

September 1958

50 Cents

55c in Canada

QST

devoted entirely to

amateur

radio



PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

THE STANDARD OF COMPARISON FOR OVER 20 YEARS

HIGH FIDELITY TRANSFORMERS

FROM STOCK... ITEMS BELOW AND 650 OTHERS IN OUR CATALOGUE B.



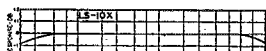
TYPICAL UNITS

LINEAR STANDARD series

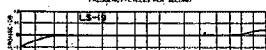
Linear Standard units represent the acme from the standpoint of uniform frequency response, low wave form distortion, thorough shielding and dependability. LS units have a guaranteed response within 1db. from 20 to 20,000 cycles.

Hum balanced coil structures and multiple alloy shieldings, where required, provide extremely low inductive pickup.

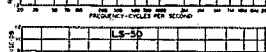
These are the finest high fidelity transformers in the world. 85 stock types from milliwatts to kilowatts.



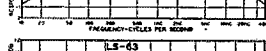
LS-10X Shielded Input
Multiple line (50, 200, 250, 500/600, etc.) to 50,000 ohms... multiple shielded.



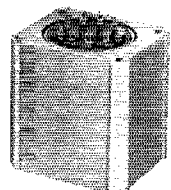
LS-19 Plate to Two Grids
Primary 15,000 ohms.
Secondary 95,000 ohms C.T.



LS-50 Plate to Line
15,000 ohms to multiple line... +15 db. level.



LS-63 P.P. Plates to Voice Coil
Primary 10,000 C.T. and 6,000 C.T. suited to Williamson, M.F. ul-linear circuits.
Secondary 1.2, 2.5, 5, 7.5, 10, 15, 20, 30 ohms. 20 watts.



CASE LS-1 LS-2 LS-3
Length 3 1/4" 4-7/16" 5-13/16"
Width... 2 9/16" 3 1/2" 5"
Height... 3 1/4" 4-3/16" 4-11/16"
Unit Wt. 3 lbs. 7.5 lbs. 15 lbs.

HIPERMALLOY series

This series provides virtually all the characteristics of the Linear Standard group in a more compact and lighter structure. The frequency response is within 1 db. from 30 to 20,000 cycles.

Hipermalloy nickel iron cores and hum balanced core structures provide minimum distortion and low hum pickup. Input transformers, maximum level +10db. Circular terminal layout and top and bottom mounting.



HA-100X Shielded Input
Multiple line to 80,000 ohm grid... tri-alloy shielding for low hum pickup.



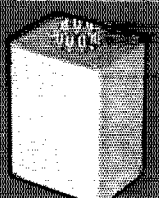
HA-106 Plate to Two Grids
15,000 ohms to 135,000 ohms in two sections... +12 db. level.



HA-113 Plate to Line
15,000 ohms to multiple line... +12 db. level... 0 DC in primary.



HA-133 Plate (DC) to Line
15,000 ohms to multiple line... +15 db. level... 8 Ma. DC in primary.



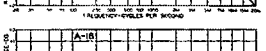
CASE HA-100X HA-106 HA-113 HA-133
Length 3 1/4" 4-7/16" 5-13/16"
Width... 2 9/16" 3 1/2" 5"
Height... 3 1/4" 4-3/16" 4-11/16"
Unit Wt. 3 lbs. 7.5 lbs. 15 lbs.

ULTRA COMPACT series

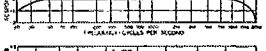
UTC Ultra Compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. The frequency response is within 2 db. from 30 to 20,000 cycles. Hum balanced coil structure plus high conductivity die cast case provides good inductive shielding. Maximum operating level is +7db. Top and bottom mounting as well as circular terminal layout are used in this series as well as the ones described above.



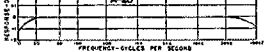
A-10 Line to Grid
Multiple line to 50,000 ohm grid.



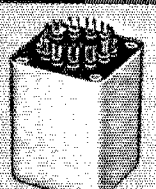
A-18 Plate to Two Grids
15,000 ohms to 80,000 ohms, primary and secondary both split.



A-20 Mixing Transformer
Multiple line to multiple line for mixing mikes, lines, etc.



A-26 P.P. Plates to Line
30,000 ohms plate to plate, to multiple line.



A CASE
Length 1 1/2"
Width 1 1/2"
Height 2"
Unit Weight 1/2 lb.

DUNGER series

UTC Dunger units are ideal for portable concealed service and similar applications. These units are extremely compact, fully impregnated and sealed in a drawn housing. Most items provide frequency response within 1 db. from 30 to 20,000 cycles. Maximum operating level 0 db. These units are also available in our stock P series which provide plug-in base. The D-16 is a new line to grid transformer using two heavy voice hipermalloy shields for high hum shielding.



D-1 Line to Grid
Primary 50, 200/250, 500/600 ohms to 50,000 ohm grid.



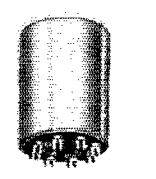
D-6 Plate to Two Grids
15,000 ohms to 95,000 ohms C.T.



D-9 Plate (DC) to Line
Primary 15,000 ohms, Secondary 50, 200/250, 500/600.



D-14 50:1 Line to Grid
Primary 200 ohms, Secondary .5 megohm for mike or line to grid.



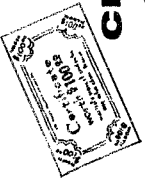
DUNGER CASE
Diameter 3/8"
Height 1-3/16"
Unit Weight 1 oz.

UNITED TRANSFORMER CORP.

150 VARICK STREET, NEW YORK 13, N. Y.
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October is hallicrafters' SSB and VHF contest month!

5 GRAND PRIZES
plus
more than
90
CERTIFICATES
each worth
\$100.00



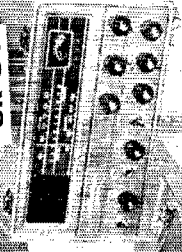
WATCH FOR DETAILS NEXT MONTH

You may win!

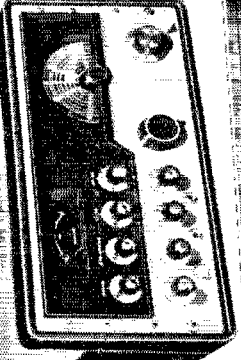
**1st PRIZE
FPM-200**



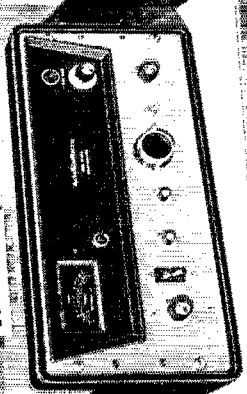
**4th PRIZE
SR-34**



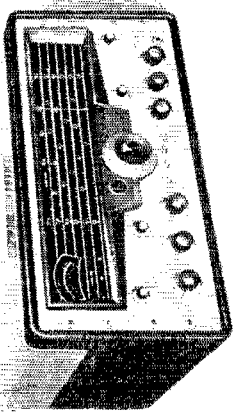
**3rd PRIZE
HT-32**



**2nd PRIZE
HT-33A**

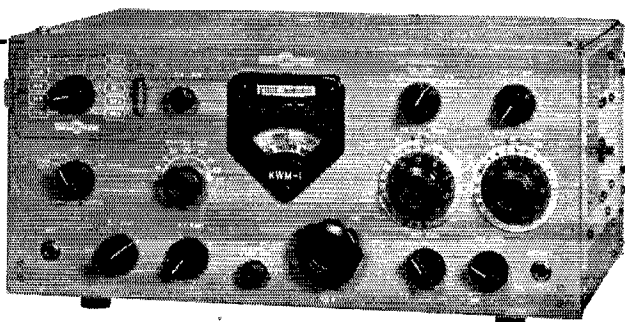


**5th PRIZE
SX-101**



Hallicrafters
DISTRIBUTION

Collins KWM-1



mobile/fixed SSB transceiver for

MAXIMUM VERSATILITY

Power

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

Mobile

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

Fixed Operation

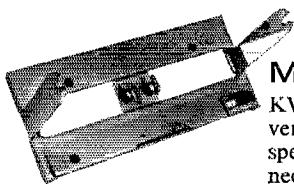
Takes very little space — includes receiver and transmitter — costs less than two separate, comparable units.

Novice

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

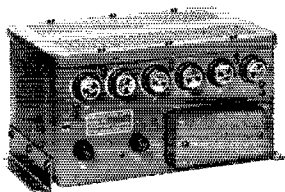
Operational Features

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



Mobile Mount

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



DC Power Supply

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

AC Power Supply

Very compact unit supplies all voltages for KWM-1.

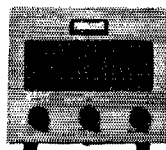
DX Conversion Adapter

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



Extra Crystal Boxes

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



Speaker Console

Contains a 5x7 inch speaker and directional wattmeter to give the fixed station that finished touch.

Collins

CREATIVE LEADER IN COMMUNICATION



QST

SEPTEMBER 1958

VOLUME XLII • NUMBER 9

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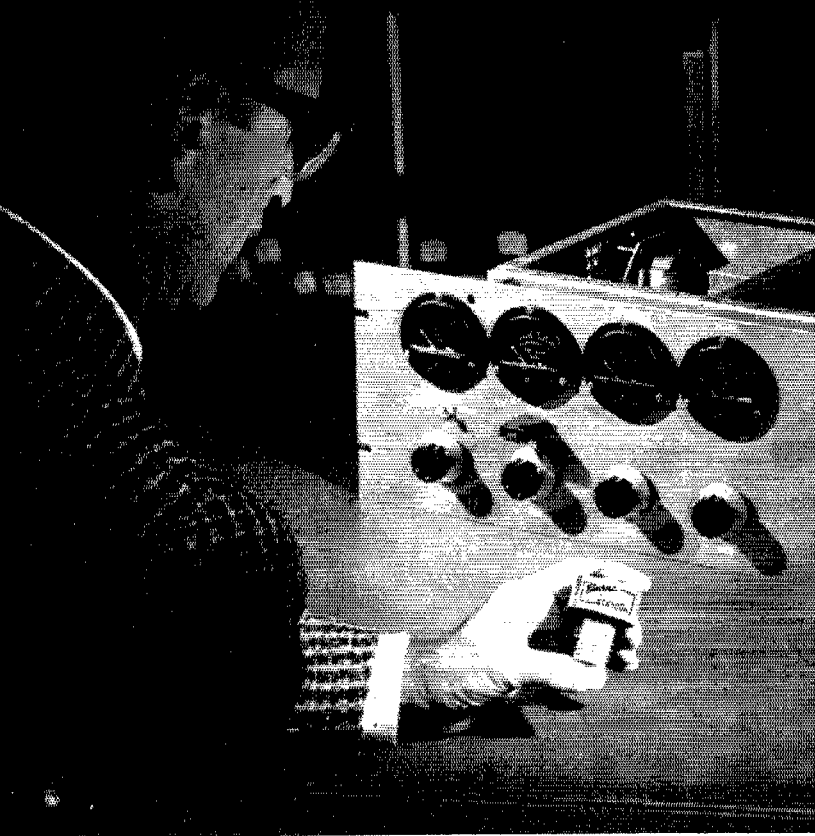
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Compact, Powerful 6-Meter Rig Uses Eimac Ceramic 4CX300A

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

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

In an unconventional approach to 6-meter operation, W6KEV uses a 6.25-megacycle crystal in a 6AG7 harmonic oscillator quadrupling to 25 megacycles. A simple 6Y6 doubler-driver provides more than adequate drive for the 4CX300A final amplifier.

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

EITEL-McCULLOUGH, INC.
SAN CARLOS, CALIFORNIA

Eimac First with ceramic tubes that can take it

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

ACTUAL

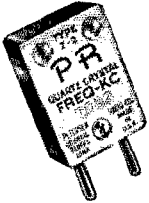


4CX300A Typical Operation to 175 Mc.

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

There's a PR for every Service!

AMATEUR



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

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

20 Meters, PR Type Z-3

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



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



Third overtone; multiplies into either 2-meter or 6-meter band; hermetically sealed; calibrated 24 to 27 mc., ± 3 kc.; .050" pins.

\$4.95 Net

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

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

\$6.95 Net



SPECIAL TYPES

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

Type Z-1, AIRCRAFT

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

Type Z-1, MARS and CAP

Official assigned transmitter frequencies in the range. Calibrated to .005%. 1600 to 10000 Kc. \$3.45 Net

Type Z-6A FREQUENCY STANDARD

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

100 Kc. \$6.95 Net



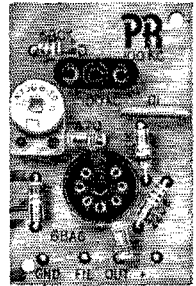
PR PRINTED OSCILLATOR KIT

Has many uses—

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

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

Each \$4.50 Net



Type 2XP

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

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

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

VHF Type Z-9R, Aircraft



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

Each \$4.95 Net

Type Z-9A RADIO CONTROLLED OBJECTS
27.255 Mc., .04% . . . \$3.95 Net



Type Z-1 TV Marker Crystals

Channels 2 through

13 \$6.45 Net

3100 Kc. . \$2.95 Net

4100 Kc. . \$2.95 Net

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

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

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

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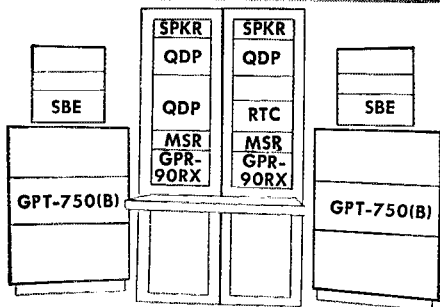
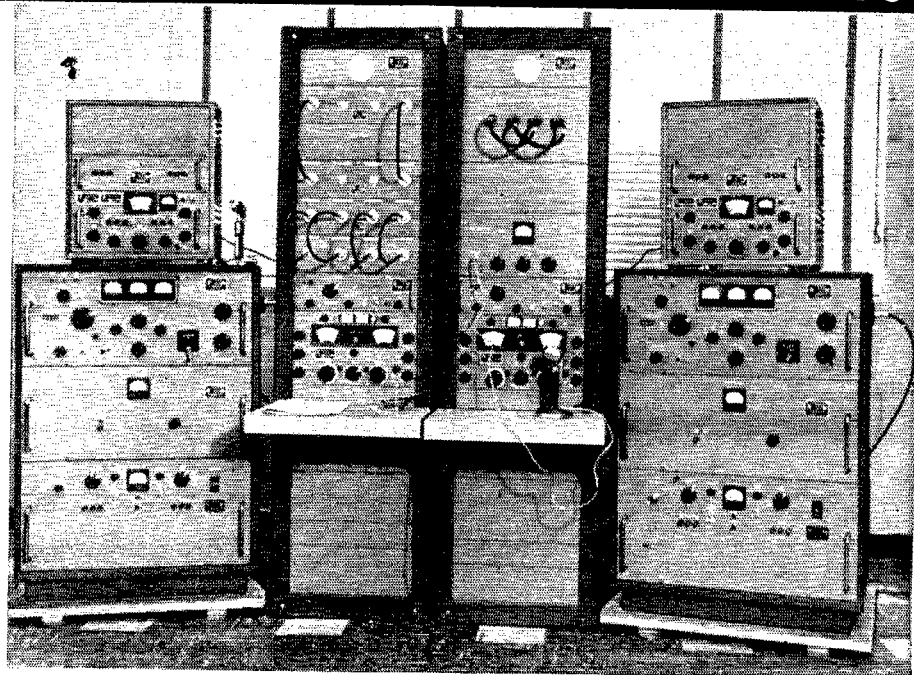
Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radioclub reports are also desired by SCMs for inclusion in *QST*. ARRL Field Organization station appointments are available in the areas shown to qualified League members. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. *All amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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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.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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"It Seems to Us..."

Superpower

On February 22, 1958, the first week end of the c.w. section of the ARRL International DX Competition, a series of unannounced inspections of amateur stations was conducted by engineers of the Field Engineering & Monitoring Bureau of the Federal Communications Commission. As a result, FCC has now ordered the suspension, for six months, of the licenses of two amateurs in the Los Angeles area for running inputs in excess of the one-kilowatt legal limit. Two other W6s were similarly apprehended and identically charged, but have appealed their suspensions and asked for hearings.

To us, the action of the Commission was in the nature of a welcome bombshell. It was a surprise, because FCC had indicated to us in previous discussions the magnitude of the task of gathering evidence sufficiently air-tight to stand up in a hearing, should it come to that (the difficulties have obviously been largely solved). It was welcome because in the case of power input amateur radio has — unfortunately — recently shown an inability to regulate itself as adequately as it does in most other aspects of rules observance. Most, if not all, of the FCC supervisory and staff personnel who initiated and conducted the station inspections are hams in private life, and so are personally interested in the welfare of amateur radio.

The amateurs now under discipline are well-known DXers. Two were members of the DX Century Club (the past tense is intentional; they are no longer). All are members of ARRL, and one even an Official Observer! But with no attempt to diminish the seriousness of their cases, let us in all fairness admit that much of the fault in this matter is ours — amateur radio's. We amateurs have too often made facetious remarks about the "California kilowatts," too often contributed only a knowing wink when the subject of superpower arose in club meetings. We have had the chance, undoubtedly many times, to stop looking the other way and to realize that the "friend" across town or in our club who goes in for this sort of thing merits only our contempt for his demonstrated inability to compete on even terms with his fellows and that, allowed to continue, it might even constitute a threat to the existing privileges of all of us. *QST* has editorialized on this subject in the past. Unfortunately, it didn't take, and there was continued weakening of moral fiber in ham ranks on the power question.

Nor is it hard to imagine the effect this sort of thing must have on our crop of newcomers. It's only natural that their sense of fair play becomes slightly dulled when they find that most of us hams, who should be actively reading the lawbreakers out of decent company, do nothing more than exhibit a slightly unhappy attitude about it all. Amateurs of today probably do not realize that in the beginning the rest of the radio world regarded us with suspicion, as likely to prove too irresponsible to be permitted to operate at all. The respect we have earned with the regulatory agencies of this country, with the military and with the citizenry and with the governments of other countries, was earned the hard way. It was earned because from the beginning organized amateur radio was characterized by intense technical interest, and insistence on principles of cooperation, keen but honest competition — and strict observance of our regulations. It has been retained and enhanced over the years only after we demonstrated that we could continue to operate on those principles, that we do so because of pride in our game and in our accomplishments, and that we have proved our ability to keep our house in order without the necessity for constant supervision and government intervention. In the matter of superpower, however, complacency on our part to the complete disrespect of law and ethics had begun to undermine the amateur spirit to a serious degree.

We therefore heartily applaud the action of the Commission, even though we must view it with a slight sense of shame. Let us hope that it will be more than a warning — that it will be a turning point against the lax attitude many of us must admit having taken in the past. Let there be no more facetious remarks about superpower, no more indifference on the part of real amateurs concerned with our standards and our future. Let there most certainly be an end to puerile editorial comment, such as recently appeared in one west coast ham paper, suggesting that power violators should be left alone so long as they can get away with it, and that any righteous amateur who reports them should be branded a traitor! Let there be a resurgence of the amateur tradition of complete self-regulation, and a determination to ostracize from amateur radio those power-obsessed characters among us who have forfeited the right to class themselves as amateurs.

COMING A.R.R.L. CONVENTIONS

August 30-September 1 — Maritime Provinces, Truro, N. S.
September 20-21 — Dakota Division, Sioux Falls, S. D.
September 28 — New England Division, Providence, R. I.
October 4-5 — Midwest Division, Des Moines, Iowa
October 10-12 — Southwestern Division, San Diego, Calif.
October 11 — Hudson Division, Albany, N. Y.
October 18 — Ontario Province, Hamilton, Ontario

A.R.R.L. DAKOTA DIVISION CONVENTION

Sioux Falls, South Dakota — Sept. 20-21

The Sioux Falls Amateur Radio Club, Inc., invites all hams and friends to attend the ARRL Dakota Division Convention in Sioux Falls, on September 20-21.

Registration starts at 9:00 A.M., Saturday morning, at convention headquarters in the Sheraton-Cataract Hotel. Ladies luncheon at noon, with general and specialty meetings and demonstrations throughout the afternoon for all hams. An effort is being made to have the Governor of South Dakota as banquet speaker Sunday noon.

Registration is \$7.50, which includes the Sunday banquet; pre-registration by September 14. Registration and requests for hotel or motel reservations may be sent to the Sioux Falls Amateur Radio Club, Inc., P. O. Box 91, Sioux Falls, S. Dak.

A.R.R.L. MIDWEST DIVISION CONVENTION

Des Moines, Iowa — October 4-5

The Des Moines Radio Amateurs Association invites all ARRL members, hams and friends to attend the Midwest Division Convention, Saturday and Sunday, October 4-5, at the Hotel Savery, Des Moines, Iowa.

The convention will start with registration at 0800 Saturday morning and continue through technical meetings and discussions, covering all phases of ham activities and featuring top-notch speakers from the ham field. A banquet and dance will be held Saturday night. Sunday's activities will include a mobile transmitter hunt and a "brunch."

A special invitation is made to all the YLs and XYLs to attend this convention with the OM. Great plans are being made to provide activities of interest for the ladies. Information on the convention can be obtained by writing DMRAA, Convention Committee, P. O. Box 76, Des Moines, Iowa. Hotel accommodations can be obtained by contacting the Hotel Savery, Des Moines, Iowa.

A.R.R.L. NEW ENGLAND DIVISION CONVENTION

Providence, R. I. — September 28

The Providence Radio Association cordially invites all amateurs to attend the 1958 New England Division Convention to be held at beautiful Rhodes-on-the-Pawtuxet, Providence, R. I., on September 28.

A full day and evening of activities are scheduled. Many fine exhibits by leading amateur equipment manufacturers and distributors will be featured. FCC examinations, transmitter hunts, net meetings, lecture demonstrations, and a host of other items of primary interest to hams are on the docket. The convention package is \$6.50 for registration and the banquet. Registration only is \$3.00 per person. Advance banquet reservations are necessary, and should be mailed to Mr. Howard A. Scholz, W1HIK, 61 Ayrault Street, Providence, Rhode Island.

A.R.R.L. HUDSON DIVISION CONVENTION

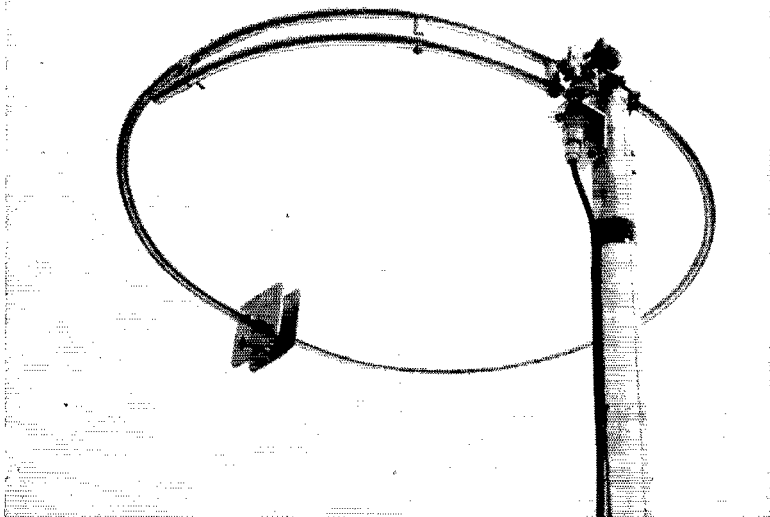
Albany, New York — October 10-12

The Albany Radio Association, Inc., is sponsoring an ARRL Hudson Division Convention on October 10-12. At the Sheraton-Ten Eyck Hotel, Albany, New York, hostesses will welcome you with your program, tickets, information, etc. Registration will begin Friday noon with exhibits and the Hospitality Room opening at 5 P.M. Saturday's program will include a meeting of the various nets and the Quarter Century Wireless Association, technical speakers, movies, FCC examinations, transistor demonstration, s.s.b., d.s.b. and a.m. forum (for 'em or agin 'em), a u.h.f. and v.h.f. symposium, and the Wouff Hong initiation. The Antique Wireless Program, first shown at the National Convention, will be repeated here. The banquet will begin at 8 P.M. Ladies' activities during the convention will consist of a luncheon and fashion show and tea at the historic Ten Broeck Mansion by costumed hostesses.

Those making advance registrations will receive brochures which include information concerning hotels, motels, etc. Advance registrations (by October 1) are \$7.50 each, which includes registration and banquet. As the main dining room is limited in capacity, seating will be based on the order of receipt of reservations. Be sure to meet your friends at the pre-convention party Friday night in the Hospitality Room. Registrations should be sent to: Convention, P. O. Box 573, Albany, New York.

OUR COVER

V.h.f., new sports car, summer weather, QST cover — they all seemed to go together in mid-July as W1HDQ ran some tests on his new two-band halo. For the details on this nifty mobile antenna, eyes right.



The 2-band halo as it appears when set up for 50-Mc. operation. Changing to 144 Mc. involves decreasing the plate spacing, by swapping cone insulators, and resetting the gamma matching clip and series capacitor.

A Two-Band Halo for V.H.F. Mobile

*50 and 144 Mc.
with a Single
Mobile Antenna System*

BY EDWARD P. TILTON,* W1HDO

HAVING thoroughly sold himself on the advantages of horizontal polarization for v.h.f. mobile work,¹ the writer spent many an odd moment pondering the possibility of working both 50 and 144 Mc. with a single antenna system. The need for a two-band antenna was intensified some months ago by a venture into the small sports-car field. There is no room in a car of this type for storing spare antennas!

The 50- and 144-Mc. bands are close to third-harmonic relationship. It should be possible, we reasoned, to work out a method whereby the antenna designed for 50 Mc. could be tunable to 48 Mc. as well, so that it could be made to work on its third harmonic. Tests with a conventional 50-Mc. halo showed that it was not too bad a 144-Mc. antenna, even before any attempt was made to tune it or match it properly. If these two matters could be handled, a halo of 50-Mc. dimensions should make a good radiator on 144

Mc.; probably better than one designed for the higher frequency.

Accordingly, we made up an experimental halo having provision for varying the spacing between the capacitor plates. With a little tinkering as to plate size, it was found that the antenna could be tuned down to 48 Mc. by the simple expedient of changing the spacing of the plates from $\frac{3}{4}$ to $\frac{5}{8}$ inch. This was a natural for two standard sizes of ceramic cone insulators. Next question: could the thing be matched on both bands without a major revision of the feed system?

It would be nice to be able to say that this problem was solved by dreaming up some matching combination that worked on both bands without changes, but such is not the case. Changing from 50 to 144 Mc. with the model shown involves three steps, but they can be handled in a matter of a minute's time. The changeover process may be less than ideal, but it is a big improvement over carrying two halos! Tests in comparison with a standard commercial halo on 50 Mc., and with various forms of dipoles and halos for 144, show that our two-band job acquires itself well on both bands.

Mechanical Details

The halo is made of $\frac{7}{16}$ -inch aluminum fuel-line tubing. This material was used because it is both strong and very light, and because we had a stock of it on hand. Any tubing of about $\frac{1}{2}$ -inch diameter could be used equally well. The loop is 67 inches in circumference. Again, this was a matter of what happened to be on hand; the coil of tubing lying under the bench happened to be just that big! The capacitor plates are $2\frac{1}{4}$ inches square, with the corners rounded off, mainly for the sake of appearance. The amount of rounding off gives a measure of adjustment, too. More on that later.

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

¹ Tilton, "Polarization Effects in V.H.F. Mobile," *QST*, Dec., 1957, p. 11.

To fasten the capacitor plates to the ends of the tubing, aluminum rod stock was turned down to make a tight fit into the ends. This was tapped for 6-32 thread, and then forced into the tubing ends. Holes were drilled through tubing and inserts, at each end of the halo, and a screw run through each to keep the inserts from turning around or slipping out. The binding-head screws that hold the plates to the inserts are equipped with lock washers. The holes for mounting the ceramic cone spacer are drilled directly below the center, midway between the center and the edge of the capacitor plates.

The halo is set into a slot cut in the vertical support. This slot should be just big enough to permit the halo to be forced into it. The first model we made merely had a screw run through the halo and vertical support, but this turned out to be sloppy mechanically after a few hundred miles of driving. The halo had to be stiffened, so we cut it at the center and inserted about 2 inches of aluminum rod, again turned down on a lathe to fit tightly inside the tubing. The two pieces of tubing were then pushed together, over the insert, and drilled each side of center to pass 6-32 screws. The halo and insert were also drilled at the midpoint, to pass the mounting screw. This was an 8-32 screw, 1¼ inches long. If lathe facilities are not available, the mounting of the capacitor plates and the securing of the halo to the vertical support can be handled with angle brackets.

Mechanical stability is important. When we had the halo working satisfactorily with the car in a stationary position we found that the slight up-and-down movement experienced with the car in motion caused a flutter on received signals. There was no flutter observed on the transmitted signal, but a variation in feed impedance could be seen as a flickering of the Communicator green eye. This was cured by some extra stiffening at the point where the halo goes through the center support. Straps of aluminum ½ inch wide were wrapped around the halo either side of the mounting post. These were then bent at right angles and the ends pulled together with a bolt. This is none too fancy, but the halo has survived numerous encounters with low tree branches in several thousand miles of driving, and the flutter is gone.

The matching arm is 14½ inches long, of the same material as the halo itself. It is mounted below the halo on two ¾-inch cone standoffs. For convenience in detaching the feed line a coaxial fitting is mounted on an L bracket bolted to the vertical support. The stator bar of the 25- μ mf. variable capacitor (Johnson 167-2) is soldered directly to the coaxial fitting. The rotor of the capacitor is connected to the gamma arm through a piece of stiff wire. To add further stiffening an aluminum angle bracket is screwed to the lower mounting stud of the capacitor and the other end mounted under the screw that holds the first cone standoff in place. Contact between the arm and the halo proper is made through a strap of ½-inch wide aluminum bent to form a sliding

clip. Be sure that a clean tight contact is made between the tubing and the clip, as high current flows at this point. A poor or varying contact will ruin the effectiveness of the antenna.

Adjustment

Probably many users do not realize it, but the capacity-loaded halo is a high- Q device. It must be tuned on-the-nose, or it will not work properly. The only reliable method for adjusting a halo is to use a standing-wave bridge, making tuning and matching adjustments for minimum reflected power. Using a field-strength meter and attempting to adjust for maximum radiated power can give confusing indications, and is almost certain to result in something less than maximum effectiveness.

The adjustment process with this design can be simplified if the halo is resonated approximately to the desired frequency ranges with the aid of a grid-dip meter. Set the clip at about one inch in from the end of the arm, and the series capacitor at the middle of its range. Check the resonant frequency of the loop with the grid-dip meter, with the ¾-inch spacer between the capacitor plates. It should be close to 50 Mc. Some variation can be obtained by trimming the corners of the plates, or by putting shims under the ceramic spacer. Both methods apply only for raising the frequency, of course. If the frequency is too high already, make new and slightly larger capacitor plates. Don't worry too much about this until an attempt has been made to match the antenna, however. Adjustments on the gamma arm and series capacitor may alter the resonant frequency somewhat.

Now insert an s.w.r. bridge between the antenna and the transmission line. Apply power and swing the capacitor through its range, noting whether there is a dip in reflected power at any point. There will be some detuning effect from the hands or a metal tool. This was taken care of by sawing a slot in the bakelite knob on the capacitor shaft, and then using an insulated screwdriver to turn the knob. If the reflected power will not drop to zero, slide the clip along the gamma arm and retune the capacitor, until the lowest reading possible is obtained. If this is still not zero, the halo is not resonant. If the halo capacitance is on the low side, moving the hands near the plates will cause the reflected power to drop. Closer spacing of the plates, larger plates or a longer halo loop are possible solutions.

These adjustments should be made on a frequency near the middle of the range you expect to use. Adjusting for optimum at 50.25 Mc., for example, will result in usable operation over the first 500 kc. of the band, and a good match (below 1.5 to 1) from 50.1 to 50.4. The s.w.r. will rise rapidly either side of this range.

To tune up on 144 Mc., insert the ½-inch cone between the capacitor plates. Slide the clip back on the gamma arm about 3 to 4 inches and repeat the adjustment for minimum reflected power, using a frequency at the middle of a 2-Mc. range.

(Continued on page 140)

TRANSMISSION lines, impedance-matching devices, and standing-wave detectors are very popular subjects in the pages of amateur radio journals and in conversations over the air. The fact that so much attention is devoted to these matters is a very healthy sign and indicates that many amateurs employ antennas which are representative of the best state of the art. However, some of these discussions, if examined closely, reveal that the participants are nearly as uninformed as the hypothetical amateur who had never heard of "standing-wave ratio." The general implication is that anyone who operates with a standing-wave ratio of more than 1.2 to 1 over the entire band is qualified for immediate entrance to the nearest mental hospital.

Like many other good things, impedance matching can be carried too far. We believe that

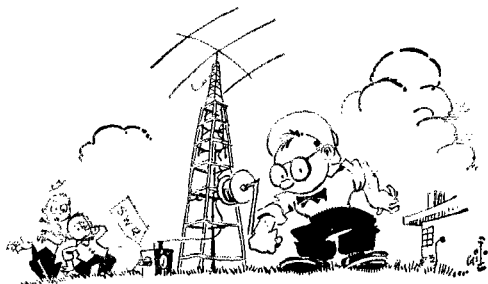
Match, or Not To Match?

BY YARDLEY BEERS,* W2AWH

Far from being the most important factor in the success of an antenna system, the transmission-line standing-wave ratio may actually be a minor consideration.

the limit was reached when we heard of an amateur who raised and lowered his antenna until he found a height at which the standing-wave ratio in the line was 1:1. This situation is certainly a case of putting the cart before the horse. The

* 4 Ploughman's Bush, Riverdale 71, N. Y.



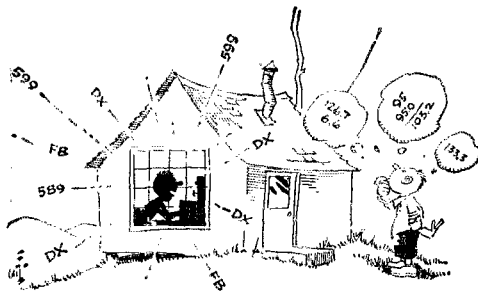
first problem is to place the antenna at the height where it has its best radiation characteristics, and then follows the problem of feeding it with adequate efficiency.

Overemphasis on impedance matching raises another difficulty — it gives many amateurs inhibitions which prevent them from using some antennas which, though not providing the minimum s.w.r., could give tolerable operation on an extra band. By accepting a mismatch on one band, often one can contrive a system which gives reasonable performance on two or three bands while if nearly a perfect match is made on one, operation on others is unsatisfactory (see example below).

Finally, amateurs frequently devote a large amount of time and money to impedance matching when the resulting improvement is quite trivial. In good scientific and engineering practice, excessive overdesign, after making reasonable allowances for safety factors, is considered nearly as great a sin as underdesign.

Computing Losses

The correct approach to this subject requires knowledge of just how much loss results from a mismatch under any given set of circumstances. Sometimes a standing-wave ratio of 3:1 may be very serious while at other times one of 15:1 may result in losses that are unimportant. The crucial point is how to distinguish between these situations. While the answer to this question is to be found in advanced transmission line theory, the results are simple to apply by those who do not have advanced training in theory or in mathematical methods. The principal results are con-



tained in a graph which has been published for the last several years in *The Radio Amateur's Handbook* (Fig. 13-12) and also in *The A.R.R.L. Antenna Book*. It seems remarkable that this graph has received so little attention when it has been so available and when there has been so much interest in this subject.

The mathematical equation which is the basis of this graph is rather cumbersome for the needs most encountered by amateurs. However, when the losses are small, approximations may be made. These lead to a very simple equation which may be used as an alternative to the graph:

$$D = \frac{S_o + \frac{1}{S_o}}{2} D_o, \quad (1)$$

where D_0 is the loss which would exist with a perfect 1:1 impedance match as expressed in decibels, and D is the loss with a voltage standing-wave ratio of S_0 . (Note that the graph mentioned above gives plots of $D - D_0$ versus D_0 for various values of S_0 .) When D is of the order of 2 db. the approximation leads to errors which may be twenty-five or fifty per cent, while when D is as large as 3 db. the formula is not valid. Nevertheless, for smaller losses it is reliable.

It is to be noted that when $S_0 = 2$, D is only $1.25D_0$, and with $S_0 = 3$, D is $1.67D_0$. Thus a standing-wave ratio as large as 3 generally does not lead to an important increase in the losses. On the other hand, for larger values of S_0 , the losses increase more rapidly and ultimately they increase proportionally with S_0 .

"Reasonable" Loss

How large losses can be and still be described as "reasonable" is, of course, a matter of opinion. We would hazard a guess that at lower frequencies losses up to 1 db. would be considered as reasonable for the band for which the antenna is mainly intended. However, if the antenna could be used without modification on additional bands, losses up to 3 db. might be tolerated, especially if these bands are of less interest and if such operation could eliminate the necessity for putting up special antennas for them. Because of the increase of losses with frequency, somewhat larger losses on a band of primary interest would have to be tolerated in the v.h.f. region.

The preceding paragraph was based upon the assumption that the principal concern is the effect of the losses upon the radiated signal. With high-power transmitters we must also worry about the power-dissipating ability of the line. With a full kilowatt, a 3-db. loss might result in serious heating of the line or in voltage breakdown. With powers up to 100 or 200 watts this is rarely a problem.

Reflected Power

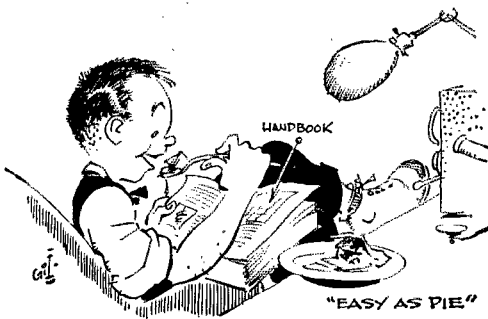
Before we consider some practical examples which will apply these concepts, let us try to clear up some common misunderstandings. Much confusion results from a misinterpretation of the significance of the reflected wave caused by an impedance mismatch. Many amateurs are inclined to believe that this reflected wave represents a dead loss of power. In the main, this conclusion is false.

To simplify the explanation, let us suppose that a transmitter has an output of 100 watts into a line of zero loss which is perfectly matched by its characteristic impedance. Then there is no reflected wave, and 100 watts are delivered to the load. Now suppose the load is changed, causing the standing-wave ratio to be 3:1; by readjusting the coupling between the transmitter and the line, the output can be restored to 100 watts. If the line has no losses, it cannot absorb any power; so the full 100 watts must be delivered to the load.

How can this be when we know that a standing-wave ratio of 3:1 corresponds to a voltage reflection

coefficient of $\frac{1}{2}$ at the load? The power associated with the reflected wave is then one quarter that associated with the incident one. If the output impedance of the transmitter matches the characteristic impedance of the line, the transmitter must be getting back one quarter of the power it sends down the line, and the remaining three-fourths, which is the net output of the transmitter, is delivered to the load. Thus the transmitter actually sends 133.3 watts down the line and gets 33.3 watts back, and the effect is to deliver 100 watts to the load, as was the case with the line which is perfectly matched. If the impedance at the transmitter end is also mismatched, the situation is more complicated; now there are reflections at the sending end, and these waves go down the line and give rise to further reflections. But the result is the same: the net difference between the total power associated with the waves going down the line from the transmitter and total power associated with the waves coming in the reverse direction is still just 100 watts.

When there are losses in the line the power received by the load under mismatched conditions no longer is equal to that received with perfect matching, but the power received by the load still is considerably greater than what the value of the reflection coefficient might suggest. Suppose that under matched conditions the losses are five per cent ($D_0 = 0.22$ db.). Suppose also that the load causes a 3:1 standing-wave ratio and that again the power associated with the original wave leaving the transmitter is 133.3 watts. The power associated with this wave at the receiving end is five per cent less or 126.7 watts, 6.6 watts having been lost. One quarter of 126.7, or 31.7 watts, is reflected, and the difference, 95.0, is delivered to the load. However, five per cent of the reflected wave, or 1.6 watts, is lost in returning to the transmitter, so the transmitter receives 30.1 watts. The net output of the transmitter is then $133.3 - 30.1 = 103.2$ watts, and the efficiency is $95.0/103.2$, or 92 per cent. This corresponds by direct calculation to a loss $D = 0.36$ db., the same result that we obtain from Eq. (1).



Effect of Line Loss on S.W.R.

There is one other frequently-forgotten general topic that deserves some mention. With

TABLE I
Losses in 40-Foot Line Used to Feed Antenna 33.5' Long Made of
No. 12 Wire in Free Space

Band (Mc.)	Impedance (Ohms)	300-Ohm Twin-Lead				75-Ohm Twin-Lead		
		S ₀	D ₀	D		S ₀	D ₀	D
				(Formula)	(Graph)			
7	12.5 - j1000	280	0.11	—	—	1000	0.24	—
14	70	4.3	0.16	0.36	0.39	1.07	0.44	0.44
21	300 + j800	9	0.20	0.92	0.88	36	0.60	Greater than 4 db.
28	4750	16	0.24	1.92	1.74	64	0.72	

losses, the standing-wave ratio decreases as we move away from the load, and for very long lines it approaches 1:1 regardless of termination.¹ Therefore, if we measure the standing-wave ratio at the input end of a long line, the observed value is overoptimistic. In the previous paragraphs the standing-wave ratio S_0 to which we have referred is that at the load end of the line. It is useful to have some idea how the standing-wave ratio, S , at the input end is related to S_0 . Again the exact formula is unnecessarily complicated, and we give a simplified approximate one valid under conditions similar to those pertinent to Eq. (1).

$$S = S_0 - 0.115 (S_0^2 - 1) D_0. \quad (2)$$

Thus if $S_0 = 3$ and $D_0 = 1$ db., $S = 2.1$, and even under these conditions of small loss there is an appreciable difference. Standing-wave measurements and impedance-matching adjustments therefore should be made with the detector connected to the load through a very short length of line.

Some Examples

The first example to be discussed is one where there is a significant advantage in obtaining a good match. Suppose that a 100-foot length of RG-8/U 52-ohm coaxial cable is used to feed a 144-Mc. antenna and the standing-wave ratio $S_0 = 5$. How much loss results? According to Fig. 13-11, page 326 of the 1957 *Handbook*, $D_0 = 2.5$ db. Then the graph loss *vs.* s.w.r. shows that $D - D_0 = 2$ db. This 2 db., which is significant especially if the antenna is to be used only on this band, can be recovered by an accurate impedance match.

As a second example, consider an antenna 33.5 feet long made of No. 12 wire. This, of course, is a half-wave dipole at 14 Mc. and two half waves in phase at 28 Mc. Suppose it is to be fed with a 40-foot line and we are trying to decide whether to use 300-ohm receiving-type Twin-Lead or 75-ohm receiving-type Twin-Lead. The results of calculations in this case are shown in Table I, using values for the input impedance of the

antenna obtained from a paper by King and Blake² and values of D_0 from the *Handbook* chart (Fig. 13-11) cited above. At 14 Mc. we note that with the 300-ohm line and its 4.3:1 standing-wave ratio we have slightly lower losses than with the 75-ohm line even though with the latter we have essentially a perfect match. At 21 Mc., in spite of the high reactance, the losses with the 300-ohm line are only 0.9 db., and at 28 Mc. the losses are 1.8 db. These values are quite tolerable for supplementary operation at low power. On the other hand, with the 75-ohm line on the latter two bands, satisfactory operation is precluded by excessive losses. Quite clearly the choice is completely in favor of the 300-ohm line even though S_0 is greater than 4:1 under all conditions considered. Furthermore, we recall that in the most favored directions an antenna with two half waves in phase has a gain of 1.9 db. Therefore, in these directions this antenna with 300-ohm line and $S_0 = 16$ has about an 0.8-db. advantage over a separate 28-Mc. half-wave dipole fed with 40 feet of 75-ohm line with $S_0 = 1.07$.

On 21 Mc. this 33.5-foot antenna is three quarters of a wavelength long and therefore is not self-resonant. As there is a popular superstition that antennas must be self-resonant, many readers may be shocked to think that we should have even considered such operation. Actually there is nothing in the fundamental theory of electromagnetic radiation that requires a driven antenna to be self-resonant. Of course, very short antennas have very low radiation resistances and large local fields and their efficiencies therefore tend to be poor. However, this antenna, being more than a half wavelength long, does not fall in this category. The principal bad feature of the nonresonance is to give rise to a terminating reactance of 800 ohms, which causes the standing-wave ratio to be 9:1. If we were to connect capacitive reactances of 400 ohms between each side of the line and the antenna the standing-wave ratio would go down to unity, but the calculations have shown that the losses would go down from 0.9 db. to 0.2 db., an improvement of only 0.7 db. To be sure, these calculations do not include conductor losses in the antenna proper nor ground losses, but there is no reason

(Continued on page 144)

¹For further information, see Goodman, "The Versatile Standing-Wave Ratio Indicator," *QST*, June 1958, Fig. 3, p. 17.

²R. King and F. G. Blake, jr., *Proceedings of the IRE*, Vol. 30, p. 335 (1942).

ONE of the first things you have to learn in amateur radio is how to solder. While it is true that there are always a few no-talent millionaires who hire mercenaries to solder for them, it is traditional for a ham to know how to solder and solder well. Even if you buy all of your station equipment you will have to solder a few connections before you can put the gear on the air. The ability to read directions — and the ability to *solder* — are requirements for the assembly of any of the popular kits.

What Tools Are Needed

Anyone interested in doing a good soldering job should have certain tools in addition to a soldering iron. We'll discuss soldering irons a little later on but let's see what other tools are needed.

How To Solder

Some Tips on Soldering for the Beginner

BY LEWIS G. McCOY,* W1ICP

First, you'll want a pair of wire cutters. A type of tool that serves the dual purpose of stripping and cutting is shown in an accompanying photograph. A good part of wiring consists of stripping insulation from the ends of wires to be soldered. Strippers of the type shown can be adjusted to cut through the insulation, but not the wire, making the removal of the insulation a simple matter.

Long-nose pliers are a "must" for any wiring job. When feeding wires through terminals it is

* Technical Assistant, QST.

often difficult to do the job with your fingers and, for this reason, a tool that will permit you to reach into such spots is needed.

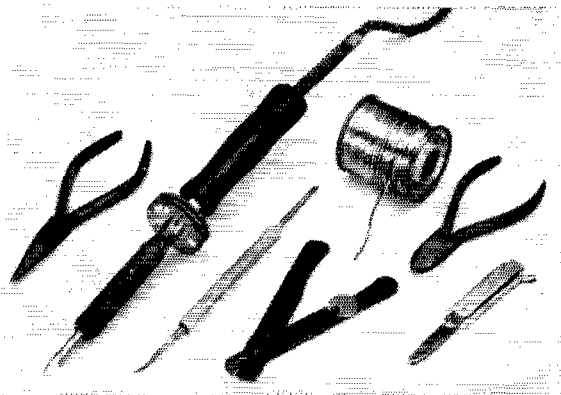
Another handy tool for soldering jobs is a "soldering aid." This tool has a pointed probe at one end and a two-tined fork at the other. The probe is useful for loosening bits of solder or wires that fall into hard-to-reach spots. The forked end of the tool is valuable for "unsoldering." Such a statement may sound peculiar to the reader of an article on soldering but read on. When you make a wiring mistake (and don't worry, you will), the forked end is excellent for loosening soldered leads. The connection is heated to melt the solder and the forked end is slipped over the wire end that is to be loosened. Using the forked end of the tool, the connection can be opened.

A pocketknife, or piece of emery paper or steel wool, comes in handy for scraping insulation and cleaning the ends of wires. Many beginners make the error of trying to solder enamel-covered wire without first removing the enamel. The wires and terminals to be soldered must be clean to obtain a successful job; enamel is insulation.

The solder used in radio work should be the *rosin-core* type. It is very important to use rosin and *not* acid-core solder because the latter will often corrode the connection after a short time. Use only rosin-core solder. We stress this point because the average radio or hardware store stocks both types and you might pick up the wrong kind. At Headquarters, we use a 40/60 rosin-core solder, which consists of 40 per cent tin and 60 per cent lead, with a rosin core. The flux helps the soldering by cleaning the surfaces to be soldered and keeping them clean until the solder flows over and into the surfaces.

Soldering Irons — Or Guns

A look through any of the radio parts distributors' catalogues will show that there is a wide selection of soldering irons offered for sale. Whether you choose a soldering iron or a gun will depend on how much soldering you plan to do. The main difference between the two is that the iron can be kept hot and ready to use at all times while a gun is a quick-heating device that



Here are some of the tools described in the text. Left to right: long-nose pliers, soldering iron, soldering aid, wire strippers, solder, diagonal cutters, knife.

Combination Power Supply and Modulator Using Transistors

Modulated Power for the Mobile R.F. Section

BY E. LAIRD CAMPBELL,* WICUT

The unit described in this article combines a transistor power supply, transistor modulator and the associated control circuits to provide all the voltages necessary to operate a 20- to 25-watt transmitter. Twelve volts d.c. from an automobile battery will power it.

EVER WORKED a mobile station and looked at your S meter closely when asked for a report? Probably it was dancing and bouncing around with every word. You may have blamed band conditions, but the real reason probably was the transmitter. Usually the battery can stand only one dynamotor, so this common power supply is used for both the modulator and r.f. section. The power needed during the modulation peaks just isn't there, so the signal has to suffer.

There is little our mobile friend can do to improve his situation if he sticks with vacuum tubes. However, transistorizing his modulator and power supply will completely eliminate his problem since the modulator operates directly from the primary power source without any loss in voltage step-up and rectification. Probably the most valuable feature is the saving in battery power — consider just the heater power that is wasted in the vacuum-tube modulator during standby periods. In the power supply, the old problem of heavy starting current for the dynamotor or the annoying buzz of a vibrator is com-

*Technical Assistant, QST.

pletely done away with when the power supply is transistorized. The transistorized modulator and power supply shown on these pages will provide better efficiency in converting low voltage to high voltage, with an over-all saving in battery current. Also, it will give the mobileer some practical experience in working with transistors.

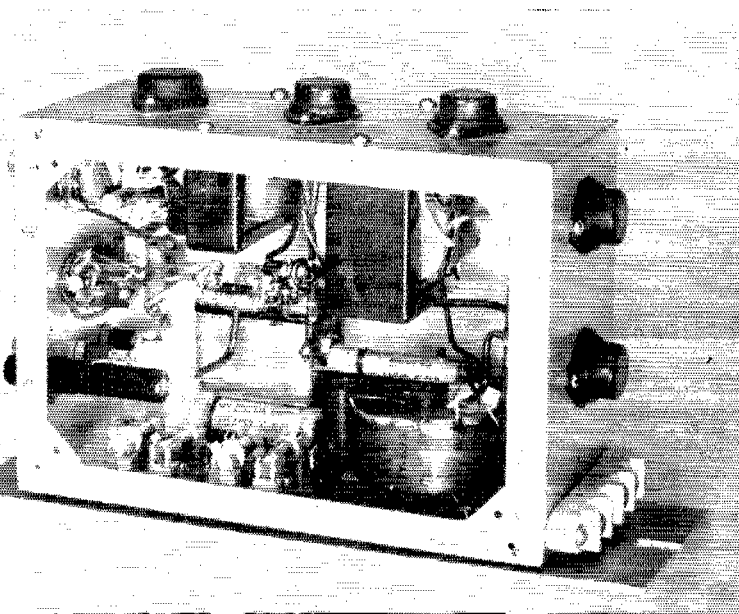
The power-supply section furnishes about 300 volts at 100 ma. This value of voltage is convenient for use with some of the popular mobile r.f. amplifier tubes such as the 2E26 or 5763. The plate and screen current required for these types is 50 or 60 ma., which will leave the remainder of power for the oscillator-multiplier stages of the rig. Instant-heating tubes, such as the 2E30 and 2E25, could be used in the r.f. section so that there will be no current drain on the battery during stand-by periods. The current required by the transistorized modulator is zero during these periods.

One of the features of the unit is that the modulator and control circuits are combined in the same box with the power supply. This eliminates long runs of interconnecting cables and makes the unit easy to install and convenient to use. Leads to the battery, mike, and transmitter are the only connections necessary.

The Modulator

As shown in the circuit diagram, Fig. 1, the modulator section uses a two-transistor speech amplifier to provide the gain necessary for driving the Class B push-pull audio power amplifier from a carbon microphone. Push-to-talk operation is included; when the switch on the mike is closed the control relay, K_1 , closes and turns on the

The transistor power supply and modulator. The power-supply oscillator transformer is located at the bottom right in this view. The two transformers suspended from the top surface are the driver and modulation transformers, T_2 and T_3 . Four silicon rectifiers and their mounting clips are at the bottom left, directly below the horn relay, K_1 . Outputs from the power supply, control circuit and modulator connect to the terminal strip.



QST for

is turned off each time it is returned to the bench. Don't misunderstand; a gun only requires seconds to heat up, but you do have to wait each time you use it. For occasional soldering jobs it is hard to beat the convenience of a soldering gun. However, if one does a considerable amount of soldering an iron is preferred.

For general radio work a 60- or 100-watt iron is the type to use. The tip diameter should be $\frac{1}{4}$ or $\frac{3}{8}$ inch; if it is much larger you'll find that there will be many spots around a chassis you can't reach. A larger iron is needed for soldering jobs that require a great amount of heat, as when large metal masses or good conductors (copper sheet) are involved. Small "pencil" irons are useful for involved kit work.

How To Solder

Before getting into the actual mechanics of soldering, a word or two about the care of your soldering iron is in order. To conduct heat readily from the tip of the iron to the work, it is necessary to maintain a thin layer of clean (not dirty "oxidized") solder on the tip at all times. A new iron can be "tinned" (coated with solder) by warming the clean tip until it will melt solder and then flowing on a little bit of rosin-core solder. Any excess solder can be "flipped off," or wiped off quickly with a rag if the boss of the household objects to a gradual build-up of solder on the floor. If the tip is dirty, or if it is allowed to get too hot before the solder is applied, it will be hard to do a good job of tinning.

As the iron is used you'll find that the tip will get scaly and dirty. When it is in this condition it becomes impossible to transfer enough heat from the iron to the work. After each soldering session the tip of the iron should be wiped off with a rag or steel wool, before the iron cools. This will help keep the tip clean and in usable condition. In case the tip becomes badly pitted it should be filed smooth and retinned.

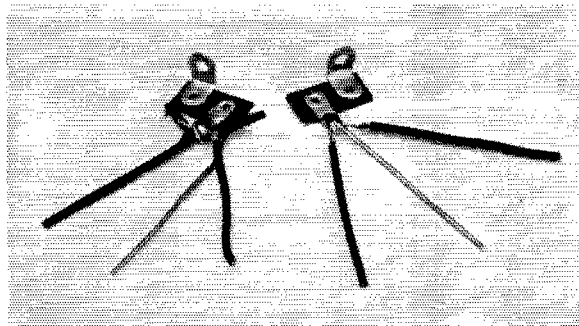
The actual process of soldering is quite simple. It consists of getting the work to be soldered hot enough to melt the solder and then flowing the solder around the work. Where most beginners make a mistake is in holding the iron to the work and applying solder to the iron and not the work. When this happens, the iron melts the solder but the work is not hot enough to take the solder, and a "cold solder" connection results. A cold solder connection appears to be a connection but actually is not. It can be avoided by being sure that the work is hot enough to melt

the solder. When it is, the solder will flow around the work and make a good electrical connection. Of course, the work must be clean in order to make a good solder joint. Tinned wire and terminals do not have to be cleaned before soldering, but dull (oxidized) copper or brass wire or fittings should be shiny before soldering.

There are two schools of thought on how a connection between wires and a terminal should be made. Many builders believe that the wire ends should be firmly wrapped around the terminal and then soldered. In such a case the solder is used to make the electrical connection between the wires and the terminal. The actual mechanical strength is furnished by the wrapped wires. Incidentally, if you have to *unsolder and unwrap* such a connection the soldering aid described earlier is an excellent tool for the job.

The other method makes use of the solder for both the electrical and mechanical connection. When a considerable amount of construction is done it isn't too difficult to make a wiring error. Nothing will mess up a wiring job more than having

to unsolder and unwrap connections. Where equipment is not subjected to continual vibration or shock it has been found (by many amateurs) that solder affords enough strength to hold the connection firmly. Just feed the end of the wire through the terminal, make a ninety-degree bend in the wire, and solder it. The bend in the wire is to keep the wire from slipping



An example of the wrong (left) and right way to connect several wires at a terminal. Be sure to remove the insulation from the wire ends, clip off any leads protruding from the terminal, and use only enough solder to make the connection.

out during the soldering process.

How much solder to use on a connection is a question that bothers many beginners. The answer is: just enough to make the connection. Most beginners are inclined to use too much solder rather than not enough. Use just enough solder to cover the connection.

Too much heat can damage small resistors, capacitors, germanium diodes and transistors. When soldering such units always hold the lead connected to the unit with a pair of long-nose pliers. Then, when heat is applied to the connection, heat traveling up the lead to the component will be conducted away by the pliers, thus preventing damage to the component.

If you follow the steps outlined below you should be able to end up with a satisfactory soldering job.

- 1) Always use rosin-core solder.
- 2) Keep the tip of the iron tinned and clean.
- 3) The work should be clean; if already tinned, the tinning should be shiny.

(Continued on page 164)

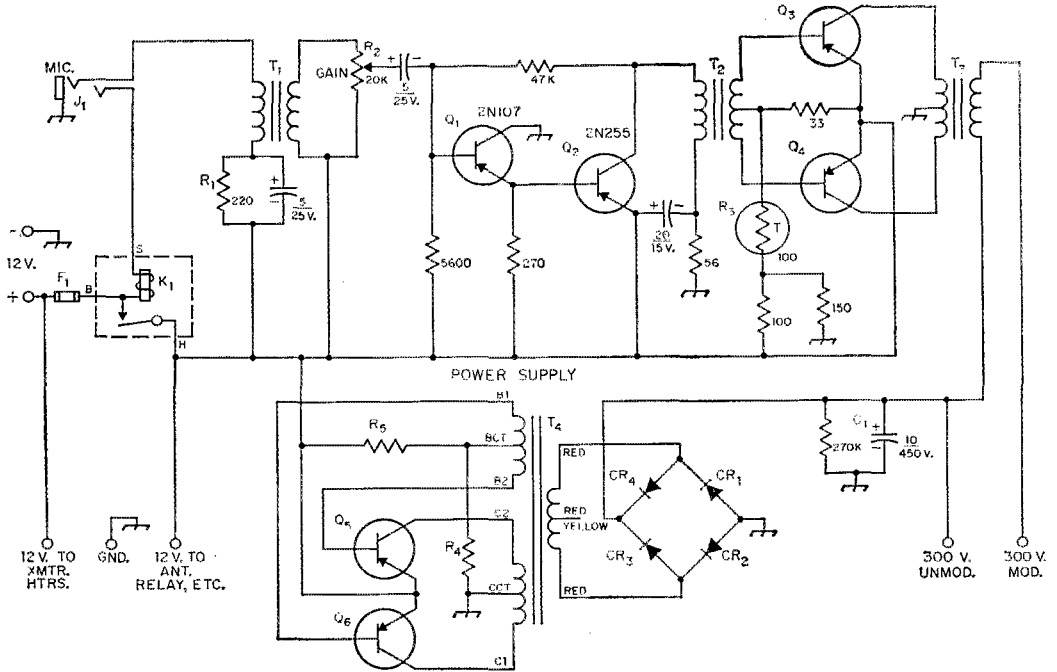


Fig. 1—Schematic diagram of the power supply and modulator. Fixed resistors are $\frac{1}{2}$ watt except as indicated below. Capacitances are in μf ; capacitors are electrolytic.

- CR₁, CR₂, CR₃, CR₄—500-ma. silicon rectifiers with mounting clips (Sarkes Tarzian M500).
 F₁—10-amp. fuse.
 J₁—Open-circuit, 3-conductor jack.
 K₁—12-volt horn relay (Echlin HR 101; see text).
 Q₃, Q₄—2N256 or 2N301A.
 Q₅, Q₆—2N278 or 2N627.
 R₁—220 ohms, $\frac{1}{2}$ watt.
 R₂—20,000-ohm volume control.
 R₃—100-ohm thermistor, B value 3300 (Globar 416H*
 R₄—150 ohms, $\frac{1}{2}$ watt, for 2N278
 100 ohms, $\frac{1}{2}$ watt, for 2N627.
 R₅—10 ohms, 2 watts, for 2N278
 18 ohms, 2 watts, for 2N627.

- T₁—Driver transformer; 200-ohm primary, 15,000-ohm secondary (Argonne AR-107, Lafayette Radio, N. Y.).
 T₂—Transistor driver transformer; 100-ma. 100-ohm primary, 100-ohm c.t. secondary (Triad TY-61X).
 T₃—Modulation transformer, transistor type, 10-watt rating; secondary tapped for 3000, 4000, and 6000 ohms (Triad TY-65Z).
 T₄—Transistor power transformer, 12–14 volts input, 300 volts, 100-ma. d.c. output after filter (Triad TY-69S).

* Available from Workman TV, Inc., 309 Queen Anne Road, Teaneck, N. J.

power supply and modulator. K_1 is an inexpensive automobile horn relay which can be purchased at most filling stations or auto parts distributors. Current for the microphone is obtained from the 12-volt source through the 220-ohm resistor R_1 . The microphone transformer, T_1 , has the gain control, R_2 , connected across its secondary winding. The audio voltage is applied to the base of transistor Q_1 through a 5- μf coupling capacitor. The common-collector circuit is used in order to provide a good impedance match to the base input resistance of the driver transistor, Q_2 . The output of the driver is transformer coupled to the bases of the Class B modulator transistors.

At high transistor temperatures, the transistor leakage current (I_{co}) increases and unless stabilized will "run away" or "avalanche," eventually destroying the transistors. This usually occurs at high ambient temperatures when the transistor power dissipation, caused by self heat-

ing, lowers the resistance of the collector. This in turn causes a still greater increase in current, and the process continues until eventually the transistors are destroyed. Since high ambient temperatures are common in mobile operation, a thermistor, R_3 , is used to confine the operation of the transistors to a safe region. The thermistor (a temperature-sensitive resistor) is placed in the base circuit of the transistors. When the temperature rises, the resistance of the thermistor increases, lowering the base-to-emitter voltage and thus stabilizing I_{co} .

The Power Supply

The power supply uses a Triad TY-69S transformer, T_4 , with two transistors, Q_5 and Q_6 , in a power oscillator circuit. The transistors operate as electronic switches to interrupt the d.c. through the primary of T_4 , much like the mechanical vibrator does in a vibrator supply.

When voltage is applied to the power supply circuit, current will flow through the transistors; however, since no two transistors are precisely alike electrically, initially one will conduct a little more current than the other. This difference current or "starting" current will cause a small voltage to be induced in the transformer winding connected to the bases of the transistors. The polarity is such that the conducting transistor is biased to conduct even more heavily while the base of the other transistor is biased to cutoff. This process continues until the increasing current causes magnetic saturation of the transformer core, at which time the induced voltage drops to zero and there is no longer enough base bias to maintain the collector current. When this happens the current decreases, causing an induced voltage of opposite polarity. The process then reverses so that the previously nonconducting transistor starts to conduct and the previously conducting transistor becomes cut off. The result is an alternating current of square-wave form through the transformer primary. This in turn induces a stepped-up voltage in the h.v. secondary of the transformer. The frequency is approximately 2000 c.p.s. in this unit.

A bridge rectifier using silicon diodes converts the high-voltage square wave to d.c. Since the rectifier is full wave, the principal ripple component is about 4 kc. This is easily filtered by a single 10- μ f. capacitor.

Construction

The modulator, power supply and control circuits are all contained in a 3 \times 7 \times 5-inch chassis. All transistors except Q_1 are mounted on the outside surfaces of the chassis walls. The photographs show the two power-supply transistors mounted on one edge and the driver and modulators on another.

It is important that provision be made to insure adequate cooling of the high-power transis-

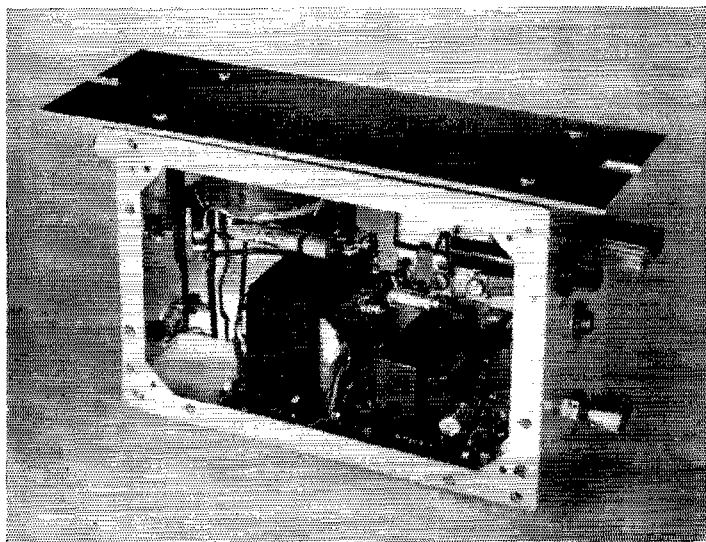
tors. Mounting them directly on the chassis would provide an excellent heat sink, but this method is impracticable because the collector terminal is also the mounting flange, and mounting directly on the chassis would short-circuit all the collectors.

A practical method of mounting is to use a common sink but to insulate the collectors from it electrically. At first, one might think this would insulate them for heat transfer as well, but there is only about 0.5 degree per watt difference in temperature between the transistor and sink when a 2-mil (0.002-inch thickness) mica washer is used as an insulator. Sheet mica (sometimes called "isinglass") available at most hardware stores can be used for this purpose if split down into sheets a few mils thick. However, we used polyethylene sheet from a plastic radio parts bag. Be sure to clean and deburr all holes associated with the transistor mounting because any punctures in the insulator will probably result in an electrical breakdown between the transistor and chassis. Insulating washers must be used in places where the transistor mounting bolts pass through the chassis.

Base and emitter terminals on the large audio transistors are small pins on the bottom of the case. Soldered connections to these terminals should be avoided because of the danger of overheating the transistor. A convenient way to connect leads is to use sleeve-lug pin contacts from a miniature tube socket. Flexible leads can be soldered to the lugs, which may then be slid over the transistor pin terminals. The power-supply transistors are supplied with soldering-type base and emitter leads. A soldering lug is placed over the mounting stud for the collector connection.

The two Class B audio transformers, T_2 and T_3 , are mounted on the inside surface of the box along with the low-level audio transistors.

Power transformer T_4 is located opposite the audio transformers on the inside of the chassis. Next to it are the four silicon rectifiers, mounted in spe-



Another view of the two audio transformers. The fuse, mike jack, gain control and battery terminals are at the right projecting through the chassis. A cover plate, not shown in the photographs, should be made to fit over the open side of the box.

cial clip holders (the holders are furnished with the rectifiers). Directly above them on the chassis is the horn relay. Its location was chosen to make the hot 12-volt lead to the power transformer as short as possible.

Most of the remaining components are visible in the photographs. The gain control, R_2 , is at the top left in the first view, with the microphone jack, J_1 , directly below it. The microphone transformer, T_1 , is behind J_1 , and is mounted on the inside chassis surface. Terminal strips are used for convenience in mounting the various resistors, capacitors, and transistor Q_1 .

A plate is bolted to the edge of the chassis so that the unit can be mounted to the automobile. Rubber grommets are placed between the chassis and the plate to act as shock and vibration absorbers.

For quick assembly and disassembly an octal socket and cable plug could be used to connect the unit with the transmitter, instead of the terminal strip shown in the photograph.

Preliminary Checks

It is wise to check the wiring and connections and to test the individual sections of the unit before installation. While checking the modulator, it is a good idea to turn off the power supply to prevent accidental shock. Remove the lead from the emitters of Q_5 and Q_6 to disable the power supply.

If you wish to observe the wave form of the modulator it will be necessary to connect a scope to the output terminals of T_3 . Before any measurements are made, be sure to connect a dummy load to the modulator. This can be a 10-watt resistor of the same resistance as the Class C load. The scope is then connected across the resistor. In order to study the output of the modulator it is necessary to apply a sine wave to the input terminals. This can be from an audio oscillator that has some sort of output control. Connect the audio oscillator output across the gain control R_2 , which should be set at about three quarters of the way on. Increase the output of the audio oscillator and observe the wave shape on the scope. Tips on testing audio equipment are given in the chapter on speech equipment in *The Radio Amateur's Handbook*.

Measure the a.c. voltage developed across the 10-watt load resistor with a vacuum-tube voltmeter in order to check the modulator power output. From the formula $P = \frac{E^2}{R}$ the power in watts can be calculated. On-the-air tests can give you an idea as to the quality of the audio.

If the modulator fails to operate, use the same trouble-shooting techniques that are used for vacuum-tube circuits. That is, go back one stage at a time, using the scope, until the troublesome section is located. From there on it's usually a matter of finding a faulty component or a wrong connection.

After the modulator is working, connect 12 volts to the emitters of Q_5 and Q_6 . The power supply should oscillate (danger, high voltage!). An indication that the power supply is functioning properly will be a 2-kc. audio whine from the power transformer when the circuit oscillates. A voltage measurement across the filter capacitor should show the output d.c. voltage to be in the neighborhood of 300 volts with no load.

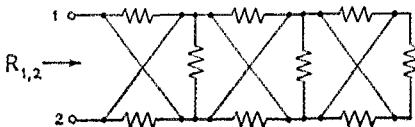
Other Notes

Once the unit has been completed and checked there is really not much work to installing it. Since the modulator and control circuits are built in, only a few connections are needed and the unit is ready to go. Connect 12 volts d.c. to the power terminals, plug in the mike, connect the leads to the transmitter and you're all set. *Important:* correct polarity must be observed when connecting the power source; otherwise the transistors will be damaged.

Concerning placement of the unit in the car: Try to find a location away from high-temperature spots and in a well-ventilated area. The trunk is not recommended since there is little ventilation; this area can become quite hot in the summertime and damage to the transistors could result. The engine compartment makes a convenient place to mount the unit but this space is not adequately ventilated except possibly while the car is in motion. The most favorable spot is on the fire wall in the passenger compartment, or under the front seat. These areas are usually well ventilated, or at least cooler than any other enclosed section of the car.



Today's problem for the network noodlers was submitted by Harrison Morgan, W1SSK, of Suncook, N. H. Allow yourself a little time for it; these lattice jobs can run into complications.



The problem is to find $R_{1,2}$ in the diagram at the left. Each resistor is 10 ohms.

— . . . —

Here's hoping you didn't have to break open last month's black box to find out what was in it. A little cogitation should have revealed that ten 1-ohm resistors would do the trick. The resistors were all tied together at one end, and the remaining ends went to the 10 binding posts.

Modifying the Viking Adventurer for 50 Mc.

How to Get Something for (Practically) Nothing

BY AL BROGDON,* W4UWA/DL4

IF YOU HAVE a Viking Adventurer, here is a very simple way to put it on 6 meters. It will deliver up to 20 watts output on that band. The same process may be used on the Knight 50-watt transmitter, as the circuitry and layout of the two transmitters are almost identical.

Unlike some conversions, the process outlined here sacrifices none of the original bands. Another band is added, and bandswitching is retained. No additional holes in the cabinet or chassis are needed, if coaxial output is retained. If 300-ohm balanced output is installed, as shown, only a crystal socket is added. The transmitter may be rewired to its original condition, so there is no impairment of resale value. The conversion requires the addition of only one 1-watt resistor, two handmade coils, and a crystal socket for balanced output, if desired. Inexpensive 8-Mc. crystals are used.

Preliminary Steps

With the Adventurer's original circuit, and the band switch in the 15-meter position, the oscillator tank circuit will tune to the 25 to 27-Mc. range. Therefore the simplest way to put the rig on 6 is to put in a crystal above 8.334 Mc. and triple to 25 Mc. in the oscillator. The 807 amplifier stage is then operated as a doubler to 50 Mc. This requires only a tank circuit that will tune 50 to 54 Mc., and a method of switching between this circuit and the original one.

Before the actual modification is begun, the following changes should be made in order to make the transmitter more r.f. tight. Replace the original output connector (Johnson designation X_{12}) with a standard female coax connector (SO-239). Replace the hookup wire that went from X_{12} to C_{11} with a length of RG-59/U coaxial cable. Connect the inner conductor to the output connector, and ground the shield to a soldering lug under one of the nuts that hold the connector in place. Do not connect the other end of the coax at this time.

807 Grid Drive

Two changes are required to improve the grid drive to the 807, in order to make it operate more efficiently as a doubler. The 807 grid bias and the screen voltage of the 6AG7 oscillator must both be raised. Replace the 807 grid resistor, R_3 , (15,000 ohms, 1 watt) with 22,000 ohms, 1 watt. Keep the old R_3 handy, as it will be used later.

Screen voltage for the 6AG7 was taken originally from a bleeder tap. It is about 180 volts. Raising it to the limit for a 6AG7, 250 volts, will

raise the output of the oscillator-tripler sufficiently to drive the 807 effectively when it is doubling to 50 Mc. This is done as follows: remove the wire that runs from the junction of the bleeder resistors, R_7 and R_8 , to the screen of the 6AG7 (Pin 6), then connect the former grid resistor, R_3 , from the B+ (Pin 4 of the power socket, X_4) to the 6AG7 screen. The screen voltage will be about 250 under load after this change.

The 50-Mc. Tank Circuit

The original 807 plate circuit is shown in the upper portion of Fig. 1. Designations are those used in the manufacturer's instruction book. The "minimum-maximum coupling" switch, SW_3 , located between C_{10} and C_{11} on the front panel, is used as the 6-meter band switch. One position is for 50-Mc. operation; the other for the normal coverage, 80 through 10 meters. The regular bands are still selected in the normal manner, with the band switch.

The circuit as modified is shown in the lower portions of Fig. 1. First remove all connections to SW_3 and terminals 1 and 6 of L_4 . Remove C_{12} . Wind the 50-Mc. plate coil, L_5 , as described in the parts list, and connect it between terminal 1 of SW_3 and ground. The coil should be centered between C_{10} and C_{11} , with its axis running perpendicular to the front panel. Mounting should be as rigid as possible. Connect a lead from terminal 1 of L_4 to terminal 3 of SW_3 . Connect a lead from terminal 2 of SW_3 to the stator of C_{10} .

At this point the circuits should look like the lower parts of Fig. 1, with only the pickup link, L_6 , left to be added. This is wound of insulated hook-up wire. The way it is wired into the circuit depends on whether 50-ohm coaxial or 300-ohm balanced output is desired.

The Coupling Circuits

Connections for 50-ohm coaxial output are given first. Connect a lead from terminal 4 of SW_3 to terminal 6 of L_4 . Connect the free end of the coax to terminal 5 of SW_3 , grounding the shield to the solder lug on the frame of C_{11} . Connect L_6 from terminal 6 of SW_3 to ground. L_6 should be tightly coupled to L_5 . Position the coils parallel to one another, then push L_6 into L_5 so they are as near to coaxial as possible.¹ Both coils

¹ The untuned coupling system for coaxial output shown by the author will work reasonably well in most instances, but the optimum method uses a variable capacitor to tune out the reactance of the coupling link. This can be connected between the coupling coil and ground, or in series with the coil and the coaxial line. The size of the coil should be adjusted so that the circuit tunes with about 40 μf . in the series capacitor. This will call for a smaller coil than the value given here for L_6 . — Ed.

* HIQ & SVC Co., 319th US ASA Bn, APO 171, N. Y.

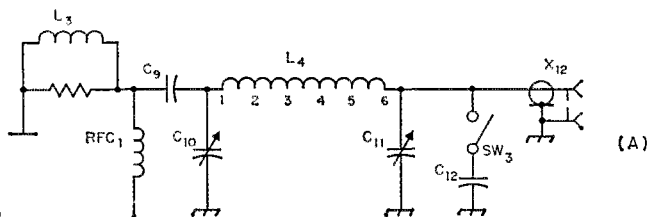
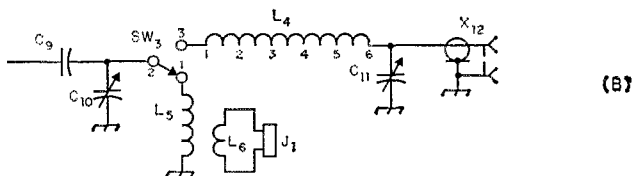
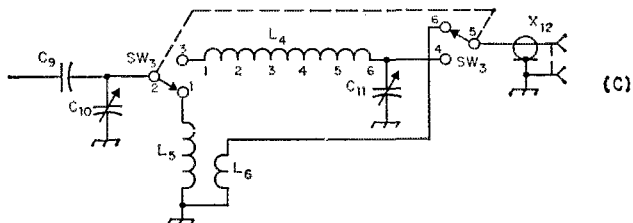


Fig. 1—Conversion of the Adventurer to include 50-Mc. operation. Circuit A is the original schematic, with parts designated as in the manufacturer's instruction manual. Conversion for use with balanced output is shown at B. Coaxial output conversion involves dual switching, as shown at C. Switch is shown in the 50-Mc. position for both conversions.



L₅—3¾ turns No. 14 enamel, 5/16-inch diameter, 1 inch long. Leave leads about 1½ inches on each end.

L₆—4 turns No. 20 insulated hookup wire, 5/16-inch diameter, 1 inch long. Leave 2-inch leads on each end.



should be mechanically rigid, so that the degree of coupling will remain the same in use.

For 300-ohm balanced output it is necessary to provide a separate output connector. A crystal socket is used for this purpose. To mount it, remove the ground lug from the rear wall of the chassis and use the hole as one of the mounting holes for the crystal socket. Enlarge the hole in the rear wall of the cabinet, so that it will pass the crystal socket.

Connect the free end of the RG-59/U coax to the junction of C_{11} and terminal 6 of L_4 , grounding the cable shield to the solder lug on the frame of C_{11} . (The second section of SW_3 is not used for balanced output.) Thread a piece of 300-ohm Twin-Lead through grommet G_2 from the vicinity of the output connector (crystal socket) to the vicinity of L_6 . Solder the Twin-Lead to the ends of L_6 , and position the coil with respect to L_5 as described above for coaxial output. Tape the Twin-Lead to the coax at points about two inches apart, from the L_6 end to four inches past grommet G_2 . Cut the Twin-Lead to the proper length and solder to the output connector.

Tune-Up Procedure

To put the modified Adventurer into service on 50 Mc. use a crystal between 8335 and 8995 kc. (The full band will allow a few more kilocycles than this, but with the power this rig will deliver we're not going to crowd the band edges. And it's better to play safe anyway, as you can't be sure that a crystal will work on the exact frequency marked on its holder.) Connect a 6-meter antenna to the output terminals. Place the band-switch in the 15-meter position. Tune the oscil-

lator for maximum grid drive to the 807. The oscillator tuning will probably be between 84 and 92 on the dial.

Tune the amplifier for minimum plate current. There will be two points, at least, where the plate current dips. The one that shows up around 80 to 90 on the amplifier dial should be the right one. Another, around 5 to 15, is on the driving frequency, 25 to 27 Mc. Check the operating frequency with an absorption-type wavemeter, to be sure that you have the right frequency. You won't work anyone but the FCC on 25 Mc.!

If all is well, your modified Adventurer should now be putting power into the antenna. Final tuning of the plate circuit, and adjustment of the position of the coupling coil, L_6 , should be made with the aid of a field-strength meter, or other device that will indicate power going into the antenna, as the plate current meter cannot be relied on entirely. Maximum output, particularly in a doubler stage, may be somewhat removed from the plate tuning point that shows minimum plate current.

To use the Adventurer on other bands, SW_3 is placed in the position marked "minimum" and left there. With this one exception, operation of the rig on 80 through 10 meters is the same as ever,² and only two switches need be thrown and the crystal changed, to put it on 6.

(Continued on page 144)

² Note that the capacitance available for tuning the output circuit has been cut in half by the removal of C_{12} . This may make the coupling capacitance too low for 80-meter operation. If such is the case, some provision can be made for clipping C_{12} in parallel with C_{11} , when using the rig on the lowest frequency band. — Ed.

CHEAP AND EASY SIDEBAND

2307 S. Clark
Tampa, Fla.

Technical Editor, *QST*:

Those constructing "Cheap and Easy Sideband" excitors may be interested in these tips gleaned from many hours spent adjusting the unit.

The r.f. phasing coils L_1 and L_2 should be spaced $\frac{3}{8}$ inch or more. Closer spacing caused trouble with the crystal oscillator; when the L_1 coil approached resonance, L_2 dropped out of oscillation.

Be sure to tightly twist the link lines and dress them apart, as mentioned in the original article. All the r.f. grounds around the balanced modulator stage should be made at the same point. This includes the capacitors across the T_2 and T_3 secondaries.

A receiver with a Q multiplier or crystal filter can be used to adjust the exciter. After carrier balance is made by observing the S meter, apply 1000-cycle tone and identify the two sidebands. By careful adjustment of the ratio pot and L_1 and L_2 , suppression of the undesired sideband is indicated on the S meter. After each adjustment of L_1 or L_2 , remove the tone and rebalance the carrier. A point will be found where the undesired sideband will be nearly eliminated. Adjust the audio balance control for complete suppression. The adjustments of L_1 , L_2 , and the ratio pot will be very critical, and the first adjustment will be time consuming. I have found the use of the receiver easier than a scope because it is easier to understand where you are at all times.

There are several spurious signals present at the output of the mixer. The third harmonic of the v.f.o. is 15.9 Mc. for 20-meter output. It is suggested that, if the rig is to be used only on 20, builders consider the use of an 8400-ke. crystal instead of one at 9 Mc. This places the troublesome 3rd harmonic at 17.7 Mc. which is far enough removed from 14.3 Mc. to keep it out of the 1625 grid circuit. There is a considerable amount of 15.9-Mc. energy present in this grid circuit if the 9-Mc. crystal is used.

— Adelbert Kelley, K4EEU

NEVER TEST A TRANSISTOR WITH AN OHMMETER

7 South Dixie
Lake Worth, Fla.

Technical Editor, *QST*:

There has been a lot of correspondence on the Handitalky rig described in March 1958 *QST*. For some reason, a high percentage of the letters included a question as to who makes the 2N248. Apparently, Texas Instruments is not a widely-known firm among the ham fraternity. However, Allied Radio and most of the other major mail-order houses list practically all of the TI stock transistors, even including those astronomically-priced silicon types.

There is one thing, however, that has come up with increasing frequency — apparently, as the things have been built — which I am sure merits a comment somewhere.

It seems that a great many hams like to measure everything, including transistors, with an ohmmeter. Since most of the common instruments have full-scale readings of four to ten milliamperes, which must be shunted or series'd with the object to be measured, very high currents will be passed between, say, emitter and base, where the transistor resistance is usually only a few hundred ohms at most. Under the circumstances, whatever the transistor might have been before this high-current steady state d.c. test was made, its condition after the test is likely to be very depressing. And when you consider that the ohmmeter check is unlikely to produce any useful information to begin with, the whole situation becomes depressing.

I think it would be a good idea if you can find the opportunity to let the boys know that this is *not* the way to do whatever it is they think they are trying to do when they try to measure their low-power transistors with their destructive ohmmeters.

— E. G. Von Wald, W4YOT

¹ *QST*, May, 1958, p. 28.

MORE ON QUAD DIMENSIONS

4 Moosehill Road
East Walpole, Mass.

Technical Editor, *QST*:

The current sunspot cycle generated the urge to construct an efficient 3-band antenna system for the 10-, 15- and 20-meter bands to take advantage of the DX possibilities. Early last year discussions with my neighbor W1ALK led to the decision that the cubical quad offered many advantages for 3-band operation. While this project was still in the discussion stage, the article in the April 1957 *QST* by W4NNQ came to our attention and this physical design seemed to have considerable merit, particularly the method of obtaining fixed spacing in terms of wave length.

Some work had been done locally with cubical quad antennas on 2 meters by W1ALK and on 15 meters by W1HTR. These attempts independently had revealed definite evidence that the element lengths should be greater than those given by the usual figures.

When actual construction was begun, both the driven element and the reflectors were made one foot longer than the figures given in the article by W4NNQ. Arrangements were made to measure resonant frequency and input impedance with a grid-dip meter and an antennoscope at the end of electrical half-wave or full-wave lines on the three bands involved. These lines were cut for target frequencies and ended up at 14,106 kc., 21,231 kc. and 28,650 kc.

The first antenna was constructed at the home of W1ALK, and with the stub on the reflector adjusted for maximum front-to-back ratio it became apparent that even with the addition of one foot to the usual length figures, the resonant frequencies were still higher than those desired. By the usual amateur procedure of cut and try, the driven-element lengths were gradually increased until resonance at the desired frequency was obtained. The rather astonishing figures came out as follows: for the 10-meter frequency of 28,650 kc., the loop length was 34 feet 11 inches; for the 15-meter frequency of 21,231 kc. the loop measurement was 47 feet 1 inch, and for the 20-meter frequency of 14,106 kc. the measurement became 71 feet 7 inches. These figures seem to stand up under repeated tests, and lead to the formula

$$\text{Loop length (ft.)} = \frac{984 \times 1.02}{f(\text{Mc.})}$$

The next question was the input impedance. Our antennoscope figures showed 140 ohms on 10 meters, 125 ohms on 15 meters, and 150 ohms on 20 meters. As a result of these figures, 150-ohm Twin-Lead was selected. The actual wire used was Belden No. 8224. These input impedances were considerably different from the usual published figures, but when the electrical half-wave lines were removed and two different random-length 150-ohm lines were connected to the antenna the same figures of input impedance held, which would seem to confirm our findings.

A duplicate antenna was installed at approximately the same center height above earth (46 feet) at W1WTF, using the measurements derived from the experience with the antenna of W1ALK. The only appreciable difference at the other location was a slight lengthening of the 15-meter element for the antenna of W1WTF.

We have been reluctant to publish these figures because of the particular design used, but contact with several amateurs who were seriously trying to resonate and match feedlines to their quad antennas seems to bear out our findings.

— George C. Rummell, W1WTF

DRIFT-CANCELLING OSCILLATOR

P. O. Box 529
La Jolla, Calif.

Technical Editor, *QST*:

The frequency-drift-cancelled oscillator principle, the basic feature of the very fine British Racal RA-17 Receiver ("A New Receiver Tuning Principle," *QST*, March, 1958) is not quite as new as some may believe. Some history:

In 1942 and 1943 the writer developed an experimental receiver using the drift-cancelled oscillator idea with both

100 kc. and 1000 kc. harmonics from a crystal standard source. This work was done at La Jolla, in cooperation with The Hallcrafters Co.

In 1947 the Collins Radio Company (*Electronics*, March, 1947, p. 209) announced the 51M-2 VHF Receiver, and claimed the DCO (Drift Cancelled Oscillator) as an exclusive development.

In 1956 the principle was again "invented" by the French in the "Stabilidyne," described by Marcel Colas in *Onde Electrique*, February, 1956.

Again, in 1957, by the British in "A 0.5 to 30 Mc. Communications Receiver" *British Communications and Electronics*, August, 1957 (RA-17), it was claimed to be developed by T. L. Wadley of South Africa.

— J. L. A. McLaughlin

CONVERTER NOISE & QUIST QUIZ

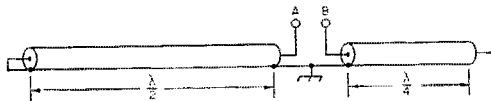
2315 Grant St.
Apt. 6
Berkeley 3, Calif.

Technical Editor, *QST*:

I enjoyed the interesting article by W8WXV in the July 1958 issue of *QST*. I would like to take issue with one point, however. The author states that "the load resistor (of the output cathode follower) should be adjusted so that the noise from the converter just overrides the receiver noise." I don't know how much "just overrides" means, but taking it to mean something on the order of 2 db., it is easy to show that the converter is not performing in an optimum manner. Since random noise is additive, the noise at the receiver output will be composed of the sum of the amplified converter noise and the receiver noise. Two db. corresponds to 58.4 per cent increase in power which means that the converter is contributing only $.584/1.584 = 36.9$ per cent of the output noise. In the ideal case, the converter would be responsible for practically all of the output noise, giving an improvement in signal-to-noise ratio (over the above case) of $1.584/.584 = 4.34$ db. This is quite a substantial improvement.

Also, I find myself in disagreement with the solution to the June 1958 Quist Quiz. I'm quite sure that if you set the thing up and measure the impedance between terminals A and B, you won't measure zero ohms (even assuming lossless coax). This is actually a very difficult problem in electromagnetic theory because the field is not confined to the interior of the coax. What is illustrated is actually an antenna. There will be a radiation resistance component between terminals AB resulting from current flowing on the outside of the coax. This is similar to the problem of the one-half wavelength folded dipole. Simple transmission-line theory would predict an input impedance of infinity (two quarter-wave shorted transmission lines connected in series) rather than the correct value of about 300 ohms. This discrepancy arises from the fact that the current distribution on the folded dipole is vastly different from that given by two traveling waves originating at the input terminals and being reflected by the shorts at the ends of the lines. Perhaps the problem should have been presented as in the figure below. In this case the impedance Z_{AB} would indeed be zero.

— Frederick W. Brown, W6HPH



TRANSISTOR POWER SUPPLY

22060 Charter
Detroit 41, Mich.

Technical Editor, *QST*:

A good many questions have been asked about the unit described in June 1958 *QST*.¹ I'd like to mention that the

¹ Karl "100-Watt Transistor Mobile Power Unit," *QST*, June, 1958.

power supply is located under the car seat, using a $\frac{1}{4}$ -inch aluminum heat sink. The panels shown in the photograph were cut in two to provide four $\frac{1}{8} \times 4\frac{1}{2} \times 9$ -inch panels (two to the side) which just fit under the seat when the seat is moved all the way back over the floor recess toward the back section (1957 Ford).

The differences between power supplies currently in *QST* apparently need emphasizing. The unit shown in February *QST*² used a toroid transformer and features small size, compactness and light weight. It has short-circuit protection and is self excited. The nominal rating is 65 watts. A single special toroid type transformer (designed for this application) is used. The chopper frequency is 1000 cycles per second.

In the April 1958 issue a larger unit using one special transformer (toroid) and two surplus 400-cycle transformers was described.³ Features include self protection against overload and use of low-cost surplus transformers (the chopper frequency is 380-1000 cycles). The article includes design data enabling the ham to do it himself.

The unit in June *QST* is a 100-watt supply using two special transformers, one a toroid type and the other having a hypersil core. The circuit is separately excited and therefore not self-protecting against overload. The circuit includes a transient-protection system to insure against sudden failure of a transistor. The features of this unit are a separately-excited chopper, transient protection, and use of a separate power transformer of a type which easily can be insulated for high voltages.

In all cases proper fusing should be used.

I think this points out the major differences between the three units, and may help the prospective builder make his own choice of system. Before long there should be more ideas for these supplies, better and less susceptible to temperature effects, overload, etc. Increased use will certainly reduce the component cost and increase the available know-how.

— Bob Karl, W8QFH

THE 701A

239 Bristol Road
Webster Groves, Mo.

Technical Editor, *QST*:

The letter from W8NJH regarding the surplus 701A was quite interesting, and I would like to add my two cents' worth. About two years ago I built a complete a.m. kilowatt on 75 using a pair of 701As in a conventional push-pull final, modulated by 810s. The final power supply was 2000 volts. Not having much information about these tubes, I made the assumption that the screen voltage should be in the 350- to 400-volt range, as did W8NJH. However, in the check-out tests the rise in plate current, when the final was tuned slightly off resonance, was rather violent. Since the rig was built as a club station transmitter for W9A1U (Egyptian Radio Club) I felt this could lead to trouble. After experimenting with lower screen voltages I finally settled on 125 volts. The plate-current rise off resonance was very pronounced, but not to the point of running a 1000-mil meter off scale. Apparently there were no adverse effects, as the rig has given a good account of itself on 75. The screen voltage was from a separate supply with an audio choke in series. The regulation of the screen supply is such that with full excitation and no plate voltage the screen voltage drops to 50 volts, thereby providing automatic overload protection.

In this rig I found that tube shields were necessary. This tube has no internal shield. The layout of the final had the plate tank capacitor across the back of the chassis with the plate tank coil on top of the capacitor. The tubes were mounted side by side between the tank circuit and the front panel. Until shielding was built up to the point where the tank coil could not "see" down into the grid structure of the tube, it was impossible to neutralize. After shielding it was quite docile. The grid circuit, incidentally, was under the chassis.

— M. L. Seuffert, W0CZA/MFM

² Chambers, "Transistorized Power Supply," *QST*, Feb., 1958.

³ Johnson, "High-Power Transistorized Mobile Power Supply," *QST*, April, 1958.

THE method of presenting pi-network tank-circuit design information used in the accompanying charts is due to D. W. Wulf, W9FID, Mendota, Ill. These graphs contain the same intrinsic information as those currently in the *Handbook*,¹ but give it in terms of inductance and capacitance, rather than reactance. The values shown apply at a frequency of 3.5 Mc. and must be modified appropriately for other frequencies. Average values for the various amateur bands can be found as follows:

- 3.5 Mc. — Use as given.
- 7 Mc. — Divide L and C values by 2.
- 14 Mc. — “ “ “ “ “ “ 4.
- 21 Mc. — “ “ “ “ “ “ 6.
- 28 Mc. — “ “ “ “ “ “ 8.

An approximate value for the plate load resistance can be found from

$$500 \times \frac{\text{Plate Voltage}}{\text{Plate Current in ma.}}$$

¹ From an article by R. C. Meidke, WØRSL, in November 1955 *QST*.

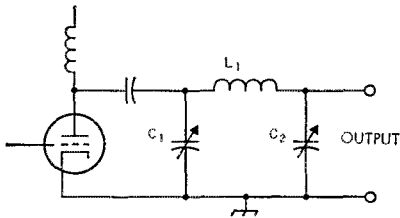


Fig. 1—Pi-network tank circuit, with component designations used in the charts. The plate load resistance is the resistance looking into the left-hand side of the network when an actual load is connected to the "output" terminals.

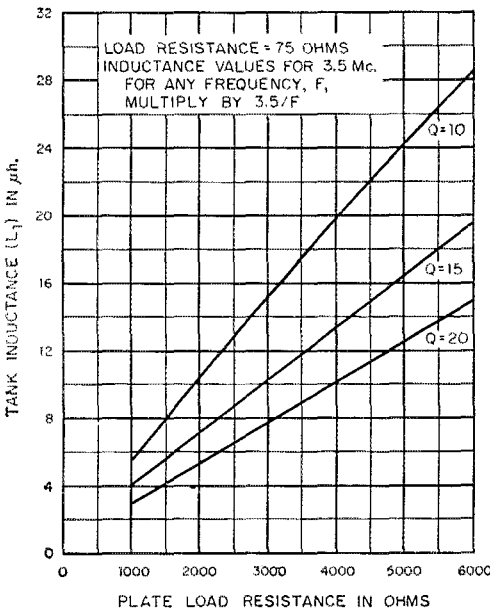


Fig. 3—Tank inductance as a function of plate load resistance, for an actual load of 75 ohms.

Pi-Network Tank Design

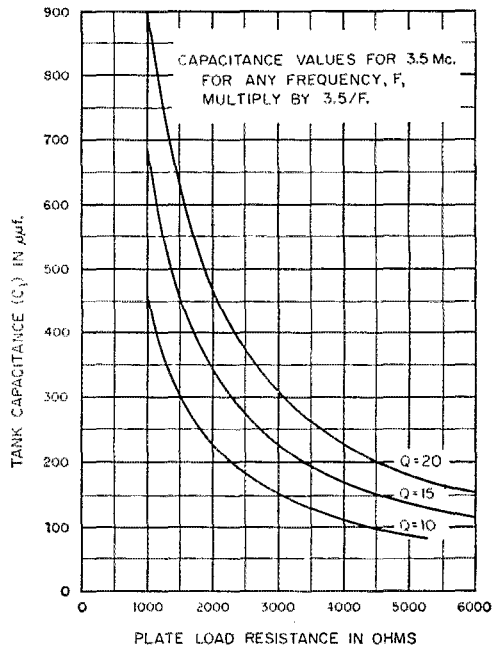


Fig. 2—Tank capacitance as a function of plate load resistance. The tank capacitance is dependent only on the tank Q , so this chart applies regardless of the value of the actual load resistance.

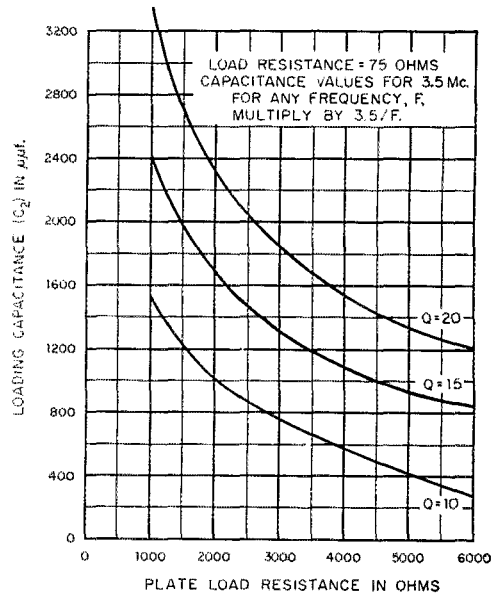


Fig. 4—Output or loading capacitance as a function of plate load resistance, for an actual load of 75 ohms.

It is generally satisfactory to use a single value of tank inductance for an entire band, provided the loading capacitor C_2 can be adjusted over a fairly wide range. When using a fixed tank inductance calculated as described above it is advisable to select a Q of at least 15, since the operating Q will decrease with increasing frequency in the band.

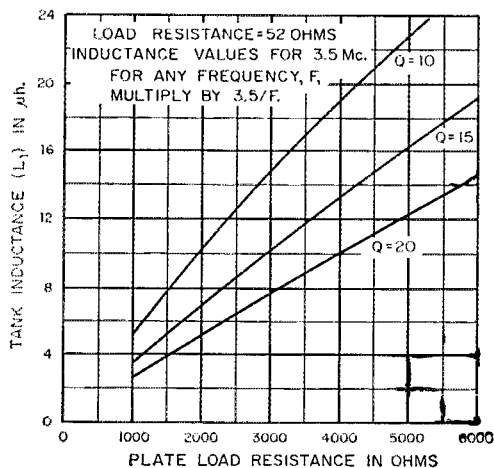


Fig. 5—Tank inductance as a function of plate load resistance, for an actual load of 52 ohms.

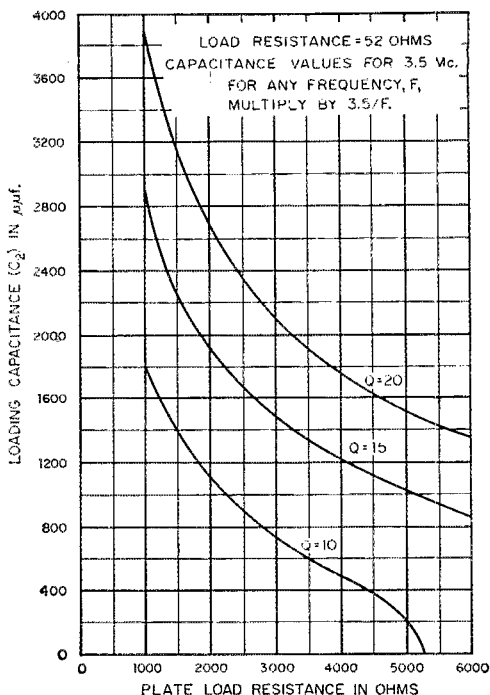


Fig. 6—Output or loading capacitance as a function of plate load resistance, for an actual load of 52 ohms.

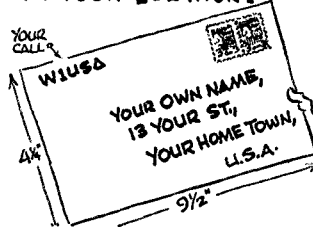
A.R.R.L. QSL BUREAU

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 $4\frac{1}{4}$ by $9\frac{1}{2}$ 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.
- W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.
- VE1 — L. F. Fader, VE1FQ, 125 Henry St., 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, 236 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 Namaau Dr., Honolulu, T. H.
- KL7 — KI7CP, 310-10th Ave., Anchorage, Alaska.
- KZ5 — Catherine Howe, KZ5KA, Box 407, Balboa, C. Z.

IS YOURS ON FILE
WITH YOUR QSL MGR?



SEVERAL suggestions have been made for improving the keying of the DX-100 transmitter.^{1,2} These systems have been quite successful in improving the keying but they have the disadvantage that the v.f.o. runs all the time, making break-in operation impossible. It is necessary to throw a switch to go from receive to transmit and back again.

W1DX has described a break-in keying system using a VR tube.^{3,4} Since I desired to use break-in

¹ Mace, "Improved Keying for the DX-100," *QST*, Aug., 1956.

² "Hints & Kinks," *QST*, Feb., 1957.

VR Break-In for the DX-100

Outrigger Application of Differential Keying

BY EMORY A. COX,* W0CGZ

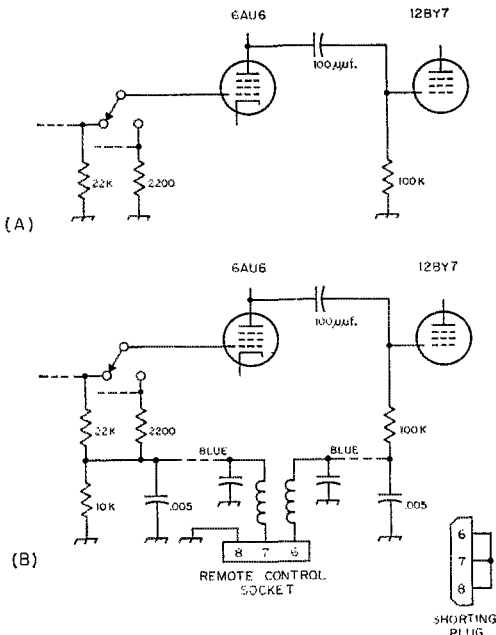


Fig. 1—(A) Portion of the original DX-100 oscillator and buffer circuit that will be changed.

(B) Modification of the circuit requires the addition of a 10,000-ohm resistor and two 0.005-μf. disk capacitors. See text. An octal plug, wired as shown, restores the DX-100 to its original type of operation.

with my new DX-100, I decided to see if his system could be applied to it.

The keying unit itself is built on a small chassis and connected to the DX-100 through the accessory socket at the rear of the transmitter. No constructional details are given, but some comments on the unit will be made later.

The first and obvious step is to pull the plug and then remove the chassis from the cabinet. Then remove the v.f.o. subchassis from the main chassis. (If you are not willing to do that, then you are not much interested in improving the keying and so need read no further.) The grid return of the 6AU6 v.f.o. tube is to ground through either a 22,000- or a 2200-ohm resistor, depending upon the position of the band switch. (See Fig. 1A.) These resistors are tied to a solder lug on the top of a 1½-inch spacer. Remove the grounded ends from the lug. (Caution: don't break the leads.)

Take a one-lug terminal strip (the kind that has the lug and insulator mounted vertically), and cut a notch out of the mounting foot so that it will slip around a 6-32 screw. Loosen sufficiently the 1½-inch screw that goes through the spacer so that you can slip the mounting foot of the terminal strip under the spacer. Orient it so that it is between the spacer and the tuning capacitor. Connect the formerly grounded ends of the two resistors to this lug. Connect one end of a 10,000-ohm ½-watt resistor to this same lug. Connect the other end to the ground lug and solder. Connect one end of a piece of hookup wire about 8 inches long to the lug (junction of resistors) and solder. Run this wire along with the other four wires already on the v.f.o. subchassis.

Looking at the main chassis from the panel, locate the head of a screw just to the right of the five-lug terminal strip near the panel. This screw is very near the hole for one of the spade lugs used to hold down the v.f.o. subchassis. Loosen this screw enough so that a terminal strip can be placed under it. Notch the mounting foot of a two-lug terminal strip (the kind that has one lug grounded) so that it will slip around a 6-32 screw and mount it under the head of the screw. Orient it so it will not interfere with the mounting of the v.f.o. subchassis. Connect one lead of a 0.005-μf. disk capacitor to the terminal lug and the other lead to ground, and solder the ground connection. Cut a piece of hookup wire (solid preferred) to about 18 inches and fasten one end to the terminal lug. Push the other end down through the nearby ⅜-inch grommet. Replace the v.f.o. subchassis on the main chassis and reconnect the leads. The new lead goes to the new terminal strip just mounted. Solder all connections.

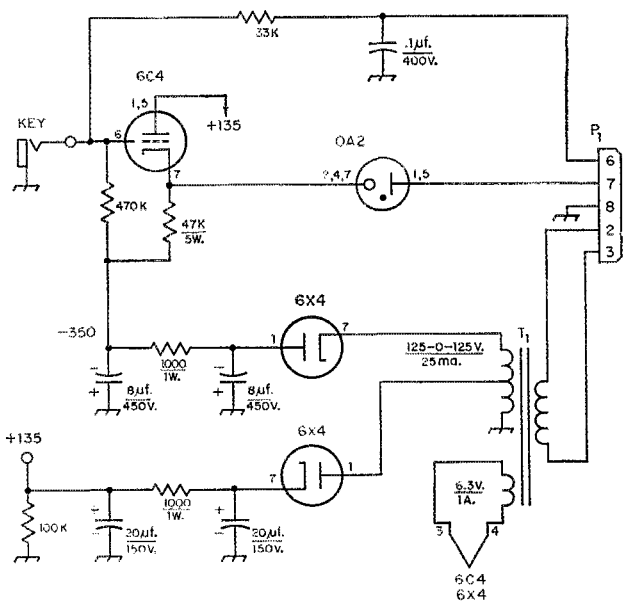
Turn the transmitter up so that it rests on the rear apron. Run the lead you pushed down through the ⅜-inch grommet along the wiring harness to the left and then toward the rear to terminal strip GG. (For those of you who have

* 916 North 13th St., Leavenworth, Kans.

³ Goodman, "VR Break-In Keying," *QST*, Feb., 1954.

⁴ Goodman, "Keying the Radiotelegraph Transmitter," *QST*, July, 1956.

Fig. 2—The VR break-in keying unit. Unless otherwise indicated, resistances are in ohms, resistors are 1/2 watt. P₁—Octal plug. T₁—Small 250-v. c.t. transformer (Stancor PS-8416). See Footnote 5.



lost your assembly instructions, this is the terminal strip on the left side of the chassis nearest the rear; it has a blue wire connected to each of the insulated lugs.) Using an ohmmeter, (determine which lug is connected to Pin 7 of the accessory socket. Connect the new wire to this lug and solder.

Now turn your attention to the 12BY7 buffer socket. There is a 100,000-ohm resistor from Pin 2 to ground. Unsolder the grounded lead. Here again be careful of the lead. Just to the right of the socket there is an unused 3/16-inch hole. Pass a 6-32 screw through this hole from the top of the chassis. (Hint: a drop of coil dope on the head of the screw will hold it in place while you work on the other side.) Mount a one-lug terminal strip by means of this screw. Connect the free end of the 100,000-ohm resistor to this lug. Connect one lead of a 0.005- μ f. disk capacitor to the lug. Connect the other lead to the adjacent ground lug and solder. Connect one end of a piece of hookup wire about 18 inches long to the terminal strip and solder. (Use insulated solid wire.) Run this wire down in the corner and back to the rear of the chassis. Then run it to the left along the wiring harness, through the 3/4-inch grommet, and over to the other lug on terminal strip GG. Connect and solder. This wire connects through the wiring harness to Pin 6 of the accessory socket. This completes the modification of the transmitter, and the wiring should be as shown in Fig. 1B.

The Keyer

We are now ready to build up the keying unit. However, any time you want to operate the rig just as it was before, merely connect Pins 6 and 7 of an octal plug to Pin 8 and insert in the accessory socket. See Fig. 1B.

Reference should be made to the articles previ-

ously mentioned for information as to circuit constants and adjustments. The constants as given in these articles seemed to be about right for my rig with the voltages shown in Fig. 2. Referring to Fig. 2, you will note a somewhat unorthodox connection of the power transformer. This connection gives about the voltages needed.⁵ Very little filtering is needed, since none of these voltages are applied to the rig when the key is down. Connection to the transmitter is made through a five-wire cable and octal plug. Be sure that the connection from the 0A2 tube goes to Pin 7 on P₁ and the one from the end of the 33,000-ohm resistor is connected to Pin 6. Power for the transformer is supplied through Pins 2 and 3, and Pin 8 is grounded. The key plugs into the jack on the keying unit. The key jack on the transmitter is not used.

Other transformers⁵ and tubes could be used. However, the voltages should be approximately as shown. A 6J5 was specified in the original article instead of the 6C4 I used. A VR-150 can be used in place of the 0A2. Other rectifiers could also be used, depending upon available voltages. A selenium rectifier could be used for the positive supply in the unit shown.

The reports I have received so far indicate crisp, clean keying with no trace of chirp or clicks, and it is not necessary to throw any switches while listening.

⁵ The values shown in Fig. 2 are those used by W0CGZ and they have given him no trouble. However, conservative design would call for a separate 6.3-volt heater transformer or winding for the 6X4 rectifier in the higher-voltage supply, with the cathode connected to one of the heater leads. As shown above, the current rating of the 6.3-volt winding of the transformer specified is exceeded.

If the separate heater transformer is used, as suggested above, the cathode of the 6C4 should be tied to one of its heater leads. — Ed.

High-Level Mixer for 144-Mc. S.S.B.

THERE ARE many ways to put a single-sideband signal on the v.h.f. bands, but the simplest approach is one that utilizes a sideband setup already in going condition on a lower-frequency band. Starting from this point, we still have to decide whether to do the job at the receiving-tube power level, or go to something in the way of a mixer that will drive a high-powered final stage or feed the antenna directly.

Advantages can be claimed for both methods. If we use a lower-level mixer, the entire s.s.b. generating and heterodyning process can be accomplished with low over-all power consumption, and at a level that makes filtering or trapping out spurious beat products a simple matter. The principal drawback lies in the number of amplifier stages required to bring the power up to a usable level. Stability and linearity requirements being what they are for the radiation of a good s.s.b. signal, this may be no simple matter, particularly for the newcomer to the game. The problem is certainly not simplified in going to 144 Mc.

The high-level mixer described here puts out enough power to be used without additional amplifier stages, if you don't care to go to high power right away. If you want to pour on the coal, a pair of tetrodes in an amplifier stage of suitable design will get you up to or near the legal power limit. The catch? Any heterodyning process generates unwanted frequencies. Some special precautions must be taken to prevent radiating them, if the mixer feeds the antenna.

The mixer shown in schematic form herewith is the work of K6GFI, Sacramento, California. Dr. Bachelor built his own phasing exciter, from the ground up, but any s.s.b. setup with 14-Mc. output can be used. Originally K6GFI tried an 832A, in the manner described in November, 1956, *QST*, page 74. This worked, but the output was far too low to drive a pair of 4X150As in a linear amplifier. This was found to be the result

of an internal capacitance of 60 $\mu\text{f.}$ from screen to ground in the 832A. The mixer was rewired for a 6524, and there was drive to burn.

As shown in Fig. 1, the 6524 is driven on 130 Mc. The heterodyne unit used a 43.44-Mc. crystal, the oscillator running on regulated 150-volt supply. Any well-designed combination that will deliver about 3-ma. grid current through the 12,000-ohm grid resistance can be used. More on this later. Output from the 14-Mc. s.s.b. exciter is fed into a tuned circuit in the screen. The screen voltage is adjusted to give maximum output. Metering of the screen current is strongly advised, in order that the operator can be sure that he is staying within the screen ratings of the 6524.

An outstanding characteristic of mixers is their ability to show output with very low drive. In addition to the desired frequency, 144 Mc. (130 plus 14), there will be a husky signal on 116 Mc. (130 minus 14). You know this one will have to be dealt with. There will be energy going through on 130 or 14 Mc., too, but that isn't all. If the 130-Mc. or 14-Mc. components have harmonic or subharmonic content, these unwanted frequencies can produce all kinds of spurious products in the mixer output. There can be s.s.b. all over the place if you don't watch out.

Precautions include more than ordinary care in the design of the 130-Mc. driver. Starting with a v.h.f. crystal helps a lot, but it introduces stability problems. Run the oscillator at low input, and with a regulated supply. Then use selective interstage and output coupling circuits, to keep down the strength of harmonic and subharmonic frequencies. The final touch, which should pretty well take care of the unwanted frequencies, is the insertion of a re-entrant-cavity filter in the line between the mixer output circuit and either the antenna or the grid circuit of the final amplifier, if the latter is used.

(Continued on page 148)

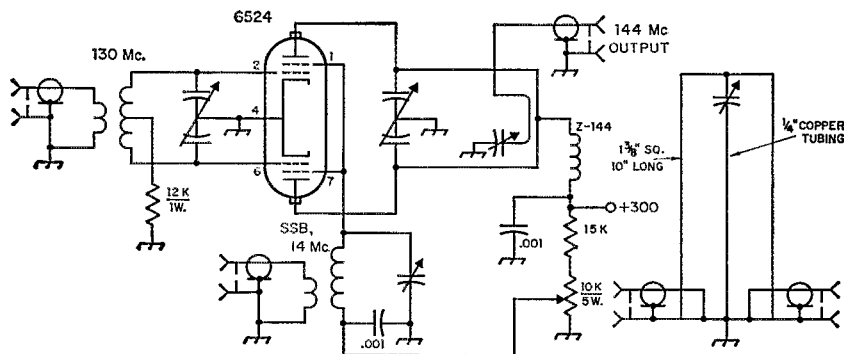
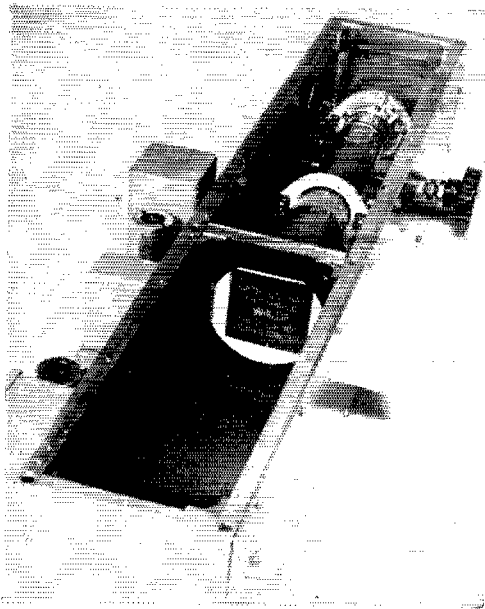


Fig. 1—Schematic diagram of the high-level mixer used for 144-Mc. s.s.b. work by K6GFI. Coaxial filter, right, is used to prevent unwanted beat products from being passed on to the antenna or final amplifier.



In Two Parts*

Part II—Circuit and Construction Details

BY

COPTHORNE MACDONALD,**
WA2BCW, EX-W4ZII

Inside view of the flying-spot scanner, with slide in place. The knob at the rear actuates a cam arrangement for moving the cathode-ray tube back and forth so the face of the tube can be placed in contact with the photographic negative containing the subject to be transmitted. The outboard chassis at the left contains the subcarrier oscillator and modulating circuits. Inside the box in the foreground, but not visible in this photo, is the photomultiplier tube.

A New Narrow-Band Image Transmission System

PART I of this article described a low-cost method for transmitting images with conventional ham gear, a method which may be of interest to experimentally-inclined amateurs. The system, by combining television and facsimile techniques, permits a 120-line picture to be transmitted by almost any amateur phone transmitter and received on the station's communications receiver. The interested reader is referred to Part I for a discussion of the system's features and principles of operation. In this issue the actual circuitry will be described, with emphasis on the critical points, in order to help the reader who might like to build similar equipment make the most of his junk box.

Here are the circuit details of the equipment described in outline in Part I of this article. The experimenter will find plenty of scope for trying out ideas of his own, since the basic system permits many variations. Discarded TV receivers and war-surplus c.r. indicator gear can be dug into for many of the components.

Transmission Circuitry

The schematic of the combined transmission-reception apparatus is shown in Fig. 3. The cathode-ray tubes (V_2 and V_9) and the photomultiplier tube (V_1) require a high negative voltage for operation. A scope-type transformer with an electrostatically-shielded 2.5-volt filament winding for the V_2 heater is used in conjunction with a half-wave rectifier to develop approximately 2000 volts d.c. If the transformer (T_1) suggested in the parts list is used the rectifier should be a 2X2; other transformers may require a different tube. R_{20} should be selected to provide 1300 to 1500 volts across filter capacitor C_1 , and will have a value of 1 or 2 megohms. Old scopes provide a fertile field for conversion to slow-scan use, but the available voltage should be at least 1500 for sufficient receiver cathode-ray tube brightness. The photomultiplier tube is quite sensitive to voltage changes so NE-2 neon bulbs were wired across the voltage-dividing resistors to regulate the dynode voltage at about 65 volts per dynode stage. The 450 volts B+ can be obtained from any supply capable of delivering approximately 200 ma. The +105- and -105-volt supplies were regulated by OC3/VR105 regulator tubes.

* Part I of this article appeared in *QST* for August, 1958

** 49 St. Mary's Place, Nutley, N. J.

The grid resistor (R_{24}) of V_{3A} is also the photo-multiplier anode load resistor; thus the grid of V_{3A} is at some negative potential whose actual value depends upon the setting of the V_2 brightness control (R_{13}) and the density of the picture being scanned. The large negative pulses coming from the sync-combiner diode (V_{12}) during retrace periods are attenuated by the R_{21} -through- R_{24} network but are still of sufficient amplitude to drive V_{3A} beyond cutoff. The voltage-dividing network in the V_{3A} plate circuit and V_4 grid circuit permits direct coupling of the video and

sync signals to the balanced modulator.

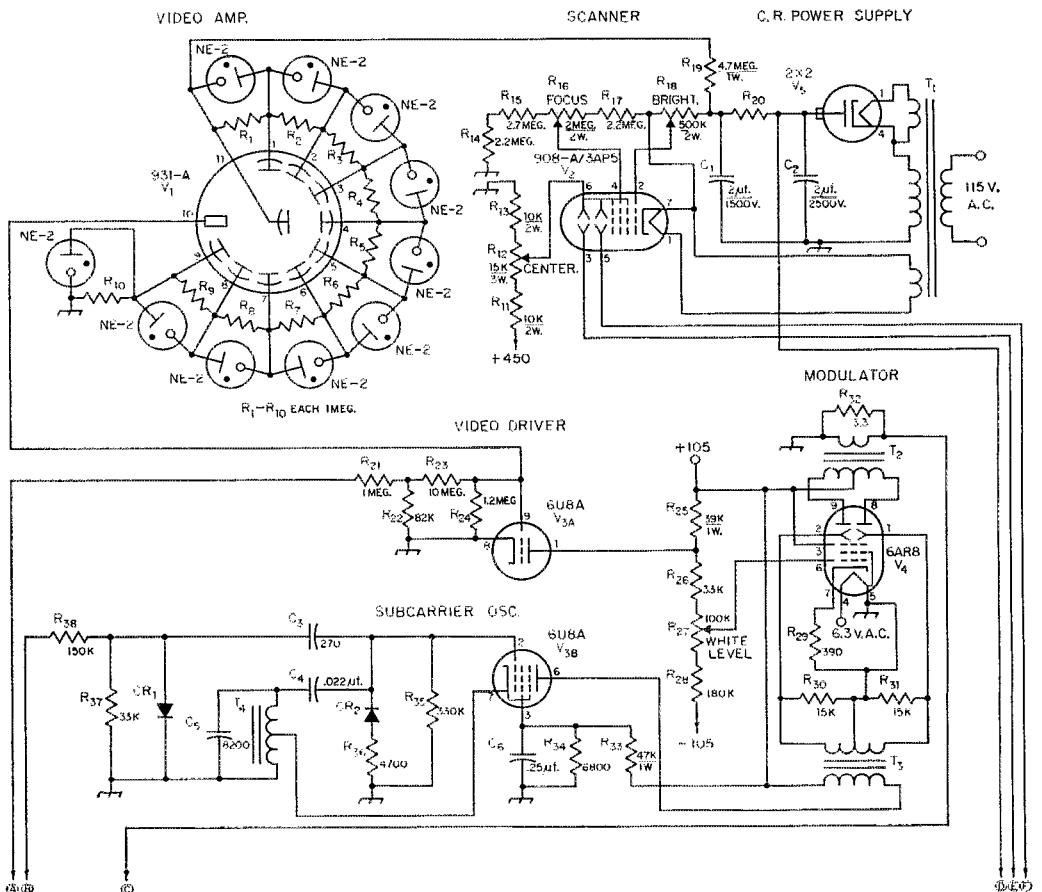
The white-level control (R_{27}) should be adjusted so that the tone output of the balanced modulator¹ is close to zero during the scanning of white portions of the picture. A scope connected to the output jack (J_1) during transmis-

¹ This is not the conventional type of balanced modulator, the accepted definition of which is a modulator whose output contains side bands but no carrier. In the present case, a balanced circuit is used to produce an ordinary a.m. signal, but with the *modulating* signal balanced out in the output circuit. This is necessary because the modulating signal and carrier are so close in frequency. — Ed.

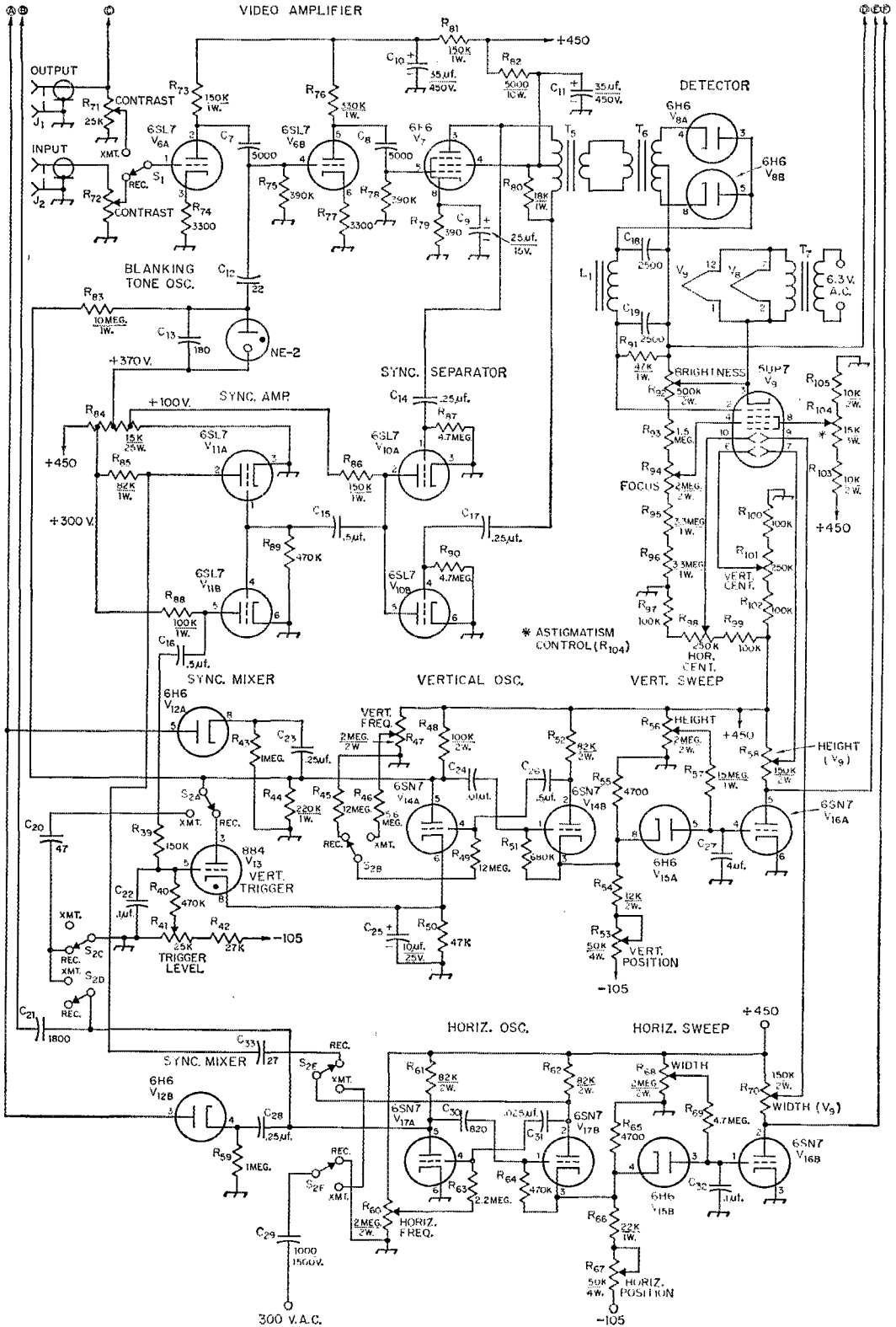
Fig. 3.—Signal-generating and reproducing circuits for slow-scan picture transmission. Unless otherwise indicated, capacitances are in μmf , resistances are in ohms, fixed resistors are $\frac{1}{2}$ watt, variable resistors are composition potentiometers, $\frac{1}{2}$ watt. Capacitors marked with polarity are electrolytic; others may be paper, ceramic, or mica as available or convenient. With the exceptions listed below, component designations are primarily for text reference.

- C_5 —See T_4 .
 C_{10} —See text.
 CR_1, CR_2 —1N34 or equivalent.
 J_1, J_2 —Microphone-type connectors.
 L_1 —12 henrys, 20 ma. (Thorndarson 20C52).
 R_{20} —1 to 2 megohms, 1 watt (see text).
 R_{31} —Slider type resistor.
 S_1 —S.p.d.f. toggle or rotary.
 S_2 —2-pole 5-position rotary (Centralab PA-2019).
 T_1 —Scope transformer, to deliver approx. 2000 volts d.c.; see text (Thorndarson 22R40; 1800 volts at 2 ma.; 2.5 volts at 2.2 amp. or 6.3 volts at 0.6 amp.).

- T_2, T_5, T_6 —Audio output transformer, push-pull plates to voice coil.
 T_3 —Audio interstage or small modulation transformer, single plate to push-pull grids, ratio not critical (Triad M-1X).
 T_4 —Autotransformer or tapped inductance; see text. C_5 may be varied to suit any available tapped coil to resonate at 2000 c.p.s.
 T_7 —6.3-to-6.3-volt isolation transformer, 1.2 amp. (Stancor P-8191).
 V_5 —2X2, or to suit filament voltage available on T_1 .



VIDEO AMPLIFIER



sion will permit this adjustment to be made, as well as setting the maximum black level at about 50-75 per cent of sync level with R_{18} . Fig. 4 illustrates the correct output wave form. No balancing control was provided in the balanced modulator, because the unwanted 0-1000 c.p.s. video was found to be 20 db. below sync level when checked on the scope with the 2000-c.p.s. carrier cut off.

The 2-kc. oscillator (V_{3B}) is an experimental circuit which permits the horizontal sync pulse to control the oscillations. It was felt that maintaining a constant time relationship between the sync pulses and individual cycles of tone might permit slightly more accurate synchronization than would be possible with a random relationship between the two. The results were inconclusive, however, with any advantage being a slight one. A standard oscillator circuit would probably serve just as well and would have a better output wave form. In the circuit used, T_4 is a high- to low-impedance headphone autotransformer. The CR_2-R_{36} combination improves the output wave form by limiting the negative grid-voltage swings so the tube is not driven to cutoff. This "gimmick" can also be applied to other types of oscillators. The oscillator output transformer (T_3) can be a small modulation transformer or single plate to push-pull grid interstage unit.

On "transmit" the horizontal multivibrator (V_{17}) is synchronized at a submultiple of the power line frequency by a voltage fed from the power transformer (external) through C_{29} . R_{60} controls the horizontal frequency and permits frequencies from 15 to 60 c.p.s. to be selected. The picture width is controlled by R_{68} which regulates the charging current of the sweep capacitor C_{32} . On retrace, V_{17B} is cut off and a heavy discharge current through V_{15B} pulls the grid voltage of V_{16B} to some negative value which depends on the setting of R_{67} . The charging rate during sweep is such that the grid never goes positive. A highly linear sawtooth wave, therefore, appears on the grid of V_{16B} ; the tube ampli-

fies this voltage, and it is fed directly to Pin 5 of V_2 .

The vertical multivibrator has a sweep range of 1 c.p.s. to 1 cycle every 7 seconds, controlled by R_{47} . The oscillator receives a sync pulse from the horizontal oscillator through C_{20} during every horizontal retrace period. These pulses have no effect until the vertical oscillator approaches the triggering point, at which time one of the pulses triggers the oscillator. The rest of the vertical sweep circuit is similar to the horizontal, with R_{56} controlling flying spot scanner raster height, and R_{53} the vertical position. R_{12} is used to center the raster on V_2 and R_{16} focuses the flying spot.

The rectangular pulses developed during the multivibrator retrace periods are coupled to the cathodes of V_{12} , where they are combined to provide the video sync pulses fed to R_{21} . The sync pulse for the 2-kc. oscillator is coupled from V_{17A} through C_{21} .

Many substitutions can be made in the picture transmission circuits. While there is no inexpensive substitute for the 931-A, any cathode-ray tube with a P5 phosphor is suitable for V_2 . The 5CP5 and 5JP5 are currently available on the surplus market. Miniature equivalents of the octal base tubes can be used, of course, and in some instances they cost less than the octal types used. Generally speaking, the R and C values in the sweep and sync circuits are noncritical; however, the time constants in the grid circuits of the multivibrators ($C_{24}R_{51}$, $C_{26}R_{49}$, etc.) should be adjusted for proper timing. Several balanced modulators were tried, but most failed to remain in balance over the wide range of control-grid voltage swing. The 6AR8 circuit was the most satisfactory in this respect, and it also provides plenty of output. If the output voltage from J_1 overdrives the first stage in the transmitter modulator, a pot or fixed pad may be installed to cut the gain.

Reception Circuitry

The audio from the communications receiver is fed into J_2 and is controlled in amplitude by con-

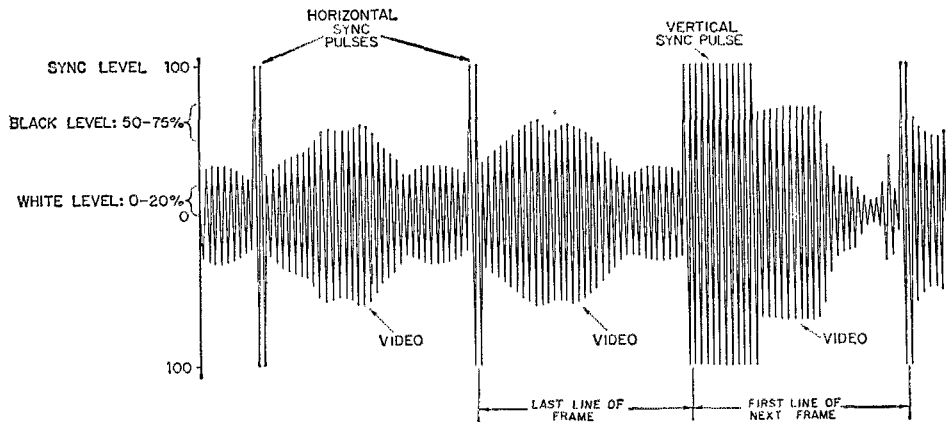
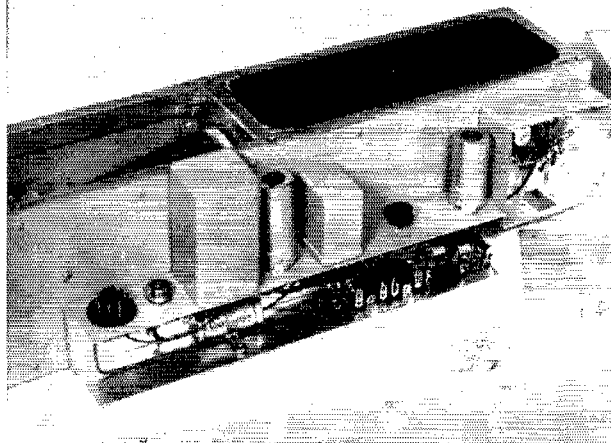


Fig. 4—Wave form of modulated 2000-c.p.s. tone. There are approximately 100 cycles of 2000-cycle carrier per line.

Side view of the scanner assembly with cover plates off the modulator chassis and 931-A socket shield. The 931-A socket, far right, has the dynode load resistors and neon-tube voltage regulators clustered about it. The tube immediately adjacent is V_5 . Moving to the left, the components on top of the modulator chassis are the control knob for R_{27} , then T_3 , V_4 , T_2 , the output connector for feeding the composite signal to the main chassis, and the power supply connector.



trast control R_{72} . During the monitoring of a transmitted image the contrast is controlled by R_{71} . These two controls can have a wide range of values from a few thousand ohms to half a megohm or more. The two small universal push-pull output transformers, T_5 and T_6 , are connected to feed the amplified audio to V_8 , the full-wave diode detector. The secondary of T_6 is at a potential of about -2000 volts d.c., but with the transformer mounted on small ceramic stand-off insulators there has been no trouble with insulation breakdown. Also at a high negative potential, and consequently mounted on stand-offs, is L_1 . This choke is rated at 8 henrys at 40 ma. in its intended filter application, but it measures only 4.5 henrys at 2000 c.p.s. with no d.c. in the winding. Measuring the actual frequency response of the filter is the best check on performance. This filter should have no attenuation up to 1000 c.p.s., the point where a gentle roll-off starts.

In the cathode-ray tube circuit, R_{92} controls the brightness, R_{94} the focus, R_{93} the horizontal centering, R_{101} the vertical centering, R_{58} the vertical size, R_{70} the horizontal size, and R_{104} astigmatism. This last control is used to adjust the anode voltage to the point where optimum focus in the horizontal and in the vertical direction occurs at the same point on the focus control.

The sync pulses are separated from the composite video and sync signal in V_{10} . The pulses fed to the horizontal oscillator are amplified by V_{11A} . V_{11B} feeds the $R_{39}C_{22}$ integrating circuit which fires V_{13} when a vertical sync pulse charges C_{22} sufficiently. The firing level is controlled by R_{41} . Since the plate of V_{13} is directly connected to the plate of V_{14A} , the firing of the 884 will also trigger the vertical multivibrator. The $C_{25}R_{50}$ combination in the cathode circuit of V_{14A} is used to raise the bias on V_{13} after firing, until the bias on C_{22} has a chance to leak off. This is done so that noise or horizontal sync pulses soon after firing won't cause the tube to fire again. To operate properly, C_{25} should be in the neighborhood of 10 $\mu\text{f.}$, not much larger.

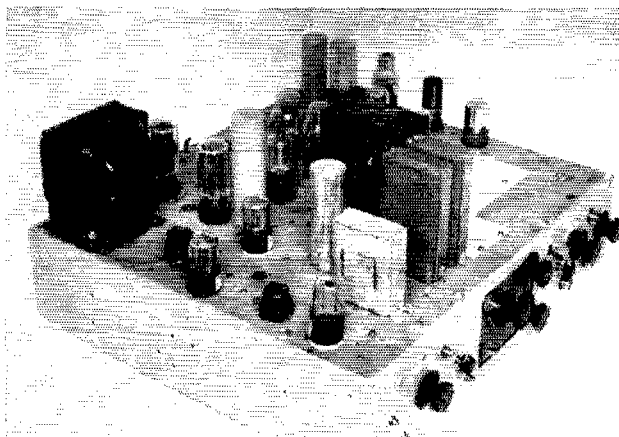
The operation of the sweep circuits is the same during reception as during transmission. One additional event not previously mentioned is the

triggering of the neon bulb blanking oscillator. During the sweep period, V_{14A} is cut off and the oscillator does not operate. However, during the conduction period the difference between the voltage at the plate of V_{14A} (about 50 volts) and the 370-volt return potential of the neon bulb is sufficient to allow the circuit to oscillate. The tone output is coupled to V_{6B} through C_{12} . The neon-bulb return voltage is a tap on R_{84} , which may be the bleeder resistor of the 450-volt power supply.

Several tubes may be substituted for the 5UP7; among them are the 3FP7, 5CP7, and 5ADP7, all of which are available on the surplus market. These tubes all have the post-deflection acceleration feature and can give a brighter picture than the 5UP7 if a high positive voltage is applied to the tube's third anode.

Mechanical Details

Physically, the equipment consists of three separate units. The largest of these is an old TV chassis upon which the power supply, sweep, sync, and receiver amplifier circuits are mounted. The important points here involve layout and insulation. In addition to the usual precautions in wiring the audio circuits, care must be exercised to reduce stray capacitive coupling between the two sweep oscillators. The steep wave forms in the horizontal oscillator are easily coupled to the vertical oscillator, where they may cause premature triggering. Several inches of separation between the two stages is recommended. The remainder of the layout is not critical. Adequate insulation should be used in the high-voltage



An old TV receiver chassis was used for the major portion of the circuitry. This assembly contains power supplies (built according to ordinary design methods) in addition to the circuits shown in Fig. 3.

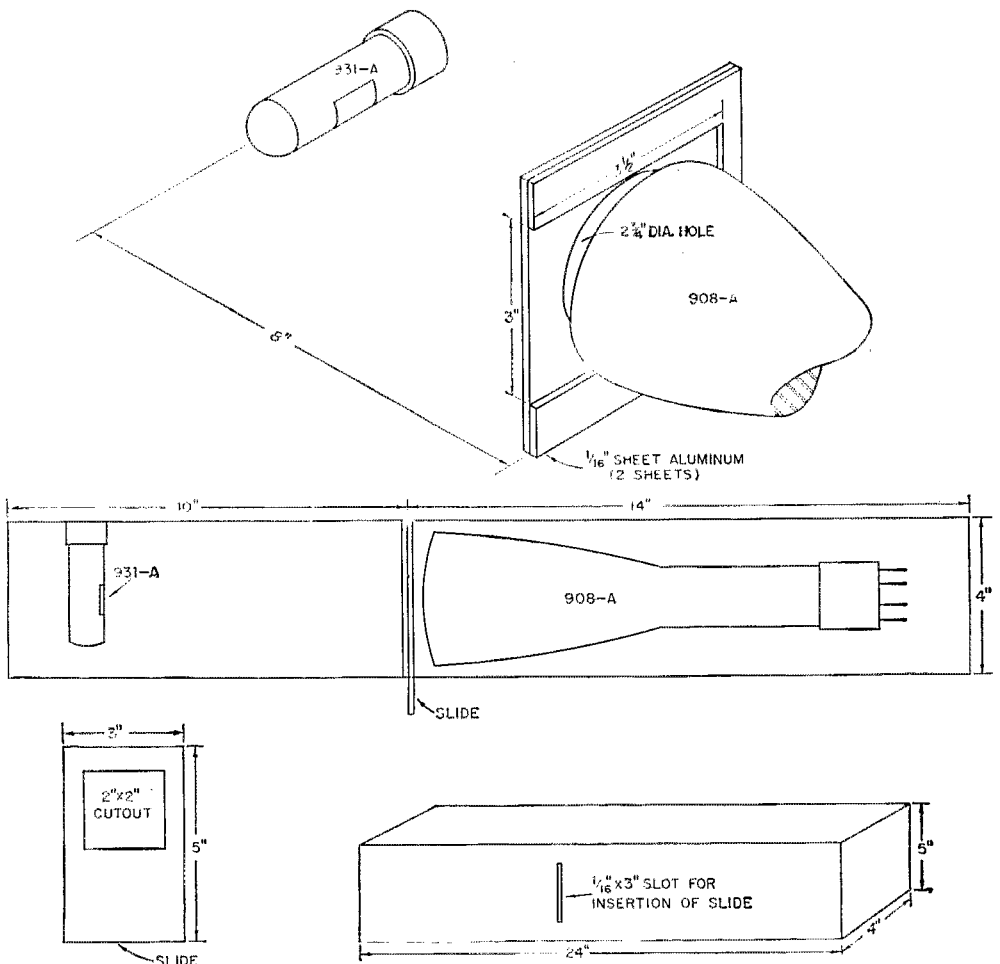


Fig. 5—Some mechanical details of the flying-spot scanner.

power supply, and the focus and brightness controls should be insulated from ground and connected to their knobs with insulated couplings.

The second unit contains the 5UP7 and the detector circuit. An ASB surplus radar indicator provided the chassis and mounting assembly for the 5UP7. Unfortunately, the magnetic shield which covered the 5BP1 originally used in the indicator was too narrow for the 5UP7 and had to be removed; the electron beam in the tube is therefore subject to deflection by stray magnetic fields. This may mean keeping the tube several feet away from power transformers.

The P7 phosphor is of the cascade type where the electron beam excites a short-persistence blue phosphor, which in turn excites a long-persistence yellow phosphor. The blue flash which accompanies the sweep is undesirable because of its extreme brightness and is therefore filtered out with a Wratten 15G gelatin filter which covers the face of the tube. Your photo dealer can obtain this filter for you.

The third unit, the flying-spot scanner, also has the 6U8, 6AR8, and voltage-regulating neon bulbs mounted on the back. The important constructional points are illustrated in Fig. 5 and in the photographs of the scanner. While this scanner has a framework of machined aluminum and sides of 1/16-inch thick aluminum sheet, equivalent results can be obtained with a much less elaborate arrangement. Actually, the first tests of the system were conducted with the scanner tube and photomultiplier in a cardboard box made light tight with masking tape, and with a negative taped to the face of the 908-A.

The aluminum scanner box was made as light tight as possible. A strip of felt covers the slot where the slide is inserted in order to reduce the amount of light entering here, and the interior is painted black to reduce reflection. Since it is desirable to have the negative directly against the face of the scanner tube during operation, the tube was mounted on a movable car-

(Continued on page 146)

Smokepuff Progress

The Smokepuff III operation was held during May and was generally considered successful. On each of the three test shots the released chemicals produced visible clouds larger in diameter than the moon, making excellent photography possible.

On the May 20 shot (and all shots were made in the early morning hours), the ionosphere recorder showed a 15-minute echo at low (3 Mc.) critical frequencies, while the 23 Mc. radar had a strong echo for about two minutes. The Smokepuff beacon signals on 2 and 6 meters were positively identified, and at one six-meter station the signal lasted for over a minute. The results on 14, 21, and 28 Mc. were nil.

The next day the gas was released considerably higher than planned, and results were not as good. The ionosphere recorder showed an echo for only two or three minutes, while the 23-Mc. radar had an echo for only 20 seconds. On 2 and 6 meters the beacon signals were barely readable. Again the results on the lower frequency were nil.

The third shot on May 22 was a calibrating shot, to verify that previous ionization was really due to the chemicals.

Additional tests are planned, with daytime shots tentatively scheduled for September or October. The Air Force again expresses its thanks to the many amateurs who have assisted in these tests.

The National Bureau of Standards Laboratories in Boulder, Colorado, has several professional (grades GS-5 to GS-13) and subprofessional (grades GS-7 to GS-9) openings. The work is in research and development on top national standards and instruments at frequencies to 1000 Mc. Those interested should send a brief record or request for further information to Section 84.10 at the above address.

Dissatisfied with this year's Field Day location? W2AYA points out that Ebbets Field in Brooklyn is still for rent.

RME, a division of Electro-Voice, has available a new DX Computer. In slide-rule form this gadget has assembled info on countries, prefixes, great circle bearings, postal rates, and the like. A handy gadget, although the unavoidable changes in postal rates and QSL bureau managers cause it to be rapidly out of date in a few respects. Available at distributors.

It had to happen sooner or later! W7RKI was

If you have worked VEØNE, this is the ship it is operating from. The Ø indicates maritime mobile operation, the N indicates Navy. VEØNE operates most generally on 20-meter phone, when in Canadian waters.

talking to a new ham running a KWS-1 on sideband when an a.m. station tried to break. The new ham replied, "Sorry, OM, but I haven't learned yet how to tune in a.m."

An eye-catching news-release form is now available for use by radio clubs or individuals who regularly send information to the newspapers or broadcasting stations in their communities. The new form is the same as that now being used by Headquarters for its releases except that the League name and address has been left off to provide room in the upper left-hand corner for the name and address of the person making the release. Drop a line to the ARRL Secretarial Department for a supply of the forms.

W6QYT, author of a host of QST articles, has been elected to membership in the National Academy of Sciences. Our congratulations to him on this well-deserved honor.

Another newspaper gem, clipped from a Baltimore paper by W3DDN. Discussing TVI, it was reported that much of the difficulty arose because of "harmony." (That certainly is a nicer way of putting it! — Ed.)

General Electric is marketing a gadget which should go well with the DX fraternity. Called a Power Control, it automatically adjusts the transmitted power of a base station to match the incoming power of a mobile radio. When adapted to amateur radio there will, of course, have to be an upper limit.

When W7MRX took his kids on a picnic, he found that he had provided for everything except utensils for roasting the hot dogs. He says there were no trees or brush (what, in the State of Washington?) to cut sticks from, so he used the top section of his mobile antenna.





A Desk-Top-650-Watt Amplifier

Smaller on the Outside — Bigger on the Inside

BY JAMES M. LOMASNEY,* W9LZV

FOR ABOUT fifteen years this author has been nursing a desire for a kilowatt rig in a desk-sized (or pocket-sized) cabinet. The linear to be described is the most recent effort in that direction. It is not pocket sized, but you can tuck it under your arm and haul it off to a remote QTH.

Despite its small size and innocent appearance, this amplifier packs as much wallop as many larger ones, and it can be dangerous to life and limb. Its construction should not be attempted by the inexperienced.

The rig, when driven by an exciter such as

the HT-30, of 30 watts nominal output, runs at about 650 watts plate input and gives about 400 watts c.w. or peak envelope output. It covers 80 through 10 meters by means of hand switching. Like the HT-30, it has a fixed 50-ohm output impedance.

The amplifier is built on an 8 × 14-inch chassis with a 10 × 14-inch panel. The chassis is 4½ inches deep, to provide space for the filter capacitors and cooling fan underneath. As can be seen by studying the photographs, the plate power supply occupies the left end of the chassis, and the r.f. circuits take most of the remaining space. The heater and bias supply is stowed under the right rear corner of the chassis behind the plate tuning capacitor. The screen regulator and standby relay are at the rear of the chassis in the center.

The controls are few and simple. The band switch has four positions, for the 80-, 40-, 20- and 15- and 10-meter bands. Other controls are the plate tuning capacitor, plate-current screen-current meter switch, power and plate voltage switches.

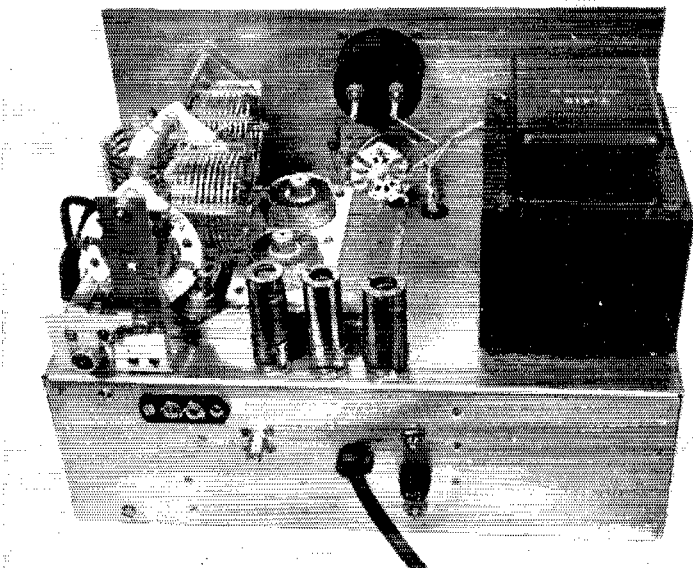
R. F. Circuit

The r.f. portion uses two 4X250B tubes in grounded-cathode connection, operating Class AB₂. 4X150A tubes work just as well, although the available plate voltage exceeds their ratings.

*561 So. Elizabeth Drive, Lombard, Ill.

External-anode tubes offer a good opportunity to build a compact amplifier, and when they are combined with such things as germanium diodes in the high-voltage power supply you can build a potent package on one chassis. The plate circuit in this amplifier will be quite a shocker to the current generation that has been led to believe that the only possible output circuit is a pi network.

This single package hardly seems big enough to contain the full works of a 650-watt amplifier, power supply and all. The secret lies in the use of 4X250B tubes and a germanium-diodes power supply. Small tube shields house voltage-regulator tubes and a relay.



Referring to the circuit in Fig. 1, no grid tuning is provided, since the output voltage from the HT-30 is enough to drive the grids directly. A 110-ohm swamping resistor in the grid box is made up of eight 220-ohm 2-watt resistors in series-parallel. The r.f. goes to the grids through a 470- μf . coupling capacitor; the small coil L_1 is a series peaking coil that was included to make the amplifier a little easier to drive in the 10-meter band.

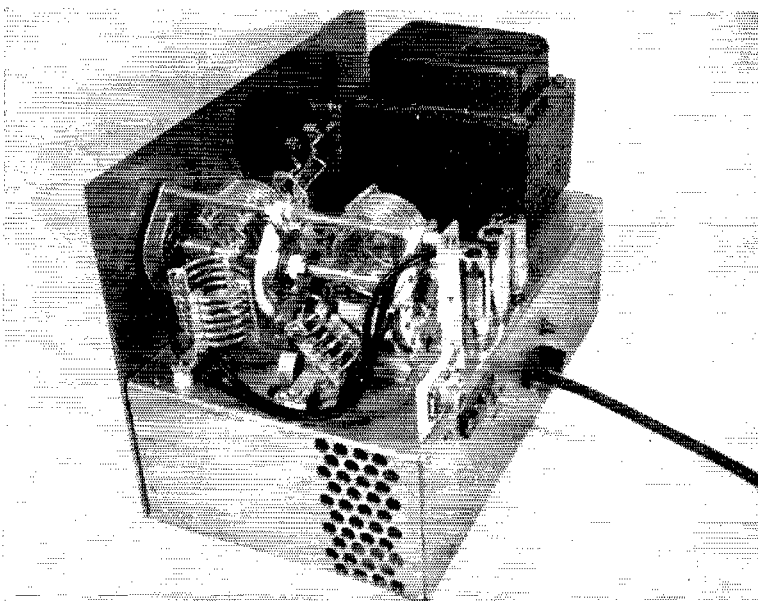
The output circuit might almost be called unconventional these days. A parallel-tuned circuit and fixed link are used, and both are switched

on each band. This has several advantages over a pi network, especially over the fixed-output-impedance type now becoming popular. No parallel-fed choke is needed. No large pi-output capacitor is needed. Tuning is straightforward and much simplified. The coupling, once adjusted, holds over a wide frequency range.

The link circuit is grounded through a removable jumper at the output connector, so that a balanced load could be fed if desired.

The small 15- μf . capacitor (CRL Type 850), from the plates to ground, provides a short path for harmonic currents and keeps them out of the

In this side view two of the feed-through insulators that support the plate capacitor and the coils are visible in the foreground.



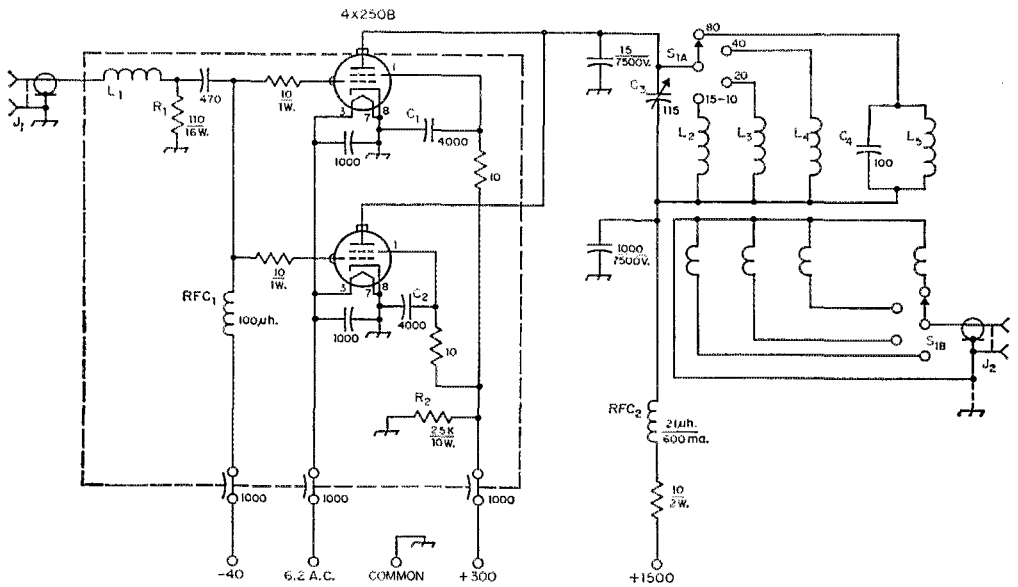


Fig. 1—Circuit diagram of the r.f. portion of the amplifier. Unless otherwise indicated, capacitances are in $\mu\text{mf.}$, resistances are in ohms, resistors are $\frac{1}{2}$ watt. The 1000- $\mu\text{mf.}$ plate bypass is a CRL Type 858-S; the 1000- $\mu\text{mf.}$ feed-through capacitors are 500-volt ceramic.

- C₁, C₂—Four 1000- $\mu\text{mf.}$ 500-volt disk ceramic capacitors in parallel.
- C₃—20–115- $\mu\text{mf.}$ variable, 2000-volt spacing. See text.
- C₄—Two 25- $\mu\text{mf.}$ NPO ceramic and one 50- $\mu\text{mf.}$ N750 ceramic in parallel, 7500-volt rating.
- J₁—UG-291/U BNC panel jack (Amphenol 31-001).
- J₂—SO-239 UHF panel jack (Amphenol 83-1R).
- L₁—6 turns No. 20, $\frac{3}{8}$ -inch diam., $\frac{1}{2}$ inch long.
- L₂—4 $\frac{1}{2}$ turns $\frac{1}{8}$ -inch copper tubing, $\frac{1}{4}$ inches long, $1\frac{1}{8}$ -inch diam. Link is 3 turns No. 16 wire, $\frac{3}{4}$ inch long, $\frac{3}{4}$ -inch diam.

- L₃—6 turns $\frac{1}{8}$ -inch copper tubing, $\frac{1}{2}$ inch long, $1\frac{1}{8}$ -inch diam. Link is 2 turns No. 12, $\frac{1}{2}$ inch long, $1\frac{1}{8}$ -inch diam.
- L₄—8 $\frac{1}{2}$ turns No. 12, $1\frac{1}{8}$ inches long, $2\frac{1}{8}$ -inch diam. Link is 3 turns No. 12, $\frac{3}{8}$ inch long, $1\frac{1}{2}$ -inch diam.
- L₅—Two coils, see text. Outer is 10 turns No. 12, $1\frac{3}{4}$ inches long, $2\frac{1}{8}$ -inch diam. Inner coil is 6 $\frac{1}{2}$ turns No. 12, $\frac{3}{4}$ inch long, $1\frac{3}{4}$ -inch diam., inside plate end of outer coil. Link is 4 turns No. 12, $\frac{1}{2}$ inch long, $1\frac{1}{2}$ -inch diam.

output coil. On the 3.5- to 4-Mc. range a fixed 100- $\mu\text{mf.}$ capacitor is connected right across the coil, so that a respectable L -to- C ratio can be maintained at 4 Mc. When switched out of the circuit, the coil and fixed capacitor resonate around 5 Mc., which does not bother any of the other ranges.

The 10-ohm resistor in the B+ lead serves as a fuse in case of a shorted tube or other fault that might endanger the power supply.

Power Supply

The plate supply uses two voltage doublers in series; see Fig. 2. Two 325-volt windings on T_2 feed strings of germanium rectifiers in full-wave voltage-doubler connections. Each doubler capacitor is 160 $\mu\text{f.}$, made up of two paralleled 80- $\mu\text{f.}$ 450-volt cartridge type units with cardboard sleeves. The chassis is lined with insulating material under the C_5 and C_6 capacitors, since their outer cans run as high as +1300 volts. The ripple is around 3 per cent r.m.s., and the regulation from no load to full load is about 15 per cent. The rectifier stacks were assembled from cells salvaged from G.E. germanium bridge rectifiers. (While

these rectifiers have many virtues, they do not like having the output shorted.) Each cell is rated at 500 ma. d.c. and 300 volts peak inverse; the nearest equivalent is the G.E. 1N153. Sixteen cells are used. Each group of four cells in one side of a voltage doubler has two 560 K resistors connected across pairs of cells to equalize the reverse voltage drop. Other 560 K resistors are connected as bleeders only as a safety measure, since no bleeders are needed for proper circuit operation. But even with the bleeders, the capacitors can retain a charge for several minutes, so be careful!

Grid bias is furnished by a 75-volt winding on T_1 , a half-wave rectifier and an 80- $\mu\text{f.}$ capacitor. About -90 volts is developed across C_9 and applied to the tubes during stand-by periods. The operating bias is adjustable from -30 to -60 volts by R_3 .

Screen voltage is taken from the +375-volt point of the plate supply (junction C_7 and C_8). It is dropped through the 6BF5 voltage regulator to deliver a low-impedance output adjustable from about 250 to 325 volts at up to 75 ma. Since this type of regulator will not handle reverse current, bleeder R_2 is provided to offset no-signal

negative screen current drawn by the 4X250Bs and make the screen meter read on scale.

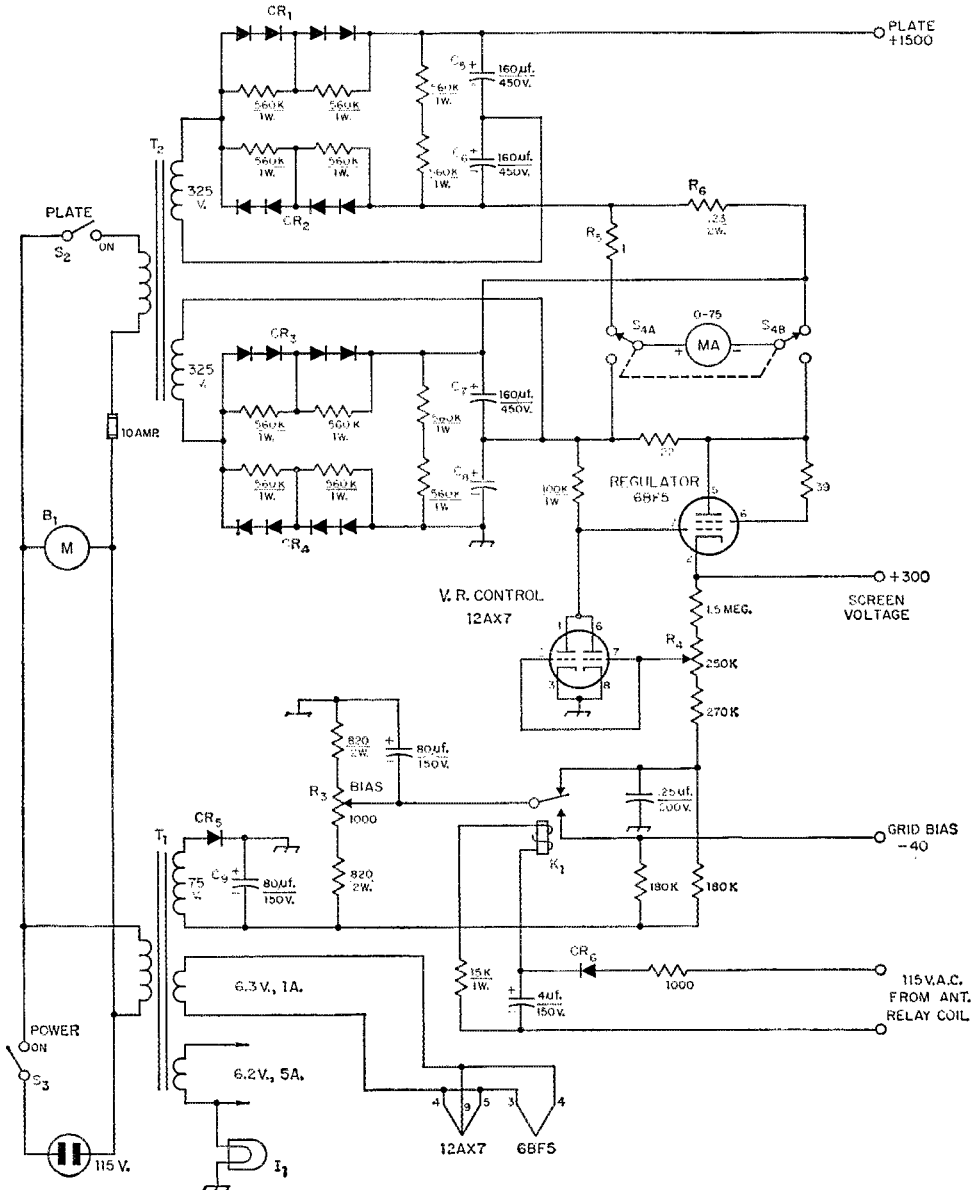
When in operating condition, the "reference" voltage for the screen regulator is the -90 volt

bias supply. In stand-by condition the reference is switched down to the tap on R_3 , thus reducing the screen voltage from its nominal +300 or so to a lower value. This action, together with the

Fig. 2—Circuit of the power supply. Unless otherwise indicated, resistances are in ohms, resistors are 1/2 watt.

- B₁—3250-r.p.m. motor with 4-inch fan blade. See text.
- C₅, C₆, C₇, C₈—Two 80- μ f. electrolytics in parallel (Sprague TVA-1716). Insulate as described in text.
- CR₁—CR₄—Four 500-ma., 300-volt peak inverse (1N153 or equiv.).
- CR₅—100-ma. 380-volt peak inverse.
- CR₆—65-ma. 380-volt peak inverse (Federal 1002A).
- I₁—150-ma. 6-8 volts (GE No. 47).
- K₁—5000-ohm coil, 4 ma. pull-in (Terado Series 600 or equiv.).

- R₃—2-watt linear potentiometer (Ohmite CU-1021).
- R₄—2-watt linear potentiometer (Ohmite CU-2541).
- S₂, S₃—15-amp. 125-volt toggle (Cutler-Hammer 7501-K13).
- S₄—Two-pole 2-throw 60-degree throw ceramic rotary switch, non-shorting. See text.
- T₁—6.2 volts at 5.5 amp., 6.3 volts at 1 amp., 75 volts at 100 ma. (Forest Electric Co. T-423).
- T₂—Two secondaries, each 325 volts at 1 amp. (Forest T-412).



increased grid bias, insures that the 4X250Bs draw no current in standby condition. In operation the grid, screen, and plate voltages all tend to vary in proportion to line-voltage changes.

The screen current is measured by switching the 0-75 milliammeter across 22 ohms in the lead to the screen-voltage regulator. The resistor has negligible shunting effect. For measuring plate current the meter is switched across a low resistance R_6 , connected between the two sections of the plate supply. R_5 was adjusted for full-scale meter reading at 750 ma. There is a maximum of 425 volts between switch contacts and 850 volts from contacts to ground.

The stand-by relay K_1 is one that plugs into a 7-pin miniature socket. It operates from 115 volts a.c. and a half-wave power supply. The input is brought out to two terminals on the rear of the chassis, where connection is made across the antenna relay coil, which in turn is connected through the HT-30 VOX relay to the 115-volt line.

Construction

As usual with a compact layout, some tight spots were encountered; an extra half inch here and there would have helped. For example, the tubes could have been moved to the left to leave more room for the low-frequency coils.

The plate tank capacitor is one from a BC-375 tuning unit, mounted under the chassis on four ceramic feed-through bushings. Four holes were drilled and tapped in the $\frac{1}{4}$ -inch square frame rods on the right-hand side of the capacitor, and 6-32 threaded rod was screwed into the holes and passed through the insulators. The four screws project above the insulators at the top of the chassis, where the B+ ends of the plate coils connect to them via copper strips. An insulated shaft extension goes through the panel to the tuning knob.

The wire from each coil was wrapped around a pipe of suitable diameter. Four Plexiglass strips were drilled with clearance holes at the desired spacing, then the coil wire was fed through the holes. The 80-meter coil was made with two concentric sections in series to get enough inductance into the available space. The 80- and 40-meter links were also threaded through strips, while the 20- and 10-meter links are self-supporting. All links are a push fit inside the insulating strips of their respective coils, and are held with a drop or two of cement after adjustment.

The two band-switch wafers are each single-pole, 4-position, 60-degree throw (Communications Products Co., Type 86). For 8 dollars, the manufacturer sent me the two wafers plus extra common contacts. (The standard common contact wipes on one side only of the rotor. The extra contact was fastened under the standard one with 2-56 hardware to make it double-wiping, probably an unnecessary precaution). A 60-degree index-and-shaft assembly from an Oak Type H switch was used, since it fitted nicely in the available space. The rest of the switch was made up from 6-32 threaded brass rod, $\frac{1}{4}$ -inch o.d.

tubing, 1/16-inch aluminum sheet, and miscellaneous ceramic spacers and fiber washers from junked rotary switches.

The front wafer switches the plate coils. The links are connected to the rear wafer through RG-58/U cable, except the 80-meter link which goes direct. The cold sides of all links are soldered to a strip of copper running around the wafer, supported by 2-56 screws through the unused holes between contacts. The u.h.f.-type output connector is mounted on a strip of bakelite fastened to the rear switch bracket; its shell is grounded through a couple of solder lugs.

The transformers were designed for us by W9PZZ, who just happens to work for the Forest Electric Co.¹ The company would consider making up a few of the transformers if any interest is shown. T_2 weighs about twenty pounds; the chassis should be at least 0.08-inch aluminum to be strong enough to carry it.

A bottom cover and a perforated-metal shield over the top, sides and rear are going to be added, for safety as well as TVI-proofing. An opening will be cut above the r.f. tubes and covered with hardware cloth.

Cooling

Each 4X250B tube requires at least 3.6 cubic feet of air per minute through the anode cooler. The base also requires some air. The tube is ordinarily mounted in an Eimac "air-system" socket so that the air flows first over the base, then through the anode cooler. This leads to a fairly large pressure drop, which is ordinarily considered to require a centrifugal blower. These are uncommon items and are very difficult to fit into a compact layout.

Accordingly, it was decided to try a fan. To reduce the pressure drop, only the insulating rings and contacts from Eimac sockets were used, mounted by the cathode tabs in oversized holes in the chassis. Many small holes were drilled in the chassis to provide additional air passage. A small aluminum housing above the chassis directs all the air through the anode coolers. It comes to within $\frac{1}{4}$ inch of the anode coolers. The opening is closed by a piece of Fiberglas-base plastic fitting on top. It comes to within $\frac{1}{16}$ inch of the tubes, so that a small amount of the air flows around the outside of the coolers.

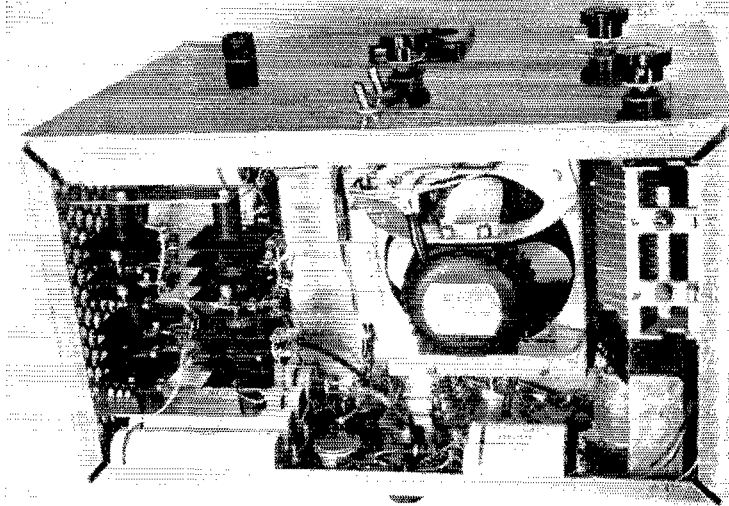
All of the left end and part of the right end of the chassis are perforated by $\frac{3}{8}$ -inch holes. The air drawn in by the fan passes over the plate rectifier fins and past the heater transformer. The whole air path is direct and free from large obstructions and sharp bends.

The fan is a 4-inch blade driven by a Rotron Mfg. Co.² Type 92-AS motor at 3250 r.p.m. It is mounted in a hole $4\frac{1}{2}$ inches in diameter in the grid housing, with about $\frac{1}{2}$ of the blade thickness projecting into the housing. The motor is a capacitor-run type. The 1- μ f. 600-volt phasing capacitor mounts on the side of the grid housing.

¹ 7216 Circle Rd., Forest Park, Ill.

² 7 Schoonmaker Lane, Woodstock, N. Y.

A husky 4-inch fan and the stack of germanium rectifiers are prominent objects in the bottom view. The plate tuning capacitor (right) is insulated from the chassis, as described in the text.



The motor, housing and capacitor can be removed as a unit, leaving only the front and rear walls of the housing in place.

While a split-phase or other small a.c. motor could be used, most of them run a bit slower than this. The extra speed is handy, especially when cooling 4X150A tubes, which want a bit more air. Series motors are not recommended because of the r.f. interference generated at the brushes.

Under the conditions described, the pressure vs. flow curves of the fan and of the tubes indicate that somewhere around 10 c.f.m. of air is delivered. This is ample for a pair of 4X250Bs but barely sufficient for 4X150As. In practice, no difficulty has been experienced in cooling a pair of 4X150A tubes. Since the only major source of heat is the tubes, and since this heat is quickly removed by the air, the whole amplifier runs cool.

Operation

No published ratings are available for 1500-volt Class AB₂ operation of these tubes. We have been setting the screens at +300 volts, and the grid bias at a point (about -40 volts) where the tubes draw 150 ma. with no drive. When operating and properly loaded, full output from the HT-30 swings the plate current to 400 ma. or so.

The various links are of approximately the right inductance to couple to a 50-ohm load. They must be quite tightly coupled to their plate coils. When properly positioned with a 50-ohm load connected, the plate current dips 10 or 15 ma. as the plate capacitor is tuned through resonance with r.f. drive applied. Once adjusted, these links are left alone. The antenna is tuned with the aid of an s.w.r. bridge to present a 50-ohm load to the amplifier. The amplifier should not be operated without a suitable load.

Operation is now very simple. The heaters are warmed up for at least 30 seconds. With the plate power switch *off*, the band switch is set to the proper range. The exciter is tuned up to give c.w. output. (Not more than 40 volts r.m.s.) The plate power is turned on and the plate capacitor tuned to the plate current dip, or to maximum indicated output if a Micromatch is being used. The exciter is then set to give the type of output desired.

No startling DX claims are made for this rig, since operating is not our strong point. However, the amplifier gets 10- or 15-db. better reports than the barefoot exciter, and solid contacts are now the rule rather than the exception.

Strays

W3RPG offers a "Directory of Certificates and Awards." The loose-leaf booklet is divided into three parts. The first has details on obtaining 92 awards issued by ARRL, clubs, nets, and other groups in the U. S. and Possessions. Section two covers 15 YL certificates. Part three discusses over 100 DX awards without providing full rules. To keep it current, replacement pages with revisions and additions can be obtained. Write W. T. Clark, 8 Frances Drive, Harrisburg, Pa.

Feedback

This refers to the circuit of Fig. 2, page 28 of *QST* for July, in the article, "Flexible Transmitter Receiver Frequency Control," by W1PLJ. If it is desired to connect v.f.o. No. 2 to the receiver mixer (S_3 to left) while v.f.o. No. 1 is connected to the transmitter mixer (S_2 to right) it is necessary that S_1 be closed to apply plate voltage to v.f.o. No. 2. This last operation can be avoided by connecting the open terminal of S_3 to the +B line to v.f.o. No. 2.

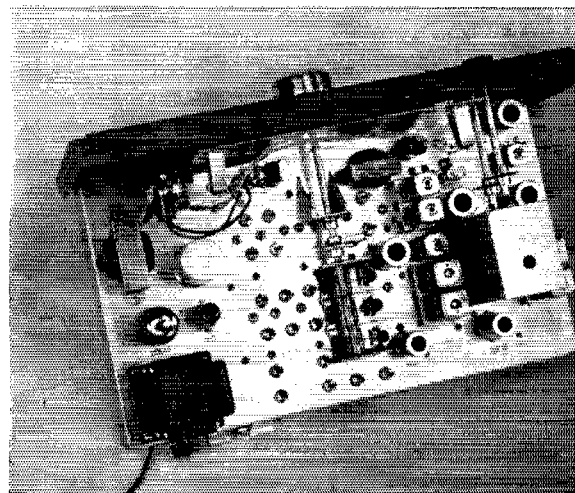
• Recent Equipment —

The RME Model 4350A Receiver

ALTHOUGH the RME 4350A receiver has been in the stores for some time, only recently were we able to snag one from the manufacturer long enough to look it over. As a consequence the following information may be old stuff to many readers, and to them we apologize in advance.

The 4350A is a double-conversion ham-bands only receiver (160 through 10 meters) with a tunable front end and crystal-controlled second converter. It has the same two-speed dial drive that was reported for the 4300 receiver (*QST*, October, 1956). At that time we mentioned that the drive was stiff but readily fixed by following the instruction manual: the 4350A had a slight "flat" spot that disappeared before we had tuned across the 20-meter band a half dozen times. Nothing has changed the writer's previous opinion that the two-speed drive is a highly desirable feature: the 1:1 ratio is useful for getting to another part of a band in a hurry, and the 75:1 ratio drive that requires $37\frac{1}{2}$ revolutions to cover a band is slick for zeroing in on sideband or anything else. The two drives are coaxial; a rear knob is used for the fast drive and the front knob for the slow motion.

A block diagram of the 4350A (Fig. 1) will help you visualize the electrical features of the receiver. The 6BZ6 r.f. stage is followed by a 6U8 converter, using the pentode section for the grid-injection mixer and the triode for the plate-tickler grounded-cathode oscillator. The first i.f.



The RME 4350A double-conversion receiver has a tunable first oscillator and a crystal-controlled second oscillator. In the tunable front end, a high-C oscillator is used for stability, with low-C signal circuits for high gain. The large shield can at the right houses a crystal filter.

is 2195 kc.; to guard against secondary images there are *four* tuned circuits between the first and second converters. Adjacent channel selectivity for the receiver is obtained in the output circuit of the second converter, where a crystal filter is used to couple to the following 6CB6 i.f. stage. A panel switch permits selecting one of three degrees of selectivity or switching the crystal out of the circuit.

The second i.f. amplifier uses the pentode section of a 6U8, and the triode section is called upon for b.f.o. service. No extra b.f.o. coupling is provided beyond that furnished by the stray capacitances in the tube and socket, but a panel control permits varying the injection amplitude by varying the plate voltage of the b.f.o. The i.f. string ends up at the diode detector where full-wave rectification is obtained through the use of two diodes of a 6T8. A third diode in the 6T8 serves as an automatic noise limiter, and the triode portion is used for audio amplification. Loudspeaker or headphone audio is served up by the 6AQ5 output stage.

The tube complement is rounded out by the 6CB6 100-kc. crystal calibrator, the 5Y3GT rectifier and the 0A2 voltage regulator. The Model 4350 didn't include the calibrator; Model 4350A has the calibrator built in and factory checked against WWV. Regulated voltage is applied to the plates of all of the oscillators and

A shield over the coil and bandswitch have been removed to show this section.



QST for

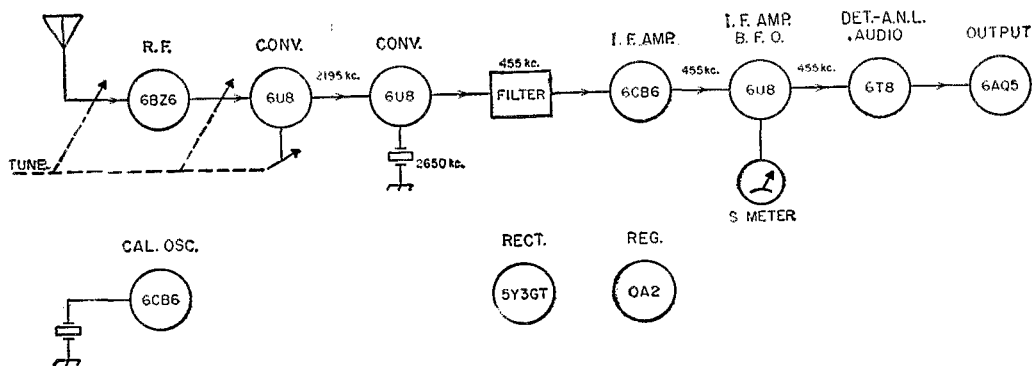


Fig. 1—Block diagram of the RME 4350A receiver.

to the screen grids of the two converter stages.

Gain in the 4350A is controlled manually by changing the cathode bias applied to the r.f. stage and the first i.f. stage (6CB6). A.g.c. is applied to the two i.f. stages and the r.f. The S meter indicates the difference between the cathode voltage of the 6U8 i.f. and a reference voltage; as an increasing a.g.c. voltage reduces the cathode current of the 6U8 the meter swings upward.

One little touch in the circuit that we've never seen in any commercial communications receiver is the positive bias (about +75 volts) applied to the tube heaters. This is sometimes done in hi-fi audio work to reduce hum caused by heater-to-cathode leakage, and was mentioned recently in a *QST* article.¹

Most of the panel controls have already been implied: two-speed tuning, band switch, crystal selectivity, crystal phasing, audio gain, r.f. gain, b.f.o. pitch and b.f.o. injection. In addition there

is a trimmer across the h.f. oscillator with a panel control marked CAL; this is to bring the oscillator into agreement with the directly-calibrated dial. There is an antenna trimmer panel control. A 3-position panel switch marked REC-STDBY-TRAN turns off some of the receiver circuits (but not the oscillators), and it can be connected to turn on an external circuit in the TRAN position. Connections are available at the rear of the receiver for making up to an external switch or relay for controlling the receiver. For those who try the receiver before reading the instruction book, the two right-hand positions on the switch marked CW-AGC-SSB AGC-SSB MGC will give no receiver output unless the RME 4301 Sideband Selector² is connected at the rear of the 4350A. (We tell you this so you won't complain to the dealer about the receiver being dead in those two positions.)

The 12-page instruction book is concise and complete.

— B. G.

¹ Ives, "Variable Band Width Q Multiplier," *QST*, April, 1957.

² "Recent Equipment," *QST*, Feb., 1957.

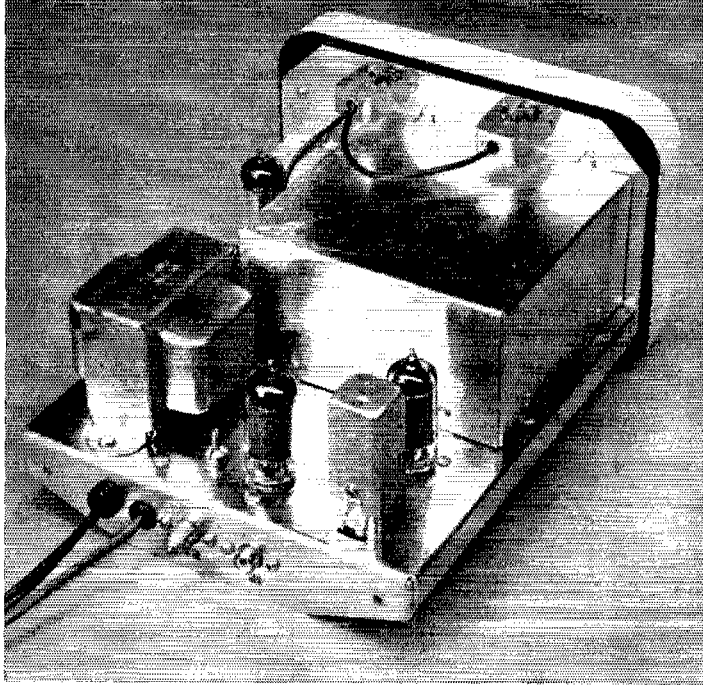
The Gonset VHF VFO, Model 3226

THOUGH designed specifically to go with the Communicator III the Gonset VHF VFO is of interest to other v.h.f. enthusiasts who are turning to variable-frequency control. It is a two-band job with calibrated ranges for 50 and 144 Mc., the output frequency being in the 24-to-27-Mc. range. It can be used with most v.h.f. transmitters that employ crystal oscillators working in this frequency range.

Two 6BJ6 tubes are used. The oscillator is the

The Gonset VHF VFO has calibrated ranges for 50 and 144 Mc. Spotting position on the function switch allows checking the v.f.o. frequency without putting the associated transmitter on the air. Ivory finish matches styling of the Communicator III. Cable is terminated in a plug to fit standard crystal sockets.





The Gonset v.f.o. is solidly built and thoroughly shielded. Two 6BJ6 tubes are used. Tube at the upper left is a voltage regulator.

series-tuned Colpitts, trimmer combinations being switched to give calibrated ranges for 2 and 6 meters, beginning at 8.0 and 8.33 Mc. respectively. The $4\frac{1}{2} \times 6\frac{1}{2} \times 8$ -inch case includes a built-in regulated power supply. Finish is ivory, to match the latest models of the Communicator. The Model III (50 or 144 Mc.) has a v.f.o. jack, so use of the v.f.o. with these involves only plugging into one of the crystal sockets with the output cable, and inserting a short length of coax provided into jacks on the v.f.o. and the Communicator.

Controls on the v.f.o. are band switch, left, on-off-spot, center, and tuning knob, right. When the v.f.o. is hooked up in this way the switch may be placed on the "spot" position and the frequency checked on the Communicator dial in the same way as crystal frequencies are spotted. In the "on" position, the v.f.o. signal is not heard in the Communicator tuning range when the send-receive switch is in the "receive" position, except in some instances when a directly-mounted whip is used for an antenna.

— E. P. T.

Johnson 250-39 T-R Switch

ELECTRONIC transmit-receive switches started to show up in quantity when voice-controlled break-in operation on side-band phone showed some of the shortcomings of antenna changeover relays. Of course, there had always been a place for such a device in c.w. operation, but most of the hot-shot c.w. men were willing to struggle

along with a separate receiving antenna.

The Johnson No. 250-39 t.r. switch is a self-contained unit complete with power supply, and all you do to use it is to connect transmitter, receiver and antenna to the three coaxial-line connectors provided for the purpose. You also plug in the line cord to a hot 115-volt outlet.

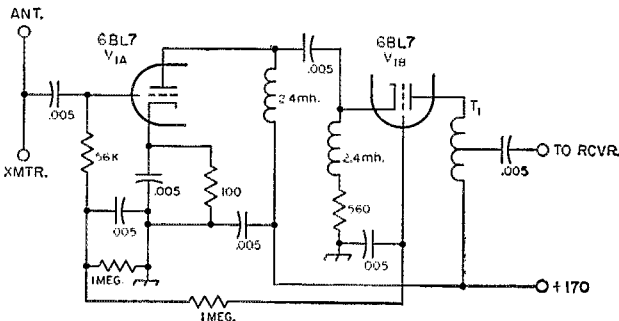
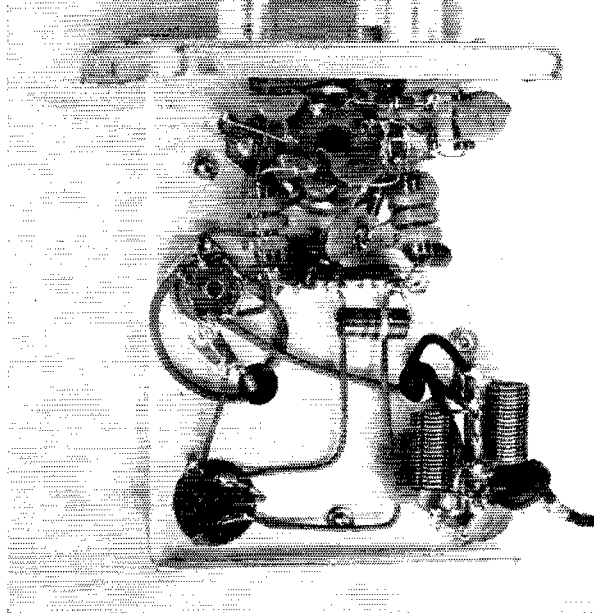
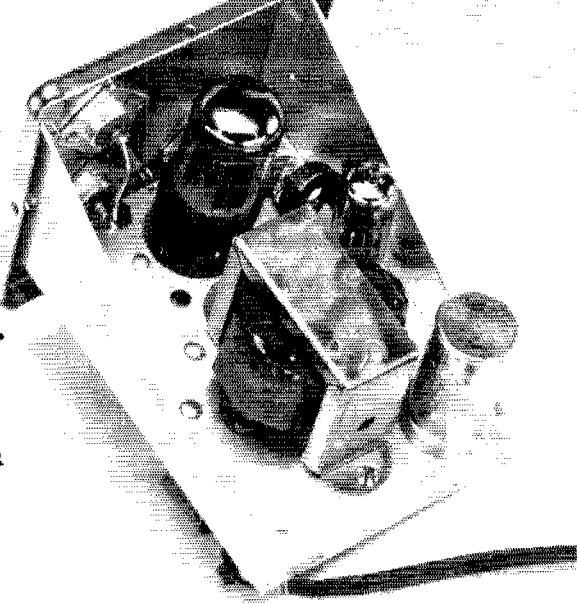


Fig. 1—Partial diagram of the t.r. switch.



Left: A top view of the t.r. switch shows the power supply occupying most of the volume above chassis. The little toroid between the two tubes is the ferrite broadband transformer, an all-important part of the switch. Right: Heavy filtering of the a.c. line prevents r.f. getting into the receiver via the "back door" of the switch.

Referring to the partial schematic in Fig. 1 (the power supply using a 6X4 rectifier has been omitted), it can be seen that a 6BJ7 is used in the cascode circuit. When the transmitter is off, the signal from the antenna is amplified via V_{1A} and V_{1B} and passed along to the receiver. When the transmitter is on, a little of the r.f. is rectified at the grid of V_{1A} and this biases off V_{1A} and V_{1B} sufficiently to protect the receiver.

Covering the range from 3.5 to 30 Mc. without tuned circuits takes a bit of doing, of course, and the heart of the t.r. switch lies in the broadband ferrite transformer, T_1 . This isn't likely to be duplicated by a home constructor, but the sub-

stitution of a suitable tuned circuit for T_1 would enable any ambitious reader to utilize the cascode circuit of Fig. 1.

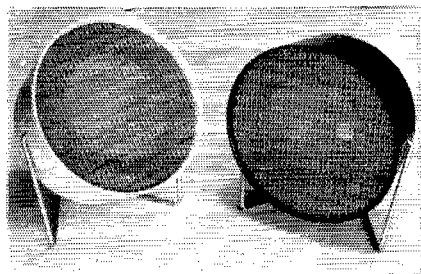
The instructions furnished with the t.r. switch cover a couple of the aspects that have puzzled some users of t.r. switches. The effect of using a wrong length of coaxial line between t.r. switch and transmitter is mentioned, and the need for cut-off bias on the transmitter output stage, to avoid diode noise in the receiver, is also pointed out. The 250-39 is rated as handling 4000 watts peak envelope power in a 50-ohm line, and the gain will run from 2 to 6 db., depending upon the frequency.

— B. G.

• *New Apparatus*

Mounting for Small Speakers

THE NEW lightweight plastic speaker baffles illustrated have obvious applications in the ham station. The molded plastic bowl comes equipped with a grille-cloth covered circular wooden baffle for a 5-inch speaker. The heavy wire bracket can be used either as a stand or as a hook for wall mounting. The baffle case can be rotated in the bracket so the sound can be directed up or down. Except for a small hole in the back for the speak-



er leads, the speaker is completely enclosed when mounted on the baffle, which fits tightly into the mouth of the bowl and is secured in place by two small wood screws.

The enclosure is 7 inches in diameter and 4 inches deep, and weighs 11 ounces. A product of J. W. Davis & Co., Dallas, Texas, manufacturers of Watterson speaker mountings, it is known as the Watterson Model 5-B.

1958 VE/W Contest

September 27-28

CANADIANS and U. S. amateurs: here's that chance to meet your next-door neighbor! Anyone in one of ARRL's 73 Sections is urged to get his feet wet in Montreal Amateur Radio Club's annual VE/W Contest, the 1958 version of which will hold forth from 1800 Sept. 27 through 2359 Sept. 28, EST times.

Who works whom? Well, Canadians contact the U. S. and Possessions and vice versa. To land other contestants, therefore, simply blast out a "CQ W" or "CQ VE," depending on whether you're north or south of the border. Once in QSO, trade exchanges consisting of a contact serial number, RS/RST report, and ARRL Section. *Example:* Having raised W9DYG on a CQ W, VE3DSU transmits "W9DYG de VE3DSU NR7 479 ONT K," whereupon W9DYG counters with "VE3DSU de W9DYG R HR NR4 589 WIS K." VE3DSU receipts if all goes well and both operators move on for more contacts.

To aid Montreal Amateur Radio Club's processing of the logs and permit accurate, speedy presentation of the results, Contest Chairman VE2BB asks that each entrant (1) familiarize himself with the ARRL-Section list on page six of this QST, (2) study the rules which follow, (3) submit a neat, legible log, and (4) carefully calculate his claimed score, applying the appropriate multipliers indicated in the sample.

If you observe the rules and mail your log postmarked by October 12 to Gordon H. Webster, VE2BB, 69 Pine Beach Blvd., Dorval, Quebec, you may be eligible for one of the certificates to be awarded to the top scorer in each section. If you're a real hot shot, you may even cop the suitably inscribed trophy which goes to

the over-all contest leader.

See you the fourth week end in September?

Rules

1) Any single-operator station in the 73 ARRL Sections may participate. An amateur may enter as mobile, portable, or fixed, but in only *one* category. Multiple-operator stations are not eligible to compete.

2) All contacts must be made during the period from 1800 EST Sept. 27 to 2359 EST Sept. 28, with a total operating time of no more than 20 hours for each entry. Times on and off the air must be clearly shown in the log.

3) Canadians will work only amateurs in the U. S. and Possessions, and vice versa. VE/VO-to-VE/VO and U. S.-to-U. S. contacts do not count. A station may be worked once on phone and once on c.w. on each frequency-band.

4) The exchange consists of a QSO number, RS or RST report, and ARRL Section. Example of W2VAQ's message to VE2BB: "VE2BB de W2VAQ NR2 579 NYC."

5) *Scoring:* Count two points for a complete exchange of information; incomplete contacts do not count (no fractional breakdown of the two points per QSO). For final score, VE/VO stations will multiply their total contact points by the number of ARRL Sections worked in the U. S. and Possessions, and then by the appropriate power multiplier listed below. For final score, W/K amateurs will multiply their total contact points by the number of Canadian areas (maximum of 9: VE1-VE8 plus VO), then by 7.22 (ratio of U. S.-to-Canadian Sections), then by the appropriate power multiplier, and then by a 2.5 provisional multiplier (based on the ratio of U. S.-to-Canadian log entries received in previous contests). All stations using power inputs of 30 watts or less receive a power multiplier of 2, those using from 31 through 100 watts receive a power multiplier of 1.5, and those using over 100 watts receive a power multiplier of 1.

6) Each entry must be accompanied by the following signed declaration: "I hereby state that my station was operated strictly in accordance with the rules of the contest and governmental regulations, and I agree that the decision of the contest committee of the Montreal Amateur Radio Club, Inc. shall be final in all cases of dispute."

7) To be deemed valid, all entries must follow the form shown in the sample log and must be postmarked no later than midnight, October 12, 1958. They should be sent to Gordon H. Webster, VE2BB, Contest Chairman, 69 Pine Beach Blvd., Dorval, Quebec, Canada.

LOG, 1958 VE/W CONTEST

Call..... W2VAQ C.W., Phone, or Both..... C.W. ARRL Section..... N.Y.C.L.I.

Date/Time On or Off Air (RST)	Time of QSO	NR Sent	My Stn.	RST Sent	My Sect.	Freq. Band	Emis- sion	Power Input	NR Rcvd.	His Stn.	RST Rcvd.	His Sect.	New Sects. Wkd.	QSO Pts.
Sept. 27 On 1800	1800	1	W2VAQ	579	NYC	3555	A1	75	1	VE2BB	599	QUE	1	2
"	1801	2	"	569	"	"	"	"	2	VE3MP	579	ONT	2	2
"	1802	3	"	579	"	"	"	"	1	VE2ARC	579	QUE	-	2
"	1813	4	"	559	"	7010	"	"	3	VE1AR	579	MAR	3	2
Off 1815														

Total operating time: 15 min.

Bands used: 3.5 & 7 Mc.

3 sects., 8 pts.

Claimed score: 4 QSOs × 2 (points per contact) × 3 (different sections worked) × 7.22 (section-balancing multiplier for all W/K stations) × 1.5 (power multiplier for 75 watts input) × 2.5 (provisional multiplier for all W/K stations based on ratio of U. S.-to-Canadian logs previously entered) = 650 (rounded).

I hereby state that my station was operated strictly in accordance with the rules of the contest and governmental regulations, and I agree that the decision of the contest committee of the Montreal Amateur Radio Club, Inc. shall be final in all cases of dispute.

Signature..... Call.....

V.H.F. QSO Party

September 20-21

ANOTHER of the popular ARRL V.H.F. Parties will be held from 2:00 P.M. local standard time Saturday, Sept. 20, through 11:00 P.M. local standard time Sunday, Sept. 21. All amateurs who can work any band or bands above 50 Mc. are urged to join in the v.h.f. fun.

Call "CQ V.H.F. QSO Party" or "CQ Contest" to raise other participants. During contact, operators must exchange names of their ARRL Sections (see page 6) to receive contest credit. Signal reports, operators' names, and equipment line-ups may also be exchanged, of course, but such information is not required by the contest rules. Figure your score as shown in rules 4 and 5.

A certificate will be awarded to the top scorer in each ARRL Section. In addition, certificate recognition will be extended to the high-scoring Novice, Technician, and multioperator station in each section from which three or more valid entries in these three special categories are received.

Submit your results as soon as the competition ends. A simple tabulation of stations and sections worked (as shown in the sample log on page 48, June 1957 *QST*) is all that is required. Log forms are now available free from the ARRL Communications Department.

Rules

1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, September 20, and ends at 11:00 P.M. Local Standard Time, Sunday, September 21. All claimed contacts must fall within this period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.

2) Name-of-section exchanges must be acknowledged by both operators before either may claim contact point(s). A one-way exchange, confirmed, does not count; there is no fractional breakdown of the 1-, 2- or 3-point units.

3) Fixed-, portable- or mobile-station operation under one call, from one location only, is permitted. A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest period.

4) Scoring: 1 point for completed two-way section exchanges on 50 or 144 Mc.; 2 points for such exchanges on 220 or 420 Mc.; 3 points for such exchanges on the higher v.h.f. bands. The sum of these points will be multiplied by the number of different ARRL sections worked per band; i.e., those with which at least one point has been earned. Re-working sections on additional bands for extra section credits is permitted. Cross-band work does not count. Contacts with aircraft mobile stations cannot be counted for section multipliers.

5) A contact per band may be counted for each station worked. Example: W2TBD (S.N.J.) works W1PHR (Conn.) on 50, 144 and 220 Mc. for complete exchanges. This gives W2TBD 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W2TBD contacts other Connecticut stations on these bands, they do not add to his section multiplier but they do pay off in additional contact points.)

6) Each section multiplier requires completed exchange with at least one station. The same section can provide another multiplier point only when contacted on a new v.h.f. band.

7) Awards: A certificate will be awarded to the high-scoring single-operator station in each ARRL section. In addition, the high-scoring multi-operator station will receive a certificate in each section from which three or more valid multiple-operator entries are received. Certificates will also be given to the top Novice and Technician in each section where three or more such licensees submit logs. Award Committee decisions will be final.

8) Reports must be postmarked no later than October 8, 1958, to be eligible for awards. See the sample log on page 48, June 1957 *QST* for correct form, or a message to Headquarters will bring printed blanks for your convenience.



Illinois — The North Central Phone Net will hold its annual outing on Sunday, September 14, at the St. Johns Sanitarium grounds at Springfield.

Illinois — The W9 members of DXCC will hold their sixth annual meeting and banquet in the Boulevard Room of the Sheraton Hotel, Chicago, on September 13. Some rare DX with pictures and stories will be on hand. Deadline for reservations is August 30. Registration fee of \$6.00 should be mailed to W9DXCC Chairman Bob Baird, W9NN, 524 Crestwood Drive, Des Plaines.

Illinois — The Peoria Area Amateur Radio Club will hold a hamfest on Sunday, September 21, at Keenland Park, on Rte. 150 north of Peoria. Games and prizes for all. Refreshments, or bring your own picnic lunch. Tickets are \$1.00 in advance (by September 6), or \$1.50 at the gate. Contact Larry Pearsall, W9FDY, 2224 W. Herold Ave., Peoria.

Iowa — The Cedar Valley Amateur Radio Club will sponsor a hamfest at the Hawkeye Downs fair grounds on Highways 30 and 218, south of Cedar Rapids, on Sunday, Sept. 7. Contests, prizes, YL activities. The Collins salvage store will be open. The XYL club will sell food. Tickets are \$1.50 for the men and \$1.00 for women. Contact Jay Spalti, W8SCM, 3239 Vine Ave., S.E., Cedar Rapids.

New Jersey — The SJRA annual hamfest and picnic will be held on Sept. 7 at Molia Farms, Old Delsea Drive, Malaga. Contests and prizes for all. Transmitter hunts on

10, 6 and 2 meters. K2AA will talk in mobiles on 145.8, 50. and 28.9 Mc. Signs on all major highways. Swimming. Sw p shop with no percentage fee. Charcoal burners permitted. Refreshments. Expected attendance is 1000. Advance registration is \$1.50, or \$2.00 at the gate. Contact Herbert C. Brooks, K2BG, 800 Lincoln Ave., Palmyra.

New Mexico — The Totah Amateur Radio Club will hold its annual get-together at Pine River Dam, Vallecito Reservoir, about 20 miles northeast of Durango, Colo., on Aug. 31-Sept. 1. Plenty of camp sites available. No registration fees or prizes. For information contact Leonard M. Norman, W5CIN, 903 North Butler Ave., Farmington.

New York — The 14th annual hamfest and ladies' night of the Oneida area hams will be held on Saturday, September 27, at the Masonic Temple Dining Room, 230 Main St., Oneida. Admission is \$3.00 per person, by advance registration only (prior to September 25) and is limited to the hall capacity of 150. Check-in begins at 5:00 P.M., with the banquet at 7:00 P.M. For reservations contact Walter L. Babcock, W2RXW, 405 Sayles St., Oneida.

Ohio — The annual hamfest of the Findlay Radio Club will be held on Sunday, September 7, at Riverside Park. Families invited. Mobile frequency is 3812 kc. Advance registration is \$1.00, or \$1.50 at the gate. Contact Fred Flowers, Secretary, W. McPherson Ave., Findlay.

Ohio — The 21st annual stag hamfest sponsored by the Greater Cincinnati Amateur Radio Association will be held Sept. 7, at Kopleng Grove, two miles south of Greenhills, on Winton Rd. The registration is \$2.50, which includes all you can eat, Rain or shine. Games, contests, radio-controlled model planes, hobby exhibits, radio exhibits, prizes. Paul R. Wolf, W8IVE, 741 Delta Ave., Cincinnati 26.



Hints and Kinks

For the Experimenter



USING FOUR-CONDUCTOR ROTATOR CABLE IN PARALLELED DIPOLE ANTENNAS

THE EASILY CONSTRUCTED multiband antenna using several dipoles, each cut for a different band, connected in parallel and fed with a common feedline has been previously described by at least four *QST* authors.^{1, 2, 3, 4} The latest of these articles described a four-band system using lengths of 300-ohm ribbon transmission line as the dipole elements. Although this idea does lead to simplified construction, it does not carry the easy-to-do-it theme quite as far as does the system used here at W9DOS.

A sketch of a five-band antenna is shown in Fig. 1. The point of interest is that the four dipoles for 7 through 28 Mc. are made from two lengths of four-conductor rotator cable. These lightweight elements are supported by a half-wave dipole cut for 3.5 Mc. Copperweld wire is recommended for the 3.5-Mc. radiator because it will stand the strain of supporting the other antennas without breaking or stretching. The 7-through 28-Mc. elements may be attached to the 3.5-Mc. antenna by means of tape or string, or a number of lightweight strain insulators (A, B, C and D in Fig. 1) may be used for the purpose.

The two lengths of rotator cable are first trimmed to a length suitable for use as a 7-Mc. dipole. The No. 2, 3 and 4 conductors of each length of cable are then shortened by removing excess wire and insulation to provide elements for the 14-, 21- and 28-Mc. antennas, respectively. The outside ends of the individual dipoles are left floating, and the inside ends are twisted together and soldered to the 3.5-Mc. antenna as shown in

the drawing. The common coaxial feedline for the five antennas may be any convenient length.

— *Sigmund J. Wysocki, W9DOS*

Editor's Note: An antenna of this type will respond readily to harmonics and submultiples of the transmitter output frequency. It is therefore especially important that these frequencies be suppressed *before* they reach the antenna.

MANUAL KEYING WITH THE "MON-KEY"

AS THE owner and operator of a "Mon-Key" electronic keyer (Electric Eye Equipment Co.), I occasionally find it desirable to either send more slowly than permitted by the lowest electronically controlled speed or to manually regulate character length during testing and DXing.

To add the manual-control feature to the key, it is only necessary to install a small s.p.s.t. toggle switch in the circuit. After removing the dust cover to expose the electronic circuit you will find a 0.01- μ f. capacitor, C_5 , at the front end of the terminal board. To further identify C_5 , this is the capacitor separated from all other capacitors by a bank of three resistors. Open up the connection going to the left end of C_5 (as seen from the front of the terminal board) and then connect the toggle switch in series with the lead. Return the dust cover and you're all set for either electronic or manual keying.

The switch may be mounted in any convenient location. Mine was placed directly below the speed control. Open the switch for manual control and, of course, close it for electronic keying. Switching over to manual control does not adversely affect the operation of either the internal keying relay or the tone oscillator.

— *Paul G. Marsha, K4AVU*

Fig. 1—Drawing of W9DOS's multiband antenna for 3.5 through 28 Mc. Individual dipoles for 7, 14, 21 and 28 Mc. are made from lengths of four-conductor rotator control cable. The 3.5-Mc. antenna, made with copperweld wire, is used to support the dipoles for the higher frequencies. A single length of 73-ohm coaxial cable is used to couple to all five antennas.

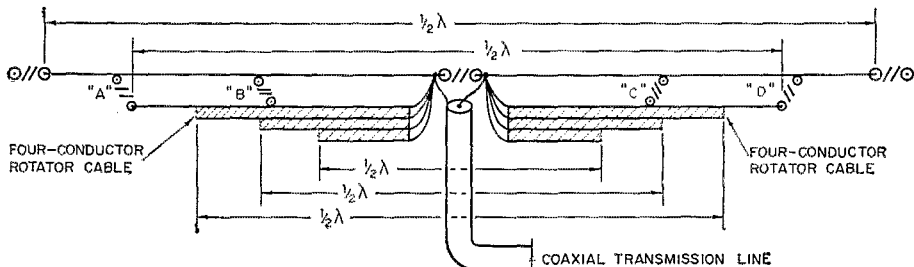
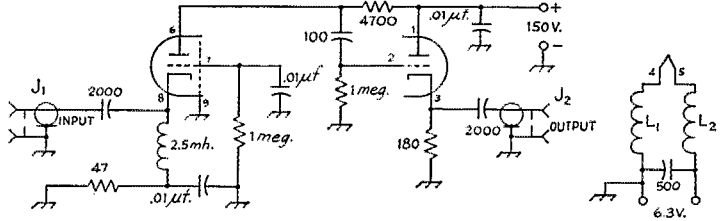


Fig. 2—Circuit diagram of W8EJJ's t.r. switch. Unless otherwise indicated, capacitances are in μmf . Resistances are in ohms, resistors are $\frac{1}{2}$ watt. L_1 and L_2 are each wound with 30 turns No. 24 wire to a diameter of $\frac{3}{8}$ inch.



T.R. SWITCHES

MODIFICATION of my 100-watt station for fast break-in brought up the antenna switching problem. A t.r. switch seemed to be the best answer, so one was designed.

The simplicity of the unit built is shown by the circuit diagram, Fig. 2. Since it could be added to existing control units, some other "120-watt table-top rig" amateur may be interested in the circuit.

A grounded-grid input stage (switched by grid rectification) $R-C$ coupled to a cathode-follower output stage, provides a broad-band low-impedance t.r. switch suitable for use with coaxial cable. The unit has some gain as shown. If needed, for long lines or to make up for resistive isolation, more gain can be had by increasing the plate resistance of the first stage to 6800 ohms or more.

The 6BK7A tube is a good choice for this application. Designed for cascode operation, it has a good heater-to-cathode voltage rating. More important is an internal shield connected to Pin 9 which very effectively isolates the two triode sections. With no power to the t.r. switch the receiver sounds dead.

My model is a separate unit with its own booster-type transformer, selenium rectifier and other power supply components built on a $3\frac{1}{2} \times 5$ -inch aluminum sheet chassis and housed in a $4 \times 4 \times 5$ -inch sheet-metal can. Construction is similar to B & W t.r. switch. I have no way of checking power-handling capabilities, but from the tube ratings this switch should handle as much power as the other units I have seen. A phono jack in the transmitter end of the low-pass filter provides a convenient point for connection to the r.f. line.

After installing this t.r. switch several interesting developments were noted. Hash from the final amplifier (parallel 807s) had to be eliminated. A clamp tube circuit was added to help the fixed bias cut plate current completely off. Zero-beating is a little more tricky, requiring less r.f. gain in the receiver. And finally, it is quite a surprise to learn how many hams pick my operating frequency to tune up on. I can hear them now!

— Charles E. Quick, W8EJJ

— —

The t.r. switch shown in Fig. 3 is my adaptation of a circuit designed for another purpose and described by ZL4GP on page 48 of *QST* for

July, 1955. Although the switch is only slightly more complicated than the simple unit developed by W9LSK (*QST*, May, 1956), it does operate without presenting a constant loss to received signals through the 3.5–30-Mc. range. In fact, the circuit shows some gain at these frequencies.

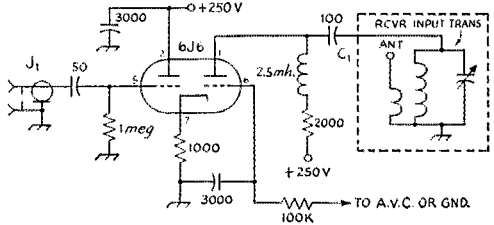


Fig. 3—Diagram of I1DAJ's simple t.r. switch. The switch is designed for low-impedance input (coaxial cable) and high-impedance output. Capacitances are in μmf , resistances are in ohms, resistors are $\frac{1}{2}$ watt.

The switch is designed for low-impedance coaxial-cable input and high-impedance output. Because of the latter characteristic, it is important that the switch be built *into* the receiver with its output coupling capacitor connected directly to the secondary of the receiver input transformer.

— Carlo Winspeare, I1DAJ

UNBALANCED TO BALANCED FEED FOR LOW-IMPEDANCE MULTIBAND ANTENNAS

IN *QST* for June, 1956, W6EBY described a balun-type coupler for use between a coaxial feed-line and a balanced antenna such as a half-wave dipole. Although the system as described makes use of an individual antenna for each band of operation, it is perfectly practical to use the same method for coupling 75-ohm coaxial cable into the center of a balanced multiband trap-type antenna system.

Here at W3BRQ, we run a length of 75-ohm coax from the pi-network output tank to a balun located out on the roof in the general vicinity of the feed point for the multiband antenna. The balun, made from a pair of relatively inexpensive B&W type 3975 coils, provides a match between the long run of coax and a short length of 75-ohm Twin-Lead that connects to the center of the antenna.

— Tony Gitt, W3BRQ

EASIER REMOVAL OF BATTERIES FROM HOLDERS

PENLIGHT cells in test instruments or transistor devices are sometimes difficult to remove from the battery holder for replacement. The designer's success in tucking the batteries into a recess, or out-of-the-way corner, is least appreciated at that moment.

Before slipping a replacement battery into place, wrap a strip of plastic electrical tape around it near one end (to clear the clip in the holder). Bring the ends of the tape together to form a projecting tab about a half-inch long. This tab is easily grasped with pliers or fingers, the next time the battery needs removal.

— *Edmund B. Thompson, KØLLJ*

A SIMPLE METHOD TO LOWER CRYSTAL FREQUENCY

INSTEAD of rubbing a crystal with solder to lower the frequency, rub one side with an ordinary lead pencil. This will lower the frequency much more effectively with less danger of fracturing the crystal itself.

If you overshoot your mark by applying too much lead you can erase it with an ordinary pencil eraser. The first time this method was tried I succeeded in lowering the frequency of a crystal about 36 kc. without breaking or chipping the crystal. The frequency of the crystal has since remained very stable.

— *Mike Kaufman, K6VCI*

ANOTHER REMOTELY-CONTROLLED SWITCHING CIRCUIT FOR COAXIAL FEEDLINES

OWNERS of coaxial-fed antennas who contemplate use of the "cable-saving" selector circuit described by W9QUW in Hints & Kinks for March, 1958, may be interested in a simplified control and indicator circuit for the system.

The relay-controlled setups I've seen usually use a progressive shorting switch wired as shown in Fig. 4. This arrangement has only one antenna-selector switch and is extremely simple to wire. Pilot-lamp indicators become more or less an accessory with this circuit, since the selector-switch pointer knob indicates the antenna in use.

S_1 , the selector control, may be a Centralab

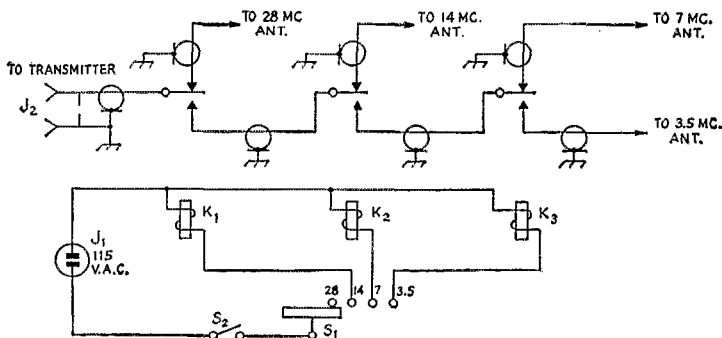


Fig. 4—Circuit diagram of the simplified remotely controlled switching circuit for coaxial feedlines.

steatite wafer section type PIS, PISD or PA-12. Phenolic Centralab sections that will do the job are the types PI, PID and PA-43. A s.p.s.t. toggle switch, S_2 , is used as the control head on-off switch. J_1 is a 115-volt chassis-type receptacle mounted adjacent to the selector switch.

— *Eugene Austin, WØLZZ*

A BAND EDGE MARKER

A FOOT-PROOF band edge marker can be made very simply by using quartz crystals and a neon bulb. When the v.f.o. tunes across the frequency of either crystal, the neon bulb will flash, indicating the edge of the band. Crystal Y_1 , can be chosen for the low edge and Y_2 , for the high edge of the band. However, it is well to remember that if too many crystals are connected in parallel the holder capacity will pass a signal of any frequency.

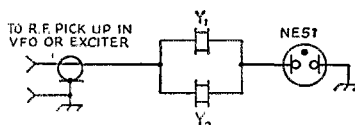


Fig. 5—Diagram of the band edge marker.

The pick-up for the radio frequency voltage can be a short piece of wire placed near a hot tank circuit in the v.f.o. or exciter. Of course, the r.f. field must be strong enough to provide sufficient voltage at the terminals of the neon bulb to light it.

— *John Grindon, WØUVX/9*

REDUCING KEY CLICKS IN CATHODE KEYED TRANSMITTERS

MOST small transmitters employ simple cathode keying. A tendency toward undue sharp keying clicks unjustified by the usual hand keying speeds can be easily reduced. Assuming the usual combined oscillator-amplifier cathode keying, a resistor is connected across the key terminals. The value should not be brought too low (below 10,000 ohms), nor the amplifier and power supply get a chance to cool. With most popular small rigs, a value like 33,000 ohms, 2 watts seems to work well. The simplicity of installation is appealing.

— *Lester Sade*

A "FIXED-LOCATION" POWER SUPPLY FOR MOBILE EQUIPMENT

MOBILE equipment permanently mounted in a car can usually be operated "fixed location" for extended periods of time only at the expense of either an overheated engine or a run down battery. And, of course, gallons of gasoline can be consumed while the car motor is being used to generate primary power for the mobile supply. If operation takes place during a hot afternoon, you're also in for some personal discomfort caused by the extra heat radiated from the motor. Ignition noise generated by your own car is still another annoyance that results from "leave-your-motor-running" operation.

Most of these problems may be minimized or completely eliminated by using a field-type battery charger as suggested by W7FVI (*QST*, July, 1955). Our version of this supply, shown here as Fig. 6, is used to charge the car battery, but the same unit may be used to keep life in any storage battery being used in the field.

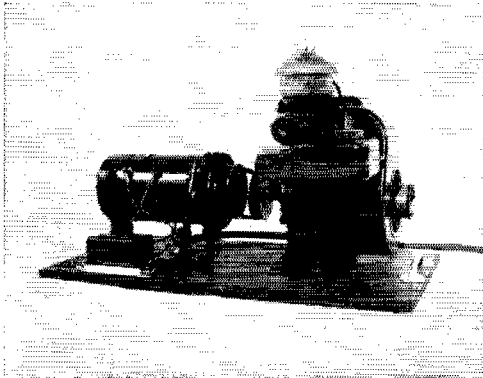


Fig. 6—W9WTY's version of the field-type battery charger described previously by W7FVI. This particular unit is used to charge the car battery during extended periods of car-not-in-motion mobile operation.

The charger consists of a small gasoline engine, an old auto generator and a voltage regulator. These are mounted on a plywood base equipped with handles. Output from the generator is coupled to the car battery through a long length of heavy duty two-wire cable. Naturally, the length of the cable will be determined by how much you want to separate the charger and the battery. If you want lots of separation so that racket from the charger can be kept in the background as much as possible, just remember that the cable may have to carry 30 amperes or more if the generator-battery system is designed for 6 volts. Figure on a wire size that will handle 15 or 20 amperes if the charger is a 12-volt affair.

— Jack Miller, W9WTY

RECORDING OSCILLOSCOPE TRACES WITH A GREASE PENCIL

THE grease pencil recording technique won't replace the oscilloscope camera, but it does pro-

vide a very satisfactory means of making permanent records of many of the waveforms observed on the ham shack oscilloscope. The procedure is to carefully trace out the waveform, marking on the face of the CRT with a grease pencil (China-Marking Lead). Then place a sheet of paper on the face of the CRT and transfer the grease pencil markings to the paper by briskly rubbing over the traced region with your fingernail. The record obtained will be a mirror image. If a real image is desired, use the same technique to transfer the mirror image to a second sheet of paper.

— Donald F. Hemenway, W3SQP

INCREASING AUDIO OSCILLATOR RANGE

HERE is a method for extending the range of an audio oscillator to cover the supersonic range between 20 kc. and 120 kc.

As shown in Fig. 7, the crystal rectifier produces a half-wave rectified voltage rich in harmonics. No difficulty has been experienced in generating 100 kc. signals (5th harmonic of 20 kc.) from a Hewlett-Packard 205 type oscillator even at levels far below its 5 watt output rating.

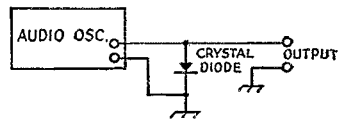


Fig. 7—Illustration showing W2LID's method for increasing the range of an audio oscillator.

One of the most useful functions of this arrangement is the provision of a signal source to aid in the alignment of low frequency i.f. amplifiers.

— D. J. Gagne, W2LID

PROXOS TO RANGER CONNECTIONS

HERE'S a simple way to connect "Proxos" (*QST*, March 1957) to a Viking Ranger. When the Proxos relay contacts close, adjust the 50,000 ohm potentiometer until the oscillator just comes on. This point is below the level needed

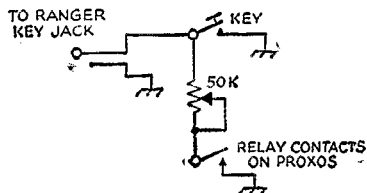


Fig. 8—Circuit diagram of W4BZE's method of connecting Proxos to the Viking Ranger.

to drive the following stages so can be used for frequency spotting and zeroing.

— Tom Jones, W4BZE

Contest Operating

*Some Tips from
a Well-Known Winner*

BY
LAWRENCE LEKASHMAN,* W9IOP

Larry Lekashman, formerly W2IOP and W8IOP, is well qualified to supply some tips on contest operating. He has for many years been a top scorer in the Sweepstakes, currently holding the record for the most number of QSOs during the 40-hour period and for the highest score. After you read this you'll have at least one unanswered question — how come the vice president of a firm that makes microphones is such a c.w. hotshot!

CONTEST OPERATING is a specialized phase of amateur radio that appeals in varying degrees to a large percentage of active hams. Within the broad framework of the many contests held each year, probably the biggest division of types is between c.w. and phone. This article, discussing those factors which contribute to high scoring, is of necessity limited to c.w. contests, since I have had little experience in similar radio-telephone activities.

Each amateur has his own reason for entering a contest. It may be that his normal operating hours are limited because of personal commitments and the opportunity to get a concentrated dose provides a healthy outlet for his amateur radio enthusiasm. Or, perhaps it is his desire to add a new state, or a new country, or to achieve some particular operating feat possible only during a contest. For example, attempting to work all states in a week end. Surely, for many amateurs there is simply the fun of sharpening their operating skill and working a lot of stations to evaluate equipment without lengthy contacts and finally, for that small group, the competitive challenge to be a winner. I fall in the last category and it is about this group that I shall expound.

On numerous occasions, I have heard amateurs talking about operators and contest results. Some of them have formed an erroneous opinion that the contest winners are the finest operators. They may well be the most skilled in that particular contest, but it is certainly only fair to acknowledge that no such conclusion can be drawn unless every amateur on the air was participating in a

* % Electro-Voice, Buchanan, Michigan.

contest. I have listened to traffic networks on 80 meters: to high speed rag chewers on 40; to skilled DXers on 20; to c.w. DX on 2 and have found on many occasions techniques of operating that I often wished I could emulate.

There is also a group of amateurs, who for reasons beyond my grasp, seem to think that amateurs who participate in contests, particularly to win, are unbalanced or immature. Contest enthusiasts are amateurs from all walks of life, professions and, indeed, represent a typical cross-section of our hobby. "Contesting" has the same sort of competitive drive as yacht racing or golf.

With the possible disturbance to the non-contest-minded amateur's normal routine, contests may be entered or not as an amateur chooses, but are simply a healthy, interesting and extremely exciting facet of amateur radio.

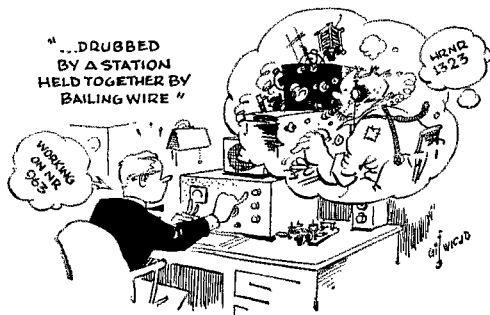
Through the years, certain operators have consistently turned in top performances in every contest. My statement will not be challenged when I say that the new "contest-minded" amateurs who turn in top scores each operating season (and there are always a few newcomers to the top scores), use techniques patterned closely after the old-timers, knowingly or otherwise. The statement can also be made that a good contest operator can handle a domestic contest such as the Sweepstakes or a DX contest with equal skill, and for this reason I have not attempted to stratify the different parameters that make for a winning score.

Just what are these factors? *QST* through the years has run comments by many of the leading operators: a cooperative wife, understanding neighbors, these facetious remarks are all true, but they hardly explain an average of 40 contacts an hour for twenty-five or thirty hours, or more.

Then what are these specifics? I have examined in retrospect my own pattern of operating for over twenty years. I have gotten to know many of my contemporaries intimately and feel that the explanations are relatively straight forward, although not necessarily simple to duplicate.

Equipment

First, let's talk about equipment. I have always been a fanatic for tidiness in my station, for immaculate equipment, for laced cables, for matching paint, but I have been given many a drubbing by a station that was held together by bailing wire, chewing gum and Scotch tape. What the



station looks like physically is important only insofar as the mental attitude of the operator is concerned. What kind of a signal the station transmits is important. We must assume that all of the top performers have good r.f. generating equipment and fine receiving equipment. Every reasonable operating convenience must be provided. As an example, for any kind of contest operating, break-in is essential. To have less is a handicap and a good score without break-in simply means it would have been a better score with break-in. Single switch control, good monitoring facilities, a comfortable chair, accurate frequency checks, a straight key and a bug with a sliding weight or a controllable electronic key — these things are a matter of individual preference and having them will not guarantee a good score, but not having them will eliminate you from competition with an equally skilled contest operator having these adjuncts. Of course, flexibility of a station to a contest man is not the same as to an ordinary amateur. As an illustration, a band-switching transmitter is certainly desirable, much to be preferred over one in which you plug in coils. But separate transmitters are even more desirable because there is no retuning to be done and the safety factor is greatly increased. For contests with low-power handicaps, such as the SS, these problems are not quite as great and operating features are even of greater consideration. My "Gold-Plated Special" SS transmitter¹ is an example of this specialized construction. Let me digress for a moment to discuss "safety factor." How many of you have had a piece of transmitting equipment blow up at a crucial moment? Almost everyone. When you disturb a transmitter by changing coils, there is a certain chance for difficulty. There is less chance if it is a band-switching transmitter with a pi network arrangement, but there is still a chance as you tune from band to band, eliminated with separate rigs.

Perhaps a right-angle drive will bind, or a shaft will slip, or any of the other innumerable annoyances that can occur in equipment. With separate transmitters this type of equipment failure is minimized. Further, you get greater ease of mind when operating, a subject that I shall touch upon later.

Antennas, on the other hand, are not quite so cut and dried. It is in this department that you find the greatest differences among stations. More than in transmitters and receivers, an individual's financial and physical resources become an important factor in producing high scores. There are some among us who are fortunate to have adequate real estate and funds to put up extreme arrays, which gives a great advantage on any given call. There are others that perhaps don't have the money, but have land and do a splendid job. But there are many amateurs that are competing for top scores who have highly restricted living areas and must depend on anything but optimum antennas. Operating skill will certainly help overcome short-comings of an antenna system. But if you take two equally matched oper-

ators and give one a better antenna setup, he will win the contest.

The likelihood of having two operators completely matched in all of the qualities that make for an outstanding score is not great and there remains the chance for the well equipped, but moderately facilitated antenna man to still win a contest. Why? For one reason, he isn't *always* calling the same station as the man with the fine antennas. When they both call him, the best antenna is going to win the greatest percentage of calls, but without professing to know what the mathematical odds are, if two stations work a thousand contacts in a Sweepstakes contest, they both simultaneously call the same station but rarely. To state it another way, to have a top score in a contest, you need good antennas, but they need not be sensational. You need a good location, but it need not be above average. It simply cannot be below average.

Operators

So far, I have said little that could not be assumed. Good contest operators have good reasonable equipment, but it is not the equipment that wins the contest. The equipment can lose the contest for a man and that is all. It is the operator that wins the contest.

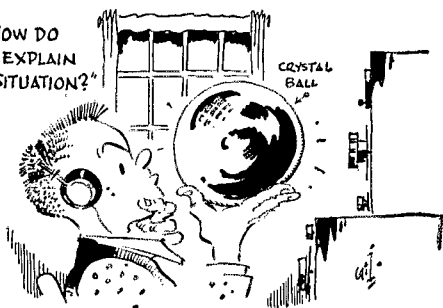
Well then, what's so special about these operators? I will try to be candid in appraising good contest operators. All good contest operators have an intuitive sense in their operating technique. I do not believe that this is wholly acquired. Either you have it or you don't. Now what do I mean by this? Let me give you a couple of concrete examples that any top scoring operator can substantiate. You call CQ SS. Two, perhaps three, possibly even four stations answer your call. Which one do you go back to? One call you may recognize immediately as being a major contest man himself. You know that he will not wait. If you don't go back to him, he is gone. The second call you may recognize as being a friend who you feel will wait to give you a contact. What about the other two stations? Intuitively, I have seen it happen repeatedly, you know whether they will wait. You know whether to take those stations ahead of your friend with the certainty that makes for big scores. I have listened to a contest man first work other major participants, then perhaps his friend, and finally without any indication that the other station calling originally is standing by, tell him to go ahead and *he's there*, and I've heard it carried out to four and even to five stations. Maybe it isn't all intuition — maybe you can tell somehow that the watery signal, that the weak, apparently inexperienced operator is going to wait because he is anxious to work you . . . you have a good signal, you are a clean operator, and possibly this is the explanation.

But how do you explain the situation where the contest man calls another station and when he stands by that other station is thoroughly and completely smeared by QRM? Suddenly the QRM is gone and here is the station sending the

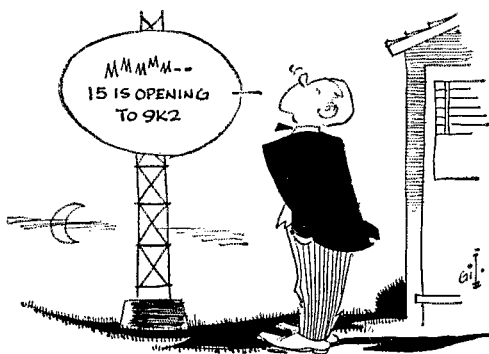
¹ CQ, October, 1948.

number, a report, a check, and the contest man is putting it down in the log because he *knows* he is working him, and in a high percentage of the time he is right. Good timing, recognizing that the station you called is sending the number at just about the time he should be if he came back to you is important and again maybe I am giving too much credence to intuition when it is simply fast and logical reasoning. Hearing a Russian call CQ and feeling instinctively that he's not just another White Russian and not being too surprised when he tells you he is on Franz Josef Land . . . is it because the pitch of the signal is imperceptibly different from the rest of the Russians? Perhaps. And if intuition is the wrong word, then razor-sharp reactions, experience, the ability to analyze and interpret a situation instantly, must be considered as an essential if you are going to win a contest against strong competition.

--HOW DO YOU EXPLAIN THE SITUATION?

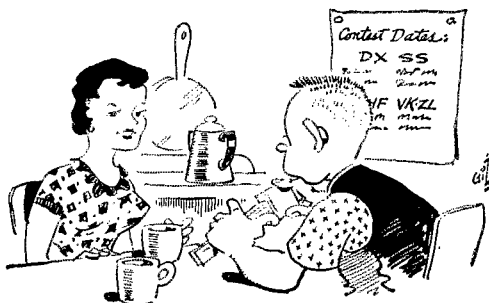


What else must the contest man have? A firm understanding of propagation and a good sense as to how to use this knowledge is a "must." Selecting the right bands at the right time keeps the QSO's rolling. But simply selecting the correct frequencies for maximum activity may not be enough. If you are two-thirds of the way through a Sweepstakes contest and are still missing sections, select your bands on the basis of skip so you get your elusive sections and not on the basis of activity. If you are in a DX contest and 20 meters is hot, but 80 meters is open to Europe the first week end of the contest, move to 80 and get your European multipliers because the chances are good that 20 will be hotter the second week end than 80. Can you learn this from a book? I don't think you have to. The application of common sense and some rudimentary understanding of CRPL forecasts, WWV forecasts, and the "sound of the band" give you this needed information. I don't recall precisely what story it was in *QST* about the old-timer who went outside his shack, sniffed the air, and knew that this was a great night for 40-meter DX. Well, that's not far wrong. With crisp fall weather, the low frequency bands in the Sweepstakes are sure to be exciting, but let the weather get sticky and listless and you better anticipate short skip on 20 and not hold out too much hope for 80. You can't possibly generalize about conditions over all of the United States by sniffing the air in your



own back yard, but there is no substitute for experience.

I have never discussed with other contest men a factor that always rates high in my performance, "ease of mind". I have gone into contests twenty minutes after getting off an airplane from Chicago or after driving five hundred miles through fog and snow, when I was dog-tired from putting up antennas or repairing a transmitter and have done well. Physical tiredness is to be avoided, but is not an insurmountable handicap particularly if there is a lot of activity on the air to keep you alert. But having to worry about other things during a contest is a handicap. On occasion, I sat down at the operating table with personal or business problems that I simply could not put aside and my performance on every count suffered badly. I am not suggesting that a man must live in a world without problems to win a contest. You stand a better chance of winning if you have had a good week at the office, if your wife and children wish you luck and mean it, if your equipment is working well, and you feel that you have uninterrupted hours of pleasure in front of you. In 1949, during the DX contest, my XYL was expecting our second offspring. The baby was due on the week end of the contest, but this was a relatively happy event and while I was certainly worried about my wife's welfare, I let her worry about holding back until after the final CQ of the contest. In addition, my good friend, Jack Willson, W2AQX, spent the week end at our house prepared at an instance's notice to drive my wife to the hospital. No moral to the story except, plan your family with the contest dates in mind!



There are other little things that I consider personally helpful, but would hardly insist that a protegee in the contest activity emulate them with assurances of a better score. I keep lots of sharp pencils on hand and use 3H's so that they don't smear during the excitement of the contest. Keep check sheets handy and mounted on cardboard so they don't curl during a contest and so the information is readily available. Try to insure privacy beforehand in a contest and arrange that the family takes all telephone calls. If I think I am going to have television interference, I talk to my neighbors and explain the situation so every time the telephone rings, I don't have to feel it is an angry complaint. From experience, I know what section or country multipliers are going to be the tough ones and will mentally lay out a schedule for the bands I plan to operate. But I change this schedule as conditions dictate. Frequently, what appears to be a hard section one year is an easy one the next year. A band that is cantankerous one year is superb the next. During the 1957 International DX Contest, for the first time 21 megacycles was open for a 24-hour period. Unusual phenomena such as this call for operating techniques that you improvise on the spot. The almost certain opening of 20 on the N-S path is a fairly certain opportunity to pick up elusive KZ5 — and remembering your propagation paths under contest pressure is essential.

Those of us who down through the years have operated energetically have built up a wide circle of acquaintanceships; perhaps we only meet these chaps once a year in a contest, but you do get to know them, remember their calls and where they are located. In a pileup they will generally single you out because they know you. In heavy QRM, if they only hear a few letters from your call, they know who you are. If I hear KFC in a contest, it is probably my old friend Vic Clark, W4KFC. Were he to hear nothing but IOP, he would know it was I, although with my moving around through various call areas, he might have to double check to see whether it was 2IOP, SIOP, or 9IOP (for future contests listen for W9IOP from the Indiana Section). This is worth important points.

If you operate enough, you acquire the ability to recognize a large number of stations by their method of operating, usually by their fists. I suppose the prime example of this in the contest world is KH6IJ, who generally is so busy working people that, with all apologies to him, if you don't know his call, it might take you a long time to figure out who it is. Yet, that blur of dots and dashes is as unmistakably KH6IJ as if it were typed out on a Kleinschmidt perforator. And even an electronic key doesn't hide the distinctiveness of a man's style. My associate, W8DUS, who uses an electronic key, still has a distinctive way of handling it, of spacing the "US" in his call so that if you heard only the "US", you would know it was he and if you listened to a sentence or two on the air, even a CQ, with a little practice you would never miss him. And signals also have a distinctiveness. Another one

of my associates, W8UPN, has a characteristic to his note and keying quite aside from his fist, which enables me to spot his signal any time I come across it. And while we frown on resonant filters and tuned power supplies, here and there is a note, or a backwave, or a tail that is as positive an identification as a man's call. If you know enough of these, particularly in a DX contest, on low frequencies where you may have a little trouble reading calls, you can perform seeming wonders of digging out stations from under the layers of noise and QRM.

Miscellaneous

I use several other techniques which are also employed by my competitors. In a contest such as the DX contest, where you can operate without a time limit, I try to sleep late the day before the contest starts so, if possible, I can stay up all of the time without any sleep. In a contest such as the Sweepstakes, if conditions are good, I will put in a maximum number of the limited hours permitted, to avoid any possibility of ending up with unused hours on a poor band. Nothing can be more discouraging than sitting on 40 meters the last evening of the contest with two or three hours unused and hearing nothing but the hollow echo of W5GEL calling CQ SS. This isn't always the smartest tactic. In 1955, the bands were good early in the contest and I worked at a feverish pace. With an hour and one-half to go on Sunday afternoon, W7KVU called me to compare notes, something which is normally taboo except among blood brothers. I had more contacts at that time than John, but he had something like four hours of operating time left against my hour and one-half. The band got hotter and hotter and, indeed, during the last hour and one-half I worked something like 65 stations which gave John a terrible shock as he heard me giving my last few numbers. But the shock wasn't enough to keep him from going on to beat me as the upward performance of the band turned up lots of stations that just weren't there earlier.

Fill out as much information on the log before the contest as possible. I enter my own call, my section, the type of contest, the amount of power; leave little to be done during the contest besides operating. Keep spares on hand for those components most likely to fail. W9JDS in South Bend would probably not be my friend today except for his unflinching good nature when I had to rout him out of bed at dawn to get a bleeder for a screen supply which failed. It isn't possible to cover every contingency, but the more you cover, the better your chances are. Imagine going two-thirds of the way through a contest with a good performance only to be knocked out only because of equipment malfunctioning. It would break my spirit and I am sure it would affect yours. In talking about spirit, consider also the ability to *not* get discouraged which is important. In my early contest days, when I thought I was doing very well and worked somebody like W3BES who was already far ahead of me, it used to take me

(Continued on page 168)

Thanks to the dozens of readers who sent in the clipping from Abigail Van Buren's syndicated column. For those who missed it, a "ham radio widow" wrote to Abby and said, "My husband has taken up ham radio operating as a hobby and he would rather talk to a stranger in Syracuse, N. Y., than to me. He spends all his time on this ham radio and I am getting fed up with being ignored. Is there anything I can do to get his attention or should I hope he outgrows it?" Abby replied, "Some hams are never cured. Don't give him the air before you find out what's on it. Women have also found this hobby fascinating."

KN2TZG and K2MHY say that they are awarding certificates for membership in a Super Rag Chewers' Club. Required for membership is proof that the applicant has QSO'd another station for a solid 18 hours.

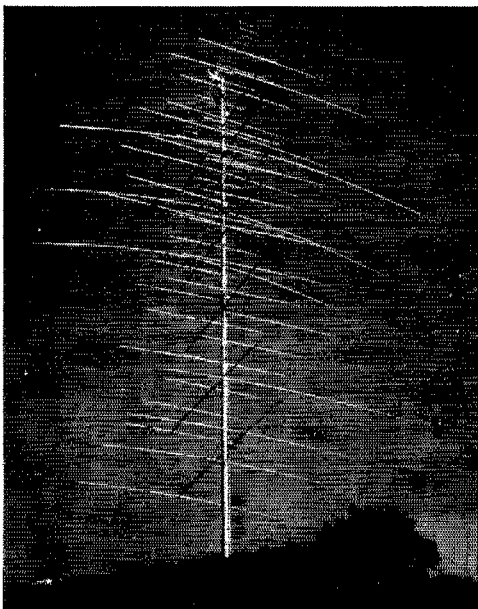
The First Army MARS s.s.b. technical net will resume operations beginning September 3, continuing each Wednesday evening at 2100 on 4030 kc. September schedules include talks on reminiscences in radio by Emil Simon, former assistant to Lee DeForest (Sept. 3); features of modern amateur s.s.b. equipment, by E. W. Pappenfus of Collins (Sept. 10); applications of inductor high frequency saturable reactors, by C. G. Sontheimer and H. F. Spier of CGS Laboratories (Sept. 17); and auditory test equipment for the blind radio amateur by Robert Gunderson, W2JIO, of the *Braille Technical Press* (Sept. 24).

The Air Force MARS Eastern Technical Net will resume its Sunday operations on Sept. 7, presenting technical discussions from 1400 to 1600 EDT on 3295, 7540, and 15,715 kc. The following talks have been scheduled: Long range radio navigational systems, by Mortimer Rogoff of the Federal Telecommunications Laboratories (Sept. 7); vacuum tube applications by Selig Gertzis, of Amperex Electronics Corp. (Sept. 14); vacuum tube considerations by Bert Green of Amperex (Sept. 21); single sideband by William Kaufman of Telechrome Corp (Sept. 28); and the basics of transistors by Charles Simmons of Philco (Oct. 5).

W1YNC suggests that a good source of distilled water for storage batteries is the water in the refrigerator tray after defrosting. Since it is condensed from the atmosphere, there are very few harmful ions which might shorten the life of the FD battery or the one in the car.

H1SSKE (W2SKE and recent *Sports Illustrated* author) has applied for the WAC certificate, and claims that this was the first Dominican Republic WAC ever made on s.s.b. in two days by a ham operating from room 712 of the Ambassador Hotel while on his honeymoon. (Bill, we have checked our records very carefully, and your claim appears to be uncontested! — Ed.)

W3LFC sent in a clipping from *American Aviation* reporting that the USAF has completed a study indicating that most people are inclined to turn knobs clockwise when they want to increase and counterclockwise to decrease whatever it is the knob controls.



There are several of these monsters around the country—this one happens to be at W1FZ, up in New Hampshire. Furnished by Telrex, it weighs some four tons, extending 111 feet above ground, unguied, and 11½ feet below ground. The whole thing rotates inside a tube which is anchored in the ground with nearly 20 yards of concrete. One coax feedline runs from the shack to a point near the top of the pole where a remotely controlled coax switch shifts the feed to one or another of the six beam antennas. There are stacked arrays on 20, 15, 10 and 6 meters, while 40 and 2 meters have only single beams each. Steel steps starting about 14 feet from the ground lead right to the top from whence, on a clear day, you can see quite a fur piece. In fact, that's W1FZ himself in the photo, enjoying the view from the top.

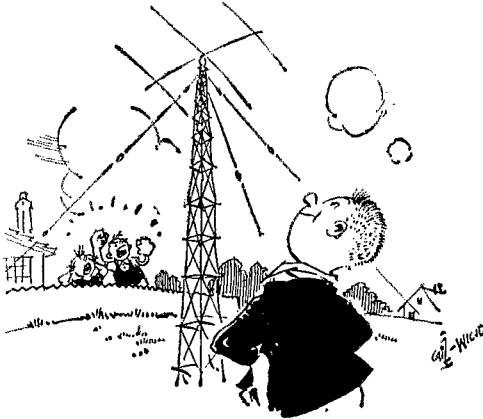
A Zoning Problem Solved

How K4LMB Handled a Difficult Situation

BY GAY E. MILIUS, JR.,* W4NJF
AND ETHEL M. SMITH,** K4LMB

WHEN John Q. Ham, general class licensee, bought his home in the suburbs, he believed that he was all set to develop a real amateur station. He would invest in a cool kilowatt and erect a tall tower on which to place a multi-element beam. DX would then be his for the calling.

But John Q. never considered that his neighbors might take offense at his tower and beam. He understood the TVI problem. Yet he had no idea there would be a question of "aesthetics," whatever that meant. He soon learned the meaning of the word. The proposed structure, which was the apple of his eye, would prove to be poison fruit to the lady next door. To her, an amateur beam appeared out of place in her neighborhood.



Animosity was generated. Although John Q. had not fired up his rig, in the minds of his neighbors he became the source of all TVI in his area. Furthermore, he discovered that he would have to apply for a "use" permit if he wanted to erect the tower or even sink a pole on which to fasten a long wire. To do this would require a zoning hearing which would be attended by all the prematurely irate owners of property within a radius of several hundred feet of his new home.

This situation has been faced by numerous amateur radio operators since their return to the air after World War II. They have been continually plagued by attempts to apply local zoning ordinances to restrict them from using their real estate in the furtherance of amateur radio. All of these attempts, at some time or other, have developed into neighborhood squabbles. They

have done nothing to aid the prestige of amateur radio.

Although the highest courts in Minnesota, New Jersey and Pennsylvania¹ have determined that the operation of an amateur radio station is a normal adjunct to the residential use of a home, it is not always easy to convince local authorities of the correctness of this point of view.

The aphorism, "There is more than one way to skin a cat" can be interpreted to mean in ham vernacular that "You can feed an antenna by several methods." K4LMB recently proved the time-worn phrase, showing that it could be more advantageous not to fight antiquated and outmoded zoning ordinances in Arlington County, Virginia, by resorting to the courts but to work toward amending and modernizing existing regulations.

In Arlington, the zoning ordinances required a "use" permit for the erection of a "radio tower." (This had no relation to a building permit which, under certain circumstances, also had to be obtained.) The phrase, "radio tower," had been interpreted for several years by the County Board of Supervisors to include all structures, commercial or amateur, used for transmitting or receiving radio frequency.

To obtain this "use" permit, it was first necessary to file an application with the County Planning Commission together with complete details of the structure and its proposed location, whether it was to be a tower or merely an aluminum pole. After filing the amateur's front lawn was decorated by a printed sign giving notice that an application had been filed.

At this juncture, the neighbors would become alarmed. They immediately visualized a large structure similar to a gasoline station and hot-dog stand. They would be further alarmed when the telephone poles, for a radius of five hundred feet from the amateur's house, were plastered with announcements of the County Board public hearing which was to be held on the application. It was also required that notice of the application be published for two weeks and often the newspapers would print a story which bore slight semblance to the actual facts.

The natural outcome of this paper landscaping and journalistic lambasting was to excite more people in the area against changing the *status quo*. Their fertile imaginations were whetted. They were certain that their TVs would be damaged and their radios, hi-fi and telephones would become inoperative the moment the amateur commenced operation.

At the end of the thirty-day period a public hearing was held before the County Board. This

* 3445 South Wakefield St., Arlington, Va.

** 5505 Eighth Street South, Arlington, Va.

¹ QST, October, 1951, p. 13.

gave ample time for the most easily aroused individuals to write letters and to circulate petitions in the neighborhood against the amateur and his intended operations. Many of them, irate, excited and vehement, packed their lunches to converge upon the courthouse where the hearing was to be held. They were there to defend their property and ascertain that the interloper was denied the permit. When the hearing was under way, Fourth of July oratory flourished and everyone pounced upon the defenseless amateur.

It was obvious that this circus at the expense of the amateur had to be resolved. Amateurs were already avoiding Arlington County because word of these difficulties had reached them. K4LMB decided to force the issue. She determined to make an attempt to persuade the County Board to broaden their interpretation of the zoning ordinance as it related to "radio towers." Good public relations were necessary. She had a great advantage. She was new in the county, had never been on the air, and had developed no animosity with her neighbors.

The plan, carefully followed, was thus:

After filing the application and paying the fee, she invited the president and business manager of the local civic association to see her station which was set up but as yet inoperative. They were given literature published by the Washington, D. C., TVI Committee and the FCC. They received a careful explanation of the ham's purposes and the customs of our hobby. (It was later



discovered that this move was the key to the solution.) These gentlemen were extremely receptive to their introduction to amateur radio and were responsible for calming the fears of many insurgent neighbors.

It is customary for the Board to look to the County Planning Commission for an opinion prior to considering each application for a "use" permit. In this instance, the Commission announced that it could find nothing in the ordinance by which it could judge whether or not "use" permits were required for privately owned radio towers. Therefore, no action would be taken on this request. But the Commission went on to say that if the zoning ordinance is to be interpreted to include privately owned radio towers as a "conditional use," requiring "use" permits, it believed that there was a need for regulation and standards governing height and location factors

by which these requests could be measured.

The Board recognized the failings of the ordinance, postponed its decision in K4LMB's case for ninety days and requested the county planning director to prepare standards by which it might be guided in these instances. A plan was discussed to form a committee to assist in this job. The committee was to include three radio amateurs, three radio-and-television servicemen, and three citizens-at-large appointed by the president of the local civic federation. This committee was to aid in the preparation of sound regulations as well as other recommendations upon which the Board could act. The three amateurs delegated were K4LMB, K4ESC, and W4NJF. Three of the leading TV servicemen of Arlington and three prominent property owners were selected.

The nine members, headed by the planning director, met once a week in the evening for four weeks. From the first, the amateurs were pleasantly surprised to find that the TV servicemen were completely on their side. On the other hand, the laymen had many questions which had to be answered and fears to be allayed.

In analyzing the issue, the committee reviewed the zoning ordinance, building code, electrical code, ordinances of other cities and technical and lay experience. The problem was boiled down to four elements: location, hazard, interference and aesthetics.

Location pertained primarily to commercial and public utility towers and was recognized to be an unimportant factor in the case of the amateur. However, the committee devoted considerable time to hazards. This phase involved strength to withstand weather conditions, removal of unused towers after the amateur had moved from the area, the attractive nuisance which the towers offered to children playing in their vicinity and danger from lightning. The committee found the structural safety was well covered by the building code and was not a matter of zoning. Recommendations were prepared on the other phases of this element.

After much discussion, all were convinced that the interference problem was not a zoning matter but was a policing matter under the exclusive control of the FCC. The work of the Washington TVI Committee, when explained, had much to do with the solution of this portion of the problem.

To the laymen on the committee, aesthetics loomed big. It was as much a subject of debate as interference. Here, however, court decisions showed that as far as the erection of amateur antenna systems was concerned, aesthetics should not be considered in zoning ordinances. Very few states have zoning enabling acts which includes aesthetics as a subject of control by zoning police power. It was successfully argued that if the lady next door disliked the tree growing in her neighbor's backyard she could not force him to remove it except that much of the tree which encroached on her property.

Nevertheless, after three meetings, the planning director and most of the committee had not considered the discontinuance of a "use" permit

despite attempts by the amateurs to that end. It was not until the last meeting that the committee realized that both a building permit and a "use" permit were being required by the county in many instances where amateur antennas were not attached to the house. The amateurs finally achieved their goal at the close of the final session. The mere obtaining of a building permit (which did not carry with it the annoyances of hearings, etc.) would insure that safety precautions were taken when these structures were erected.

The recommendations of the committee when summed up included:

(1) That there be no requirement for a "use" permit for amateur radio and TV antennas.

(2) That the County Board require an applicant to file a copy of his FCC operator's license with his building permit application. It was felt that this requirement would assure the Board without further question that the operation of the station was under proper jurisdiction.

(3) That the erection of amateur free-standing or guyed non-commercial towers be permitted only in the rear or side yards and that these towers should not exceed the height limit of the area by more than 25 feet.

(4) That the building permits be issued with a one year renewal clause and that annual inspection be had.

At the completion of the four sessions the committee's report was compiled by the planning director and presented to the County Board. This was ninety days after the original request.

Sufficient notoriety by this time had been achieved and many amateurs attended the hearing at which the report was presented. However, it was necessary to publish the zoning modifications thirty days prior to the hearing for adoption and there was no discussion relative to them at that time. The modifications recommended were duly published and promulgated in Arlington and thereafter another and final hearing was held.

K4LMB realized that the County Board members could not be expected to comprehend the interference problem which might be presented by the anticipated opposition. She, therefore, devised an unusual demonstration. First, however, she explained the scheme to the planning director and received from him complete cooperation. Consequently, when the Board met in the Arlington County Courtroom, they were greeted by the sight of three television receivers, side by side on the judge's bench. A complete amateur radio station was set up together with a "Wonderbar" antenna at one end of the courtroom. When the matter was called on the agenda, K4KSS, as master of ceremonies, announced that with the Board's permission, a demonstration of amateur radio and its effect on television would be made.

It was first shown that one television set improperly shielded would cause interference to the other two similar to that of an amateur radio station. K4LMB next threw the switch of her transmitter and called a short CQ on ten meters.



Two of the television sets from which filters had been removed immediately showed interference pattern as well as audio reaction. Although not pre-arranged the CQ was answered. While K4LMB carried on a short QSO, filters were installed on the outside of the offending television sets and the interference was eliminated. In the meanwhile, K4KSS made an eloquent explanation that if these filters had been installed within the set, every vestige of interference would have been eliminated.

One near mishap occurred which should be told here in the event such a demonstration may be repeated elsewhere. As anticipated, the p.a. amplifier in the courtroom was able to pick up the transmitted signal, but the amplifier was accidentally left on and K4LMB's voice from her rig came through clearly. However, the error was immediately discovered and turned off before anyone but the amateurs noticed.

Needless to say, the County Board was quite impressed. The newspaper reporters requested a repetition of the demonstration after the Board had adjourned, at which time photographers were present. Numerous amateurs attended the hearing and although the members of the original committee had prepared the careful presentation, the Board permitted other spectators to make comments. Several amateurs spoke briefly and gave considerable weight to our side.

The clincher to the entire situation was a brief description of the Washington TVI Committee by W3ECP, its coordinator. Several of the Board members questioned him and received competent and satisfactory answers to their questions. Immediately thereafter the recommendations were adopted and the "use" permit for the construction of amateur radio towers was eliminated from the Arlington zoning ordinance.

K4LMB had won her battle and had proved that what at times seems to be the long and difficult way can be the most effective to gain a point.

ARE YOU LICENSED ?

- When joining the League or renewing your membership. It is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

If wallpaper is your cup of tea, scan "Operating Achievement Awards" in July 1957 QST for information on 60 certificates. Most of those described in this sequel have been announced since that article's appearance, although a few are repeated due to rules revisions. We start off with the ever-popular WAVE, after which we'll swing through the Dominion to discuss five other certificates, then cover those sponsored by clubs, nets, and other groups around the States.

More Awards

WAVE (Worked All VE). Obtain 2 cards for QSOs after January 1, 1939 with each of these 9 provinces: P. E. I., N. S., N. B., Que., Ont., Man., Sask., Alta., B. C. Yukon and N. W. T. count in lieu of B. C. Each of the 2 QSLs must be from a different station and for work on a different band for a total of 18. Fee is \$1.00 in W. K. VE/VO, 10 IRCs elsewhere. Mail to Nortown Amateur Radio Club, Box 356, Adelaide Street Postal Station, Toronto, Ontario.

WCAN (Worked All Canada). Two QSLs for post-war contacts with each of the following provinces and territories: P. E. I., N. S., N. B., Que., Ont., Man., Sask., Alta., B. C., Yukon/N. W. T., Newfoundland, Labrador can replace Nfld. but all VO QSOs must be after March 31, 1949. Each of the two cards must be from a different station and for work on a different band for a total of 22. Present holders of WAVE may qualify for WCAN by submitting an additional 4 confirmations (normally 2 VEs and 2 VOs). Fee, sponsor, and QTH are same as for WAVE.

WAG (Worked All Goose) goes to the W. K. VE/VO who QSOs 4 Goose Bay Amateur Radio Club VO2s after January 1, 1958. Others need 3. Submit list with date, time, frequency, and stations worked, plus 3 IRCs, to Ted Harvey, VO2AB, Aeradio, Dept. of Transport, Goose Bay, Labrador.

DVO (Quebec City Diploma) stands for *Diplome de la Ville de Quebec*. Applicants in U. S. and Canada must work 5 stations in the City of Quebec, others 3. Log abstract and 1 IRC to VE2AFC.

WAVO (Worked All Newfoundland) is available to any amateur who can prove 2-way contacts on or after April 1, 1957 with 45 or more stations either fixed (such as VO1CZ) or portable (W2ZRX/VO1) in Newfoundland. The 45 QSOs will be distributed as follows: 25 from St. John's East, 4 from St. John's West, 2 from Buren-Burgeo, 5 from Humber-St. George, 5 from Grand Falls-White Bay, 2 from Bonavista-Twirlingate, 2 from Trinity-Conception. Rules provide for crossband work, endorsements by bands, minimum allowable signal reports, and use of Newfoundland QSO Party logs for verification. Cards not needed. Log extracts, together with s.a.s.e. or IRCs to insure delivery of the certificate, go to Newfoundland Radio Club, Box 2125, St. John's, Newfoundland, Canada.

WOC 30, WOC 50 (Worked Ontario Counties). You need 30 or 50 of Ontario's 54 Counties after January 1, 1957 for this one. Lennox counts separate from Addington as does the Patricia portion of Kenora, however, so there are 56 available all told. Send your questions or confirmations and postage to Contest Coordinator, Metro Amateur Radio Club, 570 Eglinton Ave. W, Toronto, Ontario, Canada.

W-Conn (Worked All Connecticut) is offered by the Junior Chamber of Commerce, Willimantic, Conn. when you confirm contacts with each of the 8 counties in the Nutmeg State, except that Connecticut hams must work 2 stations per county. QSOs must be all c.w. or all phone, not a mixture of modes. Applicant should submit necessary confirmations with \$.50 to John C. Sullivan, WIHHR, Whitney Road, Columbia, Conn. Separately-printed awards for A-1 and A-3.

WCCI (Worked Cape Cod & Islands) is sent to those who land 10 members of the Cape Cod and Islands Amateur Radio Assn., one or more in each of the 3 counties of Dukes (Martha's Vineyard), Nantucket, and Barnstable (Cape Cod). Send log extract to CCIARA, Box 309, Dennisport, Mass.

The Framingham Radio Club Certificate is yours for contacting 10 members of this Massachusetts club and applying via W1GLA, 14 Emmett Street, Marlboro, Mass.

WAMC (Worked All Massachusetts Counties) is so

spanking-new that the ink isn't dry. Get cards for QSOs after January 1, 1955 with the 14 counties and shoot 'em along with \$.50 and return postage to Merrimack Valley Amateur Radio Club, Box 211, Lawrence, Mass.

Get the **NGRA Certificate** by QSOing 5 members of Norfolk County (Mass.) Radio Assn. and writing Wis AGR AYI GDY HTR IXI KBL or others in the club.

WWGNY (Worked Westchester County New York). U. S. and Canadian hams send QSLs from 4 different amateurs in Westchester County and \$.50, those elsewhere 2 QSLs and 4 IRCs to P. Kragh, K2UPD, Award Manager, Rye Neck Radio Club, 115 Wapanoca Avenue, Rye, N. Y.

Worked All Bronx. If outside NYC, show proof of contact with 20 amateurs in the Bronx; if within the 5 boroughs, show confirmation of 20 QSOs with Bronx amateurs, all of whom are Fordham club members. Contacts after January 1, 1957 only. Fordham Radio Club, Bronx Masonic Temple, 1931 Washington Avenue, Bronx 57, N. Y.

The **WMOB Award** is issued by the Midnite Oil Burners Net. Become one of the mob by working 3 or more members of this K2/W2 group after April 1, 1958. Arthur J. Larsen, K2YJC, 23 Flower Lane, New Hyde Park, L. I., N. Y.

SJRA Contact Certificate. Stations within continental U. S. need 35 SJRA members, others 25. After October 1, 1957. Stickers for additional contacts. Forward QSLs to South Jersey Radio Assn., Box 316, Haddonfield, N. J.

Worked All Altoona. The Horseshoe Radio Club issues this when W3KQD receives your list of calls (plus dates, times, types of emission) of 25 amateurs in Altoona, Penna. contacted since January, 1946.

Keystone Award. 100 Pennsylvania amateurs since January 1, 1957. Send the QSLs and an alphabetical-by-calls list to Awards Manager, Harrisburg Radio Amateurs Club, W3BQA, RFD 3, Dillsburg, Penna. Fee \$1 to those in U. S. and Possessions, 1 IRC and return postage to others. Endorsements for working 100 stations in any calendar year and for working 25 Penna. Novices at cost of 1 IRC or s.a.s.e.

P6MNA. Six contacts with members of the Pittsburgh 6 Meter Net which meets on 50.4 Mc. at 7 P.M. EST Mondays. List to W3HFE.

The **Breeze Shooter's Net** of Pittsburgh hangs out on 10-meter phone and will present a certiff of membership to amateurs who work 10 of the clan. According to W3VEK, you should transmit your list on the air to the tenth member.

The **Western Pennsylvania Mobileers** of Pittsburgh, 29,360 kc., also distribute a membership certificate for 10 groundwave or 5 skip contacts with Mobileers. The Mobileers must be operating mobile at the time. Secretary W3ZUW recommends that applicants pass lists to the fifth or tenth member worked.

Washington Mobile Radio Club for 12 member-contacts. Applicants may be at home but WMRC men must be mobile. QSLs to W4NJF.

Worked Mobile Sixers comes in two parts. For Class I (stations within 35 miles of City Hall, Philadelphia), contact must be made on 50 Mc. with 15 Mobile Sixers while they are mobile or with 30 members either mobile or fixed. Class II (for stations beyond 35 miles) requires contact with 5 mobile members or 15 either mobile or fixed. Proof goes to Secretary W3JBA, 717 Haines Lane, Springfield, Penna.

Maritime Mobile Amateur Radio Club. Verifying QSLs from 30 MM stations to John G. McKinley, W3OB, Secy., 1317 Orangewood Avenue, Pittsburgh 16, Penna. Contacts must be with ships at sea beyond the 3-mile limit and over distances of 100 miles or more. Ships at dock or on inland waters do not count.

VA-JF (Virginia Jamestown Festival Award) can still

he had but all contacts must have been made during the calendar year 1957. See rules page 52, July 1957 QST.

VA-CD (Virginia Cradle of Democracy) requires QSOs since January 1, 1958 with 13 amateurs located on Virginia's lower peninsula south of the line running from Jamestown to Williamsburg to Yorktown. Log with dates, times, calls, band, emission, and operators' names to Harold Keto, K4IQV, 3926 Shell Road, Hampton, Va.

WAFG (Worked All Florida Counties) has just been announced by the Dade Radio Club. Amateurs in the States must submit confirmations from the 67 Florida Counties, each card showing date of contact, mode, call, location, and operator's signature. The foreign applicant must furnish a list of confirmations in his possession containing the above information and certified by 2 other amateurs. Only QSOs after November 15, 1945 count. Sticker endorsements when all work done on c.w., phone, one band, RTTY, s.s.b., etc. Get in touch with Dade Radio Club, Box 104, Miami, Fla.

A Conch Net Certificate comes your way for working 10 members of the Key West Amateur Radio Club. List to W4GAH, Secy, KWARC, Box 595, Key West, Fla.

Razorback Award. U. S. and Canadian hams need either 25 Arkansas hams, including 5 members of the Amateur Radio Club of the University of Arkansas, or 10 club members. Charge of \$.50 to U. S. people, 3 IRCs to Canadians. QSLs should be sent to the club, Room 311, Engineering Bldg., University of Arkansas, Fayetteville, Ark. No fee to DX stations, who must work 5 members and forward a list.

The 6-Meter Club of Dallas will number you among its honorary members if you have worked 10 of the group since March 22, 1957. List to K5BDL.

Get **OC6MN** by confirming contacts with 6 members of the Oklahoma Central Six Meter Net after January 1, 1957. Try K5QGO, K5JKX or K5HVA.

A 507 Award, sponsored by Totah Amateur Radio Club, is available for contacting one member station operating from Four Corners, sole point in the U. S. common to 4 states and 3 FCC licensing areas. Ship the QSL to Box 24, Farmington, New Mexico. W5CIN is there Field Days.

San Gabriel Valley Radio Club (California) will come forth with an award when you send the last station a log including dates, times, and calls of 10 members worked. More details from W6DTQ.

Worked All San Diego-50 Mc. Three categories: (1) If in San Diego County, you need 20 confirmed contacts with S. D. stations on 6 meters; (2) If a K6/W6 outside the county, 15; (3) If outside California, 5. S.a.s.e. and 10¢ to K6UJL or K6OBS.

San Diego's **Graveyard Net**, 50.4 Mc., bestows recognition onto anyone who works a net member for at least 30 minutes for 3 consecutive nights after midnight, PST presumably. K6UJL is in charge.

A Logger's Certificate is presented by the Radio Club of Tacoma to any amateur working 10 members. List goes to the tenth or to Secretary W7UYL. QSOs after Jan. 1, 1957.

Worked All Tucson. Old Pueblo Radio Club awards this when W/K's raise 15 Tucson hams, others 10. Special mention for single-band accomplishment. Try Box 8392, Greenway Station, Tucson, Arizona.

Nevada Achievement Certificate. Proof of contact with 25 different Nevadans, when sent to W7BJY, brings this from Southern Nevada Amateur Radio Club. Endorsement for each 25 additional.

Worked All Ohio Counties calls for QSOs with the 88 counties in the state. Send log indicating date, time, call, sig report sent and received, emission, band, and county for each contact to W8EQN, chairman of the Ohio Council of Amateur Radio Clubs.

For the similar **Worked Ohio, All Counties on Six Certificate** you obviously have to stick to 50 Mc. Application form available for s.a.s.e. to Central Ohio Radio Club, Box 23, Delaware, Ohio.

Greater Cincinnati Amateur Radio Assn. bequeaths wallpaper for 5 QSOs with its membership when W8SMQ receives the proof.

The **V.H.F.-over-50 Club** of northeastern Ohio, says W8SLE, will come through with an award when a list of 10 members worked on 6 meters or other v.h.f. bands is dispatched to anyone in the club.

WCLE (Worked Cleveland) is offered to amateurs who have earned at least three certificates issued by member clubs of the Cleveland Area Council of Amateur Radio Clubs. To receive any of the following (all applicable to WCLE), one must have contacts with the necessary number of members from points outside the Cuyahoga, Lake, Geauga, Portage, Summit, Medina, and Lorain Counties of Ohio, and forward a list to the issuing officer of the club.

Club	Members Needed	Issuing Officer
Indian Hills RC	5	KN8IDM
Parma RC	5	W8KGA
South-East ARC	5	W8OPC
Westpark Radios	10	W8AJW

Requests for WCLE should include a list of appropriate certificates held and be mailed to the council in care of W8CTZ.

Worked West Virginia. Amateurs in W. Va., Ohio, Ky., Va., Md., or Penna. need contacts with 30 different West Virginians since January 1, 1958. U. S. hams outside of the above 6 states need 15. Others need 5. Send confirmations with s.a.s.e. to Kanawha Radio Club, Box 129, Spring Hill Station, South Charleston, W. Va.

Worked All Counties in West Virginia is a real toughie which no one has latched onto yet, although it was announced July 1, 1946. Anyone who has confirmations from the state's 55 counties should forward them pronto to Mountaineer Amateur Radio Assn., Box 909, Fairmont, W. Va. for certificate No. 1.

Hilbilly Certificate for 5 SMARC contacts. Southwest Missouri Amateur Radio Club, Box 328, Springfield, Mo.

Mark Twain Award for 5 Hannibal (Missouri) Amateur Radio Club QSOs. W9TBI.

SOS Award. U. S. hams need 25 Kansas QSOs, 10 of them in Sedgwick County, Kansas; others 10 Kansas stations, at least 4 being in Sedgwick County. Contacts January 1, 1955 or later. Endorsements for phone, c.w., Novice, YL, mobile. Fee \$.50 or 4 IRCs foreign. QSLs required. Sunflower Operator's Society, 2350 S. Washington, Wichita.

WASCARC Award for working all members of Scott County (Kansas) Amateur Radio Club. For a starter, check with W8MI, W8ZUX or K8DZF. —W1ZDP

Strays

It's quite an accomplishment for a Novice-class licensee to qualify for BPL (about a dozen have done so to date), but here's one who has done so three times and is thus the first novice to receive ARRL's coveted BPL Medallion (May, 1955, QST, p. 73). Ted Mallick, KNØMMZ, made BPL in February, March and April, 1958, as a Novice, now has his General class ticket and is still pushing traffic. He says he got interested in traffic handling by listening to the Tenth Regional Net (NTS) and, with the help of a couple of fellow students at Grinnell College, started originating traffic for the college kids. A list of QN signals, a copy of the Operating Booklet and a net directory got him connected with the Nebraska Slow Speed Net, the Kansas Novice Net and the Minnesota Junior Net. Says Ted: "With all these outlets, I quit writing letters. It became known around the college that I would send radiograms free, and the response was very good. All I had to do was push the key."



Election Notice

Re-Examination Filing

V.H.F. C.W. Filing

ELECTION NOTICE

To All Full Members of the American Radio Relay League Residing in the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern and West Gulf Divisions:

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1959-1960 term. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Articles of Association and By-Laws will be mailed to any member upon request.

Nomination is by petition, which must reach the Headquarters by noon of September 20th. Nominating petitions are hereby solicited. Ten or more Full Members of the League residing in any one of the above-named divisions may join in nominating any eligible Full Member residing in that division as a candidate for director therefrom, or as a candidate for vice-director therefrom. No person may simultaneously be a candidate for both offices; if petitions are received naming the same candidate for both offices, his nomination will be deemed for director only and his nomination for vice-director will be void. Inasmuch as all the powers of the director are transferred to the vice-director in the event of the director's resignation or death or inability to perform his duties, it is of as great importance to name a candidate for vice-director as it is for director. The following form for nomination is suggested:

Executive Committee

*The American Radio Relay League
West Hartford 7, Conn.*

We, the undersigned Full Members of the ARRL residing in the _____ Division, hereby nominate _____ of _____ as a candidate for director; and we also nominate _____ of _____ as a candidate for vice-director; from this division for the 1959-1960 term.

(Signatures and addresses)

The signers must be Full Members in good standing. The nominee must be a Full Member and the holder of an amateur license, and must have been a member of the League for a continuous term of at least four years at the time of his election. No person is eligible who is commercially engaged in the manufacture, sale or rental of radio apparatus capable of being used in radio communications, or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon EDST of the 20th day of September, 1958. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for vice-director but members are urged to interest themselves equally in the two offices.

League members are classified as Full Members and Associate Members. Only those possessing Full Membership may nominate candidates or stand as candidates; members holding Associate Membership are not eligible to either function.

Voting by ballots mailed to each Full Member will take place between October 1st and November 20th, except that if on September 20th only one eligible candidate has been nominated, he will be declared elected.

Present directors and vice-directors for these divisions are as follows: *Central:* John G. Doyle, W9GPI, and George E. Keith, W9QLZ. *Hudson:* George V. Cook, jr., W2OBU, and Lloyd H. Manamon, W2VQR. *New England:* Milton E. Chaffee, W1EFW, and Frank L. Baker, jr., W1ALP. *Northwestern:* R. Rex Roberts, W7CPY, and Howard S. Pyle, W7OE. *Roanoke:* P. Lanier Anderson, jr., W4MWH, and Thomas H. Wood, W4ANK. *Rocky Mountain:* Claude M. Maer, jr., W0IC, and Carl L. Smith, W0BWJ. *Southwestern:* Walter R. Joos, W6EKM, and Virgil Talbott, W6GTE. *West Gulf:* Grady A. Payne, W5ETA, and Carl C. Drumeller, W5EHC.

Full Members are urged to take the initiative and to file nominating petitions immediately.

For the Board of Directors:

A. L. HUDLONG
Secretary

July 1, 1958

RE-EXAMINATION FILING

As reported in this department of July *QST*, FCC has proposed to amend our rules to provide that Novice and Technician Class licensees may be called up for personal examination in the same manner as is now provided for Conditional Class licensees. In accordance with instructions of the ARRL Executive Committee, comment of the League has been filed in favor of the proposal. For the information of those amateurs who may have misunderstood the proposal, we point out that no wholesale re-examination is contemplated by the Commission; it simply puts Novice and Technician Class licensees on notice that, should any question be raised as to their competency, or as to whether proper procedures were following during the mail examination, FCC may in its discretion require a personal appearance before a

Commission engineer to demonstrate through re-examination that the licensee is indeed qualified. We publish below the text of the ARRL comment.

FEDERAL COMMUNICATIONS COMMISSION

Proposed amendment to section 12.45(a) regarding operators' licenses of technical and novice class amateurs } Docket 12444

Comment of The American Radio Relay League

Pursuant to paragraph 6 of the Notice of proposed rule making in docket 12444, The American Radio Relay League, Inc., files these comments on behalf of some 70,000 U. S.-licensed amateur radio operators who are members of the League.

1) Inasmuch as the intent of the proposed rules change is to bring provisions for novice and technician class licensees into line with those already existing for the conditional class licensee, and thus make uniform the authority of the Commission to require, as necessary, personal appearance for re-examination of an amateur originally licensed through mail procedures, the League concurs with the Commission's proposal.

THE AMERICAN RADIO RELAY LEAGUE, INC.
By PAUL M. SEGAL
Its General Counsel

A. L. BUDLONG
General Manager
July 21, 1958

V.H.F. C.W. FILING

As reported in this department of August *QST*, the League has petitioned FCC to amend our rules to provide for 100-ke. segments at the low end of our 50- and 144-Mc. bands for exclusive c.w. use, and the Commission has issued a notice of proposed rule making to that end. We publish below the ARRL comment in support of the proposal.

FEDERAL COMMUNICATIONS COMMISSION

Proposed amendments to section 12.111 of the Rules providing for the type of emission in certain amateur frequency bands } Docket 12485

Comment of the American Radio Relay League

Pursuant to paragraph 8 of the notice of proposed rule making in docket 12485, The American Radio Relay League, Inc., files these comments on behalf of some 70,000 U. S.-licensed amateur radio operators who are members of the League.

1) The League strongly favors the proposal to amend section 12.111 of the amateur rules to establish 100-ke. segments for c.w. emission at the low ends of the 50- and 144-Mc. bands.

2) This proposal, which originated with the League, is designed to afford the many experimentally-inclined amateurs now operating in the 50- and 144-Mc. bands with a means of further adding to the knowledge of propagation characteristics of the very-high-frequency portion of the radio spectrum. Useful data in this field come primarily from analysis of records of long-distance communication such as is provided by F_2 and sporadic-E layer propagation. Indeed, at the request of the U. S. ionospheric panel for the International Geophysical Year, the League is now conducting an extensive program of study and analysis of very-high-frequency propagation phenomena, in which some 1,000 amateurs around the world are enrolled.

3) Serious experimenters have many times in the past found considerable difficulty in establishing long-distance contacts by continuous-wave emission because of disruptive interference from stations employing voice transmissions. The League believes that provision for the comparatively-small exclusively continuous-wave segment of 100 ke on each band would permit a great deal more useful, serious work by amateurs and thereby contribute to the development of the radio art. The League does not believe the setting aside of such a small segment will have any noticeable effect on the use of the bands by voice stations which, even in areas where Channel 2 television service poses a potential interference problem, will have adequate space above 50.1 mc. in which to conduct their routine operations.

4) The League expresses its appreciation for the prompt action of the Commission in issuing its notice of proposed rule making, and repeats its request for continued expeditious handling so that, if adopted, the new rules will become effective for as much as possible of the balance of the International Geophysical Year, which ends December 31, 1958.

THE AMERICAN RADIO RELAY LEAGUE, INC.
By PAUL M. SEGAL
Its General Counsel

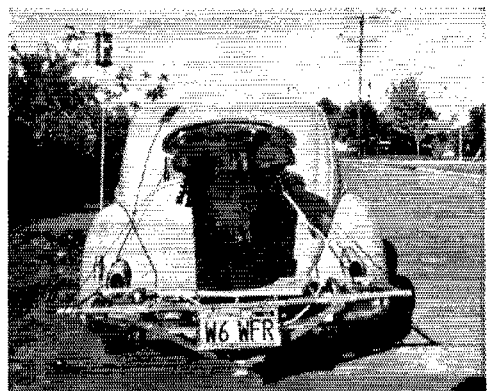
A. L. BUDLONG
General Manager
July 21, 1958

11-Meter Band Withdrawn

Just at press time, FCC announced final action on its proposal of a year ago to cancel amateur sharing privileges in 26,960-27,230 kilocycles. Effective September 11, 1958, this band may no longer be used by the amateur service. Details next month.

Strays

We can understand W6WFR's explanation of how he buys these "pole pigs" from the power company as junk at \$3.00 per KVA, and how he converts them to ham use by draining the oil and removing the case, and how it furnishes a nice cool kilowatt power supply, but what we can't understand is what keeps the VW from tipping over backwards while he's carting the pole pig home!



YL News and Views

CONDUCTED BY ELEANOR WILSON,* W1QON

AIR DERBY-AMATEUR LIAISON

FOR THE seventh consecutive year amateurs engaged in special net operation to assist the participants in the annual All Woman Transcontinental Air Race. This year's race, the twelfth annual, covered 2177 miles, from San Diego, California to Charleston, South Carolina. Official refueling stops were required at Yuma and Tuscon, Arizona; El Paso, Midland, Abilene, and Tyler, Texas; Jackson, Mississippi; Montgom-

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

Below, left: Using a Communicator on two meters, Mary Poe, W6MWU, relayed take-off times of the race planes as they crossed the starting line at Montgomery Field. Sixty-one planes took off in 40 minutes. W6MWU and logger K6VRH are both members of the San Diego YLRC, which organized initial relay operations.
Photo courtesy Cris Christian

Below right: Chairman of the Board of Directors of AWTAR for a sixth term and an amateur herself, Betty Gillies, W6QPI (left), makes a last-minute check with a member of the San Diego Chapter of the Ninety-Nines at the impound area at Montgomery Field. Leaving an hour after the last race ship had taken off, Betty flew her Piper Apache to the Charleston terminus, carrying with her the official log of starting times of all TAR entries.
Photo courtesy Cris Christian

ery, Alabama; and Macon, Georgia. Period of the race, popularly known as the Powder Puff Derby, was July 4 through July 8.

Carolyn Currens, W3GTC, of Norristown, Pa., was General Chairman of amateur operations. Amateur chairmen at each stopover city were aided by scores of operators along the flight

At Race headquarters in the Lafayette Hotel Mrs. Gertrude Lockwood, AWTAR Chairman for the start of the race, requests latest information on location of aircraft from Pat Mulheim, W6GGX, Radio Chairman for San Diego. W6GGX/6 was the call used for hotel radio operations.
San Diego Evening Tribune Photo





As General Chairman of the AWTAR radio net, Carolyn Currens, W3GTC, worked for a full year organizing the operation. Licensed in 1956, Carolyn's home QTH is Norristown, Pa. Her OM is W3EQZ.

Margaret Brown of Jackson, Miss., operated W5TXK/5 for AWTAR radio operations at the Jackson Municipal Airport. Margaret, Odus Lovell, W5TAK, and members of the Jackson ARC manned the station for four days on 7210-kc. and 3953-kc. s.s.b. handling race traffic.



route, who relayed such information as take-off and arrival times, weather conditions, progress reports, and personal messages for the 81 women pilots who flew in 61 light planes.

Single-sideband operation was used wherever possible, with the bulk of traffic handled on 40 meters (7210 kc.) during the day and on 75 meters (3953 kc.) at night. Initial relays from portable stations at the airports to fixed stations in the various cities were usually on 2 meters. The Interstate Single Sideband Net was of particular help in getting traffic through despite widespread unfavorable band conditions.

Report from San Diego

From San Diego Amateur Radio Chairman Pat Mulheim, W6GGX, comes the following report of amateur proceedings at the start of the race:

"On June 29 and 30 an HT-32 and SX-101 and Gonset Communicator and appropriate antennas were installed at race headquarters in the Lafayette Hotel and at Montgomery Field. For four days prior to the race both stations were manned twelve hours a day by San Diego YLRC members for the convenience of the pilots as they arrived and to assist race officials in coordinating

activities at both places. Many personal messages were handled for the pilots who came from all over the United States, Alaska, Canada, and Australia.

"Members of the San Diego YLRC who operated W6GGX/6 at the hotel and W6MWU/6 at the field were K6s QKE, UHI, VRH; W6s GGX, MWU, VSL, and WDL. K6MGL and Florence Irwin assisted in logging. Nightly schedules were maintained between Chairman W3GTC in Charleston and W6GGX on 20 meters via the sideband stations of OMs W6JUT in San Diego and W4TWW in Charleston. On July 9, when the winners were announced in Charleston, Betty Gillies, W6QPI, Chairman of the Board of Directors of AWTAR, gave the information to W3GTC, who relayed it to race officials in San Diego via OM K6BPL, who had stood by for hours awaiting the final results.

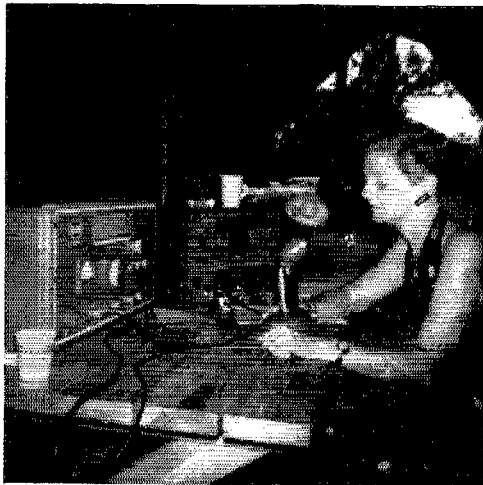
"Mrs. Frances Bera of Long Beach, California, won the race for the fourth time, having piloted winning aircraft in 1953, 1955, and 1956. Mrs. Bera flew a Beechcraft Bonanza and maintained an average ground speed of 177.8 m.p.h. Rain, electrical storms, and high winds plagued the pilots in the eastern half of the flight, and 13 of the 61 planes were forced to drop out of the race before its conclusion at noon on July 8.

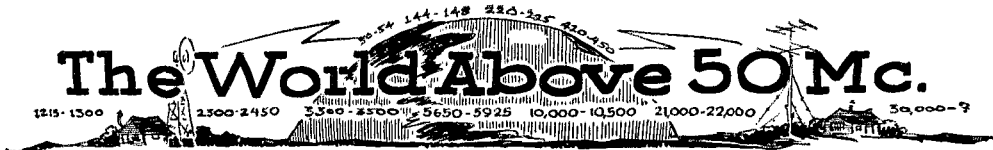
"I wish it were possible to personally thank each of the hams who assisted in relaying traffic and helping to keep the net frequencies clear. The cooperation was wonderful and the results gratifying. The Hallcrafters Company, Western Radio, and TV Supply Company in San Diego were very generous in their loan of all the equipment used in San Diego, and I understand Hallcrafters supplied gear for some of the other stops also."

Official Appreciation

Expressing her appreciation to all concerned
(Continued on page 156)

A first FD for Marge, K4RNS, who operated K4PFN/4, the club call of the Daytona Beach ARA at Tomaka, Ormond Beach, Florida.





CONDUCTED BY EDWARD P. TILTON,* WIHQ

It's always interesting, as we come to the close of a summer sporadic-*E* season, to look over the record and try to decide whether it was a good year, just average, or a poor one. Such a decision is not easily come by, for it depends a good deal on where you sit. Read our *OES Notes* in this issue, for example, and see how geographical position affects one's estimate of the quality of 1958's *E*_s season.

Southerners, who always get more double hop than other sections of the country may feel that this was a wonderful season. So may Middle Westerners, who get single-hop propagation in almost every direction. W6s don't find too much to praise in the 1958 record, and neither do the W1s and 2s.

How can you put a character figure on sporadic *E* anyway? We think you have to take into consideration the number of openings, their duration, the stability of signals during openings, the number of double-hop days, the shortness of the skip in the better openings (a good indication of ionization density), whether there has been any evidence of *E*_s activity on 144 Mc., and the length of the season, to name a few items.

The 1958 record shows openings seemingly less frequent than in most years. Many of them were short, and signals were highly erratic, much of the time. Double-hop openings were few and far between, for both East and West Coasts. Large areas of the country are completely lacking in the logs of some of our most consistent observers. There is very little mention of 50-Mc. skip under 400 miles, the hallmark of high-density ionization and high m.u.f. To our knowledge there was nothing on 144 Mc. all summer that can be traced to *E*-layer activity.

These observations are pertinent, in view of the fact that we are presently passing through the peak of the hottest sunspot cycle in the 250-year record of solar observation. Is there a correlation between sporadic-*E* and solar activity? If so, it is an obscure one, to say the least. One is tempted to look for a negative correlation, what with a very poor year having coincided with the peak of the previous cycle ten years ago, but good years and bad years follow each other in such random fashion that attempting to find a significant relation between sunspot numbers and sporadic-*E* is a risky guess, at best.

We do know that *F*₂-layer conditions are directly related to solar activity. The m.u.f. this fall will be whatever Old Sol makes it, and present indications are that there will be plenty

of life in the 50-Mc. band through at least the end of 1958.

Another correlation between propagation conditions and solar activity now fairly-well established is that the peak in auroral activity lags the solar peak by a year or so. From this we can assume that aurora DX on both 50 and 144 Mc. may be both more frequent and more widely distributed in the coming few months than at any time in the past several years. DX possibilities via the aurora should be good on 220, and it is just within the realm of possibility that someone will work auroral DX on 420, one of these days.

North-south DX on 6, being associated largely with periods of disturbed propagation conditions and aurora, should hold up well after the solar activity peak. Such was the case in the previous solar cycle. The last work across the North Atlantic was in 1947, but 50-Mc. DX to South America was good for at least three years thereafter. But sporadic-*E*? Nobody, including the world's best scientists, has yet come up with anything definite on *E*_s and solar activity—which is just one more reason for careful and complete recording of amateur experience in this department.

Here and There on the V.h.f. Bands

The summer sporadic-*E* season brought on another rush of 50-Mc. WAS applications. Six new members have joined the club since our last report. K9DXT, Peoria, Ill., W6ABN, Long Beach, Cal., W6BAZ, Santa Rosa, Cal., W9JFP, Milwaukee, Wis., W0QIN and Minneapolis, Minn., and VE3AET, Lansing, Ont., are the new members. Reg Strong, VE3AET, is the first VE 50-Mc. WAS. His special certificate, in honor of this achievement, carries serial number 44.

An aurora session that broke out at the start of the Field Day operation June 28 and carried over well into the following morning served several good purposes. First, the sizable totals run up on 6 and 2 by the well-equipped Field Day stations (while the lower frequencies were well-nigh washed out) served to awaken many denizens of our lower bands to the FD possibilities of v.h.f. Second, it helped to sell v.h.f. e.w. to many who had not previously considered keying jacks and b.f.o.'s to be necessary parts of a v.h.f. station. An example of the aurora coverage: W8LOF, Piqua, Ohio, worked 2-meter Field Day stations in Iowa, Ontario, Illinois, Pennsylvania, New Jersey, and Connecticut between 0240 and 0435 on the 29th. Maine, New Hampshire, Massachusetts, and Rhode Island home stations were worked in the same period.

W4WNH, Elizabethtown, Ky., says that the aurora of July 8 was highly productive on 144 Mc., with southern stations getting the big play. Shelby heard or worked W4ZXL, Greensboro, N. C., W4EQM, Langdale, Ala., W4LNG, Atlanta, Ga., and W5RCL, Marks, Miss. in an opening that started at the unusual time of 1245 CST. Some signs of the aurora remained through the night, but the best of it was over by 1800.

W1AZK, Chichester, N. H., deserves a medal for a contact he made during the July 8 session. Not many of the 2-meter gang tune more than the first 200 kc. of the band,

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

but Don looked up on 145.26 Mc., to find KN8KTX on c.w. Is this contact the first aurora DX by a Novice? KN8KTX is the son of W8SFG, Hubbard, Ohio, so he comes honestly enough by his aurora interest.

W4EQM reports that signals peaked between 1615 and 1745 EST. on the 8th. Carey worked W4HJQ, Glendale, Ky., W0BFB, Mitchellville, Iowa, W4WNI, K2QJY, Farmingdale, N. J., and W8GFN, Spring Valley, Ohio. Heard were W5RCI, W4ZXL, K2CQI, W8EPM (?) and W4LNG. The W4s were the loudest of the lot. Note the considerable success that Deep South stations are having in aurora work of late.

W0SMJ would like to see a frequency listing of leading 144-Mc. stations all over the country published occasionally in QST. We're willing, if such a list can be made meaningful. It should include only consistently active stations, and only those with big arrays, at least a fair amount of power, and facilities for c.w. operation. Frequencies should be *measured*, not figured to several decimal places by multiplying out the frequency marked on the crystal holder. If you can give your frequency to within 2 kc., and can meet the specifications given above, send us the info. When we have a good batch of calls and frequencies we'll run the list. And by then, everyone will have gone v.f.o.!

The Tourids meteor shower June 30 to July 2 netted a new state for W1AZK. Don had skeds with W4YUX (ex W2BHS/4) near Columbia, S. C. at 0500 EST. Good bursts were heard at once, and by 0510 Jack was coming through consistently enough so that complete information was exchanged in about 15 minutes. This was No. 24 for W1AZK, a notable total for a station in the wilds of New Hampshire. W4YUX, incidentally, is a good bet for South Carolina. He has 500 watts on 144. 162 Mc.

A 6-meter man who has nothing but DX to work is VE7AQQ, Sointula, B. C. Every 50-Mc. contact Ike has made has been via some form of DX propagation. He has 40 states to his credit, however. In a recent QSO with W6BJL, VE7AQQ reported 144-Mc. aurora reception of W6AHE, May 12.

Nevada contacts will be available on 50 and 220-Mc. during the September V.H.F. Party, if plans made by W6CGG and K6KFF jell. They expect to have good setups on both bands on Mt. Rose, a 10,800-foot elevation near Reno. Your conductor knows the slopes of Mt. Rose, having been stopped by heavy snow cover in an attempt to operate from the summit in June, 1956. We had to be content with setting up only a mile or so from the main highway, but we still had a busy evening working W6s on both 50 and 144 Mc. Mt. Rose and other peaks in the area appear to be responsible for the success W7MAH, Reno, enjoys in working certain W6s on 50 Mc. K6RNG, Oakland, plots what appears to be a double knife-edge path from his location to Reno. It works consistently on 50-Mc.

Every time we get a report like the one below, we recall the remark of a well-known Louisiana W5. During a 10-meter QSO some years ago this good friend of ours said "We've tried 2 meters here and it just doesn't work!" Evidently W5KTD, Shreveport, La., hasn't got the word, for on June 29 and 30 he worked 4 Kansas stations, 8 in Illinois, 3 in Iowa, 6 in Ohio, 2 in Missouri, and 1 each in Kentucky, North Carolina, Tennessee, Oklahoma, Indiana, Pennsylvania, and New York.

The last, with W2ORI, Lockport, N. Y., is believed to be the first 2-meter QSO between the two states. It was the 11th such "New York to—" first for W2ORI. We credited him with one he says he doesn't deserve, however in giving him the first Kansas contact some time back. That honor belonged to W2BAV.

W5AJG, Dallas, reports that W5KTD is often in on DX conditions to the north and northeast that do not reach him, though Dallas and Shreveport are on the same latitude line. In turn, W5KTD is at times out of range of openings that favor W5RCI and W4HHK. W5AJG has checked with stations 100 miles south of Dallas, to find that they miss things he catches. The June 29-30 tropospheric session was a fine example. W5KTD got the best of this. Leroy worked only Illinois and Iowa, and the South Texas stations were hearing nothing unusual.

V.h.f. men are great for this "grass on the other side of the fence" business, admittedly, but greener fields may be far from imaginary, in many instances. Tropospheric openings, being associated with large-scale air-mass movements, tend to follow such natural courses such as major river valleys, wide-open plains or coastal areas. A long-term study of the daily weather maps will show air-mass move-

ment patterns and give good clues as to what you can expect in the way of tropospheric propagation in your area, and in adjacent territory of differing topography. It's a fascinating angle of v.h.f. endeavor that too many fellows ignore.

The June 28 aurora was caught by W0IC, Denver, thanks to a telephone call from W8KAY. Claude worked W0SMM, W4HJQ, W0EMS, W0WRT, W9AAG and W9ZIH, between 1643 and 1800 MST. W0IC now has high power to a pair of 4X250Bs, and a 32-element array. He runs nightly 5-minute tests on 144.103 at 2200 MST, with the beam east. He then listens on 2 for 5 minutes, and then on 7095 kc. Tests with W6NIZ have produced at least a few meteor pings every time, showing that 2-meter signals can get over the Rockies from the West Coast and down into Denver. Extensive skeds are set up for the Perscids, of which more next month.

Here's some 50-Mc. DX going begging: W6NTR reports that VK9XK, Papua, is on 50.005, c.w. each Saturday at 2400 GMT, and nightly at 0900 to 1200 GMT. He wants to work Ws on 6.

For West Virginia on 2, look for K8AXU/8. Al lives in Elkins, and operates regularly from Bickel's knob, a 4000-foot elevation nearby. He has worked as far west as W0III, Ames, Iowa. Frequencies: 144.17 and 144.6 Mc. He has had little luck working northeast. This duplicates the experience of your conductor in two sessions from this, one of the highest spots in W. Va., a couple of years back. Ohio and Michigan were easy, but not a peep from the northeast did we hear.

New 1215-Mc. DX Record W6MMU/6 and W6DQJ/6 Work Over 225-mile Obstructed Path

A significant milestone in amateur microwave work was reached over the week end of July 19-20, as the result of a 1296-Mc. expedition by Russ Robertson, W6DQJ, and Don Goshay, W6MMU. Mt. Hamilton, elevation 4420 feet, was the northern end of the 225-mile circuit. Getting up there and back represented 1000 miles of driving by W6MMU. W6DQJ travelled a mere 300 miles, to set up on 8830-foot Mt. Pinos. Their 225-mile contact was unique in several respects.

The path was far below line of sight. With only sea-level land between the two mountains the direct path would have just grazed the earth at the midpoint. About 180 miles of the distance is over mountains running roughly in the same direction as the signal path. There are interfering mountains at three points, the highest being more than 5000 feet above the line-of-sight path. There is little doubt that this is the roughest long path ever traversed by amateur signals on a frequency above 1000 Mc.

Transmitters and receivers were both crystal controlled. The transmitters were 2C39A triplers delivering about 6 watts on 1296 Mc. (See W6DQJ's article in July, 1955, QST.) The crystal-controlled converters will soon be described in QST by W6MMU. Antennas were 4-foot parabolas. Contact attempts began at noon on Saturday, continuing until 2130 without success. Arrangements were made over the 144-Mc. liaison circuit (which required relaying by W6BUT and W5FZA) to try again at 0900 on Sunday. Contact was made at once at 0900, signals averaging around 579, with wide-range fading. The signal faded into the noise at 1000, and was heard no more.

Several facts stand out in this story. First, all communication was by c.w. — yes, c.w.! The excellent stability of all the gear enabled precise setting of the controls. When first heard, the signal was on the exact spot where the equipment had been set throughout the test period, so it is known that propagation, not equipment adjustments, brought the signal through. Last, but not least, no signal could be heard on 144 Mc. at any time during the tests; all liaison work had to be carried out through the relaying home stations.

Portable power for the expeditions was supplied by W6BUT and W6ABN. Assistance and moral support were furnished by W6ABN at Mt. Pinos and K6TAM at Mt. Hamilton. The signals of W6MMU/6 were heard and recorded by W6BUT, Taft, Cal., 195 miles south of Mt. Hamilton, on the floor of the San Joaquin Valley.

Helical Elements in 6-Meter Antennas

The article by W9KNC in May QST (describing Helixes for lower frequencies) started W7QLZ, Phoenix, Ariz., thinking about the possibility of using helical-wound

elements in 50-Mc. antennas. Clyde found that a fiber-glass fishpole (77 cents in some stores) made a good base for winding 50-Mc. whips. He has had a 20-inch whip on the top of his pickup truck for several months, and it seems to do just about as well as a full-length quarter-wave whip. Where such a short whip is mounted in the ideal spot at the center at the car top, it will perform better than a full-length whip mounted at a lower position. The 20-inch model weighs only 6 ounces. It tunes sharper than a full-length job, but it works well over 500 kc. in the 50-Mc. band.

The next step was to make a helical-wound dipole. This turned out to be 36 inches overall, about $\frac{1}{2}$ the length of a conventional dipole. It works, but is extremely critical as to frequency, and the feed impedance is low.

Clyde is also using a helical-wound halo. It is wound on a plastic crochet hoop, only 7 inches in diameter. (A 28-Mc. halo of similar design is only 13 inches in diameter!) This is an excellent transmitting antenna on its design frequency, but it is usable only over about 25 kc. at 50 Mc. Getting the feed impedance up to a point where the halo can be fed with 50-ohm coax is also something of a problem. Careful pruning of the elements and feedline make these low-impedance antennas usable, with the short length of coax needed in a mobile installation.

Coming — A Boom in F.M.?

The possibilities of wide-band f.m. for amateur v.h.f. communication have gone almost unexploited over the years. This is not due to any short-comings of f.m.; it is the result of a combination of factors, including lack of suitable receivers of a type available to amateurs. Narrow-band f.m. can be copied on a conventional communications receiver by the slope-detection method, though it is not at its best when received in this way. Wide-band f.m. under discussion here, cannot be read on anything but a receiver designed for the purpose.

This does not limit the usefulness of f.m. for commercial service. Receivers designed for the job are part of every mobile installation. Usually they are fixed-frequency jobs, set up on one communications channel and left there through the life of the equipment. They are called upon to receive nothing but the stations in their own network. Such networks, as anyone knows who has worked with wide-band f.m. in police, fire or other mobile services, provide solid interference-free communication. Results are so good, in fact, that everyone wants to get into the act, and available channels in the 25-50 and 152-162-Mc. f.m. bands have long-since been spoken for in many parts of the country.

To make more room in the crowded bands available for f.m. mobile service, FCC some time back started a move to cut the channel widths in half. Just when this will be accomplished is not known at present, but the mere fact that such a change is in the wind has repercussions of interest to the amateur v.h.f. fraternity. Changing to the narrower bandwidth will be done in some instances by modification of existing equipment, but it will also accelerate replacement sales. Much good used gear will thus be available to amateurs at moderate cost. It is not technically obsolete. With only slight modification, much of it can be adapted to amateur net-type operation. It is a natural for CD service or radio club liaison applications.

Wide-band f.m. is usable in the 10-meter band between 29 and 29.7 Mc., and on any amateur frequency above 52.5 Mc. Gear for the low commercial band can be converted readily, in most instances, to the upper part of the 50-Mc. ham band, and the high-band equipment should not require much modification for use on 144 Mc. Fixed-frequency f.m. nets are already working out well in many parts of the country. There are hundreds of such mobile installations in the high end of the 2-meter band around Chicago. Rome, N. Y., Memphis, Tenn., and the Pacific Northwest have 50-Mc. nets going strong.

We are indebted to Gene Colson, W7UVH, Olympia, Wash., for the inspiration for these comments. He feels that the overall efficiency of wideband f.m. (no heavy-iron high-drain modulators), its freedom from noise, its constant audio level — and now its availability — might well help to fill the largely unused upper reaches of the 50- and 144-Mc. bands, providing a type of reliable communication that could be a real boon to many ham groups.

What, No States-Worked Boxes?

Feeling that there were both errors and deadwood in our

50- and 144-Mc. states-worked boxes, we are in the midst of a call-by-call check on them. A stamped self-addressed reply card was sent to the holder of each call listed in the July issue of *QST*. The returns more than confirm our suspicions; over half of the approximately 250 cards thus far returned show that the records were out of date. To give the slow ones a chance to catch up, we are omitting the boxes this month. Next month the boxes will include only calls represented by the returned cards, plus new listings that have come in since the end of June.

How to get in? People keep writing in to ask, but it's very simple. If your record on 6 or 2 is equal to or better than others from your area currently listed, send us your standing. On 50 Mc. it need only be the number of states you've worked. Confirmations are not required until you reach the point of applying for WAS. On 144, send us the number of states and call areas worked. (Canadian call areas and provinces do not count.) Give us the call of the most distant station you've worked, or the distance thereto. No new listings will be run that are not complete in all three categories.

Boxes for 220 and 420 are in the works. Quite a few of you have written in to say that you want them, but we still do not have enough complete records for these bands to make a very imposing display. What have you done on 220 and 420? Let us know and we'll run a box (or boxes) for these bands as soon as we have enough data. What would you like to see in such tabulations?

OES Notes

K1CKZ, Norwalk, Conn. — Here is an inexpensive non-directional 6-meter antenna that is easy to make. It is a folded dipole made of Twin-Lead. Dimensions are standard, but the dipole is formed into a square and mounted on an X frame. The latter is made of two pieces of light wood, 1 by 1 inch in cross-section, $37\frac{1}{2}$ inches long. TV-type screw-eye insulators are screwed into the four ends to hold the dipole. The two ends of the dipole are fastened to an insulating block about 2 inches long. The dipole is mounted on the frame so that the insulator is in the middle of one side, and the feedpoint directly across the square from it. An eye hook was screwed into the center of the frame, and a rope was fastened to this to suspend the dipole in a horizontal plane. Running the rope over a high tree branch makes it possible to raise and lower the dipole at will. The cost was practically nil, and there are no rotation problems.

W1UHE, N. Tinerton, R. 1. — Called CQ on 50.6 Mc. with teletype for one month. No answer! (W0JHS is on 50.2 with RTTY — E.P.T.)

W3JWZ, Glenshaw, Pa. — W3QVW transmitting good-quality TV picture to W3MQT.

W3NPF, Washington, D. C. — While in Havana recently had privilege of visiting Radio Club of Cuba as guest of CO2XZ. Cuban amateurs are currently prevented from operating, but many are working on gear for future use. They include many v.h.f. men and at least one TV enthusiast, who has built his own camera.

K4EUS, Chester, Va. — worked W9GAB, Beloit, Wis. on 144 Mc. via tropo, after having held m.s. skeds unsuccessfully for 3 days. Heard numerous pings, however.

W4FNR, Ft. Lauderdale, Fla. — Excellent *E_s* openings on 50 Mc. in last half of June. Worked KP4ACH June 20, W6 and 7 June 21, and TG9JW on the 29th. This one (at 1023 EST) is something of a rarity for *E_s*.

K6QMK, Pacoima, Cal. — Very few *E_s* openings during June. Colorado, W3 and W8 in June 28.

K5DCQ, Irving, Texas — Band open almost daily during June, in one direction or another.

K9IKM, Fond du Lac, Wis. — Band open nearly every day, mostly to east.

Strays

K0DQI made DXCC when he was 13 years old, and wonders if he is the youngest to do so.

— . . . —

Sweepstakes motto — "If you can keep your head in the midst of all this confusion, you just don't understand the situation."



CONDUCTED BY ROD NEWKIRK,* W9BRD

When:

The experiences of an individual appear to us arranged in a series of events. . . . We understand by a clock something which provides a series of events which can be counted.
— EINSTEIN

My time is your time. — VALLEE

* * *

Interstellar ham communication in the future is likely to be a family affair. Avant-gardist Grandpa Jones, after making sure that Doppler shift wouldn't slide him out of the band, called CQ ARCTURUS back in 1949. Pa Jones selects an answer 76 years later and closes his return transmission with PSE QSL. U SHUD LIVE SO LONG, replies Joe Pft!!!kx on Arcturus Planet Delta Xi, this copied by Junior Jones around the year 2101. Junior doesn't. Baby Jones takes over, says FB OM BUT MISSED MOST and sigus off for chow.

Now a QSL always will be the final courtesy of a QSO. If radio signals take 38 years for a one-way trip from Arcturus, how about the rocket mail? Considerably longer in transit, the way things look now. Yet let's assume that a QSL does arrive, a rare affidavit giving Baby Jones's great-grandson a shot at Spatial DXCC No. 1. Great! But wait — OM Pft!!!kx up Boötes way filled out the card in Arcturus Delta Xi Special Double-Summer Time. This is an enigmatic complication because Delta Xi's DXCC country status hinges on a date technicality. Several succeeding generations of Joneses attempt to correlate Delta Xi SDST with Earthian GMT. No luck. Alas! By default the first cosmic DXCC falls to a luckier line of Smiths.

* * *

The nightmare faced by the Jones clan dwarfs our own time-reference difficulties. We don't have to invoke the Lorentz transformation to ascertain Nepal's time with respect to our own. Everywhere in our world an hour is an hour, 15 degrees of the rotational arc. And we have a convenient normalizer for international communications purposes: GMT, Greenwich Mean Time. Why don't all DXers use it?

It's a crass imposition to inflict something like "6:34 P.M. MST" on an otherwise obliging and very busy SV1 or FK8. And it's downright foolish if you really desire a logcheck and return QSL. Newcomers to the DX field may be leary of GMT conversions, preferring ambiguity to possible error; but ambiguity slashes QSL returns. Wherever you are, better tune in a WWV timecheck, add five hours for GMT and

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then stick to it. By all means let your time be their time.

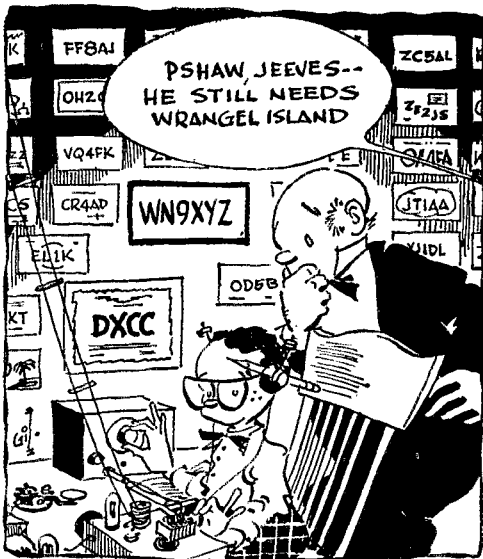
— . . . —

July's bit about the 100-plus countries total of KNØLTB shook some interesting grapes off the DX vine. Thirteen-year-old KN4RID claims a 116/78 record with his Ranger, 75A-4 and Telrex rotary. But KN6ZBV (now K6ZBV) appears to be front-runner in the race for No. 1 Novice DX Century Club certification with 117 worked and 93 confirmed. Close!

What:

Propagational pundits proclaim a solar-cyclic downswing, that the coming season's conditions should be almost — but not quite — as fine as last year's. This pronouncement pertains to our higher-frequency DX bands in the main: fall-winter-spring openings on 10 and 15 should be a bit less abundant and solid. The silver lining on this little cloud lies in increased DX pep and potential on 40 and 80. Time to think about hoisting those ground-planes and longwires again for that long nighttime 7- and 3.5-Mc. skip! Good old 20, of course, rolls on like OM River, sunspot recession or no. Like so . . .

20 c.w., as we were saying, is *rollin'*. Postal proof from W1s APA AZW JNZ MBX TS, K1DFC, W2s HMJ (over 250 confirmed), JBL SUC, K2s AYC LKS JGG QXG UYG, W3LOS, K3AUN, W4CXY, K4s IEX IGD (73/53), MDF MWB (71/41), PHY RJM RXQ, K5s COU ESW (45/25), JZZ LNN, W6s KG YY ZZ, K6s ALH (65), CQF SHJ SXA THZ TXA (144/109), W7s DJU DKH QNI YGN (172), W8s CSK IBX (119/100), KX NOH TDD YGR, K8EGX, W9UBI, WØWXJ, KØHGB, VE3EIL, KL7PI and KP4AOO presents such evidence as BV1US 11 hours GMT, one C9B (10 kc. above the lower band-edge), CN8s EM IE, CP3CD (10) 23, CR6s 6A1 6AP 6CK 22-23, 7C1 (5) 13, 7FC (15) 13, 9AH, CT2s AI 6, BO (35) 0, DMs 2AVN (23) 3, 3KDN 20, DUs 1AQ (70), 1QR (80) 10-11, 6IV (90), 7SV 12, EAs 6AW 1, 8BF 8CB 8, 8CP 9AP 9BM, EL3B (20) 23, ET2s TO (70) 15-16, US (70) 3, FB8s XX (60) 4-8 of the Kerguelens, ZJ (40) 9-13 of Amsterdam, FF8s AC (83) 6, AJ BF (14) 21, FK8AT 11, FO8AC,





VP2LB of Castries, St. Lucia, finds his QSOs in great demand since recent Caribbean modifications on your ARR L DXCC Countries List (p. 97, June QST). Boris obviously prefers the vocal.

F08AP 0, GC3IDP (95) 19, HAs 5DH (34) 4, 5KFR 4, 8WS, HCHM 11, HE9LAC (20), HLISK (5), HPs 1BR 5CC 1, HSLC (10) 14, HZIAB, IITGP, am, ITIs AGA C'LS (85) 5, JAs in number, JT1AA (55) 11 now stalking stuff for his own DXCC, JZ0HA (50) 14, K5BSF, KG6, KAs 2KS 2LN 2UW 8KW 9AF (30), KB6BJ (80) 6, KC4s USh 5-6, USK, KC6s IDL (38), 1FR 4A1 (20) 5, 6AA9 (29), KHGAZI, KW6, KM6s BJ 7, BK (50), EVK 5, KP6AL 4, KR6s AO JF LR (10) 11, RY SS (9) 9, KS6s AD 10-12, AG (20) 7, KV4AA (80) 20-22, KW6CM (90), KX6s BT 7, BU, LU8Z1 (5) of Deception isle, LZ1s KAG KBA KNB KPC, MP4s BAM BAU (46) 2, BBE BCK, OA4BW/83, OR4VN (18) 11 of Belgium's antarctic project, OX3s DL (58) 4, UD WE (110), PJs 2CK 2ME (10) 1 of Sint Maarten, 3AB, PZ1s AO (70), AP 10-12, AR 11, RAEM of Moscow, SPs galore, ST2AR, SUI1M, SVs 1AA 3-4, 0WB of Rhodes, 9WV (98), 0WP (90) 4, TI2PZ, UA1KAC 4 6 in Antarctica, UA9s CC (24) 21, KAR (40) 19, KCC KCK (26) 4, UA0s LJ KFG LA, scads of UB5s, UC2s AR (45) 3, BB (32) 3, CB KAR, UD6s AF (70) 1, KAB 22-23, UG6AB (29) 2, UH8KBA (40) 0, UJ8KAA, UL7GL 22, UN1s AN 3-4, KAB, UO5PK (58) 3, UO2s AB (80) 21, AG AH AN (5) 3, AO (8) 3, BP, UR2AO, VK9s AD (27) 11, KX (33), NT, RR (80) 9, VM, VK0KT 11, VP8s 2SI 3AD (55) 22, 3YG (90) 1, 4WI 5BL 6HT (13), 6LN 7BT 7RV 8BM 9DM 9DO 9Y (72), VO2s 2GW (75) 22, 3CF 22 23, 3HD 4FM 23, 8AJJ, VRs 1C 2DG 12, VS1s BB FW GK (22) 10-11, HU (10) 17-18, HX (23) 10-11, VS2s DW FK (70) 14, VS4s 4JT 5AT, VS6s AE (89) 11, DS (90), LV (60) 15, DX EC (100) 14-15, VS9s AC (85) 21, AP, XE1AAH who demonstrates Mexico's rising ham population and consequent two-letter call shortage, XW8AI (10) 15, XZ2TH 10-11, YJ1DL (43) 11, YO2s 2CD 3KBC 2, 3RD 3RF 3ZA 5LC, YV6s 1CF 4AU 5GO (44), 5HL 11, ZBs ICR 21-22, 1HPG 21, ZCs 3AC 5VZ, ZDs 1FG (70) 1, 6NJ 7SA 23, ZEs 1JV 7JY (28) 11, ZKs 1AK 4, 2AB, ZL5AC of New Zealand's antarctic enterprise, ZM6As, ZP5s AF (56) 21, CF 2-3, HB (5) 2, Marion's ZS2M1 (97) 15, 4X4s FU 2-3, JQ KK MY (52) 22, 5A2TY and 9K2AQ who now signs G3FJU. And this roster is only a spot check!

20 phone is always fashionable for the rock-cruiser crowd. We like BV1s US USC (190) 13, CRs SSP (145) 5, 7AP (190) 14, DUs 1FR 61V (180) 8, EA0AC* ET2US* (345) 0, HL9s KR* (130), KS (145) 12, HP1s LO* (815) 12, ME, KAs 2CD 2MIM 01J, KB6s BJ 12, BL*, KC4s USB USH* (255), USV*, KG1s AD DK* EE FR*, KG4s AQ* (297) 23, AW (221) 16, K6CGGA, KX6s BU* (290) 14, BY, OQ5GU* (280) 23, PJ2AA* (295) 23, SV0WB (130) 4, VK9s AA of New Guinea, BS of P.T., AD* (305) of Norfolk isle, VQ4ERR* (301) 13, VRs 1C 4JB, VSs 4JT* (255) 15, 5AT 5BY* who is ex-HS1A they say, 6AE (110) 13, 6DJ, VU2RX* (310) 14, XE2MD, YS1MS (180) 16, YV5ED (150) 9, ZEs 1JV 2JE (180) 13, 7JR, ZK2AB and 4X4GB (140) 3 as reported workable by W1s APA MBX, K2QXG*, K5s BGB* COU, W6YY, K6s CQF SHJ TXA, W7YGN W81XB and W9UBI*. Asterisks as usual designate sideband emitters.

15 phone fans find 21-Mc. A3 possibilities every bit as good as 14 Mc, with the added blessing of less local chatter. W1JNZ, W2DY, K2TCD, K4s IEX PHY RXQ (97/52), K5JJP, W6ZZ, K6QHC (110/57), W7LXH, K9s GDQ GSG, K8s HGB* and LFQ suggest you mingle with GN8s GO (220), IW (180), JS (190), CP1AM 22, CXs 1FM (270) 23, 6AS, EA8BQ 3, ET2US (190) 4, HB9IE*, HC1GE, HH5RL, H18GA (230), HL9KT (228) 15, HR1OL (150), IT1CDS, KAs 2BE 2KS 2ML 7H11 7WW, KC4USK*,

KGs 1FR* 4AL, KR6s CP EB (200) 1, ES (220) 12, KW6CB, KX6s BQ* BT BU BY* CC (330) 15, CH, LX1DE (210) 14, MIB (228) 14, OAs 4AK 2, 4CL*, 4GV, 4HR* 4IGY (300) 18, 5H*, OQ5s HP 22, IG 22, IS (215), OY1R, PJ2AE, SVs 1AA 0FR (230) 23, 0WZ of Crete, 0WS, TP2WCY (250) 4, TG9MB 23, T12s AB MEF, Prince Edward Island's VE1ADE (250) 17, VE8MC, VK0ET (230), VP1s 1EE (76), 2LO, 3UN 3, 4TO (77), 5WS 22, 6BG 6JR 6MC ZBO (230) 23, 7BV 9HH, VQ4AA, VS8s 2UW (200) 23, 90 (322), XQ8AG (200) 20 21, YN1s KF PS, YS1s LA (240) 4, MS 17, ZB1s Bj 22, DC (275), RT (275), VC (260), ZB2A, ZD1EO, 4X4s GB HK (180) 23, 5A5s TO and TS.

15 c.w. keeps an amazingly tenacious grip on the group, summer doldrums notwithstanding. Reporters K1DFC, W2AZO (34 18), K2TCD (111.95), W3CMN (45/34), K4s IEX LAY 0TG PHY RXQ (97/52), K5s COU ESW (45/25), JPZ KGF LNN, W6ZZ, K6s CQF QHC SXA, W7LXH, W8s CSK (97/66), NOH (159.138), YGR, W9MFFY, K9s GDQ (37/22), GSG, K8s HGB LEQ and KL7PI inform us of the 21-Mc. A1 availability of GEs 1AD 2AT 3AG 3AT, CNs 2BK 8GU (10), 8GV, CR6A1, CT3AB, DU7SV, EAs 8CB 9AP, EL2A, FA8ZZ, FB8AH, FQ8s AG AP 5, GCs 2FZC (36) 23, 3HFE 8DO, GD3FXN (50), GM6UC, HA5KBP (60) 20, HE9LAC, IT1AGA (50), JAs 1ACB 1CAR 3CS 6PA 22, 7AD, KB6BJ (30, 70) 2 KM6BK (100), KP6AL (50), KX6GB, LU0AC on the briny, LX2GH, LZ1KBN (70) 21, OA4FA (60), OQ5s BT IG (50) 23, OX3BT, P1L1C, WY, PJ2s AE AL ME (50) 4, PZ1AQ, SV0s WP (40), WY (17) 21-22, UAs 3YR (20) 22, 4NB 6UF 9OI 01J, UBAs AQ KBA WF, UC2s AA (60) 20, AX 3, CB (60) 19, KAB, UOQAN 4, UR2KAA, VESTO, VK9RR (100), VP1s 5BL 7BT, VO3s 3HD 4FM 4KPB (30) 23, VR2DG, VSs 6DS (50) 9C (36) 4, 9AO, WP4AOT, XEs 1PJ 1YL 0NIID, YO2BU (46) 17, YV6s BJ EB 3, GY (73) 19, HF (30), ZB1s Bj DZ GUIH VY, ZC4RF (75) 5, ZE2JS, ZL5AC (60), 4X4s IV (45) and JU.

15 Novice DX pluggers of the youthful stamp meet their annual September nemesis: school. So KNs 1D1W 1DPB 4RID 5M1X 9JLH and WV6API wasted little time in sulking away GE1AD, CN8GU, CRAs 4AD 6CS 7BN, CT1HE, DU7SV, EAs 6AM 8BK, ET2US, FB8XX, FB8AH, FQ8AP, HA5KBP, HE91AC, HK0AL, J7AD, JT1AA, Ks 2LIQ KG6 6T9Q KG6, KB6BJ, KC4UA, KG4As, KM6BK, KP6s AK VR4 AL, KR6A1, KX6AF, LU2ZS, LX1RE, OD5AF, PJ2ME, ST2AR, SV0s WP WF, T12LA, UA9OI, UA0s AA CI KAR, UC2BE, UG6FB, UJ8AF, UO5AA, UO2AB, UR2BU, VK9s CK NT RR, VP8s CC CR CV, VSs 6DS 9AE, W6WY, KW6, WP4s AMR AOD, WV4BW, YV6s FT HL, ZE7JY, ZL5AC and 5A1TS.

10 phone and c.w. staggered through the m.u.f. dip and W8NOH outshells the story: "Signals on ten were very spotty and not in for long. But they were there for those who care to dig for them." On phone K3AMH 4 (72/54), K6CQF, W7VCB and W81XB found EL8D, HC1NH, KM6BI, KX6AF, PJ3AA, VP1s 1GLG IRL 7BO and numerous PYS LUs and ZSs catchable. On c.w. K6SXA and W8NOH joined the boys for F2BV (just France), FASCR, HH8GL (40), KB6BJ (94) 22, KW6CA (77) 1, PYS LUs VKs and ZLs. This is the month for 28-Mc. resurgence, gang. All set?

40 c.w. comes to life around this time, too. K1DFC, W3LAX, W5MPE, K6s EYV QHC, W7DJU, W81BX, K8EGX and K0HGB kept busy during the dog days with DU7SV, FA8RJ, HH2KV, KP6AL, PJ2MF, VP1s 5BL 5RS 7BT (1) 2, 8CY (12) 8-9, 9CR, XE2UA, YV5HL and ZS10. Then, naturally, there is the West Coast monopoly of these JAs: 1ACU 1AA 1AHC 1AL 1ANA 1ANB 1ANF 1ASO 1AZU 1BEZ 1BL 1BNA 1BRA 1BRI 1CAA 1DY 1EF 1IE 1PC 2AA 2LC 2ZY 3CW 3TT 3ZY 4LL 5SW 5WG 6AK 6MF 6ST 7AB 7AC 7BO 8SW 9AB 9BE 9BY 9HB 0GC and 0HX. Any Easterners working 7-Mc. JAs? Seems to be a curtain along the Rockies. Novice news on 40 tells of KN1DIW, KN3DHI, WN6YKs and WP4AKB picking off FG7XE, KH6s BVV COB, VK3XB, VP6GN, WL7CPW, WV4BW and YV5HL. We expect to see the 80- and 160-meter DX lepidoptera out of their cocoons in time to inspire some lower-frequency paragraphs for next month's "How's." How about it?

Where:

South America — W0LUX assures that all QSLs for the impending Galapagos go of HC8s (W8s) AGO LUX and WGF will be answered upon the trio's return to Minnesota. W1RST stands by to accommodate VP4WI QSL-seekers for QSOs made from the 29th of June through the 2nd of July. "VP4WI is located at the U. S. Naval Station, Trinidad, and I put it on the air under considerable difficulties — drenching rains, a shack filled with tropical bugs, etc." I have been authorized by the parents of the late S. Ward, VP8BU/VP8BT, to act on their behalf and handle all accumulated QSLs. The parents are endeavouring to locate the station logbooks and cards will be

issued if same are found." This from G8KS — as recorded previously in these pages Stan accidentally drowned at Port Stanley on the 1st of April. . . . Regarding June PYØNA Trindade efforts PY1CK says: "Began replying to cards in early August; QSLs without IRC via bureau, with one IRC direct by sea mail, and with two or more coupons direct by air." . . . Antarctic KC4 data courtesy K1NAP: "KC4USA (Little America), KC4USK (Knox Coast, Wilkes Station) and KC4USW (Weddell Sea, Ellsworth Station) will close at the end of the 1958-'59 antarctic summer. Get your QSOs with these KC4s before the 1st of January. . . . We have received many letters concerning contacts with various antarctic stations for QSOs as far back as 1956 for which no QSLs were received. We will attempt to have this situation clarified. I request all hams who have had contacts with any of our KC4 stations prior to January 1, 1958, and who have not received QSLs as yet, to supply K1NAP with information as to the antarctic stations' calls and addresses, dates, times, frequencies of QSOs and reports sent/received. . . . Mail service to and from the Antarctic is closed during the months of February to September inclusive. QSLs for contacts made during or after March 1958 will be mailed directly from Antarctica in the months October through February." . . . KV4AA assures W8CSK that YVØAB's confirmations began clearing around the middle of July.

Asta — If it isn't one thing it's surely another. W1ELR is told by V6GDV that self-addressed envelopes often are spoiled by high tropical humidity upon their arrival in Hong Kong. "Please seal in waxed paper." . . . W8KX reports ex-G1MCC (W8FEL) still filing QSLs and logs for his activity a decade ago on the China mainland. Inquirers should include s.a.s.e. . . . G3ISX tells K8CHG that 9K2AQ is back at G8FJU toiling over his Kuwait QSL accounts. . . . "After work in Bangkok as HS1MQ for several months in 1957 I closed my station on December 31st. Tell the boys that if they don't have a deserved QSL from HS1MQ they should resubmit QSO data and IRCs to my home LU8BF location." . . . WGDXC has it that former KAØIJ operator Woody hangs out at 336 N. Cherry Lane, Fort Worth 8, Texas.

Africa — Declining IRC manipulations, ZS6IF will QSL his Swaziland, Basutoland and Bechuanaland DXpeditionary operations on a card-for-card basis via bureaus. . . . According to W6YY the friends and neighbors of ZD78A were astounded by Bob's recent receipt of 2500 QSLs in a single mail delivery.

Oceania — Family enterprise KB6BL requests through K2QXG that s.a.s.e. be included with all cards. Helen and OM designate air as the only practical mail route to and from Canton unless your patience is jovian. . . . K2QXG assists with VK9VM's confirmation chores and notes that about twenty per cent of all applicants unethically expect him to foot the postage. "The boys get complete exchanges within ten days at a substantial postal saving. It makes one feel real good to open an envelope, take out the card bound for VK9VM, and find a note thanking one for the service." . . . VR3P pleads for patience concerning Christmas cards and suspects foul play in his receipt of QSLs for spurious VR3P contacts. . . . "KX6BP speaks of a shortage of QSL stock," writes W7DJU. "Contacts will just have to wait until a supply reaches Gene and Mac." . . . From KP6AK of Jarvis to W9OVF: "Since the first of this year I have been using only 75-meter phone in the Line Islands net plus regular 20-meter skeds with Honolulu for traffic. I will work any-

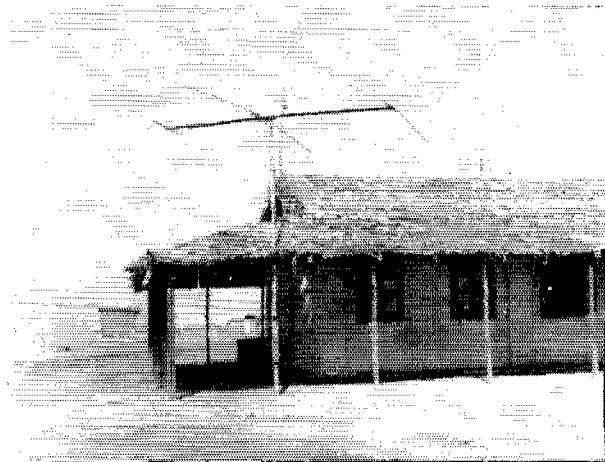
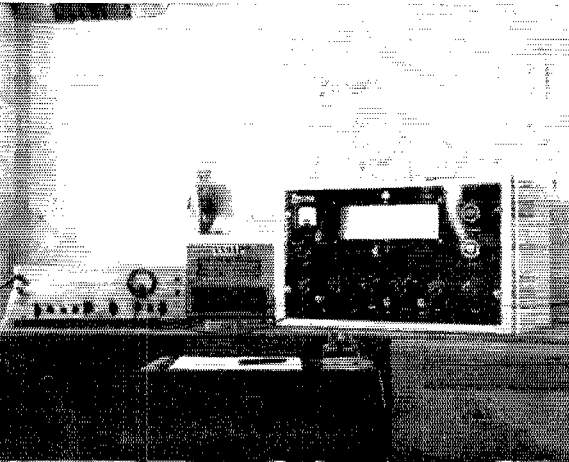
one I hear calling me after completion of traffic work." Thus the gadabout KP6AK worked by Harry and others in the '58 ARRL DX Test must be disregarded. . . . Corroborative verdict from FK8AS via W1ICP: "FKØAD is a pirate, and we act to obtain his full QRT." . . . WØGXP is assisting JZØPB with QSL details and offers similar aid to other rarish overseas DX operators in bona-fide need. "The usual procedure will be followed — s.a.s.e. returns direct, others via bureaus." . . . VK5RX confirms the unfortunate passing of VK5BY whose signals were widely worked Up Over. W3VKD was final QSO for Doug; VK5HR holds the VK5BY log and is closing out QSL matters. . . . KC6UZ notifies, "All former holders of Trust Territory calls are requested to file their present addresses and submit self-addressed stamped envelopes if they wish to have their QSLs forwarded to them. I still receive cards for KC6 and KX6 QSOs made as far back as 1951 and '52. Incidentally, there are many cards on hand for KC6DX, a station formerly operated in this area without proper authorization. He is not recognized as a legitimate ex-ham in our records."

Europe — Just f.y.i. F7CO correlates some New York APO numbers with their F7 locales: 56, SHAPE Hq. at Versailles; 230, Paris and Orly Airport; 84, Dreux Air Base west of Paris; 17, Fontainebleau; 83, Toul Air Base east of Paris; 16, Bordeaux Air Base; 128, Camp des Loges near Paris; and 17, Laon Air Base northeast of Paris. . . . K2TCD hints that DL4LS may still be of assistance regarding SWØWN's Crete QSLs. . . . Regarding his labors on behalf of OY7ML's QSL situation, W6NJU states: "Self-addressed envelopes will expedite matters considerably." . . . More from LA2JE/P via W1ICP: "I will be QRV from Hope Island, Svalbard, for the next year. But I do not believe LA5HE will be able to handle my QSLs in 1959. Cards for me thus should be sent via bureau; if sent to my home QTH they cannot possibly be answered before August or September, 1959." . . . UO5PK assures W8YIN he QSLs 100 per cent through the Moscow bureau. . . . The present YU3BU points out that his call was employed by another operator as late as 1955. Naturally Filippic cannot be responsible for the first YU3BU's QSL matters.

Hereabouts — "Had a swell time at St. Pierre and, made more than 1000 QSOs in 40 states and 29 countries," communicates K2JGG, FP8AB. "I am first QSLing all cards received, the rest later when possible. Some confirmations may be slow in coming through because of the carelessness of certain operators in filling out their QSLs. About a third of all contacts sent cards within one week of my return to N. J. Incidentally, while I am no better off financially than most hams, I feel that one has no business going on a DXpedition unless one can personally afford it. A few DXers sent me currency with their cards and this is being returned." . . . K2GMV states that cards received for his summer FP8AU sortie went out via bureaus unless IRCs and/or s.a.c. were attached. . . . KG1CK points up the tribulations experienced by overseas stations whose QTHs are handed about inaccurately. The outcome is especially painful for those who await QSLs for certification filings. We trust the correct KG1CK address which follows will help mend matters and induce the majority of Bud's mail to fly right. . . . The VP7NZ who was active from April, 1955, to March of this year invites QSL inquiries at the address to follow. . . . W3EQK terminates his QSL-aid arrangement with YS1MS as of the 1st of this month. Similarly, KL7PI understands that W2CGJ no

VS9AP runs a close race with VS1BB/VS9 for our QTH of the Month. The neat operating position is used by the RAF gang at Khormaksar, Aden. Operator Geoff, most active DXer there for some time, scheduled a return to England shortly after shipping these photos to W6YY.

VS1BB/VS9 highlighted and delighted this spring's DX season by making the Maldives workable on 10, 15 and 20 meters with a DX-35, HRO-MX and dipoles. Here Barry faces camera while second op Vic makes with the log. A view of the encampment's "Sunset Boulevard" also appears. Equipment used by VS1BB/VS9 remains on the scene for possible use by other DX visitors. The 457 gang, 457s DT and RD in particular, are inclined to join in the fun. Meanwhile VS1BB sets his sights on something even rarer: the Nicobars and Andamans. (Photos via W7PHO)



longer acts as PJ2ME's Stateside QSL *chargé*. . . . In dispensing QSL assistance as indicated in the directory to follow. W2CTN, W0IC and K8DPJ desire the usual courtesy of stamped self-addressed envelopes. K8HTT, by the way, volunteers his services as QSL agent for a deserving overseas station in the juicy category. . . . You can thank W1s APA AZW ELR TS TUW UED WPO ZDP, W2s DY HMJ SUC, K2s JGG QXG TCD, W3s CMN NCF, W4CY, K4s IEX MIWB OTG RXQ, KN4RID, K5s COU ESW, W6s KG NXP YY, K6SXA, W7s AMM LXH NRB QNL, W8s CSK KX NOH YGR YIN, K8HFO, W9s CMQ LNQ VVJ YNB, K0HGB, VE3EIL, F7CO, KL7PI, VKs 2GH 5RX, DeRidder (La.) DX Club, International Short Wave League, Japan DX Radio Club, No. Calif. DX Club, West Gulf DX Club and Willamette Valley (Wash.-Ore.) DX Club for the individual suggestions that follow.

CEIEI, A. Schermer (W2HY), ACMC, Potrerillos, Chile
CR4AD, H. Brito, Box 16, Praia, Cape Verde Islands
CR4AU, F. de A. Henriques, P. O. Box 39, Praia, Cape Verde Islands
CX3CS, P. O. Box 37, Montevideo, Uruguay
E8BF, M. Cevalmor, Box 66, La Laguna, Tenerife, Canary Islands
F2US, MARS Radio, Kagnev Stn., APO 843, New York, N. Y.
F2BV, E. Henry, 37 Boulevard de la Resistance, Calais, France
FB6s XX ZZ (via FB8BC or REF)
FO8AT (via W0LRU)
FP8AB (to K2JG)
FP8AO (to W2ORA)
FP8AU (to K2GAIU)
FP8AV (to W3MYL)
GC3MFS, D. Stewart, Boulivot House, Boulivot, Grouville, Jersey, C.I., U.K.
ex-HCIBP, B. Lora, P. O. Box 456, McCleary, Wash.
HC1FM, P. O. Box 460, Quito, Ecuador
HC8s AGO LUX WGF (to W6s AGO LUX and WGF respectively)
HL9KT, 304th Sig. Bn., Radio Co., APO 301, San Francisco, Calif.
HP1ME, M. Espinosa, Apartado 493, Panama, R. P.
ex-HS1MQ (to LU8BF)
IINT, P. G. Mazzuchetti Magnani, 24 corso Francia, Turin, Italy
ex-JZ0DN, P.G.A. Gerlins, 44 Dr's Jacoblaan, Zeist, Netherlands
JZ0PB (W/Ks via W0GXP)
K1FLZ/KL7, Lt. D. S. Tracy, 748th AC&W Sqdn., AFS, Kotzebue, Alaska
ex-KZGPZ/VE8, K. Cote, 20 Belmont Ave., Northampton, Mass.
K2IVJ/VE8, E. Eggert, 926th Sq., APO 863, New York, N. Y.
K5BPH/KL7, B. Davis, USAF, Det. 4, Box 1070, Fairbanks, Alaska
K8JTI/VE8, 926th Sq., APO 863, New York, N. Y.
K86BL, Canton Island, Phoenix Gp., So. Pacific (air only)
KG1CK, S/Sgt. B. W. Lafferty, 1983rd AACs Sqn., APO 23, New York, N. Y.
KG1EE, Chas. Dierole, 1281 Brian St., Detroit 24, Mich.
KG4AW, MCB-1, FPO, New York, N. Y.
KL7COJ, R. L. Fleck, Box 24, Navy 127, FPO, Seattle, Wash.
KM6BL, Det. ComBarFae, Navy 3080, FPO, San Francisco, Calif.
KP4AOO, R. Burt (W8URO), Box H-3, Navy 116, FPO, New York, N. Y.
OA4IGY, c/o U. S. Embassy, Lima, Peru
OD5CB, K. Nabhani, P. O. Box 266, Tripoli, Lebanon
ex-OE13WC, M/Sgt Wm. M. Curry, Hq. & Hq. Co., USASETF, Loralistical Command, APO 19, New York, N. Y.
OY7ML (W/K/VEs via W6NJU)
TF2WGY, 933rd AC&W Sqn., APO 81, New York, N. Y.
UA9CC, A. I. Portnaggin, Radio Club, Sverdlovsk, U.S.S.R.
UB5DW, A. Chichno, P. O. Box 58, Kiev 1, Ukraine S.S.R.
UQ2AN, B. Greiza, P. O. Box 1601, Riga, Latvian S.S.R.
VK2AYY/LH and **VK2FR** (W/K/VEs via W2CTN)
VK4CI, c/o Station 4QL, Longreach, Queensland, Australia
VK5BY (to VK5HR — see text preceding)
VK5NO, 573 Main North Rd., Elizabeth, S.A., Australia
VK9BS, R. A. Sutherland, P. O. Box 84, Port Moresby, P. T.
ex-VK9JF, F. Fulton, c/o Cable & Wireless Ltd., 44 Northam Rd., Penang, Malaya
VK9MK (via K8DPJ)
VK9VM (via K2QXC)
VP1DL, D. Owen-Lewis, Punta Gorda, British Honduras
VP1NW, N. Wakefield, c/o Citrus Co., Pomona, Stann Creek, British Honduras
VP2AZ (via W0TIC)
VP2VB (via KV4AA)

VP7BU (to K5LJA)
VP7BV, Yost, FACN-475-24-05, MCB-7, Det. India, Navy 106, Tent C-3, FPO, New York
ex-VP7NZ, F. M. Mason, 512 Riverview Dr., Melbourne, Fla.
VP8BT/VP8BU (to G8KS — see text preceding)
VP8GC, C. Johnson, c/o L. Hill, 12 Greenoak Rd., Petts Wood, Kent, England
VP8GI, H. E. Dyer, c/o Westminster Bank Ltd., 12 High St., Southampton, England
VP8CJ, J. Wynne-Edwards, Ditton Pk., Slough, Bucks., England
VP8CZ, E. H. Ross (G3LWS), FIDS via Port Stanley, Falklands
VR3P, J. Brown, Decca Navigator Co. Ltd., BFPO 170, Christmas Island, Pacific
VS2CR (via MARTS)
VS6DG, c/o Grinent Eng. Co., Rm 306, C&C Bldg., Connaught Rd. Central, Hong Kong
W3ZA/3W, L. Rundlett, MSUG, Box 34, Navy 150, FPO, San Francisco, Calif.
W4BTC/KP4, B. Sterno, c/o StratCom, 1938th AACs Sqn., APO 845, New York, N. Y.
W5RYG/KG6, J. Boutte, 852nd AC&W Sqn., APO 334, San Francisco, Calif.
XE0BBK (to W5BBK)
XE9NH (to W9NH)
XQ8AG, Vanguard Site No. 7, c/o U. S. Consulate, Antofagasta, Chile
ex-XV5A (to W3ZA, 3W)
YN1JR, J. Roberts, IAGS, U. S. Embassy, Managua, Nicaragua
YSIMS (see text preceding)
YU3BU, P. Florjan, P. O. Box 38, Piran, Yugoslavia
ZBIDS, R. A. Strafford, 2 Patricia Flats, Zabbar Rd., Pawla, Malta
ZB1US, 135 Valley Rd., Birkirkara, Malta
ZBZZ, R. Bush, C. 23, RAF, New Camp, Gibraltar
ZCARP (via RSGB)
ZDIFG, A. Torre, UNESCO T. A. Mission, c/o Teacher's College, Njala, Sierra Leone
ZM6AS, P. H. Fenton, Civil Air, Faleolo, Western Samoa

Whence:

Asia — Singapore stuff: VS1BB of Maldives fame writes, "Have feelers out for a VU5 ticket on Car Nicobar. Involved are VS1s HS JF HX and myself, call possibly VU5GL or VS1GL/VU5, in August or September for two weeks. By the way, how long is this power failure in South Dakota going to last?" HII! . . . From the *Malayan Radio Amateur* comes word that "Three VS1s are leaving for the United Kingdom — HQ HZ and JK. VS1HQ is G3LCS, VS1HS is G3W3KGD, and we look forward to hearing VS1JK with a G call also." . . . From LU8BF: "During my stay in Thailand as HS1MQ I worked about a thousand stations, mostly LUs, PYs and ZPs who had their first chance to work HS in Spanish. I ran 500 watts, used an AR-88 receiver and folded dipoles for 14 and 21 Mc." LU8BF now concentrates on 15 and 6 meters with 750 and 50 watts respectively. . . . W8N0H advises, "UA9CC would appreciate fellows listening for him on voice. I check with him on phone and he comes in well enough although

Petite CN8CC strokes a rhythmic bug when OM CN8MZ isn't striving to enhance his own 200-confirmed DXCC status. In this layout a homebrew rig runs fifty watts on 10 through 40 meters, a double-con 15-tube receiver, and the main skyhook is a 20-meter rotary beam. Eunice supplies a perfect squeel for our June jabber re the scarcity of full-time XYL DX hounds; five junior operators.

(Photo via W8KX)



G3s BQR, IFB, AAE and JUL (left to right) turned in a masterful DXpeditionary performance in May as GC3AAE. Their six-day long-haul spree accounted for over 2000 QSOs with 112 countries, these logged mostly on 14-Mc. c.w. and s.s.b. with a KWM-1 and multiband trap dipole. Possibly establishing precedent in our DXcursonian milieu, two XYLs came along to ancient Essex Castle to enjoy the view and assist with the cuisine. G3AAE writes: "Before we tried it we wondered whether perhaps the life of a DXpeditionary was too much like hard work. It was no pushover but we soon realized that it was a whole of a lot of fun. Even before we landed back in G-land we were discussing the possibilities of a repeat performance back in Alderney or at some other interesting location."



he has hum. He says this is due to poor power regulation and a 40-cycle current difficult to filter." Wis HEG and UED relay statements by Korea's Ministry of Communications at Seoul: "At present there are only three amateur radio stations in Korea operated by foreign personnel. The Ministry has granted licenses to the 8th U. S. Army, U. S. Air Force in Korea and to the Korean Military Advisory Group respectively. These have been issued on an organizational basis and not on an individual basis. We must regretfully inform you that the established policy of the Ministry prevents us from granting your own request [for licensing] at the moment. Under the circumstances we are not even issuing license to citizens of our own country." Thai talk courtesy WITS and W3NCF: H5IA is Statesward but H5Is B and E remain active, mostly on 20- and 15-meter phone. H5IC pokes out a heftier signal with his new 3-element beam on 20 and seeks Maine, the Dakotas and Mississippi to complete WAS with a 200-watt 813 affair on c.w. or modulated by 6146s. H5IC also has acquired H5IA's 15-meter spinner. Joining the W6UW gang atop Mt. Hamilton this Field Day, W6YY noticed JA8AE getting into the swing of things with many a CQ ED. Bob also reports a hospitable JA welcome recently accorded merchant mariner ZL1ARB upon docking at Hakodate. VS90 now is QRT after operating mostly 21-Mc. phone from the desert inside Oman's border." confirms W6YY. In quoting the Wall Street Journal WGDXC's organ mentions that 42 Americans and families now are in Nepal. Hams, please. UA3DPE contemplates an early trip to Mongolia's Altan Bulak area." informs W8NOH. "And UC2BB says an expedition has left for Franz Josef Land to sign a U.S.S.R. army call there without numeral." Hmmm. Some sources indicate the curtailment of amateur operations in areas of the Middle East and as far afield as Ceylon — temporarily, we trust. We urge all DXers to monitor W1AW's regular bulletin transmissions for possible official news in this connection.

Africa — Certification developments on the African front: VQ4KRL calls your attention to RSEA's Worked-All-VQ award which is based on the accumulation of 25 credit points from at least four VQ numerical areas. Each

VP8CZ will be the first to agree that Cyprus was never like this. Ted finds his hirsute and woolly appearance necessary in warding off the weather at Base G, Admiralty Bay, South Shetlands, while he dreams of warmer ZC4FB days. (Photo via W9CMQ)



VQ1 QSL earns you five points; VQ2, one point; VQ3, three; VQ4, one; VQ5, three; VQ6, four; VQ7 (1) five; VQ8-Mauritius, four; VQ8-Chagos, four; VQ8-Rodriguez, five; and VQ9, five. Check with VQ4KRL for further WAVQ details. . . . WAZS (Worked All ZS) may be claimed by any licensed amateur who can produce evidence of two-ways with 100 South Africa stations distributed as follows, ZS1, sixteen confirmations; ZS2, ten; ZS3, one; ZS4, nine; ZS5, sixteen; ZS6, forty-five (1); ZS7, ZS8 and ZS9, one each. Oh yes, before you rush off to your QSL files we should add that contacts prior to January 1, 1958, don't count. More specific data may be secured from SARL at P. O. Box 3911, Cape Town. . . . OVARA's gazette points out the DAP sheepskin, one certifying proficiency in working Portuguese Africa, CR6AI has the pitch and this includes the requirement of confirmed QSOs with three CT3s, four CR4s, two Portuguese Guinea CR5s, one Sao Thome CR5, fifteen CR6s and fifteen CR7s, all contacts dating since August 15, 1957. . . . From ZS61F of recent Swaziland note: "My trips to ZS8 and ZS9 will take place early next year. I will try to get gear ready for s.s.b. use on one or both excursions but first I must see how my ZS7 plans work out." W0WET signs ET2TO these days and ex-ZS1BB is active as ZETJR. W9VVJ informs, "ST2AR needs the Dakotas and Nebraska for WAS and comes through well around 0430 GMT near 14,050 kc." Japan's JDXRC gang drools while overhearing VQ9GU tests with VQ4s AQ and ERR. Those Seychelles continue to be the object of tantalizing DXpeditionary rumors. WGDXC has 9G1BF closed down for a six-month leave. W2BOK writes W1WPO: "When I returned to the air in 1953 I began calling FB8BR. I must have called him twenty or thirty different times during the ensuing three years but I was never able to raise him. When I finally broke the jinx and worked him he told me I was his last QSO from Madagascar — he left for France in a few hours."

Oceania — ZL2GX, NZART's Contest and Awards Manager, invites world-wide participation in the 1958 VK/ZL DX Contest on October 4-5 (phone) and October 11-12 (c.w.) from 1000 GMT Saturday to 1000 Sunday. The exchange consists of six figures (five on phone) made up of the RST plus consecutive QSO numbers starting with 001. Work as many VKs and ZLs as you can, counting one point for each completed contact. To determine final score, multiply total QSOs on all bands by the total number of VK/ZL districts worked on all bands; ZL1 through 5 plus VK1 through 0 (less VK8) gives a maximum possible multiplier of 14 per band. Logs must show, in this order, date, GMT call of station contacted, numbers sent and received, and band. Underline each new VK/ZL district worked and use separate sheets for each band. A summary sheet accompanying your log should list your name, call, QTH, rig, and score data, and carry a signed declaration that all rules were obeyed. Certificates go to highest scorers in each country and U. S. A. licensing area, and in other classes depending on activity. Mail entries to reach NZART, Box 489, Wellington, New Zealand, on or before January 23, 1959. Austere item via WITUW from the VR3P mill: "Christmas Island VR3 activity no longer is permitted, this by order of the military authorities. Also, so far as is known here, VR3A no longer is operating at Fanning because of a personal accident." VR3P, incidentally, heartily endorses W2HMJ's observation on pp. 60-61, June QST. JZ0BP is on 15 phone generally daily and particularly on week ends between 1300 and 1500 GMT," advises W0GXP. "Dave is v.f.o. but usually can be found near 21,250 kc." Pacific Trust Territory news from KC6UZ's good offices: "KX6s BX CD CE CH CI CK CL and ZD will be closed out by the first of October. KX6BV is heading for KH6-land. KX6CB has been with Project Betty on Roi Island in the Marshalls but closed down and was last reported on Wake Island. Old-time

(Continued on page 152)



Correspondence From Members -

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

READ IT!

816 Connecticut Ave., N.W.
Washington 6, D. C.

Editor, *QST*:

Every literate person knows the rule that one should not sign any document without reading it. It should also be well known that the document should be not merely read but also understood.

Nevertheless I find myself startled at the number of radio amateurs who move into new apartments, set up their transmitters, get some sort of TVI trouble and finally, when it is too late, discover that their leases either prohibit or highly restrict amateur-radio operation.

Any amateur who values his hobby and wishes to enjoy it should make certain before moving into a new home that his lease doesn't have language which will give him trouble over his operation.

— Paul M. Segal
General Counsel, ARRL

DX QSLs

7357 Decelis Place
Van Nuys, California

Editor, *QST*:

Enclosed is copy of a letter received from a club in W8-land soliciting funds for a DXpedition.

I am very much opposed to these attempts to have fellow hams finance these trips. If DX is so important we have to purchase our QSLs I don't want any more. If these men want some DX while on an expedition, fine, but let them pay for their own fun.

— A. D. Lester, W6USY

8 Catherine Berg
St. Thomas, Virgin Island

Editor, *QST*:

Since there are all kinds of investigations going on against rackets, let's start our own investigation into the biggest racket to hit amateur radio — actually paying for QSLs on an expedition (so-called) going around the world. If you don't pay, you don't get a QSL. Is that legal or amateur radio? I think it's amateur racket radio. Gangsters have slipped into amateur radio. Let's clear the hobby of them.

— Antonio Jimenez-Benvenuti, KV4BA

RFD 2
Carmel, Indiana

Editor, *QST*:

... It has always been my impression that amateur radio was not-for-profit and this thinly-veiled blackmail is disgusting. I have noticed a rising trend toward this sort of egotistic commercialism of the DXpedition and deplore its ultimate consequences — the direct purchase of rare QSLs.

In startling contrast (a non-commercial venture) the DXpedition of W2EQS to FPS-land last year. My QSL from Charlie was handled promptly and no bill preceded or accompanied it.

— Richard Lieber, K9GEL

PHONE OR C.W.

CG LORSTA, APO 331
San Francisco, California

Editor, *QST*:

Reference W2TB's letter, May *QST*, suggesting the opening of amateur frequencies equally to phone and c.w.:

Has he tried to copy c.w. with some fellow's fone signal howling in his ear at 85? Let's keep the bands as they are.

— R. Windell Glenn, KR6CC

13 Glenwood Avenue, SW
Tacoma 99, Washington

Editor, *QST*:

I have read with amazement some of the suggestions of amateurs who would have FCC reorganize the rules and regulations for amateur radio to fit the narrow little segment of the whole amateur picture in which their interests lie.

To me, amateur radio is c.w. and it is phone. It is single-sideband and it is u.h.f. It is RTTY and it is rag-chewing. Interest yourselves in any of these phases but grant the right of others to select only those that most interest them. For W2TB's information, the use of the entire band is authorized for c.w. Due to good sportsmanship, most c.w. men refrain from using their privilege of operating in the phone end of the band. If he got his wish, both c.w. and a.m. operators would suffer, for of course the c.w. man would then feel he had the moral right to operate anywhere on the band.

I personally favor c.w. Because that is true does not mean that I believe rules should favor c.w. anymore than I believe they should favor a.m. or s.s.b. or f.s.k.

I would like to refer the dyed-in-the-wool a.m. man to section 12:27 of the rules and regulations. I have heard many phone men admit proudly they cannot copy or send 10 w.p.m. If they are right, they no more deserve to hold a General License than I have to wear an Army Colonel's uniform.

— Clarence H. Stevenson, W7HMS

TAKE YOUR TIME

Amity Road
Woodbridge, Connecticut

Editor, *QST*:

In the short time I've been on the air I've had a chance to make a few observations and would like to pass them on for your "What It's Worth" department:

1) There are too many novice lists on the air being ruined by bug keys. Most of the time the keys are way out of adjustment and the dits run together like machine-gun fire and their pacing is way out of proportion to the dabs, making copying difficult to say the least.

2) Oh! How many hams on the air merrily QSO along, apparently without ever having glanced at the *Handbook* chapter on "Operating a Station" and c.w. procedure!

3) Except through the very worst of QRM I believe any c.w. signal could be armchair copy if characters were well formed and spacing was proper. A good clean fist is bound to stand out above the other sloppy hash on the air.

— Robert H. Schutz, K1BEM

CP RUN QRM

Beaver Valley Road
Fairborn, Ohio

Editor, *QST*:

A Wouff Hong to all amateurs who don't listen before tuning up. I was thwarted July 3 on W6OWP CP run and also W1AW CP run of June 23. Hope I can get this month's 20 or 25 w.p.m.

— Theodore W. Midlam, Sr., K8GKF

CTC

599 North Court
Circleville, Ohio

Editor, *QST*:

I think Ronald Litt's idea (page 73, June *QST*) concerning the use of carbon tet is excellent. However, I have learned

from the Manufacturing Chemists Association, Inc. and the National Safety Council, that carbon tet is toxic by inhalation, prolonged or repeated contact of the liquid with skin or by oral intake—so be sure there is adequate ventilation. Also, when carbon tet is used on fires and hot equipment, the vapors or fumes given off is phosgene gas which can be deadly!

— Lewis E. Whaley, K8GOY

"YOU — ALL"

260 Vine Street
San Jose, California

Editor, *QST*:

Regarding the fairly common phone practice of using the singular "we," it seems that there are but few to whom custom has granted this privilege; *via*, a newsreporter speaking editorially, the Pope, Lindbergh and his famed airtcraft, and of course the classical example—the man with a tapeworm.

So, as for the phone ham who persists in calling himself "we," I suggest he be addressed as "you-all."

— Walter M. Drozdiak, W6LDO

QLF

32 Willow Road
Menlo Park, Calif.

Editor, *QST*:

In reference to KN4TDN's reports of the many poor lists heard on the ham bands today, I would like to suggest we resurrect the signal QLF, which has been used off the air for years by many DX and traffic men, as follows: QLF? Are you sending with your left foot? QLF: Try sending with your left foot.

— Paul L. Wolf, W6RLP

NOVICE QSLs

1209 Parsifal St. N. E.
Albuquerque, New Mexico

Editor, *QST*:

I would like to compliment those hams who have earned their WAS without using a confirmation from a Novice. My explanation for this not-so-absurd statement is that Novices seem to be the only people that QSL. Recently I have worked 5 new states, all QRM free QSOs. After double-checking their addresses I QSL'd them. After 5 weeks for some, and 7 months for another I have not heard from them, though they all said they would QSL. Some will not QSL even when I send a stamped-self-addressed envelop. I never heard of this trouble as a Novice.

So while everyone is registering their gripes against the Novices, I want to shake their hands.

— Jerry Hobart, K5IAM

HOW

2637 Langdon Farm Road
Cincinnati 13, Ohio

Editor, *QST*:

Having just seen the latest edition of *How to Become a Radio Amateur*, I would like to highly recommend it to any hams who want to introduce newcomers to amateur radio. I had not seen a copy of this publication since the one I bought in 1955 and I was very pleasantly surprised to see the new approach in the new edition which I bought for an interested friend. It is one I have tried to present to interested friends and newcomers to our high-school club, and it is written on a level which appeals to the beginner.

Congratulations and thanks to the ARRL.

— John Levy, K8AJV

S.W.L. PRO . . .

424 Trout Brook Drive
West Hartford, Conn.

Editor, *QST*:

Three cheers for William Fisher. I think it's about time someone spoke up for the s.w.l. I believe that along with Mr. Fisher's proposals the League should also offer awards for s.w.l.s similar to the WAC, WAS, DXCC, etc. As Mr. Fisher said the s.w.l. does lack the qualifications for a license but I believe with the League and hams behind them and helping them out with advice and moral support that many

of them would become licensed amateurs. I believe that the goal of most s.w.l.s is to become a ham and that with a little encouragement from hamdom's leading organizations, they would take the big step.

— Robert Spargo

P. O. Box 27
Kentwood, Louisiana

Editor, *QST*:

I agree fully with Mr. Fisher.

— A. B. Morris, KN6MPN

... AND CON

1011 Glasgow Drive
Dallas 23, Texas

Editor, *QST*:

A letter from William Fisher in the May issue of *QST* suggested an s.w.l. section. I disagree with him for several reasons. If s.w.l.s want to become hams they should be interested in hams, not other s.w.l.s. Second, s.w.l. is a broad term. It includes dyed-in-the-wool s.w.l.s who listen only to foreign broadcast, planes, and ships as well as the ones who listen to the ham bands. The s.w.l.s who listen to foreign broadcast usually do not have any intention of getting a ticket. As final argument I submit the words that have been appearing on the covers of *QST* for a good many years. These words are: "Devoted entirely to amateur radio." A radio amateur is licensed and an s.w.l. is not so I say let's keep it a ham magazine.

— Ray Sullivan, K6GHP

99 Water Street
Millinocket, Maine

Editor, *QST*:

I think I reflect the attitude of most hams when I say I don't like to receive a bunch of s.w.l. cards! They invariably wind up in file 13. I know my signals are getting out, because I talk to other hams. It's not very difficult to obtain a ham license. Where the pleasure of listening to hams talk, without being able to reply, comes from I fail to see.

— Nick K. Thompson, W1LWV

Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1AYA, James H. Newton, Manchester, N. H.
W1BVB, Donald B. Fancher, Waterford, Conn.
W1SXD, Joseph W. Sloan, Newton Highlands, Mass.
W2AQS, Robert Surdam, Syracuse, N. Y.
W2CLC, John P. Eckardt, Levittown, N. Y.
W2JPT, Elizabeth Fairclough, Palisades Park, N. J.
W2KZC, Eugene Davis, New York, N. Y.
W4CMT, H. A. Underwood, Louisville, Ky.
W5CVE, Walter E. Smith, jr., Houston, Texas
W5KTB, Grady L. Breece, Metairie, La.
W5QWV, Lloyd E. Brasher, New Orleans, La.
K6DAP, Adolph W. Myers, Long Beach, Calif.
W6DAT, R. E. Betts, Belmont, Calif.
W7AQN, Paul C. Dickman, Butte, Mont.
W7BSE, Carl P. Wolfrom, Price, Utah
W7HJV, Raymond J. Horstman, Polson, Mont.
W7HWX, Donald R. Richards, Reedsport, Oreg.
W7TBV, Francis M. Peyton, Longview, Wash.
W7UPX, Joseph B. McNutt, Safford, Ariz.
W7UWR, C. H. Bowers, Portland, Oreg.
W8LAH, Willard Radcliff, Fostoria, Ohio
W9DEO, Daniel E. Bloss, Aurora, Ill.
W9FXB, Art M. Linick, Chicago, Ill.
W9JCL, Robert G. Wilson, Neenah, Wis.
W9KUC, Thomas W. Peterson, Rolling Prairie, Ind.
W9STP, Harvey A. Pfeifer, Milwaukee, Wis.
KN0KAC, Albert A. Canfield, Clay Center, Nebr.
KN0MII, Walter J. Maytham, Mason City, Iowa
VE1FH, L. P. Doucette, Inverness, Nova Scotia
G2CZ, Cyril T. Atkinson, Leicester, England



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
PHIL SIMMONS, WIZDF, Asst. Comm. Mgr., C.W.

ROBERT L. WHITE, WIWPO, DXCC Awards
LILLIAN M. SALTER, WIZJE, Administrative Aide
ELLEN WHITE, WIYYM, Asst. Comm. Mgr. Phone

Alaska to be 49th State. The WORKED ALL STATES significance prospects for Alaska is bound to bring us some letters, so this is to anticipate some questions and to supply all who may be interested with some of the answers. As we go to press, only approval in a territorial referendum appears to be needed to make Alaska our 49th state in the union. We'll all welcome this recognition for KL7's. With over 500 calls in the summer book, we're quite sure that WAS workers will find activity (as a statewide group) equal or superior to that current in Wyoming, Delaware, Vermont or Nevada, for example.

There will be *no change* in processing any WAS applications up to the date when Alaska actually legally becomes the 49th state. This date will be announced by WIAW and ARRL OBS announcement when it becomes known. The general ballot there on statehood has been announced for November 25, six days under the deadline for decision.

The basic WAS rule (page 6 of the *Operating an Amateur Radio Station* booklet), covers present and future changes in statehood: "Two-way communication must be established on the amateur bands *with each of the states.*" However, from the date Alaska becomes the 49th state the written confirmations of two-way contacts will take 49 (instead of 48) QSLs to make the grade. The Alaska card sent in then must cover a contact made as of that or subsequent dates, representing a date following the fact of Alaska's statehood. Prior Alaska cards cannot be substituted for any WAS credit.

Present Holders. WAS certificates are issued on the basis of but one to each amateur when he qualifies. Those now holding certificates will not, just because of Alaska, be eligible for another from their present locations. When one *moves* he can start working for a new WAS certification from the new QTH, if it is more than 25 miles from where he attained the earlier award. If a present holder loses a certification through fire or destruction, it can be duplicated from ARRL card records of its issuance.

Current WAS Workers. If you are at the 48-state level and complete your working these states prior to the date of Alaska's addition to the list, you may submit these QSLs, at once then or within the 6 months following the effective

date that Alaska elects to become one of the Union, for as-of-that-date WAS certification. *N.B.* No such WAS-issuances will be made unless all QSOs confirmed represent worked-dates *earlier* than the date of Alaska's ratification-of-statehood.

Future WAS. After this six months' grace period "to get them in" ARRL will issue WAS awards *only* on the basis of presentations of confirmations representing all-49 states, and with date of the Alaska contact required to be *after* Alaska became a state. Which new candidate for WAS will be the first after the date of statehood to get a KL7 and his card, and get all the Forty Nine in to Hq. for his WAS?

Power Excesses Draw FCC Suspensions. Violations of the FCC regulations for the Amateur Service as well as of provisions in our telecommunications treaties are a usual basis for suspensions of amateur operator licenses, in addition to possible other penalties. Following our practice in reporting FCC suspensions when they appear in FCC public information releases, we record the following.

FCC ordered (June 16, 1958) that the Advanced Class amateur radio operator license of Roger D. Mace, Los Angeles, California, be suspended for a period of six months, his license to be returned to the offices of FCC at Washington for the period of his suspension, *it appearing that the licensee* on February 22, 1958 violated Sec. 12.131 of Part 12 of the FCC Rules, by operating his station W6RW, with power input in excess of 1 kw.

FCC ordered (June 16, 1958) that the Advanced Class amateur radio operator license of Herbert R. Grove, South Gate, California, be suspended for a period of six months, his license to be returned to the offices of FCC at Washington for the period of his suspension, *it appearing that the licensee* on February 22, 1958 violated Sec. 12.131 of Part 12 of the FCC Rules, by operating his station W6BPD, with power input in excess of 1 kw.

FCC also ordered (June 18, 1958) suspension for six months of the Advanced and Extra Class operator licenses of Charles A. Bailey, jr., W6BXL, and Samuel J. Roley, W6VUP, respectively. In both instances violation of the power input limits was alleged, also in W6VUP's case there was alleged failure to observe Sec. 12.151, which requires operation in accordance with good engineering and good amateur practice. Messrs. Bailey and Roley have elected to contest the separate suspension orders, and these automatically are held in abeyance, pending completion of the hearings on their cases.

Contest and Award Activity. Can 1958-1959 activity possibly equal that of last season? The look at our last 12-months records showed a healthy "plus" in almost every type of award-listing. The most popular certification, that for the Rag Chewer's Club was most in demand with 5429 certificate issuances (+57%) as many as



On April 5, at a combined meeting of the Connecticut Nets, these members of CN (Conn. C.W. Net) posed for a picture. Seated, l. to r., are W1s KYQ (RM and Net Manager), GVK, YVM, DAV; standing, W1s WPR, BDI, TYQ (SCM), YNC, EFW (ARRL Director), FEA, RGB, MQT.

the Code Proficiency (2209 certificates, 1091 endorsements) and Worked All States (1452) certifications put together. In connection with DXCC there were 113,381 cards checked for 794 new certifications and 1867 endorsements. WAS submissions required the checking of 80,640 cards or other statements covering the two-way work. Initial DXCC issuances were up 37% on the year and the interest in WAS, already high, increased about 15%.

IRP Cards to Get Boost for DX Users. The International Amateur Radio Union in its June 1958 calendar urges that societies, especially those in countries with limited numbers of amateurs, contact their postal authorities and attempt to secure complete recognition and understanding of the use of these cards. A few reports were received where the foreign administrations (or clerks representing them) refused to handle the special postal card forms without additional local postage. In September 1957 *QST* we expressed surprise that more DXers were not using the International Reply-Paid double postal cards as provided under Sec. 2 Art. 52 of the Universal Postage Convention. We hope the use of the forms can be stepped up to save DX stations time and postage, and to make a guaranteed follow-up reply possible, without any expense to amateurs at the distant end.

Section Officials Meet. At the call of W4ZD, Southeastern Division Director, ARRL SCMs and SECs of the division met May 31 at Ocala, Florida. Purpose of the meeting was to improve understandings between the different state emergency and traffic nets, report progress, and exchange organizational ideas. W4CFJ-Georgia, W4EBD-Alabama, also W4KGJ and W4IYT of Florida were present.

A Wisconsin section meeting with numerous SCM appointees present also was held in May. W9KQB-SCM gave a status report, then introducing Director Doyle, W9GPI, and the SEC, W9YQH. Among the 613 AREC (Wis.) members there are 230 mobiles and 97 emergency units

registered. Wisconsin has 25 affiliated clubs. Wisconsin's nets BEN and WIN handled approximately 9000 messages in the first four months of 1958, indicating a record year for traffic ahead for these section nets.

On this page there is a picture of Connecticut Section Officials meeting in their annual traffic-net session. Joint spring and fall get-togethers of the three nets set the stage here for organization discussions and new NCS appointments. RM W1KYQ made the reservations for this one; v.h.f.-PAM W1FHP has excellent traffic coverage, CVN now supplementing the c.w. and phone nets CN and CPN. Dinner meetings add to the social and fraternal enjoyment of all appointees.

— F.E.H.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

These frequencies are employed throughout the United States by amateurs using radioteletype.

A.R.R.L. ACTIVITIES CALENDAR

- Sept. 4: CP Qualifying Run — W6OWP
- Sept. 17: Frequency Measuring Test
- Sept. 18: CP Qualifying Run — W1AW
- Sept. 20-21: V.H.F. QSO Party
- Oct. 1: CP Qualifying Run — W6OWP
- Oct. 11-12: Simulated Emergency Test
- Oct. 17: CP Qualifying Run — W1AW
- Oct. 18-19: CD QSO Party (c.w.)
- Oct. 25-26: CD QSO Party (phone)
- Nov. 6: CP Qualifying Run — W6OWP
- Nov. 8-9, 15-16: Sweepstakes Contest
- Nov. 17: CP Qualifying Run — W1AW
- Dec. 3: CP Qualifying Run — W6OWP
- Dec. 23: CP Qualifying Run — W1AW
- Jan. 8: CP Qualifying Run — W6OWP
- Jan. 10-11: V.H.F. Sweepstakes
- Jan. 17-18: CD QSO Party (c.w.)
- Jan. 21: CP Qualifying Run — W1AW
- Jan. 24-25: CD QSO Party (phone)

OTHER ACTIVITIES

The following lists date, name, sponsor, and page of this *QST* on which more details appear.

- Sept. 6-7: LABRE DX Contest (c.w.), LABRE, p. 152.
- Sept. 6-7: Virginia Free-for-all QSO Party, WIKX, p. 128.
- Sept. 13-14: LABRE DX Contest (phone), LABRE, p. 152.
- Sept. 26-28, Oct. 3-5: Cleveland SS, Cleveland Convention, p. 108.
- Sept. 27-28, VE/W Contest, Montreal Amateur Radio Club, p. 48.
- Oct. 4-5: VK/ZL DX Contest (phone), NZART, p. 75.
- Oct. 11-12: VK/ZL DX Contest (c.w.), NZART, p. 75.



It doesn't seem possible that the summer is almost over and that we are on the threshold of another active season. But there's the calendar, staring us in the face.

For the past few years — ten, to be exact — we have tried to pry off the lid of the fall season in the AREC by conducting a nationwide activity called the Simulated Emergency Test. Its purpose has been twofold: (1) to survey our facilities and put them through their paces so we can obtain a picture as accurate as possible of our present capabilities, and (2) to put on a public demonstration to place our wares in the public eye. Some AREC units have concentrated on the former, some on the latter — and, sad to say, some have done nothing. In the early SETs, cooperation with the Red Cross was paramount, primarily because the Red Cross gave us the best cooperation. More recently, with the necessity for putting our best foot forward in the civil defense picture, c.d. has exerted a primary influence in this activity, although the traditional cooperation from the Red Cross has continued. To some extent, it might be said that participation in the SET as such has declined because AREC groups are already conducting frequent tests and drills under RACES and do not feel either the necessity nor the desirability to throw an extra drill into their already-tight RACES schedule.

Detailed announcement of the SET (Oct. 11-12) will appear in next month's *QST*, and the dates set for it have been in the Activities Calendar since the July issue. A bulletin with instructions will be in the hands of ECs by late September — not as a notice, but as a reminder and as a vehicle for transmitting the report form and any last-minute instructions and/or changes. We urge you to plan to take part. Get behind your EC (and *push* him if he needs it) to put on some kind of an exercise to show the public that we amateurs are capable of plenty of emergency communications *as amateurs in our own name*, and to reveal to yourselves just where you stand in preparedness. This means that we should ring in c.d. or r.c. or any other agency we would normally serve. If they are part of the local emergency communications plan it would be unrealistic not to include them — and above all, we want the SET to be realistic, because only in that way can it serve any useful purpose. But one thing we want you to be sure to remember is that this is an *AREC* exercise, run by amateurs as amateurs for public service. We want it to be as typically amateur as the Field Day or the DX Contest. And by "typically amateur" we *don't* mean casual or haphazard.

Each ARRL activity is different from the others in some major respect, although nearly all emphasize competition and operating ability. The Field Day is competition among groups under field conditions. The DX Contest puts emphasis on long-haul contacts. The Sweepstakes is a domestic endurance contest. Each, in its own field, has something to offer the contest-minded amateur, and many of our outstanding amateurs participate avidly in all three while some specialize in one or the other. The Simulated Emergency Test, like the others, is a major annual ARRL activity but, unlike the others, it is not a contest — at least not in the same sense. One does not compete with other individuals or groups (unless one wants to "challenge" other groups of the same size), but with one's previous year's "score," to see if it can be bettered. For that reason, we have endeavored to keep the scoring system the same from year to year.

After last year's SET, we wrote (in this column, Dec. *QST*) asking for suggestions as to how to make the SET more interesting. The response was infinitesimal. How about thinking about it, fellows? Then, in your annual SET message to headquarters, give us your opinion as to whether we should (1) leave the SET as it is, or (2) make it more competitive. If you wish to elaborate, do it by mail, not by message. This will give us something to go on.

On May 1, Columbus, Miss., was struck by a surprise tornado which did considerable damage and disrupted power and communications for about an hour. W5BEV

reported the trouble into Ala. Emerg. Net P, whereupon two mobiles (K5LBB and K5IKB) from Amory, Miss., were dispatched to the trouble area, contacting the Red Cross, Salvation Army and Police Department upon arrival. Other stations actively assisting in the ensuing emergency communications were W4EBD, K4s ANQ KGH and LOE. — K4AOZ.

Over 300 people were involved in a systematic search for a missing child near El Paso, Texas, on June 2. Local amateurs assisted, and it was the amateurs who located the child, through an odd combination of circumstances. Seems that K5KOK's battery went dead from too much mobile operating, and the El Paso 10 Meter Emergency Net dispatched assistance in the form of a portable generator. While the battery was charging, one of the cars detected a child's crying; investigation proved it to be the missing child, and the glad news was spread to search headquarters by amateur radio. Amateurs participating included W6s KOK RUN, K6s DHL KOK and W6LVS.

On June 4, West Great Falls, Mont., was flooded by a severe rain storm. Communications were set up by the Great Falls AREC at 2030 MST and remained in operation until midnight. The generator of the Great Falls Radio Club was used to provide power and lights in the flooded area. Trucks for hauling sand and gravel were dispatched to the area thru W7ZUQ. Other amateurs participating in the activity included W7s VHK/m JGG YXG YIO/m ZOL/m, K7s CFA BYB/m. — W7KUH, *SEC Montana*.

Dunn County, Wis., was struck by a tornado on June 4, and emergency action lasted through June 8. The Red Cedar Radio Club set up a fixed transmitter at the Community Hall in Colfax, operating through the Badger Emergency Net. The station was active for 72 consecutive hours; taking turns at the operating position were W9s WMY YCY RHU IYF MEO YFZ LFC OWH, KN9s JIH



During the Wisconsin tornado emergency, this station was set up at the Colfax Community Hall to handle some of the emergency traffic. That's W9WME at the controls, with W9WMY standing.

IAG and HJT. An Air Force portable rig was sent over from Fort Snelling and was operated at the Dunn County Court House in Menomonie by K8ILI and KL7CDP under the call K8FDD. An already-installed antenna at this point was of great assistance. For three days after the storm, the amateurs continued to assist in clean-up operations with mobile and portable units. In addition to some of the above, W9SLT and W9WAW operated on the frequency established for Operation Alert. K9GYF assisted in keeping the equipment in operation and also repaired several defunct state police radios.

The Badger Emergency Net went into operation just before midnight June 4 and remained in session off and on until June 8, logging 68 hours. W9NRP lists 252 stations who participated in the net during that time, including net controls W9s APU KON MWQ NRP QJW RHU SAA YT ZAD and ZSO. Operators at W9YT were W9s GSS LPL LYH SZR VOO ZQA, K9s ELT IER and W5YSC. W9NRP

also lists additional operators in the Dunn County area as W9s HRU LFC WDK and K9KGB, and operators who came from various points outside the area to assist as W9SLY/m, W9MEO/m, W9WAW/m and K8PZT.

Tornadoes and record-breaking floods swept through North Central Indiana precipitating emergency conditions from June 8 to June 11. In Howard County (Kokomo), considerable damage was done and the AREC and RACES went into action. Assembly was at the c.d. building where

NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

transmitters on 75 and 6 meters were activated. Mobile units were dispatched to different sections of the city to report on conditions in the absence of normal communications facilities. Taking part were mobile W9s DKR PUK YDP GAV and UKT, K9s CFG DCX and W9QUI operated at the control center. Fixed stations W9s TTA JKR and QHC were in support. — *K9DCX, EC Howard Co., Ind.*

The Cass County Radio Club kept the club station, W9VMW, on the air 24 hours a day from June 11 to June 14 during the Wabash River Flood in Indiana. The station is installed in the county c.d. headquarters. All telephones south of the Wabash River went out during the height of the flood. Mobiles stood by at the Southside fire station and at radio station WSAL to relay emergency calls. Three six-meter portable rigs were used to check points along the river within the city. Other mobiles kept watch on the river gauge, bridges and roads closed by water.

The club station operated on both 6 and 75 meters. There were three portable and five mobile units on six meters and two mobile units on 75. The following is a list of participating stations: W9s ZYR EGV ILU MBG CFI YIU RDF HST, K9s GPQ IAM EQT HFC GMH AWH AXX CRP HGV ADN EJJ. — *W9HST.*

In the early evening of July 3 a storm hit Billings, Mont., accompanied by tornado funnels and hail up to one inch in diameter, causing considerable damage and disrupting communications in the area. The AREC, under EC W7YHS, went into action. Mobiles were dispatched to damaged areas to handle any local emergency calls, and reports on conditions, and a few personal messages were handled. K7BVO assumed net control of the stations in the emergency net. Stations reported such things as roofs off of houses, bridges

Flexibility is a key part of the emergency program in St. Joseph County, Ind. W9ZIB's setup, shown above, is one example. The gasoline engine drives a generator which keeps the extra battery charged during periods of prolonged operation on the 2-meter gear on the right. The car is also equipped for mobile operation, 10 through 160 meters. Photo by W9YME.

out, trailer trucks upended, and requests for poles, pole-sets and emergency generators. Amateurs taking an active part in the emergency were W7s YZQ/m FTV/m ZCO/m MQI/m YHS and K7AEZ/m. All had the highest praise for the manner in which K7BVO handled the difficult net control assignment.

At 2030 on June 6, Johnson Co., Ind., EC W9EQB was alerted by civil defense to transmit tornado warnings for Johnson, Brown and Bartholomew Counties. The transmissions were made on 7250 kc. at 15-minute intervals for one hour, asking amateurs in the above-mentioned counties to stand by for further information. W9EQB then stood by on the frequency until 0005, but no further emergency situation developed.

Within minutes after the first tornado warning was issued, members of the Cuyahoga County (Ohio) AREC began leaving their jobs to man the weather net on June 13. W8LHX and K8GJW set up a six meter portable unit at the weather bureau, W8PVC acted as master 10 meter net control and W8TFW as master net control on six meters. Each collected reports from the several nets on each band for forwarding to the weather bureau. Although the severe weather turned to the south and the expected crisis did not develop, 38 stations turned out to operate five separate nets — and this during working hours. — *W8AEU, EC Cuyahoga Co., Ohio.*

Amateur radio served in a personal emergency in Alabama on June 29. Seems K4DQL, who already was on crutches, fell down some steps and re-injured his bad leg. Since there was no one else at home and he had no telephone, he finally managed to crawl to his transmitter and give K4PHH a call. The latter came over, fixed up a makeshift stretcher with a plank and finally got the injured man to a hospital. — *K4AOZ.*

On July 9, the Billings (Mont.) AREC was again alerted for an approaching storm. Nine stations reported in for duty and remained on official alert until the storm blew itself out somewhere northwest of Billings a little over an hour later. Although there was no actual emergency communication, this wide-awake AREC group was in readiness for any eventuality, and spent the time they were on active alert in discussing detailed plans for operations in the event the storm did strike them. — *W7YHS, EC Billings, Mont.*

While amateur mobile units of the Rochester (N. Y.) c.d. were assisting in communications for the Memorial Day parade in May, a man took violently ill on a street corner. Nearby were a police car without a radio and an amateur mobile unit. The amateur unit called W2QYT in the mobile control truck, who dispatched an ambulance to the scene and within five minutes the sick man was being taken care of. This took place much faster than would have been the



case if the policeman had had to telephone from a nearby house—W2QYT.

On May 30, 1958, the Boy Scouts of District 6, Queens County, N. Y., held an emergency mobilization. Local amateurs participated in mobile units to inform the boys of the location of the incident over an 8-mile peninsula, pointing up the importance of mobile communications. Nineteen amateurs participated.

Amateurs in West Virginia assisted in controlling traffic to and from the dedication ceremonies at Camp Gallahad, some 35 miles north of Charleston, on June 8. Three mobiles were used to control shuttle traffic up and down the single lane road, a mile long and about a 600-foot drop. A portable rig was set up to maintain contact with three fixed stations in Charleston. Results were so good that the amateur group has been asked to coordinate a similar activity on the same road at a later date. — W8HZA.

The Cuyahoga County AREC tackled two activities on the same day, thus unwittingly demonstrating its versatility and flexibility. In addition to activating a weather net to handle a tornado alert, nine amateurs provided communications for a Flag Day parade in Cleveland on June 13 at the insistence of parade officials, who had been very skeptical of the value of amateur participation the year before. Everything went off without a hitch, as expected. — W8AEU, EC Cuyahoga Co., Ohio.

Here's a new idea for an AREC activity — a wild horse roundup! AREC members of Cuyahoga and Summit Counties, Ohio, had just such an activity on June 20 when an attempt was made to corner a runaway horse which had been at large for six weeks, defying capture by experts. The roundup was staged in the same manner as a big game hunt, with beaters on foot and horseback driving the horse into a blind canyon made by an old stone quarry. Six mobiles were stationed at strategic points on the surrounding roads and three hand-carried units accompanied the beaters to effect proper coordination with all groups. But the horse made his escape up the fantastically steep banks of the canyon and was subsequently tracked for miles with the amateur units coordinating the whole effort. In the end, the chase was abandoned and "the phantom had won again." — W8AEU, EC Cuyahoga County, Ohio.

Twenty-seven SECs reported for May, representing 6888 AREC members. This is an increase of seven reports and over 1000 AREC members from last year. Good show, men! Only one of the reporters was a new one for 1958, and we welcome the Kentucky SEC to the 1958 record. Sections reported: W. N. Y., Ga., S. Texas, E. Fla., E. Bay, Iowa, Colo., Wash., San Joaquin Valley, Ala., Nevada, N. C., E. Pa., B. C., R. I., Ont., Maritimes, NYC-LI, Santa Clara Valley, Vt., Wis., Mich., Conn., N. Texas, Md.-Del.-D. C.

RACES News

FCDA is no more. On the first of July its merger with the Office of Defense Mobilization went into effect, and the new agency is called the Office of Defense and Civilian Mobilization, with headquarters at Battle Creek, Mich., under Leo Hoegh (pronounced Hoyg) as administrator. The status of RACES changes not at all under the newly-formed agency; in fact, very little change will be evidenced except in the name, as far as we amateurs are concerned. RACES is still under the Operations Division of the Communications Office and is still handled by Jim MacGregor, W8DUA. All that is changed is the name — unless they change something else while this is getting into print.

That's the way it goes. No sooner do we get used to rattling off a set of initials like FCDA than we have to change to another, entirely different set. Our literature will carry some FCDAs for quite a while yet, but as it is revised any FCDAs will be changed to ODCMs.

On June 3, the City of Los Angeles RACES organization conducted a surprise test, information on which was not released to the amateurs until approximately two hours

before the beginning of the exercise. Approximately 300 square miles were covered. All transmitting and receiving facilities were assembled after receiving instructions, except for the relay point on Mount Lee. At approximately 2015, command posts began actual operation. Contact with the portable base headquarters station was perfect and reports in message form were dispatched. This totalled 1808 words, an average of approximately 8 words per minute. Open air time could have accommodated at least 25% more capacity had the need been present. Not one word or numeral in any of the reports was received incorrectly. All operation was by emergency power except the portable base station and the relay point.

The San Bruno, Calif., RACES group, headed by RO W6VYH, is getting all set for a big program this fall. The city council has approved the operating room to be installed at the new civic center, construction of which will be complete some time in September. New equipment has been purchased to maintain contact on 6 meters with Area 6, San Mateo County RACES Headquarters. — W6VYH, Radio Officer, San Bruno, Calif.

Schuylkill County (Pa.) Radio Officer W3ZRQ, finding contact from town to town, borough to zone control or zone control to county control impossible on 2, 6 or 10 meters, has set up a c.w. net to train operators for this point-to-point function on 80-meter c.w. The v.h.f. bands will be used for local purposes only, under the new plans. W3ZRQ states in his letter announcing the new net that "Past and previous drills have definitely shown phone as impractical when the bands start acting up, QRM, QRN and QSB the worst offenders."

TRAFFIC TOPICS

It's getting to be that time again — for net registrations, we mean. Last year's net directory was the biggest ever, and it doesn't look as though the end is yet in sight. We want all service nets to register, but in last year's directory we had registrations for a great many nets which rendered no services, only chewed the rag. Nothing wrong with chewing the rag, of course. If we thought there was, we wouldn't be issuing several thousand RCC certificates every year. The trouble is that this year we are casting about for a way to make our net directory a little smaller, and the first thought that comes to mind is that we ought to cease registering those nets that are not dedicated primarily to public service. In past years we have avoided soliciting registrations except for those dedicated to a public service, such as traffic handling or emergency communications. From now on the new policy is to register *only* such nets. In this way, we hope to cut our net directory down to a reasonable size.

If you have not registered your net with us since August 1, 1958, it is in the "inactive" file and will not be reinstated unless you act. Here are the deadlines: (1) For appearance in the net list in November, 1958, QST: September 15. (2) For appearance in January, 1959, QST: November 15. (3) For appearance in the multi-lithed cross-indexed net directory: November 1. (4) For appearance in March, 1959, QST: January 15. (5) For appearance in May, 1959, QST:

The best way to register your net is to request a copy of this net registration form from ARRL or to fill in the form on a postal card. It contains spaces for all the information we need on your net.



NET REGISTRATION	
Name of Net.....	.....
Net Designation.....	Freq.....Days.....
Mgr.....	Starts.....Ends.....ST
Direct coverage.....	.....
Purpose of Net.....	Starting date.....
NCS.....	.....WTS?.....
Liaisons.....	.....
This info submitted by.....	(Name and/or call)
CD-85 (Rev. 9/54)	

March 15. Nets listed in *QST* will not be re-listed in subsequent *QST* lists unless a change is made in the net information given.

The best way to register (or re-register) your net is to get a copy of CD-85 from us, fill it out and send it in. If you don't have CD-85 and don't want to wait for us to send you a copy, here's the information we need (Items 1, 3, 4, 6 and 8 are absolutely required):

1. *Name of Net.* Please indicate the official name of the net. If you don't know it, find out before you register. If it has none, decide on one before you register. The net will

that is, Use AST, EST, CST, MST, PST or GMT. Nets registered under "daylight saving" time are not corrected to standard time without notification by the registrant at the time the change is made; we recommend that you avoid using DST and register your net in terms of standard time only. If your net has no specific ending time, indicate it approximately so we will have some idea how long the net normally lasts.

7. *Direct coverage.* This is the coverage area of your net by stations who actually report in regularly, not including the coverage of nets or stations with whom regular liaison is maintained outside the net session.

8. *Purpose of net.* Nets organized primarily for social or ragchew purposes will not be registered. Indicate purpose as traffic, emergency, or both.

9. *Starting date.* If a new net, the date it started. If a net recessed for the summer, indicate its fall starting date. If an old, continuously-operating net, the year it was founded.

10. *Net control stations.* All nets have net control stations, otherwise they are not nets. List them by calls. They go on our mailing list to receive certain bulletins.

11. *NTS?* Indicate whether net is an integral part of the ARRL National Traffic System. In other words, is this net represented in its NTS regional net in accordance with the NTS plan?

12. *Liaisons.* We'd like to know the names (or designations) of nets with which regular direct traffic interchange is conducted.

13. Call letters of the amateur who submitted this information.

Form CD-85 registration cards will be sent to anyone on request. We'd much prefer that you submit your registration on this card. Net managers and persons who registered traffic and emergency nets in the 1957 year-end directory will receive card reminders that their net is due to be re-registered. Also, CD-85 cards will be included with all copies of the September LO Bulletin and the October CD Bulletin. Generally speaking, it is not possible for us to go through reports, bulletins, or miscellaneous correspondence to ferret out registration information, so better make a special point to send us the information requested above. We try to be accurate, but we're human, so check your listing as soon as it appears in *QST* and let us know if there is anything wrong with it, so it will be correct in the master directory. It is not possible for us to enter into extensive correspondence concerning any particular net registration. If the information you submit is in some way insufficient, we cannot register you.

Important note: registration of your net in our net directory gives you no special status as over an unregistered net. The net listing is for information only.

Net reports. Transcontinental Phone Net reports the following traffic: 1st Call Area, 1377; 2nd Call Area, 1845; 4th, 5th, 8th, 9th and 9th Call Areas, 690; Total, 3912. Early Bird Transcontinental Net reports 531 messages handled in 30 sessions. North Texas Oklahoma Traffic Net reports 31 sessions and 290 messages with 264 check-ins.

National Traffic System. We welcome the new Twelfth Regional Net back into existence. This region originally comprised the Arizona, Colorado, New Mexico and Utah sections and reported to the Mountain Area Net (MAN) under the original NTS plan. Both MAN and the two regional nets of that area folded due to lack of personnel, and the Eleventh and Twelfth Regions were added to the Seventh and Sixth respectively. Later the Thirteenth Regional Net (Eastern Canada) changed its name to Eastern Canada Net and was officially designated the Eleventh Regional Net.

The new regional net will cover, in addition to the sections mentioned above, the Wyoming section. It will report to the Pacific Area Net, and will operate on a limited schedule for the summer, although it is hoped that in the fall it will be able to undertake full regional net operation. In this regard, much will depend on the support and cooperation given manager W5DWB. So, you traffic men in the new Twelfth Region, how about getting behind him by organizing your section traffic nets and having solid representation in TWN; also, by volunteering to take PAN liaison at least once per week? Ed will need all the help he can get; don't let him down.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for June traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W2KEB	264	1427	1023	202	2916
W7BA	23	1171	1143	26	2363
W3CUL	195	791	648	123	1757
W6SCA	30	629	618	1	1278
W6CPI	10	489	451	38	978
W8UPH	9	482	449	32	972
W0RDR	10	420	420	8	958
W9DO	17	448	393	72	930
W6GYH	356	249	234	10	849
K0HLR	32	391	346	42	811
K4FBA	226	288	49	199	802
W4PL	9	400	380	10	799
W5RCF	17	391	380	11	799
W9NZZ	322	280	0	280	782
W0LCX	36	367	352	15	770
K4SHJ	47	378	321	27	769
W0LGG	36	351	308	20	715
W7PGY	27	351	302	32	712
K9BELT	28	328	308	19	683
W9CXY	5	331	325	6	667
W0IA	27	322	316	2	667
W5ACK	2	325	275	10	612
W5FNL	29	351	278	2	655
W0EZO	9	290	275	5	579
W1UEQ	306	119	101	31	557
K1AQB	21	262	257	5	545
K6GZ	360	92	49	43	544
K4ELG	35	253	236	17	541
K6GK	10	265	110	155	540
K6YBV	20	255	235	11	521
K0CLS	42	242	219	12	515
K2PHF	229	156	121	0	506
K5KBH	14	233	227	5	506
W0GAR	6	250	245	5	506
W1EFW	33	239	224	5	501

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
K6MCA	33	329	330	7	699

BPL for 100 or more originations-plus-deliveries

K9GED	218	K0JCF	106	Late Reports:	
W1GHZ	160	W9PCQ	105	K2FCB (Mar.)	175
W2BVE	114	K2UTV	100	W8PHA/5 (May)	
K1BCS	110	K6SXA	100		142
W4SHJ	106			K2FCB (Apr.)	125
				W1GHZ (May)	104
				K2FCB (Apr.)	100

More-Than-One-Operator Stations

KG1DT	251	W9RHU	195	Late Report:	
				W2CXM (May)	258

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K2OYI, W4IWM, W5FPI, K6HLR, W8WXC.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their NCMA 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.

appear in the list exactly as you register it, insofar as practicable, so be careful of misspellings, illegibilities, etc. We reserve the right to decline to register nets with asinine names like "Idiots Net," "Moron's Net," and the like.

2. *Net Designation,* if any. The set of letters which identify the net on the air, in writing or in conversation.

3. *Frequency or frequencies,* in kc. If more than one frequency, be sure you line them up properly with time and days of operation. Spot frequencies are required for registration.

4. *Days.* Tell us which days, not how many. "Daily" means every day, including Sunday.

5. *Call of net manager.* This is the amateur who organizes the net, arranges for NCS, conducts correspondence, or otherwise is the person to be contacted about the net. Call him what you like, but put his call in the net manager's space on the registration.

6. *Net starting time(s).* Net ending time(s). Do not list your net on "local" time. We often don't know what time

June reports:

Net	Ses- sions	Traffic	Rate	Average sentation (%)	Repre- sentation (%)
1RN.....	25	337	.337	13.1	89.4 ¹
2RN.....	48	434	.326	9.1	98.6
3RN.....	42	276	.336	6.6	75.4
4RN.....	44	368	.223	8.4	51.9
RN5.....	50	625	.368	12.5	81.6
RN6.....	20	610	.857	30.5	18.2 ¹
RN7.....	33	205	.150	5.4	....
8RN.....	33	109	.161	3.3	79.8
9RN.....	53	973	.573	18.3	76.4
TEN.....	81	679	.290	8.3	52.3
ECN.....	17	32	.121	1.8	58.8 ¹
EAN.....	21	804	.686	38.3	94.4
CAN.....	30	862	.660	28.7	100.0
PAN.....	30	881	.441	29.3	86.7
Sections ²	766	5273	....	6.9	....
TCC Eastern	64 ³	98			
TCC Central	60 ³	704			
TCC Pacific..	95 ³	548			

Summary....	1287	13818	RN6	9.6	CAN
Record.....	1297	13818	....	15.9	100.0
Late Reports:					
9RN (May) ..	55	1501	.686	27.5	85.9

¹ Regional net representation based on one session per night. Others are based on two or more sessions.

² Section nets reporting: ILN (Ill.); NJN (N. J.); SCN (Cal.); OSN & BN (Ohio); Iowa 75 Phone; SCN (S. C.); S. Dak. 40 Phone & S. Dak. 75 Phone; GSPN (N. H.); MJN, MSN, MSPN Noon & MSPN Evening (Minn.); MDD (Md.-Del.-D. C.); KYN, KPN & MKPN (Ky.); QKS (Kans.); TLGN (Iowa); FMTN (Fla.); CN & CPN (Conn.); HNN & CWXN (Colo.); WSN (Wash.); AENB & AENP (Ala.); QMN (Mich.); GN (Fla.).

³ TCC functions reported, not counted as net sessions. Congratulations to all you NTS boys. Considering a bad month for conditions and light traffic we did extremely well by continuing to set new records and by 100% reporting at regional, area and TCC level, plus 39 section net reports. Judging by advance reports, July will be better, not worse, than June, even with so many of the NTS gang going on vacation. By the way, are you taking that little rig along?

W2ZVW is the new 2RN manager, replacing W2ZRC after August 1; bad conditions on the early session are causing difficulty. More support from Pa. is needed on 3RN; only W3LXU is doing his part. W4SHJ has issued 4RN certificates to K4ELG, W4FDV and K4QES. In RN5, Texas has the most traffic but is the hardest section to work, because of QRN. W7GMC says that Alberta and Saskatchewan can now be covered only by mail. TEN has suspended the 1700 CST session "until traffic and conditions improve." ECN is effecting its liaison with VE1 on 7 Mc. CAN continues to operate well in spite of vacations; everyone who leaves is responsible for getting his own substitute.

Transcontinental Corps. June reports:

Area	Func- tions	% Successful	Traffic	Out-of-Net Traffic
Eastern.....	63	85.7	1078	98
Central.....	60	96.5	1150	704
Pacific.....	95	89.4	1092	548
Summary.....	218	90.3	3320	1350

Note that the total traffic handled by each area of TCC is about equal. This is as it should be, even though the Central Area has only two schedules per day while the Eastern and Pacific Area each has four. The TCC roster: Eastern Area (W3WG, Director), W7s AW EMG NJM, W7s HDW VDT K2KIR, W7s COK LXU WG, K4KNP, W9XD, Central Area (W6BDR, Director), W9CXY, W7s LXC SCA BDR LGG, Pacific Area (W6BPT, Director), W5DWB, W6s ADB PLG BPT EOT VZT HC UTV, K6s DYX EWY HLR GES GID, W7GMC, W7s KQD WMK.

W1AW SUMMER SCHEDULE

(All times given are Eastern Daylight Saving Time)

A map showing how to get from main highways (or from HQ. office) to W1AW will be sent to amateurs advising their intention to visit the station. Also, a master schedule

showing complete W1AW operation will be sent to anyone on request.

Operating-Visiting Hours:

Monday through Friday: 1300-0100 (following day).

Saturday: 1900-0230 (Sunday). Sunday: 1500-2230.

Exception: W1AW will be closed from 2230 Aug. 31 to 1300 Sept. 2 in observance of Labor Day.

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, 21,010, 28,060, 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.

General Operation: Use the chart on p. 100, May QST, for determining times and frequencies for W1AW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on all the above-listed frequencies except 1820 kc. Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. On Sept. 17, Sept. 18 and Oct. 17, instead of the regular code practice, W1AW will transmit certificate qualifying runs and a frequency measuring test.

Hidden Transmitter Hunts Popular. The Oregon Hams Mobile Society announced several practice hunts last spring in advance of the convention. These all were put on a time and mileage basis, one point for every minute used and 5 points for each mile covered, the low score determining the winner. One 3.8-Mc. hunt in May (11 A.M. to 2 P.M.) was arranged to end in a picnic at a park near the hidden transmitter location. Such transmitter hunts are an activity with many clubs. The choice of frequency band depends on the relative local popularity of the various operating bands. The 3.8-Mc., 28-Mc., 144-Mc. and 50-Mc. bands seem to carry most such activity. Both the Harrisburg (Pa.) Radio Amateur Club and the Santa Barbara (Calif.) ARC report "hunting" a popular feature.

FREQUENCY MEASURING TEST, SEPTEMBER 17

ARRL invites all amateurs to try their hand at frequency measuring. W1AW will transmit signals for this purpose starting at 9:30 P.M. EDST (6:30 P.M. PDST), Wednesday, September 17. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the signals before the measurement transmission starts. The approximate frequencies used will be 3502, 7027 and 14,104 kc. About 4½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 9:36 P.M. It is suggested that frequencies be measured in the order listed. Transmissions will be found within 5 or 10 kc. of the suggested frequencies.

At 12:30 A.M. EDST, September 18 (9:30 P.M. PDST, September 17), W1AW will transmit a second series of signals for the Frequency Measuring Test. Approximate frequencies used will be 3623, 7112 and 14,184 kc.

Individual reports on results will be sent to all amateurs who take part and submit entries. When the average accuracy reported shows error of less than 71.43 parts per million, or falls between 71.43 and 357.15 parts per million, participants will become eligible for appointment by SCMs as Class I or Class II OOs respectively.

This ARRL Frequency Measuring Test will be used to aid qualification of ARRL members as Class I and Class II observers. Present observers not demonstrating the requisite average accuracy will be reclassified appropriately until they demonstrate the above-stated minimum required accuracy. Class I and Class II OOs must participate in at least two FMTs each year to hold appointments. SCMs (see listing, page 6) invite applications for Class III and IV observer posts, good receiving equipment being the main requirement. All observers must make use of cooperative notices, reporting activity monthly through SCMs, to warrant continued holding of appointment.

Any amateur may submit measurements on one or all frequencies listed above. No entry consisting of a single measurement will be eligible for QST listing of top results. Listing will be based on over-all average accuracy, as compared with readings made by a professional lab.

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 Sept. 18 at 2130 Eastern Daylight Saving Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,010, 28,060, 50,900 and 145,600

kc. The next qualifying run from W6OWP only will be transmitted on Sept. 4 at 2100 PDST 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 EDT. 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 July QST

- Sept. 3: An 80-Meter Tuner, p. 11
Sept. 8: A Receiver for the 60-Mc. Man, p. 14
Sept. 11: A Novice Band Checker, p. 19
Sept. 15: Choosing Capacitors, p. 22
Sept. 23: Beam Talk for the Layman, p. 35
Sept. 25: A Filterless Terminal Unit for FSK, p. 38
Sept. 29: How to Top the CD Party, p. 68

DX CENTURY CLUB AWARDS

HONOR ROLL

Table with columns of call signs and numbers under the 'HONOR ROLL' section.

Radiotelephone

Table with columns of call signs and numbers under the 'Radiotelephone' section.

From June 1, to July 1, 1958 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.

NEW MEMBERS

Table with columns of call signs and numbers under the 'NEW MEMBERS' section.

Radiotelephone

Table with columns of call signs and numbers under the 'Radiotelephone' section.

ENDORSEMENTS

Table with columns of call signs and numbers under the 'ENDORSEMENTS' section.

Large table of call signs and numbers in the upper right section.

Radiotelephone

Table with columns of call signs and numbers under the 'Radiotelephone' section.

W/VE/VO Call Area and Continental Leaders

Table with columns of call signs and numbers under the 'W/VE/VO Call Area and Continental Leaders' section.

Radiotelephone

Table with columns of call signs and numbers under the 'Radiotelephone' section.

• 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, PAM; TEJ, RM; PDJ. The E. Pa. Net meets Mon. through Fri. at 1830 on 3610 kc. PFN meets Mon. through Fri. at 1800 on 3850 kc. New appointments: GKI as Chester County EC, KPI as Lancaster County EC, K3AFW as OPS, K3ALD applied for ORS appointment. NF tested his new driver on FD at EIA/1 with good luck and is building a p.p. 813 final. TEJ reports the usual summer lull in PFN activity, while PDJ is QRT from the E. Pa. Net for the summer. FYR operated portable 18 miles north of Scranton at a cottage on a lake on FD and during early July. BNR is on day work again and reports increased net activity. HNK's new job cut his traffic total, but he found time to qualify at 20-w.p.m. code proficiency. K3-BLC is now General Class. NOI, KKW and RLT provided communications for the Firemen's Parade at Adamstown on June 7. ID used an AT-1 for the entire month's work. EPL blew his power transformer and is QRT. ELI, who was QRT with a bad back, is recovered and expects to spend the summer in Wildwood. KJ earned a W.-Conn. Worked All Connecticut Award. KN3DTL received his first QSL card on his 18th birthday. KN3DPI is active on 7175 kc. for those who need Northumberland Co. QSLs for WAPC award. New officers of the Delaware Valley ARC are UZO, pres.; TAT, vice-pres.; APD, treas.; EBB, secy.; DYY, corr. secy. New officers of the Short Skip RC are DVB, pres.; HNP, vice-pres.; KN3AUM, rec. secy.; YLL, corr. secy.; ZPX, treas.; K3BRL, act. mgr. LEZ worked 9K2AZ on phone for a new rung in the DXCC ladder. CIEU now resides in the Easton Area. PVF is on almost exclusively mobile. DVX is operating portable near Equinix without commercial power, using a M-5 generator and a Viking II. Reports of Field Day operations were too numerous to mention, but many thanks to all who sent them in. Traffic: W3CUL 1757, WHK 350, TEJ 182, IVS 74, EYT/3 68, ZRQ 50, NF 46, K3ANS 32, W3BNR 18, LHA 13, UIU 12, BFF 10, PYF 10, K3ALD 9, W3BUR 9, FYR 8, HNK 7, QLZ 7, ID 6, K3APF 4, W3NQB 4, SMF/3 4, EAN 3, ELI 2, CMN 1.

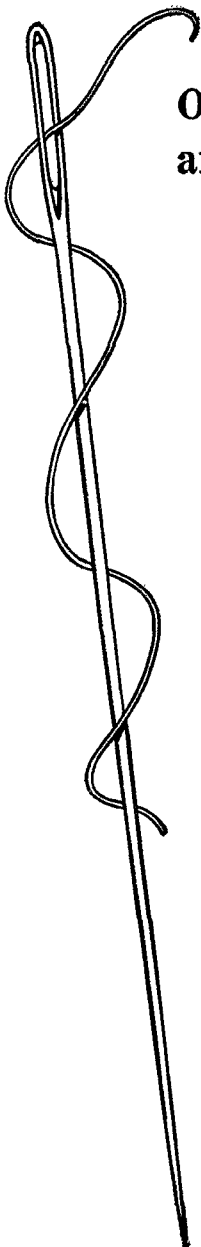
MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Louis T. Cronberger, W3UCR—Asst. SCM Delaware: Ray de Courcelle, 3DQZ. SEC: CXG. Section nets: MDD, 3650 M-S 1915 EST; MEPN, 3820 kc. MWF 1820 and 1300 EDST SS; DELEN 3905 Sat, 1830 EDST. Field Day in MDD appears to have been a huge success from the number of FD messages received and the number of calls heard. The following FD messages have been received: BOQ/3, CAB/3, K3CJT, CWC/3, FDJ/3, LID/m, NKF/3, NEW/3, QVW/3 and RCN/3. The Washington Area clubs (nice write-ups in the *Post and Star*) and ECs made good use of the Governor's Proclamation of Amateur Radio Week in conjunction with their FD activities. The VHF QSO Party also showed a large participation, with several of the groups going to the mountains of Md., Va., and W. Va. G5BT visited the WTVIC on June 10 and Charlie told the group how TVI was handled in G-Land. On June 18 G5BT told the WMRC about the new mobile (only permitted for about a year) operation in England. At the same meeting NL showed the "WMRC produced Movie" (color and sound) which started many WMRC members in many roles. CQX gave a talk on "Message Form and Routing of Traffic" at the ARA May 21 meeting. Delaware Station Break announces that the Kent Co. ARC of Dover will start classes immediately after Labor Day for club members (not presently General Class or better) to qualify for their General Class tickets. The AMARC has reelected QLG pres., and

elected HXN vice-pres.; Joe Bosak, rec. secy.; and Clarence Beyens, corr. secy. Congratulations to IXA, JXN and K3BVEH, who made General and IXF and K3AUX who are now Tech. Class. Al and Betty are both working on the code for their General Class licenses. QJP/VOL is at the Argentinia Station Hospital, Newfoundland, in the Navy. EOY/DAG is on a mobile trip to California and Mexico (XE3EOV/m). HCE has moved into a new home with a built-in ham shack at Odenton Heights. SFY reports the B-60 Net, 145.92 Mc., is now monitored almost continuously in the Washington Area. BWT reports that he and the XYL (AKB) now have the 66-ft. wire back up and that CDQ now has a folded dipole on 40 and a vertical on 20 meters. LGS is now mobile with 50 watts. WSE is attending summer OCS at Ft. Benning, Ga. Ex-W2HTC is now in D.C. and is awaiting his new call, 3UUM, ex-DLAME/W80VO/KT7-DHL/K80EI, reports a return to the old call and D.C. Ex-KR6RX/W6HLP now is K3EFF and is stationed at Andrews AFB, INB, ex-K6JPM, has a new mobile on 6 meters with the Communicator III and Hale. W8OKI is en route to K17-Land from APG and his XYL, #HKEY, has returned to Bartlet, Nebr. Best luck to PG, from all the gang for a speedy recovery from his recent heart attack. OVI, a member of the MEPN, is going to Turkey for a tour with the Navy. KA reports the new Gonset Tri-Band beam is working out PB and hopes to have the new kw. on the air soon. The MEPN Picnic proved to be a real success with an attendance of nearly 600. Program chairman ECP read a short greeting from YA Atlantic Division Director, who was unable to attend. Van also introduced the SCM, who in turn introduced DQZ, Asst. SCM, Delaware, and CXG, SEC. Among the many present were Atlantic Div. Asst. Dir. CQD, ECP and PRL. KN3KWJ joined Silent Keys on June 27 at 76 after a long illness. Please be sure that your station activities reports or club news reaches your SCM by the 5th of the month for the preceding month. Traffic: W3UE 303, QCW 132, PQ 96, K3WBJ 79, W3NMM 78, COK 52, EUP 26, CN 16, WSE 15, CQX 14, UCR 12, FNM 7, LGS 6, BUD 3, OYX 3, IXX 2, JZY 2.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW, PAM; W2ZI, RMs; W2YRW, W2HDW and W2ZL, K2HOD, W2PAU and W2RG are still on the sick list, W2HDW, NJN Manager, reports June attendance 388 and traffic total 256. K2QOL (RG's son) has been taking over his Dad's QNIs on NJN, 2RN and EAN. Forty-nine DVRA members visited ARRL Hq. and WIAW, K2DSL graduated from Cathedral High School with high honors and two scholarships. K2SOL, Gloucester Co. EC, has a new three-element beam on 14 Mc. K2JKA, Asst. EC, is organizing a Gloucester Co. 75-meter AREC net. K2-CPR's DX total is now 231 worked and 224 confirmed. K2IIV, Trenton, is handling Mercer County C.D. (RACES) publicity. Early Field Day reports indicate a big increase in scores and participation. K2BKG, Atlantic Co. supplies SCARA news each month. K2JJC, Pitman, has dropped the "N." The Haddonfield High School boys have started a radio club. Many are SJRA members, including KN2SHH and K2UDA. The SJRA Hamfest will be held at Molia Farms, Malaga, Sept. 7. K2BG visited W6-Land during July. DL4KY (ex-K2QOM) is active on 14 Mc. W2QBH has been doing FB publishing SJRA's monthly paper *Harmonics*. The Burlington Short Wave Radio Club, K2MXN, and club members K2PPV and K2QJ, received Public Service Awards in recognition of their work during the March snow storm. All appointees are urged to send me a Form 1 activity report at the end of each month. Traffic: W2HDW 168, K2EWR 136, W2ZX 72, K2JGU 70, K2K0K 59, W2BZJ 45, K2SOL 13, K2S0I 11, K2JKA 9, K2CPR 5.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUJ—SEC: W2PPY, V.H.F. PAM; W2LXE, RMs; W2RUF and W2ZRC. NYS C.W. meets on 3615 kc. at 1800; ESS on 3590 kc. at 1800; NYS-PTEN on 3925 kc. at 1800; NYS C.D. on 3509.5 and 3993 kc. at 0900 Sun.; TCPN 2nd Call Area on 3970 at 1900; SRPN on 3980 kc. at 1000; LSN on 3970 kc. at 1600. Late reports show that K2FCB, operated by K2CBD, made BPL in March, April and May. W2CXM also made BPL in May. An NYS C.W. certificate went to W2ATC; ESS certificates to K2JBX, K2KTK, K2OFW, K2QIW, K2SHM and K2SIL; and NYSPTEN certificates to W2QSL, K2POR, K2PPY, K2QDT, W2RQD, W2RWY, W2UXZ, W2WNK and W2WTL. K2EED is the new EC for Warren County.

(Continued on page 88)



One of this country's greatest strengths— and we're thankful we're stuck with it!

Since the day when the first S-1 receiver left the original Hallicrafters production line—25 years ago this month—we have been prodded by a terrible and wonderful needle.

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Here at Hallicrafters we learned, the day we opened our doors, that competition in the amateur radio industry is tough, sincere and talented. And through the years, we have grown more and more to believe in this principle:

To meet competition headlong, to out-think and out-produce it every step of the way with newer and more useful amateur equipment, is not merely a matter of business survival . . .

. . . but the only real guarantee of better things for a better amateur world.

In celebrating our *25th Anniversary*, we pledge our skills and resources to maintaining our competitive leadership.

And as long as our competitors continue to challenge that position, amateur radio will become stronger and continue to grow.

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Where the new ideas in communications are born

Chicago, Ill.

K2BBJ has been endorsed as OPS and W2EMW as ORS. K2QDT has been appointed Asst. EC for Erie county, representing the ECEN. The Cornell ARC elected K2. OGO, pres.; K2ADY, vice-pres.; WNTBF, secy.; W3WR8, treas. RAGS elected K2LGA pres.; W2TAY, 1st vice-pres.; W2DBN, 2nd vice-pres.; K2UIT secy. and W2NAL, treas. The club is working on a suitable emblem and QSL card. Lots of Field Day activity was reported. Your SCM and SEC held forth at RAWNY'S W2PPY/2. W2UTF is asst. net dir. of the 2-Meter Warden Net for c.d. in the Rochester Area. K2CUQ has 21 states confirmed on 6 meters. W2TPV received his 30-w.p.m. CP from ARRL. K2TQC has worked 74 countries on phone with a ranger. W2EMW won the club award for SS activities. The Syracuse V.H.F. Club announces that its annual roundup will be held Oct. 11. The club has a very successful operation this year handling communications for the Annual Regatta on Onondaga Lake. W2COB has been feeling under the weather. W2ROH is building a half gallon on 220 mc. using p.p. 4X150As. K2UNZ and W2WVR are two new NCSs in the NYSPEN. K2QNM and K2QKK have been in the hospital but now are doing well. K2GUG and K2LTC are working on moonbounce. The Corning Area Radio Amateur Assn. got nice local coverage on its Field Day activities in the new shack on Quakerbush Hill. The Rochester DX Assn. elected W2TQR, pres.; W2MG, vice-pres.; K2ITM, secy.-treas. K2UZJ received the Penna. Keystone Award. (It requires 100 Pa. QSOs.) The RARA has taken over the local c.d. truck as a club project. Said truck has a 10-kw. generator mounted in a trailer, and equipment in the truck is set up for all bands. Traffic: (June) K2RYH 348, W2RUF 325, K2IYP 218, K2KIR 136, K2KJZ 73, K2JBX 61, K2MES 60, W2ATC 52, K2JDD 45, K2UZI 41, K2TQC 39, W2PVI 34, K2JUNZ 30, K2RTN 27, K2QDT 26, W2VUY 23, K2HUK 21, W2RQF 17, W2RUT 9, K2SIL 8, K2BBJ 5, K2RWY 4, W2TPV 4, K2RIT 3, K2SYN 3, K2TYF 3, W2EMW 1, KN2QHR 1. (May) W2CXM 261, K2FCB 200, K2TQC 143, K2LGT 27, K2TVF 9, W2TPV 4. (Apr.) K2FCB 145. (Mar.) K2FCB 151.

WESTERN PENNSYLVANIA—Acting SCM, Anthony J. Mroczka, W3UHN—SEC: OMA, RMs: GJY, GEG and NUG. PAMs: AER and TOC. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. We regret to record the passing of TCD. New appointments: GJY as RM, KBZ and LAG as OOs, KQD received his DXCC in May. New officers of the Horseshoe RC are KQD, pres.; ROA, vice-pres.; K3BLG, secy.; K3AHG, act. mgr. ZVA now is on s.s.b. with a Johnson 1 KW. MRI has a new Globe Chief. GQH now is mobile. The Horseshoe RC furnishes a nice certificate for working 25 Altoona stations. If interested, contact KQD. The new Tri-State Six Meter Net has been organized and is operating under the name "PENOWVA" at 2000 every Tue. on 50.52 Mc. The Washington County ARC meets the 2nd Wed. at 8 p.m. at Brownson House, Washington, Pa. A new Novice call is KN3BMJ. **KILO-WATT HARMONICS** reports: APN has a new Elmac AF67; MPK received his 1st-class radiotelephone license; SVJ now is serving in Germany; JQJ passed his General Class exam and received his 2nd-class commercial phone license; FML vacationed in Florida; the 2-Meter WX Net operates the last Thurs. of each month on 144.534 Mc. with KWH as net control. The Etna RC reports: K3AQE is the call of the Western Penna. School for the Blind Children (this made possible by the combined efforts of Mr. George McGunagle and the Whitehall Lions Club); NSQ is home from the hospital after an eye operation; EXW has PD at North Park, CDK and KN3DBI have organized the Weinal's Area RC in Westmoreland County. WRE is rebuilding her rig. Up Erie Way: WBM is building a 2-meter super selective receiver; KPM and EFG are students at Vets School; ZUL is recuperating from minor surgery; WDK has a new 20-meter antenna; K3ENW, YLI and K3ENV are on 6 meters; K3AXS has a Communicator in his car. LXU is looking for support on 3RN. JWZ now has WAS. KN3BZP passed his General Class exam. JIV has a new six-element beam on 6 meters. CXX and BSF joined VP2VB in dishing out contacts from VP2-Land during July. RTB nabbed O77ML and FL3AC for Nos. 196 and 197 worked. ZAO is losing sleep chasing elusive matter on 14 Mc. K3BPE attends a teletype repair school in Chicago. The West. Pa. Bellows and Chirpers Society operated PD in Indiana County under the call QJ/J3. Traffic: (June) W3TXU 345, YA 15, GJY 4, WRE 4, UHN 3. (May) W3LSS 50.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME, SEC: HOA, RM: MAK, PAM: RYU, EC Cook County: HPG, Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. This is the first report since Field Day and it seems that

the conditions were not just right for most of the gang to roll up as good a score as last year. This is the report received from the various clubs participating. UQT is recovering from a broken heel while repairing—of all things—a TV antenna. Philco's Dick Seifert spoke at the last Hamfesters' (Chicago) meeting about the Very High Frequencies. K9HCP received a Russian SWL card from UA3-62. PVD is using a new vertical. WRE is operating from the SS *North American*, which sails the Great Lakes. The Starved Rock Radio Club toured the Streator radar station during the July 5 meeting. The Peoria Area Radio Club is very busy planning its Annual Hamfest to be held Sept. 21. FM claims that the advance tickets are selling rapidly. SXL and K9ESP are now on 6 meters and out trying for some DX. The gear for the Springfield and Sangamon County RACES program has been installed and Radio Officer GOJ reports that all tests are very satisfactory. GPB has been appointed General Counsel for the Chicago Area Radio Club Council. The Midwest YL Convention, held recently in Toledo, was well represented by the gals of the Chicago clubs. VVJ reports that his Hillsboro C.D. plans have been sent to Chicago and their authorization should be forthcoming soon. The new club's cubical quad antenna is attracting attention on top of the new hillside location. CSW and the North Central Phone handled 332 messages. CSW also announces that the annual outing of the North Central Phone Net will be held Sun., Sept. 14, at the St. John's Sanitarium grounds. MAK reports that the ILN cleared 216 messages in 25 sessions. He would like to have more operators for the net in the southern and central part of the State. Wes Schum gave a demonstration of s.s.b. amateur equipment at the Peoria Area Club on July 11 and presented some equipment to the club. K9USJ worked South Africa on 6 meters. News is scarce this month. Vacations and outside activity must have taken precedence over hamming. Traffic: (June) W9DO 930, MAK 377, K9ERH 251, W9PCC 157, FAW 122, TZN 53, CSW 40, PRN 6, K9GSR 3, FDL 2, SKR 2. (May) W9WBE 89, W9SXL 5, GDI 2, K9ANI 2.

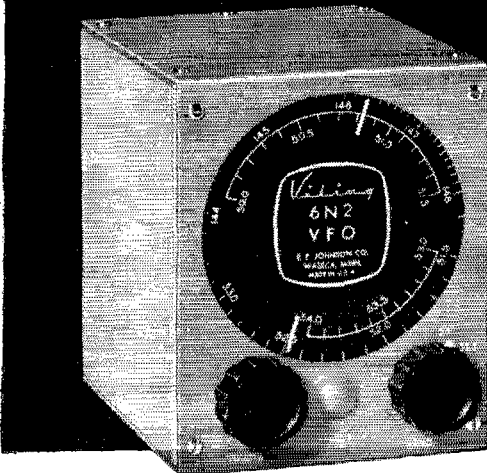
INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM: Seth Lew Baker, 9NTA, SEC: CMT, PAMs: BKJ, KOY, SWD and UXK, RMs: DGA, JOZ and TT. IFN meets daily at 0800 and Mon. through Fri. at 1800 on 3910 kc. QIN meets at 1930 on 2656 kc. daily. K9DWK was appointed OPS; Joe is active in CAEN. K9GBB is manager of the Vanderburg Co. AREC net, which meets weekly at 29.6 Mc. St. Joseph County has formed a new AREC net meeting at 1750 on 3880 kc. K9HYD is now Gen. Cl. JWH has a cubical quad up and is working on 10 meters. CMQ made DXCC with 105 countries confirmed. AB, the Michiana ARC station, made WAS. K9CBBY is Gen. Cl. in Indianapolis. PQZ reports five new Novices in the Bedford Area as a result of the Boy's Club classes. They are KN9MRE, MWW, MWX, MXH and MXL. K9AJA, ex-W5TIA and K7BIT, is new in Mishawaka. GJS is using a new presentation Vibrolex received for Father's Day. K9AUE has a rig on 6 meters and has finished the final and power supply for his low-frequency rig. URQ reports four new Cond. Cl. hams in Princeton: K9HKL, ILK, IIV and ILG. LQE is reported to be operating s.s.b. from Washington. The Marion County Mobile RC held a picnic at Greenfield and displayed its very FB emergency trailer. SWD reports IFN morning traffic as 88 and evening 130, for a total of 218. JOZ reports QIN traffic as 175. CAEN handled 32 messages, according to FHZ. REN traffic was 57, as reported by TT. All of the state nets were alerted for flood emergency work, but fortunately only local communication was required and this was furnished by the various county AREC groups. Are you registered with your EC in case of an emergency in your area? NZZ was the only station to make BPL Traffic: (June) W9NZZ 782, ZYK 270, JOZ 152, BTM 130, TT 104, TQC 100, EEZ 74, VAY 71, FJR 70, SWD 67, K9IXD 44, W9UQP 37, EJW 32, K9GBB 27, W9GHS 27, RTX 23, CC 22, K9ELE 21, W9EGQ 20, MHP 20, DOK 18, WHL 16, CDW 12, K9NBK 12, W9NTA 12, BUQ 11, BDG 10, BDP 10, YXX 10, IMU 9, MMY 9, WID 9, K9HSU 8, DWK 8, W9ENU 8, NQG 7, DGA 6, QYQ 6, HUF 5, PQZ 5, QR 5, K9CFC 4, W9UXK 4, K9GSV 3, W9STC 3, K9AZK 2, CFG 2, W9HRW 2, PPS 1. (May) W9AB 8.

WISCONSIN—SCM, George Wolda, W9KQB—SEC: YQH, PAMs: NRP and AJU, RMs: K9AEO and SAA. The Wis. Slow Speed Net, which meets on 3620 kc. at 1830 CDT, now is managed by SAA. The call is WSSN. Congratulations to the MARS operator at Trux Field, Madison, 8RMP/9, on his recent marriage. Also of Madison, NLA is brasspounder for the Wis. State Patrol. Operating during the V.H.F. QSO Party with a 6N2 at Fond du Lac, the following had 85 contacts in 10 sections: K9s GEF, KHW, GAJ, KBZ, BOE, IKAI and W9NHE. K9GDF moved the station to the basement and now is using a new all-band vertical. IQW is sporting a new tri-band beam. K9ELT received his WAC

(Continued on page 98)

NEW FOR VHF!

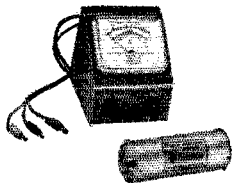
VIKING "6N2 VFO"



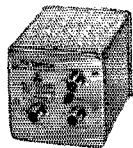
Here's good news for VHF operators: the Viking "6N2 VFO"—exceptionally stable, compact, and packed with outstanding new features! Designed to replace 8 to 9 mc. crystals in frequency multiplying 6 and 2 meter transmitters, including types using overtone oscillators, the Viking "6N2 VFO" provides rock-solid output for operation on any frequency in the 6 and 2 meter bands. Unit is temperature-compensated and voltage-regulated for minimum drift and high stability. "6N2 VFO" is housed in an attractive, extra heavy, shock-proof aluminum cabinet. Plexiglas dial is calibrated from 144 to 148 mc., 50 to 51.5 mc., 51.5 to 53 mc., and 53 to 54 mc. for maximum bandspread. Dial is edge-lighted for high visibility—10 to 1 vernier tuning gives you positive frequency control. The Viking "6N2 VFO" is available completely wired and tested or as an easy-to-assemble kit, complete with tubes and calibrated dial.

Cat. No. Amateur **\$34.95**
 240-133-1 Kit..... Net
 240-133-2 Wired and tested... Amateur Net \$54.95

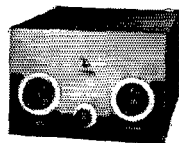
Other popular Johnson station accessories...



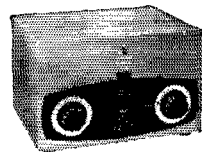
DIRECTIONAL COUPLER and INDICATOR—Provides continuous reading of SWR and relative power in transmission line. Coupler may be permanently installed in 52 ohm coaxial line—handles maximum legal power specified by FCC. Curves supplied for popular multimeter basic ranges. 0-100 microammeter calibrated in SWR and relative power. Monitors incident or reflected power quickly with flip of a switch.
 Cat. No. Amateur Net
 250-37 Coupler.....\$11.75
 250-38 Indicator..... 25.00



T-R SWITCH—Provides instantaneous high-efficiency electronic antenna switching. Excellent receiver isolation. Gain: 2 db at 30 mcs.; 6 db at 3.5 mcs. Rated 4000 watts peak. Instantaneous break-in SSB, DSB, CW or AM. Will not affect transmission line SWR—provides effective impedance match to most receivers 3 to 30 mc. range. With tube, power supply, and provision for RF probe.
 Cat. No. Amateur Net
 250-39 Wired.....\$27.75

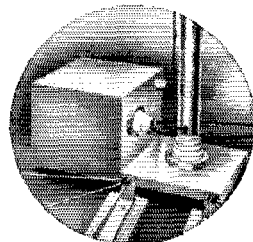


275 WATT "MATCHBOX"
 Performs antenna loading and switching functions required in medium power amateur stations. Band-switching 80, 40, 20, 15, and 10-11 meters. Matches balanced antennas from 25 to 1250 ohms and unbalanced or single wire antennas from 25 to 3000 ohms. Input impedance, 52 ohms, rated 275 watts. Fully shielded. Provision for RF probe.
 Cat. No. Amateur Net
 250-23 Wired.....\$54.95



KILOWATT "MATCHBOX"
 Bandswitching 80, 40, 20, 15, and 10-11 meters—self-contained. Use with transmitters up to 1000 watts input—handles unbalanced line impedances from 50 to 1200 ohms and balanced line impedances from 50 to 2000 ohms. No coils to change, no "tapping down" on the inductor. Fully shielded. Provision for RF probe.
 Cat. No. Amateur Net
 250-30 Wired.....\$124.50

"MATCHSTICK"—Fully automatic, pre-tuned multiband vertical antenna system. Band-switching 80 through 10 meters. Remotely motor driven from operating position. Easily mounts on roof top or in limited space location. Low SWR (less than 2 to 1) all bands. Impedance: 52 ohms. Complete with 35' mast, base, tuning network, relays, control box and high-strength, durable Dacron guy lines.
 Cat. No. 137-102..... Amateur Net \$129.50



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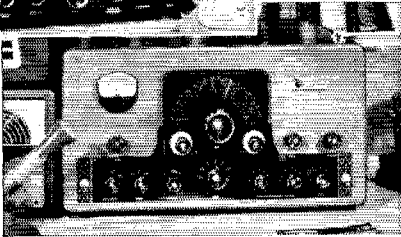
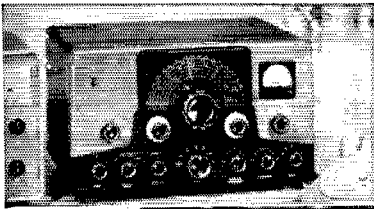


E. F. Johnson Company

2823 SECOND AVENUE S. W. • WASECA, MINNESOTA

VIKING "RANGER" TRANSMITTER/EXCITER

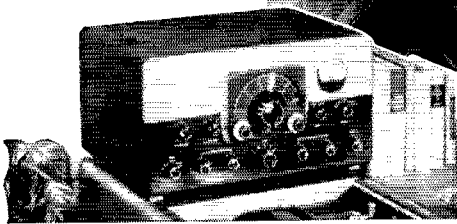
Superbly engineered . . . delivers solid audio punch! This popular 75 watt CW or 65 watt phone transmitter also serves as an RF/audio exciter for high power equipment. Built-in VFO or crystal control—instant bandswitching 160 through 10 meters. 6146 final amplifier—wide range pi-network output. Timed sequence keying. TVI suppressed. With tubes, less crystals.
Cat. No. 240-161-1 . . . Kit Amateur Net \$229.50
Cat. No. 240-161-2 . . . Wired and tested Amateur Net \$329.50



VIKING "VALIANT" TRANSMITTER

Here's effective power, wide flexibility, and many unique operating features combined in a compact desk-top transmitter! 275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) and 200 watts phone. Instant bandswitching 160 through 10 meters—built-in VFO or crystal control. Final amplifier utilizes three 6146 tubes in parallel—wide range pi-network output. Silver-plated final amplifier inductor—built-in low pass audio filter—low level audio clipping. With tubes, less crystals.
Cat. No. 240-104-1 . . . Kit Amateur Net \$349.50
Cat. No. 240-104-2 . . . Wired and tested Amateur Net \$439.50

DOLLAR-FOR-DOLLAR—YOU CAN'T BEAT A VIKING TRANSMITTER



VIKING "PACEMAKER" TRANSMITTER/EXCITER

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

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

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

VIKING "KILOWATT" AMPLIFIER

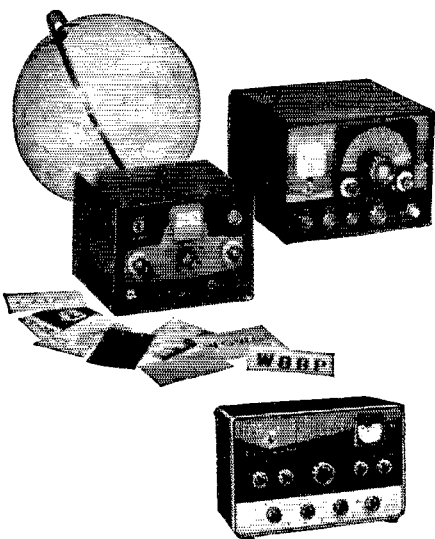
Here's the finest power amplifier ever designed for the amateur service! A sparkling concept of contemporary transmitter design and engineering craftsmanship, the Viking "Kilowatt" is the only amplifier that gives your signal the authority of maximum legal power in all modes. Class C final amplifier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

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

Matching accessory desk top, back and three drawer pedestal.

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

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



VIKING "NAVIGATOR" TRANSMITTER/EXCITER

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

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

VIKING "ADVENTURER" TRANSMITTER

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

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

VIKING "6N2" TRANSMITTER

This compact VHF transmitter punches your signal out with 150 watts CW and 100 watts phone input. Instant bandswitching 6 and 2 meters. Completely shielded and TVI suppressed, the "6N2" may be used with the Viking "Ranger," Viking I, Viking II, or similar power supply/modulator combinations. Operates by crystal control or external VFO with 8-9 output. With tubes, less crystals, key, and microphone.

Cat. No. 240-201-1 Kit Amateur Net \$129.50
 Cat. No. 240-201-2 Wired Amateur Net \$169.50



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

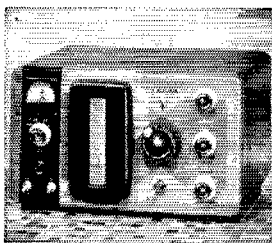
VIKING "FIVE HUNDRED" TRANSMITTER

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

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

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

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



VIKING "COURIER" AMPLIFIER

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

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



VIKING "THUNDERBOLT" AMPLIFIER

Rated at 2000 watts P.E.P.* input SSB; 1000 watts CW; 800 watts AM linear! Continuous coverage 3.5 to 30 mcs.—instant bandswitching. May be driven by the Viking "Ranger", "Pacemaker" or other unit of comparable output. Drive requirements: approx. 10 watts Class AB₂ linear, 20 watts Class C continuous wave. Employs two 4-400A tetrodes in parallel, bridge neutralized—wide range pi-network output. With tubes.

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

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2824 SECOND AVENUE S. W. • WASECA, MINNESOTA



CLELL K8DKY



DAR K8ADS



DICK K8BMJ



DOUG K8GNA



AL W8HTX



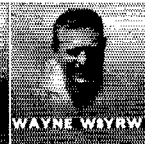
REX K8GND



FRED K8GMY



ERNIE W8VPN



WAYNE W8YRW



FRANK W8WUN



AL K8BLI

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

HEATH *hams work to bring you*



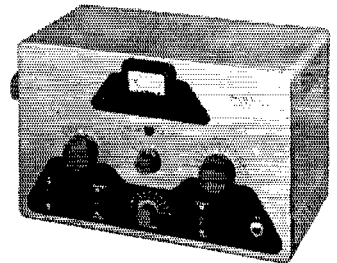
CHUCK K8CJ



ROGER MACE (W8MWZ)
SENIOR HAM ENGINEER
HEATH COMPANY

HEATHKIT 50-WATT CW TRANSMITTER KIT

MODEL DX-20
\$35⁹⁵.



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

HEATHKIT "APACHE" HAM TRANSMITTER KIT

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

MODEL
TX-1

\$229⁵⁰

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

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



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

...top quality at lowest prices!

HEATHKIT "MOHAWK" HAM RECEIVER KIT

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

MODEL
RX-1

\$274⁹⁵

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

Outstanding results can be expected with the new "Mohawk" receiver which is designed to combine all the necessary functions required in a high quality communications receiver. A perfect companion for the Heathkit "Apache" transmitter, the "Mohawk" features the same wide-band slide rule type vernier tuning and covers all of the amateur bands from 160 through 10 meters on seven bands with an extra band calibrated to cover 6 and 2 meters using a converter. External receiver powered accommodations are available for these converters which will be available in Heathkits soon. The "Mohawk" is specially designed for single sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled, wired and aligned front end assures ease of assembly. All critical wiring is done for you insuring top performance. This 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc. Five selectivity positions from 5 kc to 500 CPS. A



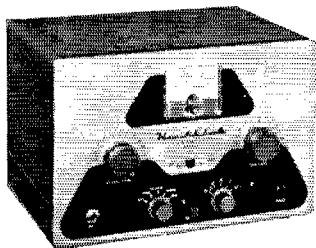
bridged T-notch filter is employed for maximum heterodyne rejection. Complete accuracy is obtained with the use of a built-in 100 kc crystal calibrator and the set features 10 db signal-to-noise ratio at less than 1 microvolt input. S-meter and many other fine features built-in for top-notch signal reception. Shpg. Wt. 90 lbs.

HEATH COMPANY

A Subsidiary of Daystrom, Inc.

**BENTON HARBOR 9,
MICH.**

HEATHKIT PHONE & CW TRANSMITTER KIT



MODEL
DX-40

\$64⁹⁵

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

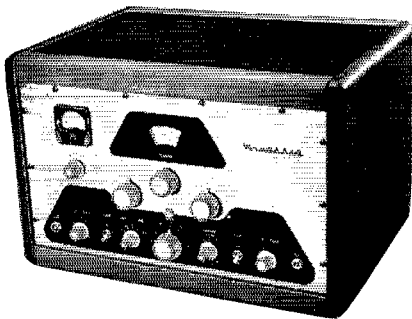
HEATHKIT DX-100 PHONE & CW TRANSMITTER KIT

MODEL
DX-100

\$189⁵⁰

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

You get more for your transmitter dollar when you decide on a DX-100 for your ham shack! Recognized as a leader in its power class, the DX-100 offers such features as a built-in VFO, built-in modulator, TVI suppression, pi network output coupling to match a variety of antenna impedances from 50 to 600 ohms, pi network interstage coupling, and high quality materials throughout. Copper plated 16-gauge steel chassis, ceramic switch contacts, etc., are typical of the kind of parts you get, in assembling this fine rig. The DX-100 covers 160, 80, 40, 20, 15, 11 and 10 meters with a single band-switch, and with VFO or crystal operation on all bands. RF output is in excess of 100 watts on phone and 120 watts on CW, with a pair of 6146 tubes in parallel for the final amplifier, modulated by a pair of 1625 tubes in parallel. VFO tuning dial and panel meter are both illuminated for easy reading, even under subdued lighting conditions. Attractive front panel and



case styling is completely functional, for operating convenience. Designed exclusively for easy step-by-step assembly. No other transmitter in this power class combines high quality and real economy so effectively. Here is a transmitter that you will be proud to own. Time payments are available! Shpg. Wt. 107 lbs.

more fine ham gear from the pioneer



HEATHKIT GRID DIP METER KIT

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

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

MODEL GD-1B

\$21⁹⁵

HEATH COMPANY

A Subsidiary of Daystrom, Inc.

**BENTON HARBOR 9,
MICHIGAN**

HEATHKIT ALL-BAND COMMUNICATIONS-TYPE RECEIVER KIT

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

MODEL AR-3
and 12.6 VAC at 300 ma. Shpg. Wt. 12 lbs.
Cabinet: Fabric covered cabinet with aluminum panel as shown part 91-15A. Shpg. Wt. 5 lbs. \$4.95

\$29⁹⁵.

HEATHKIT ELECTRONIC VOICE CONTROL KIT

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

MODEL VX-1

\$23⁹⁵.

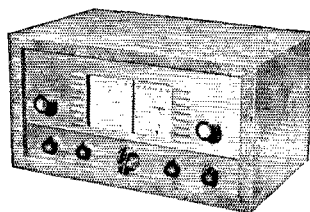
HEATHKIT "Q" MULTIPLIER KIT

This fine Q Multiplier is a worthwhile addition to any communications, or Broadcast Receiver. It provides additional selectivity for separating signals, or will reject one signal and eliminate a heterodyne. Functions with any AM Receiver having an IF frequency between 450 and 460 KC that is not AC-DC type. Operates from your Receiver power supply, and requires only 6.3 VAC at 300 ma (or 12.6 VAC at 150 ma), and 150 to 250 VDC at 2 ma. Simple to connect with cable and plugs supplied.

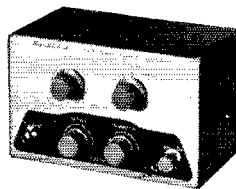
MODEL QF-1

Effective Q of approximately 4000 for sharp "peak" or "null". A tremendous help on crowded phone or CW bands. Shpg. Wt. 3 lbs.

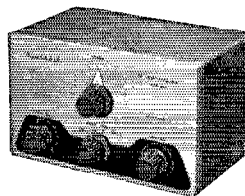
\$9⁹⁵.



ALL-BAND RECEIVER



ELECTRONIC VOICE CONTROL



"Q" MULTIPLIER

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

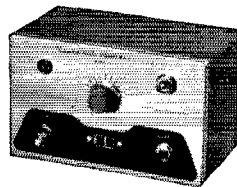
...in do-it-yourself electronics!

HEATHKIT "AUTOMATIC" CONELRAD ALARM KIT

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

MODEL CA-1

\$13⁹⁵.



"AUTOMATIC" CONELRAD ALARM

HEATHKIT VARIABLE FREQUENCY OSCILLATOR KIT

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

MODEL VF-1

\$19⁵⁰

HEATHKIT REFLECTED POWER METER KIT

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

MODEL AM-2

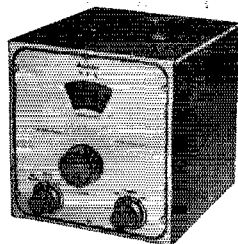
\$15⁹⁵

HEATHKIT BALUN COIL KIT

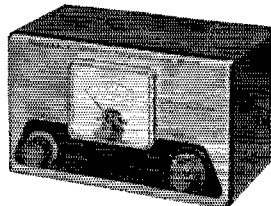
This convenient transmitter accessory has the capability of matching unbalanced coax lines, used on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance. Design of the bifilar wound Balun Coils will enable transmitters with unbalanced output to operate into balanced transmission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

MODEL B-1

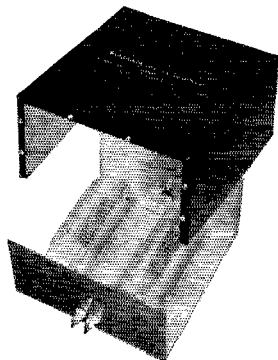
\$8⁹⁵



VARIABLE FREQUENCY OSCILLATOR



REFLECTED POWER METER



BALUN COIL

save 1/2 or more . . . with **HEATHKITS**



**FREE
1958
Catalog**

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

Rush Free 1958 catalog.

HEATH COMPANY

BENTON HARBOR 9, MICH.

a subsidiary of  Dalestrom, Inc.

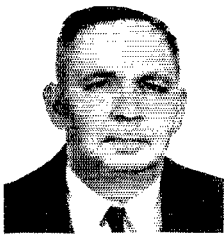
name _____

address _____

city & state _____

QUAN.	ITEM	MODEL NO.	PRICE

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



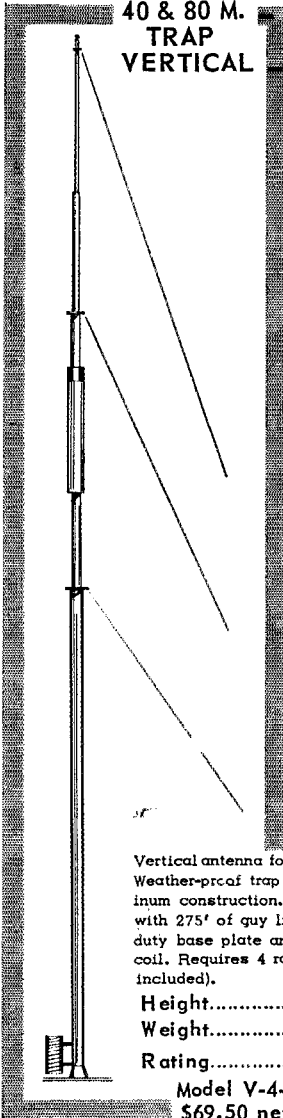
mosley presents these

NEW

additions
to a fine line
of Amateur
Communication Arrays.

Carl E. Mosley, W0FQY

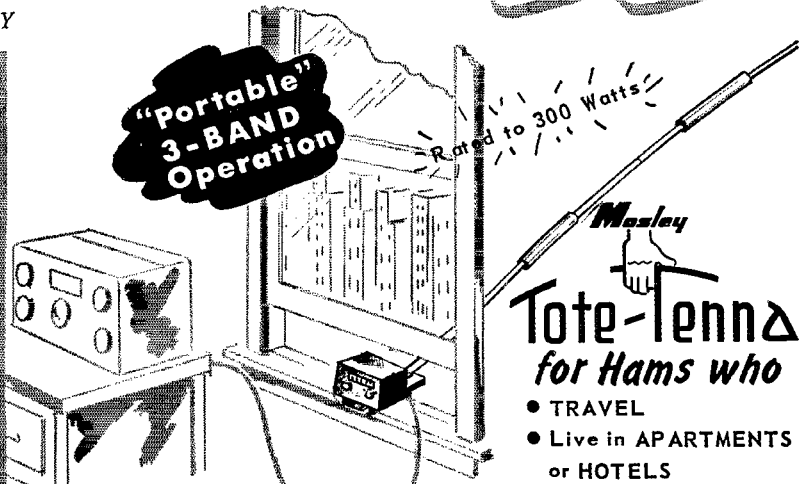
40 & 80 M.
TRAP
VERTICAL



Vertical antenna for 40 & 80 M.
Weather-proof trap and aluminum construction. Complete with 275' of guy line, heavy duty base plate and loading coil. Requires 4 radials (not included).

Height.....43' 5"
Weight.....38 lbs.
Rating.....1 KW
Model V-4-8
\$69.50 net

**"Portable"
3-BAND
Operation**



Rated to 300 Watts

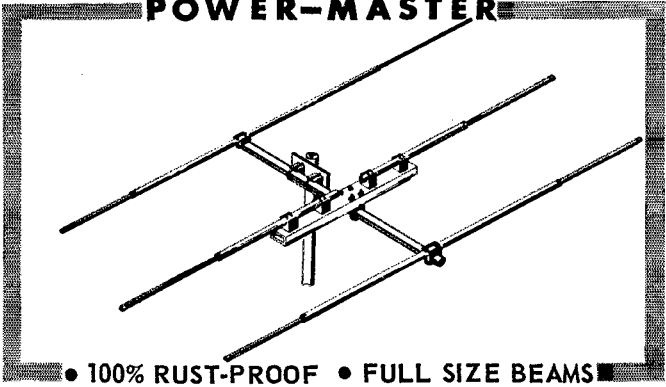
Mosley
Tote-Tenna
for Hams who

- TRAVEL
- Live in APARTMENTS or HOTELS

"Tote-Tenna" is ideal for the Ham who cannot have a permanent installation. Unique design permits quick, easy set-up; just unfold and clamp to window sill. When not in use "Tote-Tenna" folds into a compact package for easy storage. Available with or without carrying case.

"Tote-Tenna" is designed for 10, 15 and 20 M. Low SWR over full bandwidth. Electrical 1/2 wavelength on each band provides excellent performance. Price and Availability to be announced!

POWER-MASTER



• 100% RUST-PROOF • FULL SIZE BEAMS

"Power-Master"... the All New full size beam by Mosley! Packed with a host of new features that will make yours the "Big Signal" on the bands! High efficiency assured with the famous Mosley Match. Rated to 1 KW. Low SWR over full bandwidth.

- Model A-310. 3 Element, 10 Meters.....\$37.50 net
- Model A-315. 3 Element, 15 Meters..... 42.50 net
- Model A-320. 3 Element, 20 Meters..... 77.25 net

Send for free MOSLEY literature describing these and many more Amateur antennas.



8622 St. Charles Rock Road • St. Louis 14, Mo.

AT HAM DISTRIBUTORS-
COAST-TO-COAST

Station Activities

(Continued from page 88)

wallpaper. New AREC member K9DTK received a 4-year scholarship and is going to major in E.E. at Marquette U. K9CEF now is an Army MARS station. A new "Courier" is under construction at MWQ. GAB is up to 32 states, 9 call areas and best DX of 1075 miles on 2 meters. CAS talked himself to a phone WAS. OVE's new Valiant is swingin' the 8 meters on all bands. New officers of the Point Radio Amateur Club include KXXK, pres.; K9GYA, vice-pres.; and BCC, secy.-treas. VEP's XYL, VIK, is the new NCS for the WSSN, along with CBE, SAA and K9GSC. K9CJL received his WIN certificate. K9EOS is DXing with a new beam. Among those selected to attend "Badger Boys State" from all junior high school students of the State were K9AEQ, K9ALP, K9BTT, K9EUG, K9JVV and W9MIN. CCO is due back after a cruise with the Navy in the Far East. How about some more OPS appointments? We have only nine in our section, with 24 ORSS, 6 OOs and 9 OESs. This is your column; please let's have your news and monthly reports no later than the 6th. Traffic: (June) K9ELT 653, W9CXY 667, K9GDF 343, W9RHU 304, SAA 172, DYQ 101, MWQ 74, KQB 57, K9DTK 51, W9YT 39, K9AEG 37, CJL 25, W9VHP 16, GFL 14, SIZ 13, W8RMF/9 9, K9IMX 8, W9VTK 6, K9CEF 4, W9CBE 3, K9GAJ 2, IQO 2, W9RQK 2. (May) W9YT 102.

DAKOTA DIVISION

NORTH DAKOTA—Acting SCM, Arnold L. Oehlsen, W9YCL—A total of 85 amateurs registered at the North Dakota Ham Picnic June 15, an excellent turnout. Your Acting SCM was sorry that Governor's Day activities at Camp Grafton prevented him from arriving at the picnic until most of the gang had departed. Amateurs in the Dickinson Area have organized the Teddy Roosevelt Amateur Radio Club with the following officers: K8IAB, pres.; NAD, vice-pres.; K8HCY, secy.-treas.; ZCM, act. mgr.; and K8APX, pub. chairman. K8COV has earned his 1st-class commercial ticket and his amateur Extra Class ticket. The gang at Bismarck, operating Field Day as ZRT, worked the West Coast and British Columbia on 6 meters. K8CMX received appointment as ORS. K8CMX and K8CNC were mailed C.W. Section Net certificates. Traffic: K8CNC 47, W9YCL 17, K8JLW 12, ADI 9, IAB 2, W8IHM 2, K8CMX 1.

MINNESOTA—SCM, Robert M. Nelson, W8KLG—Asst. SCM: Bob Schoening, #TKX, SEC: TUS. RAs: K8DIA and K8GCN. PAMs: QVR and TCK. Mobile units from both the St. Paul and Minneapolis AREC groups supplied communications for the tornado-damaged areas in and near Colfax, Wis. TUS, present manager of the KMG Net, has been appointed SEC. MSN and MIN held their annual C.W. Net Party at the QTH of RQJ, at which time K8GCN was elected the new manager of MSN. He also has been appointed RMI. RQJ, who has done a nice job as MSN manager the past year, was forced to resign because of a change in working hours. OPX's 12-year-old daughter received her Novice Class license. Her call is KN8QEH. The Mankato Area Radio Club has seven new Novices among its members. K8MJI got his General Class ticket. OJH is back on the air using a Ranger. K8IZD now runs a Globe Scout 680. BBY has a new 20A s.s.b. rig on the air. RNY has only six states to go for WAS on 50 Mc. K8JCF made BPL again. K8GCN has received his BPL medallion. Fifty-three members of the KMG Emergency Net received Public Service Awards from Keep Minnesota Green, Inc. The St. Paul Radio Club held its Annual Banquet at the Northwood Country Club in North St. Paul. Ninety-five delicious steak dinners were served, an interesting program was given, and the newly-elected club officers were installed. They are OYC, pres.; THY, vice-pres.; KJZ, secy.; RHI, treas. Traffic: (June) K8ODV 262, JCF 131, GCN 120, W8KLG 101, K8IZD 80, W8RQJ 54, K8ISV 42, EPT 40, KYK 37, W8OPX 37, FGP 32, QVR 32, KYG 27, OJK 26, BUC 24, OJG 21, PET 21, K8MPG 19, KN8ORK 19, W8UMX 17, WMA 11, ALW 10, K8HJC 10, W8QVQ 8, EMZ 7, K8OBP 7, MII 5, W8LUX 4, K8AEE 2, GKI 2, GQX 1. (May) K8DIA 36.

DELTA DIVISION

ARKANSAS—SCM, Ullmon M. Goings, W5ZZY—SEC: K5CIR, PAM: DYL, RM: SZJ. We are very happy to know that the club in Ft. Smith is being reactivated. The club has a 15-meter net that meets each night at 2100 on 21.375 kc. It was very encouraging to hear so many of the portable 5s during Field Day. YM had 3 DX-100 rigs on, K5INJ had 3 Vikings operating on emergency power. K5PXP, at Russellville, had 2 stations operating on emergency power. The boys at Harrison

(Continued on page 102)

FIELD ENGINEERING with a Future!



Edward K. Doherr, W1EEE, Assistant Manager
Government Services Division

Resourceful field engineer—now Raytheon executive

Ed Doherr's imagination and quick action probably saved the life of the Air Force pilot in the story at right.

Today, as a Raytheon executive, Ed (W1EEE) still keeps in touch with the activities of Raytheon field engineers in remote parts of the world with the help of a potent kw heard almost nightly on the low end of twenty.

Field engineering experience has helped many Raytheon engineers to become executives. As activities are expanded, field engineers have the opportunity to qualify for new key positions.

Requirements: field experience plus an EE degree or the equivalent in practical experience with air or ground radar, missiles, microwave or sonar. Benefits: attractive salary, relocation assistance, insurance, educational programs, etc.

Interviews in most U. S. cities and overseas. Please write G. E. Dodge for details. No obligation.



ZERO PLUS 3

The story of the coat hanger that saved a jet pilot

It happened during an H-bomb test near Eniwetok.

Air Force planes had to be at exact altitudes and distances before shot time. A special radar system permitted personnel of the command ship to identify each aircraft and check its position on the radar scopes.

The shot went off as planned, but when the shock wave hit the ship, it knocked out the special radar antenna high on the mast.

The Raytheon Field Engineer* on board went into action. He quickly fashioned an emergency antenna from a metal coat hanger, climbed the mast,

and taped the antenna in place.

With the system working again, it was discovered that one pilot was flying in the reverse direction—out to sea. An Air Force officer reported that the prompt restoration of the special radar undoubtedly made it possible to save this pilot and his plane.

Raytheon Field Engineers work with the Armed Forces to keep electronic equipment in top operating condition. Their skills are another reason why Raytheon has earned its reputation for "Excellence in Electronics".

**Edward K. Doherr, WIEEE; now Asst. Mgr., Government Services Div.*



Excellence in Electronics

RAYTHEON MANUFACTURING COMPANY
Government Services Division, Waltham 54, Mass.

10% PRICE SLASH!



"I am now using the Gotham V80 vertical antenna with only 55 watts, and I am getting fantastic reports from all over the world". VP1SD

ALL-BAND VERTICAL ANTENNAS

GOTHAM'S sensational new vertical antennas give unsurpassed multi-band performance. Each antenna can be assembled in less than two minutes, and requires no special tools or electronic equipment. In the V160, resonance in the 160, 80, 75, and 40 meter bands is secured through use of the proper portion of the loading coil. Yet, when the coil is eliminated or bypassed, the V160 will operate on 20, 15, 10 and 6 meters! The same idea applies to our V80 and V40 multi-band verticals. No guy wires needed; rugged, occupies little space, proven and tested.

I USE MY GOTHAM ALL BAND VERTICAL ON 6, 10, 15 AND 20

ME TOO, TOM-AND LAST NIGHT I SWITCHED TO 40, 80, AND NO. WORKED SOME REAL DX!



Simple design and superior materials give all-band operation, and effective, omni-directional radiation. Gotham verticals are rugged, with low initial cost and no maintenance. Guaranteed Gotham quality at low Gotham prices. Perfect for the novice with five watts or the expert with a kilowatt.

10% PRICE SLASH!

TAKE 10% WHEN ORDERING

QUALITY MATERIAL

Brand new mill stock aluminum alloy tubing with Aluminite finish for protection against corrosion. Loading coils made by Barker & Williamson.

ALL-BAND OPERATION

Switch from one band to another. Operate anywhere from 6 to 160 meters. Work the DX on whatever band is open.

EASY ASSEMBLY

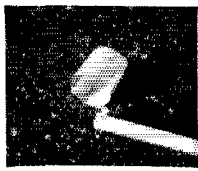
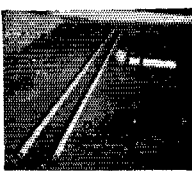
Less than two minutes is all you need to put your vertical together. No special tools or electronic equipment required. Full instructions given.

SIMPLE INSTALLATION

Goes almost anywhere. On the ground, on the roof, or outside your window.

AMAZING PERFORMANCE

Hundreds of reports of exceptional DX operation on both low and high power. You will work wonders with a Gotham vertical.



PROVEN DESIGN

Over a thousand Gotham verticals are on the air—working the world and proving the superiority of Gotham design.

AND THE PRICE IS RIGHT!

"I worked LU3ZS on Half Moon Island in Antarctica on Dec. 26 at 21150 Kc. I was using my Gotham V80 vertical antenna and only 35 watts." KN5GLI

HOW TO ORDER. Send check or money order directly to Gotham or visit your local distributor. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

WORK THE WORLD



Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

- 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

Name.....

Address.....

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

GOTHAM 1805 PURDY AVENUE
MIAMI BEACH 39, FLA.

10% PRICE SLASH!

HI JIM, HEARD YOU WORKING THAT DX STATION. HOW DO YOU DO IT ON THE LOW POWER YOU RUN?



EASY, BILL. I'VE GOT A GOTHAM BEAM. I'M WORKING STATIONS I NEVER HEARD BEFORE. DX IS A LINCIN NOW.



THAT SETTLES IT, JIM. I'M GOING TO GET A GOTHAM BEAM TOO. ARE THEY EASY TO INSTALL AND OPERATE?



VERY EASY, BILL. AND THEY'RE FOOL-PROOF AND TROUBLE-FREE. LICKS YOUR NOISE AND WRM PROBLEM TOO. MY GOTHAM BEAM IS THE BEST INVESTMENT I EVER MADE.



YOU COULD WORK WONDERS IF YOU HAD A GOTHAM BEAM!

PUT AMERICA BACK TO WORK!

10% PRICE SLASH!

TAKE 10% OFF WHEN ORDERING

Study these specifications—compare them—and you too will agree, along with thousands of hams, that GOTHAM beams are of the best!

TYPE OF BEAM. All Gotham beams are of the full half-wave plumber's delight type; i.e., all metal and grounded at the center. No wood, tuning stubs, baluns, coils, or any other devices are used.

MORE DX CONTACTS

GAIN. Gotham beams give the maximum gain obtainable. Our 2-element beams give a power gain of four (equivalent to 6 db.); our 3-element beams give a power gain of seven (8.1 db.); and our 4-element beams give a power gain of nine (9.6 db.)

THOUSANDS IN DAILY USE

MATCHING. Matching of the transmission line to the beam is extremely simple and quick. No electronic equipment or measuring devices are required.

ALCOA QUALITY ALUMINUM

ASSEMBLY AND INSTALLATION. No special tools are required for assembly and installation. Entire job can be done by one man in less than an hour. Full instructions are included with each beam.

CONSISTENT PERFORMANCE

MAST. Any Gotham beam can be mounted on a simple pipe mast. Diameter of the pipe should be between $\frac{3}{4}$ " and $1\frac{1}{2}$ ".

YOU WILL WORK THE WORLD

STANDARD AND DELUXE BEAMS. Standard beams in the 6, 10 and 15 meter bands use $\frac{3}{8}$ " and $\frac{3}{4}$ " tubing elements; the deluxe models for these bands use $\frac{7}{8}$ " and 1". In 20 meter beams, the standard has a single boom, while the deluxe uses twin booms.

TRIBANDER BEAMS

6-10-15 TRIBANDER \$39.95
10-15-20 TRIBANDER 49.95

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.

TWO BANDER BEAMS

6-10 TWO BANDER \$29.95
10-15 TWO BANDER 34.95
10-20 TWO BANDER 36.95
15-20 TWO BANDER 38.95

Each Two Bander has twin 12' booms, and full-size half-wave elements. $\frac{7}{8}$ " and 1" aluminum alloy tubing, all castings and fittings are supplied. Assembly is easy.

Airmail Order Today — We Ship Tomorrow

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6-10 TWO BANDER \$29.95
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2 METER BEAMS
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 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
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(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

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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
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 Beam #R15 (15 Meters, 3-El) 49.95

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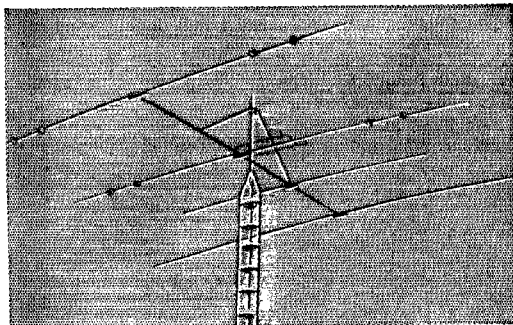
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operated portable using KØDGL/5. The club at Fayetteville is outfitting its emergency communications truck. The club at Pine Bluff has set up a complete course for hams in the making, both code and theory being taught by Jim Brooks. This class is being held at the Boy's Industrial School. KN5RFX is a new ham in Osecola. We hear that WUM finally got that s.s.b. rig on the air. We hear that WUM finally got that s.s.b. rig on the air. KRO has moved his QTM to Cotton Plant. Let us not forget to support the various traffic and emergency nets. K5DNG is active on 3.5- and 7-Mc. c.w. only. FMF is active part time, as his health permits. DRW has the HBR-14 and is on 20-meter s.s.b. BED/5 has a DX-100 and is active on all bands. Traffic: W5DAG 136, CEU 21, WSM 7.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Field Day messages were received from USN/5, K5GRG/5, K5BYA/5, ABD/5, UK/5, DSZ/5, KC/5, DDV/5 and K5ZZ/5. K5KLA lost his antenna in the process of moving and needs help in securing another. MXQ has been trying out a new car. CEZ says he enjoyed the eyeball QSOs with KRX, FMO, MXQ, K5AGJ, GY and #BLL while running around during vacation. EA is doing double duty at the TV and BC station but still finds time to report into LAN, OZK and all MARS nets. K5AGJ has changed his taped transmissions of ARRL Official Bulletins from 1815 CST to 1915 CST nightly on 3615 kc. The Louisiana C.W. Net meets at 1930 CST on the same frequency following the transmission. We are looking for new members in all parts of the State for this net. Join and get your code speed up. K5GPB is helping a few friends to get started. K5MOJ reports that KN5QXV and KN5RAS are new hams in Ville Platte. K5DGI is back home from L.S.U. and operating his mobile gear in the car and at home. K5ARH is getting ready to put a pair of 813s on the air. Your SCM had a pleasant visit from Brother Pat, YN4CB, who has been teaching in Chicago and who spent a few days in New Orleans on his way back to Bluefields, Nicaragua. Holders of all ARRL appointments, please check the expiration dates and forward the certificates to the SCM for reinstatement or endorsement. Mail reports early. Traffic: W5CEZ 224, K5AGJ 98, W5MXQ 79, K5ARH 53, W5EA 6, FMO 6.

MISSISSIPPI—SCM, John Adrian Houston, sr., W5EHH—K5LYC, pres. of the Natchez Amateur Radio Club, reports that 16 members participated in Field Day operating under the call KHB/5. The Jackson Amateur Radio Club operated at Camp Kichapoo on Field Day under the call TAK/5. K5JIE reports the Two Meter Club Inc., of Gulfport used emergency power on Field Day and operated under the call CBW/5 from the club house in Gulfport. The Biloxi Amateur Radio Club has received a charter of incorporation. SPX, UOO and QYX are the incorporators. ISV has been elected treasurer of the club. The Biloxi Club holds classes in code and theory for anyone interested in getting a Novice ticket. Classes are held each Tue. and Thur. from 7 to 9 p.m. at the Methodist Assembly. New members of the Biloxi Club are KN5WOG, KN5PBX, KN5PYW, K5IQI, W6RUJ and W8ZQT. YAA has to give up his appointment as V.H.F. PAM as he will be off to language school and Spain. FPI, NRU and K5BKK are liaison stations from the MMEN to the National Traffic System. Ex-GG now is W6GG. Traffic: W5EPI 136, JHS 52, K5BKK 23, W5NRU 20, K5CFG 10, W5GDW 8, K5GRV 5, HAR 5, AUR 2.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: RRV, PAMs: UOT, PAH, ZZ and VQE, RM: NHT. PD messages were received from Memphis, Oak Ridge, Greeneville, Johnson City, Jackson and Carroll County clubs. 5RCF and K4LLB have 5-kw. emergency power units. PHQ enjoyed a visit to K2USA. UVU is experimenting with transistor transmitters. We were sorry to hear of the illness of PL's wife. Hats off to the regular BPL winners, PL and W5RCF. CXY reports he is working 6 meters mostly but fishing is running it a hard race. From K4KYL's report we seem to be missing a lot of fun on 6 meters. ZZ and K4MYI report in the 6 Meter Net Bulletin of plans for a state-wide traffic net meeting on 50.5 Mc. K4BWB reports on the big Memphis Hamfest with 250 in attendance, including the largest single family—K4JSP, his XYL and five harmonics. Hamfest time is here with Crossville, Chattanooga and Kingsport scheduled for big doings. Traffic: (June) W4PL 799, W5RCF 799, W4VJ 44, K4LLB 43, LTA 38, W4UIO 37, UVL 34, PFP 24, CXY 20, K4LPW 16, W4PAH 10, VQE 9, K4KYL 6, W4TDZ 6, JVM 5, RRV 5, NHT 3, ONO 3. (May) W4PFF 41, K4KYL 9.

GREAT LAKES DIVISION

KENTUCKY—SCM, Albert M. Barnes, W4KKW—SEC: JSH, RM: K4AIB, PAMs: K4ECJ, K4LOA, OGY and SUD. June storms around Northern Kentucky took K4OCN's quad, a long wire and two beams, leaving only a 40-meter groundplane standing. MVX reports the Au-

(Continued on page 106)

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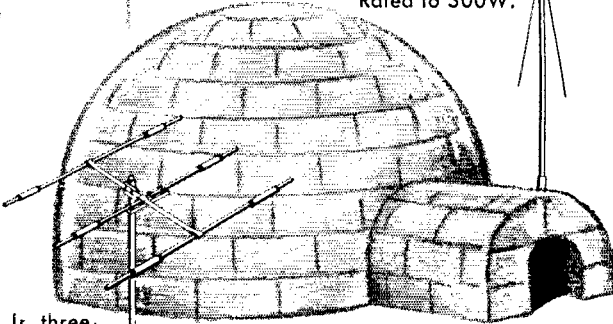
TA-32 Jr. two-element rotary beam antenna. 10-15-20M. Rated to 300W.



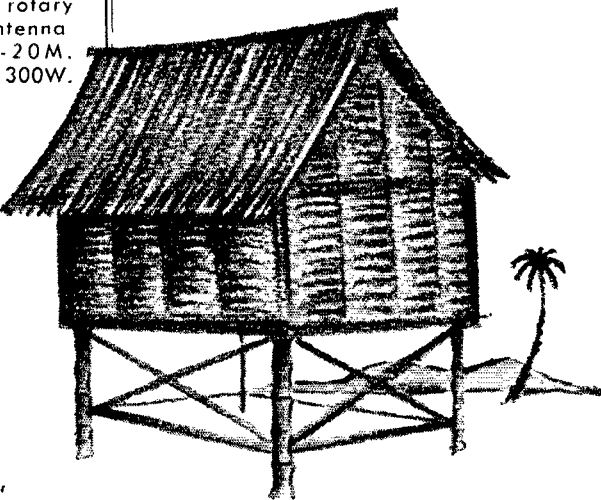
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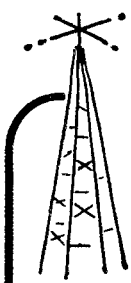
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- ★ Dial calibrated for 6, 2, 1 1/4 and 3/4 meter bands.
- ★ Power available from receiver for future companion 2, 1 1/4 and 3/4 meter converters.
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with RF Gain Control to Reduce Mixer Overloading

- Model XC-50 I.F. Tuning Range 14 to 18 mc
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- Model XC-50-N I.F. " " 30.5 to 34.5 mc
- Model XC-50-C4 (with Dual Crystal Oscillator)
I.F. Tuning Range 28 to 30 mc
- Model XC-40 (Russian Satellite Converter)
RF Input: 40 mc
I.F. Output: 14.4 mc

NEW 1 1/4 METER SERIES

with Low Noise High Gain 417A Tube

Covering input frequency of 220 to 225 mc

- Model TC-220-6 I.F. Tuning Range 49 to 54 mc
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- Model XC-144-N I.F. " " 30.5 to 34.5 mc
- Model XC-144-CE (Special European Converter)
RF Input Range: 144-146 mc
I.F. Tuning Range 28 to 30 mc
- Model XC-144-C4 (with Dual Crystal Oscillator)
I.F. Tuning Range 28 to 30 mc
- Model TC-108 Vanguard RF Input: 108 mc
I.F. Output: 14.4 mc

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- Model PSR-150 available..... price \$49.95
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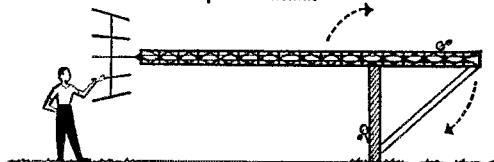
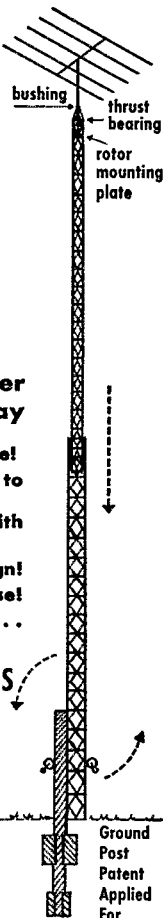
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dubon Amateur Radio Society helped KN4VUD, VTY, VTT and VTZ to get their tickets. The Mammoth Cave Radio Club and MARS had a swell get-together June 1. Field Day was a big success with the Amateur Radio Transmitting Society (ARTS) set-up in Iroquois Field having 20 operators and two transmitters. The KYANNA Club in Shawnee Park had 35 operators and three transmitters. The Blue Grass Amateur Radio Club had rigs on all bands from 15- to 80-meter phone and c.w. using three gas-driven generator supplies. New OPs are K4JOP and K4PNA. New ECs are K4BPX, Winchester, and K4KJQ. Lexington, RM K4AIs reports KYN cleared 170 in 30 sessions on the summer net at 1900 CST with K4KIN, K4KJO, K4LHQ, K4JOP and K4CSH as NCSS. OGY reports KPN cleared 111 in 25 sessions with K4MMW, K4GAG, HNI, K4KHE, K4ICN, K4WBG and SUD as NCSS. Morning KPN held 28 sessions with K4PGH, K4QCW, GTC, K4QHZ and K4MMW as NCSS. The Ky. Six-Meter Net holds sessions every Sun. at 2200 CST on 50.57 Mc. Give K4LOA or K4HTO a call at that time. ZDB visited 9DO in Joliet, Ill., with his XYL, ZDA, CDA and #KJZ. K4BUE and K4GAG send in excellent OC reports. K4PGH is building a 1X-100B. K4CC has a new mobile unit. K4TXI is the call of the Harlan Radio Club. WNII is active on 2 meters. K4SPJ has a Gonset 111 with linear. K4KC put up a new 4Y-Gain tri-bander 55 ft. high. Trailing K4AIS, 172, W4-RKY, 168, K4KIO 81, W4RPF 67, SUD, K4JOP 59, W4ZDB 59, K4MMW 49, W4KKG 42, K4KIN 38, PGH 33, W4GTC 32, K4WBG (K2UTT) 31, CC 28, W4CDA 24, K4CSH 22, W4JSH 19, K4QHZ 18, W4HNI 9, M4X 8, SZB 5, JUL 4, K4HTO 1.

MICHIGAN—SCM, Thomas G. Mitchell, W8RAE—SEC; YAN, RMs: DAP, Fast Net; FWQ, Slow Net; OCC, 3RN Liaison. These new RMs have replaced ELW, ILP and NUT, who have "retired" after serving us so well. Thanks to Seth, Lamp and Clyde and good luck to the new managers. Since I will be away on vacation at the normal report time, I have asked our SEC to supply some remarks relative to the status of our AREC organization after his first six months in office. There are 651 registered AREC members in Michigan. Local emergency nets total 24 with all bands from 160 through 2 meters in use except for 20 and 40 meters. The 10-meter band is the most popular with ten nets, and 6-meters is second with six nets. YAN will forward further information on these upon request. All local nets report that they are tied into long-haul circuits either through QMIN on 3663 kc. or through BR/MEN on 3930 kc. There are 29 current Emergency Coordinators appointed in 33 of the 83 counties in Michigan. Many more EC appointments (county) are open for those amateurs interested in the AREC where such appointments are not filled. The largest AREC unit is Oakland County, where EC YLA reports 240 registrants. The smallest unit is in Crawford-Rosecommons Counties, where there is one registrant, according to EC DXH. Fullest AREC coverage is the proud claim of EC CRH, with every known amateur in Osceola County registered. AREC and RACES continue to exist side by side as they work toward their common goal. Minor difficulties have been ironed out, for the most part, through the good offices of State RACES RO RDN and his staff. The southeastern counties are a RACES stronghold, with WFA the only Area RO reporting. Aside from Area 4, outstate RACES is all but non-existent and RDN would appreciate help of that score. YAN reminds us that ALL amateurs should be registered with the AREC. If you don't know why or how, drop a line to your SEC for a quick reply. Providing emergency communications facilities is one of the basic reasons for our existence and a well-organized AREC is the backbone of readiness. Thanks to YAN for these remarks. He is doing a fine job and can do better with your cooperation. June and July traffic reports will appear in the next issue.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM; J. C. Erickson, 8DAE, SEC; UPB, RM; DAE, PAI; HPP, HUX and HZZ, K9CQA received his Technician Class license. KN8KSN is a new ham in Dover. The Tusco RC held its annual mobile roundup with 13 attending. K8JSZ has a new Valiant. New Knucklehead certificates went to DBF, SLF, NDT, K8s CLX and FOW. HCR made W.A.A.L. KNSIRY has a Glob, Chief 90A. Cuyahoga County AREC furnish communications at the sport car races at Put-in-Buy, with AEU, LHL, LHX, QLB, QXG, TFW, K8s ADQ, DPA, BLX, ETP, GJW, IZF, JHZ and KKO taking part. They had an alert of a possible tornado and their Weather Net went into action with AEU, BAF, BZB, FAG, FTD, INO, ISK, LHX, NLX, NNX, NOX, NZI, OKI, PVC, QLB, QXG, RDP, SZF, TFW, TNL, VMI, ZAH, ZJQ, ZPR, K8s ARG, ABA, BFT, BWH, CCW, CEF, LJC, DOG, DNZ, ETP, GJW and KKO. At the time of the tornado alert the Flag Day Parade went along without a hitch as the mobiles were ready to warn those attending. AEU, AVU, BPE, NZI, PZR, QXG, VFU, WLM and K8AAG helped in the parade's safety. They also joined forces with Summit County amateurs in trying to round up a

(Continued on page 108)

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G33



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

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

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

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

External speaker is available as an optional accessory. 6" by 9" speaker is contained in an attractive cabinet designed to match receiver, and blend with surroundings. Has headphone jack and tone control.



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W7UYK . . . W7AUG . . . W7BDY . . . W7UBA
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CLEVELAND CONVENTION SWEEPSTAKES

Sept. 26-28; Oct. 3-5

All amateurs are invited to enter the Cleveland Convention Sweepstakes, the purpose of which is to provide operating fun and to publicize the convention of October 18.

Objective: To contact Cleveland area (Cuyahoga County, Ohio) hams and exchange point-winning information.

Contest Periods: The week ends of Sept. 26-28 and Oct. 3-5, from 1600 EDT Friday to 2359 EDT Sunday. Operation throughout the 112 hours is permissible.

Contest Classes: *Class A*—All hams outside of Cuyahoga County, Ohio, working those in the county; *Class B*—All Cuyahoga County hams working those outside the county.

Procedure: General Call is "CQ CC." *Log data:* County neighborhood club affiliation, if any; message and a listing of its text number. A station may be worked only once regardless of mobility, band or emission.

Form Message: The following text shall be included in a full ARRL-type radiogram: "Revital-ize amateurwise Cleveland Convention October 18 Number—" The number in the text indicates the number of times you have originated and passed this message. The form message shall be sent only once during the contact, with the option of origination left to the participants of the QSO.

Scoring: One point for basic log entry; one point for club entry; either two points for origination or one point for receiving a form message, but not both.

Sample Contest Log Line:
6/3/58 1851 W8FAT Fred, South Street—Originated 5 (or revd. 11).

Prizes: First place in each contest class gets an expense-paid day at the convention, including transportation, room, meals, and registration. Cleveland area residents will also receive buying power credit at any local radio jobber. Second and third place in each class will merit trophies, and certificates will be issued to runners-up to at least seventh place.

Submission of Contest Entries: Contest logs are available free from W8CTZ or the address below. Logs must show, in addition to "log line," the complete name, address, call, and telephone number of the contestant. They shall be postmarked no later than midnight October 8, and sent to the Contest Chairman, Cleveland Amateurradio Convention, Box 5167, Cleveland 1, Ohio.

wild horse in the rugged countryside. They used mobiles along with walkie-talkies and after driving the horse into a blind canyon made by an old stone quarry, it escaped by going up a bank almost too steep for a human to climb. They were forced to give up the big game hunt. Those who took part were AEU, IZF, JHS, JH7, LFX, QXG, K8s CHE, CXE and DJC. KNSJAS was left a baby boy by the stork, KN8GGX has a new DX-40 rig. IZM has been very ill, JHK was on a three-week vacation, Ohio Valley ARA's *Ether Waves* tells us the KC-4AF QSL cards are in the mail. Only 1PH made the BPL in June. New appointees are IAY and QLJ as ECs, OYL, K8s AJF and HTI as OOs, K8s ETK and CZJ as ORS and GKB as OES. FSM showed slides of his trip to Honduras to the Canton ARC. IBS received a WTO certificate and his father, K8ANX, and WAEP. HXB has a new NC-300. AHR now is mobile. The Greater Cincinnati ARA's *The Mike and Key* informs us of the stag hamfest to be held Sept. 7 at Kolping Grove. On the same day, the Findlay RC will hold its big hamfest. Your SCM plans to attend this one but since the

(Continued on page 110)

J O W E R S

ALL THE WAY IT'S E-Z WAY!

See Page 106

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Tunable VHF CONVERTER

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Radio amateurs designed and built this versatile VHF converter. Specifically designed to extend the range of any communications receiver through the 6, 2 and 1 $\frac{1}{4}$ meter amateur bands.

The VHF 126 is an independent receiver

with its own power supply utilizing the low-frequency IF stages and audio of your present receiver. Simple to install, it requires no circuit modification to select either VHF or standard communication ranges.

Here's Why You get "Top-of-the-Hill" Performance

- Extends effective usefulness of any receiver to 225 megacycles
- Performance equals that of costly astronomy receivers
- Dual Conversion eliminates images
- Dual-speed tuning: 1 to 1, 75 to 1
- Heavy, steel cabinet
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Range: 48.4 to 54.2 MC; 143.4 to 149.2 MC; 219.4 to 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.

Panel Controls: Antenna changeover switch, band selector, tuning control, line switch.

Dimensions: 16 $\frac{1}{2}$ " wide, 10" deep, 10" high.

Weight: 32 pounds.

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Ward J. Hinkle, Owner

GCARA has its on the same date he cannot attend both this year. Why don't representatives from both clubs meet and toss a coin with the loser to change the date? I have heard many say they would like to attend both. Hope all Ohio Field Day participants had good scores in spite of the aurora. The Ohio Slow Speed Net has been in operation for several months and needs more stations who want training in handling messages and those phone men who want to get their code speed back up as well as serve their fellow man. The Ohio Slow Net meets from 6:30 to 7 p.m. EST, Mon. through Sat. on 3580 kc. Get into it; I think you'll like it. Traffic: (June) W8UPH 972, K8BPX 404, W8VTP 125, OPU 100, K8CZJ 75, W8-HXB 71, DAE 65, H8X 63, K8DDG 51, W8VDA 45, A1 34, BEW 34, VGR 26, PBX 21, UHW 16, CCZ 12, LMB 12, K8EJL 11, W8HEJ 11, QCU 9, H2J 8, H2J 7, CSK 6, GQD 6, K8HXF 6, W8WYS 3, STF 2. (May) W8LT 45, QCU 9, JHH 6, MIXO 2.

MUXON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC; W2KGC, RM; W2PHX, PAMs; W2LJG and W2NOC, Section nets; NYS on 3615 kc. at 1900, NYSPTEN on 3925 kc. at 1800, ENY (emerg.) on 145.35 Mc. Fri. at 2100, MHT (Novice) on 3716 kc. Sat. at 1300. Among those reporting to the SCM on Field Day were W2EFU/2, W2GM/2, K2MBU/2, W2SZ/2, K2UTV/2, K2VSR/2, and K2ZMH. New appointment: W2URP as OO. Endorsed: K2BCU as EC. K2HINW will be in California for a year. Winners of the June hidden transmitter hunt in New Rochelle were W2VOH, K2ZAU, KN2TQJ and KN2COI. The Pelham H. S. Club was given a Super Pro along with a QST collection. New officers of the Lakeland H. S. Club include W2AKK as pres. and K2UTV as communications mgr. ARRL Public Service Awards were received by K2MBF, K2OTQ and K2RDI. A new RCC certificate hangs in the shack of K2YZI. New officers of the Schenectady club include W2GRI, pres.; K2QJL, vice-pres.; W2LCB, secy.; K2SPP, treas.; W2GTB, K2AXY and K2DMR, directors. The annual club dinner was held June 2. V.h.f. expert, W2RMA, now is living in Syracuse. K2PRB received honorable mention in a science contest sponsored by the National Science Association. Heard regularly on the NYSPTEN is WA2-ADL, a new long-call General. Congrats are in order to K2UTV, who made his third BPL in June. W2LWI worked North Carolina on 2 meters for a new state. Operating on Overlook Mountain during the June V.H.F. Party were K2UKE, K2LIN, K2CVG, K2KOO, K2KOP, W2LWI and KN2ROE. All appointees are urged to check certificate dates and send them in for endorsement. Traffic: (June) K2UTV 196, W2PHX 147, K2YTD 92, W2-EFU 73, K2VTW 72, K2YZI 58, K2LKI 34, K2VCZ 23, K2ZAU 21, K2QJL 19, W2FVP 7, K2YTK 5, K2PRB 4, W2AKK 1. (May) K2HPQ 195, K2VTW 160, K2YZI 30.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannels, W2TUR—SEC; W2ADO, RM; W2-WFL, PAM; W2OBW, V.H.F. PAM; K2EQH, Section Nets; NLI, 3630 kc. nightly at 1930 EDT and Sat. and Sun. at 1915 EDT. NYC-LIPN, 3908 kc. Mon through Sat. at 1730 EDT. V.H.F. Traffic Net, 145.8 Mc. M-W-F at 2000 EDT. Our traffic nets continue their pace with the NYC-LIPN group averaging 30 stations per meeting. W2KEB and K2PHF earned the section's only BPL cards. WA2AHM became the first new call to report traffic. K2QBW now sports a CP-35 certificate. W2JGV is spending the summer in Pennsylvania. Ditto K2DEM/3 as a radio counselor at a summer camp. The NYC-LI boys are well represented at the Cornell U. RC with K2OGG, pres.; K2ADY, vice-pres. and WN2BF, secy. W2NNK and K2RAR copied the Armed Forces Day message while your SCM monitored NSS to no avail, missing the message for the first time in ten years. A new 20-meter beam has been installed at W2DSC. W2-JBQ and W2FBA teamed up for FD again. K2LVS is using a DX-35. W2IVA operated from K4WAR while spending his ROTC duty there. Your SCM made 200 local 10-meter mobile-to-mobile contacts in 14 months. A new call in Oceanside is WA2ANP. Ex-W2BPV now signs WIPZ from Washington. Congratulations to W2-QBS, also signing W3BRG, who recently was married in

(Continued on page 112)

J O W E R S

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See Page 106

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

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

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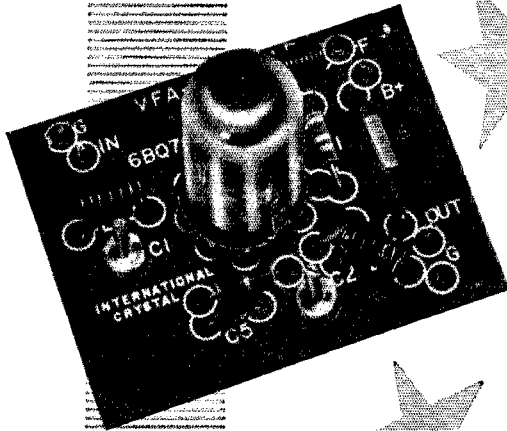


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For 2 Meters and 6 Meters, using the 6BQ7A in a low noise circuit. Designed to mount in a standard 3" x 4" x 5" minibox.

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

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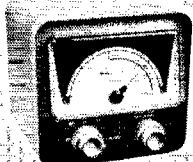
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On Both 6 & 2 Meters:
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52-72 ohm coaxial output matches; all beams and most doublets. Variable antenna loading control. Regulated screen supply. Four stage RF Section, all metered, allows straight through operation. Harmonic and TV Suppression. Reserve power for accessory operation from two sockets. Provisions for antenna changeover relay. Suitable for mobile use; provisions for plug-in power supply. New duo-band final tank circuit, eliminates switching and increases efficiency.

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Especially designed for driving the Hi-Bander, and similar transmitters for 6 & 2M. King size 7" tuning scale. Perfect zero beat with exclusive bandspread control. Built-in well-filtered power supply with voltage regulation. Completely temperature compensated. Calibrate switch for zero beating signal frequency without tuning on Xmitter. Approx. 50V RF output. Plugs directly into Xmit. socket. 100% tuning stability. Percentage drift: .003% on 6M, .008% on 2M.

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A peak limiting audio pre-amplifier. Ideal for use with the Hi-Bander. Band pass and filters speech frequencies at pre-set amplitudes. Response: 300-2500 cycles. Harmonic suppression helps reduce distortion. Increases modulation intensity without increasing transmitted power. Plugs directly into Hi-Bander. Aux. equipment socket for operation of VFO 6-2.

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W3-Land, W2IU and his XYI, W2SRM, are mobilizing on 75 meters with a 5-watter, K2DQD operated from FP8-Land and VEI and VO4 during his vacation. K2IRS has joined the Army ALRS group. KN2OGA is a new call in Northport, W2HAR added three-element Tri-Band beam to his station. W2NEF mobilized to Las-Vegas, Nev. for his vacation. The FCC commended W2OQI for his work in locating transformer interference in Patchogue, K2JTW is installing a mobile rig for 40 and 75 meters. K2JQR has an AT-1 and an 8-76 on the air. The group at the South Side Senior HSRC, K2-LAK, has now worked 39 states and 30 countries on 14 Mc. In two months K2UYG worked 40 states, WAC and 22 countries on 20-meter c.w. K2VUI added an LA-1 amplifier to his station and now has WA and WAS. W3RA-2, a newcomer to the section, is on the air with a DX-35 and an XC-98. W3NWK moved to Arizona. WA2HAM, ex-K4RME, will ask anyone on 40 meters for the WPX Award. K2TSE is heading for Cornell U. For the second year in a row, K2UEI and K2VMY won first prize in the physics group exhibit, Queens Science Fair. New officers of the Nassau RC are: W2VL, pres.; K2EP, vice-pres. and W2NYN, secy. K2DDC operated portable from the Columbia U. Engineering Summer School at Lakeside, Conn. The Linorad RC, K2YRM, reports for the first time with the following officers: W2FEY, pres.; W2N2GU, vice-pres.; W2RQJ, secy. and W2FUG, treas. The club works all bands with an NC-300 and Viking II. K2VMY soon will be heard from Arizona. A 6-meter walkie-talkie aboard K2ISG's boat helped summon aid via K2VIX when the boat's propeller shaft broke. K2ACD has now confirmed 45 of 46 states worked on 50 Mc. K2UJT now signs W3MKG. Your SCM mobilized to Florida for a visit with OM, W2GG/4, Traffic; (June) W2KEB 2916, K2PFF 506, W2VZ 406, K2QBW 219, W2JGV 116, K2SFF 57, K2DFM 39, W2KVF 38, K2HAR 29, W2EW 22, W2UG 22, W2DSC 20, W2EC 16, W2VYN 15, W2BQ 14, WA2AHM 13, K2DDC 13, K2LDG 13, K2TSE 11, K2AAW 8, K2KRJ 8, K2KYL 8, K2RDP 8, KN2DKR 7, K2LAS 7, W2NNK 7, K2GB 6, W2N2YF 6, W2PF 5, K2MEM 5, K2VU 5, W2RA 5, W2TUK 4, W2OBW 3, K2DQD 2, K2EQH 2, W2HU 2, K2ABA 1, K2IFZ 1, K2IRS 1, K2MYS 1, KN2OWD 1, W2TNP 1, KN2UAG 1. (May) W2DSC 228, K2VU 74, W2CKQ 53, W2GP 3.

NORTHERN NEW JERSEY—SCM, Lloyd H. Mannon, W2VQR—SEC; W2IIN, PAM; W2VDE, V.H.F. PAM; K2KVR, RMS; W2BRC, W2NKD and W2CGG, W2IUC operated for the Nite Owl Net group during Field Day. Net control stations for the NJ Six-Meter Net during June were: K2AAK, W2VNI, W2LXN, W2MDS and W2IZV. A total of 121 stations checked into the net during that period. W2BVE made RPL this month. W2CVW is active in both RACES and NJN. W2BGB received the TCRA club award for the highest individual c.w. score in the SS Contest. K2PIM has received a WAC certificate. K2MIF is headed for the Armed Services come September. W2OQH has completed WAC. K2VNL has added a final to the 6-meter rig. W2BVE is a new ORS. W2BRC is spending his vacation in the Adirondacks. New officers elected by members of the Amateur Radio Society of Harrison are: K2JCF, pres.; K2OZW, vice-pres.; KN2DQY, secy.; K2KEZ, treas.; K2SKK, gen. mgr.; K2CUB, dir. The ARSH held its first annual dinner and dance May 25. An excellent time was had by all and some real fine prizes were awarded. KN2JTF and KN2TIM are new technicians in the section. K2POD and K2ZON have made General Class. K2HRE is a new Technician Class station. Other directors of the ARSH are W2MMP, W2OKO and W2GCV. W2PSU reports an unidentified station on 10 meters is interfering with normal operations. Let's track him down. KN2SNG is the new call of Dave Davis, age 10. K2HHT is a new Technician Class licensee. K2ZSQ is now General Class. The Railway High School RC, K2MYX, held Field Day on the Madison school grounds. The project was led by K2QNI. KN2TXE is a new Novice Class station. K2GBP was home on leave. The NJN held 29 sessions during June with attendance up to 388 and traffic 256. Good going for the summer season. Section Net certificates were issued to W2CVW, W2BVE and K2VAB during June. The GSARA has polished up the *Slope* and now has a real commercial printing job. W2BDS was a recent speaker at the GSARA. W2VJH is honeymooning in Europe. W2QCP is on his summer stand in Seaside Heights. KN2AIWE is a new Novice Class licensee. Traffic: W2-BVE 271, W2RXL 85, K2AAE 80, W2MILY 52, W2DRY 44, W2RRC 36, K2VAB 35, K2JYI 27, W2RZO 22, W2-CVW 20, K2VNL 10, W2EBG 9, W2KFR 9, W2CJX 4, K2JTU 4, K2ALF 4, K2YBC 4, W2NTY 3, W2PSU 3, W2EWZ 2, K2SBT 2, W2GVT 1.

MIDWESTERN DIVISION

IOWA—Russell B. Marquis, W8BDR—The amateurs of Southwest Iowa furnished communications for the Red Cross and other service organizations at Exira and
(Continued on page 114)



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This is no common "signal slicer" but a completely new rear end that connects in minutes to any receiver having an IF from 450 KC to 500 KC. No fancy wiring required, as the HC-10 has its own power supply and audio output system, and has no effect on the normal operation of the receiver.

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It is a veritable "box of tricks," providing 7 degrees of selectivity, making possible selection of 1, 2, or 3 KC bandwidth in either upper or lower sideband position. Or, in the BOTH sideband position, the bandwidths double to 2, 4, or 6 KC selectivity. A 500-cycle bandwidth position is provided for optimum CW performance — we thought of everything!

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Separate diode AM detector, noise limiter, squelch and a product detector team up to provide optimum performance on all types of emission. A vernier pass-band tuning control with plus/minus 3 KC range makes zeroing in on sideband easy as pie. And to put the real trimmings on — an adjustable BFO with a plus/minus 2 KC range along with an adjustable AVC decay time add up to just about everything! An input signal voltage range of .005 to 2 volts produces a 6 db change in output proving our boasts about the excellent AVC characteristics of this little honey.

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Thanks for reading . . .

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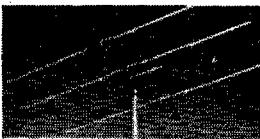
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Carefully engineered, incorporating the latest design principles for top performance, the hy-gain monobanders are factory pre-tuned and pre-matched. Complete with easy-to-follow instructions for assembly, these beams sold with 1 year guarantee. Features include large diameter elements and ruggedly built Boom/Mast clamps. Booms hot dipped galvanized steel for max. strength with minimum wind resistance. Elements 6061T6 alloy. Extremely simple to put up and into operation.

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Audoben after a severe flash flood. A fixed station had to be set up in Audoben for use as net control. The Des Moines Club furnished communications during a flood there. About 125 persons attended the 160-meter Net Picnic at Clear Lake. NWX, Midwest Division Director, and BDR were present. K8CYF received a 30-w.p.m. Code Proficiency certificate. QVA renewed his RM and ORS appointments. LGG renewed her RM appointment. UTD renewed as ORS and K8EXN as EC. SCA reports that the Waterloo Club is going to revamp its c.d. equipment. KN8GKF, QKI, PTO and QDH are new Novices in Ames. A novice net is being started in Story County on 3708 kc. W6ELQ and his XYL from San Diego visited BDR. LGG and EFL have a new Johnson KW final. VRB is now using a vertical antenna. Eleven Field Day groups reported activity in the '58 FD. Both the managers of TLGN and the 75-Meter Phone Net report activity is holding up well during the summer season. Traffic: (June) W8SCA 1278, BDR 958, LCX 770, LGG 715, PZO 579, K8CLS 515, W8CZ 374, QVA 98, K8BLJ 74, APS 61, W8GXQ 61, BLH 49, K8KUC/Ø 43, W8NTB 36, NGS 33, VWF 33, SLC 30, LJW 28, NYX 21, K8DPT 16, HBD 14, W8PTL 13, GQ 12, JDV 12, MEL 11, FMZ 10, K8GHH 9, AVZ 8, IHC 8, W8UTD 6, K8EXN 5, W8Y1 5, C0D 4, K8GBD 4, W8HNE 3, W8BTR 2, CGL 2, K8IGU 2. (May) W8GXQ 347, K8CYF 66, W8BLH 14, GQ 7.

MISSOURI—SCM, James W. Hoover, W8GEP—Net reports: MEN, 13 sessions; QNI 485, QTC 131; NCS, OHC-4, VPQ-4, DWX-3, OMM-1, OVV-1, MON, 50 sessions; QNI 214, QTC 173; NCS, OUD-41, GBJ-8, RTW-2, KIK-1, OUD has been trying to work his brother in Hawaii without success, but GBJ has been able to help out with relaying. K8DLS has a DX-100 and an 41Q-140X. K8LGZ has dropped the "N" and is now enjoying some phone work. K8DZD has moved from Dixon to Waynesville. K8JPJ has just graduated from the Novice Class and has added a new WRL 755 v.f.o. K8DEX is back in Springfield. A record Field Day turnout in Missouri is indicated from messages received by the SCM and SEC. K8AXU, Northwest St. Louis Amateur Radio Club, worked 85 stations on 6 meters during FD with the aid of a band opening. The St. Louis Amateur Radio Club has moved into new quarters at Buder Park. The club call is K8LIR, IFC, K8HZW and K8ABK, from St. Louis, attended the North Missouri ARC Hamfest in Moberly. JNK spent a three-week vacation in Florida operating mobile and portable on all bands including 6 meters. The following paragraph is taken from a letter to the editor of the *Heart of America Radio Club News*. "Did you ever wonder what makes an organization click? Watch one that is really going places sometime and notice what is happening. The critical eye will show an active *Group Effort*—where everyone is participating." Make your organization click by being a worker. Traffic: (June) W8CPI 988, GAR 506, GBJ 163, OUD 96, KIK 91, VPQ 70, OVV 66, RTW 49, K8LNQ 45, W8VZB 32, VJD 31, K8LWX 30, KN8ONK 26, W8BUL 21, K8DLS 21, LGZ 20, W8VLE 8, EPI 8, CKQ 6, GEP 6, K8JPJ 2. (May) W8VZB 69, EEE 38.

NEBRASKA—SCM, Charles E. McNeel, W8EXP—The Nebraska 75-Meter Phone Net reports for June QNI 409 and QTC 44 with poor conditions on 3983 kc. at 1230. The Nebraska SS Net, which discontinued operation on June 8 to return on Sept. 1, reported for 8 days of June QNI 51 and QTC 23. The Nebraska Morning Net on 3980 kc. daily at 0730 reports QNI 515 and QTC 152 with 35 members on roll call. The Nebraska nets are planning a summer picnic with time and place to be announced, so watch for dates. The Western Nebraska Net reports QNI 546 and QTC 88 for June. The Fremont boys had a very successful Field Day with 1708 contacts. Other Field Day reports are Hastings with 3 transmitters and 6 operators at Crystal Lake. Grand Island with operators on 80, 40 and 20 meters and Crete with 4 operators on at the Airport. Other reports failed to reach us in time for this writing but the Nebraska section was well represented. About 40 Nebraska and Colorado hams gathered at the Elk Horn Lodge in Estes Park on June 21 for a very nice week end. Traffic: W8MAO 104, K8BDF 92, DGW 78, W8NLK 53, K8LW 51, W8JF 51, P.T. 50, ZWG 30, K8KCA 36, DFO 31, W8EGQ 22, LXS 21, K8HKI 16, BRQ 15, W8OCU 15, SPK 14, ZOU 13, VFA 11, K8ELQ 10, W8OKO 8, PDJ 8, URC 6, BOQ 5, HOP 4, KDW 4, UOV 4, K8LXK 3, W8SWG 3, WZR 3, QKR 2, VZJ 2.

NEW ENGLAND DIVISION

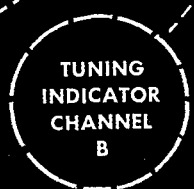
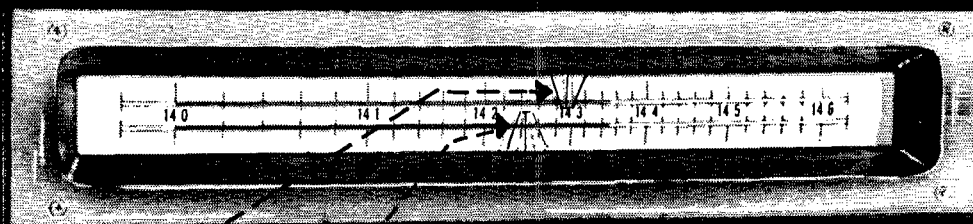
CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—SEC: EOR, RM: KYQ, I.F.F. PAAL: YBIL, V.H.F. PAM: FTP, Traffic Nets: CPN, Mon.-Sat. at 1800, Sun. at 1000 on 3880 kc.; CN, Mon, Sat, 1800 and 2130 on 3640 kc.; CVN, Mon, Wed, and Fri, 2030 on 145.98 mc.; CTN, Sun, 0900 on 3640 kc. KIAQB and EFW made BPL. Shortly after you read this we will start a monthly bulletin covering all phases of ham radio in Connecticut. If interested in more information and a free copy, send me

(Continued on page 116)

BECAUSE IT'S SO REVOLUTIONARY

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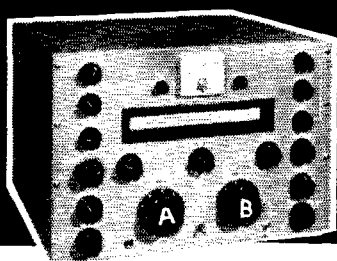
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TA TB
RB TB



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- Operates on 10, 11, 15, 20, 40 and 80 meter bands.
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Power Supply #P35
\$139⁵⁰

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- 2.** Set tune selector switch to RB TA. Tune channel B to foreign DXing station. Tune channel A to any desired frequency inside the American ham band. You are now set to transmit inside ham band and receive DXing stations outside the ham band.
- 3.** Set tune selector switch to RA TB. The same tuning procedure applies as to Mode 2 except channel A and channel B are now reversed.
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Sidebander DSB-100

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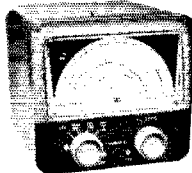
VOX

Designed for the DSB-100, the Globe VOX plugs into socket at rear of Xmtr. Extra contacts for aux. circuits. W/T: \$24.95 Kit: \$19.95

QT-10

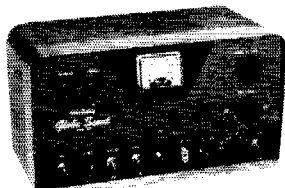
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a card or radiogram. KNIDDY has dropped the "N." KYQ reports CN handled 384 messages during 25 sessions, including 95 on the second session, with an average daily attendance of 13 stations. High QNI goes to AW and GVK. KICKZ has a new 9-meter Communicator III. KIDLAM's brother acquired KNHQA. Another brother combination, KIBHM and KNIHW, has a new Globe Scout 680. FHP advises CVN handled 22 messages during 13 sessions. Average attendance was 9 stations. WHL and his XYI attended the Graveyard Net Picnic in Lynchburg, Va. A Communicator III and a turn-tilde provide UED with some pleasant 2-meter mobiling. The CQRC of Torrington provided communications for the Soap Box Derby July 4. ECHI pulled a "first" by getting "Worked all Conn." on both c.w. and phone. WEL reports the 6-meter net handled 34 messages during June with an average of 15 stations per session. QRP now has 184 countries confirmed. XOL had transmitter trouble during the V.I.F.E. Party. BDI is mobile with a new 2 meter "bulb." AIWB was active during the V.I.F.E. Contest and Field Day. YBL reports CPN handled 205 messages during 28 sessions with an average daily attendance of 26. High QNI goes to DHP/AIDB, 28; DAV, TVU and YBH, 25; FHP and VQH, 24. MIB operated on 2 meters during Field Day. EOR is State Radio Officer. ORR's XYI is KNHVO. KIACC and KIDEB are new on CPN. KIBMI is a new OPS. Appointments renewed: AAY, BEH, FEA, MQT, RWS and WPR as ORS; EKJ and HDQ as ECs; VW as OO and OPS; HDQ as OES. Reports received: SEC from EOR; OES from KIBML, KIBMI, KICKZ, FVV, HQM, KIK and VWP; OO from AIWB, Traffic: (June) KIAQ 545, EPW 501, YBII 287, KIBEN 232, WIKYQ 232, AW 230, TYQ 96, FHP 82, GVK 68, KIBEB 58, WIQJM 57, PFF 54, KIK 44, RAN 44, MIB 40, AIWB 33, CU H 31, LV 30, BDI 29, HAT 25, VYI 25, REF 24, KIACC 18, WIAMI 15, AVS 14, KIAQE 11, WIOBR 11, GHX 9, KIBFJ 7, DDF 7, BMJ 6, WIGVJ 6, ECH 4, HQM 4. (May) WICUH 45, HAT 14.

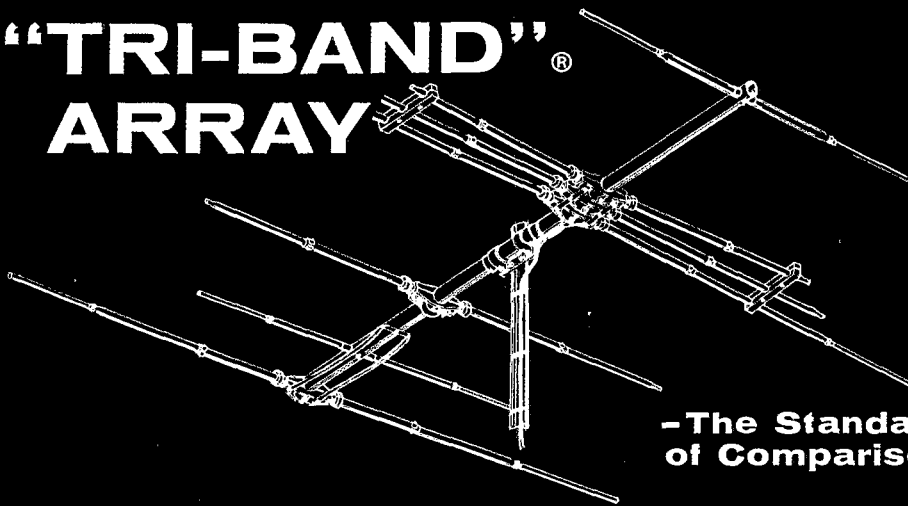
MAINE—SCM, John Fearon, WILKP—SEC: QJA, PAM; VYA, V.I.F.E. PAM; JAIN, RM; EFR, New appointments: LXA and QJA as OPS; VYA and YVW as OBS; KIBWB as EC. Renewals: WHI as ORS. An SGN certificate was awarded to KIBAY and a PTN certificate to KIBXL. Sorry to report that EOP is a surgical patient at the Charlotte County Hospital at St. Stephens. N. B. JAS and his XYI had a pleasant vacation in Ontario. NUT has a 500-watt rig ready to go on 2-meter c.w. KNHKK, HOH and HOI are new Novices in Biddeford, W6AAQ/1 is now in Malta using the call ZB1AAQ. KAS has a new must up and is trying out an NC-300. AHE is working portable at Laurelville using a 6146 on 2 meters. IZS entertained KIBAY, BAZ, AOQ, BQJ, WJRM and their XYIs at his home June 25. KIH8Z is a new ham in Princeton. KIALJ is operating portable at K'Port. BPM has WAS for 10 meters. KLAND, DPM, DWO and GUK have dropped the "N." KIBAY has been lost to many hams at his camp on Pequaket Lake. Ex-WIAGO is now KIDNN in Veysey. The Augusta Club had an excellent luncheon June 15. KIDPM is a new ham in S. Portland. KNHTE is working portable in Skowhegan. HYH and SRQ are back on 75-meter phone and 80-meter c.w. again. OTM has returned to 75-meter phone with both a.m. and s.s.b. UOT has WAC and is working for WAS on 15 meters. FKII is active on 80- and 40-meter c.w. RZX is working portable at Old Saybrook, Conn. QLU has moved to Dayton, Ohio. The Scarborough hams were very active during their tri-centennial celebration, July 4-13. CRP got WAS, I had the pleasure of meeting with the Kittery C.D. group recently at the QTH of WHI, KEZ, MXT, UAW and OTR have Viking Valiants. Traffic: (June) WILKP 179, GPY 90, UDF 42, KIAQ 40, WICEV 28, FVE 23, FV 22, OTO 15, HYD 13, IHN 13, IZK 11, VYA 10, KIBFX 9, BXT 1 9, WIBX 8, KIBAY 7, WILWO 4. (May) WHIH 182.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointments: YWB Norfolk, NJP No. Easton as ECs; NJL as ORS/OPS. Appointments endorsed: BGW and HZ as OOs; UKO as OPS. KNHIC is new in Hyde Park. BZO has a Ranger and a DX-100. Net certificates have been issued to members in this section who are active in our Mass. Phone Net. Heard on 75 meters: SJJ and 3GHY/1 Burlington. A meeting of the Area ROs was held at Natick with Steve KIGFR, BL, EVZ, RO, VYI, AYN and ALP. KNIGRP is on 2 and 80 meters. KICPW is on 6 meters. ZOP was in the hospital. The Framingham C.D. group helped out in the V.E.W. Parade on 2 meters. Heard on 2 meters: KRG, KIBAF and KNIEEG. KIAFF is on all bands. Most of the clubs were out on Field Day but conditions were not so good. HIL is working on a v.f.o. for 2 and 6 meters. The Chelmsford C.D. and Radio Assn. covered the Lowell Motor Boat Races. GJA and QPU are handling traffic. JSM rebuilt the 28-element 2-meter beam and put up a 55-ft. crank-up tower. FJJ has mobile on

(Continued on page 118)

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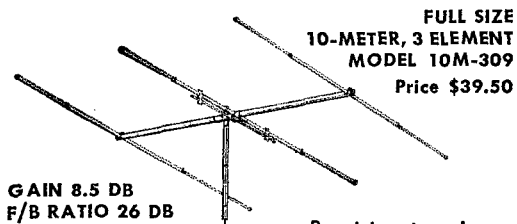
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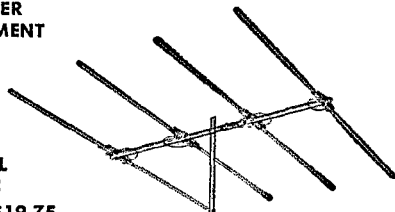


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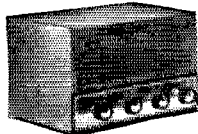
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2 and 10 meters. GHZ has an 813 rig and a new SX-101 on the way. NJL is active in nets. MIX is at a camp on Cape Cod as a counselor for the summer. NF needs two more QSLs for DXCC. He is going to N.Y.C. with a Gonet and work with it from a hotel window. ETH is working DX on 15-meter c.w. YPH has a Worked All Connecticut certificate. The QRA held its annual banquet. LGO will be at Alton Bay, N. H., all summer. The Braintree Club held a meeting. The Framingham Club held a banquet and went up to Mt. Wachusett for the V.H.F. QSO Party on 2 and 6 meters with FRR K1s BTF, BYS, AIU, BTP, KN1s GSO and GYH. 1WK was on FD in Hopkinton. The Shoreline ARA went up to Hogback Mt. on FD. The Fall River Club went to Freeport on FD. The No. Shore Club was at Middletown on FD. HIC will be on 6 meters from New London, N. H., during the summer. FVD went to Ohio for a trip. AUJ/6 is living in Chula Vista, Calif. Traffic: (June) WIAWA 448, FJJ 215, GHZ 160, QPU 139, EAE 126, NJL 125, EUT 122, KIDGI 106, BUF 90, WIEUT 88, (KO 53, EPE 30, AUQ 22, RCQ 22, KIBYL 20, WIMIX 18, TY 14, UE 14, ATX 12, KICMS 11, WILBE 6, SMO 6, WU 5, NOS 4, AKN 1. (May) WIGHZ 104, CZW 38, RCQ 32, TY 27, AOG 21 NF 6, GEK 2, ETH 1.

WESTERN MASSACHUSETTS—SCM, Osborne R. McKeaghan, W1HRV—RM: BVR, PAM: MNG. The West Mass. C.W. Net meets on 3560 kc. at 1900 EDST Mon. through Sat. The Mass. Phone Net meets on 3870 kc. at 1800 EDST the same days. BYH has been endorsed as OPS and AGM as EC. Field Day saw much activity in the section but poor band conditions were reported. The Hampden County Assn. on Wilbraham Mountain had 50 members turn out to operate 12 transmitters. The Pioneer Valley Club on Montgomery Mountain had 35 members around to operate 11 rigs. Your SCM was vacationing in the South this year at Field Day time and missed out on the section activity. KGJ, DZY and DGL, all of Fitchburg, went on their annual Field Day expedition to a mountain in Vermont where they had 2 rigs operating 80 through 6 meters. DGA reports working his 33rd state on 6 meters. BYH, of Fitchburg, is working as a station engineer at WREB in Holyoke. The Hampden County Assn. will hold several hidden transmitters hunts during the summer in place of monthly meetings. This is a swell idea to keep up interest in the club. JJO won a 20-meter beam at the Concord Hamfest, West. Mass. was well represented at the hamfest, we hear. HRV regrets a lack of 10-meter mobile contacts while on a trip through the southern states caused by no v.f.o. That situation will have to be remedied before the next trip. Would like to call the attention of the West Mass. League members to the fact that the current term of the SCM expires in November. Because of the pressure of other activities, HRV regrets that he will be unable to seek reelection. Traffic: (June) W1UEQ 557, LDE 168, BYR 87, DGA 47, OSK 40, KGJ 20, GDL 19, AGM 9. (May) WIDZY 15, DGA 8.

NEW HAMPSHIRE—SCM, John A. Knapp, W1AJ —SEC: BXU, RMs: CRW and COC. PAM: CDX. V.H.F. PAM: TA. The GSPN meets at 1900 Mon. through Fri. and at 0900 Sun. on 3842 kc.; the NHN traffic net nightly at 1900 on 3685 kc.; the N. H. State RACES Net (BXU NCS) 0800 Sun. on 3993 kc. The Concord Brasspounders, OC, enjoyed the Annual FD set up on Oak Hill, Loudon. "Walk-in" type trucks for operating positions were much in evidence. K1BCS and family attended International Field Day in Burlington, Vt. TNO reports that there are approximately 40 N. H. stations being heard regularly on 6 meters. MEL is building a new modulator for his AT-1. He reports good results on 2 meters using a 4-watt transceiver. West Lebanon's new Twin State Radio Club, K1HGS, uses a Lyco exciter to an 813, with 811 modulators, running about 200 watts. The officers of this club are RFP, pres.; VEG, vice-pres.; KFD, secy.-treas.; FN, act. mgr. NHN certificates go to MTX, HKA, K1BOO and K1BCS. CDX is a new OBS. Endorsements: YHI as OBS and OPS. Traffic: (June) K1BCS 176, W1QGU 74, JFJ 72, HKA 34, EVN 21.

(Continued on page 120)

J O W E R S

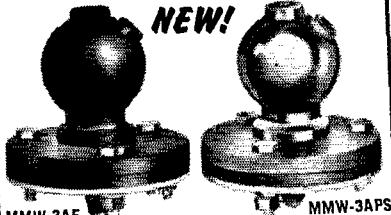
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See Page 106

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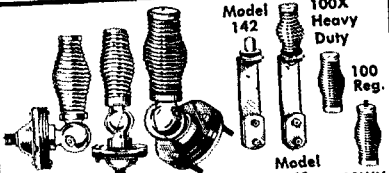
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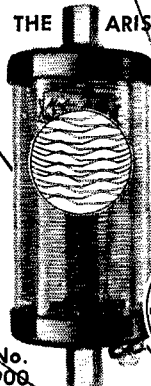


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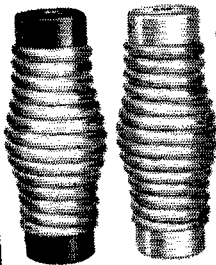
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NEW! from Master Mobile

NEW HEAVY DUTY MOBILE SPRINGS

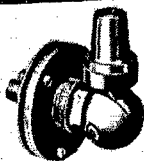


MMW-7 MMW-7SS

PROTECTS YOUR MOBILE ANTENNA

Heavy duty flexible spring mounts on the base and holds the antenna. Special flexible "give" spring prevents sharp impacts and breakage. Lockwashers included.

MMW-7 Cad. plated, black painted ends \$4.50
 MMW-7HC Heavy Cad. plated—Extra Protection \$5.50
 MMW-7SS Deluxe Stain. Steel..... \$8.95



No. 321 BODY MOUNT
 Swivel base body mount, less spring. Specially constructed diagonal ball joint for maximum strength. Amateur Net **\$7.95**

NEW! SLIM-JIM ALL-BAND BASE LOADING ANTENNA COIL

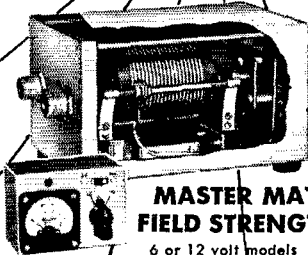
FOR 10 11 12 15 20 40 80 METERS



FOR 96" WHIP
 SIZE 1 3/8" x 19"

NO. 8-1080

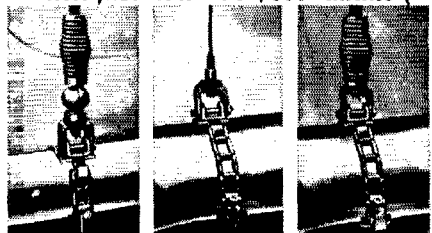
Positive action, just slide whip in or out to loading point and lock nut into position. **\$1795**



Automatically tunes the entire band from the driver's seat!

MASTER MATCHER & FIELD STRENGTH METER
 6 or 12 volt models **\$24.95**

BUMPER MOUNTS WITH NEW X-HEAVY DUTY CHAINS



No.444 \$17.80 No.445 \$7.95 No.446 \$13.45

EMERGENCY • COMMERCIAL • AMATEURS



Master Mobile Mounts, Inc.

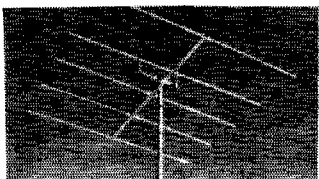
1306 BOND STREET • LOS ANGELES 15, CALIF.

AT LEADING RADIO JOBBERS EVERYWHERE

VHF Antennas

FOR 1 1/4, 2 & 6M

from **hy-gain**



**6 METER
5 ELEMENT
\$15.95**

6 METER, 8 ELEMENT BEAM: \$26.95

The hy-gain 6-meter beams are adjustable for max. gain over the entire band, from our instructions. No further tuning necessary. Calibration Chart supplied with each instruction manual. Factory preassembled, these beams feature heavy wall 3/8" aluminum elements of 6061T6 alloy and 1 1/4" diameter aluminum booms. May be stacked for additional gain. Stacking Bars available at \$3.95 extra.



New, precalibrated (GAM-MAXIAL) Gamma Match assembly

with coaxially formed reactance cancelling capacitor built in, makes possible for the first time a perfect 1:1 SWR. Coax connector for 52 ohm feed incl. Developed exclusively by hy-gain for use in the hy-gain single-band beams.



**2 METER
5 ELEMENT
\$6.95**

**1 1/4 METER, 10 ELEMENT BEAM: \$9.95
2 METER, 10 ELEMENT BEAM: \$10.95**

The hy-gain 1 1/4 & 2 Meter Beams are factory pre-assembled; elements snap into position for immediate use. Features 3/8" aluminum elements of 6061T6 alloy & 1" diameter aluminum booms. Easy to put up and into operation, these beams may be stacked for additional gain. Stacking bars available at \$3.95 extra.



The 1 1/4 & 2 meter beams incorporate the Folded Ratio Dipole with nominal impedance of 450 ohms. A 1:1 SWR with 450 ohm open wire transmission lines for max. efficiency at VHF frequencies may be realized.

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K1BOO 20, W1ENM 13, A1J 11, CUE 3. (May) K1C1F 18, W1MEL 5.

RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ, PAMs: KCS and YRC. RM's: BBN and BTV. The CRA held its annual election on June 5. New officers are POP, pres.; CMH, vice-pres.; KNIEBM, secy.; and OOX, treas. More Official Observers are needed in this section. If you are interested, please contact your SCM. Most Rhode Island clubs participated in Field Day again this year and, although conditions on the bands were far from ideal, enthusiasm remained high. The BVARC has conducted a standard First Aid Course for all members. "All Six Meter" RIYL certificates have been awarded to WTR, FVZ, LSP and K1C0L. TXL has a new Windom antenna. UHE received an Armed Forces Day certificate from the Department of Defense for his copy of their message from teletype. The RISPND averaged better than thirteen stations per session during June. Traffic reports from more of these stations would be appreciated. Application forms for amateur call letter registration plates are available from the Rhode Island Registry of Motor Vehicles. Traffic: (June) W1COMH 126, YRC 85, TXL 77, DD4 22, WED11. (May) W1LSP 10.

VERMONT—SCM, Mrs. Ann L. Chandler, W1OAK—SEC: E1B, RM: BNV, PAM: ZYZ. A new EC in Essex County is Arline, ZWN. BXT received his traffic medallion. A fine crowd, including plenty of mobiles, turned out for the International Field Day at Malletts-Bay. The Vermont National Guard, K1WBL/1, was operating from Camp Drum for two weeks. FMK and K1CUS spent a few days in Washington. D. C. J1Z and UNF are back in St. Johnsbury. ZLH/1 operated Field Day from Lake Dunmore with ten operators, while AUE and LYD went to Mt. Wheelock. K1BYH puts out a nice signal on 50 Mc. MMN worked 9GAB in Wisconsin for his 20th state on 144 Mc. FMK operated from Mt. Greylock on FD working 50 Mc. Traffic: W1OAK 171, K1CYY 38, W1WYZ 23, VSA 17, FVE/1 13, E1B 12, K1B0L 9, W1LH1 7, K1AUE 3, W1ZJL 2.

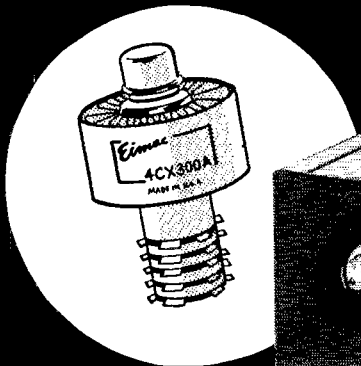
NORTHWESTERN DIVISION

ALASKA—SCM, Eugene N. Berato, KL7DZ—Field Day went off with a bang. The AARC, KL7AA, set up with 10 operators with BJD in charge and five positions. Signals conditions were poor. CRE, was reported active with one transmitter and one operator. CRE, formerly W8FGB, W3YGD, of Pennsylvania, and W7APF, Oregon's Traffic-handler, are now permanent residents of Alaska. CDF now reports 400 prefixes on c.w. and soon will be packing to return to his stateside home and W9KLD. KL7/K6JOX has a KVM-1 at Barrow. CQL is newly-licensed on the Arctic Coast. OOT is on RTTY. 14,350 Mc. CFS is on at Barter Island. DG was an Anchorage visitor. AN and his XYL, ZR. The KATALA Hermits, are now permanently established in Anchorage. We sure would like to hear from the Southeastern and Westward hams. Report forms are available on request. Traffic: KL7BJD 147, CDF 34, ASQ 21, CRE 3, BEC 2, CEJ 2.

IDAHO—SCM, Rev. Francis A. Peterson, W7RKI—Sorry to report the death of MFC of Twin Falls. AXV and VQC are recovering from trips to the hospital. Twin Falls Club is now affiliated with ARRL. All clubs should be and should have OOs and OBSs. The Shoshone County Club had 15 out for Field Day and did fine until the generator blew up. VQC got a new Morrow set for Father's Day. BDL built a new mobile. CDA lost the tree which held up his antenna. New Novice and Conditional Class tickets are sprouting up all over. Ham picnics were well attended at Boise, Twin Falls and Pocatello. Forty new ECs have been appointed. Get your nominations for SCM in early. They should really be for someone who can tour the State and meet all of you. Get a new member. Traffic: W7EEQ 27, VQC 10, WHZ 10.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WX1—SEC: KUH, PAM: EOL, RM: KGJ. The Montana Phone Net meets Mon.-Wed.-Fri. at 1830 MST on 3910 kc. HJV joined Silent Keys. Field Day topped outside activities and there were ham picnics at Fort Peck, Billings and Harlowton. EAN and SNV moved from Billings to Anchorage, Alaska. K7CMW moved from Billings to Thermopolis, Wyo. WSW moved from Great Falls to Columbia Falls. 5ETA moved to Great Falls. K7BIX is a new call in Helena and is ex-6ENS. K7EFA is the new call of the Yellowstone Radio Club. Other new calls: K7EEP in Billings, K7DVZ and K7NDPP in Bozeman. KN7EBC and KN7ECE in Great Falls. K7ECB in Choteau. K7CIA is a new Conditional Class license at Harlowton. BOZ has a new grandson. OIQ went to Oklahoma City for CAA training. K7BON vacationed in Wyoming. IWW vacationed in Texas and California. K7BVO has a new Globe Scout. K1C8R in Rhode Island, wants a schedule with a Montana station on 10-, 15- and 20-meter phone or
(Continued on page 122)

Here's a KILOWATT That's a Real KILOWATT



SSB-1000F LINEAR AMPLIFIER

Designed and constructed for optimum efficiency under maximum LEGAL operating conditions: 1 KW average input on SSB, CW and RTTY in a compact, completely self-contained desk top unit . . . Class AB1 operation at all times insures minimum distortion and elimination of TVI (3rd and 5th order distortion products down 35 db) . . . Generously rated components . . . Cooling system permitting continuous operation under the most grueling conditions . . . "Continuous oscilloscope monitoring of signal envelope, assuring clean operating conditions at all times and all power levels — a standard feature on all ELDICO equipment as pioneered in 1954 . . . Independent metering of plate and screen circuits including automatic overload protection . . . No grid tuning and constant 52 ohm input impedance (a must for clean SSB) combine to simplify exciter tuning and loading . . . No external attenuator required.

RADIAL BEAM POWER TETRODES: The use of EIMAC's new 4CX300A's, plus a 2500 volt plate supply, allows compactness, high efficiency and dependability. Ample plate dissipation (600 watts) permits the SSB-1000F to operate at the maximum LEGAL kilowatt level.

**NO ONE CAN RUN A
GREATER LEGAL KILOWATT**

ELDICO SSB-1000F:

Frequency Range: (in Megacycles)

80 meters	3.50 to 4.00
40 meters	7.00 to 7.30
20 meters	14.00 to 14.35
15 meters	21.00 to 21.45
10 meters	26.90 to 29.70

Power Ratings:

DC average input: CW; 1000 watts
AM; 700 watts
PEP input, SSB: 1250 watts
PEP output, SSB: 850 watts
Power input: 115 volts, AC, 60 cps,
1250-1750 watts

Drive Requirements: 30 watts peak envelope power. Input impedance 50 to 75 ohms.

Tube Line-Up: 10 tubes including 3 voltage regulators, 2 rectifiers, 1 oscilloscope deflection amplifier, 1 oscilloscope detector, 1 oscilloscope, and 2 power amplifiers.

Physical Dimensions: 10 3/4 inches high, 17 inches wide, 15 inches deep. Weight 98 lbs. Finished in ELDICO Gray.



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FORMERLY **WRL Electronics**

GLOBE electronics presents . . .

the

Sidebander DSB-100

Kit:

\$11995

W/T:

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A Complete Transmitter for **3 MODE OPERATION** AM - CW SIDE BAND

40w AM; 50w CW
100w P.E.P. DSB
Input, Suppressed
Carrier

Barefoot or piggy-back, this unique sideband transmitter can be used simply with your present AM equipment, using standard crystals and regular VFO. Exclusive automatic balancing and floating grid circuit holds carrier suppression to 35db or better. Continuous band coverage 3-9mc and 12-30mc. Three stage RF section allows straight through operation for max. efficiency. Internal tone generator facilitates tuning. Pi-Net 52-300 ohms. Speech clipping and filtering assures powerful communication punch and narrow band width. Provisions for Antenna Relay Control. Ample power reserve for external accessories at socket on chassis rear apron. Forward Look, Ceramic band and function switches.

VOX

Designed for the DSB-100, the Globe VOX plugs into socket at rear of Xmitter. Extra contacts for aux. circuits.

W/T: **\$24.95**

Kit: **\$19.95**

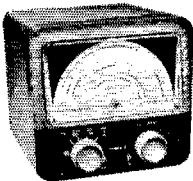
QT-10

Plugs directly into VOX unit. Wired & tested only. **\$9.95**

Hand in Hand with Globe's New

VFO 755A

SUCCESSOR TO THE 755



Ideally used with the Sidebander, the 755A is well-filtered and self-contained in the new Forward Look Cabinet. Covers 10-160M, with output on 40 & 160M. Improved vernier dial drive with shock absorption. 10:1 tuning ratio. Voltage regulation. Approx. 50V RF output; will drive oscillator stage of any Xmitter, on the market; plugs directly into Kcat socket. Temp. compensated for stability for SSB or DSB. Calibrate switch for zero beating.

Kit: **\$4995** W/T: **\$5995**

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Send for Detailed Brochure

COMPLETE LINES OF HAM GEAR!

122

c.w. NPV is working in Washington. Traffic: K7BVO 11, W7OOG 4, TRU 3, NPV 2.

OREGON—SCM, Hubert R. McNally, W7JDX—WNV has moved to a new spot in Oswego and should be back on the air soon. PQJ still is reporting out-of-band operations. We regret to announce death of HWX, of Realsport, an old-timer on OEN. LT reports poor conditions on Field Day. DEM says he caught no Salmon but did get some Kamloops at Diamond Lake, which skins the SCM somewhat. Good results were reported for Field Day by the following clubs; Lebanon, Beaverton, Valley, Coos County, Astoria, Tualatin Valley, Rogue Valley, PARC and OARS. The Salem Amateur Radio Club, Box 81, Salem, Ore., is the new W7-K7 QSL Bureau. Send at least three Number 11, stamped, self-addressed envelopes and get the DX cards you are missing. Over 18,000 cards are on hand awaiting envelopes. The Portland Radio Club has moved to a new location at the OMSI quarters in the Museum Building. AJN reports a slump in activity on OSN, most likely because of summer conditions and weather which draws many operators into other interests. BRATS for May and June were AJN, ZFH and OMO. The Mobile Group plans to assist the Oregon-International Mileage Marathon in Oregon Aug. 27, 28 and 29. Traffic: (June) WLT 50, AJN 35, ZFH 32, CUW 16, JDX 14, OMO 9, DEM 3. (May) WTAJN 20, BVH 18.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—A total of 18 Field Day messages was received by the SCM, denoting a good turnout for Field Day operation. CAM is running code and theory classes Tue. and Wed. evenings. FAW is designing and building a new super-duper ham shack. NMP, from Butte, Mont., now is located at Clarkston and operates 40 and 15 meters. HDT is busy working on 2-meter gear for c.d. K7AEJ is using a DX-35 and an NC-88 at Ross Dam Camp. JNC has his tri-bander up in a new location. HUT is building an 80-meter tuner. K7FAE makes DXCC and still handles lots of traffic on the MARS circuits. VI has a new 20-meter bantam and his first contact was KR6AF in Okinawa. FIX is back from vacation and is very QRL trying to catch up on PANN. QPX, from Tacoma, now is located at the Coast Guard station in the Philippines and is trying to get a DU call so he can work Stateside. New appointments: CAM as OO; CZY and AMC as ORSS. The following stations renewed their appointments: PQT as SEC; PQT, RML and WQD as ECs; UOJ as OBS; CZY and EYF as OOs; CZY and PQT as ORSS. UOJ transmits bulletins Tue. and Fri. evenings on 3993 kc. at 1830 and on 146.160 Mc. at 1845 and 29.6 Mc. at 1900 PST. QLIH is working on an RTTY converter. John says "Look out for weird signals from the Everett Area." JC received a card saying he has 93 QSL cards at the Bureau! AMC is back on c.w. while waiting for a new mike. OEX and PGY were guests of the Tacoma Amateur Radio Club at the June 24 meeting. WAI is working for points on his GMTHC. AIB's vacation plans went askew when he suffered minor injury to his knee. GHM is looking for a v.f.o. NWP is now 2-meter f.m. mobile. BA still is running high in traffic and doing an excellent job on moving it, too. IVB reports too many irons in the fire. The following from the Clarkston Area received their RACES certificates: HDT, PKR, PSL and UJA. CWN is QRL with c.d. nets. WVU now is residing in Kirkland. This section still is in need of ECs and Asst. ECs. How about some recommendations to fill existing vacancies. OEX now is operating from his new shack (what a deal it is all built with mahogany) and using a 4-1000A final and a 75A-2 receiver. Traffic: (June) W7BA 2363, PGY 712, QLIH 158, HUT 137, APS 120, JC 82, AMC 37, WAI 31, EHH 19, LVB 17, AIB 16, CZY 14, GHM 9, NWP 4, EVW 3. (May) W7GIP 136, BXH 12, FZB 4.

PACIFIC DIVISION

SANTA CLARA VALLEY—SCM, G. Donald Eberlein, W6VHM—SEC, W6NVO, RM, W6QMO, PAM; W6ZLO, W6MMG has returned from New Hampshire after vacationing there. W6QIE has a new Viking Ranger. W6AMH placed second in S.C.V. during the phone section of the SS. The NPEC had a hot time with a grass fire just before starting FD. W6DEF is back on 144-Mc. mobile. W6CBE kept skebs with W6UH/AM while he was on a trip to the Marshall Islands for IGY. W6OH1 has been elected Northern Area Director of the ALN. W6RFF has returned to traffic after some years lay-off. W6QMO reports a new 2-meter Gouset. W6RSY is now Asst. Mgr. of NCN. K6EWH now is using a 500-watt final with a pair of 811s. A new club has been formed in Palo Alto named SPARK (South Peninsular Amateur Radio Club). Newly-elected officers are K6JTW, pres.; W6JVI/6, vice-pres.; W7PRX/6 sec.; K6DZL, trans. Another new club has been formed in Gilroy. Officers of the Radio Amateurs of Greater Gil-

(Continued on page 124)

Transistor Power Supplies* and Components

* Complete Units

D SERIES (Standard)

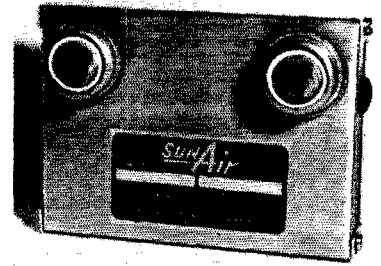
Continuous operation at 30 watts. Selective taps at 200, 250 and 300 volts; intermediate voltage at 1/2 selective taps. Both voltages can be drawn simultaneously if total power does not exceed continuous ratings. Positive or negative ground operation. Input and output filtering included except for intermediate tap.

Size: 4 3/4" x 3 3/4" x 1 1/4" 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: 4 3/4" x 3 3/4" x 1 1/4" Wt.: 14 oz. 12-V Input: **\$37.50** 24-V Input: **\$79.50**



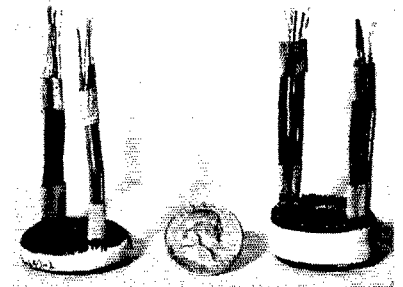
Toroid Transformers for Transistor Power Supply Application

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 (3 1/2 ozs.). 1-10 units: **\$18.50 ea.**

With Encapsulation (4 1/2 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 (3 1/2 ozs.). 1-10 units: **\$21.50 ea.**

With Encapsulation (4 1/2 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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GUARANTEED CRYSTALS!

HERMETICALLY SEALED CRYSTALS $\frac{1}{2}$ Spcc. $\frac{3}{4}$
.050 or .093

- Amateur & Novice — .01% tol. ea. \$2.50
 Marine & Aircraft Fund. — .005 tol. ea. 4.10
 10 to 30 Meg. tpl. .005% ea. \$3.75
 Overtones: 30. to 54 Meg. tol. .005% ea. 4.10
 54 to 75 Meg. tol. .005% ea. 4.25
 75 to 90 Meg. tol. .005% ea. 4.50

Special! FT-243 Prec. Calib. to 1st Decimal

- 2 Meters { Exam: *8010.6 x 18=144.190
 { Exam: *8010 x 18=144.180
 Note—10 KC difference between the above
 6 Meters { Exam: *8340.6 x 6=50043.6
 { Exam: *8340 x 6=50040
 Note—3.6 KC difference between the above

This is a must if you want exact freq. on these 2 pop. bands.

Hermetically Sealed for new Gonsel.....ea. \$2.50
 Thin-Line FT-243 for new Gonsel.....ea. \$1.49
 Calibrated FT-243 as exam. above* spec.ea. \$1.19
 Don't take chances with uncalibrated surplus—Be sure of freq.

NOVICE BAND FT-243 Fund. or DC-34 Freq.....99c

- 80 Met. 3701-3748—Steps of 1 KC. FT-243 or DC-34
 40 Met. 7150-7198—Steps of 1 KC. FT-243 only
 Dbl. to 40 Met. 3576-3599. Steps of 1 KC. FT-243 or DC-34
 15 Met. 5276-5312—Steps of 1 KC. FT-243

4035	4995	5880	6362	6815	7316	7758	3	7710	7875	8067	7	8283	3	8575
4045	5030	5892	6373	6825	7325	7766	3	7716	7880	8072	3	8290	3	8580
4080	5035	5900	6380	6830	7330	7770	3	7720	7883	8075	3	8291	3	8583
4095	5090	5906	6400	6850	7350	7783	3	7725	7890	8080	3	8300	3	8590
4110	5127	5925	6405	6857	7358	7785	3	7730	7891	8079	3	8308	3	8591
4135	5165	5940	6415	6867	7366	7790	3	7733	7900	8080	3	8310	3	8600
4165	5205	5960	6425	6880	7373	7793	3	7740	7906	8106	3	8310	3	8603
4175	5235	5985	6440	6906	7375	7790	3	7741	7908	8103	3	8316	3	8610
4190	5245	5993	6450	6915	7380	7793	3	7743	7910	8100	3	8318	3	8616
4210	5275	6015	6475	6940	7406	7800	3	7746	7916	8120	3	8325	3	8620
4225	5305	6035	6495	6963	7408	7806	3	7750	7920	8125	3	8325	3	8625
4255	5395	6080	6535	6993	7413	7810	3	7753	7925	8130	3	8330	3	8630
4280	5435	6095	6556	7015	7425	7810	3	7753	7930	8133	3	8335	3	8633
4295	5470	6120	6575	7020	7433	7816	3	7755	7933	8140	3	8335	3	8640
4300	5480	6140	6580	7025	7440	7820	3	7750	7940	8140	3	8340	3	8640
4330	5500	6162	6590	7025	7441	7825	3	7753	7941	8150	3	8340	3	8650
4340	5545	6200	6610	7030	7445	7825	3	7753	7941	8150	3	8340	3	8650
4395	5582	6235	6630	7033	7445	7830	3	7753	7941	8150	3	8340	3	8650
4395	5587	6235	6630	7033	7445	7830	3	7753	7941	8150	3	8340	3	8650
4445	5645	6305	6680	7040	7450	7830	3	7753	7941	8150	3	8340	3	8650
4490	5660	6315	6690	7045	7450	7830	3	7753	7941	8150	3	8340	3	8650
4495	5675	6325	6700	7050	7450	7830	3	7753	7941	8150	3	8340	3	8650
4525	5680	6335	6710	7055	7450	7830	3	7753	7941	8150	3	8340	3	8650
4540	5700	6345	6720	7060	7450	7830	3	7753	7941	8150	3	8340	3	8650
4580	5706	6350	6730	7065	7450	7830	3	7753	7941	8150	3	8340	3	8650
4610	5725	6360	6740	7070	7450	7830	3	7753	7941	8150	3	8340	3	8650
4620	5730	6365	6745	7070	7450	7830	3	7753	7941	8150	3	8340	3	8650
4635	5740	6370	6750	7070	7450	7830	3	7753	7941	8150	3	8340	3	8650
4640	5750	6375	6755	7070	7450	7830	3	7753	7941	8150	3	8340	3	8650
4695	5760	6380	6760	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4710	5773	6385	6765	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4735	5775	6390	6770	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4780	5780	6395	6775	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4785	5785	6395	6775	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4815	5800	6400	6780	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4820	5806	6403	6780	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4840	5820	6410	6785	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4845	5825	6410	6785	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4852	5840	6406	6780	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4880	5850	6415	6790	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4900	5855	6425	6795	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4930	5860	6435	6795	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4950	5875	6440	6800	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650
4980	5875	6450	6806	7075	7450	7830	3	7753	7941	8150	3	8340	3	8650

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roy are W6PZUp pres.; K6PWD, vice-pres.; W6GGQ, secy.-treas. The club is sponsoring the idea of a big brother in training Novice operators. Each General Class club member takes on the responsibility of training one new Novice operator, teaching him the proper operating procedure and helping him to keep a clean signal. W6ZLO will be in charge of the booth of the NBRC at the Monterey County Fair this year. K6DXX, WINJAI, W6YHM and W6HC are guests of the Fort Ord Radio Club at a dinner June 4. Traffic: K6GZ 54, W6BPT 148, W6RSY 146, K6PQJ 120, W6GMO 101, W6ZXS 70, W6AIT 69, W6EON 68, W6YB 67, W6YHM 44, W6HC 39, W6OII 32, K6YKG 24, K6HGV 15, W6DEF 9, W6RFF 9, K6VJ 5.

EAST BAY—SCM. B. W. Southwell, W6OJW—SEC: W6CAN, ECs: W6LGV, W6ZZF, W6UIZ, K6EDN, K6JNW and K6QZG. W6CBF has been busy with RTTY, FM and Armed Forces Day. W6AGA is a new Novice in Danville. W6VSV, K6ONAI, K6AXN, W6ORR, W6OHQ, W6GGV, W6PBC, W6BHR, W6EDC, W6QV and W6OVR are active on 432 Mc, nightly from 7:30 to 8:30 P.M. and Sun. at 10 A.M. Best DX is W6AJF, Sonoma, and W6OJB, Folsom. W6BO operated mobile on 20-meter c.w. cross-country and visited W6ZY. The East Bay Radio Club held its annual auction June 13. WINJM was guest speaker at the CCRC meeting held on June 4. Yours truly attended the Pacific Division Convention in Fresno and a good time was had by all. W6LGV underwent surgery at Kaiser Hospital on June 9 and is recovering P.B. He used a Gonsel on 144 Mc, in his hospital room to keep in touch with the gang. W6WJN, who was in the hospital in another room, also was on 144 Mc. K6ZMI says someone is bootlegging his call on 20-meter phone so if you hear K6ZMI on 20 meters, please notify the FCC. K6ZWI's NYL passed her Novice Class exam. K6EYB is a new member of the MDARC. The Hayward Radio Club will hold an auction first at Hidden Valley Ranch, Mission San Jose on Aug. 23. HRC's mobile picnic was a huge success. K6JNW, K6CFY, K6SWY, KN6SCS and K6TKL enjoyed the Pacific Division Convention. W6AHF is a new Novice in Hayward. EA6AF was a visitor at the NCDXC meeting. Ex-KL7CF gave an FB talk on Collins line. K6VXK worked W6JYE. W6AGJ and W6CNM on 50 Mc, with a 4-tube transceiver and a three-element beam. K6GK had trouble with receiver gremlins. K6DMW operated FD at W6IHY/6. K6QZG is the new EC for the Richmond, San Pablo and Pinole Area. W6LRT/8 operated on Mt. Vaca during P.D. New officers of the NCDXC are K6AQP, pres.; K6ENX, vice-pres.; W6LTY, secy.; W6VE, treas. W6PIR is NCS of the 50-Mc. Net between AREC and county radio office. K6ZBL has RTTY on 40 and 80 meters. K6OSO is Asst. EC for Berkeley. Keep those reports coming in. Traffic: (June) K6GK 540, K6DMW 121, W6JOH 42, K6ZBL 42, K6OSO 22, W6PIR 3. (May) W6CBF 4.

SAN FRANCISCO—SCM, Fred H. Laubscher, W6OPL—Asst. SCM, Edwin L. Olmstead, K6LFCF. Each month in this column we try to tell the story of the San Francisco Section. Each time we practically have to make a tour of all the members and pry any and all news out of them. This last month saw a new low in responses. W6OPL and K6LFCF mailed each other activities cards and that was the sum total of all correspondence received. The office of SCM is your contact with the ARRL. We won't bite. We will bend an ear to your problems and do our utmost to represent your interests. We can't know your interests unless you tell us what they are. Field Day is behind us and most of the clubs in the section were out in full force. The Marin bunch (MARC) is sure that its score is the highest. The SFRC braved the winds and went to the usual spot, having good results and a fine time. A bunch of the YLS hiked to the very top of Mt. Davidson and played it real cey on 8 meters, refusing to give any more than "SF Section" for several hours. W6GXH is now portable KL7. John was your SEC until he moved. Your new SEC is K6ANP, in San Francisco. W6JEU went to W4-Land, almost got hitched, visited VP-Land, flew home and now is moaning about the lousy eyeball DX he had. He didn't meet enough hams to make the trip worthwhile. We notice more of the WA6 calls floating about the ether these days. K6VRR finally got the rig on phone and was told by W6PVC to confine his operation to 75 meters as W6PVC had a monopoly on strange sounds on 160. W6IFO promptly proved him wrong. I never knew an LAI could make such a racket. Lack of facilities has temporarily canceled the joint MARC/TAM Hanifest for this year. W6SLX is spending a week or so at Treasure Island. The summer months seem to bring much outdoor activity among the members of the ham fraternity here in the Bay Area. There are more mobiles on the air and a contact with local hams is almost a certainty any hour of the day or night. Some of the 75-meter mobile gang are doing a public service in reporting fires and accidents while they travel the freeways of the state. Continuous watch is maintained on 3975 kc. in the Bay Area from 0900 to 1600 by K6LFCF. Any emergency calls for fire or

(Continued on page 126)

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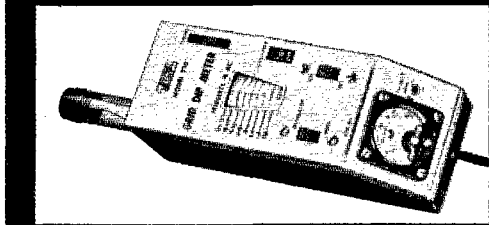
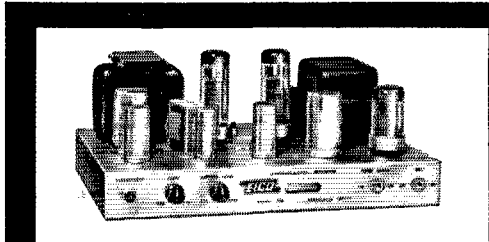
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police service is relayed immediately. Others in the East Bay are monitoring the same frequency. A new net for the Bay Area is being started with surplus i.m. gear, low-powered and on 29.2 Mc. Several years ago, this was a great pastime but during the skip seasons it fell by the wayside. Hope we have more news this coming month. Traffic: K6LCT 18, W6BIP 6, W6OPL 6.

SACRAMENTO VALLEY—SCM, Ralph Saroyan, K6CFF—All clubs in our section participated in Field Day this year. A tip of the hat to W6ODY who operated portable 6 meters for the Boy Scouts at their summer camp. Two new Novices in Chico are KN6TQA and KN6TVY. Both are engineering students at Chico State and are former 8th grade students of W6GUV. Recently members of the Golden Empire Amateur Radio Society of Chico and the Tehama County Radio Club of Red Bluff gathered with their families in the Tehama County State Park at Woodson Bridge. A few from Redding and other valley points also were present. Paul finally got his ticket, K6ASZ, and has a new DX-40 on the air. Listen for another new one on 1930 kc., W6YOE. If someone tells you the FCC never "gets around" don't you believe it! Recently one of our new Novices took his Conditional Class exam. In connection with his 13 w.p.m., a field engineer from FCC later presented his credentials and right there, in his own home, the amateur had to prove himself using the FCC's equipment. Fortunately, our friend made it with flying colors but it indicates no amateur should permit his ability to decline. Once again, your SCM solicits monthly activity reports from all amateurs with particular emphasis on clubs. See you next month? Traffic: K6YBV 521, K6SXA 197, W6ODY 20, K6SXX 3.

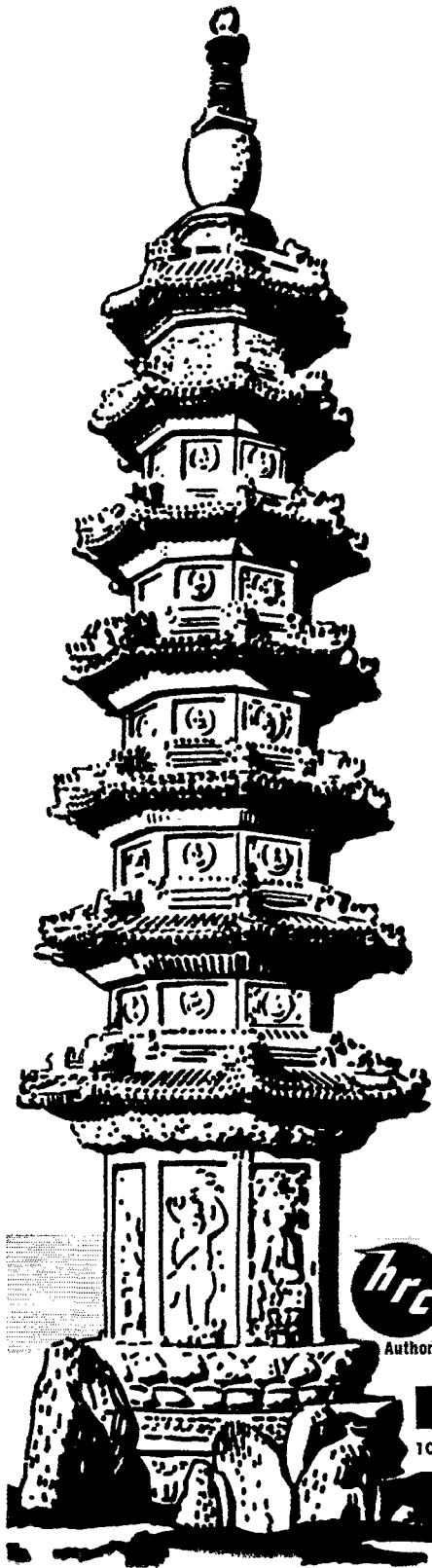
SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Fresno Amateur Radio Club held its Field Day at Shaver Lake with 40 operators and made 497 contacts. The Stockton Radio Club held Field Day at Mielke Grove. The Delta Amateur Radio Club held Field Day at Valley Springs. The Pleasant Valley Radio Club held Field Day at the Kettleman Hills with 7 operators. W6EUH went to Nevada for Field Day. He made 218 contacts with 39 sections. The Turlock Amateur Radio held Field Day on Fremont Peak near Hollister. K6ZCD has his BC-1306 perking very well for his boat. The Fresno gang is holding 6- and 75-meter hunts after e.d. check-in time on Mon. nights. W6PAG is building a kw. final. W6DBH and W6NNG are playing checkers on 2 meters. K6EKH is taking a trip to Chicago. W6JPS won a 6-meter converter. W6JPU built a transistorized RTTY converter. W3LNT, ex-W6GEG, and his XYL were recent visitors in town stopping in on the way to Washington, D. C., from Honolulu. I doubt that anyone in the Bakersfield Area is reading this column because I have asked for news and activities from that area repeatedly and have gotten not one card. I would like to thank the gang from up north for their wonderful support, and by North I mean Turlock, Stockton and the Deltas. Hope everyone had a wonderful vacation and is now ready to huckle down. Traffic: K6CPQ 104, W6ADB 79, W6EUH 1, W6HAB 1.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: HUL, PAM: DRC, V.H.F. PAM: ACY. V.h.f. activity should take on a new aspect in this section in the next few months. A repeater transmitter is proposed for the highest mountain east of the Mississippi, Mt. Mitchell. CVU, Radio Officer of Madison County, has made two trips to Mt. Mitchell to run tests to determine the coverage from that point and the results so far are excellent. During the remainder of the summer CVU will make additional tests from the mountain. Thanks, Ray, for carting the equipment, including a gasoline generator, "up the Big Hill." Thanks to you we are reasonably sure that it will work. Fellows, let's quit kidding ourselves and stop sitting around expecting someone to Give us equipment. Look over the surplus market and the circuits in QST, build or buy some v.h.f. gear. Talk with FUS relative to what Catawba County has done and is doing with 2-meter equipment. Plan your AREC drills around this equipment, then if we ever have to resort to the use on RACES we will have the equipment available. I am working into Winston-Salem it will with 7 watts. Thanks to RA, YUL and club station NC for their excellent cooperation. ZXI sends along information that he copies my station in Greensboro. It can be done, fellows, and when the AREC determines to do something about it you will find activity on 2 meters and will enjoy working the band. GXR still is top traffic man with DSO second and RRH third.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE, PAM: YOS, RM: AKC, K4OBB reports KYN is doing noteworthy work listening to "Moonbounce" signals and star noise. AIB is doing considerable 2-meter experimentation while K4JNU rag-

(Continued on page 128)



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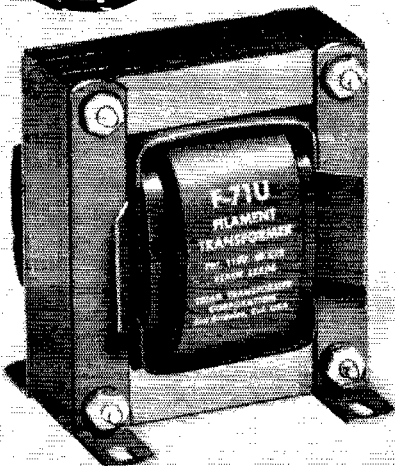
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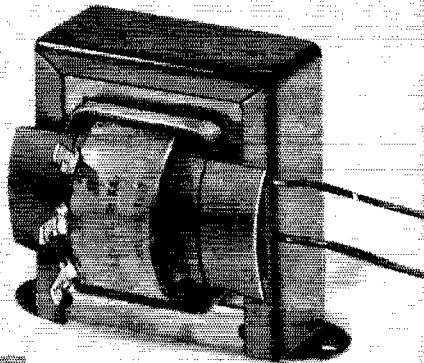


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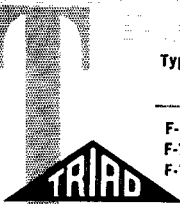


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chews. COA, DX, FFH, BZX, EOZ, HAQ, MPR and K4ETB have qualified for Section Net certificates on the phone net. YOS is doing photogrammetry at Fort Belvoir this summer. Our first Silent Key since WW2 is K4OKC. CXO and NTR have new kw. s.b. rigs. K4KJJ and TKS are now s.s.b. K4ASA is back on 75 meters from a new QTH. FDG has been transferred to Greensboro. N. C. K4GQG is sending a schematic to QST on a converted double s.b. rig. The Charleston RC, operating HHO for four days, did a wonderful job in handling the Powder Puff Derby on 40 and 2 meters. KN4RJA and ROB are now General Class. The new club call for the Rock Hill RC is K4YTZ. K4PJE is busy preparing for the Pawley's Island Hamfest. The hurricane season is upon us. Join the AREC, participate in an emergency net. Be prepared. Traffic: (June) K4GAT 226, AVU 100, W4DAW 63, AKC 53, W4JD 30, K4PIA 27, BVX 26, BLF 20, K6RCO/4 13, W4CHD 8, K4PIK 4, (May) W4DAW 91, K6RUO/4 3.

VIRGINIA—SCM, John Carl Morgan, W4KX—FD activity was at an all-time high this year. Your SCM received FD messages from an even dozen clubs and all fresco groups, with several others known to be active. Another fine VFN Picnic saw K4DJID elected net mgr., with W4BGP as assistant. Kudos are due outgoing manager K4ASU, Peripatetic People; IA Manila-bound. RCM headed for 2 years Alaska duty. SNH moved to Petersburg. ODY had a brief re-fit in drydock at the Norfolk Naval Hospital. KN8EYD now is General Class and awaiting a K4 call in the Winchester Area. OOL reports that the SVARC has several new ticket-holders progressing. K4MBL is keeping the Mine Depot Club rig warm. The Old Dominion ARC got a new call, K4VLW, and a new Globe Champion which was promptly burnt up on FD, says K4BUI. K4QER reports that K3IWN/4 is running nightly Novice and General Classes at Langley AFB. QER snagged her first DX and now has deserted the phone bands for c.w. LW reminds that Washington Area traffic is deliverable by landline from Arlington-Fairfax faster than via 4RN-EAN-3RN routing. K4MJZ needs more mobiles to round out his up-and-coming Arlington County AREC 10-Meter Net. CVO's new operating set-up is to be patterned on NBC master-control—he hopes. K4JKK says that repairing people's lawn mowers cuts down operating. K4DSD blew the power transformer in the new QRO final. T-k! T-k! Judging from reports, we'll meet a flock of the Virginia gang at the National Convention. Hope to see YOU there. Traffic: (June) K4ELG 541, Q1X 321, W4QDY 295, K4QES 185, W4SHJ 168, K4EZZ 156, KNP 122, W4YVG 48, K4MJZ 43, W4AAD 35, RCM 33, BGP 32, K4EAS 28, W4KX 16, K4PTG 15, W4OOL 11, CVO 8, K4DSD 6, JKK 4, W4YTA 4, BRF 2, K4DPX 2, EAQ 2, W4LW 2, (May) K4QIX 318.

VIRGINIA FREE-FOR-ALL QSO PARTY

September 6-7

Amateurs everywhere are invited to participate in a QSO Party to be held from 6:00 P.M. EST September 6 to midnight EST, September 7.

Rules: (1) Outside stations will attempt to contact as many Virginia amateurs as possible using any band or mode, but a given station may be counted but once regardless of band or mode. (2) Out-of-state c.w. amateurs call "CQ VA." Virginia c.w. stations should identify themselves by signing "de (call) VA K." Phones say "CQ Virginia" or "Virginia calling." The calling procedure used should indicate whether a station is seeking a Virginia or an out-of-state contact. (3) Each contact must include a two-way exchange of QSO number, RS or RST report, and state or country. **Examples:** "NR1 W1AW 579 CONN" or "NR3 W4YHD 58 VA." Virginia stations will send "Virginia" even though the fact be self-evident. (4) Score one point for each complete two-way exchange. No credit will be allowed for incomplete contacts. (5) Suggested rallying spots: 3680 and 3835 (the Virginia net frequencies), 7080, and points from 25 to 50 kc. inside each edge of the various bands and phone sub-bands. (6) Logs should reach the Virginia SCM (see address, p. 6) no later than October 7, 1958.

WEST VIRGINIA—SCM, Albert H. Iiix, W8PQQ—Asst. SCM: Festus R. Greathouse, SPZT. SEC: KXD, PAM; FGL, RAS; GBF, HZA, PBO and VYR. V.H.F. PAM: K8AON, K8AON has to give up his appointment as V.H.F. PAM because he is moving to Welch. He has done a fine job in shaping up c.h.f. activities and his
(Continued on page 130)

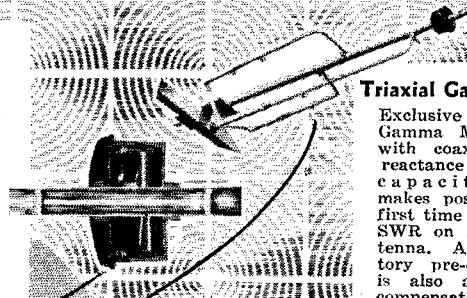
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the Hy-Gain FULL SIZED trap tribanders

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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.



Triaxial Gamma Match

Exclusive Triaxial Gamma Match system with coaxially formed reactance cancelling capacitor built-in, makes possible for the first time a perfect 1:1 SWR on a 3-band antenna. Although factory pre-calibrated, it is also adjustable to compensate for variations which may be encountered at each installation site. Exceptional bandwidth maintains low SWR over entire band. Use of this system permits tuning array for maximum gain with no compromise to facilitate matching.

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 3" dia.) 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.

Two-Element, Full Size Trap Tribander

Top full-size performance in limited space with one transmission line on 10, 15 and 20M.

5.8 db gain
18 db F/B Ratio

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Three-Element, Full Size Trap Tribander

There are more 3-Element Trap Tribanders in use than all other 3-Band Beams combined.

8 db gain
25 db F/B Ratio

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Construction

Hot dipped galvanized steel boom 1 1/2" 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. 1 1/4", 1", 3/8" and 3/4" sizes are used. All hardware galvanized and iridite treated.

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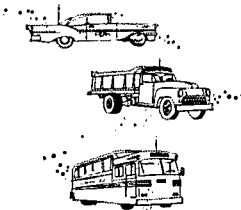
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signals will be missed. IYU is functioning as Acting V.H.F. PAM 8FNI (K8KLI and KN8ILT were manned by operators during the Field Day operations. DIE operated in Kentucky as DIE4 during FD while on vacation. CSG returned from National Guard exercises at Ft. Knox. He operated the MARS station and met several hams while there. New stations on 6 meters are K8KTC, JHX and JQI. K8HRO worked 100 stations and 18 sections during the V.H.F. Picnic. HHD has moved to an antenna farm at Tornado. He is the proud father of a new jr. operator. FNI made BPL in June. EGF has a 40-meter rotary beam in operation. K8BIR is a new OPS. K8CRM is a new ORS. ESH is having antenna troubles. The report is somewhat shorter than usual because your SCM was out of town on business on the 5th. Traffic: W8FNI 585, K8HID 82, HRO 3.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, B. Eugene Spoonmore, W8DML—SEC: NIT, EC5, K8BIL, CEN, COI, DCC, DXF, W8DLZ, DQX, GDC, KQD, LO, NUU, NVX, OMN, PGX, PXZ, RRV, SFS, SIN, UPS, VSM, WMK, YMP. According to *Splatter Chatter* K8JTZ is not a bachelor any more and WVV is weakening. FRQ is having voice trouble. K8DTV has moved to Oklahoma. NMT is working on a field-strength meter. K8HFB is taking bookkeeping lessons. K8KTX has six Novices. The *RF Carrier* informs us the operating frequency is 3890 kc. A number of the Montrose Club attended a recent club meeting. PXZ and QEL have been bachelors part of the summer. With Field Day over and with several clubs and individual stations reporting, it looks like it was lots of fun with some pretty good scores. The El Paso Radio Club furnished communications for the Pikes Peak Hill Climb and did the usual good job. K8CEN, MYD, AVP, JMB, JHP, W8CVG and a number of others, including ANO and K8DNA from Pueblo, participated. The *Round Table* tells us K8EVQ, UQN and W7GXC/5 are new parents. June was vacation month for K8HPP, JPI and K8EDH. 4VKQ-ex-pres. of the Denver Radio Club, now lives in Florida. KQD was a visitor with NWJ, K8DCC, EDK, EDH, W8WME and W8QOT. A group of Nebraska hams, including EXP and KQX, held a get-together at Estes Park. Traffic: (June) W8IA 667, KQD 328, K8IXF 95, DCC 46, W8CBI 39, DQN 30, TVT 30, QOT 21, NIT 13. (May) W8TVI 36.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John Sampson, 70CX. SEC: FSC, RM: UTM, PAM: BBN, V.H.F. PAM: SP. The Ogden Amateur Radio Club had 27 licensed and 6 unlicensed assistants participating in Field Day activities at Snow Basin. The Salt Lake group operated from Little Mountain with BOD, JBV, EZM, ZKL, KN7s COM, DAJ and DAK participating. Amateurs helped make Tooele's Annual Pony Express Relay Race successful by providing an on-the-spot account of the progress of the horses during the 55-mile race. HIX was set up in the judges' stand at the fairgrounds. FSC operated his station at the midway point, while CKD and FND followed the horses in their mobiles. DQW, ZKL, JBW and KN7COK assisted in the operation. FSC and CKD have new triband beams. New Novices in Utah are KN7s CUD, DYW, DVM, DYN, DYO, EKL, EHL, ECW, ECV, EGY and EDW, an NYL. K7DLU is her OM. Traffic: W7OCX 10, JBV 7, QWH 2.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN, PAM: ZU, V.H.F. PAM: FPB, RM: DWB. The NMEPN meets on 3838 kc, Tue, and Thurs. at 1800 MST and 6730 MST on Sun. The Breakfast Club meets on 3838 kc, Mon, through Sat. The RMN meets on 3570 kc, Mon, through Fri. Please try to check on as many of these nets as you can. The Caravan Club from Albuquerque did a very nice job at the Convention in Santa Fe. A very good job was done by the Santa Fe Club members. Everybody had a very nice time at the Rocky Mountain Division Convention. Very nice prizes were given for the mobile judgments and transmitter hunts. Thirty-six hams joined the Royal Order of the Wouff Hong at the Convention at Santa Fe. K5KWR, from Portales, is now in Germany. Eleven members checked into the V.H.F. Net in Albuquerque during the month of June. WNU is doing a very nice job as fixed station for the Caravan Club. Traffic: (June) K5WSP 213, IQL 7, LFF 7, W5BTH 5, GD 4, K5GFC 4, CIN 2, DAB 2, QBP 2, DAA 1, GOJ 1, W5GRI 1, SGC 1. (May) W5DWB 425, K5LOU 3.

WYOMING—SCM, James A. Masterson, W7PSO—SEC: MNW, RM: BHH. The Pony Express Net meets Sun. at 0830 on 3920 kc, with AMU and MWS alternating as NCS. The YO Net meets Mon., Wed, and Fri, at 1830 on 3610 kc, with BHH, DXV and NMW alternating as NCS. BHH reports that the YO Net will reconvene after a short summer recess on or about Oct. 1. The YO Net will have a traffic outlet to the newly-formed Twelfth Regional Net of the National Traffic System. The RN12 will include New Mexico, Arizona, Utah, Colo-

(Continued on page 132)

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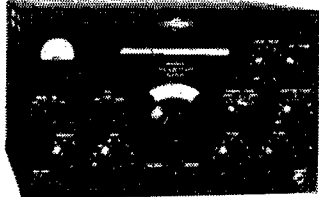
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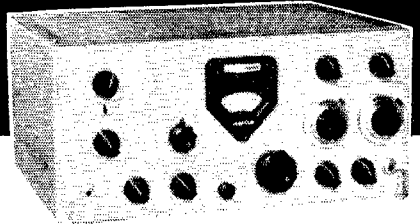
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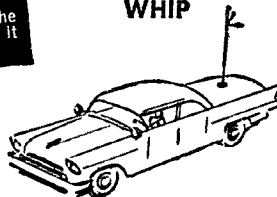
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radio and Wyoming. PSO attended the ARRL Rocky Mountain Division Convention in Santa Fe, N. M. This was a real fine event and the New Mexico sponsoring the Rocky Mountain Division Convention on one of the 6 years. IVC, VTB and UFB are keeping the v.h.f. frequencies active around Central Wyoming. KPZ has a full gallon going on 20 meters.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Clarke A. Simms, jr., W4HKK—SEC; EBD, PAMs; DGH and K4BTO, RM; RLG. Welcome to more new operators this month, KN4YBF, in Selma; K4UJN, the XYL of UEL in Birmingham; and K4VJL, the XYL of YFN, in Huntsville. Congratulations to the new officers of the Montgomery Club; K4TJAI, pres.; K4DOL, vice-pres.; GYG, secy-treas. K4DPH offers to sked anyone needing Alabama on 6 meters. CTU has a new final tube after 16 years. It's nice to have TOI back as OO and K4HJAI as OBS. Anyone desiring appointments in these two categories, please contact me. We have a great need for both at this time. K4KJD has a new 5-kw. generator for emergency work and the plaque as the outstanding NCS of AENP for the past quarter. Congrats, Bill, K4MQH has a new sideband station, an LA-1 excited by a 10-A and a BC-458 v.f.o. WAZ needs some news and pictures for the bulletin and I could sure use some news articles for QS7. See what you can do to help. Traffic: (June) W4KJL 120, K4BTO 76, W4YRO 75, PVG 51, U8M 40, K4GOW 28, AOZ 27, W4DGH 27, M1 25, K4ANB 24, J4WB 23, W4CTU 16, K4KJD 16, KBT 15, W4CRY 14, ZSH 12, K4MQH 12, W4HKK 10, K4IPF 7, HJM 6, PHH 6, AAQ 4. (May) K4AAQ 6.

EASTERN FLORIDA—SCM, John F. Porter, W4KJG—SEC; IYT, RM; K4SJK, PAM; TAS; IAV was the first amateur in the world to make DX Four Square. This means he has received confirmation from 100 foreign amateurs who have worked 100 other DXCC members. He now has 237 countries confirmed and 243 worked, making him the top DX man in Florida. K4DAS took over as net manager for the Gator Net during the summer months. The Lakeland Amateur Radio Society has a new club house furnished by the City. K4AHW received a Public Service Award for emergency traffic to Ecuador. K4JIZ now has accurate frequency-measuring equipment in operation. Naples now has 10 licensed hams and a new club that is growing fast. The club call is K4YHB. The LARA again will sponsor the V.H.F. Picnic the first Sun. after Labor Day at Alexander Springs. The SMRC is now 100 per cent AREC. ACO is the new Comm. Officer for Palm Beach County CD. The BARC has eight new club-saver units under construction. These are 2-meter units costing around thirty dollars each. SFT is the new CD Comm. Chairman for St. Pete. George also has been appointed Red Cross Chairman for Emergency Comm. WPF made WAS after a long grind. The Old Goats now have an official emblem. Guess what it is! Congratulations to OVO, who was instrumental in getting our Governor to proclaim June 23-29 as Florida Amateur Radio Operators Week. On 2 meters in Lake Wales are L4M, YZP, DPD, RY and KN4VGF. The Dale Radio Club is now sponsoring a Worked All Florida Counties Contest. Certificates will be issued. See Florida Skip for more details. New hams are KN4VSC and KN4VGD. Officers of the Tampa Amateur Radio Club, Inc. are LAW, pres.; DDM, vice-pres.; CE, treas.; YIL, secy.; KM, EWT, CRA, GLZ, GMI, dir. Traffic: (June) K4SJK 769, KDN 270, W4DVR 167, K4LCF 158, W4WAM 155, IYT 98, TAS 73, K4DAS 68, COO 57, BLM 49, BR 40, JCF 40, BNE 37, RZQ 24, JJJ 23, AHW 14, DIT 10, MEW 9, W4RJI 8, K4DRO 7, IWT 5, MTP 5, W4SIZ 4. (May) W4EHW 31.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC; PQW, RMs; AXP and BVE, Pensacola; New PARC officers are K4RO pres.; K4DDD, vice-pres.; K4PIQ, treas.; K4S01, secy. The Ladies Auxiliary president is Mrs. Glen Weeks the XYL of OOW. Guest speaker at the installation dinner was State Senator Philip Beal, brother of EZT, CMW, through ham radio, assisted in obtaining some serum from New Orleans for a soldier at Eglin AFB who was snake bitten. K4KOS keeps 29,560 kc. hot, while mobbing between Pensy and Red Bay. The Panama City and Pensacola Clubs participated in Field Day. The FWB Club held a picnic June 15 at Shovel River Park. The week of June 22-28 was proclaimed Florida Amateur Radio Week by Gov. Collins, through the efforts of OVO, Ft. Walton; New hams in town for the summer are ZVY, 2GRX and #LVS. K4YVQ has received his ticket. UBR, a new ORS, uses a DX-40 and an SX-100. A West Fla. c.w. Net has been established by the RM, BVE. It meets at 1830 CDST daily on 3650 kc. OJD and CEF are among the members. All you c.w. ops please QNT, especially Pensacola and Crestview. AIS still needs 4 more for WAS on 6.

(Continued on page 134)

Bob Henry,
WQARA
Butler, Mo.

Ted Henry,
WQOU
Los Angeles



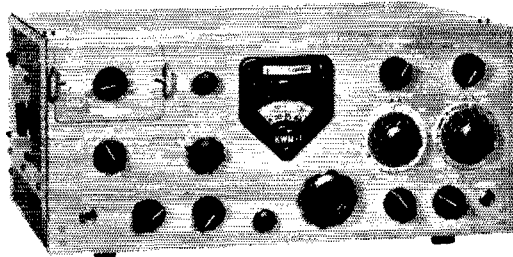
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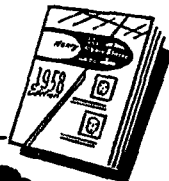
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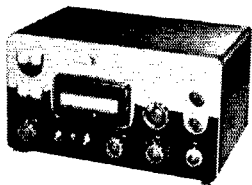
AGM only needs 9. PAA and GMS picked up a new country by working Korea. PQW has been doing an FB job helping Jack Criswell, who is blind, to get started in ham radio. GQM lets us know that Tallahassee is still in the section. Traffic: (June) W4BVE 99, UBR 46, OLD 35. (May) W4DSH 17.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: K4AUM. PAMs: LXE and ACH. RM: PIM. GCEN meets on 3995 kc. at 1830 EST. ON Tue. and Thurs. 0800 on Sun. ATLCW on 7150 kc. at 2100 EST Sun. GSN Mon. through Sat. at 1900 EST on 3995 kc. with PIM as NC; the 75 Meter Mobile Phone Net each Sun. at 1330 EST on 3995 kc. with UH as NC; the Atlanta Ten Meter Phone Net each Sun. at 2200 EST on 29.6 Mc. with VHW as NC; the GTAN each Sat. at 1000 EST on 7290 kc. with K4ORR as NC; the GPYL Net each Thurs. on 7260 kc. at 0900 EST with K4IFF as NC; the Georgia Novice Net Tue., Thurs. and Sat. at 1800 EST on 7157 kc. with K4CZQ as NC. Georgia hams surely are sorry to lose UKX, who passed away June 30 in Macon. K4AIQ was in charge of communications for the AWTAR Powder Puff Derby at Macon. K4DNL and K4KKR, from Atlanta, went down to help out. The GPYL Net now has 31 members with KN4YFW as the latest. The Columbus Amateur Radio Club's new officers are K4PEG, pres.; CVY, vice-pres.; K4BAI, secy.; NYS, treas.; KN4VGI, act. mgr. KN4YIM is a new ham in Cedartown. KN4UW, KN4UNQ, KN4YGY, KN4YIJ, KN4YIE, KN4YHN are new Novices in Georgia. K4IUE and K4TYU are now General Class. Field Day went over great in Georgia with 23 clubs participating. June 23 through 28 was set aside as Amateur Radio Week in Georgia, as proclaimed by the Governor. The Proclamation was presented to CFJ on the State Capitol Grounds by the Governor's Secretary, Tom Gregory. The K4CZR transmitter was set in Rich's Dept. for that week and operated by members of the CSCO and Atlanta Radio Club. Aek Radio donated the receiver. Hams of both clubs participated in installing the equipment. Traffic: K4FBA 802, LVE 277, CZQ 91, W4BXV 38, DDY 37, K4FCI 26, BAI 11, KZP 1.

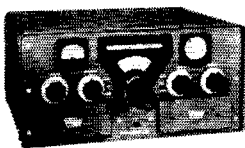
WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA. KD will attend the ARRL National Convention in Washington and will visit son KP4PUJ there. KD's WAS certificate is now endorsed for phone and for 80-, 40-, 20-, 15- and 10-meter c.w. KD has worked 455 KP4s and 70 WP4s. KD has sent in cards for WAZ, DXCC-220 and YLCC. The Caribbean Federation of VP2s are new countries available for DXCC and raised KD's countries worked to 235. W4LEA is the new CAA maintenance chief at San Juan. CK is interim president and RM vice-president of the PRARC. The club paper, *Ground Wave* is being edited by the PRARC board of directors since the resignation of DV. DV is installing a 10-kw. emergency power in the radio shack. WP4ALY also has a 10-kw. plant in his garage. ALY added a 7-Mc. antenna to his collection of antennas for novice bands. AON is using his father's rig on 80 meters. DJ received a QSL from WAR and a Certificate of Merit from the Secy. of Defense for making solid copy of the Armed Forces Day message. ANS burned out the 20-meter trap in the Tribander beam. W2IKX is visiting KP1-Land. AAA is set up on 20 meters from a new QTH. The 3925-kc. Net frequency is beginning to show more activity in preparation for the hurricane season. A law has been passed exempting amateur radio equipment from excise taxes. The Mayaguez ARC Hamfest held at A & M College was attended by 150. AMG moved to a new QTH in Country Club Manor. FD results were poor with the PRARC being almost rained out and bands dead and the Mayaguez ARC rained out. The Ramey ARC sent the SCM a FD message reporting a total of 18 operators with 2 positions and conditions bad. The ROTCARC at UPR was active FD. The UPRARC received a completely-equipped radio truck from the Navy. ACT has joined the Army. The Ramey MARS Net is on 7330 kc. Mon. at 8 P.M. WT's MARS call is AH2AG. KY4BA has a 500-watt emergency plant to run H.W. TBS-50 and 75A-4 and has a new 3-kw. Varian to keep input to the Globe King at 115VAC. Father Carl, KP4EE, at Ponce, wants BCL reports on his new BC station WEUC on 1420 kc. FJ and PQ are teaching amateur radio to the businessmen of Ponce two nights per week at the University. Traffic: (May) KP4KD 2.

CANAL ZONE—SCM, P. A. White, KZ5WA—The CZARA Field Day transmitters made 460 contacts in spite of the fact that 10 and 15 meters were dead a large part of the time to some areas. Viking II transmitters and NC-300 receivers were used under the call KZ5JW/KZ5, with antennas on all bands near the town of Gamboa. A second Field Day station was active at Albrock AFB under the call KZ5AF/KZ5 with 18 operators. JS, our popular MARS director and CZARA Club member, has gone to Atlanta. UJ received his new KWSI in June. VR pinch-hit for BG, CZARA Club president, who was in the U.S. on vacation. W7CZU/MM, W5AXI/MM, K6BUM/MM and W8YXK/MM all visited

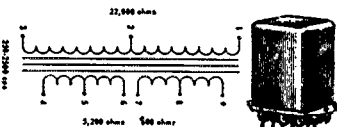
(Continued on page 136)



JOHNSON Viking "Thunderbolt"
 Delivers solid communication power—over 2000 w. P.E.P. input; 1000 w. CW; 750 w. AM linear; in a completely self-contained desk-top package. Continuous coverage 3.5 to 30 mc.—instant bandswitching. May be driven by the Viking "Navigator", "Ranger", "Pace-maker" or other unit of comparable output.
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Amateur Net (Wired & tested) \$589.50



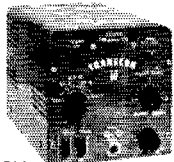
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Amateur Net \$595.00



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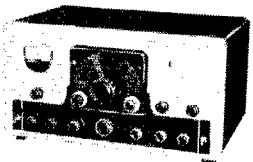


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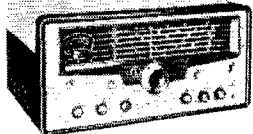
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 Weston 1 1/4" sq. (ruggedized) 0-100 μ a. **\$4.50 ea. 2 for \$8.75**
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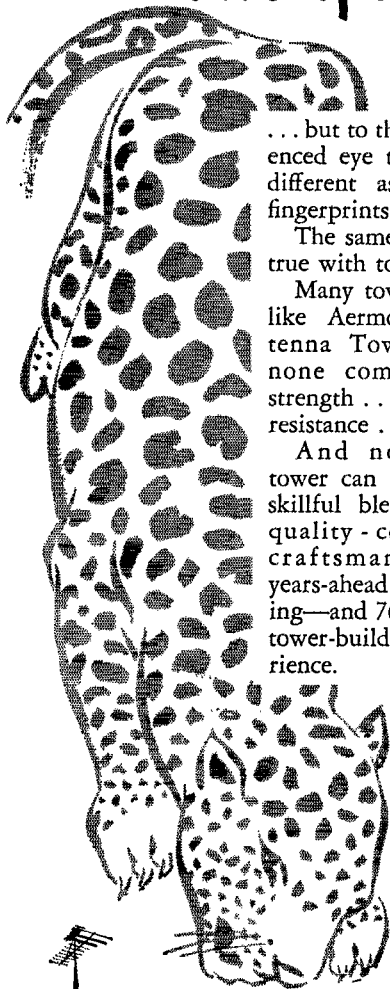
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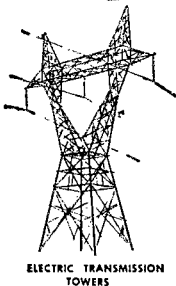
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here in June and July. K4CUH from Orangeburg, S. C., attended the CZARA Club meeting in July. Mr. Vincent Biava, of the Dredging Division, was guest speaker at the CZARA July meeting. His subject was "Toastmasters International" and its activities and purposes. Traffic: KZ5KA 69, HO 51, VR 22, RM 15, WA 12.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. P.A.M.s: K6BWD and W6ORS. R.M.s: W6BHG and K6HLR. BPL was earned in June by K6HLR, K6MCA and W6GYH. Congrats, fellows!! The L.A. section will miss K6KZY, who has moved to Michigan. K6MCA is looking for traffic skeds on any band, and now has 4 operators. W6GYH won a 4CX300A at Fresno! New officers of the San Gabriel Valley Radio Club are W6SRE, pres.; W6UXV, 1st vice-pres.; W6GMC, 2nd vice-pres.; W6BUK, secy.; K6OON, treas. K6QGD has been reelected as treasurer of the LAYLRC, and is recuperating from an operation. A speedy recovery. Jean, K6EA is QRL working around the house. K6OZJ received GMTEC. Congrats, Jack! W6USY is building a cabin at Big Bear Lake. K6BWD is taking a nice trip around the country. Field Day was a big operation all around the section, and a great time was reported by all. W6BEG is sporting a new Heath reflected power meter. New officers of the Rio Hondo Radio Club are K6GIP, pres.; K6VET, vice-pres.; K6YFH, secy.; W6UKC, treas. A large group from the L.A. section attended the Fresno Convention and reported a fine conclave. New Officers of the Tri-County Amateur Radio Assn. are K6DQA, pres.; K6VFG, vice-pres.; K6JYR, secy.; K6LHA, treas. Support your section nets! On phone, the Southern California Six Net; on c.w. the Southern California Net on 3800 kc. at 1930 daily. Traffic: (June) W6GYH 849, K6HLR 811, K6MCA 699, K6OZJ 302, W6BHG, K6KZY 188, K6EA 60, K6QGD 60, K6GCC 26, W6USY 26, W6SRE 12, K6BWD 4, W6AM 2, W6LVQ 2. (May) K6HSQ2.

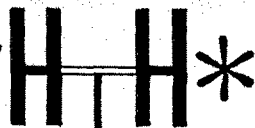
ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: YWF. PAM CSN: 3895 kc.; NYT. Field Day saw a large number of groups out in the field. We received messages from Prescott RC BKP/7, Catalina RC WUC/7, Arizona ARC 10/7, Scottsdale IXH/7, Douglass KAE/7 and CAF/7. We also heard that Yuma, Tucson, Mesa, NYN/7, Phoenix V.H.F. Club, and several groups from Phoenix in the Payson Area also were active. PLW reports that the Phoenix V.H.F. Club has over 50 stations on 6 and 12 on 2 meters in the Phoenix Area. New officers of the club are DIQ, pres.; AGG, vice-pres.; and GGJ, secy.-treas. The club station, K7DAW, in the Red Cross Bldg., is being operated on 6 and 2 meters. V.h.f. hams within 100 miles of Phoenix who need help with their equipment may contact DIQ or K7BAM at P.O. Box 6602, Phoenix. Traffic: W7OIF 11.

SAN DIEGO—SCM, Don Stansifer, W6LRU—4CKB is now in Chula Vista. The Helix Club was nearly blown out of the Laguna Mountains during Field Day when winds reached over 45 miles per hour. CAE vacationed in Canada and the Pacific Northwest. K6BEC was home from M.I.T. in Boston and worked at Convar during the summer. K6DRR, ex-K6BAWB, is now a San Diego resident. The South Bay Amateur Radio Society celebrated its first birthday in July with a pot-luck dinner. ZVQ is the proud father of a girl. K6KGS talked to his father, a Navy captain, when his father was at BVIUSC. CHV is now up to 232 countries. Plans for the Division Convention to be held Oct. 10-12 are now completed. From all indications it promises to be the best and largest ever held in this area. Plan to attend this outstanding amateur event. All clubs in San Diego, Orange and Imperial Counties are invited to have their secretaries send their SCM news of activities for this column prior to the 7th of each month. This also applies to individual amateurs. With summer now over and school opening soon, it is hoped that more news reaches the SCM so this column can be of more general interest to the entire section. Traffic: W6EOT 331, KN6IYK 206, W6SK 94, W6DFR 31, K6EQL 10.

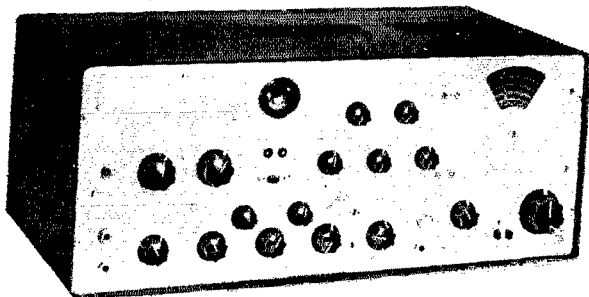
SANTA BARBARA—SCM, Robert A. Hemke, K6CVR—W6CEM gave an FB talk about tuned circuits to the Santa Barbara Radio Club. He did a fine job of explaining the all-too-mysterious pi-tuning. At the Fresno Convention we saw W6HUT, W6IHD, W6FYW and W6JFP from the Santa Barbara section. K6VDW's jr. operator received his Novice ticket with the call WV6AEX. W6BRY and W6MKQ are keeping skeds on 2 meters. A strong wind snapped one of the top guys on W6FYW's 2-meter beam and he had horizontal polarization for awhile. Fortunately it was discovered in time and the beam was saved. W4QA/6 is now W4ACQ, the first to receive a WA call in the Santa Barbara Area. K6DXV sold the a.m. mobile rig and is going s.s.b. mobile. K6KPU is installing a Viking mobile rig. K6BVZ made an FB 2-band mobile s.s.b. transmitter for 80 and 40 meters from a surplus Command transmitter. K6IU is

(Continued on page 138)

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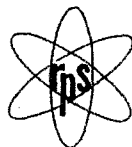
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WEST GULF DIVISION

NORTHERN TEXAS—SCM, Ray A. Thacker, W3TFP—Asst. SCM: E. C. Pool, 5NFO. SEC: BNG. PAMs: K5AEX and IWQ. RM: ACK. BNG, of Ft. Worth, has been declared your new SCM of Aug. 10. I was extremely pleased with this information because I know that Les will do an outstanding job as SCM, as he has done as SEC. The Central Texas ARC recently sponsored a "family picnic" at Lake Waco. K5DNQ is now on phone with a Globe Scout. MBB has joined the s.s.b. fellows. BFK is on the road to recovery after surgery. KN5RGA is new to the hobby from Muleshoe. EVS keeps busy with overseas traffic. The San Angelo ARC's new officers are K5HOT, pres.; K5IRQ, vice-pres.; KN5LTM, secy.; K5MGH, treas.; RSV, activities; K5CNB, EC. Look forward to the Third Annual Hamfest in Waco. The date, Aug. 31. The CTARC members are wonderful hosts and hostesses. I was very pleasantly surprised to receive so many Field Day messages this year, the largest number in the three years I've been SCM. I must admit, however, that apparently our ECs are missing a bet. There were a great many non-AREC members participating. Come on ECs, let's get after all hams in your county to fill out a Form 7! It becomes necessary to remind you again that the deadline for this column is the fifth (5) day of the month. Please pass on your traffic and news reports in time! Traffic: W5ACK 612, K5KBH 506, W5SMK 155, K5HGL 134, W5BKH 128, AYX 43, GY 40, TFP 39, K5JZK 29, DNQ 27, PXV 23, W5LR 22, K5LL 17, W5RVI 10.

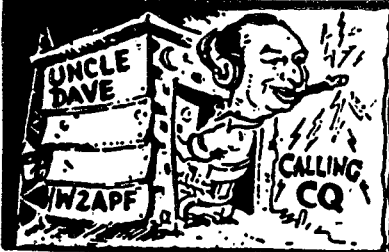
OKLAHOMA—SCM, Richard L. Hawkins, W5FEC—SEC: LXH. PAMs: MFX and K5INC. RM: JXM. Field Day 1958 was widely participated in by the Oklahoma section. Many sent messages to the SCM for the extra points. New officers of the Lawton-Ft. Sill ARC are RDK, pres.; KS, vice-pres.; K5DLP, treas.; K5MIF, secy. KN5OXF removed the "N" while on vacation. PWN enjoyed a vacation in W0-Land at Denver. New officers of the Bartlesville ARC are YKB, pres.; K5HZF, vice-pres.; and K5EZZ, secy.-treas. K5INC finally hooked up with a Nevada station for No. 48 and WAS. Enid has a new XYL ham, KN5REU. K5CAY has a new HT-32. A new Novice in Bartlesville is KN5RIP. HIM, in Fletcher, renewed his ticket after several years' lapse and received his old call. Please remember, the 5th of the month is the deadline for items in this column. Oklahoma's Ham of the Month: MFX for his excellent work as PAM. Traffic: K5CAY 187, JCB 151, INC 49, W5FEC 42, CCK 33, KY 30, JXM 25, K5CBA 20, W5GOL 17, MFX 15, FKL 12, VLV 8, PNG 7, ERI 6.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF. RM: FCK. PAM: ZIN. EV, MSA and QKF attended the South Texas Emergency Net Convention in Kerrville. QKF, ETA and QEM visited the El Paso Amateur Radio Club on June 27. RPH and his XYL are back in Corpus Christi. It is Silent Keys for AEP. New calls around El Paso are KN5QFD, KN5QON, KN5QOH and KN5QMI. New OBSS are MVL and K5LEY and new OOs are K5HSA and MVL. AIP is the new EC at Houston. K5PFF has dropped the "N" from her call. New calls around Houston are KN5RFO and KN5RDY. K5PEQ is the new EC at Baytown. There was lots of activity in Southern Texas on Field Day. The Corpus Christi Radio Club operated 8 transmitters from Rattlesnake Point. The Houston Amateur Radio Club had 27 AREC members operating from the Park in Houston. The Magic Valley Radio Club operated from the southernmost tip of Texas. The El Paso Amateur Radio Club operated from Cloudcroft, New Mex. The GAYLARKS Club from Houston operated 3 transmitters from Bryan, while the OMs did the cooking and kept the antennas up. The Harlingen Air Force Base Radio Club is going 2 meters with an antenna 75 feet in the air. K5LJL has dropped the "N" from his call. HQR has gone S.S.B. DSY has moved to Dallas in Northern Texas. Traffic: (June) W5UMY 300, EDG 109, ZIN 74, K5DER 24, JCC 4. (May) W8PHA/5 428.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCM: Aaron Solomon, IOC. SEC: AEB. Field Day conditions proved to be a disappointment to many Maritime clubs but it must be remembered that the full results of the contest cannot be judged by scores alone. Members of the Sydney Club are progressing rapidly with their club house project. W1EOP, often heard operating mobile VE1, has recovered from a severe operation. ZR. WL and W1QCC/VE1 are sporting new 50-Mc. five-element beams. IK has joined the ranks of the 6-meter group. New appointments include VE1PZ as ORS. Many ARRL appointments are now open. Please contact this office for information. I would like to take this opportunity to

(Continued on page 140)



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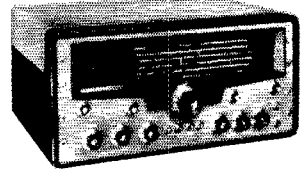


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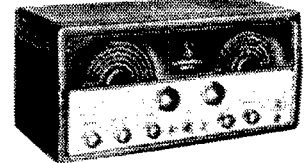
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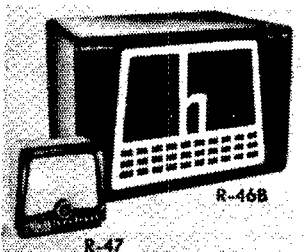
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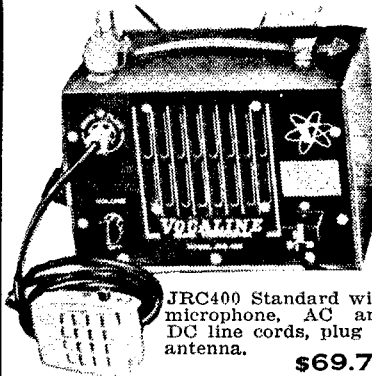


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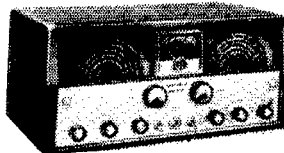
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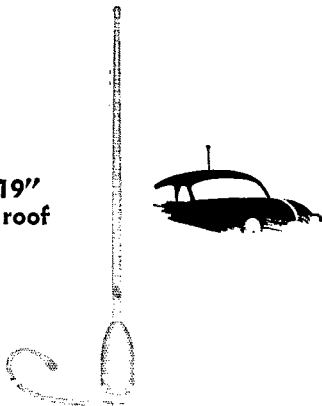
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thank those who have been so consistent in their reporting of events and happenings in their areas. We still can use more information. This is YOUR Column and the best way to make sure it is kept interesting is to make certain that YOUR reporter is kept informed. Please address all correspondence to R.R. 3 or P.O. Box 1312, St. Stephen, N. B. Traffic: (June) VE1OM 13, PZ 13, AEB 11, (May) VE1FQ 56.

ONTARIO—SCM, Richard W. Roberts, VE3NG—This report, being written at the end of June, will find many of our members and readers very tired from participation in the Annual Field Day and the North Bay Hamfest. The two occurred the same week-end. ARRL FDs are on the fourth week end of June. EIL, ex-2XB, is back on the air after 7 years. His QTH now is Hamilton. Many old friends were at the Bay. Some of those seen were RW, KM, JX, RG, DEX, AMT, RH, EAW, AQB, DVO, DZA, DPO, GH, CJM, AWC, BVP, DKO, ASA, VZ, 2BE, 2HI, DTB, DQL, BOV, NG, BAX, etc. DVU is manager of the Muskeg Net. The Hamilton RC is hard at work on the ARRL Ontario Division Convention to be held Oct. 18. The Scarborough RC is conducting class instruction for would-be hams. The Northtown Club has instructed over 100 in a similar project over a period of twelve years with all passing the exam. The Sarnia C.D. was a FD competitor this year. Many others also were using c.d.-loaned equipment. Hot news: AEJ has a vertical antenna and worked a UC2KAK on 14 Mc, as his No. 1 contact. Also, it was on his first CQ. The Scarborough RC is running FB hidden transmitter hunts. Likewise, the Westside V.H.F. RC is running a summer contest for its members. This club has been in existence for twenty-one years. Is this the oldest club in Ontario? 3DFU worked PJ3AA. ARUBA. Much interest is being shown by Ontario Hams in boat mobile installations. Some of those already operating on Canadian Waters are as follows: TX, NG, AGA, DZA, DVO and D/TO. Traffic: VE3DCX 170, BUR 110, NG 102, AUU 77, DPO 70, EUH 66, KM 66, DTB 61, ELU 50, NO 46, RH 35, AML 27, DZA 22, RW 10, CF 8, AVS 2.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Fall activities will be starting up again and it would be encouraging if more stations would take an active part in traffic nets. For c.w. try OSN/PQN, 3535 kc, at 1900. For phone: Quebec Phone Net, 3780 kc, at 1845. Many groups took part in Field Day activities but results were meager because of exceptionally poor conditions. BG enjoys talking to VKs and ZLs via s.s.b. EC renewed his ORS appointment. YF is Official Observer and is taking an active interest. ATQ now signs JZ. AGN is busy rebuilding his operating layout in the basement. APC is listening on 2 meters with a new eight-element Telrex Yagi. AXZ has joined the cubical quad boosters. A visit to AIO's QTH revealed an imposing antenna farm. Dipoles on 55-ft. towers are proving very effective on 20 meters. A new quad is being hoisted on top of one of the towers. QC and QH are active on 20 meters. AOV also favors 20 meters where he has been observed with a very acceptable signal. Traffic: VE2DR 68, EC 60, BG 25.

ALBERTA—SCM, Gordon W. Hollingshead, VE6VM—PAM: OD, NC, QE and NQ were active Field Day stations with 8, 5 and 13 operators, respectively, participating. Alberta representatives at the Arnprior C.D. Center June 23-27 were WT, MJ, ON and RE. EE, QS, PQ, ZL, SO, TF, VK, HG and WT conducted a series of amateur radio demonstrations at the mammoth Scout Jamboree July 7-10. PV reports the Lethbridge ham class wound up with 18 candidates sitting for the exam. Traffic: VE6HM 241, OD 8, PV 7.

SASKATCHEWAN—SCM, Lionel O'Byrne, VE5LU—TH was a recent visitor to W6-Land and is rebuilding the mobile for 75, 20 and 10 meters. HR and VL are mobile on 144 Mc. Saskatoon has 4 mobile and 3 home stations on 2 meters. LM has a 75A-4 receiver and 144 equipment. DU has a new 10-meter beam. K5LOQ was a recent visitor at HR's. We regret to include among Silent Keys 5GD, who passed away very suddenly, and 7FF, an ex-VE5. JK, BU and GI are on 144-Mc. phone with 20 watts to a 2E26, using a Collinear antenna. NA was seen in Regina and district. QL, our PAM, reports that activity on phone is low. Traffic: VE5LM 28, RE 12, DS 11, HF 4, QL 4.

Two-Band Halo

(Continued from page 12)

Tuning up at 145 Mc., for example, will give quite satisfactory operation from the low end to 146 Mc., the halo being much broader in frequency response when it is operated on its third

(Continued on page 142)

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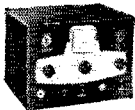
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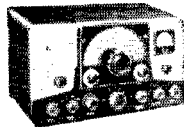
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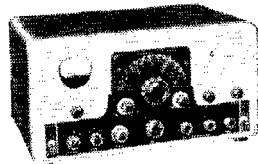
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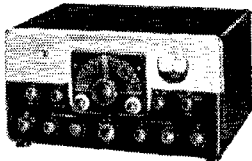
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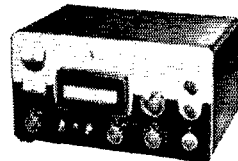
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Convert to Fone With the Universal Modulator UM-1



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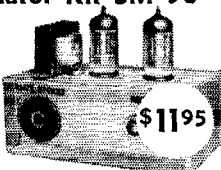
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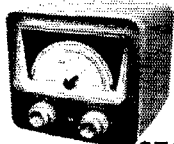
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harmonic. In our model the series capacitor in the gamma arm was at about the middle of its range for 50 Mc., and near minimum for 144 Mc. Slight differences in mechanical construction may change the value of capacitance required, so these settings should not be taken as important.

The closeup photograph shows a dodge we used to avoid carrying a spare insulating cone around in a pocket, running the chance that it would be missing when a band change was to be made. The head was cut from a 6-32 screw, leaving a threaded stud about 1/2 inch long. This is screwed into one of the ceramic cones. The other cone then serves as a nut, to tighten down the capacitor plate. In changing bands we then merely swap cones.

Results

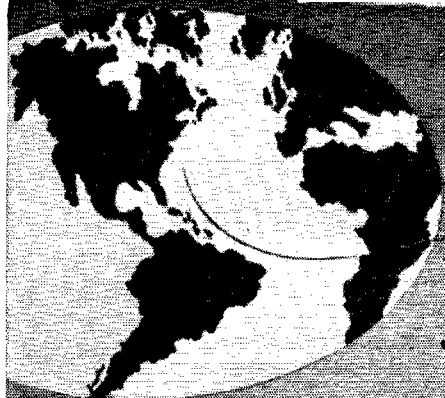
Extensive tests have been run with the 2-band halo on both 6 and 2 meters. Several contacts over skip paths of 1000 miles or so have been made on 6, using less than 3 watts power output. Ground-wave coverage is considerably greater than is possible with a vertical whip. For those who may not be familiar with what can be done locally on 6, here is an example of typical coverage. Calling CQ upon leaving Coventry Lake, 20 miles east of Hartford, we raised W1FVY, in the capital city. The contact was maintained without loss of a word, through the 45 miles of hilly country driving, from Coventry to the home location of W1HDQ, nearly the same distance to the west of Hartford. Signal reports received average some 10 db. above those obtained with a vertical whip, but on receiving the effective margin is much greater than this, as a result of the far better signal-to-noise ratio obtained with horizontal polarization in mobile work.

On 144 Mc. an extra dividend accrues from the fact that our two-band halo is a larger antenna than even a horizontal dipole for 144 Mc. In some previous tests we had found that a half-wave dipole was appreciably better than a 144-Mc. halo. There was some directional effect from the dipole, but in mobile (actually in motion) work it did not seem particularly important. Much of the signal received in a 2-meter mobile setup is scattered from trees, buildings, hills and the like, so it seems to be coming from several directions at once. In stationary tests of the 2-band halo we oriented a dipole for best signal, and then switched to the new halo. An increase of several db. was reported in nearly every instance, and the two-band halo was at least the equal of the horizontal dipole every time. Either is way ahead of a vertical whip, in work with horizontally-polarized stations.



Proving the superiority of phone over c.w., K1EIT was able to get his pet alligator to give a short croak over the mike during a QSO with K1BAO.

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Viking Adventurer

(Continued from page 23)

Results

With the rig modified as described, the author has had good results on 6 from his home location in middle Tennessee. In one good band opening May 21-22, 1957, 17 states in 7 call areas, from Maine to Texas, were worked, with a "4-element beam only 15 feet off ground. Signal reports ran as high as 20 db. over S9. When "20 db. over S9" is translated, it comes out as "100 times as strong as an extremely strong signal" so you can see that the modified Adventurer does all right!

One word of caution; the use of 8-Mc. crystals in a simple circuit like the one in the Adventurer just about guarantees that multiples of the crystal frequency will appear throughout the television frequencies. Taking care of the TVI situations that can develop is beyond the scope of this article, except to warn the potential user that equipment such as this, connected directly to an antenna, is an open invitation to trouble in a congested area where either Channel 2 or Channel 6 is in use. TVI causes and cures have been treated extensively in *QST* and *The Radio Amateur's Handbook*.

This is not to imply that the Adventurer is worse than other transmitters as regards TVI. In fact, it may be better in many instances. It is well shielded, and if coaxial output is used the customary TVI-prevention devices can be employed to good advantage. So, if you'd like to get on 6, and the d.c. bands as well, this is about as cheaply as you can do it and still work out well.

Match, or Not To Match?

(Continued from page 15)

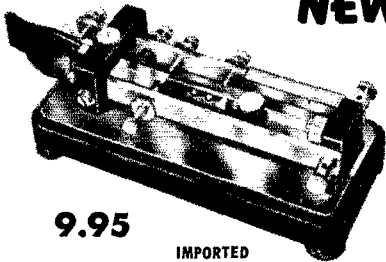
to believe that these should be very different than with 14- or 28-Mc. operation.

At 7 Mc. the antenna is also not self-resonant. Here is a "short" antenna, and its behavior is different than at 21 Mc. On 7 Mc. the reactance is about 100 times as large as the resistance, resulting in unreasonably high standing-wave ratios: about 280 with 300-ohm line and about 1000 with 75-ohm line. Neither of the methods of calculating losses which we have discussed can be used, but it is plainly evident that the losses must be so high as to make the antenna virtually useless with either type of line. Moderately satisfactory operation could be obtained by inserting loading coils to tune out the 1000 ohms of capacitive reactance. Then the line losses would be greatly reduced. However, the loading coils would represent an additional source of loss. Probably the highest Q obtainable for the coils would be about 400, and with this Q the coils would have an equivalent series resistance of 2.5 ohms. A better match would be obtained with the 75-ohm line, with which S_v would be 5 and the line loss D would be 0.6 db., while the loss in the coils would be another 0.8 db. With 300-ohm

(Continued on page 146)

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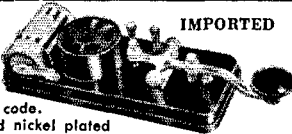
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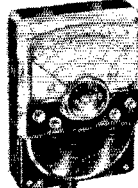
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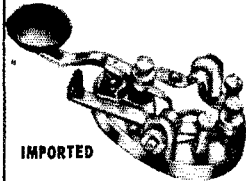


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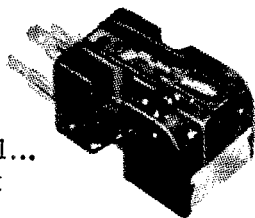
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Frequency response . . . 30 to 20,000 cycles; flat within ± 1.5 db in fundamental stereo range of 30 to 7,000 cycles.

Channel separation . . . in excess of 20 db.

Uniformly high compliance . . . superior tracking throughout frequency range.

SPECIFICATIONS

Diamond stylus 0.0008 inch radius
Recommended needle force 5 to 7 grams
Compliance, lateral and vertical . . 2×10^{-6} cm/dyne
Open-circuit output voltage 0.4 volts ± 3 db
Extended stereo range at ± 2.5 db . . 30 to 16,000 cps

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line and with the loading coils in use, S_0 would be 20 and D would be 1.1 db. The loading coils would be effective in reducing the reactance to negligible values only over a narrow band, probably about 100 kc., and for operation over a wider band the coils would have to be readjusted. This calculation has demonstrated that the use of such a "short" antenna without loading coils is undesirable, while with loading coils there are several undesirable features. Thus the use of such an antenna should be limited to situations where space is extremely restricted, as in mobile work.³

The antenna chosen for this second example is not entirely fictitious. One which we have used the past several years conforms approximately to this description except that ours is vertical, and the upper half is a war-surplus whip. On 14 Mc. it has been our old stand-by, mainly the one with which we hammered out a DXCC with powers not exceeding about 175 watts. On 21 Mc., in spite of its unorthodox nature, it loads very easily. It may not be the best antenna that can be built for this band (recently we have supplanted it with a miniature two-element beam which we hope to describe in a later article), but with it we have been WAC and have worked quite a bit of DX with little difficulty, some with only an 807 in the final. Since conditions became good on 28 Mc. most operation on that band has been with a beam, but when this antenna has been used it has got out quite well. And there was the time when for a joke we called a JA with 50 watts to an 807 — but the joke was on us because he came back on the first call and gave an S8 report!

³ The author here has in mind the solid-dielectric type lines that have been the subject of discussion in the article. With open-wire line — i.e., parallel-conductor line using air or essentially all-air insulation — the line losses are not unduly high even with very high standing-wave ratios. Such a system requires tuned coupling at the transmitter, so the fact that the band width is narrow is not too great a handicap since the system can be easily re-resonated when the operating frequency is changed. — *Ed.*

Image Transmission

(Continued from page 36)

riage, operated by a cam arrangement. This permits the 908-A to be moved back to allow a slide to be inserted, and to be moved forward under spring tension directly against the slide for scanning. This relatively elaborate arrangement has proved unnecessary in practice. Satisfactory results are obtained by rigidly mounting the tube so that there is just enough space to insert the slide between the face of the tube and the aluminum plate which backs up the slide.

Since it is impossible, because of the thickness of the glass covering the face of the tube, to lay

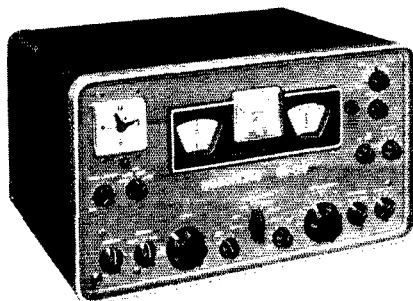
(Continued on page 148)

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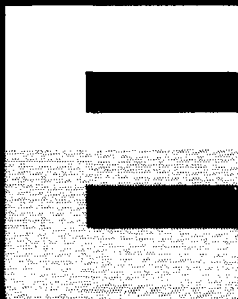
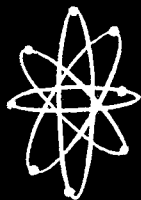
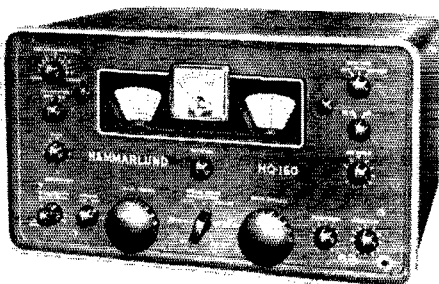
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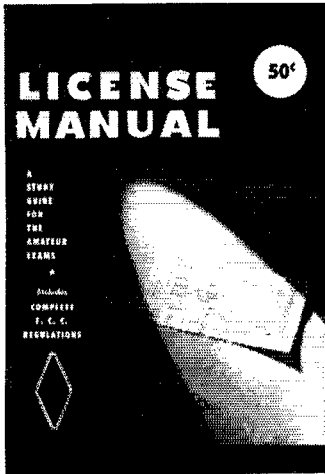
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the negative directly against the phosphor in the 908-A, some parallax is present which could reduce the scanner resolution if precautions are not taken to minimize the effect. To help the situation, the 931-A was mounted about 8 inches from the face of the scanner tube, and the glass envelope of the 931-A was painted black, except for a $\frac{1}{2} \times \frac{1}{2}$ -inch square section in front of the cathode which was left clear. The angle formed by imaginary lines drawn from the extremes of the exposed cathode area to the spot of light on the scanner is kept small in this way, thereby keeping down the parallax.

Conclusion

The equipment just described is certainly not the ultimate in design, but represents the first attempt to get a system of this type operating on the ham bands. Because of this, the experimenter has a wide-open field for originality in his circuitry, and all who are interested in constructing a system are urged to become familiar with the techniques employed in conventional TV, since many of them can be adapted for slow-scan use. An acquaintance with oscilloscopes, especially the direct-coupled variety, also would be valuable. While the amplitude-modulated audio-sub-carrier method of modulation used in this system has the dual advantage of simplicity of circuitry and versatility of application, it is also technically possible to use the flying-spot scanner output to amplitude or frequency modulate an r.f. carrier directly. The experimenter may therefore want to make his equipment flexible enough to conduct these tests. Use that good old ham ingenuity, because this is an opportunity for amateur radio to make a real contribution to the art.

Acknowledgments

Thanks are extended to Dr. H. A. Romanowitz, Head of the Electrical Engineering Department at the University of Kentucky, whose cooperation and support made this project possible; and to K4KYY, K4HBG and PJ2AO for the help they gave with the air tests.

High-Level Mixer

(Continued from page 30)

The coaxial tank circuit for this purpose is easily built. K6GFI uses a flashing-copper rectangular tank $1\frac{3}{8}$ inches square and 10 inches long. The inner conductor is quarter-inch copper tubing, tuned with a 50- μ f. APC-type padder. The input and output coupling should be as loose as possible, to provide maximum rejection of unwanted frequencies. Loops may be No. 14 wire, brought out through coaxial fittings, about two inches up from the cold end. Their position with respect to the inner conductor is adjusted to give the desired rejection characteristics.

The 6524 is operated at 300 volts on the plates. It draws about 50 ma., which is much less than the plate dissipation rating of the tube. Screen

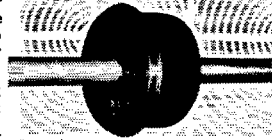
(Continued on page 150)

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Three-Element Mini-Tribander

The 3-Element Mini-Tribander is extremely lightweight, only 39.8 lbs. With a turning radius of 13' 10", this space-saving beam may be installed almost anywhere, yet boasts most of the features of the hy-gain full-sized trap tribanders.

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Construction

Boom is 1 1/2" dia. by .065" wall thickness, hot dipped galvanized steel. Elements are 6061T6 high strength aluminum alloy. Telescoping sections of 1", 1/2", 3/4" 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.

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current is about 4 ma., and the grid current 3 ma. At this level, more than adequate driving voltage is available for a pair of 4X150As operating as an AB₁ linear amplifier. Higher-powered radial beam tetrodes of the same general type could raise the power level to the legal limit.

Details of circuit constants other than those given above were not included in the information we have from K6GFI. The experienced builder of v.h.f. gear should have little difficulty in building suitable tuned circuits by referring to similar applications in the v.h.f. chapter of the *Handbook*. Increasing the diameter of the grid coil over that given for a similar 144-Mc. circuit should take care of tuning down to 130 Mc., though probably most 2-meter tank circuits would tune that far anyway.

— E. P. T.



September, 1933

... *QST* twenty-five years ago ran to eighty pages and contained complete info on the revised amateur regulations which went into effect on October 1. Phone bands were widened, and filtered d.e. was required on 160, 80, 40, and 20 meters. Amateur mobile operation was permitted, but only on the v.h.f. Class A, B, and C licenses replaced the Temporary, First Class, Extra First Class, and Unlimited Phone. These, of course, are just the highlights of what were extensive changes.

... In line with the new regs, the ubiquitous Mr. Grammer told us how to build plate supplies to conform to them. ... W2NB discussed an inverted ultraudion amplifier, while Ross Hull described some featherweight sets for the v.h.f.

... On the operating side, it was reported that the 10-meter band was still holding up, while Handy reported on the first annual Field Day. It was described as a great success, with some 50 logs received. (*This year we expect maybe 1100!*)

... A technical note in the back of the issue called attention to a new receiver technique by John Reinartz, using a squeezing oscillator to obtain super-regeneration.

Strays

ZS1BW is forming a Silverleaf DX club in Capetown and wants local hams to contact him. (He says *QST* is the best way to get the word around!)

W6UQC agrees that while the term "73s" is somewhat redundant, perhaps there would be no objection at all to "88s."

W5TIK has been an Internal Revenue Agent for nearly 30 years, and wonders if there are any other agents who are hams.

One of W3YOH's vociferous neighbors says that not only does he hear the voice of W3YOH on his TV set, he also sees his picture! — *KN3DPD*

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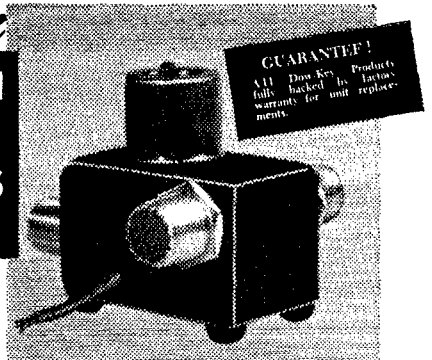
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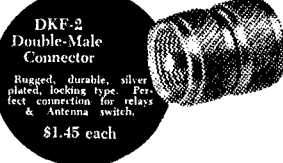
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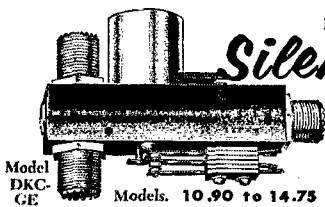
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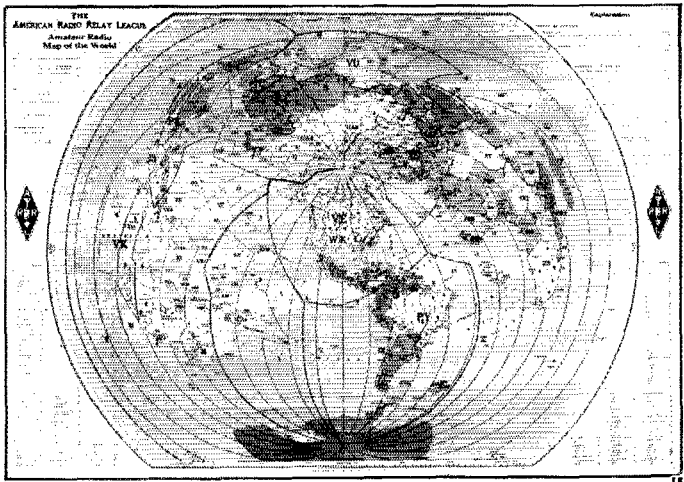
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How's DX ?

(Continued from page 75)

s.s.b.er KX6NB shut down and headed out for civilization after five years in these tropics. KC6AN is heard on 20 c.w. from Guam and the Trust Territory using the calls KH6CV. KC6. KG6. KXG while traveling as an electronics technician for the Weather Bureau. "YJDL says he's active almost every day starting at 0800 GMT." remarks 14-Mc. c.w. specialist W1TS. K2QXG hears that ZL1A1 sent an s.s.b. exciter through VR2AP to VK9AD of Norfolk Isle. The frequency to watch: 14,305 kc. OVARA reports KP6s AK AL and AM to depart Palmyra-Jarvis shortly. Hey! WGDXC finds Cocos candidate VK9LE scheduling VK6MK on 14,185-kc, phone each Sunday at 1200 GMT. The "How's" grapevine. Ws ITS 1VG 2JWK 3BSF 9YNB, VK2AGH and club sources, report that VK2AYJ encountered punko conditions on his initial July junket to Lord Howe. Meanwhile VK2FR, the island's permanent ham population, does intermittently brisk business on 20 c.w. around 0900 GMT. WGDXC learns that Chatham's ZL3VB intends to work 14 Mc. with a 100-watt supply by W7s EJD and PHO. Also that FK8AS investigates possibilities of an operational jaunt to Wallis where he already has permission to radiate.

Europe — Continental DX certifications of possible interest to the readership: Sea of Peace (SOP) diplomas based on confirmed July '58 QSOs with such Baltic countries as DL DJ/ DM LA OH OZ SM SP UA1 UA2 UP2 UQ2 and UR2 are offered by the DM Contestburo, DM2ABB, Post Box 185, Schwerin (Meckl.) D.D.R. Worked-All-LA (WALA) is a tapestry available world wide and is issued by NRRL, P. O. Box 898, Oslo, Norway. Rule 3b calls for evidence of contacts with twenty different LA stations and at least six of these must be located north of the Arctic Circle. QSOs prior to January 1, 1950, do not qualify. ART's Radio Club of Cremona announces a "Cremona Stradivarius Award" for W.K.VEs and others who hook two Cremona stations between September 10th and 30th. This drapery is geared to coincide with Cremona's XIII Fair festivities. 11s AK AZN BEM BMF BWN C1F COR FE FH RMO SZH TAM TC THZ TMX ZAY and ZBD are QSO possibilities. Check with the club at Box 144, Cremona, for more specific specs. SM5CQH is responsible for a "1959 Low-Frequency Award" formulated on 40- and 80-meter long-haul proficiency after the 1st of January. Drop Styrbjorn a line for the total tale. OVARA's *Ether Waves* mentions that one UA1KWT is said to have operated from Franz Josef Land in June. W6YY and others confirm that F8FC & Co. have deferred their Andorra PX1FC plans till next summer. HE9LAC tells WGDXC friends that South Dakota and Utah would conclude his WAS project. W7AMM, stationed in Italy, is making overtures preliminary to a possible San Marino foray this autumn. K9CPW's letter from SM4UW bemoans the high impossibility of DX work at his Krylbo location thanks to spurious radiations from near-by 16,000-volt electric railway mains. "Even our nearest BC station has trouble overriding this noise with 200 kilowatts and must feed its programs into local homes by wire. Despite all this I have managed 87 countries since June of 1957. Next fall I'm moving to another town, a much better location for DX." DJ3OE gets a bang in working W/Ks with a two-watt v.f.o. while revamping the 400-watt line. Regarding his 1959 Svalbard tenure LA2JE/P writes WHICP: "The layout will be the same except for a different receiver, an old Sky Ranger designed for 110-volt d.c. My rig will be the usual 20-watt outfit with 61.6 p.a." One revolting development recorded by G3s AAE BQR IFB and JUL while signing GC3AAE on Alderney this May: "On our seventh day the local electricity authority decided to carry out plant maintenance and arbitrarily cut off the mains supply from dawn till dusk. This was a bit annoying — especially coming at the week end when operation could have been at its peak — but there was nothing we could do about it. Luckily it was a bright and sunny day so we were able to go exploring the more distant parts of the island." W6YY discovered EA6AF visiting Six friends while absorbing CAA training in San Francisco. Bart, a Spanish Air Force captain, will be back in the Balearics next month to add to the 700 contacts he has collected on DX bands since 1949. GM6UC/m easily works into California on 15-meter c.w. with a 30-watt erenconed in his English Ford.

South America — On your mark for Brazil's LABRE DX Contest scheduled over the first and second week ends of September, c.w. and phone respectively, 0001 GMT Saturdays through 2400, GMT, Sunday. The customary 579001 and 449002 RST-QSO numbers will prevail, the T being omitted on phone, of course. Contacts between amateurs (a) in the same country count zero points but are permitted for the purpose of obtaining multipliers; (b) in different countries outside the American area each count one point; (c) in different countries in the American area each count two points; and (d) in the American area and

(Continued on page 154)

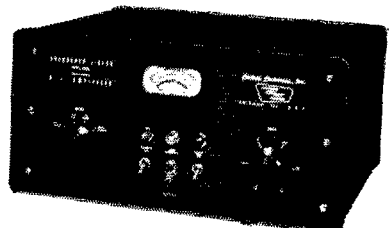


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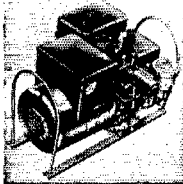
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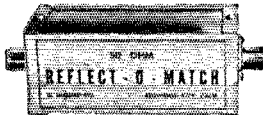
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in all other countries of the world count three points. In other words, anybody can work anybody for contact points, multiplier credit, or both. Only the 3.5 through 50 Mc. bands may be used. LABRE's "American area" agrees with ARRL Countries. Contact entities in North and South America. Multipliers: one for each American-area country and one for each Brazilian call area (PY1-9) contacted per band. Multiply total QSO points by total multiplier for score. Certificates for first and second place in each country in single- and multiband (three or more bands) categories when your log, postmarked by November 30, is received by the LABRE Contest Commission, Caixa Postal 2353, Rio de Janeiro, Brazil Brazil's island-hoppers continue to bask in the DX spotlight. PY1CK writes, "I hope to be back on Trindade in August or September again as PY0NA along with PY6NB (PY2CK) and PY0NC (PY7AN) and possibly others. Operation is planned with two stations on a.m., s.s.b. and c.w." The site is the Brazilian Navy's IGY base on the island. Meanwhile, down on the ranch at Fernando de Noronha, we find resident PY7s and other visiting PYs kirding for a flurry of fall operation on several bands The Radio Club of Chile notes that CF2s AB BM and DJ inhabit Juan Fernandez archipelago some 400 to 500 miles west of Valparaiso. "These stations are seldom active due to difficulties with the electric current. They communicate with low power (around 25 watts) with amateurs in Valparaiso and Santiago on 40-meter phone whenever conditions permit." CE3AG and fellow members mul over possibilities of a high-efficiency multiband DXpeditionary assault that will put Juan Fernandez on the ham map with a flourish Under the auspices of VP2VB, W3BSF, YVs 3BS and 5GO, Aves Island shone as YV6AB on several bands, phone and c.w., in early July. VP2VB's Yasmie II sailed the crew in with a full killerwatt. Stops at the British Virgins and other Caribbean points followed A personal visit from TI2GO intrigued W8JIN and OVARA brethren concerning a possible club Cocos (TI9) coup W2HMJ finds W6GTO banging away on 20 as HC4IM W8YFJ is among those accepting OA7's bid for 3.5-Mc. schedules Zero hour approaches for the Galapagos gambol of W0s AGO LUX and WGF After a sweaty session of VP4WI operation W1RST observes, "Working station after station with contest-type QSOs really is no fun. U.S. hams owe a debt of gratitude to DX operators who live in rare countries and put up with this sort of think year after year. A few days of it almost drove me nuts!" W5MPE is struck by the splendid signal of VP8CY on 40 meters, radiated by the British IGY crew in Coats Land, Antarctica.

Hereabouts—Those in need of newly available VP2 DXCC credits should consider 40 phone. There KP4KD quickly caught Dominica's VP2DJ, St. Kitts's VP2KW, St. Lucia's VP2LB, Grenada's VP2s GV and GX The DX Bulletin of WGDXC records 20-meter phone activity by HR3HH, 9 on Utilla Island near the south entrance to the Gulf of Honduras A doff of the "How's" hat to Northern California DX Club's DXer on its tenth anniversary Former WGDXC editor K5ABW convalesces after surgery down south. Present co-editors W5s GNG KBU and NW prepare to relinquish redactional duties to successors) after a sterling 12-month performance Best Field Day DX at W6UW '6 was KH6BVM. W6UF '6 made it all the way to JA8AE W8YIN garnered 100 countries on single side band with a spunky HT-32 W2HMJ favors his quad over a three-element Yagi on the basis of deeper side nulls Reminder: W9s KA and NN expect a jolly throng at this month's W9-DXCC Banquet Meet scheduled for the 13th at Chicago's Sheraton I find many hams using cement-based self-supporting 50-foot towers not intended for this type of ham service," tips W8KX. "All makers specify that house brackets must be used for at least twenty feet above ground. This means that only the top three-fifths is self-supporting. The excessive strain does not show up until the third or fourth year when rust sets in. Also, an additional note in this connection, all should be aware that appropriate insurance against property damage and public liability is available at a nominal fee." W2CTO's WAS-for-DX Vermont excursion with K2BU and W2WTL ran into grim conditions in May and scored only fifty contacts. Undaunted, W2CTO returned a few weeks later and gave an added 100 W2CTO/1 Vermont QSOs to hams in 31 countries on five continents Ks 21VJ, VE8 and 8JTL, VE8 will wheel a BC-610 and KWS-1 around DX bands at Frobisher Bay, Baffin Island, through February of next year. The boys receive with a 75A-4 and are armed with rotaries for 10 and 20 W8CSK learns that KL7CDF becomes W9KLD again next month VE3PK seeks data on the 21-Mc. PX1AD he worked in February of last year, and W8KX solicits hints on how to confirm a March 1957 FB8AX QSO W4s HKR and TXE envision a DXpedition-type trip to the Dry Tortugas directly K5CRE and Louisiana cohorts may undertake a prolonged s.s.b. probe of the Bahamas before autumn expires Of interest to our Novice colleagues is this item from Virginia's Hampton Roads Radio Club: "In order to encourage the Novice in

(Continued on page 156)

HAMS ACROSS THE COUNTRY... HAMS AROUND THE WORLD

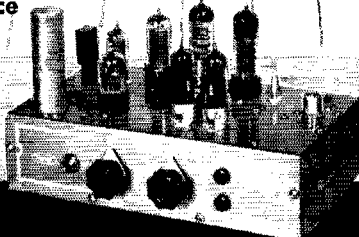
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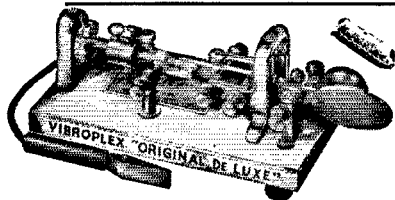
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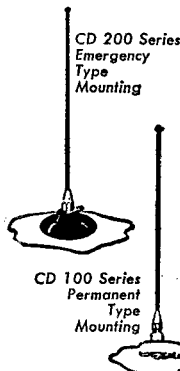
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Ten Years Ago in "How's DX?"—Professing no panacea for the problem, your September 1948 column lead decries the gifts-for-QSLs approach to DXCC fame Eighty meters resumes its postwar DX binge, W4BRB capturing CX1DB, KG6DI, LU3EL and VP4TO. On 75 phone G8VB has all states in 278 contacts with North America, thanks in part to W1AAL's assistance On 40 we find W2RDK with 96 postwar countries confirmed Twenty c.w. is all a-tingle with AR1WW, FI8ZZ, FT4AG, HL1s AE AU, Js 2COM 3KBE 9ACB 9ACS 9KCA, LX1s AW HW, MB9BA, MDs 3AB 4TH, TAs 1AA 3FAS, rarish Us, Ws 4FVI, KX6 GODD/F18, YR5I and ZC1CL XE1AC paces our 14-Mc. A3 reporters with AR8AB, CT3AN, EA9AL, HL1AC, MF2AA, PK4PQ, VQ8AE, VR2AZ, VRI, VS7s GR PW, ZD3A and ZS8A Morsels off the grapevine: Spain's ham prohibition is rumored on the wane. . . . PJ8s X and XTX point up lack of amateur recognition in the Netherlands Antilles. . . . Sardinia's new label is IS1. . . . Activity by ZS2MI may install Marion Island on the ARRL DXCC List. Said Countries List also is modified by the substitution of "Antarctica" for the outworn "Little America" entry. . . . M1B's passing leaves only M1A to represent San Marino on DX bands.

YL News and Views

(Continued from page 67)

with the race, Mrs. Betty Gillies, W6QPI, Chairman of the Board of Directors of the AWTAR, summarized: "Everything went beautifully, and again I say I don't know how we could ever manage without the ham net! Carolyn, W3GTC, did a great job of setting it up and everyone was most cooperative. Heartfelt thanks from the various race committees and myself to the radio chairmen at the various stops and to all who worked on the net. Their splendid cooperation is deeply appreciated."

What AWTAR Is

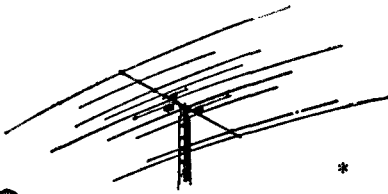
The All Woman Transcontinental Air Race has been sponsored each year since 1947 by the Ninety-Nines, Inc., an organization founded by Amelia Earhart in 1929 for women pilots. The only race of its kind in the world, the AWTAR is for stock aircraft only, not exceeding 350 horsepower, crewed entirely by women, and flown with the main object of beating one's own handicap "par" speed by as many hours as possible. It is flown during daylight hours only and under CAA visual flight rules. The race is financially supported by contributions from aircraft companies, by contributions from Ninety-Nines members and from the cities and/or organizations at the start and finish points.

Among the diversified group of contestants are flight instructors, commercial pilots, former military service pilots, engineers, nurses, teachers, housewives, and grandmothers. (One of this year's contestants is a licensed Funeral Director and Embalmer!)

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(Continued on page 158)

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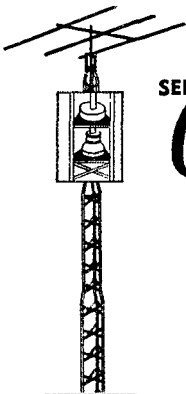
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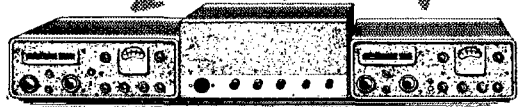
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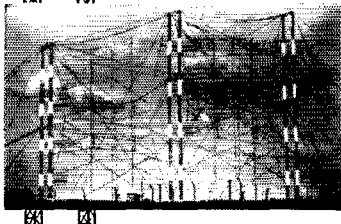
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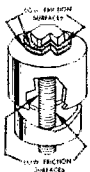


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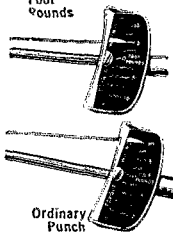
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(Continued from page 156)

the Parachute Club of America. Several Ninety-Niners have accumulated as much as 10,000 hours of flying time.

The AWTAR has become of great interest to veteran and fledgling pilots and to the general public as well. It is a unique experience for those who participate in the race and an inspiration to those who would someday fly themselves. It has afforded airwomen the world over an opportunity to meet and enter into friendly competition. And, importantly, it has done much to develop public confidence in private flying.

Those Who Helped

Assisting General Amateur Radio Chairman W3GTC were the following stop-over city chairmen and operators in the various call areas. Numbers of other amateurs, whose call letters are unknown, also ably assisted. Apologies to those who may be omitted.

San Diego, Calif. — Pat Mulheim, W6GGX, Chairman. K6s MGL, QKE, UHI, VRH; W6s MWU, VSL, WDL. Yuma, Ariz. — Harry McElfish, W7ANB, Chairman. K7BDD; W7ZZT.

Tucson, Ariz. — Thornton E. Benson, K7CBT, Chairman. W7s DCK, DRU, FEV, SMZ, SQX, ZFC.

El Paso, Texas — Wade Williams, K5ILG, Chairman. K5s CTZ, EJU, ESE, GSA, GTO, ITB, KOK, KOL, LEY; W5s GDA, LWP; W6VZA; K9GWT.

Midland, Texas — George Martin, K5ODH, Chairman. Abilene, Texas — Dale Cone, K5BKE, Chairman K5MIM.

Tyler, Texas — Betty and Clayton Vredenberg, K5IMD and W5NYN, Co-Chairmen.

Jackson, Miss. — Margaret Brown, W5TKK, Chairman W5TAK.

Montgomery, Ala. — Clarke Simms, W4HKK, Chairman. Macon, Ga. — Carolyn Wellborn, K4AIQ, Chairman.

Charleston, S. C. — O. D. Dawson, K4POP, Chairman. K4s ADZ, AOG, CNG, EMV, GKG, ODO, OKD, OYU.

PLK, PQJ, RUU; W4s CSP, LVF, OOH, TWW, UOQ, VCB/3, VMY, WLF/4; KNIGBW/4; KN4s TRS, TXY, UXF, VVF, YCT; K6RUO/4.

NONE OTHER

Chiggers and bugbombs . . . sunburn . . . near frost-bite . . . parched throats . . . damp sleeping bags . . . boiled coffee . . . throwaway dishes . . . Bermuda shorts . . . Sloppy Joes . . . glowing campfires . . . a quick dip . . . annual enthusiasm . . . 24 hour battle fatigue . . . OM tent-pitchers . . . stubborn YL independence . . . shaky antennas . . . rig breakdowns . . . contact thrills . . . efficient loggers . . . shift changes . . . QRM, QRN . . . QRZ, QSP . . . score comparisons . . . Next Year!

What else but Field Day? Now let's focus in on some of the details of the YL picture of one of hamdom's top annual events.

The Camellia Capital Chirps of Sacramento, Calif., set up operations near McClellan Field. W6HTS manned the 2-meter rig, K6s ENK and PWH, and W6LTG took turns on 80 and 40 using a BC-457 and a DX 35. Other than combatting a stubborn generator, an ailing transmitter, and frosty temperatures at night (forcing even the stalwart to wrap themselves in everything from bath towels to cardboard) the girls had the usual fine time.

It was a first FD for members of the new Gulf Area YL ARKlub. Eight general class members and 2 novices worked the full 24 hours, using rigs on 80, 40, 20, and 15. Three stations operated simultaneously on a.m., c.w. and s.s.b. Members of the young club are justifiably proud of the 550 contacts made (41 states, Hawaii, Canal Zone, and 3 VE sections). Maximum power was 120 watts — total score was 3325. Of the ten YLs who operated FD, only three had ever worked a contest of any kind before. The girls did prevail upon their OMs to set up camp for them (only the YLs operated though) and somehow inveigled them to turn chefs for a few hours. Concluding that two meals never tasted better, the girls were served barbecued chicken,

(Continued on page 160)

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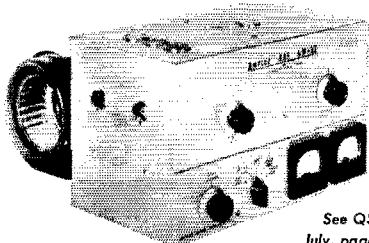
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See QST
July, page 31

DESIGNED for high efficiency and extreme stability. It can be used in Class C or Class AB₁ service. Class C efficiency, 70% to 80%. Drive required on Class C, less than 10 watts.

CONTAINS: Two Eimac ceramic 4X250B's in push-pull; a dual band coaxial grid circuit; separate but readily interchangeable silver plated plate circuits for 6 and 2 meters, a special balancing capacitor to permit balancing of drive on the push-pull grids; a front panel switch to allow grid current or screen current of either tube to be monitored individually; grid/screen meter; plate meter; blower; special air system sockets with built-in screen bypasses, plus other features.

PERMISSIBLE INPUTS: Class C, CW, 1 KW; Class C, AM (plate), 600 W; Class AB₁, SSB, 1 KW Single Tone; Class AB₁ driver amplitude modulated, 700 W.

Dimensions: 7½" H x 12" W x 14" Deep, incl. blower.

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Panel model 19" x 8¾" 249.00
Other plate circuit, (so you can work both bands) silver plated, readily interchangeable..... 44.50
Power supply..... Price on request

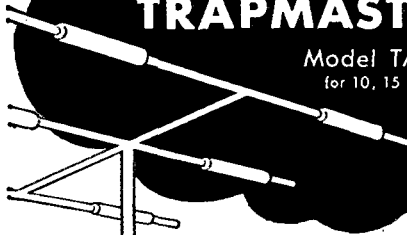
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(Continued from page 158)



Robbie, K5HTO, helps gather some of the 550 contacts claimed by the GAYLARKS, while Betty, W5ERH, awaits her shift at the rig.

potatoes baked in coals, pinto beans with ham hock, tossed salad and hot garlic bread for Saturday night supper, and bacon, eggs, hash-brown potatoes, hot biscuits, and water-melon for Sunday breakfast! GAYLARKS who operated were K5s ALF, BJU, HTO, MIZ, PFF, and W5s CXM, EGD, and ERH. Loggers were KN5s POD and RFO. The FD site was 95 miles from Houston on the farm of Dr. (W5EYAM) and Mrs. Ross Margraves.

The WHOOTS (Women Ham Operators of Texas) also experienced their first club FD. Twelve members used the club, call, K5QHI, to earn a score of 240 points. Forty, 20, and 15 phone were the bands worked. Operations occurred on the "back 40" of W5SPV's country place, six miles southwest of Dallas. On hand for the activities were K5s BNB, BNH, GBX, GMI, GRF; W5s KEC, SLQ, SPV, SYL; KN5s MTF, PTO, and K4COV/5.

Also reported FDing were Edith, W3AAU, of Philadelphia, who operated with the Short Skip Radio Club. . . . Carolyn, W3GTC, took time out just before the AWTAR (she served as General Chairman of the Radio net for the race) to pitch in for points for the Northern Pennsylvania RC. . . . Frances, K7ACK worked W7ACY for the Tillamook RC (Oregon). . . . Rhode Island SCM June, W1VXC, put in several hours working W1JT/1 for the East Providence ARA. . . . W1QON did her usual stint for the Walpole ARC.

We're sure that numbers of other YLs worked FD this year to some extent, and we would still like to receive reports of such activity for our YL FD files.

N. D. (Chie) Tilley, K5BGT, should have been included in the list of DXCC YLs which appeared in the May '58 column. With 150 countries confirmed (phone and e.w.), Chie had every right to be on the list.

NEW BOOK

CQ YL by Louisa B. Sando, W5RZJ. Printed by Case Thompson Printing Co., Albuquerque, New Mexico. 165 pages, 6 1/4 by 9 inches, plastic-coated paper cover, spiral bound. Price \$3.50.

This book should command widespread attention as the first complete history of the YLs of amateur radio. Containing 18 chapters and more than 500 photographs, the book outlines YL activity, beginning with the first YL, 8NH in 1915 through to the several thousands of YLs in 1958.

Every phase of YL activity is covered. There are several chapters on the Young Ladies Radio League, including a history of the organization, its officers, awards offered, conventions, etc. Chapters on young YLs, handicapped YLs, marine operators, YLs and public service, DX, v.h.f., Field Day, YL clubs, conventions and hamfests, "long-time" YLs, and pre-war licensees are comprehensive and accurate, and reflect the extensive research done by the author on subjects with which she has long been familiar.

Since 1947 W5RZJ has been editor of the YL column in
(Continued on page 162)

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How to Become a Radio Amateur	50c	A.R.R.L. Antenna Book	\$2.00
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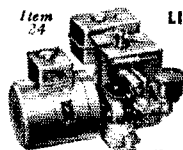
*Subscription rate in United States and Possessions, \$4.00 per year, postpaid; \$4.25 in the Dominion of Canada, \$5.00 in all other countries. Single copies, 50 cents.
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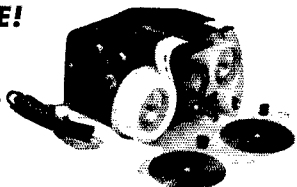
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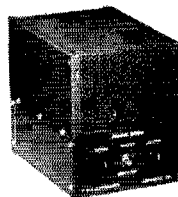
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Lafayette, Ind.

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(Continued from page 160)

CQ magazine. Licensed in 1943, Louisa was assistant to the editor of *QST* during World War II, adding to her experience in writing and publications work. Formerly W10OH, W20OH, W700H, and W6SCF, W5RZJ currently operates on 10 and 20 phone from her Santa Fe, New Mexico, home, where she resides with her OM (ex-WN5UCZ) and their two young children.

In the preface of the book, Mr. A. David Middleton, W5CA, former ARRL director of the West Gulf Division, summarizes: "From the moment the first two-way amateur-radio communication began it was inevitable that there would be women radio amateurs as well as men. And, it was therefore inevitable that some day there would be a sizeable number of YLs and that eventually the history of the distaff side of ham radio would be compiled. . . . I don't know how she (the author) found the time to do the research, assimilation and writing of all the material in *CQ YL*, but here it is, to be read, studied and treasured for all time by YL and OM alike, along with that 1936 classic history of amateur radio, *Two Hundred Meters and Down*."

Concurring with W5CA, we feel a debt of gratitude to W5RZJ for giving us the first history of YL participation in our beloved hobby, and we feel that we will enthusiastically recommend the book to all YLs and OMs for many years to come.

Copies of the book may be obtained by sending a check (\$3.50 per copy) to Louisa Sando, W5RZJ, 212 Sombrio Drive, Santa Fe, New Mexico.

Contest Operating

(Continued from page 57)

a long time to regain my composure and pick up my pace. Feeling that if it affected me this way, it would affect my competition in this manner, my practice is to go like a demon during the opening hours of the contest. Perhaps I'm the only one who reacts this way and, if so, I have revealed a chink in my armor. And surely you need to be a good enough sportsman to recognize that you can't always win.

What about personal operating techniques? There will always be controversy over some techniques employed on the amateur bands. I hear and read about tail-ending being severely criticized. Yet, skillfully used, it minimizes QRM and indeed there are some stations in a contest that consistently work the station that gets in and out with a fast break and one sign of their call. Don't do it because somebody has objected in a letter to *QST*; you may never work that station and perhaps that multiplier. In a DX contest, it is the DX station itself that dictates the type of operating techniques employed by the Americans. If he says move up or down 10 kc., that's where the pileup will be, not on his frequency. If he works the fellow on his frequency, that's where you are going to have to be to work him. But the bore who thinks he is going to work a DX station simply by staying on the frequency and signing his call more than the next guy is the kind of operator who spoils the fun for everyone. Don't be that kind of operator.

National High?

The League, and as a matter of fact, most amateur societies, do not recognize so-called national winners for obvious reasons. Competing in a DX contest from the 9th call area, you could

(Continued on page 164)

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(Continued from page 102)

hardly expect to equal a score from the 2nd call area where Europe is a considerably easier shot. Yet the drive by contest men to win mythical championships beyond their call area is undoubtedly what has sent contest scores higher in each successive year. And each year most of us are of the opinion the ultimate has been reached. I'm more conservative in making that kind of prognosis today than when 661 contacts was good enough to win national high in the Sweepstakes, or 100 different countries in a DX contest was considered a near miracle. It takes twice 661 to do it in a Sweepstakes today and 130 countries on a single week end has been achieved.

As a parting thought, you may ask, why do the scores go up each year? Do we become better operators? Is our equipment improved? In my opinion the principal reason is greater amateur activity, followed closely by improved equipment. I do not think that the operating skill has improved materially during the years, but with more stations competing, the field is bigger. With better equipment, the sharp operator has more tools to work with. As I think back, during my early indoctrination in contests, to the outstanding performances of W3BES or W3CHH, there was little to be improved in their operating. High speed, the ability to do tricks with c.w., are no advantage. Common sense operating speeds, a good knowledge of your equipment and that competitive spark . . . he it called intuition, savvy or acumen . . . are the elements that make a fine contest operator.

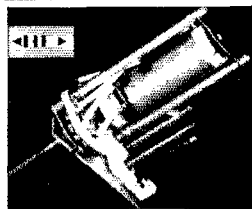
How to Solder

(Continued from page 17)

4) To prevent a cold solder joint, be sure the tip of the iron is hot and clean enough to heat the work. If the iron is hot enough, the solder will flow freely when heated and it will cool with a shiny surface. Solder that hasn't melted properly will cool with a dull surface.

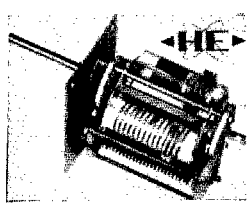
5) Use just enough solder to make a connection.

And, last but not least, something that you would have found out anyway: A hot soldering iron can burn holes in clothes and workbenches and wooden tables, and it can raise a beautiful big blister on your skin. Be careful!



GP-20 \$5.95

Miniature interstage, 20 watts.
Size 1 1/4" x 2 3/8" x 3 1/2" deep.



GP-50 \$12.95

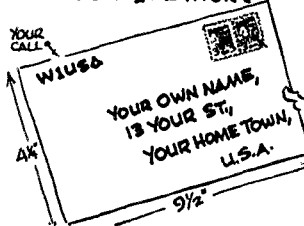
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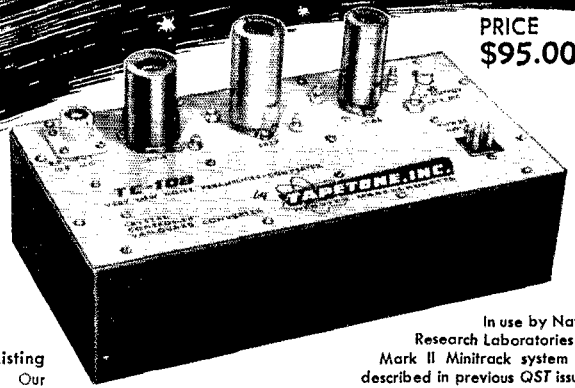
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In use by Naval Research Laboratories on Mark II Minitrack system as described in previous QST issues

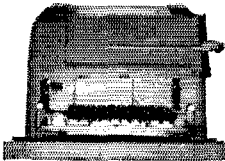
VANGUARD, TC-108

- Power Gain: 2000 (33 db).
- Noise Figure: 2.1 db.
- Rejection of Signals at Intermediate Frequency: 90 db.
- Image Frequency Rejection: 65 db.
- Intermediate Frequency output: 14.4 mc.
- Rejection of all other Spurious Responses: greater than 65 db down.
- Matched Input Impedance: 50 ohms.
- Output Impedance: 50 ohms nominal.
- Output Bandwidth: 300 kc at 1/2 power points.
- Tube Complement: 417A/5842, 6BQ7A/6BZ7, 6CB6, and 12AT7.
- Power Requirements: (a) 6.3 volts at 1.3 amperes. (b) + 150 volts DC at 60 ma. regulated.
- Dimensions: 9 1/2" x 5" x 2 1/2" shielded base. Maximum seated tube and tube shield height 2 1/4".

Write for free TAPETONE instruction booklet on how to assemble equipment for tracking U. S. Satellite.

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Same as above but equipped with synchronous motor. \$375.00

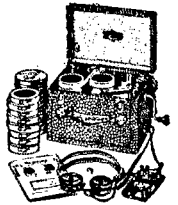
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- F/B Ratio 23 DB
- V.S.W.R.

1:1 at design center. Less than 1.5:1 within 2 Mc.

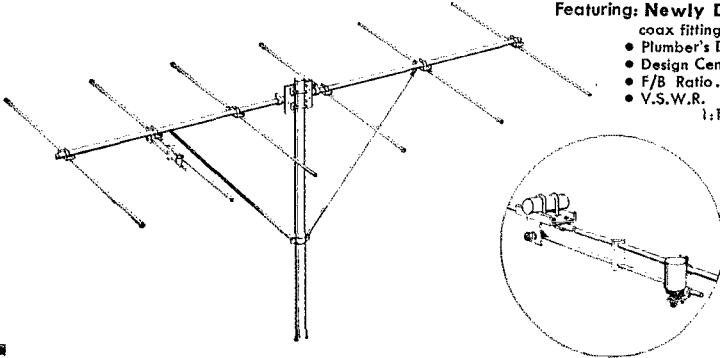
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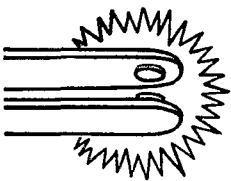
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New Books

Radio Operator's License Q & A Manual, by Milton Kaufman. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. Sixth edition. 720 pages, including index, 6 by 9 inches, cloth cover. Price, \$6.60.

Once upon a time there was one "commercial" operator's exam and once you passed it you could take any kind of radio operating job. Now there are seven kinds of commercial licenses and some special endorsements in addition. The examination comes in eight sections or "elements", selected elements being assembled into a complete examination for a particular type of license.

This volume gives answers followed in each case as necessary by a detailed discussion to the FCC study guide questions for each element. The questions and answers consume almost 600 pages of the text, evidence of the thorough treatment. The remainder of the book is split up into five appendices giving the rules governing commercial operators, extracts from the radio law, telegraph and Q codes, and descriptions of direction finders and auto-alarms.

Commercial Radio Operator's Question and Answer License Guide, published by the American Electronics Co., 1203-05 Bryant Ave., New York 59, N. Y. For Elements 1 and 2, 48 pages, 6 by 9 inches, paper cover; price, 75 cents. For Element 3, 122 pages, same format; price, \$1.75.

Answers to FCC study guide questions in compact form. Element 1 covers basic law; Element 2 covers operating practices in the various services; Element 3 is the radio-telephone technical exam.

A feature of these books is a sample FCC-type multiple-choice examination for each element. You can test your knowledge with these, the answers being indicated separately in the back of the book.

Electronic Designers' Handbook, by Robert W. Landee, Donovan C. Davis, and A. P. Albrecht. Published by McGraw-Hill Book Company, Inc., 330 West 42nd St., New York 36, N. Y. 1200 pages, 6 1/4 by 9 inches, cloth cover. Price, \$16.50.

The appearance of a new reference book such as this, or a revision of an old one, inescapably drives home anew the point that there is a staggering amount of design material — in being and continuing to accumulate — in the field of electronics and radio. The evidence is not only in the size and scope of these Handbooks but equally as forcibly in the absence of data that could have been included if unlimited book space and unlimited preparation time had been available. As expressed by the authors in the preface to this volume, the problem is one of getting a book into print before the material becomes either obsolescent or limited in scope. As an example of having to stop somewhere to meet a publication deadline, there is a section on fundamentals of vacuum tubes and transistors, in which the basic characteristics of transistors are given detailed treatment; however, the applications in the remainder of the book are illustrated by vacuum-tube circuits only.

The book is divided into twenty-three sections, each taking up a separate subject such as voltage amplifiers, power amplifiers, modulation, oscillators, receivers — the "basic" subjects without which no handbook would be complete. Subject headings that are perhaps not so common, and which represent more-recently-prominent techniques, include multivibrators, delay circuits, trigger circuits, clippers, limiters and clamps, computer and servo-mechanism principles, and network analysis. There are also separate sections on filters and on feedback.

Radio — as a division of the broader electronic field — is treated principally in terms of fundamentals rather than from the practical design standpoint. There is, for example, little specific treatment of communications equipment or television (the terms do not appear in the index.)



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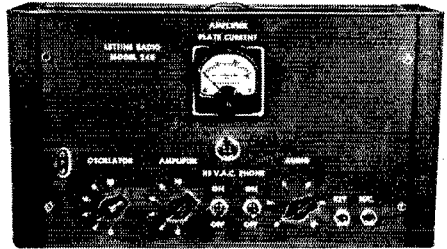
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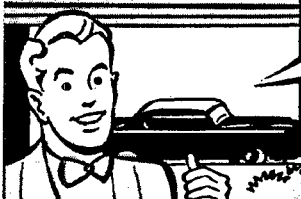
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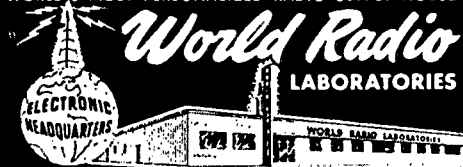
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Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

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QSL'S-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

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QSL'S, samples dime. Eddie W. Scott, W3CSX, Fairplay, Md.

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FREE! 100 "Thingloss" Antecall QSL'S. Order 100 "Hevigloss" red, blue, green (black back), radoprint. Ojal, Calif.

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QSL'S-SWLS. Neat, distinctive, clean! Samples 25¢ deductible. C. Fritz, 1213 Briargate, Joliet, Ill.

QSL'S-SWLS. 10¢, \$2.50. Samples 10¢. QSO file cards, \$1.00 per 100. Rusprint, Box 7507, Kansas City 16, Mo.

QSL'S. Glossy. Samples 10¢. W1OLU Press, 30 Magoun, Medford, Mass.

QSL'S for economy-minded hams, \$4.65 for 500. Free brochure. K9EUF Print, 1839 46th St., Rock Island, Ill.

QSL'S. We've printed a million! Samples 10¢. Larger quantity, 25¢ (refunded). VYS QSL'S, 1704 Hale, Ft. Wayne, Ind.

QSL'S. Rubber stamps, reasonable, nice designs. Samples, dime. Stan, W2DJH Press, 19 Elm, Warrensburg, N. Y.

WORKED All States? Mount your QSL'S neatly in first QSL Album designed especially to hold your WAS cards. Heavy leather-textured covers, sturdy wire binding, individual spaces for all 48 states. Cards can be inspected, removed, replaced, \$3.50 postpaid. Call letters in gold for adding to cover, \$1.00 extra. Hanover Electronics, 126 East 37th St., N. Y. C. or your dealer.

416B Owners, brass mounting plate, machined $\frac{1}{8}$ — 40 hole, \$2.50. Robert B. Flint, W9BYB, RR #2, P.O. Box 290A, Bridgeport, Ind.

CALL plates, Deluxe 8" x 1 1/4" black phenolic laminate with engraved white letters. Only \$1.00 p.p. Polished plexiglass base. \$1.00 extra. L. & J. Products Co., P.O. Box 122, Downers Grove, Ill.

HARCO'S in Sandusky, Ohio, for your best deal in Ham Gear, National, Hammarlund, Hallcrafters and WRL Globe transmitters, Hy-Gain and Mosley beams. 1725 Columbus Avenue, Main 5-9864.

KITS assembled, wired and tested promptly. Our charge 20% of kit price. Experienced with all makes ham equipment, test instruments at high fidelity. Partly wired kits same price. Finest checking equipment. Also equipment including transmitters, designed and built, factory standard workmanship. Have kits sent direct to us. Surplus gear converted. (Licensed ham since 1924, and graduate engineer, Ex W9AXJ). Money back guarantee. W0KJX, L. P. Jackson, 645-A Marshall Ave., St. Louis 19, Mo. Tel. WOODLAND 2-2948.

MOBILE Batteries, Vita-Pac Special Service Types, 6 and 12 volt for all cars. Used by Police and Fire Departments. Free data. Small Communications, 1340 Ford Rd., Cleveland 24, Ohio (Paul, WSEWV).

S.S.B. Transformers identical and exact as used in W2EWL exciter (see QST March 1956). Brand new 3 for \$4. No C.O.D.s, please. S. Tucker, W2HLT, 61-10 Little Neck Parkway, Little Neck 62, N. Y.

BARGAINS: Send for list of reconditioned receivers and transmitters with new guarantee. Partly wired kits same price. Finest checking equipment. In stock, new Collins, Johnson, Hallcrafters, WRL, National, Hammarlund, Gonset, Elmec, Drake, Central Electronics, B&W, Hy-Gain, Mosley and Gotham beams. Shipped on approval. Write Ken, W0ZCN or Glen, W0ZKD, for your best deal. Ken-Elis Radio Supply Co., 428 Central Ave., Ft. Dodge, Iowa.

NEW Mercury outboards and boats. Will take ham gear on trade. Write: Boyd Retter, K0IMO, Boyd's Marine Shop, Clinton, Iowa.

WANTED: Aircraft, Airline, Military, Electronics gear and test equipment. Collins, Bendix, ARC, Airforce, Narco, BC348, BC610, ARN6, ARN1, ART13, 5113, 1M62A, others. We pay C.O.D. advise price condition. Ritco, Box 156, Annandale, Va., Phone Jefferson 2-5805.

KIT wiring, Rates reasonable. Write: John Hjelm, W0DBT, 1782 Portland Ave., St. Paul 4W, Minn.

DX Radio Coop forwards outgoing QSLs, 2¢ each. Callbook, \$5.00. Schematics, 59¢. Sam's Information free with schematic, 500 QSO City Cards, \$4.00. Free Flyer, "DX Radio Coop", Box 5933, Kansas City 11, Mo.

CODE Practice tapes, name your speed, \$3.75 each. Bob, W4BJN, 931 Maple Ave., Dayton, Ky.

VAN Sickle will trade photographic, boat or radio on new KWS-1 Collins. Gene, W9hJF, 4131 N. Keystone, Indianapolis, Ind.

SMALLEST "S" Shielded" D'Arsonval meters available. 1" round or rectangular. Standard ranges available, \$4.95 postpaid. Alco Electronics, Lawrence, Mass.

SELL: Perfect 75A2 \$285; New Universal product detector, \$30; Sonar SRT 120P and VFO, \$25; Morrow 5BR, \$45; P1103, \$20; Johns MicroMatch MIM2, \$25. Harry Taubin, W2GCW, 731 Gerard Ave., Brx 61, N. Y.

WANTED: Unused electronic tubes, commercial gear, lab test equipment and components. Will pay cash or swap for choice ham gear, etc. Write for Barry's "Green Sheet", check full of bargains in ham gear, tubes, relay racks, transformer, etc. Barry Electronics Corp., 512 Broadway, New York 12, N. Y.

COAXIAL-CABLE — 53 ohms — 100 ft., \$3.95, postpaid. Satisfaction guaranteed. Van Dick, Riverlawn Drive, Wayne, N. J.

MUST Sell complete SSB station at once: KWS-1, 75A-4 and SC101. Must go together. In a like-new condx. One year old. Price, \$2500. Write or call K5HRJ, Charles Clarke, Box 535, Knox City, Texas.

HOUSECLEANING: KWS-1, several other transmitters, receivers, kits, accessories, Triband beam; tremendous quantity of excellent components. Best trade prices. 5-page list for stamped envelope. WALDW, 5514 No. 16th, Arlington, Va.

KITS Wired: For details, write Stephen Colender, KN2DVM, 130 Franklin Ave., Pearl River, N. Y.

TELEVISION Personnel. Available September 1, a young, married, sober, educated, intelligent, producer-director. Would like to be associated with a live-wire TV operation. Need another ham on your staff? I'll go anywhere. Examples of my work available on kine. Resume and excellent references. David L. Bell, W8GUE, 128 Haven Road, Syracuse 10, N. Y.

FOR Sale: Globe Chief xmtr, Heath V.F.O. ant. coupler, \$70 f.o.b. Blughanton, N. Y. Mike Brechko, 25 Ogden St.

WILL Trade — 10 Select-O-Vend candy and gum vending machines (4 new, two used, cost \$49.95 each) for DX100, Johnson Ranger! who have you? W3ISA, RD #2, Meadville, Penna.

BEAM Antenna for sale: E. F. Johnson Co. 3-element 20 meter with T-match, used, \$50; E. F. Johnson Co. 10 or 15 meter 4-el. with T match, new and unused, \$50; Western Gear Delta Tenna 10-meter ground plane, used, \$10. W8UJB, John A. Bailey, 1104 W. Market St., Akron, Ohio.

FOR Sale: Collins 32V3, vy grid condx, \$450 w/spare RK4D32; 75A-4 w/500 cps and 3 Ke filters, \$475; speaker, \$10; Johnson Matchbox \$30; Johnson Signal Sentry complete, \$10; two Simpson #37 0-1 ohms, 1 1/2 meters each, Triple Model 326 0-1 meters, \$8; Hickok CRT test adapter \$5. Please add postage. Transformers, chokes, crystals and small parts. Write for list, W. Steckel, 2215 Riverside Dr., Seranton, Penna.

WANTED: Stereo camera equipment, projector, slide trays, glass and so forth. Trade two-meter Lettine, National 220 converter, Gonset 66B, single side band gear, W90KM, 1207 Oneida St., Joliet, Ill.

SWAP Gonset 3-30 converter for 6M mobile converter. K1DEL, 32 Sigourney St., Jamaica Plain, Mass.

COLLINS KWS-1, \$1400. Has seen very little use, like new thruout, with 4X-250Bs, John Grabau, 14904 Grapeland, Cleveland 11, Ohio.

CRYSTALS, Meters, transformers, tubes: wide selection. Reasonable. Send stamp for catalog. Rljor, Box 81, Rego Park, N. Y.

FOR Sale or Trade: DX35 with VFO-TC28-50c with pwr. supp and VFO, ARC-5, TBX-8 transceiver, BC-B24 with AC pwr supp. Richard Green, K5LUN, P.O. Box 2035 Sta. #1, McAllen, Texas.

VIKING II, NC-300 for sale. Viking with VFO, time-sequence keying, factory-wired, excellent, \$215. NC-300 with matching speaker, calibrator, like new condx, \$295. Dave Smith, 54 Butler Rd., Searsdale, N. Y. Tel; SC 3-4053.

SALE: Moving to smaller home. To best offer goes Johnson Viking II, Matchbox, VFO, low pass filter, Standing wave bridge and meter, all coax connections and also a Hallcrafters #2OR. Paul Crawford, Shawnee-on-Delaware, Pa.

FOR Sale: Used Karr 1500-3500 Kc mobile receivers complete with all tubes, power supply and control head, \$10. Ralph Vickers, P.O. Box One, Steubenville, Ohio.

CW Man sells out: Lyseo 600 \$55; NC-100XA with xtal filter, 8 meter, excellent, \$65; both for \$100; kW power supply, \$30; BC458; BC454 with AC supply. All offers considered. All F.O.B. Parker Swanson, K5GEM, 2312 Suffolk, Houston 27, Texas.

SELL National NC-240-D receiver with speaker, \$135. Heath FM3-A tuner-wired, \$25. Marc Molyneux, Jr., 106 Hienville Ave., Mobile, Ala.

EIGHT 416B tubes. Will swap for an amateur receiver in gud condx. K8GWY, 20295 North Norwood Drive, Detroit 41, Mich.

VIKING Mobile and Gonset Super Six. Both in good condition; \$100. M. R. Robinson, Evergreen Court, Windmere Homes, Saugerties, N. Y.

WANTED: Top prices paid for #11A (20M) and #13A (40M) band spread coils (2) set for old National's DC SW3 receiver! Hasbrouck, 1157 Palms Blvd., Venice, Calif.

SELL: Elicio 75TV Xmtr, modulator AM40, \$60; TBX6 transceiver 80 and 40 meters, \$25. Seymour Krauer, 2851 Sedgwick Ave., Bronx, N. Y. K18-3216.

ANY Kits wired, etc. Any kit wired, tested and checked. 15% above kit price. Partly wired same price. K2DQT, George Kupp, 61 Cortlandt St., Belleville 9, N. J. Pick up anywhere in New Jersey and deliver. Phone PL 9-8829.

FOR Sale: \$475 buys a complete station: xmtr, a DX-100; revr a NC-300, low-pass filter, Matchbox, mic, SWR bridge, 3-el, 10 mtr beam with TV rotator and misc. parts. John J. Brandt, 31 Viscoloid Ave., Leominster, Mass.

H&W 5100B, Serial 2140, practically new, less than 20 operating hours. No time for hamming, \$375. RCA AR-88 receiver, .5 to 30 Mcs. Q-multiplier and low-noise B1 built-in, new tubes, realigned, service manual, \$155. Sprovis, 723 Maple Court, Moorestown, N. J.

SELL: Dyna Labs Gaussmeter Model D-79 with instruction book, carrying case, two probes. New condition, not adaptable our special research problem; \$225 prepaid for cash. Lampkin Laboratories, Inc. RFD #1, Bradenton, Fla.

FOR Sale: Good condx, Globe Chief 90 w/2 xtals; \$39; SX-25, \$40. Dave Kovach, 161 LaGrange St., Vestal, N. Y.

W0CVU Gold Cup given for 100th Country verified two way SSB. Airmail your QSL. Don't delay.

OOB-100 Kc. etal in Billee TC92 oven. Also SNC filter choke 8 henrys, 500 mls. Choke F.O.B. Philly. Best offer by 15th. Walt Deemer W8GYP, 450 Edgehill, Ardley, Penna.

TRADE LP filter, SWR Bridge, 0-1 Ma., meter for weaver J2.5 scope, single shot 20 gauge. What have you? Melvin Gardner, Batavia, Iowa.

SELL: WRL linear LA-1, works great, practically new; also FM-3A, 680, 585, QF-1 Teraft 6M condx. w/dwr. supp., all equip. is in gud wkg. order. Will take best bid. K3BCV, 5 Wellesley Road, Swarthmore, Penna.

2-METHEP Gonset Comm. III, two months old, with 3 xtals, cables, whip, instruction manual and schematics, condx and appearance new. First \$135 money-order takes it. I will pay shipping and insurance. Nelson C. Denison, W1VCU/KTH6, 3447 Likili St., Honolulu 18, T. H.

SELL Collins transmitter 32V1, \$275 cash. One owner. W8HITU, Llangollen, New Castle, Delaware.

HAVE Viking II with spare #29-B and Johnson Model 122 VFO, \$170. Also have Morrow 2B7 mobile converter, \$15; Gonset Communicator II, \$160. F.O.B. Albuquerque, New Mexico. Barry Copeland, W8ZUV/5, 316-B Cornell, S.E., Albuquerque, N. M.

FOR Sale: Johnson Matchbox, Mod. 250-23. In gud condx, \$40. K5LEN, Walt Hastings, 3545 Forest Hill Road, Jackson, Miss.

600L, \$395; 20-A, \$195; QTI, \$7.50; 458 VFO, \$35. All same as new condx. W5FQK, 1724 Franklin St., North Little Rock, Ark.

WANTED: 500 or 600 watt Multimatch modulation xfmr. Also want Jennings vacuum variable, 300 mfd, type UCS, also 4-250A tubes. Will sell modulation monitor scope, 2BP1 tube, mounted on 5 1/2" rack panel, \$17.50; deLuxe Par-Metal enclosed relay rack gear. Cost over \$70, will sacrifice for \$35; instructograph with ten tapes. Variable speed electric model, \$15. Larry Kleber, K9KLA, Belvidere, Ill.

FOR Sale: HT-9 transmitter, complete with spare #14, \$75. Prefer local sale. Also PE-103 (unpacked) brand new, \$20. H. A. Garon, W6LCA, Donadsonville, La.

NEW Unconverted BC-457A with tubes, \$5.00; unconverted BC-452A Q5'er less tubes, \$5; Regency TC82A transistor broadcast receiver, \$25; Hallcrafters S-53A receiver in fair condx, including manual, \$40; K&E 12" log Duplex Vector slide rule with case, \$12; K&E 6" pocket slide rule, new, \$5. A. F.O.B. W8CQL, 523 E. Judson Ave., Youngstown 2, Ohio.

HRO 50T1, sprk. A, B, C, D coils, \$250, calibrator 50NCU, \$15; E, F, coils, \$14 ea. Consider late NC-183 as part trade. Telfrad reg. standard 1 Mc., 100-10 Kc. \$18. Complete list of parts and tubes available. M. Marshall, 455 Washington Ave., Dumont, N. J.

HEATH DX40, 75 WATT C.W. and phone rig, in exc. condx, instructions included, \$60. K2BYX, Schwartz, 2772 Ocean Ave., Brooklyn, N. Y., N1 8-7261.

BARGAINS: Send for list of reconditioned receivers and transmitter with new guarantee, 10% down with up to 24 months to pay. In stock new Collins, Johnson, Hallcrafters, WRL, National, Hammarlund, Gonset, Elmec, Drake, Central Electronics, B&W, Hy-Gain, Mosley and Gotham beams. Shipped on approval. Write Ken, W0ZCN or Glen, W0ZKD for your best deal. Ken-Elis Radio Supply Co., 428 Central Ave., Fort Dodge, Iowa.

SELLING: Johnson Ranger with Grd Block Keying, in excellent condition, first offer for \$500. K1E L.F., Harvest Hill Lane, Stamford, Conn. Telephone PReside 8-0970.

FOR Sale or Trade: HQ-150 with matching speaker. Need complete 12 V mobile Rec. and xmttr or \$200. All letters answered. Rec. #td. Red Lamer, WOLNA, 1221 N. 3rd, Salina, Kans.

STILL waiting for WAS: DXCC confirmations? Send Reply-Paid QSL's 5, 26c, 25c, \$1.00. Hart, 407 Farke, Birmingham, Mich.

FOR Sale: Heath AR-3 receiver. In excellent condx; \$25 f.o.b. K1BBB, 93 1/2 Dr. Drive, Newington 11, Conn.

HEALTHY DX-100, in A-1 condx. A real beauty; \$199. No shipping, str. but will deliver within reasonable distance in my QTH. Lad Jelen, Rte 4, Medina, Ohio. Tel. CE 9-5005.

VIKING I, modified to Viking II with improved audio \$160. Viking VFO \$30; SX-28 and matching speaker, \$125; Heath Q multiplier, \$5 Dow-Key TR switch, \$6. All above in perf. condx. Sell all above \$300. Will ship. Lou Israel, K5MAI, 2304 Foster, Las Cruces, N. M.

SELL Gonset Communicators, 2 meter, gud condx, \$60; in exc. condx, \$160. Both for \$200. Inquiries ansd. "Rick" Rioks, W5DUS, 633 Ingleside Dr., Baton Rouge 6, La.

SWAP or sell 8-40B receiver, \$60; VHF-152A, \$40. In gud condx. James Cotten, 110 College, Weatherford, Texas.

FOR Sale: Bandmaster TBS-50D with 1110 Vac power supply and matching VFO; revr HQ-140X with x" matching speaker, plus Astatic mike, all in gud condx. Complete, \$325. F.o.b. Glen Connolly, W1WOK, 29 Capen St., Medford, Mass.

SWAP: Like new Cannon 55 MM camera, 50 mm f1.8 lens, carrying case, flash, filter attachment in case and three filters. Newwood director light meter and case, tripod, complete instructions. Want xmttr, revr combination, such as HQ-129X and Globe Scout. Make ur offer. Replies for all, Andrew Sedor, W3IZO, 27 Bryn Mawr Ave., Bryn Mawr, Penna.

SALE: Viking Valiant Factory wired, \$325; Gonset II 6 volt 2 meter, \$125; NC300 with calibrator, \$275; SSB 350V linear, self-contained, \$100; all equipment clear and in perfect condition. Joseph Henry, 4 Wilson Rd., Valley Stream, L. I., N. Y.

FOR Sale: Gonset Communicator, Crystal Mike, 3 xtals, mobile connector, \$150. Jack Resnick, K2QPP, 63-07 71st St., Middle Village, N. Y. TW4-8980.

FOR SALE: TC813 transmitter, \$37.50; BC342N, \$75; Tsl3F Handset, \$5.90; T17 mike, \$3.50; BC375 modulation trans., \$3.00; BC375 roller inductance, \$3.50; Bud dual spaced 80 80 ufd, \$5.00; ART-13 driver, \$2.00; AHC-5 80 CW, \$8; all in new condx. R. Lewis, W1AEX, 4 Hope Ave., Newburyport, Mass.

NOVICES Attention! Harvey-Wells TBS-60D with VFO and power pack for sale in 1st class condx. from Maline to California, no trouble. Have DX-100 now. Steve Bedell, W2ITJ, 110-15 106 St., Ozone Park, L. I., N. Y.

VHF Round-up. Don't forget October 11. That's the date of the Syracuse VHF Round-up. All the big DX men will be there so don't stay home and listen to a dead band. Contact W2EMW, 18 Homeland Dr., North Syracuse, N. Y.

SELL or Trade: BC-348, external pwr supply and 8 meter; SCR xmttr, SCR revr partly modified; Vibrox original; 2 type 832 unused. Want: prop pitch motor or rotator, H. E. Brown, 4 Ward St., Woburn, Mass.

FOR Sale or trade: BC610E, BC614E speech amp., coils five bands, spare tubes and parts throughout; SX28 revr, Mosley 10 meter beam; Hy-Gain all-band trap antenna, everything in exc. condx. Will trade for Gonset Communicator III and linear for 2 meters. Pick up at my QTH. H. C. Stamate, W0CRP, Box 76, Leesburg, Ind.

B&W 5100-B and 5188B latest 2 factory run, \$500; National NC300 xtal calbrated speaker, 417 A, 2 meter converter, National 6 meter converter with cabinet, \$325; Commercial 1 KW 2 meter final, silver plated, 4-125A blower, etc., \$150; Johnson 6N2 complete with 700 power supply, \$165; Johnson Viking Matchbox, \$20. J. Dawson Ransome, W2SAT/3, Old Welsh Rd., Huntingdon Valley, Penn. Phone CHapel Hill 1285.

WANTED: SSB 20A, late model, factory wire. Also 458 VFO. Give details and best prices. W4KQM, 5454 South Angela, Memphis, Tenn.

WANTED: Receivers, Transmitters and accessories. Nelf Enterprises, 118 S. Clinton, Chicago 6, Ill.

SELL: HQ-129X, \$90; Viking II factory wired; Heath VFO, excellent condx, \$190. Want SSB exciter, W5BDV/2, Pleasant Drive, Mounted Road, Rome, N. Y.

TRADE KWS-1 for late model Volkswagen or Simca. Herb Hollister, Box 17, Boulder, Colo.

WANTED: Used code oscillator. KN9LZX, Denny, 8411 Walnut, Munster, Ind.

FOR Sale: Hallcrafters \$20R revr with Q multiplier, \$45. Allen Anderson, K8COF, 6699 Royalton Rd., Brecksville, Ohio.

WANTED: 833A, W1BRX, Buttonball Lane, Weston, Conn.

WANT: AM one final and power to meet following specs: Minimum of 500 watts out, prefer bandswitching, well TVI suppressed, rack panel construction, well metered, pi net loading, A-1 workmanship. Capable of drive from Vallant or equal. No junk! All replies ans'd. sell: Gyro electronics radio control xmttr and revr, excellent, trade \$30; 8 Simpson Co. Ma. 4 1/2 in. square meters, \$5.00 each; 2 Simpson 0 to 10 volt DC 4", in. square meters, \$5.00 each. Sell or trade: Friez wind direction and speed recorder, new. Friez microbarograph. N. K. Thompson, 99 Water, Millisocket, Me.

144 Mc. SSB transmitter. Send for specification sheet. Tele-Products Co., 26184 Springland, Farmington, Mich.

NCQ-5er, unfinished, \$25. KN8LCC, Fedak, 8023 Theota Ave., Parma, Ohio.

WANTED: Pacemaker, state number, condition and price. K4JZG, Room 4, Hains Bldg., Sebring, Fla.

FOR Sale: Collins 32V3, with Collins low pass filter and D-104 microphone. Guaranteed used less than 15 hours. Like new condx: \$490.00. George Gathman, 32 Delaware St., Elizabeth, N. J.

CANADIANS: Johnson Viking Ranger for sale, \$225. Kenneth Dixon, VE3DZY, 635 Armour Road, Peterboro, Ont., Canada.

COLLINS 75A-4, exceptionally fine receiver, latest circuitry, used as display unit, perfect in every respect. Brand new appearance, in original factory shipping carton, \$535. C. Brooner, P. O. Box 261, Morton, Ill.

TWO K138, two 811-A's, UPC S-21 Universal modulation transformer and S-8 driver transformer, all for \$25. (In cleaning out everything and going strictly mobile. Send for price list of parts and equipment. David Clark, K2OZB, 32 Ewer Ave., Rochester 22, N. Y.

WANTED: Hallcrafters HT-4 (Army-T173FR) complete and Hallcrafters SX-28 (Army-AN/GRRS); modified as issued. State price wanted. Pfc. Charlie F. Gray, RA13167181, HQ & HQ Co, 3rd Arm. Cav. Regt., Ft. Geo. G., Meade, Md.

TRANSFORMERS (3) W2EWL Special, \$3.00 postpaid. SSB, latest diagram, template, 3xfrms, disc ceramic Emica condensers, coils L1 thru L7 for W2EWL Special (Mar. 1956 QST?), \$10.95 postpaid. Vitale, W2EWL, Bensville, N. J.

FOR Sale: KWS-1 \$1500; HQ-129, like new, \$135. Szabat W3LST* 16 Pearl, Old City, Penna.

ART-13 transmitter complete with a.c. power supply, operating manual, schematics, and calibration book. Excellent condition, ready to operate. \$100 f.o.b. Cal Watts, 252 Kenwood Rd., Smyrna, Ga.

FOR Sale: DX-20 converted to 75 watts, perf. condx, also 4 xtals, \$40. Will ship. KN9KNU, 660 First St., Crete, Ill.

COLLINS 75A2 and DX-100, \$800; Regency ATC-1 tuner, \$45, all in good condx. W6NU1, 1452 N. First Ave., Upland, Calif.

FOR Sale: Stancor ST202 xmttr, 100 watts; \$30. Hi Radio, 107-47 106 St., Ozone Park 17, N. Y.

BARGAINS: With New Guarantee: Collins 32V-2 \$349.00; KWS-1 \$1,399.00; Collins 30K-1 \$550.00; Johnson KW and Desk like new \$1,195.00; 8-72 \$49.50; Hallcrafters HT-30 \$349.00; HT-31 \$299.00; SX-101 \$319.00; HT4 with Speech Amplifier and Antenna Tuner \$95.00; SN-85 \$49.00; NC-95 \$19.00; NC183D \$59.00; NC-300 \$19.00; HQ129X \$15.00; D-X35 \$55.00; Elicio SSB-100 \$295.00; 51-SB \$195.00; 51-SB-B \$185.00 B & W 1-1000-A \$295.00; (H1 or Low Z Mike) \$69.50; AP550 Power Supply \$29.50; Tape Recorders and test equipment, inquire for models and prices. Free trial, terms, write Leo, W6CFQ for best deals. World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

12 Volt 2 band revr/xmttr loading coil schematic fine condx; shotguns, rifles, pistols, perfect. Want: Good Communications revr, xmttr, or other ham gear. Answer all correspondence. Curt Nelson, KN9MEB, 410 Morgan, Elgin, Ill.

WANTED: Johnson 250 Watt Matchbox. Must be in A-1 condx. W8OHV, Gast, Route 4, Prospect, Ohio.

SELL: MK-2 transceiver, new, unused. Spare parts, 80 & 40 meters with VFO, Mod. II or converter. Res. offer, over \$50. List available. K2RHH, 222 E. 87th St., New York 28, N. Y.

GONSET How-Tie 20 meter beam in excellent condition, w/aluminum tower and rotator. Write for the details and price. W1BKQ, George, 35 Ridgeway Ave., Pittsfield, Mass.

NOVICES! Complete push-to-talk 2-meter station: BC-312 with spkr, Teracon com., deluxe 522 xmttr conversion including xtal mike input. All with power supplies and in perf. condx. Antenna, xtals, mike, relays and cables included. Local sale only \$135.00 K2EWB, Woodmore, L. I., N. Y., CE 9-9250.

TRADE Fine photographic outfit (all or part) for amateur transmitting and test gear. Latest models Nikon, Roliflex and Omega enlarger with 2 lenses, comp., dark room speed-light, exp. meters, etc. Want factory-wired lab models. Will be willing to pick up and deliver within 100 miles radius of New York City. Fred O'Burn, 628 W. 238th St., Bronx 63, N. Y.

GONSET Two-meter Communicator for sale. 110V AC and 6V DC. Complete with microphone, whip, AC cord, mobile cable and instructions: \$120. Auguste Schwab, Jr., K2LGS, 560 Woodmere Blvd., Woodmere, L. I., N. Y., Tel. FRanklin 4-4168.

RTTY Technical data, equipment schematics, operating news. 12 issues, \$3. Sample free to interested amateurs. ARTS Bulletin, W2EBZ, Cool, Editor, 443 West 47th St., N. Y.

WANTED: A sked with Nevada on 20 CW for WAS. Please write VE3FGG, 64 Barrie, Gait, Ont., Canada.

BARGAIN: Kilowatt amplifier using push-pull 810's into B&W completely enclosed with meters and all power and bias supplies. Will throw in free: antenna match, \$30 of transmitting and rectifier tubes, Messner signal shifter, and 813 driver (or transmitter) unit if bought before next month. Amplifier price \$250. Dave Ranney, Box 590, Yankton, So. Dakota.

B&W 518B, excellent condx, \$180. W7NUT, Nick Minko, 463 North 7th, Laramie, Wyoming. Apologies for missprint in last ad!

FOR Sale: KWM-1 w/516-F, 312B, Matchbox, LP filter, in original packing; also new PR 4X150s, used PR 4X150s. Assorted resistors, capacitors, inductors, chokes, transformers, etc. Best offer over \$1000 takes this complete SSB station plus extras listed. Ambrose, 71 Jarvis Circle, Needham, Mass.

Wanted: Central Electronics 20A and VFO, Slicer, 600L or other linear amplifier or KW final and power supply. Oscar Ploy, Thornton, Iowa.

SELLING DX-35, \$45 and Lettine 242 six meter transmitter, \$69. Heathkit a year old and Lettine six meters old. Both in excellent condition. I have original cartons, instructions, etc. Write Carl Chi, W2KJK, 250 Riverside Drive, New York City 25, N. Y. or phone Monument 3-9201, mornings or evenings.

CW Men: Johnson Adventurer excellent condx, used 6 months. K1CCA.

WANTED: Gonset 6 used transceiver. K2TWN, 222 East 87th St., New York, N. Y.

CONVERTED Prop pitch motor, xfrmr and two 110VAC/60 cycle selsyns, \$25. F.o.b. Peekskill, N. Y. Dick Walker, RF'D 43.

THUNDERBOLT, factory-wired, checked out on air on CW and SSB one time, no trades. \$500 cash f.o.b. Fort Worth, Texas. James Farmer, W5JMC, 3202 N. Elm.

SALE: Need cash, 6-meter Gonset, 6 meter comm, \$304.9B, \$160. Prefer local deal. Will demonstrate. In gud condx, \$6-110V. Holds 4 xtals, Jerry, N9GDS, 1934 No. Monticello, Chicago 47, Ill. Tel. Dickens 2-9069 or NA 2-1963.

GONSET Communicator II, 6 meters, excellent condition. Complete with 2 crystals. First check for \$150 takes it. W2KVM, 218 D Street, S.W., Glen Burnie, Md.

SELL: NC-173 plus S38 and Select-O-Ject, \$125; RDO revr 3-tune units 40-1000 Mc, \$60; AT7 xmtr, fair, \$20; HQ-420, HQ311, \$50; Gonset Super Six one hour's use only, \$30. Write for complete list of particulars and misc. Clayton A. Carlson, KN2PGW, 229 Cooper Ave., Dumont, N. J.

TO All concerned! The Ohio Valley Amateur Radio Association (OVARA) has not been connected with the publication of the Ohio Valley DX Bulletin since January 1958.

ME Trade-um! HQ-150 with speaker, Viking II, VFO (122) and Matchbox (275) for HT-32um. W2MHL, Walt Zmetronak, 147 Parvue Ave., Paramus, N. J. Tel. COlfax 1-9449.

FOR Sale: Complete ham station of late WFOZD including BC610D transmitter; BC312-N receiver and accessory equipment, \$275. Also Collins 75A1 receiver recently factory realigned, \$225. No shipping. Mrs. Ted Goodner, Rocky Ford, Colo.

WON! Universal service KW4-M (52 ohm) coax ratiometer at Dayton Hamvention, never used, \$40. Dan Hearn, K8GVG, Cherry St., Kenton, Ohio.

DX100 in A-1 condx; \$185, low pass filter, \$8; NC-100 revr with matching spkr, \$55. Bonus of new J. T. 30 mike to the purchaser of entire rig. K2PVQ, Ivan Huntman, 42-22 Ketcham St., Elmhurst 73, N. Y.

REBIRVE Sunday September 7 for the Cedar Rapids Hamfest at Hawkeye Downs on Highways 30 and 218 south of Cedar Rapids. There will be contests and prizes, lectures, a program for the women and the salvage store will be open. Registration is \$1.50 for the men and \$1.00 for the women. For information and pre-registration contact Jay Spalti, W8SCM, 3239 Vine Ave., S.E., Cedar Rapids, Iowa.

COMPLETE 12 volt mobile rig, \$190. Includes Viking mobile transmitter, Viking mobile VFO, Gonset Super Six, Gonset Super-celver, controlled reluctance mike, PE101C dynamotor control panel, antenna relay, Webster Band Spanner and bumper mount, all cables, coax, etc. K8CFU, Box 673, Franklin, Mich.

FOR Sale: Complete parts 6-meter transceiver April 1958 QST and other QST projects. K&G Electronics, Jack Kelly W1KAH, 39 Walshe, Winthrop 52, Mass.

KWS-1, 75A-4, low pass filter, Jones Micro-Match, Gonset bow-tie beam. All for \$2100. K2AOS, Raoul Poliak, 190 Devonshire Dr., New Hyde Park, N. Y.

DX-35, \$60; BC-34NF, power supply, \$70; Vibroplex Original, \$15; pr. Baluns, never used, \$7. K2LEB, Box 22, Elizabethtown, N. Y.

BOB Graham, W1K7J, Graham Company, New England's only exclusive ham dealer, handling all lines of new and used amateur equipment, is now located at 505 Main St., Reading, Mass. Tel. REading 2-4000.

FOR Sale: Jackson CRO-2 scope with probes, \$100. Sylvania 134Z VTVM, \$25; VM tape recorder, with ten (10) tapes, \$110. T. R. Dunn, Old Blue Point, Road, W. Scarborough, Maine, W1BPM.

OSCILLOSCOPE, 5", Heathkit OM-2, needs new transformer, \$18; Dynamic mike with stand, \$15; 3/4" Weston meters, 100 Ma and 500 Ma DC; \$3.50 each, 4 amp. R# 86. Several 2000 and 3000 volt oil condensers, 1 to 10 μ F, 1 per μ F. R. Emmott, W2AI, Florham Park, N. J.

GENUINE Bargain on 6 meter 12 volt Gonset Communicator in perf. condx for \$195, also practically new SX-101 with very few hours on the air for \$325. W8WRI, Joe Luneke, 1039 Truxton Dr., N.E., Grand Rapids, Mich.

SELL Collins 32V2 like new \$330; HRO 57AL receiver, \$75; all inquiries answered. Pierre Declaive, W6GLB, 8438 Alma Ave., Castro Valley, Calif.

SALE: DX35 with relays for standby, tune and antenna switchover. Conrad indicator control system complete with switches, \$56. Heathkit multipl. and power supply, \$11; 12-33 Mc. Preselector, \$6. Gary Cooper, K4PLZ, 318 Hemlock, West Palm Beach, Fla.

VIKING II, factory-wired, with VFO and push-to-talk, \$225; good SX-76 with condx, \$125; also V-M stereo tape recorder, used very little, \$125. Dr. Marion Gunter, K5HNP, Mart, Texas.

75A4 latest model, perfect with 500, 2100, 3100 cycle filters, \$550. K17GT, Colonel Hill Geysler, 19B Davis Road, Westover AFB, Chiecope Falls, Mass. Phone LYeem 3-8519.

KWS-1, Serial No. 1329, 75A-4 Serial No. 2486, both \$2000 or make offer individually; EV 664 mike, \$25; Telrex 503-A, prop-pitch, heavy duty selsyns, roof tower, \$175. Amount of use doesn't justify ownership. K2MPC, George F. Toik, 20 The Oaks, Roslyn Estates, N. Y.

HAVE 4-400A, 4X150As, 4-65As, 813. Am looking for 3000V DC pwr supp. Anyone for a swap? W1GYP, 38 Bacon St., Bliddeford, Me.

FOR Sale: 6PR 90 receiver and Johnson Viking 500 transmitter. Both perfect, scratch-free condx. Prefer local package deal, no shipping, svt. \$75 takes both. Bill Reilly, W2LWP, 152 Dyckman St., NYC. Tel. LO 9-2281.

SELL: Dual power supply 1200 volts, 400 mils 250 volts, 100 mils, \$40; 100 watt modulator 4-6L6s with power supply, \$40; Handbook RF section 813 final, \$20; sell separately or enclosed in screened bud 5' rack, \$125 with antenna tuner (pick up preferred), BC221M, \$50, Gonset 3-30 converter, \$20; PE103, \$10; pair 5s selsyns \$5, Drake 75M loading coil, \$4. F.o.b. Warren, Penna. W3NQA, 201 Pioneer.

TUBES: Brand new 4-65As, \$9.50; 4-125A, \$15; 4XT50A, \$12; 4D32, \$22.50; 4E27, \$8.50; 5894, \$10; 5E29 (6249H), \$6; 832A, \$4.75; 4E26, \$2.25; 10TH, \$1.00; VT-127, VLF version of 10TH, \$4; 813, \$7.50; 814, \$3.50; 815, \$1.75; 802, \$2; 304TL, \$10; 304TH, \$9; 2C39A, \$8; 811, \$2.50; 811A, \$3.50; slightly used guaranteed grid 4-400A, \$18; 4-1000A, \$28; Collins ART-13 transmitter, exc. condx, \$95; BC-610 modulation xtrmr, \$48; like new, complete, model 15 teletype, \$300; BC-639 receiver 100-150 Mc w/ 110V RA 42 power supply, ideal for 2 meters, ultrat, police, U. S. Satellite, \$100; all guaranteed. C.O.D.s OK. Bill Slep, W4PHY, Box 178, Lilenton, Fla.

SELL or swap NC-101X, in gud condx. Want general coverage receiver gud condx or repairable. Will add cash if necessary. H. Cohen, K2ITQ, 1975 83rd St., Brooklyn 14, N. Y. Tel. CL 6-5856.

LINEAR Amplifier Hallcrafters HT-31, 500 watts new condition, \$200 for quick sale. Joe Corbals, K2GFR, Wappingers Falls (near Beacon), N. Y.

FOR Sale: 300W Thordarson multi-match modulation transformer, \$30; Precision E-400 sweep generator, \$65; Millen sideband selector, \$20; BC624 unconverted, \$8; power supply and audio for above, \$5; pair Bendix 2 meter FM transceivers, \$15 each, 6V. F.o.b. Burlington, Wisconsin. John Holmbeck, 553 Lincoln.

SELL: Super Pro BC794B with power supply, and manual, in good condition, \$125. Want 75A-4. R. Phoenix, W9HPN, 432 S. Madison, Macomb, Ill.

GOLD Decals, two inch for car window, shack, etc. Guaranteed. Your call, \$1.00 set, postpaid. Wooten, Rt. 4, Box 82B, San Antonio, Texas.

ALUMINUM for every ham need. Before you decide on that next beam or shield your rig, why not write to Dick's, Cherry Ave., Route 1, Tiffin, Ohio for list of tubing, angle, channel, castings, plain and perforated sheet, complete beam kits, and VHF collinear arrays. Build it yourself and get the best for less.

FOR Sale - TBS-SOC transmitter w/ Harvey-Wells AC Supply E-3 2 tube mike preamp, for only \$60. Gordon Hopper, W2MEC, 75 Kendall Ave., Framingham, Mass.

FOR Sale: AR-3 and QF-1, \$33. Fred S. Kirby, KN1HTS, 5 Emery St., Westfield, Mass.

SALE OR trade: NC300, speaker, calibrator, Globe Chief, WRL VFO model 755; Vibroplex original Signal Sentry. Want mobile rig complete, Morrow, etc., or will consider outboard boat. Local deal only. Thomas Dalton, K2QCP, Box 95, Hackettstown, N. J.

VIKING 2 for sale; factory wired, less than 2 years old for \$200 or \$220 with Viking VFO, W3DVX, 65 North Church St., Carbondale, Penna.

WANTED: Collins 75A1 or 75A2. Must be reasonable. All replies will be answered. K2BCL, 1264 State Road, Webster, N. Y.

MUST Sell: Very little used Hammarlund HQ-140X, with matching speaker. New condition; \$170. Need money for college. Harry Benson, K5BXP, 507 East 14th St., Okmulgee, Oklahoma.

FOR Sale: Wired and tested, DX-20, used very little, \$40; also Heath Q multiplier, \$10. Stanley Hayes, Benson, Ariz.

HRO Colls G, H and J wanted, W8KYK

SELL Cheap, need the money: ARC-5, BC-458A, \$4; Four power transformers, all \$5; CQs, Dec. 1953-January 1955 and QSTs Dec. 1952 to present, \$5.00. W9QXR, 1424 Noyes, Evanston, Ill.

FOR Sale: One Hallcrafters HT-9 transmitter with all coils, \$75. Will not ship but will deliver up to a hundred miles. L. Comer, R #1, Shenandoah, Va.

LM18 Freq. Meter, in carrying case, with original calibration book, \$59.50. A.C. power supply for LM, \$12.50. Ferris Field strength and noise meter ranges .16 Mc to .35 Mc to .20 Mc., \$165. K6JFZ, 887 Bridge Rd., San Leandro, Calif.

SELL Collins KWS-1, slightly used in excellent condition, \$1450. George Homan, K6GB, 418 D st., Niles, Calif. Tel. SYcamore 3-4624.

FOR Sale: WRL "Globe Champ" xmtr and RME 4300 revr. K8BYE, Neel Tyree, 870 1/2 Belford Ave., Los Angeles 45, Calif. Tel. ORchard 2-8873.

SEPTATEMBER Closeout! Following items top quality reconditioned and demonstrator items: B&W 1000A linear, \$395; Collins 75A3, \$375; Collins 75A4, \$549; Edico 88B 1000 linear, \$395; Gonset 500W linear, \$149; Gonset 2 meter Communicator III, \$219; WRL (Globe King 500B, new factory sealed crate, \$598; WRL Globe King, 400 complete \$199; Hallcrafters HT-32, \$549; Hallcrafters HT-33, \$495; Hallcrafters SX-101 \$235; Johnson Valiant, \$349. Also hundreds of stand-out values in smaller units. Write for our brand new catalog No. 758 just released. Burghardt Radio Supply, Inc., Box 746, Watertown, So. Dak.

FOR Sale, like new Precision Mod. 400 sweep generator, \$70; E-200 C generator, \$35, both \$100. New Carter dynamotor 12V in. 400V at 325 Ma outp., \$10. W4ZRS.

DX100 new tubes, \$170, AR3 QF1 FB, K8GHY, 408 W. Ionia St., Lansing, Mich.

MOBILE AF87 with mounting rack, James C1050 power supply, Dow coax relay, Gonset Super Six, Johnson Whipload 6 coil, \$215. Will sell separately. Pentron MP-2 tape recorder, \$85. W9LLU, Edwin Hofmeister, Rte 1, Rolla, Mo.

FOR Sale: B&W 5100B and B&W L1000A. Both in like new condition with all manuals, Both for \$675. Will separate. F.o.b. Chicago. A. Martinka, 3723 Magnolia Ave., Chicago 13, Ill.

CENTRAL Electronics 20-A exciter and VFO in matching cabinet used only few hours. First money-order one hundred ninety bucks W3OJ, 4923 St. Elmo Ave., Bethesda, Md.

COLLINS 310B exciter, A-1 condition, \$160. Dave Walsh, K1BPC, 12 Saechem Road, North Kingstown, R. I.

SELL OR trade BC-348 receiver AC power supply, \$40. Bill Hemphins, 106 N. University, Seminole, Okla.

6-10-2 meters Clegg 62T10 transmitter, 200 watts CW 150W AM, three bands hi-level plate modulation. Like new condition. In original packing. Best offer over \$375. Simon, K8AOL, Dodd Road, Willoughby, Ohio.

HAVE Twelve 304TLs in factory sealed cartons. Will sell for \$108, six for \$56 or \$9.95 each. Four 250THs, also new, \$16.50 each. Les Essington, W5BL, Box 65, San Antonio 6, Texas.

NEED The following back issues of QST: Jan., Feb., 1921; Feb., 1922; Jan. 1928. WILKE, % ARRL, 38 LaSalle, West Hartford 7, Conn.

CUBICAL Squad, Triband, complete, never assembled, \$45. Davis, W6JVB, 2655, Homedale, San Diego, Calif.

FOR Sale: 813 tubes, \$5.50. Three for \$15; three OK slightly used 61A6s, \$5; perfect 10X exciter with VFO, anti-trip, and 80 through 15 coils, \$135. Assorted parts and meters. F.o.b. Steelton, Penna., Ed Aicher, 625 Pine. Want 6 meter mobile gear.

PAIR BC611A Handle-Talkies, new condx on 3885 Kc. New batteries, \$125. K6EYB, Danville, Calif.

FOR Sale: Collins 75A-3 receiver, mechanical filters, xtal calibrator, speaker, \$425 or best offer, Howard Bailey, WIUIL, 10 Lake Ave., Amesbury, Mass.

FOR Sale: Garrard RC-80 3-speed record-changer, \$25; portable mill, pica type, \$25; Soumscriber dictating machine, \$50; Brush Soundmirror tape recorder, \$55; Webster 50-watt PA amplifier, \$35; power supply, 400 VDC at 200 Ma., V. AC, \$10; two 200 Ma chokes, \$5; UTC transformers, 8-40, \$10; 8-42, \$12.50; 8-45, \$13.50; 8-61, \$6; LS-72, \$12.50; UTC chokes, 8-27, \$3; 8-28, \$3 each. Priced F.o.b. V. R. Hein, 418 Gregory, Rockford, Ill.

SELL Complete station; DX-40, Heath VFO, Lynmar TR switch, NC-173 with speaker, QST window sill antenna, DN-HZ microphone, and key. \$195 takes all or will sell separately. Walden, W2IEY, 64-19A 186 Lane, Flushing, L. I. N. Y., Call Olympia 8-8757.

ASTATIC D-104, \$10; Morrow MBR5 with match, AC supply, \$147; Heath 3" scope, \$27; 8 Mc. xtals for 6 meters, 79¢; Ls3 coil forms 4 for \$1, 2 µfd oil-filled cond., 600 volt, 15¢; 40 mel coils 49¢. All guaranteed like new condx, F.o.b. Chicago 35, Treger W9VJ, 2023 N. Harlem.

WORLD Famous Pocket Size Tape recorder "Minifon." Weight 32 ounces. Works on batteries only, with microphone headsets and battery recharger; \$280 postpaid. Write to Industrial Communications Equipment, Scherer, K4VJX, Havelock, N. C. P.O. Box 406.

FOR Sale: Mackay 167BY 900 W CW transmitter, Parallel 813s pi-net final; xtal and VFO, 80 thru 15 meters. A real DX getter. Will deliver and help set up Indiana or adjoining states, \$300. Byron E. Fortner, W9PYM, RFD #10, Box 486, Indianapolis 19, Ind.

CRYSTALS Airmailed. Novice, net, General, FT-243. Any kilocycle .01%, \$500 to \$600, \$1.00. Thin Gonset \$1.45; 1700 to \$499 \$1.75; \$601 to \$1,500 \$1.95; new crystals. Guaranteed. Marine, CAP MARS, etc. Write for frequency listings and brochure. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

HQ-129X \$99, HRO-60 \$298, BC-794 1.2-40 mc \$119, Communicator 6m 179, Communicator 2m 159, 75A-4 \$495, 32V-1 \$289, Gonset \$77 \$210., 5100-B \$325. Teletype machines, Converters. Trade your used ham or surplus gear (BC-221, BC-348, BC-610, R-388/U.R.R., URA-8, etc) for new Johnson Thunderbolt, Vallant, Hallcrafters, Hamlund, Central Electronics, National, Fisher H.F.L., Bell etc. Write or phone Tom, W1AEN Altronics-Howard Co., Box 19, Boston, 1, Mass. (Richmond 2-0048) Stores: 278 Friend, Boston; 60 Spring, Newport, R. I.

IMPOSSIBLE — but true. Offering complete set of QST's from first issue of December 1915 through December 1957. Beautifully bound. Sorry, cannot break set; selling all or none. L. A. Morrow, W1VQ, 99 Bentwood Road, West Hartford 7, Conn. Phone A.Dams 2-2073.

SAVE \$150 on new 75A4 #4626. Complete with all packing and manuals. Disposing because of illness. Robert A. Smith, W1LFL 320 Busby Hill Road, Simsbury, Conn.

FREE Description: KW final, \$200. W3BJ1, 1804 Matravvers Road, Glen Burnie, Md.

NOVICES! For Sale: SX-99 with speaker and Q-mult., \$150; DX-35, \$50. Both in ex condx. Both for \$195. Russ Fisher, 410 No. 6th St., Marshalltown, Iowa.

SALE: NC-125 receiver, \$115; 75A-3, 3 Ke, 8 Ke filters, \$395.00; 32V-3, \$495; DB22-A Pre-Selector, \$32.50; G-E V.F.-9 Electronic switch, \$12.50; Sylvania X-7018 modulation monitor, \$14.50; Heathkit SG-1, \$10; cased 8 ampere Variac, \$10; cased set four Millen freq. meters, \$9.50; B&W grid dipper, \$27.50; 24 hour clock, \$9.50; Penton 9T-3C tape recorder, \$60; Bud CPO-128A keying monitor/oscillator, \$12.50; Trav Electric 6V DC/110V AC converter, \$6.50; Busby Hill Road xtals, \$12.50. Everything advertised above electrically and mechanically A-1, no modifications; F.o.b. manuals furnished. Request complete listing. H. O. Severeid, W9DPL, Rte. 1, Box 12-B, New Augusta, Ind. (Tel. Indianapolis TRinity 8-2005; QTH: 3602 West 71st St.

BC-342-N receiver with spkr and pwr supp. in sep. cabinet, gud cond. w/manual, \$45.00; Gonset Tri-Band converter, 75-20-10, gud condx, \$20; Jelmssner Mod. BX Sign. Shifter as is w/pwr supp and tubes, \$7.50. M.J. Collins, W5QDQ, Box 561, Sour Lake, Texas.

VIKING II, VFO, Matchbox, filter, SX-99, VP beam, rotor, in perf. condx. I prefer local buyer. W9TSE, Hoye, 1618 McOrmieck, Wichita, Kans.

SALE: 20A with 458 VFO, \$125.00; 75A-4 latest conversions, \$475.00; Globe King 500H, \$450; first cash takes it or all for \$1000. W1ZZP, 73 Whitney Ave., Milford, Conn.

COMPLETE! 6 meter 100 watt 'phone xmttr with mks, xtal, pwr supp, TVI suppressed, \$99.50, 6 meter or 2M VFO, new design, with pwr supp., \$39.50; 1 KW dummy antenna, cabinet, \$5.75. Xmttr pwr supplies, \$10 up. K9KJX, L. P. Jackson, 646-A Marshall, St. Louis 19, Mo.

HAVE an HRO-50? Give It Super Selectivity with Collins 353D-31 plug-in mechanical filter adapter. New condition, 40% off net cost. W. M. McDonald, Dadeville, Alabama.

SELL! Viking VFO Viking Adventurer plus modulator and power supply, \$60.00 takes it. Also RCA Radio course RCA TV course, \$30 each. J. J. Cusumano, K2KJJ, Phone WE 9-5684, Joseph Cusumano, 33 Willow, Port Chester, N. Y.

VIKING II, factory-wired and VFO, \$229; SX-99 with matching speaker, \$18; 2 meter 12 volt Gonset II, bought last October \$163.00, W9N 6-9-1 revar. Telectronics, Heathkit converter with 7 Mc. L.F., Viking 6N2, Bruce Florsheim, K9ANI, 2531 West Morse, Chicago 45, Ill.

TECHNICAL Manuals TM11-273, 120 pages covering BC-312 receivers and BC-191 transmitters, \$2.50, 1D-60/APA-10 Panadaptor maintenance manuals, \$2.75. Both postpaid in U. S. A. Electroucraft, 27 Milburn St., Bronxville, S. N. Y.

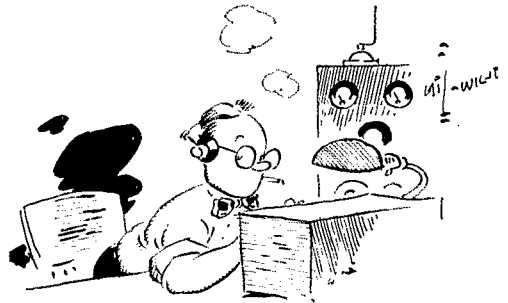
RECONDITIONED. Shipped on approval with easy terms. Hallcrafters \$38 \$29.00; \$40B \$79.00; SX99 \$119.00; SX71 \$149.00; SX96 \$189.00; SX100 \$229.00; SX101 \$299.00; HQ129X \$159.00; HQ100 \$139.00; HQ140X \$189.00; HQ150; National NC98 \$99.00; HRO50T \$189.00; NC183D \$279.00; NC300 \$279.00; Viking II \$199.00; Ranger \$179.00; Vallant, Pacemaker, PMR6A, PMR7A; AF67; Collins 75A1; 75A2; 75A3; 75A4; KWS1. Many other items. Write for list, Henry Radio Company, Butler, Mo.

EUROPEAN Ham will swap jewelry, silverware, antique porcelain, "worn out sputniks" or whatever you like — except cash — for Collins 75A3 or 75A4 and one single PL8 filter, OZ7FG, Grenaa, Denmark.

HALLCRAFTERS S40A plays good all bands, cabinet fair, \$50. Also Vibroplex, tube checker, 24 hr. clock, all in gud condx. Send for list. Blum, 396 E. Whittier, Columbus 6, Ohio.



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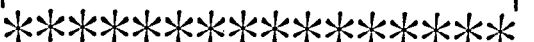
THAT pal of yours—the one you ragchew with two or three times a week—is he a member of the American Radio Relay League? He should be; the more hams who are, and the more interest they take in their organization, the stronger the League will be. The stronger the League, the stronger all of ham radio will be, for ARRL is the recognized spokesman for amateurs in the U.S. and Canada, and the leader of organized amateur radio internationally.

AND say! If you're in the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern, or West Gulf division, you have an extra "handle" right now for signing up new members. Director elections are in progress in those divisions, and members whose dues have been received at Headquarters by noon, September 20, will be able to vote this year. Wat sa, OM?

P.S. Don't forget that additional licensed amateurs residing in the same household with a full member may join the League for only \$1—without having to obtain a subscription to QST.

QST and ARRL Membership \$4
\$4.25 in Canada, \$5 elsewhere

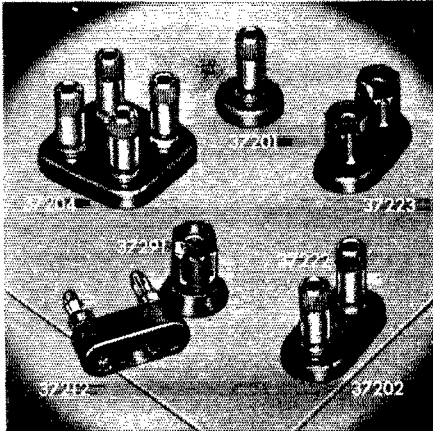
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What is a Mercury Battery?



How does this battery differ from zinc-carbon batteries in construction and performance?

Mercury batteries are ideally suited to modern trends toward miniaturization such as vest-pocket portables, hearing aids, instruments, electric wrist watches, and military equipment.

The electrical characteristics of the mercury cell differ considerably from those of the zinc-carbon cell. Its high capacity-to-volume ratio gives it from 2 to 15 times the capacity of other primary cells of the same volume—or, by the same token, substantially reduced volume for the same battery capacity.

The mercury battery—a mercuric oxide, alkaline primary cell—was invented during WWII, and developed by P. R. Mallory & Co. Inc. Chemically, this battery consists of a depolarizing mercuric oxide cathode, an anode of pure amalgamated zinc, and a concentrated aqueous electrolyte of potassium hydroxide saturated with zincate.

Mechanically, the cathode and anode are pressed shaped structures which are assembled into a steel container. Currently, there are two basic physical designs—the flat, button-like unit, and the cylindrical unit resembling an ordinary pen-light battery. Both structures are self-venting for protection against circuit abnormalities such as shorts or reverse currents;

Longer shelf life is possible because deterioration during inactivity is minimum. This is important where batteries must be installed in equipment which operates at widely separated intervals or only in case of an emergency.

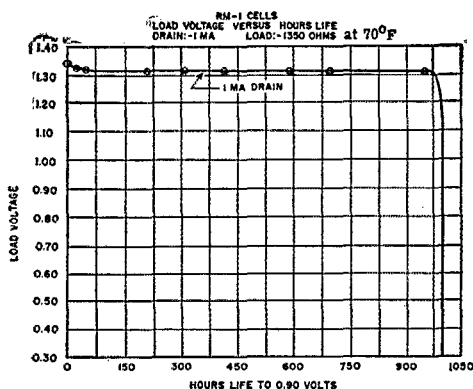
When used at current drains within design specifications, no "recuperation" is required to maintain a mercury battery's efficiency. The most important electrical feature, however, is the mercury battery's constant voltage. The measured potential of this battery, under a given set of conditions within its ratings, stays substantially the same to the end point of its life. (See performance curve.) Over long periods of time, voltage regulation within 0.5% is maintained—for shorter periods, regulation of

0.1% may be realized. This enables the use of these batteries in such services as a reference point in a regulated power supply, computers, and other critical circuits.

Mercury batteries have an exceptional ability to withstand severe shock and acceleration, and have extremely high resistance to moisture and corrosive conditions. Momentary short circuits will cause no permanent damage, with almost complete recovery to full open circuit EMF within minutes. Excessive load currents cause no damage, with almost immediate EMF recovery.

Mallory Mercury Batteries are available through Mallory distributors. For those who desire more complete engineering information, a copy of the Mallory Technical Data Bulletin on Mercury Batteries may be had by writing me in care of the Mallory Ham Shack, P. R. Mallory & Co. Inc., P. O. Box 1553, Indianapolis, Ind.

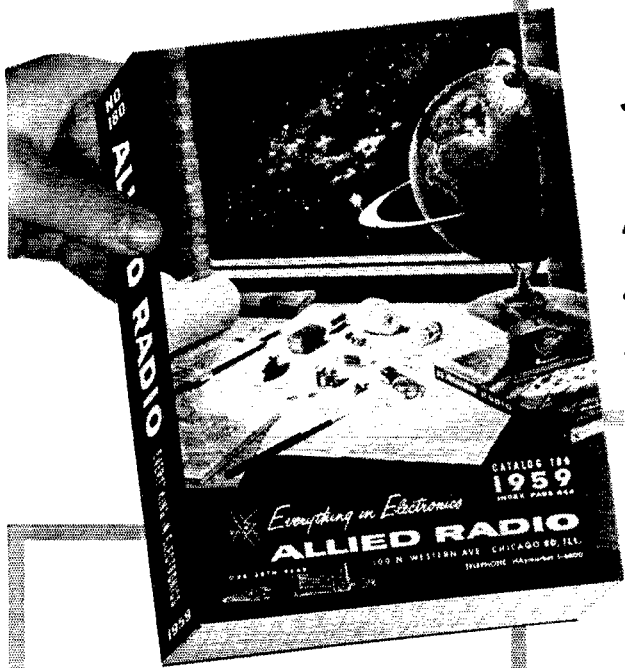
Lem Temple, W1DI



A typical mercury battery performance curve showing voltage vs. life. Note the constant potential to the end.

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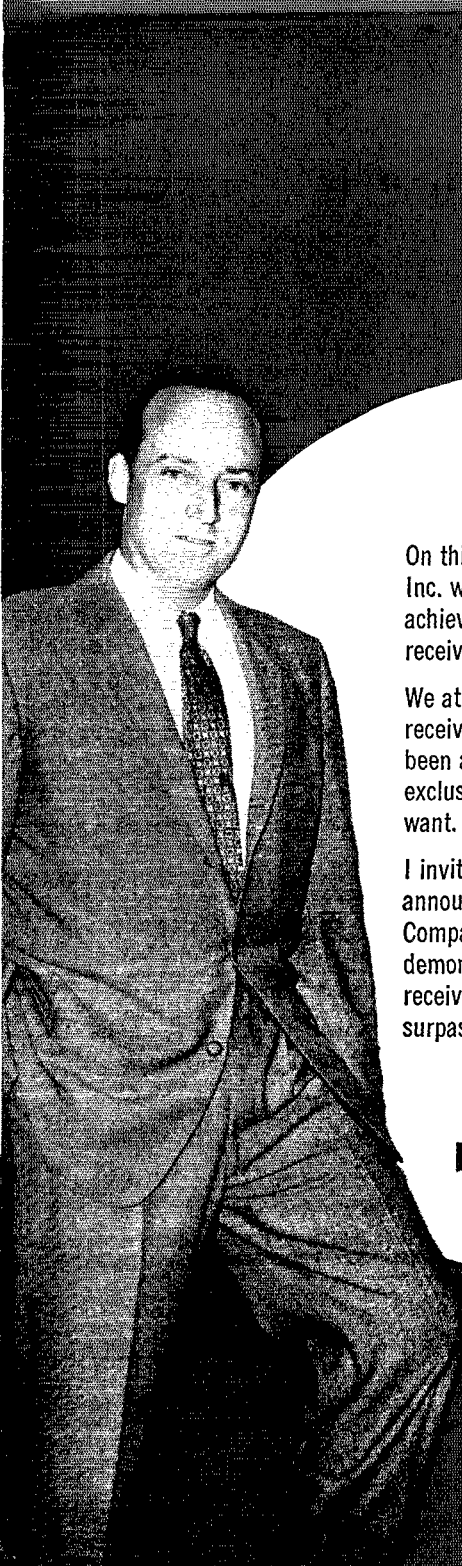
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I invite every radio amateur to watch for this announcement and then visit his National Company franchised distributor to see a demonstration of this outstanding new receiver. I am sure that you will agree that it surpasses everything to date.

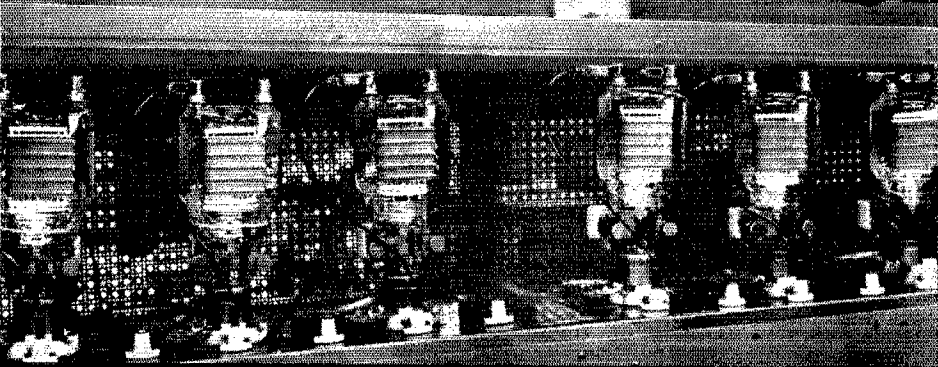
Sincerely,

Joseph H. Quick, President

National Company, Inc.



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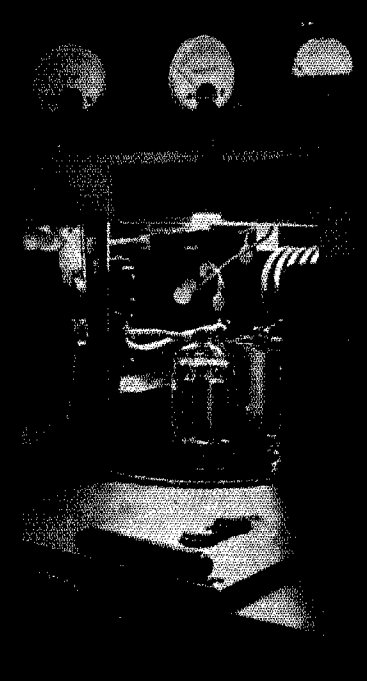


100% electrically stabilized under conditions at — or above — tube's rated maximum plate dissipation and plate current

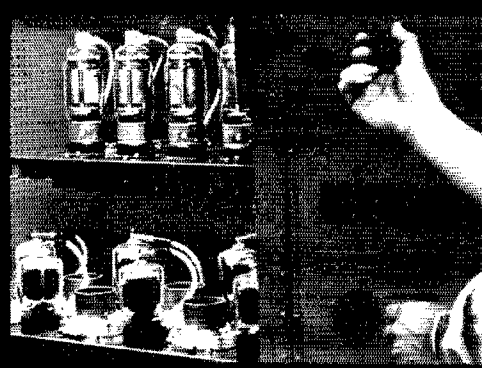
EVERY TUBE... 100%



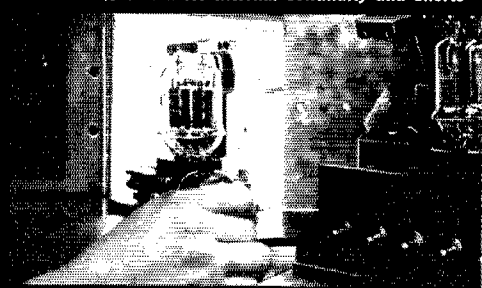
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100% tested for internal continuity and shorts



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Did you know that every single RCA amateur power tube you buy is tested for its "solid-signal" capacity?

To make sure every RCA amateur power tube that leaves the factory will take the "gaff" of transmitter operation...to be certain that every RCA amateur power tube type has high uniformity of characteristics from tube to tube...to assure you that every RCA amateur power tube you buy is capable of providing maximum hours per tube dollar, RCA puts amateur power tubes through some of the most rigid tests on record. Examples

of these tests are pictured here.

Proving-ground tests like these are just a few reasons—among many—why leading amateur and commercial transmitter designers specify RCA power tubes year after year.

RCA power tubes are known for conservative ratings, large reserve of cathode emission, and full power output at relatively low plate voltages. And they are available at RCA Industrial Tube Distributors everywhere. For technical information on specific types, write RCA Commercial Engineering, Section I-37-M, Harrison, N. J.



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