $37.50; 4-400A, $39.00; 4-1000A, $65.00; 4X150A, $13.50; 4X150G, $35.00; 4X250B, $39.50; 75TL, $12.00; 304TL, $16.00; 304TH, $20.00; 6146, $4.00; 6159, $4.00; VT-127A. Elmac. K.w. with a pair on VHF., $4.50. All guaranteed. Bill Slep, Box 178, Ellenton, Florida.

RUBBER Stamps: Why wait for cards? QSL with rubber stamps — sample impressions, immediate delivery KAY, K2UKQ, Blanchet Rubber Stamp Co., 21 Lincoln Ave., Orange, N. J

NC-300, never used, $290; SX-99, with Heath Q-multiplier, $100; Transcon 6-meter mobile transmitter-converter, transmitter xtal and VFO, converter xtal, $60; BC-221 reg. power supply and original calibration book, $55; PE103 with cables, $25; Collins TCS5 transmitter, covering 160, 80, 40 meters, VFO and modulator, $35; RCA aircraft receiver, 12 volt vibrator power supply, covers 200–400, 500–1300, 2300–6500 Kc, $20, all equipment in A-1 condx. F.o.b. Harrisburg, Pa., K3BJR, 607 Blue Ribbon Avenue.

ALUMINUM for every Ham need. Write to Dick's, Cherry Avenue, Route 1, Tiffin, Ohio for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

BARGAINS! If you are looking for any ham gear, new or used, write for our big free list. There's nothing like it — absolutely nothing. Fabulous trades. Time payments. "Doc" W9BHV, 355 North Columbia Street, Frankfort, Indiana.

TRADE in your camera, gun toward new ham gear. Collins, HT-32A, NC-303, HQ-110, etc. Write for offer. Mount View Distributors, Franklin, Mass.

CRYSTALS Airmailed. New crystals. Novice, Net, Converter, CAP, MARS, General. FT-243. Custom finished to .01%. Any kilocycle, 3500 to 8700 — 99¢. Small hermetic holders .050" or .093" pins $1.95. 1700 to 3499 and 8701 to 21,400 kilocycles FT-243 $1.95, hermetic $2.50. Sockets FT-243 or .050" hermetic, 15¢. Airmailing 9¢ per crystal. Californians add 4%. All SSB crystals including KWM-1 conversion available. Write for information. Crystals since 1933. C-W Crystals, Box 20650, El Monte, Calif.

Sale: Following equipment, cash only, FOB Phoenix. Make offer on any or all. Excellent condition, manuals: 75A-4 with reducing knob, speaker, 3.1 and 0.8 filters. KWS-1 with antenna relay, spare 4CX250. Two-KWM-1, spare 61468, never used mobile. 312B-2 KWM speaker console and wattmeter. HRO60T with matching speaker, calibrator, coils ABCD, AD (6-meter bandspread). NC300 speaker. Gonset 6-meter communicator and linear. Morrow Conelrad Monitor. Lafayette (Lester) 6-meter converter, 7-mc. I.f. DX adapter for KWM-1, new. Sylvania 219 Tube tester. B&W CX49A condenser. Electro-Voice Ionovac Speaker. All cash inquiries answered. Inspection by appointment. W7KVU, John D. Ryan, 8040 Mohave Road, Scottsdale, Arizona. Telephone Whitney 5-7195.

HQ-129X, spkr. $129. NC-300, $269. SP-400 .5-40MC $175. SP600 $495. NC-183D $279. SX-101 Mk3, $295. R-9 $85. 51J-3 $575. New parts for 4-250As in KW final $99. 310C $89. T47A/ART-13 $75. LM $55. Boehme Keyer $95. Teletype printers, perforators, tape transmitters. 12000 ohm relays, $2. All types transmitters, receivers, test equipment purchased or taken in trade for NEW Johnson, Hallicrafters, Hammarlund, National, Moseley, Fisher Hi-Fi etc. Write Tom. W1AFN. Alltronics-Howard Co. Box 19, Boston 1, Mass. Richmond 2-0048. Store: 60 Spring, Newport, R. I., Fred, W1JFF.

FOR sale: Collins 75A3, perfect condition, $395.00; Peerless 650 watt multimatch modulation transformer, $49.00 pair; never used Elmac 4–250-A's, $24.50 each. W6VZB

SELL — GPR-90 and DX-100, excellent condition. Best offer. A. Dole, 30 Omaha Drive, Cranford, N. J. BR6-2302.

HEATH DX40 $60.00; VFO $19.00; Excellent condition. W2ULS, Rockleigh Rd., Rockleigh, N. J. P. O. RD1, Westwood, N. J. CL5–1134.

LINEAR 300 Watts CW; 430 Watts PEP SSB; 100 Watts AM. This is the famous Vantron "300". Minimum tuning adjustment. Driving power only 15 watts maximum. Matches 50–100 ohms antennas. Size 8" x 8" x 10". Weight — 18 lbs. Fully guaranteed like new. First $69 cash — K2YFQ — Gil Vazquez, 522 West 136 Street, New York 31, NY-Fone TO 2-6979.

SALE: Ranger factory wired $145. With matchbox $170. W3HKS, 609 Birmingham Ave., Woodcrest, Wilmington, Del.

SELL Viking Mobile Transmitter, excellent condition with instruction book, $65 F.O.B. Also sell for Elmac 304TLS, never used, and guaranteed. W3PBO, 1400 Owens Rd., S.E., Washington, D. C.

SELL: Pair unused 4-400A's. $20. C.O.D. ok. K4GTZ, 1601 E. Unaka, Johnson City, Tenn.

TWENTY-two years of *QST*, 1936 through 1957, plus eight earlier issues. Nov & Dec. 1945 missing. Best offer F.o.b. W2KWW, Burns, Grand St., New Milford, N. H.

COLLINS KWM-1 latest with 110V DC, mobile supply, and mounting, $950 or best offer. R. Charbeneau, Franklin, Michigan.

WANTED: Heathkit OL-1 oscilloscope. W9DDL, 5006 N. Second St., Loves Park, Ill.

SELL: B&W 51SB with conversion kit for Viking I or II and Collins 32V series, in perf. condx. Best offer over $150, W1ALW, 33 Jones Court, Norwich, Conn.

COLLINS KW1 for sale. In exc. condx, $2295. R. Gumm, 770 7th, West Bend, Wis.

HALLICRAFTERS SX-100 with R-46B spkr. $225. Harvey-Wells TBS-50B with power supply, $65; code keyer TG-34A with 15 tapes, $35. KOJJZ, Darrel Wilt, 2300 Seabrook, Topeka, Kansas.

FOR Sale: 20A, Deluxe VFO and QT-1, $215. W9RHE, 6920 N. Medford, Chicago 46, Ill. Tel. RO 3-2360.

PLATE Transformers, primary 115 or 230 60 cycle. Secondary 840V CT at 500 mills, new, $6.00 each; F.o.b. Detroit; 1N69 crystal diodes, 3 for $1.00 postpaid. New HS 62/U phones with boom mike, 600 ohms $4.95. Lee Industrial Surplus, 28180 Van Born, Inkster, Mich.

SELL: HT-32, HT-33, nearly new. Have been tested only. SX-101, Mark III new, in sealed carton. All three: $1300.00. Andy Blumenstock, 9600 Jamaica Dr., Miami 57, Fla.

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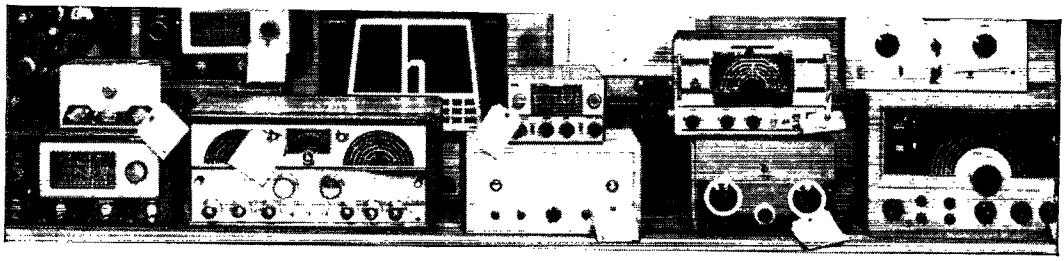

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Johnson

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6N2 Transmitter	89.95
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EASY TERMS AVAILABLE—ONLY 10% DOWN!

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Mail, phone or wire your order to Jim Sommerville, W9WHF, Allied Ham Shack

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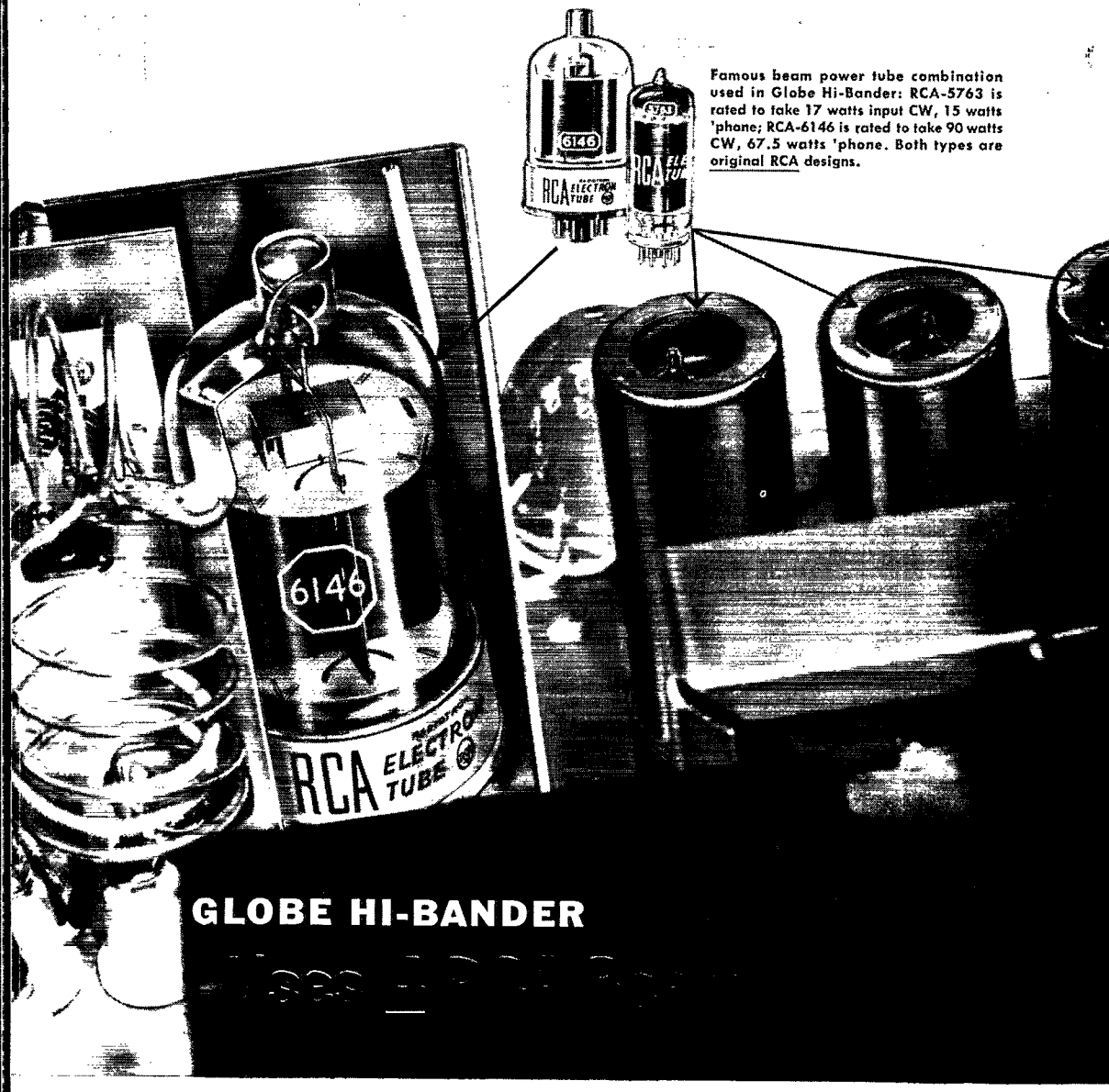

Famous beam power tube combination used in Globe Hi-Bander: RCA-5763 is rated to take 17 watts input CW, 15 watts 'phone; RCA-6146 is rated to take 90 watts CW, 67.5 watts 'phone. Both types are original RCA designs.

Capable of delivering a "healthy" signal on "6" or "2", both in fixed and mobile operation, Globe's Hi-Bander goes RCA "all the way"—with three RCA-5763's in the low-power stages and an RCA-6146 in the final.

Why do RCA Beam Power Tubes continue to be the number one choice of so many commercial transmitter designers? Beam power design—an RCA development—makes it practical to use fewer stages, tubes, and components. And high-perveance design—an outstanding characteristic of RCA beam power tubes—enables you to get desired power with a lot less plate voltage.

Time-tested in commercial and amateur stations for more than a quarter century, RCA transmitting tubes have earned a reputation for reliability—*by proved performance*. Available at all RCA Industrial Tube Distributors. For a tube bulletin on RCA-6146 or -5673 write RCA Commercial Engineering, Sec. C-37-M, Harrison, N. J.

RADIO CORPORATION OF AMERICA
Electron Tube Division **Harrison, N.J.**

For the name of your nearest RCA Industrial Tube Distributor, call Western Union by 'phone number and ask for me, Operator 25.