QST

August 1958
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devoted entirely to

amateur radio

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

Now "Top-of-the-Hill" Performance with the only

Tunable VHF CONVERTER

for the serious VHF man

RME/VHF 126

Radio amateurs designed and built this versatile VHF converter. Specifically designed to extend the range of *any* communications receiver through the 6, 2 and 1¼ 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.

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- 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
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- Complete shielding reduces spurious radiation below FCC requirements

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: 16½" wide, 10" deep, 10" high.
Weight: 32 pounds.

YOURS NOW FOR THE FINEST VHF RECEPTION. $239, Amateur Net!

GET THE FACTS about RME equipment—built *by* Hams, *for* Hams. Write Dept. Q88 for Bulletin 244. See your RME-Electro-Voice Dealer.

RME® DIVISION OF Electro-Voice®

RADIO MANUFACTURING ENGINEERS, Inc.

Division of Electro-Voice, Inc., Buchanan, Michigan

New!

hallicrafters "2 and 6"

Also available—
A. C.—only model

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

COMPLETE SPECIFICATIONS

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

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

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

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

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

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

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

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

Available with convenient terms from your Radio Parts Distributor.

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

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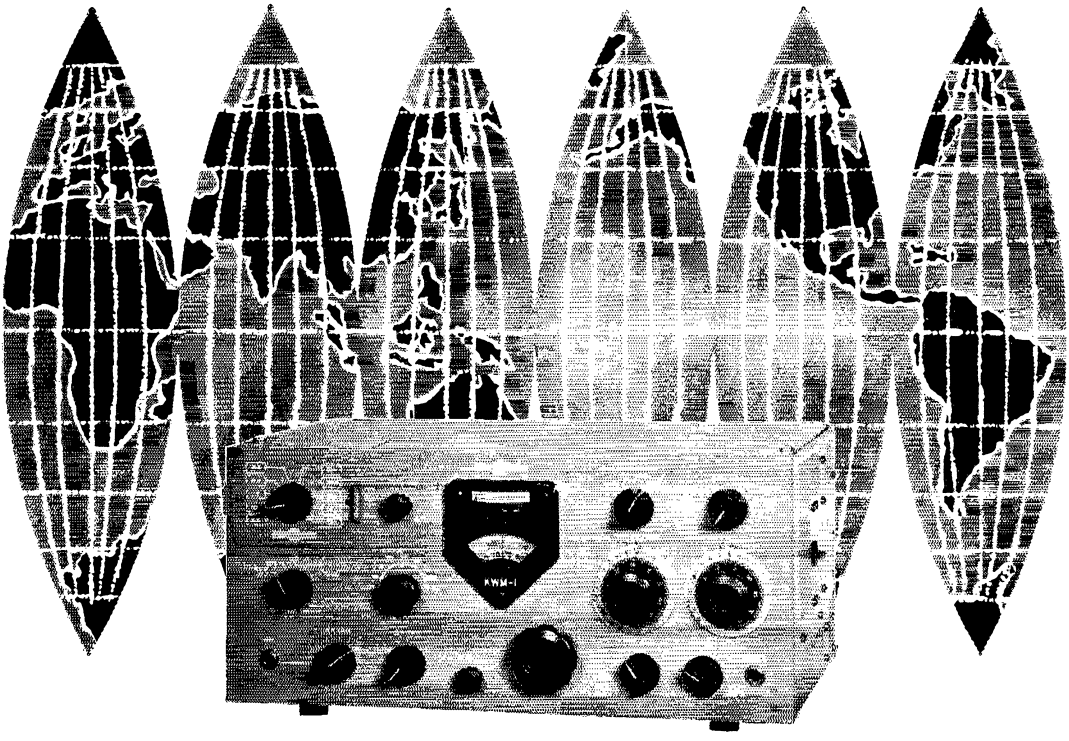

Collins KWM-1

Favorite of DXpeditions

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

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

*P.E.P.

COLLINS

QST

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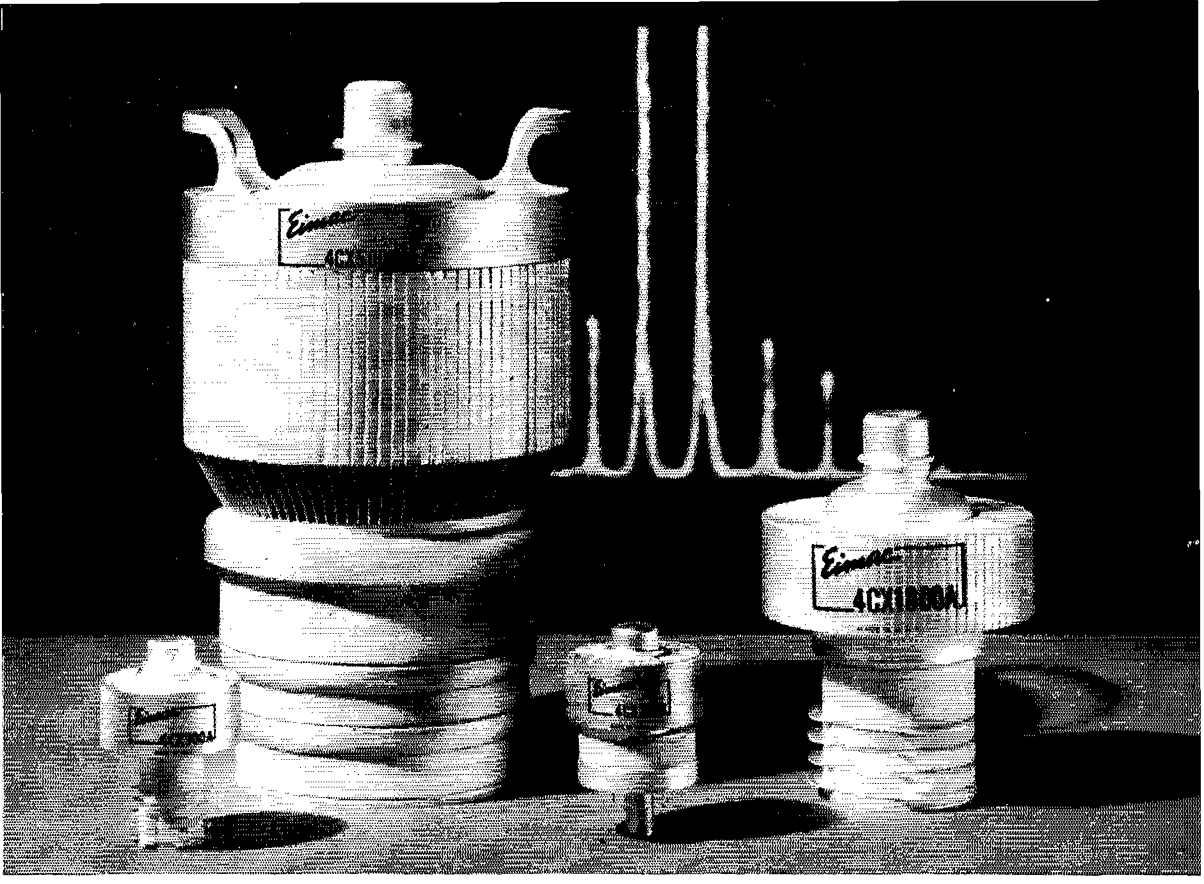

The Ideal Approach to SSB . . .
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Driving Power	0 w	0 w	0 w	0 w
Peak Envelope Power	325 w	400 w	1680 w	11,000 w

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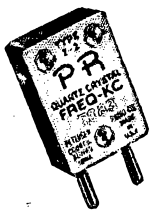
AMATEUR



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SPECIAL TYPES

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

Type Z-1, AIRCRAFT

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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—

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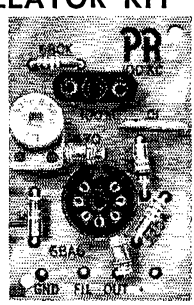
- As Foundation Circuit for Low Frequency SSB Crystals

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



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

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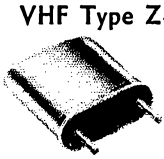

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. 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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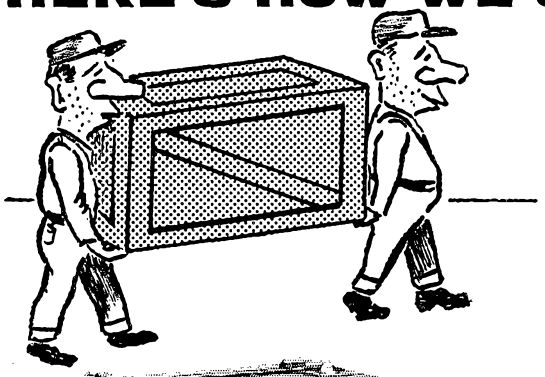
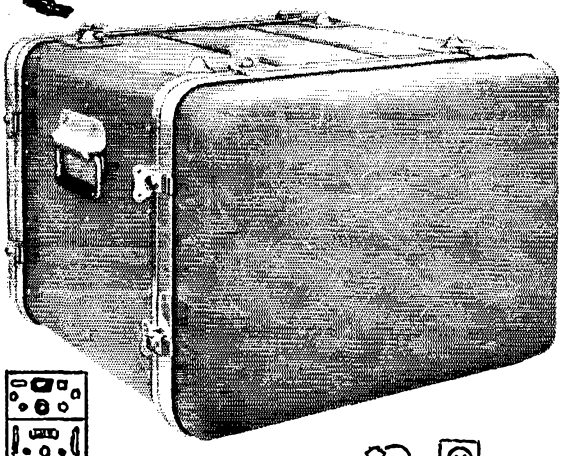
*Official appointed to act temporarily in the absence of a regular official.

HERE'S HOW WE SOLVED IT!!!

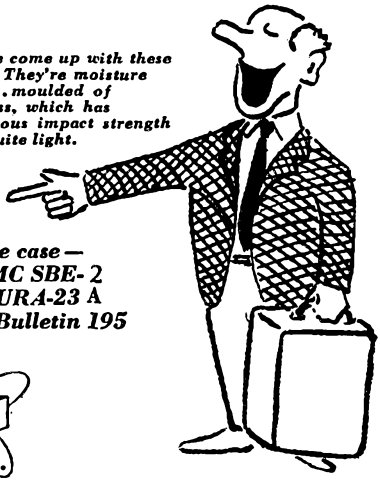


After we design and produce and test a piece of operational equipment like that shown we hit a common problem —

Usually the equipment is wrapped in cellophane which in turn is encased in a vapor proof bag with a dessicant (high class word for moisture prevention). Then it may go into another carton, and then into a case made of 3/4" lumber. Now this packing is heavy (sometimes more than the equipment) and takes a lot of space.

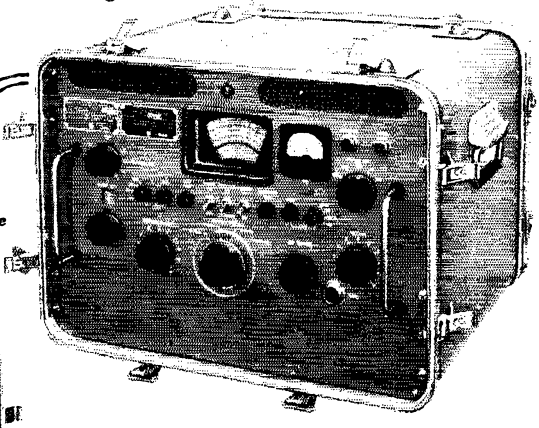


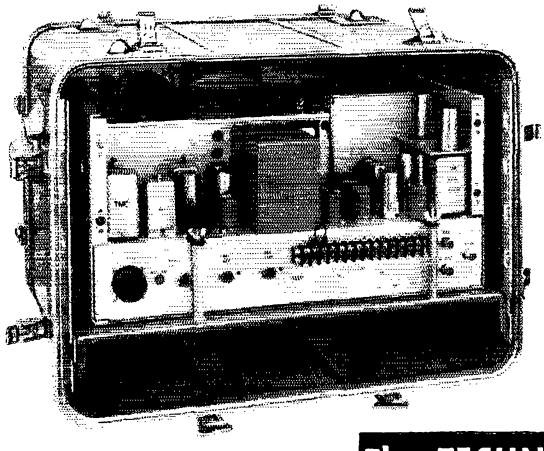
So we've come up with these cases . . . They're moisture proof . . . moulded of fiberglass, which has tremendous impact strength but is quite light.



In the case — the TMC SBE-2 AN/URA-23 A Request Bulletin 195

All you have to do is take off the covers and plug it in.





Also when unpacked it requires more handling and unpacking with heavy tools, so we've come up with these cases . . . They're moisture proof . . . moulded of fiberglass, which has tremendous impact strength but is quite light. When the equipment arrives all you have to do is take off the covers and plug it in. Simple, huh? Dimples on the top permit stacking a number of units one on top of the other.

Bulletin 217 has the story but call us for the full possibilities of TOC.

The TECHNICAL MATERIEL CORPORATION

IN CANADA
TMC Canada Ltd., Ottawa, Ontario

Main Office MAMARONECK NEW YORK

THE AMERICAN RADIO RELAY LEAGUE, *INC.*,

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

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

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

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

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4331 N. Wildwood Ave., Milwaukee 11, Wis.

Vice-Director: George E. Keith W9QLZ
RFD 2, Box 22-A, Utica, Ill.

Dakota Division

ALFRED M. GOWAN . . . . . WØPHR
1012 South Willow Ave., Sioux Falls, S. D.

Vice-Director: Charles G. Compton . . . . . WØBUO
1011 Fairmount Ave., St. Paul 5, Minn.

Delta Division

VICTOR CANFIELD W5BSR
Box 965, Lake Charles, La.

Vice-Director: Sanford B. DeHart W4RRV
227 S. Purdue Ave., Oak Ridge, Tenn.

Great Lakes Division

JOHN H. BRABB W8SPF
708 Ford Bldg., Detroit 26, Mich.

Vice-Director: Dana E. Cartwright W8UPB
2979 Observatory Ave., Cincinnati 8, Ohio

Hudson Division

GEORGE V. COOKE, JR. W2OBU
3 Daisy Lane
Commack, L. I., N. Y.

Vice-Director: Lloyd H. Manamon W2VQR
709 Seventh Ave., Asbury Park, N. J.

Midwest Division

ROBERT W. DENNISTON . . . . . WØNWX
Box 631, Newton, Iowa

Vice-Director: Sumner H. Foster . . . . . WØGQ
2315 Linden Dr., S.E., Cedar Rapids, Iowa

New England Division

MILTON E. CHAFFEE W1EFW
53 Homesdale Ave., Southington, Conn.

Vice-Director: Frank L. Baker, Jr. W1ALP
91 Atlantic St., N. Quincy 71, Mass.

Northwestern Division

R. REX ROBERTS W7CPY
837 Park Hill Drive, Billings, Mont.

Vice-Director: Howard S. Pyle W7OE
3434 74th Ave., S.E., Mercer Island, Wash.

Pacific Division

HARRY M. ENGWICHT W6HC
770 Chapman, San Jose 26, Calif.

Vice-Director: Ronald G. Martin W6ZF
4212 Berrendo Drive, Sacramento 25, Calif.

Roanoke Division

P. LANIER ANDERSON, JR. W4MWH
428 Maple Lane, Danville, Va.

Vice-Director: Thomas H. Wood W4ANK
1702 N. Rhett Ave., North Charleston, S. C.

Rocky Mountain Division

CLAUDE M. MAER, JR. . . . . WØIC
740 Lafayette St., Denver, Colo.

Vice-Director: Carl L. Smith . . . . . WØBWJ
1070 Locust St., Denver 20, Colo.

Southeastern Division

JAMES P. BORN, JR. W4ZD
25 First Ave., N.E., Atlanta, Ga.

Vice-Director: Thomas M. Moss W4HYW
P.O. Box 644, Municipal Airport Branch,
Atlanta, Ga.

Southwestern Division

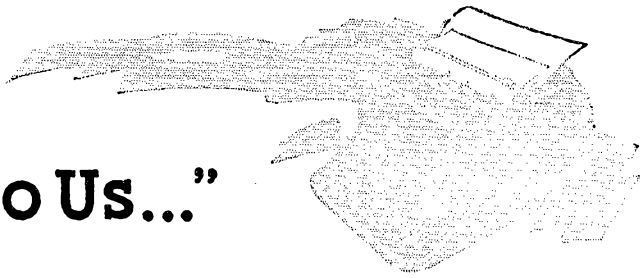
WALTER R. JOOS W6EKM
1315 N. Overhill Drive, Inglewood 3, Calif.

Vice-Director: Virgil Talbott W6GTE
9226 Alexander Ave., South Gate, Calif.

West Gulf Division

GRADY A. PAYNE W5ETA
5103 Linden St., Bellaire, Texas

Vice-Director: Carl C. Drumeller W5EHC
5824 N.W. 58th St., Oklahoma City 12, Okla.



"It Seems to Us..."

LEAGUE ELECTIONS

Seventy thousand radio amateurs — that's how many of us there are in the ARRL — gathered in one place certainly would make a joyful noise, with QRM worse than 75 meters on a winter night. Clearly it would be impossible to run our affairs on a membership-meeting basis; we are spread from Hawaii to Halifax, from Jacksonville to Juneau. Yet every one of us has a part in the management of our organization through the democratic process of nomination and election of representatives to serve on the ARRL Board of Directors. The Full Members in each of the League's sixteen divisions choose a director every two years to represent them in the determination of policy and the overall direction of the League.

To ensure that some experienced men are present at each Board meeting, and to lessen confusion at election time, the elections are staggered; half of the divisions elect in even years, the other half in odd years. This year the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern, and West Gulf Divisions speak up. Details on the nominating procedures are in the "Happenings of the Month" column, on page 53.

Particularly since each director now represents an average of over four thousand members, these men should be the best available, men fully familiar with amateur radio, and enjoying the confidence of the majority in their division. They should be mature men of ability and stature, for they direct the affairs of an organization whose budget runs well over a million dollars per year.

It is up to members to ensure that good men are nominated, before the deadline of September 20th. Don't assume that someone else will send in a petition for the candidate of your choice; it has happened that good men have failed of nomination because of a "Let George do it" attitude. It is also wise to file the petition as soon as possible, too. Sometimes less than ten of the signers can be located in the membership file, thus making the nomination invalid; in the middle of September it's rather late to start another petition and get it to West Hartford by the deadline.

Each director has the responsibility of keeping himself aware of League affairs in his division, and of learning the needs and desires of his constituents, through personal contact, club visits, hamfest QSOs and letters. A proposal you make in a note to your director may well result in an action at the annual Board of Directors meeting, and if the other fifteen divisions concur, an idea of yours may result in some significant change in the amateur structure. Therefore it is important that you take part in the choosing of this director, and in keeping him informed.

Once more we would like to emphasize that you, the 70,000 voting members, are the League. Basically, you decide policy; you recommend changes in regulations; you keep the League's organizational structure up-to-date; and you oversee the total work of the League — all through your own division director. It's true that the routine business, technical and operational matters are handled by a professional staff of more than sixty, but only in accordance with the wishes and directives of the Board of Directors, who in turn derive all their authority directly from you, the members.

Summing up, for the League to continue as a strong democratic organization, and its leadership in amateur affairs, all of its members must be concerned about its government. Nominate your candidate, then, and when the ballot comes, early in October, be sure to vote.

NATIONAL COVENTION

Breathes there a ham with receiver so dead (and stack of *QST*s so unread) he hasn't heard something about the 10th ARRL National Convention in Washington, D. C.? Impossible! But if this brief article reaches such a person, we urge him to drag out *QST* for April, June and July and feast his imagination on the program outlined on pages 60, 63, and 66 respectively. The rest of you, already scheming to attend, can get further inspiration from the new dope on page 56 of the present issue.

Fourteen Washington-area clubs, bound together in the Foundation of Radio Amateur Clubs, have been toiling strenuously to make the August 15-17 affair the most memorable ever. There are sideband, traffic, YLRL, DX, military, v.h.f., technical, and ARRL meetings for the hams; cruises, fashion shows and luncheons for the wives; parties, dances, floor shows, tours and the grand banquet for everybody.

Not only will all the ingredients of a first-class ham convention be present, but the city itself is fascinating to visitors, and the sponsors have arranged tours to practically every corner of it. Raid the piggy-bank, pack the suitcase, grab the XYL and we'll see you in Washington!

COMING A.R.R.L. CONVENTIONS

August 15–17 — ARRL National Convention, Washington, D. C.
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. MARITIME PROVINCES CONVENTION

Truro, N. S.—Aug. 30–Sept. 1

Truro Area Amateur Radio Operators cordially invite all ham brasspounders, rag chewers and others to attend the ARRL Maritime Provinces Convention at the Canadian Legion Hall in the hub town of Truro, N. S., over the Labor Day week end, Aug. 30 through Sept. 1. The convention registration will open at noon Saturday followed by a motor parade through the town late in the afternoon. The official opening banquet Saturday evening will start an evening of speeches and social competitive activity. A chicken barbecue will be held at the formal closing of the Convention Monday noon, Sept. 1.

Registration fee of $5.00 will include all banquets and hamfest participation but all must be made in advance. Banquet reservations cannot be guaranteed unless registration is received not later than August 20. Accommodation reservations and hamfest registrations may be made through the Secretary, Carl Crowell, VE1TT, P. O. Box 164, Truro, N. S.

Alabama — The North Alabama Hamfest Association will hold its annual hamfest at Spring Park, Tuscumbia, on Sunday, August 24. For further info, contact Howard G. King, W4ZUP, Box 306, Florence.

Georgia — The Confederate Signal Corps will hold a hamfest on the Southeastern Fair Grounds at Lakewood Park in Atlanta on August 17. Plenty of activities and prizes. Registration is $1.00, plus barbecue ticket of $1.50. For further info contact Virgil D. Baker, jr., K4CFN, 115 Womack Ave., East Point.

Illinois — The Hamfesters Radio Club is holding its 24th annual picnic at Santa Fe Park, 9100 South Wolf Road, on Sunday, August 10. From the east, take Route 4A (Archer Ave.) to 87th St. in Willow Springs, and turn west to the grove. From the west, take Route 66 to 79th St., then east to Wolf Rd. The park has modern facilities, parking, tables, shade. There will be radio displays and lectures, food and refreshments, events and prizes. Swap tables. Advance donation $1.00, or $1.50 at the gate. For further info or for tickets, write to R. R. Balfour, W9PBM, 8213 Kingston Ave., Chicago 17.

Illinois — The Egyptian St. Louis Hamboree and Picnic will be held on Sunday, August 24, at the Egyptian Club grounds just across the Mississippi river from North St. Louis on Highway 66. Signs will mark the spot, and the frequencies 50, 56 Mc., 29,640 kc., and 3940 kc. will be monitored for mobiles. "Diver" Delps, W9QMG, will entertain the children, while W9QDF will take care of the adults. Sidebanders will hold their annual Tri-state meeting at 2 P.M. Contests and prizes. Food and drinks on the grounds. No admission charge. For further info, write W. H. Guhman, WØWPS, 317 No. Meramec Ave., Clayton 5, Mo.

Indiana — The Big Bull Hamfest will be held at Highland Park, Kokomo, on Sunday, August 10, from 10 A.M. to 4 P.M. Bring the family and the picnic basket. Lots of playground and table space. Contests and prizes for all. Registration $1.00. For further info, contact W. Jerry Smiley, W9DKR, 1826 W. Madison St., Kokomo.

Indiana — The Tri-State Amateur Radio Society will hold its annual hamfest on Sunday, August 24, at Baurer's Grove, Evansville. Games, contests and prizes. You can bring your own lunch, or make reservations for food. Drinks available on the grounds. Mobiles check in on 75, 10 or 6 meters. Advance registration is $2.00, or $2.50 at the gate. For further info write Wilbur Weisling, W9OVB, 719 North Main St., Evansville.

Iowa — The Central Iowa VHF Club is sponsoring a family picnic at Lake Ahquabi State Park, just south of Indianola, on Sunday, August 17. Potluck dinner. Drinks will be furnished. Prizes. WØSMJ/Ø will be on 50 Mc. to talk in mobiles. Swap and sell tables. For further info contact Jim Cessna, WØSMJ, Indianola.

Kansas — The Kansas-Nebraska Radio Club will sponsor its annual hamfest on Sunday, August 3, at the National Guard Armory in Concordia. This is an all-day affair, with a picnic dinner at noon and games and prizes in the afternoon. For further info contact A. B. Reeves, WØJEO, 1108 Hillside Drive, Concordia.

Louisiana — The Cenla Amateur Radio Club is sponsoring a hamfest on August 31 in Alexandria, but we have no other details.

Michigan — The annual picnic of the Saginaw Valley Amateur Radio Ass'n will be held Sunday, August 3, at Ojibway Island Park in Saginaw. No advance registration. For further info contact Max W. Thomas, W8SXY, 116 No. Michigan Ave., Saginaw.

Michigan — There will be a hamfest and picnic on Sunday, August 2, at Allegan County Park. Bring your own lunch. For further details contact Harold J. Fausnaugh, W8JUU, RFD 2, Lawrence.

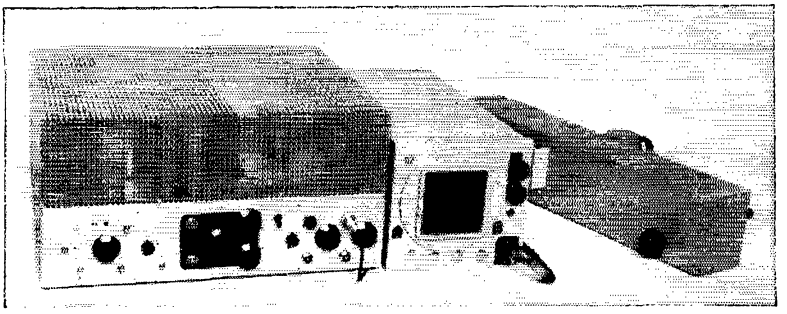
Minnesota — The Saint Cloud Minnesota Radio Club will hold its annual picnic hamfest on Sunday, August 10. Registration will start at 1000 at Wilson Park on the east bank of the Mississippi. Mobile field strength contest, hidden transmitter hunt on ten and seventy-five, oldest and youngest hams present, games and prizes. Huge shelter house in case of rain. Bring your own lunch — free coffee provided. Playground, swings, slides and swimming. Registration of $1.00 per call includes the family. For further info, contact Bob Molitor, WØRVO, 315 7th Ave. N., St. Cloud, Minn.

Mississippi — The Biloxi Amateur Radio Club will hold a hamfest on 23-24 August, at the Community House

(Continued on page 34)

OUR COVER

The mysteries of this month's cover will soon be revealed if you will proceed directly to the facing page and start in McDonald's article on an image transmission system. Part II of this two-part series will be along next month.



A New Narrow-Band Image Transmission System

In Two Parts

Part I—Principles of Slow Scan Picture Reproduction

BY COPTHORNE MACDONALD * W4ZII/2

FOR THE past twenty years or so the conventional wide-band TV system and various mechanical-scanning fascimile systems have been the only common methods of transmitting images by electrical means. Recently, however, another method has been used to transmit images over wire lines. This method involves using television type pick-up and reproduction devices with slow scanning rates to produce narrow bandwidth video signals.

The Bell Telephone Laboratories' "Picture-Phone" system uses a live pick-up camera to generate the video signal, a magnetic storage drum to freeze the action, and special "Iatron" image-storing cathode-ray tubes to reproduce the image. A 60-line picture, 40 lines wide, is scanned once every 2 seconds and can be sent over ordinary phone lines.

Dage Electronics developed a system for use with "high-fidelity" phone lines which are flat from 60 c.p.s. to 5000 c.p.s. or higher. Both these systems employ expensive components and, consequently, have not been widely used.

Upon reading about these "wired" systems the writer became intrigued with the possibility of utilizing the slow-scan principle for image transmission by radio. In September, 1957, he started the design and construction of a low-cost slow-scan system which is especially adapted to the transmission characteristics of amateur phone equipment. This work was undertaken as a personal project in an independent problem course at the University of Kentucky.

Briefly, the system uses a cathode-ray tube flying-spot scanner to develop a 120-line picture, scanned once every 6 seconds, from a slide em-

Above: These three units contain all the specialized picture transmitting and receiving equipment, ready to be connected to an ordinary phone transmitter and communications receiver. The shielded chassis at the left contains the sync, sweep, power supply, and receiver amplifier circuits. The detector, low-pass filter and 5-inch cathode-ray tube for receiving are in the center unit. At the far right is the light-tight box containing the flying-spot scanner. The modulator chassis is mounted on the rear of the scanner unit.

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

In this cathode-ray picture transmission system, facsimile communication becomes possible without moving parts. By thus eliminating the precision mechanical scanners and reproducers used in ordinary facsimile, picture transmission and reception by amateur stations is made immediately practicable. The final record picture is easily made by photographing the receiving cathode-ray tube display, or the composite video and sync signal can be recorded on magnetic tape with any home-type recorder, for playback at any subsequent time.

The system takes no greater band width than voice communication, and the signal can be transmitted and received with any equipment suitable for phone work.

bodying an inexpensive photographic negative. The video output of the scanner amplitude-modulates a 2000-c.p.s. carrier, resulting in an audio-frequency signal consisting of the 2000-c.p.s. carrier and video side bands extending both ways in frequency to 1000 and 3000 c.p.s. This signal is then fed to the radio transmitter's modulator. At the receiving end, the audio-frequency output of the communications receiver is processed and the picture is presented on the screen of a low-cost electrostatically-deflected cathode-ray tube with a long-persistence P_7 phosphor.

The system can be used with almost any amateur phone transmitter and receiver with no changes necessary in the regular station equipment. The slow-scan unit merely plugs into the transmitter mike jack and receiver headphone jack. Air tests on the 11-meter band indicate that conditions and equipment which give good phone transmission, with a reasonably good signal-to-noise ratio, will also transmit satisfactory pictures. The actual type of modulation used in the transmitter seems to be relatively unimportant so long as the audio output of the receiver is a reasonably good replica of the input to the transmitter modulator. Plate modulated a.m. was used in all the tests made so far with good results, as the pictures show. Eleven-meter s.s.b. was non-existent in the Lexington area during the testing period, but this mode of transmission should be quite satisfactory, and the required frequency accuracy of the reinserted carrier should actually be less than for phone reception. N.f.m., with limiter stages in the receiver, could be used to reduce the effects of fading on picture transmission.

While the system presents a less detailed image than conventional facsimile it is adequate for many purposes, and the system is superior to existing facsimile in certain other respects. For one thing, the transmission time is a few seconds instead of minutes. This increases flexibility of operation by permitting rather rapid alternation of voice and picture transmission over the same circuit. This would, of course, be of vital importance in emergency work where all transmissions must be kept short. Also, by presenting ten scans every minute instead of one every few minutes, it should be possible to dodge the intermittent interference so prevalent on the ham bands. Also, the slow-scan system uses inexpensive and readily-available components, and if cost is not a factor a live-pickup Vidicon camera could easily be added to the system. The slow scanning rate, of course, requires that all images be still, but this should not be too great a disadvantage with the type of material which the ham is likely to transmit.

The System

The important system characteristics are listed below:

Number of lines: 120

Aspect ratio: 1:1 (square picture shape)

Vertical repetition rate: 6 seconds

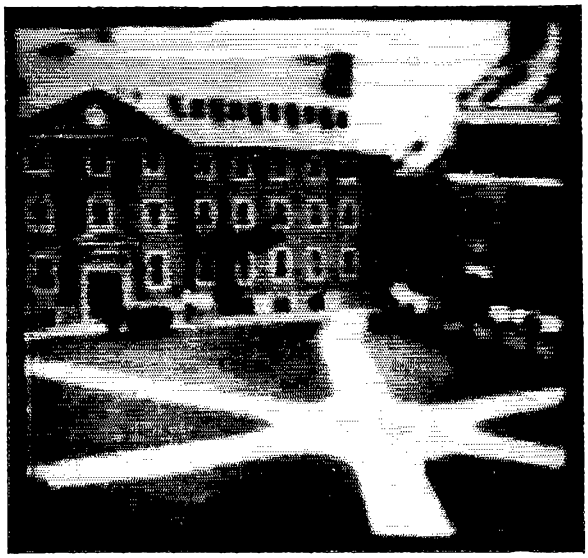
Horizontal frequency: 20 c.p.s.

Modulation: Amplitude-modulated 2000-c.p.s. subcarrier. (White level, 0-20 per cent of maximum amplitude; black level, 50 per cent to 75 per cent of maximum; sync level, maximum amplitude.)

Pass band required: 1000–3000 c.p.s.

Synchronization: Maximum-amplitude carrier bursts coinciding with retrace periods. (Approximately 0.015 second for vertical pulse and 0.0015 second for horizontal.)

Many possible combinations of sweep times, aspect ratios, and audio carrier frequencies were studied in an attempt to find the most suitable combination. The maximum possible vertical sweep time is limited to about 6 seconds because the brightness of the P7 phosphor on the receiver cathode-ray tube face decays too rapidly to



This picture shows the kind of resolution that can be obtained with the 120-line scanning system described here. Taken off the monitor during transmission.

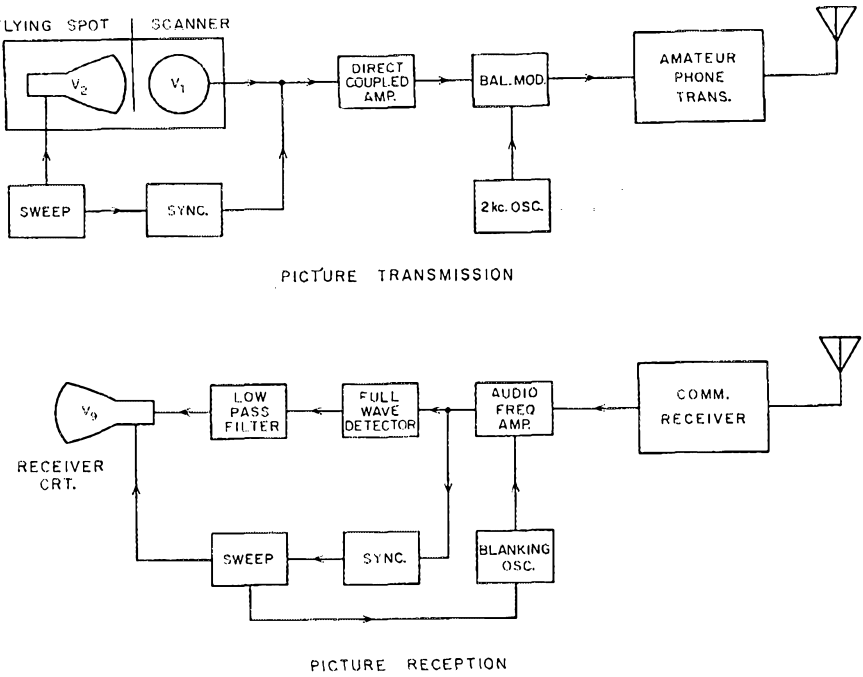


Fig. 1—The separate transmitting and receiving setups are shown in this block diagram.

retain bright picture detail much longer than this. The 1:1 aspect ratio is a picture shape which makes efficient use of a round cathode-ray tube screen, and does not favor the viewing of horizontal objects as the usual 4:3 aspect ratio does. The band-width requirements of the flying-spot scanner video output are d.c. to approximately 1000 c.p.s. The 2000-c.p.s. subcarrier frequency was chosen because it permits the upper video side band to fall within the 300–3000-c.p.s. pass band considered representative of current amateur practice, and provides at least two cycles of carrier for each cycle of modulating frequency.

Modulation polarity was selected to make low level represent white and high level represent black, for two reasons. First, the synchronizing pulses, being at the infrablack level, will blank the cathode-ray tube retrace if the receiver retrace and sync trigger time is less than the duration of the sync pulse. Second, strong noise pulses appear black rather than bright white as they would if high amplitude represented white.

Simple rectangular pulses lasting the duration of the retrace period permit synchronization of the receiver sweep oscillators. Since the vertical pulse is only about one-third the length of a scanning line, it is completed well before the next horizontal sync pulse starts. This avoids the need for serrating the vertical sync pulse to prevent upsetting the horizontal sweep, as is necessary when the pulse is over one line in length.

The picture transmitting and receiving circuits were combined in a single unit with common power supply and sweep circuits, in order to keep the cost as low as possible. As shown in the block diagram of Fig. 2, send-receive switches make the appropriate sync connections and, on "transmit," also feed the output signal into the video receiver to permit the outgoing picture to be monitored on the receiver cathode-ray tube (V_9). The simplified block diagrams in Fig. 1 represent the circuit connections on "transmit" and on "receive." These diagrams, along with the details of the Fig. 2 block diagram, will be explained in the discussion to follow. Actual circuitry and mechanical details will be described in Part II of this article.

Picture Transmission

The flying-spot scanner consists of a light-tight aluminum box with a 908-A cathode-ray tube (V_2) mounted at one end. The tube faces the other end where a 931-A photomultiplier tube (V_1) is mounted so that light from the cathode-ray tube will strike it. A slit in the side of the box directly in front of the cathode-ray tube allows insertion of a slide, which consists of a size 120 or 620 photographic negative mounted on a 3 × 5-inch cardboard frame. The slide is held in position in the scanner by its cardboard edges in such a way that the transparent portion of the slide is in intimate contact with the glass face of the 908-A cathode-ray tube. Thus any light which appears on the surface of the 908-A passes through the photographic negative before it strikes the photocathode of the photo-multiplier tube, some 8 inches away.

In operation, a small bright spot on the cathode-ray tube face is caused to sweep across the tube in raster fashion by the horizontal and vertical sweep voltages. The 908-A is a 3-inch electrostatically deflected tube with a P5 very-

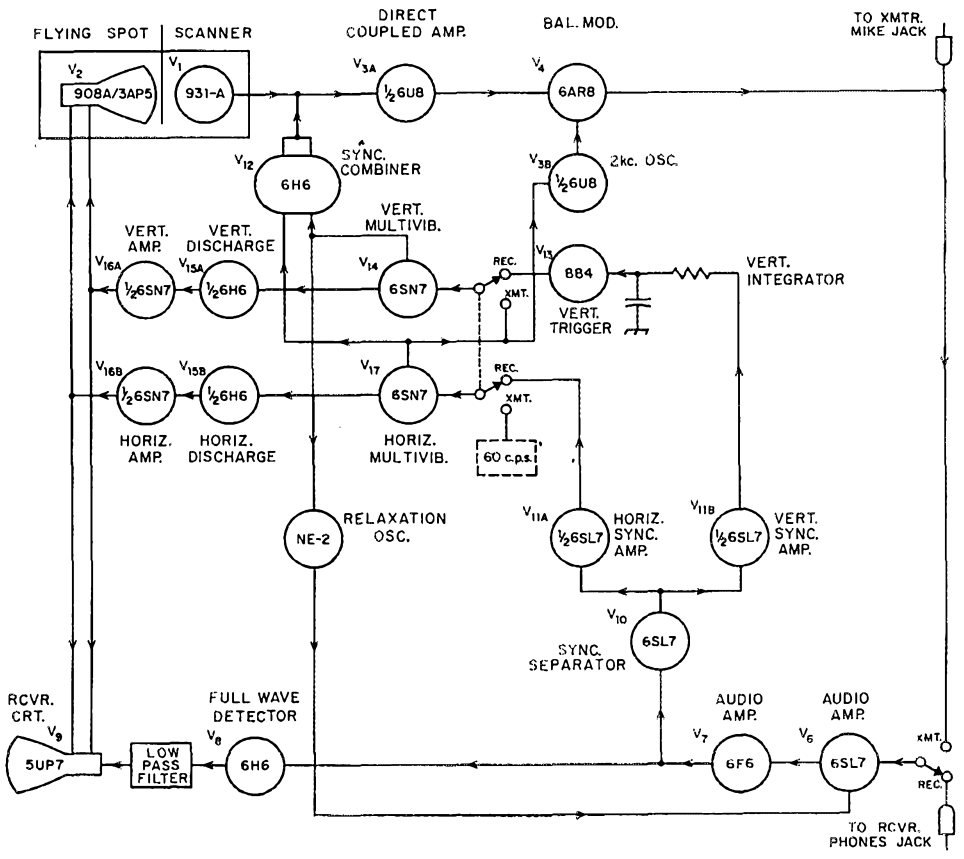
short-persistence screen, whose brightness decays to 1 per cent of its orginal value in 35 microseconds. The spot, therefore, remains a spot at the sweep frequencies used and does not leave a "tail" of undecayed brightness behind it as it sweeps across the tube. The spot faintly illuminates the cathode of the 931-A photomultiplier, and the intensity of the illumination is inversely proportional to the photographic density of the negative at a point directly in front of the spot. The small photocathode current is amplified approximately 40,000 times by the secondary-emission action of the dynodes. The voltage across the multiplier anode load resistor is, then, a video signal whose instantaneous amplitude follows the variations in picture brightness as the negative is scanned.

Plate-coupled 6SN7 multivibrators are the heart of the sweep and sync generation circuits. The 20-c.p.s. horizontal multivibrator (V_{17}) is synchronized with the 60-cycle power line, not only as a convenience in keeping its frequency constant, but to insure that any hum in the video will result only in variations in picture shading, not diagonal hum patterns. The vertical multivibrator (V_{14}), with a period of about 6 seconds, is triggered by the horizontal oscillator during a horizontal retrace period. This insures that the vertical retrace will always occur at the beginning of a line, which is necessary for proper positioning of the vertical sync pulse.

Sweep capacitors, charged through resistors from B+, are discharged during retrace periods by current from the multivibrators, channeled through isolating diodes (V_{15}). The saw-toothed voltage developed across each capacitor is coupled directly to the grid of its associated sweep amplifier, half a 6SN7 (V_{16}). One of the horizontal and one of the vertical deflection electrodes of the 908-A are internally tied to the tube's anode which is returned to a positive centering potential. The other deflection electrodes are connected to the V_{16} plates, putting the varying saw-toothed plate potential directly on the deflection electrodes.

The rectangular pulses developed by the multivibrators during the retrace periods are combined in a dual-diode tube (V_{12}) to form a composite sync signal. This signal is coupled to the photomultiplier load resistor where it is added to the video signal. The grid of a d.c. amplifier (V_{3A} — triode half of a 6U8) is also connected to this point. Since the sync pulses drive the triode beyond cutoff, the output voltage

Fig. 2—Complete block diagram, showing transmit receive switching and stage functions.



consists of video during the sweep period and of sync pulses, clipped to constant amplitude, during the retrace periods. The ratio of sync level to video level is controlled by the cathode-ray tube's brightness control, increased brightness raising the video level and reducing the ratio.

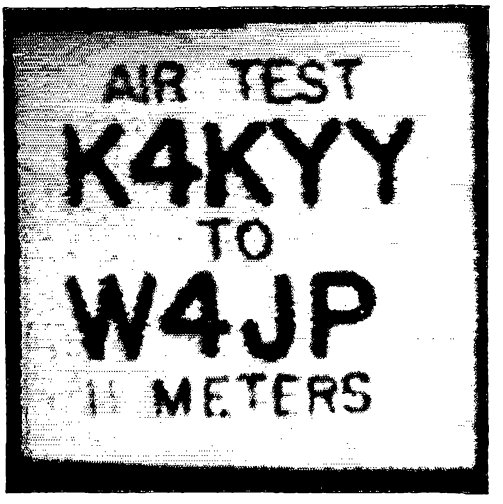
Since the video signal at this point has important components from d.c. to 1000 c.p.s., it is evident that it cannot be applied directly to the ordinary transmitter modulator which attenuates frequencies below about 300 c.p.s. To surmount this difficulty, the video is directly coupled to the control grid of a 6AR8 sheet-beam tube used as a balanced modulator (V_4). This tube can be thought of as a miniature beam tetrode with two plates and two deflection electrodes. In operation, the 2000-c.p.s. output of a synchronized electron-coupled Hartley oscillator (V_{3B} —pentode half of the 6U8) is applied in push-pull to the deflection electrodes in the 6AR8. This causes the electron beam to be deflected back and forth from one plate to the other at the 2000-c.p.s. rate. The beam current is controlled by the grid voltage and is therefore proportional to the level of the video signal. The output is taken from the plates through a push-pull transformer. The balanced push-pull connection prevents the original 0- to 1000-c.p.s. video signal from appearing in the output, the only output being the 2000-c.p.s. carrier and its side bands. This output may be connected directly to the transmitter modulator. It should be noted here that, although the image source is a photographic negative, signal polarities have been handled so that the transmitted image is positive — that is, clear negative is black level, dense area is white.

Picture Reception

A three-stage audio-frequency amplifier, using a 6SL7 (V_6) and a 6F6 (V_7), amplifies the signal from the communications receiver (or directly from the video generator) to a peak level of about 100 volts. This signal is coupled through an isolation transformer to a full-wave diode detector (V_8). The output of the detector is fed to the grid of the 5UP7 cathode-ray tube through a low-pass filter which passes 0–1000 c.p.s. without attenuation or excessive nonlinear phase shift, but which effectively removes the ripple.

The 100-volt signal is also applied to an i.f. type full-wave triode sync separator (V_{10}) which separates the sync pulses from the composite sync and video signal. These pulses (actually a series of short pulses; one for each alternation of the 2000-c.p.s. carrier) are amplified by the two halves of a 6SL7 (V_{11}), one output going to synchronize the horizontal multivibrator, the other to an *RC* integrating circuit. The vertical pulse is approximately 10 times as long as the horizontal pulse, and the higher integrator output voltage, when driven by a vertical pulse, is sufficient to separate the vertical from the horizontal.

In conventional TV the vertical oscillator is brought into sync by changing the oscillator



Test picture transmitted by radio over a 7-mile path. The signal-to-noise ratio (peak sync pulse amplitude to peak noise, 12 db.) was in the range where "snow" is evident in the picture.

frequency slightly. This could be a lengthy process with an oscillator that makes only one sweep every six seconds. To solve this problem the integrated vertical sync pulse is used to fire an 884 gas triode (V_{13}). The 884 plate is directly connected to one of the vertical multivibrator plates, providing positive triggering action during almost any part of the vertical sweep period.

Since the retrace times on receive are the same as on transmit, and since an appreciable time is required for vertical sync pulse integration, blanking of the receiver cathode-ray tube is not assured. To insure blanking, a neon-bulb relaxation oscillator, fired by the vertical multivibrator plate voltage during retrace, is coupled to the receiver audio amplifier. The burst of tone signal from the oscillator is amplified, detected, and fed to the cathode-ray tube where the voltage extinguishes the beam for the entire retrace period.

Tests

Since the transmitting and receiving circuits use the same power supplies, sweep oscillators, and sweep amplifiers, it was impossible to have the actual picture transmitter located at one point and the picture receiver at another. In order to conduct tests, therefore, it was necessary to tape record the audio-frequency picture signal. While even the home-type recorders have adequate frequency response, some of the less expensive machines have appreciable "wow" or other forms of instantaneous speed variation which cause a slight skewing of lines in the picture. The effect is most noticeable when viewing an image containing vertical lines, and appears slight in an image of a face.

Incidentally, tape recordings could be a big help in getting started with this mode of trans-

(Continued on page 140)

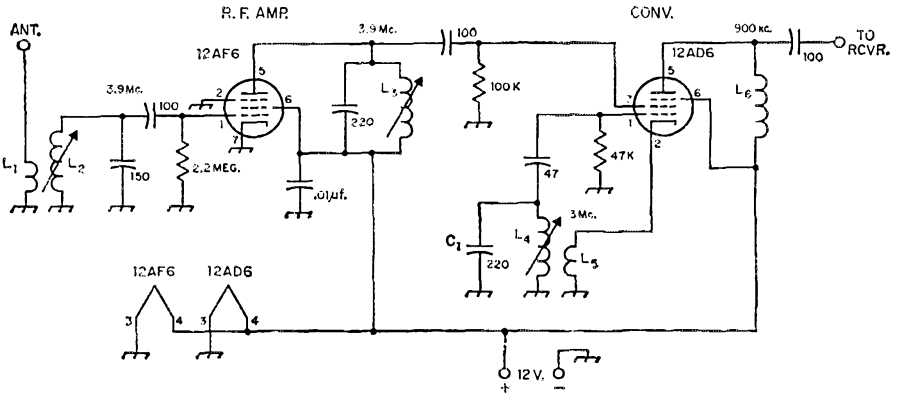


Fig. 1—Circuit of the 12-volt converter. Unless indicated otherwise, capacitances are in μμf.; all resistors are ½ watt and values are in ohms. C_1 should be silver mica; all other capacitors may be mica or ceramic.

L_1, L_5—10 turns No. 28 enam., wound over ground end of associated coil.

L_2, L_3, L_4—32 turns No. 28 enam., close-wound on ⅜-inch iron-slug form (CTC LS-3 form).

L_6—10-mh. r.f. choke.

Mobile Converter —No B Plus

Many of the newer cars are equipped with transistor radio receivers having no B supply that can be used to power a mobile converter. W5ZCC solves the difficulty with a simple fixed-tuned converter using 12-volt tubes.

75-Meter Unit for Transistor Car Receivers

BY WILLIAM E. LaFARRA,* W5ZCC

With the development of transistor auto radios, many hams have found to their sorrow that their standard converters will not work, since these receivers have no vibrators or transformers. A closer look will disclose, however, that the usual "transistor" radio actually employs a combination of transistors and tubes. The tubes in some of these receivers are of the conventional type, but in most cases tubes of the newer series that operate directly from a 12-volt battery are used.

A trial was made using these tubes in a 75-meter converter, and it was found that they performed very satisfactorily. To keep the system simple, it was decided to use the b.c. receiver as a tunable i.f. so that it would not be necessary to provide for tuning the converter. The converter could be preadjusted and mounted in an out-of-the-way place in the car. No connections to the car receiver are required other than to plug the output of the converter into the antenna jack of the car receiver. The unit can be built using all new parts for less than ten dollars and a small utility box will house all of the components as shown in the photographs.

The circuit is shown in Fig. 1. A 12AF6 r.f. amplifier feeds a 12AD6 pentagrid converter. The tuning of all circuits is fixed. The high-frequency oscillator operates at 3000 kc. About the only critical component is the oscillator padder C_1. This should be a silver-mica unit to keep frequency drift to a minimum.

Adjustment of the slug of L_4 will determine where the band comes in on the broadcast dial. I've got mine adjusted so that a 3800-kc. signal comes in at 800 on the dial, a 3900-kc. signal at 900 kc. and so forth. Then reading signal frequency is merely a matter of adding 3000 to the dial reading.

Tuning of the converter is best done at night when there are plenty of signals on the air to work with. The mobile antenna should have been previously tuned to resonance. With the b.c. receiver tuned to 800 kc., adjust the slug of the oscillator coil L_4. At least a few of the stronger signals in the 75-meter band should be heard. If none is heard, the oscillator is in all probability not functioning. Reversing the connections to the tickler winding L_5 should make the circuit oscillate. If a high-resistance voltmeter is handy, a negative-voltage reading of 5 or 6 volts from Pin 1 of the 12AD6 to ground should indicate

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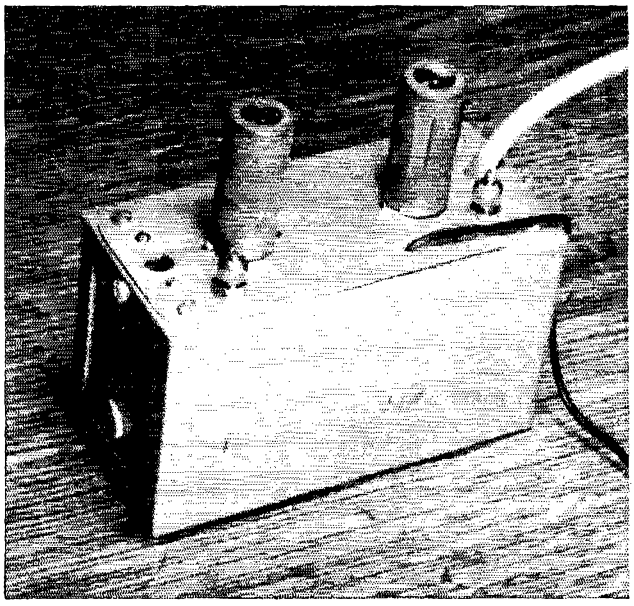


The 12-volt converter is assembled in a 3 × 4 × 5-inch aluminum box. The 12AF6 is to the left and the 12AD6 converter tube to the right. The shielded lead to the right goes to the broadcast antenna jack.

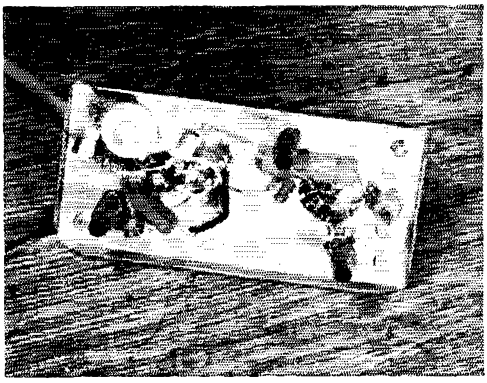
proper operation of the oscillator.

Once the oscillator is working, it is a relatively simple matter to move the incoming signals up or down to the desired spot in the b.c. band by adjusting L_4. Relatively weak signals should be used while adjusting the slugs of L_2 and L_3 for maximum strength. If you have waited until night, you should hear several out-of-town signals coming through. These signals should preferably be around 3900 kc. (900 kc. on the car radio). Peaking the converter up on 3900 kc. should provide complete coverage of the 75-meter phone band. However, if most of the operation is to be around some particular frequency, adjustment of the slugs on a weak signal there will give peak performance on that frequency.

After a final adjustment, the sensitivity was compared with that of a commercial converter and the comparison was very favorable. Filament current constitutes practically all of the drain from the battery, since the plate current of the 12-volt tubes is in microamperes. The filament drain is 150 ma. per tube. This converter and our transistor radio combined draw a total current of less than one ampere, which is a very desirable feature for mobiling.

If you are interested in a more elaborate converter of this type, I refer you to a previous article in *QST* for September, 1956.[1] For my purposes, the simpler 75-meter converter described here was entirely adequate since this is the popular band in this area. However, this type of converter could be made for any other single band desired.

[1] Chambers, "Something New in High-Frequency Mobile Converters," *QST* September, 1956.



Inside view of the 12-volt converter. L_6 is in the upper left-hand corner with L_4L_5 below it. L_3 (above) and L_1L_2 (below) are to the right. The antenna connector at the right-hand end is a b.c. antenna input jack.

Strays

What's in a name? W6BES tells us that W3DUZ lives on Lux Lane.

—···—

The annual field day of the Radio Society of Bermuda will be held on August 9 and 10. The VP9s will be competing for the Phillips Challenge Cup, and hope that all hands will be watching for them on phone and c.w., 10, 15 and 20 meters.

Keeping Equipment Cool

Heat Disposal in Low- and Medium-Powered Electronic Assemblies

BY RONALD L. IVES*

There was a time when the problem of eliminating excess heat in amateur equipment was rarely given any consideration. Layouts were generous with space, enclosures were rare, and operation was intermittent enough so that high operating temperatures were only occasionally responsible for component failures. Not so today, what with the necessity for good shielding. As this article shows, there is a great deal more to effective heat disposal than simply adding a fan.

WHENEVER THE power input to an electronic device exceeds the power output, the "lost energy" must be disposed of somehow, usually as heat. As no electronic device is 100 per cent efficient, the problem of heat disposal is always with us.

Most engineering texts on heat disposal are too involved and theoretical to be of much use in solving practical problems. The majority of practical works, of which there are many, give rather good empirical data for installations involving kilowatts and megawatts, but are strangely silent regarding the problem of keeping an assembly 17 by 8 by 10 inches, with an internal dissipation of 55 watts, at a temperature below 180 degrees F.

Practical heat disposal may be divided very roughly into four broad categories, which are somewhat interrelated and overlapping. Any improvement in one category will usually result in some improvement in at least one of the others. These categories are:

1) Over-all heat reduction.
2) Localized heat reduction.
3) Localized thermal stabilization.
4) Heat exclusion.

The primary aim in over-all heat reduction is to make an assembly that will run cooler. To have a minimum of heating in any assembly, keep the power input to a minimum, and use the most efficient circuits possible. Don't overload any component, for the heat output of most electrical devices increases faster than the useful power output after the optimum operating point is passed.

* 251 Lincoln Ave., Palo Alto, Calif.

Electrical Efficiency

Use of efficient components suggests employment of selenium or silicon power rectifiers in place of tubes; *LC* rather than *RC* filters; semiconductor diodes in place of thermionic diodes; minimum-drain bleeder resistors; low-drain voltage regulators; capacitative, rather than resistive, a.c. voltage dividers; and even use of high-voltage filaments in some cases. Operation of tubes at minimum practicable voltages (such as 150 in place of 300) reduces not only heat production but also power-supply requirements.

To cite only one way in which heat production can be reduced in an electronic assembly, let us take the case of a power supply using a 5U4 rectifier. Heat production here will be 15 watts from the filament, up to 4 watts plate loss, and a minimum of 1 watt core and copper loss in the transformer — totaling about 20 watts. If we sub-

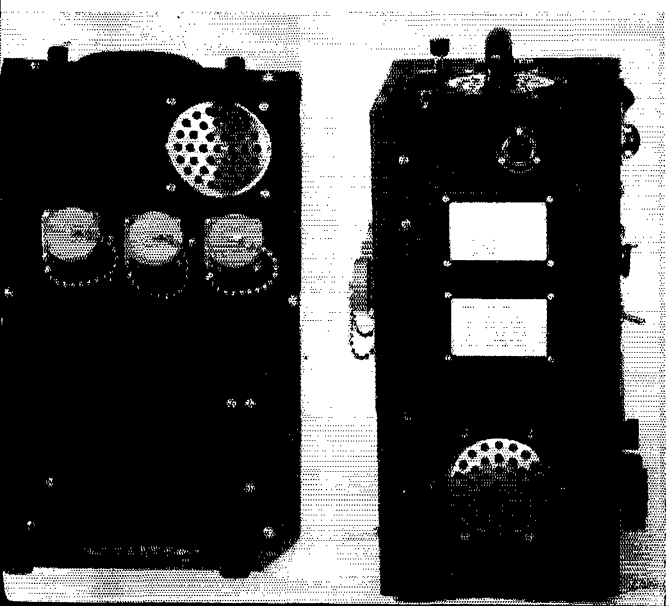


Fig. 1—Air vents to permit convective cooling of a monitor receiver.

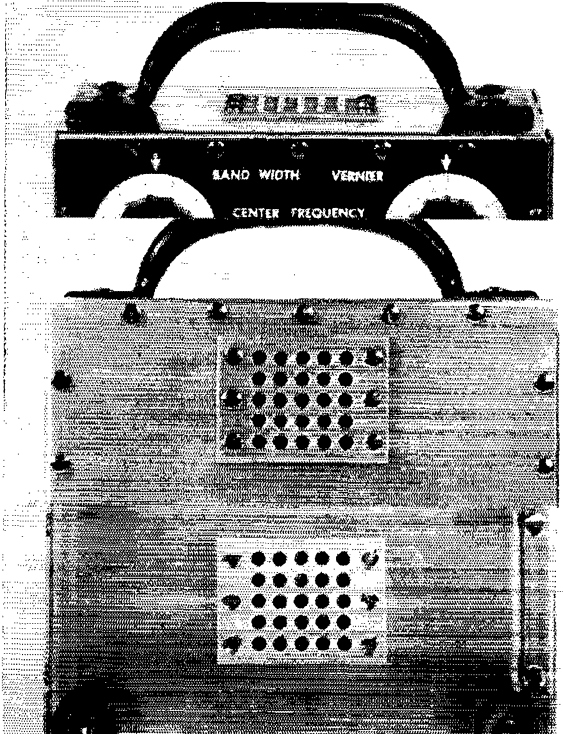


Fig. 2—Vents in small electronic device to facilitate convectional cooling. A similar vent is provided in the chassis shelf, inside the case, to provide an "open" air channel.

stitute selenium rectifiers, heat production will promptly drop to about 5 watts, because we have eliminated the filament heat from the assembly entirely. Selenium rectifiers are both bulky and costly, particularly in the higher voltage ranges, but produce much less heat in operation than a thermionic rectifier. If we now replace the selenium rectifiers by silicon rectifiers in appropriate voltage range, the four watts of plate loss produced in the original 5U4, or its equivalent produced in the selenium rectifiers, drops to about 0.5 watt, because of the very low voltage drop in silicon rectifiers. We have also raised the output voltage of the rectifier-filter system for the same reason, and the total heat production from the power rectifier and transformer is now in the neighborhood of 1.5 watts, or about 7 per cent of what it was at first.

Chassis

Use of a conductive chassis, with as large a surface area as possible, will facilitate equalization of internal heat and rapid cooling by conduction — aided by convection in most instances — as well as by radiation, which occurs at the surfaces of all components and over all parts of the chassis. Most rapid conduction will occur with a copper chassis, but steel, which also furnishes magnetic shielding and mechanical rigidity, is usually the optimum material. Aluminum, although a fairly good conductor of heat, has somewhat unhappy mechanical properties for many applications.

Use of chassis brackets not only increases mechanical strength but also adds to the surface area of the chassis, facilitating cooling by radiation and convection, *provided* there is a conductive bond between the chassis and the end brackets. In general, if the bond between chassis and brackets is a good electrical conductor it will be a good thermal conductor also.

Air Vents

Last, but by no means least, adequate vents for convectional air circulation, and hence convectional cooling, must be provided. If an electronic assembly is completely boxed in so that convection cooling does not take place or is sharply restricted, cooling will occur only by heat conduction to the enclosure, and thence by radiation from it. As the thermal conductive path to the enclosure may be of high resistance, and since the trapped air between the assembly and the enclosure is a poor conductor of heat, the assembly will tend to operate at a very high equilibrium temperature.

If adequate paths for convective cooling are provided, as by inlet and outlet vents with an uninterrupted air path between, convective cooling will take place automatically, appreciably lowering the equilibrium temperature.

Arrangement of air vents in a medium power assembly — a 10-tube, six-band monitor receiver which consumes 65 watts — is shown in Fig. 1. Upper-level vents permit heated and expanded air to escape, lower vents allow cooler air from the environment to enter. Rubber feet on the case bottom keep the bottom vent unobstructed. It is important that both top and bottom vents be provided. If the lower vents are omitted convection will not take place, because there is no inlet for cooler "replacement" air. Remember that a chimney will not draw if the stove draft is closed!

Venting arrangements for a smaller assembly, dissipating only about six watts but somewhat temperature sensitive, are shown in Fig. 2. A similar vent is provided in the chassis itself, to permit "through" air circulation.

Vent apertures should also be provided in the tops of chassis and other "inverted box" structures to prevent entrapment of heated air. Unless these are provided, localized "hot spots" may occur under the chassis, leading to seemingly mysterious failures of components even though the entire assembly operates at an average temperature far below the maximum for the specific items.

Local Heat Reduction

Localized heat reduction is desirable or necessary in most electronic assemblies because some components will operate indefinitely at relatively high temperatures but others will fail promptly

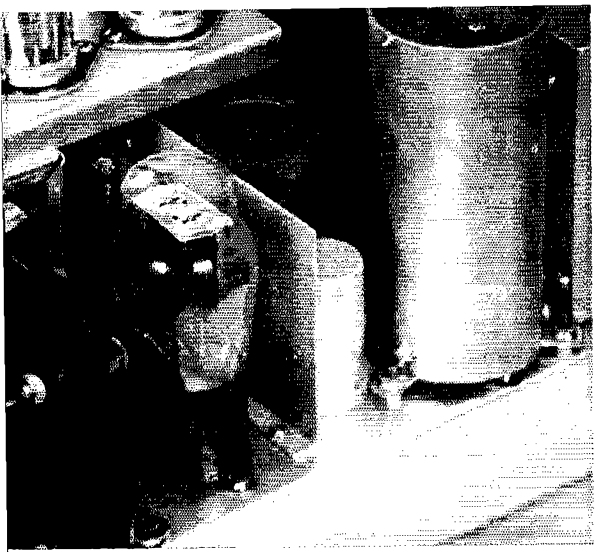
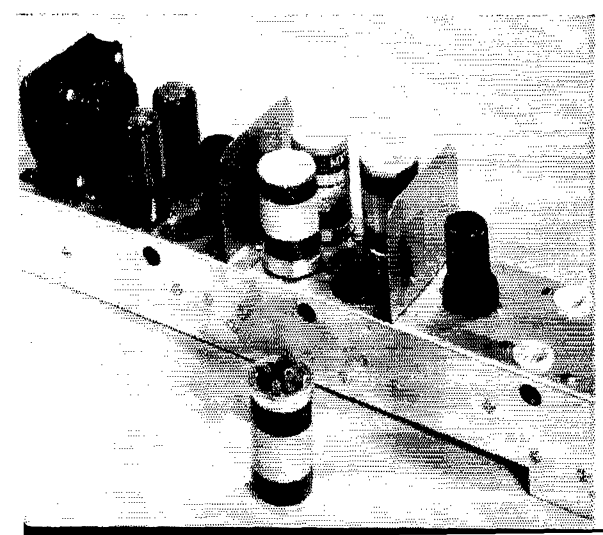


Fig. 3—Thermal shielding in a pulse amplifier.

if heated to much lesser values. For example, ceramic-insulated fixed resistors will operate satisfactorily above the melting point of soft solder, while tube bases come loose at about 150 degrees C.; and electrolytic capacitors, in general, imitate Vesuvius at temperatures somewhat below 90 degrees C.

The general method of localized heat reduction is to prevent heat from normal "stoves" from reaching temperature-sensitive components. This is accomplished by use of heat baffles, guided convection, and insulation. One example of thermal shielding, to prevent cooking of dry electrolytic capacitors by tube heat, is shown in Fig. 3. Here, a high-power pulse amplifier tube, which dissipates considerable power, is surrounded by a tubular shield. This reflects back much radiant heat and acts as a chimney to expedite convectional cooling. Note that the bottom of the cylindrical shield is open so it will "draw." Between the power rectifier, at left, and the capacitors is a vertical plane baffle which

Fig. 4—Use of heat baffles and chassis vents to lower capacitor temperatures and keep internal chassis temperature down.



reflects back heat from the rectifier and guides local convections up both its surfaces. As these baffles function principally as reflectors, their surfaces should be bright. Without these heat baffles capacitor life was measurable in hours of operation, and not many hours at that. With the baffles in place, the operating life of the capacitors was extended to years, so that the equipment became obsolete before they failed.

Another installation using baffles to reflect heat away from a capacitor bank, along with chassis vents to keep internal temperatures within reasonable limits, is shown in Fig. 4. Socket mounting of the capacitors here insulates them against heat conducted along the chassis surface.

Temperatures of many components, such as resistors, can be lowered by use of oversize components. If a 1-watt resistor is electrically necessary and the assembly runs hot, substitution of a 2-watt resistor will sometimes be helpful. This lower temperature is not due to lower dissipation. If the resistor dissipates one watt, it will do so regardless of its nameplate rating, but a higher-rated resistor is physically larger and has a larger radiating surface, so its equilibrium temperature will tend to be lower.

Mounting of tubular elements, such as resistors, with through bolts and massive brackets will facilitate conduction of heat from the component to the chassis. Again, this will not reduce the amount of heat produced, but will conduct it away from the source more rapidly, lowering the equilibrium temperature.

Rectifiers

Selenium rectifiers in most amateur and some commercial equipment are operated somewhere between maximum recommended current and the "stink point." In addition, they are commonly stuck in an unvented corner of the chassis — creating, so far as the rectifier is concerned, a sort of autocrematorium, as in Fig. 5, lower left.

Much of this trouble can be eliminated by use of adequately sized rectifiers, or even oversized rectifiers (more radiating area for the wattage to be dissipated); and by mounting them above chassis, as in Fig. 5, upper left and right. Use of a through bolt and heat conductive bracket will be found helpful in eliminating unwanted heat. A pair of small selenium rectifiers mounted in this manner is shown in Fig. 5, lower right.

Perhaps the most satisfactory mounting for the smaller selenium rectifiers is by bracketing them over a relatively large chassis hole, as in Fig. 6. Here convectional cooling is at a maximum, conduction cooling is facilitated by the center bolt and brackets, and wiring to the lugs is made easy since they project below the chassis top even though the body of the rectifier is above it.

Power Tubes

By use of suitably vented sockets, a large

power tube can be made to drive convections that will ventilate a large part of an electronic assembly. By mounting a standard socket in a vented sunk assembly, as in Fig. 7, air from under the chassis will be sucked out and upward by the convection about the power tube, *provided* a cool air inlet is also present under the chassis. This particular vented sunk assembly, heavily chromium plated and quite "professional looking," is found in most plumbing shops where it is usually called a sink strainer.

Careful arrangement of components will often remove most of the problems of heat disposal without the use of complicated or costly special devices. One example of this is shown in Fig. 8, where the major heat producers, the power rectifiers (A) are surrounded by the transformers and chokes of the power supply, which are substantially heat-immune. A heat baffle (B) is placed between the audio power tubes and the nearest electrolytic capacitor, to prevent cooking it. Capacitors are protected against heat from the two adjacent 12AU7s by wide spacing (C). Convectional cooling of both the chassis shown and of chassis above and below it is assisted by leaving the speaker well (D) open at both top and bottom.

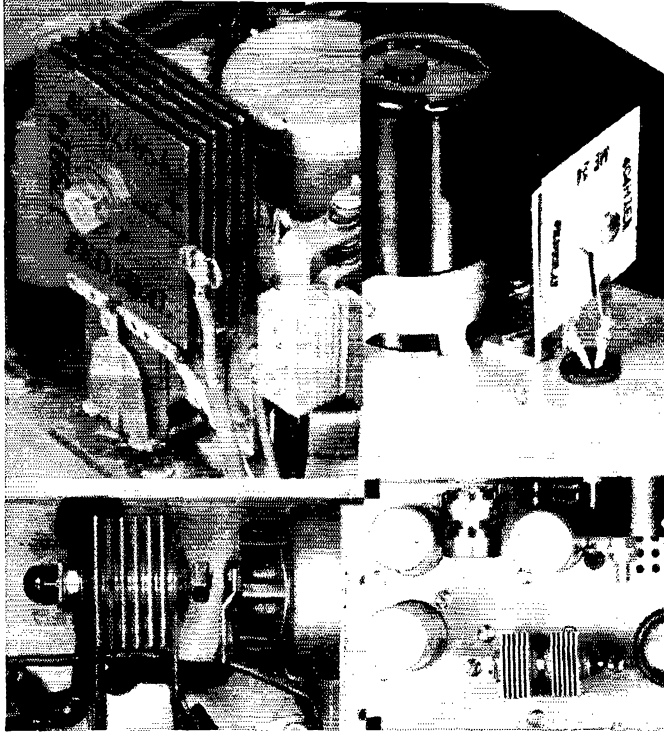


Fig. 5—Selenium rectifier mountings.

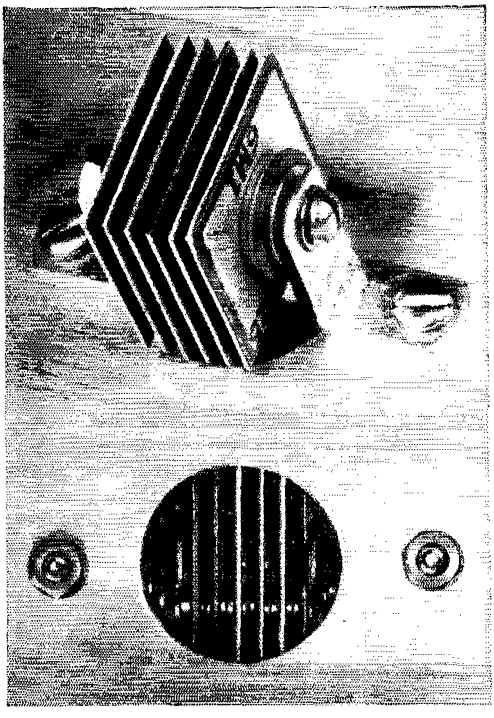


Fig. 6—Recommended mounting for selenium rectifiers.

Thermal Stabilization

Localized thermal stabilization is necessary or desirable when frequency is controlled by heat-sensitive components, which includes almost all components except zero temperature coefficient crystals. One of the best methods yet developed involves the use of insulated compartments with the temperature controlled thermostatically. This is substantially a crystal oven, for which many adequate designs are known.

Additional thermal stabilization can be provided by mounting the temperature-sensitive device on or in a block of some substance with great thermal mass, such as an iron or brass block. If the temperature-control device, such as a thermostat, is mounted on the surface of this block and the thermally sensitive equipment (such as a crystal) within it, internal temperature variations can be held to a very small fraction of those at the thermostat.

By use of "thermal ballast," plus shielded and insulated containers, plus a sensitive thermostat or series of them, the temperature at the critical point can be held constant to any accuracy desired (except 100 per cent!) and stabilities of plus or minus 0.01 degree C. are rather easily attained.

Where lesser temperature stability is needed, as in most amateur and commercial equipment, thermal stabilization is commonly obtained and maintained by leaving the equipment turned on at all times. If the installation as a whole is fairly massive, rather gratifying thermal stability can be attained in this manner.

Fig. 7—Vented sunk socket mounting for power rectifier.

Isolation

Thermal isolation of a heat-producing component, so that its heat will not affect adjacent components and so that the heat produced by adjacent components has little effect on its equilibrium temperature, is attained by use of basal insulation and concentric lateral shields, vented to facilitate convection, as in Fig. 9. At the extreme left is the entire shield assembly. To its right is the outer "chimney," vented to allow influx of cooler air at the bottom. Next is the tube, mounted in an elevated and insulated socket, to reduce conduction of heat to and from the main chassis. At extreme right is the tube shield, an entirely conventional component.

Tests with nested shields of this type show that, for a tube dissipating about five watts, the spacing between the tube shield and the outer chimney must be at least ⅛ inch, and full convectional cooling does not take place until the spacing is about ¼ inch. All other factors remaining the same, tube temperature changes with this type of shielding are slightly less than one fifth the changes without the shielding. An additional concentric shield improves the thermal stability only by a factor of about 1.5, and a fourth shield causes such a small improvement that it might well be omitted.

Fans

Both localized and general cooling can be facilitated by use of fans, although the improvement that they can bring about is not always as great as is commonly believed. Fan motors, particularly the midget shaded-pole jobs that are quite popular, produce considerable heat themselves. Only if the fan removes more watts of heat than it produces will its use lead to improved cooling.

Placement of fans and proper direction of their air flow is quite important. A very small fan directed to aid convection may be a very effective cooler, but the same fan opposing convection may be less useful than no fan at all. Also, for any given installation, there is an optimum rate of air flow. Up to this point, increasing the air flow increases the cooling in almost any direct ratio. Beyond this point, doubling the air flow may only increase the cooling 20 per cent. In very general terms, subject to many exceptions, optimum cooling is to be expected when the air in a chassis enclosure is changed from five to ten times a minutes.

Small fans are best driven by shaded-pole induction motors; larger fans by capacitor start and run induction motors. Brush-type universal motors are not recommended for use around communications equipment, as very extensive shielding and isolation are needed to keep the brush noise out of receiving equipment. Where relatively large amounts of heat must be dissipated, as in high-power transmitters, it is com-

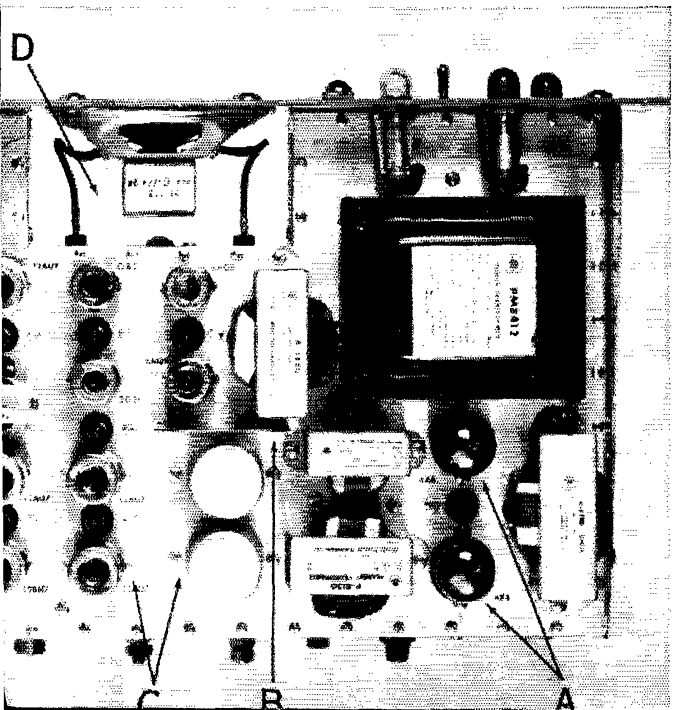


Fig. 8—Component arrangement to minimize heat disposal problems.

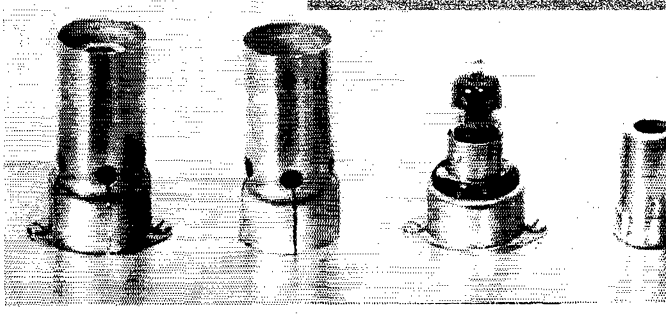


Fig. 9—Thermal isolation of a heat-producing element.

monly desirable to mount the fan motors outside the chassis enclosure, and also out of the air stream, so that fan-motor heat is not carried through the electronic assembly. Centrifugal fans are ideal for this specific application.

In considering all heat disposal problems, both economics and good sense should limit our efforts to getting rid of *harmful* heat. Little or nothing is gained by running equipment at 5 degrees above ambient when all components are substantially immortal at 25 degrees above ambient. Improvement of performance and service life will result from keeping the over-all equilibrium temperature somewhat below the maximum rating for the components used, and frequency stability will be improved by minimizing changes in the equilibrium temperatures of the frequency-determining components. Further heat reduction is usually supererogatory, like measuring bricks with a micrometer, and gives little useful return for the effort expended.

General rules for heat control can be summarized as follows:

1) For minimum heating of a given assembly, keep power input at a minimum.

2) Use components and circuitry of maximum electrical efficiency. All input energy that does not appear at the output is dissipated as heat.

3) Arrange components and circuitry for minimum heat at critical points. Wherever possible, isolate heat-sensitive components from heat sources by interposing a heat-immune component. Remember that radiant heat follows the inverse square law; that heat conduction is substantially a linear phenomenon; and that heated convective air rises.

4) Arrange extra heat conductors, vents, baffles and cooling fans to compensate, insofar as possible, for remaining uncorrected thermal conditions.

5) Apply *Occam's Razor* to each and every planned layout and circuit. This useful logical tool can be paraphrased into the question, "Is this the simplest arrangement that will perform the requisite function?"

6) Build and test.

7) Make necessary corrections in installation.

Acknowledgment

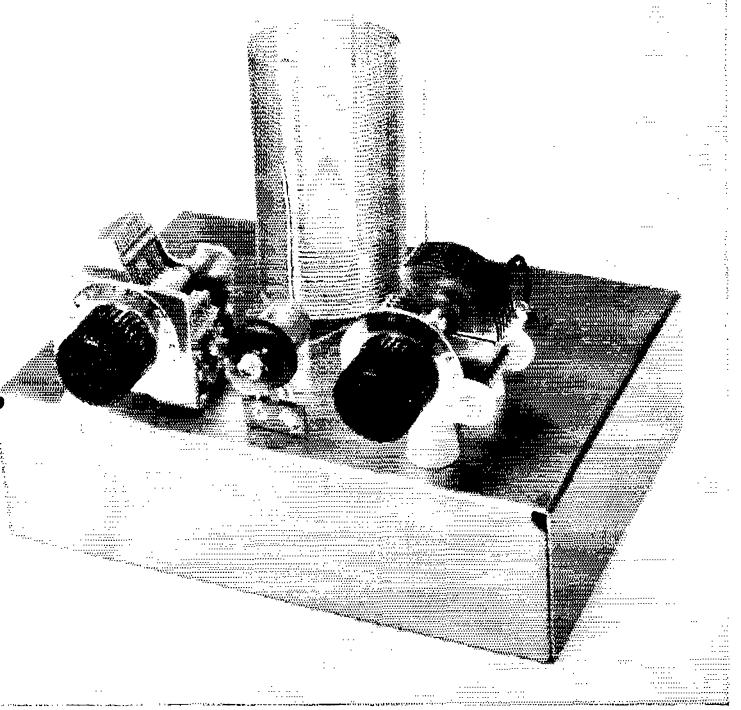
The writer is indebted to Mr. James P. Welsh of Cornell Aeronautical Laboratory, and to Dr. Stuart W. Grinnell of Stanford University, for helpful discussions of thermodynamic problems related to heat control and disposal; and to Mr. John Bethel of Palo Alto, Calif., for skilled photographic work.

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.
W2, K2 — North Jersey DX Association, Box 55, Arlington, New Jersey.
W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — Robert Stark, W5OLG, P.O. Box 261, Grapevine, Texas.
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.
W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.
W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive, Flossmoor, Ill.
WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.
VE1 — L. 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, 286 Rutland St., James, Man.
VE5 — Fred Ward VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 833 10th St. N., North Lethbridge, Atla.
VE7 — H. R. Hough, VE7HR, 1684 Freeman Rd., Victoria, B. C.
VE8 — W. L. Geary, VE8SAW, Box 534, Whitehorse, Y. T.
VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. Johns, 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 *Namauu* Dr., Honolulu, T. H.
KL7 — KL7CP, 310-10th Ave., Anchorage, Alaska.
KZ5 — Catherine Howe, KZ5KA, Box 407, Balboa, C. Z.

80-Meter



An 80-meter antenna coupler like this is easy to build and tune, and assures that the transmitter can be loaded fully and that harmonic radiation is suppressed.

The neon bulb between the two capacitors serves as a tuning indicator; it is coupled to the coil through the capacitance between the coil and the upright length of wire. Phono jacks mounted 4 inches apart at the rear of the chassis are used for input and output connections. The lefthand capacitor, C_1, is mounted directly on the chassis, but C_2, at the right, is supported by small ceramic insulators.

RECENTLY at a radio club the author asked how many of the Novices present had received "QSL cards" for harmonics from the FCC. Of those present, approximately half had been cited by the FCC! All of the notices were for second harmonics of 80-meter operation. The unhappy part of the situation is that simple preventive measures would have kept the harmonics from being radiated. Before we discuss methods for preventing harmonic radiation let's first see what a harmonic is and how it can cause trouble.

HARMONICS, Harmonics, Harmonics

When you key your transmitter on, say, 3725 kc., you want all your output power to be on that one frequency. Unfortunately, life isn't that simple. Transmitters have the nasty habit of generating additional signals at integral multiples of the fundamental. These signals are called "harmonics." If the fundamental is 3725 kc., there will also be a weaker signal at 7450 kc., a still weaker one at 11,175 kc., another at 14,900 kc., and so on up. As a Novice you may not know all of the amateur band frequency limits but, take our word for it, the harmonics just listed do not fall in any amateur band. It is bad enough to cause unnecessary interference to fellow amateurs, but you can be sure the commercial services take a very dim view of amateur interference to their signals. The transmitter is determined to generate harmonics, but the harmonics will generally not be radiated if we can keep them from reaching the antenna.

If you're using a coax fed antenna, be it dipole, trap, or vertical, here is an antenna coupler that will work in coax line. This gadget will help you load your transmitter and even more important, keep your 80-meter second harmonic at home where it won't earn you FCC notices!

The first step in cleaning up a harmonic problem is to find out how bad the harmonic is. This can be determined quickly with the help of a neighboring ham by having him listen at the harmonic frequency. He should be at least a couple of miles away from you, otherwise your fundamental signal may overload his receiver. An overloaded receiver can generate harmonics and "birdies" in itself. This would, of course, lead to false conclusions by your friend.

If you find that your friend can copy a harmonic of your fundamental, you must do something to eliminate the harmonic, no matter how weak it is. Otherwise, it will be just a matter of time before you receive an official notice from the FCC.

Possibly you don't have any amateurs living nearby who can check your signal. In that case there is another way to determine if harmonics are reaching your antenna. Build yourself a simple absorption-type wavemeter. The one described in July *QST*[1] is sensitive enough for checking harmonics.

To use the wavemeter to see if harmonics are

[1] McCoy, "A Novice Band Checker," *QST*, July, 1958

Loading Without Harmonics

Keeping Spurious Signals From Being Radiated

BY LEWIS G. McCOY,* W1ICP

getting to the antenna the instrument should be coupled to the output lead in the transmitter (or to the feed line if Twin-lead or open-wire feeders are used). Then tune the wavemeter through the harmonic frequencies. If even a trace of harmonic shows it must be suppressed.

The wavemeter will also show if your transmitter is tuned to the correct band. It is possible with many transmitters to tune them up on the wrong frequency. If you want to tune up on 3725 kc. but actually end up on 7450 kc., it is just as bad if not worse than having a harmonic. That's why it is a good idea to have a wavemeter to check the tuning of your rig.

One way to reduce harmonics to a point where they should no longer be a problem is to install an antenna coupler in the feedline. Fig. 1 is the circuit diagram for a coupler to be used with coax feedlines. Most transmitters these days are designed to be worked into coax lines. Unfortunately, if you go direct from the transmitter to the antenna without benefit of a coupler (or filter), it is quite easy to end up with an appreciable amount of harmonic being radiated. The coupler described here, when installed in the coax line near the rig and correctly adjusted, will provide adequate harmonic attenuation. Some transmitters have no means for adjusting the coupling or loading of the final amplifier. Another advantage in using this coupler is that it will provide such an adjustment.

Making the Coupler

The coupler shown here is mounted on a $2 \times 5 \times 7$-inch aluminum chassis. Two phono jacks mounted on the back of the chassis are used for J_1 and J_2. The leads from the jacks are brought up to the top of the chassis through two holes in the chassis top. Rubber grommets are used in the holes to provide further insulation for the wires.

*Technical Assistant, *QST*.

Both variable capacitors, C_1 and C_2 are mounted on top of the chassis. Standoff insulators are used for mounting C_2 because this capacitor must be insulated from the chassis. The coil L_1 is made from a length of Miniductor stock by unwinding fifteen turns from one end and a single turn from the other. When the fifteen turns are unwound, four polystyrene support bars approximately one inch long remain. The coil is mounted on the chassis by cementing the ends of the bars to the chassis with Duco cement. Let the cement dry overnight and the coil will be firmly mounted on the chassis.

An NE-21 neon bulb, mounted permanently on the coupler chassis, is used for an output indicator. A ½-inch diameter grommet is slipped over the glass bulb and a piece of stiff wire is wrapped around the grommet. The wire is soldered to a standard terminal tie-point mounted on the chassis between the two variable capacitors. A 2½-inch length of hookup wire is soldered to the base tip of the neon bulb. This short length of wire serves as a capacitive pickup, C_3, to the coil.

The Antenna System

A sketch of a Novice installation using the coupler described here is shown in Fig. 2. The diagram also includes the dimensions of an 80-meter dipole for the Novice band.

The coupler can be installed anywhere in the station but it is usually more convenient to mount it near the transmitter. An antenna change-over relay or switch can be installed at the transmitter or in the coax line between the rig and the coupler.

In order to "get out" well the antenna should be mounted as high above ground and as clear of surrounding objects as possible. The antenna will still work if it isn't mounted high and clear but don't expect to get as good results. Some

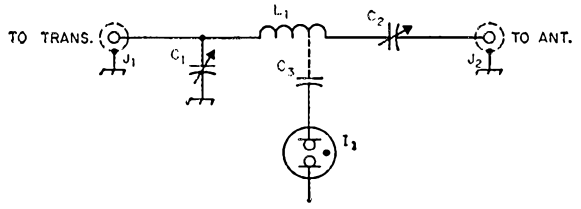


Fig. 1—The circuit for the simple coupler for coax feedlines.

C_1—400-$\mu\mu$f. variable capacitor, broadcast replacement type (Allied No. 61H009).
C_2—100-$\mu\mu$f. variable capacitor (Hammarlund MC-100-M, Bud 1855).
C_3—See text.
I_1—NE-21 neon bulb.
J_1, J_2—Phono type jacks.
L_1—48 turns of No. 18, 16 turns per inch, 1¾-inch diam. (B & W 3023) Miniductor.

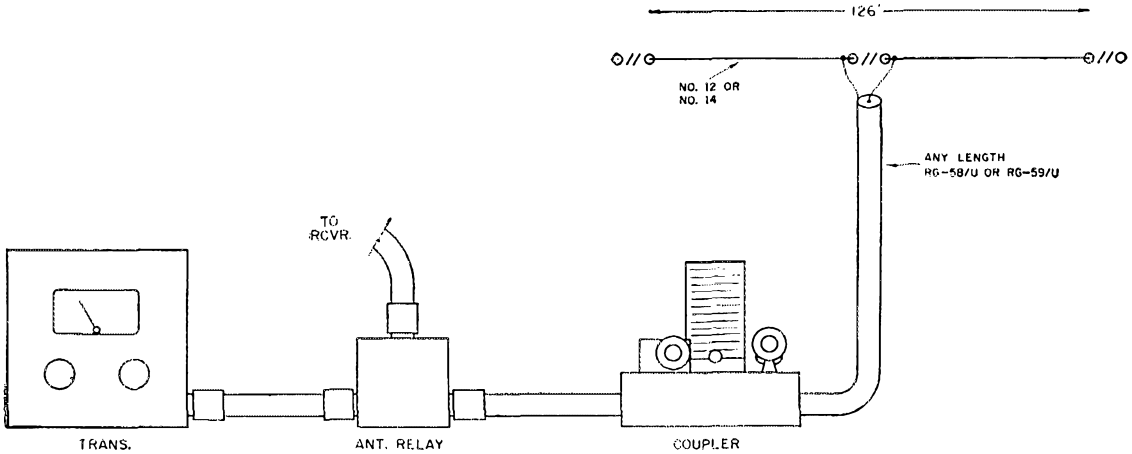


Fig. 2—This drawing shows an antenna system for operation in the 3.7- to 3.75-Mc. Novice band. Either RG-58/U or RG-59/U coaxial cable can be used to connect the different units together. To use the same antenna for receiving, an antenna changeover relay can be installed as shown or, if desired, it can be mounted inside the transmitter.

amateurs don't have the necessary space to put up an antenna 126 feet long. In such a case the ends of the antenna can be bent down or to one side to fit a shorter run.

The feedline can be any convenient length, and one of the advantages of coax is that it can be run along metal rain gutters, through pipes, and even under ground without upsetting the electrical characteristics of the line. However, if possible, it should be perpendicular to the antenna for the first 50 feet or so from the antenna.

Adjusting the Coupler

There is nothing complicated about adjusting the coupler, assuming the feedline and antenna are reasonably well matched, but certain precautions should be observed to obtain maximum harmonic attenuation. Turn C_1 to maximum capacity (plates fully meshed) and leave it set at that position. Now turn on your rig and tune it up normally, dipping the final to resonance. Next, tune C_2 for maximum brilliance of the neon bulb. If the bulb doesn't light move the pickup wire closer to L_1; if the light seems too bright move the wire away or make it shorter.

You may find that there are two settings of C_2 that will cause the bulb to light. One will be near maximum capacity and the other near or at minimum capacity. It is *very important* to use the setting of C_2 nearest maximum capacity (plates fully meshed) as this is correct tuning for 80 meters. A tuning indication near minimum occurs when the antenna coupler is tuned to the second harmonic and this is exactly what you do not want to do.

To increase the loading of the amplifier stage in the transmitter decrease the capacity of C_1. Once you have obtained the recommended plate current reading, with the amplifier tuned for a dip, the transmitter is adjusted.

Some amateurs have antenna systems using 300-ohm Twin-Lead for a feed line. The usual custom with this type of installation is to come out of the transmitter with coax to a set of balun coils and then use 300-ohm line to the antenna. Unfortunately, balun coils do not provide harmonic attenuation so such a system can get you into trouble. The coupler described here can be installed in the coax line between the transmitter and balun and will give you the protection you need.

We have discussed only the problem of 80-meter harmonics since, as pointed out earlier, they are responsible for the majority of FCC tickets to Novices. However, the same techniques outlined here can be used on the other bands. For additional information on antenna couplers and harmonics the reader should refer to *The Radio Amateur's Handbook*, or to the articles listed below:

McCoy, "The Evils of Multiband Antenna Systems — And the Cure," *QST*, Mar., 1957.
McCoy, "Eliminating 80-Meter Novice Harmonics," *QST*, Mar., 1956.
Wood, "What About Low Frequency Harmonics?" *QST*, August, 1955.

This month's short lesson in logic is submitted by Louis Frenzel, Jr., W5TOM.

A "black box" has ten binding posts mounted on it. An ohmmeter measurement between *any* pair of terminals indicates 2 ohms resistance. Question: What is inside the black box?

—•••—

Numbering the capacitors of last month's problem from 1 to 23, the answer to the problem is to disconnect No. 7 and No. 11. This leaves a block of .006 μf. (Nos. 1 through 6) a single .001 (No. 7), a block of .003 μf. (Nos. 8, 9 and 10), a single (No. 11) and a block of .012 μf. (Nos. 12 through 23). Any capacitance from .001 to .023 μf. can be made from various combinations of these in parallel.

Filtering and Shielding the Station Receiver

Measures for Reducing Stray Pickup and Radiation

BY DAVID T. GEISER,*
WA2ANU, EX-W1ZEO

Worthwhile benefits result from good shielding and filtering in a ham-band receiver — for example, two not specifically mentioned by the author are better receiver utilization of the directive characteristics of beam antennas and greater immunity from noise pickup when the transmitting antenna is used for receiving. The simple measures described here can be applied in principle to practically any receiver that needs treatment.

The average amateur purchases a commercially-built receiver as part of his station. Commonly he will find that the receiver, while generally satisfactory and meeting all advertised specifications, has some undesirable features. Two faults often found in receivers are unsuitability for rapid break-in operation and the production of television interference particularly when receiving 10-, 15-, and 20-meter signals. This note tells how these troubles were eliminated from my HQ-129X and — in general — the methods by which they would be minimized in any receiver.

Difficulties with break-in receiver operation are usually caused by excess transmitter signal leaking into the receiver, making it necessary for the receiver send-receive switch to be turned on and off for each transmission. This often causes a frequency drift making the receiver lose the incoming signal temporarily if the receiver is ad-

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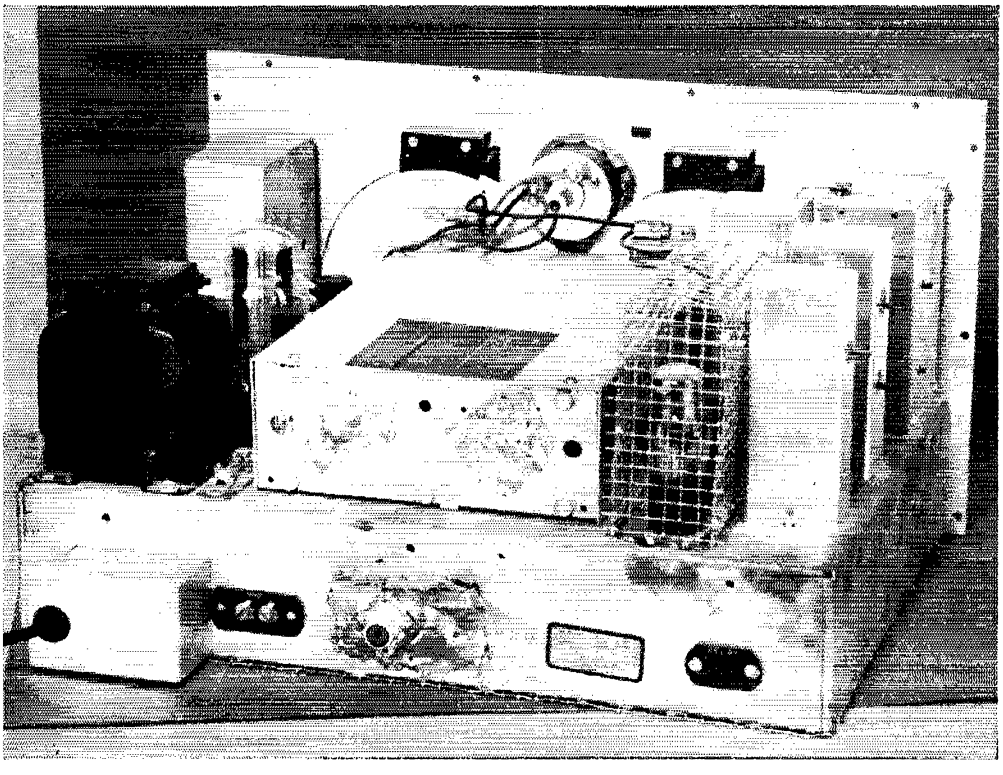
Shielding of sensitive pick-up points in the author's HQ-129X utilized common materials such as hardware cloth and aluminum foil. The small box at the lower left houses the a.c. line filter. Not visible is the additional internal bypassing on leads to exposed parts such as the pilot lights.



justed for greatest selectivity. Other very undesirable results of transmitter signal leaking into the receiver are overloading of the first stage, shortening the life of the tube nearest the antenna, and occasionally burning out of the first tuned circuit. Similarly, overload of the first grid will cause pulses of grid current to flow, generating transmitter harmonics in the receiver for transmission to nearby television receivers. This will occur even if the receiver send-receive switch cuts off the plate and screen voltages of the first tube, for only the cathode and control grid of the first (or other) stages are involved in this type of harmonic generation. If the transmitter signal can be kept out of the receiver, none of these troubles will occur.

Modern receivers are all potential transmitters. This is a characteristic of superheterodyne receivers, for this type includes an oscillator whose output frequency has a fixed difference with a desired incoming signal. All oscillators have some harmonic output, and if the receiver oscillator is not sufficiently shielded and filtered (like a good ham transmitter), it may radiate enough harmonic power to interfere with television receivers. Harmonic radiation is not a fault of just amateur receivers, for most old-timers remember how whole sections of the 160-meter band were made unusable by fundamental and harmonic radiation from a.c.-d.c. broadcast receivers.

Curing one of these troubles will usually cure the other, for the filtering and shielding necessary to prevent the transmitter signal from entering the receiver will also effectively block receiver oscillator harmonics attempting to leave the receiver.

Extra advantages result from receiver filtering and shielding that is effective enough to make the receiver antenna connection the only r.f. path into or out of the receiver. Antenna line filters become effective against strong unwanted stations. The receiver is always left in RECEIVE position [1] with improved receiver stability. A transmission-line t.r. switch [2] has a chance to be really effective, and even an antenna duplexing bridge can be used.[3]

Working Over the HQ-129X

Three local hams had TVI trouble with their communications receivers (all nationally-known, factory-built) and I wanted to try antenna duplexing bridge experiments. As my receiver had already been torn into for other modifications, it was selected for the full treatment. Many of the modifications incorporated will not be necessary with other receivers of even the same model, but severe test conditions were set up so that every possible type of signal leakage would occur.

The receiver was tested with a shielded resistor dummy antenna, the resistor matching the input impedance as determined by diode noise generator measurement.[4] The transmitter was loaded into the station antenna for the initial tests. Later, when the pickup had been substantially reduced, the transmitter output was fed into an unshielded series-resonant combination of capacitor, inductor, and resistor (Q of about 11) near the receiver.

The HQ-129X had been modified earlier for use of a low-noise single-ended converter stage,[5] so it is not possible to tell how much pickup the unshielded grid lead of the original 6K8 converter would have had. It is probable there would have been a great deal.

The greatest signal pickup was by the VR-105/OC3 voltage regulator tube used to stabilize the voltage on the oscillator plate and the r.f., converter, and i.f. amplifier screens. It was necessary to shield this tube. An almost equal source of leakage was the 6SS7 r.f. amplifier, because the metal envelope does not provide sufficient shielding against pickup. The shield covering the voltage regulator tube also was extended to cover this r.f. amplifier tube. There is no reason why commercially-available individual shields would not be satisfactory if shimmed with aluminum foil or similar material.

The writer used ¼-inch-mesh hardware cloth for shielding wherever convenience was not unduly impaired, but recommends the commercial shields when trade-in value is a factor.

The next prominent cause of leakage was the antenna terminal strip. This strip was removed and replaced by an SO-239 coaxial connector soldered in a copper plate which in turn was soldered to the chassis.

[1] In the HQ-129X, the send-receive switch controls the r.f., mixer, and first i.f. plate supplies.
[2] The Wright t.r. switch and many others.
[3] Fessenden, U. S. Patent 1,170,969 and others.

[4] Goodman, "How Sensitive Is Your Receiver?", *QST*, September, 1947.
[5] Santangelo, "Second Guessing The Experts On The HX-129X," *CQ*, April, 1952.

The Shielding Story in S-Meter Readings

	Before	*After*
Receiver connected to shielded dummy, transmitter on regular antenna	Meter	pegged
Shield over VR105/OC3	Pegged	S9
Shield over 6SS7 r.f. amp.	S9	S8
Antenna coax connector installed	S8	S5
Power-line filter installed	S5	S4
Change to transmitter output into dummy antenna near receiver		S9
Rear holes in tuning capacitor frame plugged up	S9	S6
Rear bearings of tuning capacitor covered	S6	S4
Slot in tuning-capacitor shield covered	S4	S2
Shield over bottom of chassis	S2	Less than S1
Leads to meter, pilot lamps and headphones bypassed		Inaudible

Power-line filters (Sprague Hypass) were next installed in a Bud Mini-Box mounted against the chassis. In the position shown in the photograph the box readily slides through the rear cutout of the receiver cabinet.

The tuning capacitor assembly was the next leaky item. Punched holes in the rear frame were plugged with nuts, bolts, and washers. The slot in the tuning capacitor shield that formerly was used for passing the grid lead to the 6K8 converter was closed by bolting on a metal plate, and the rear bearings of both capacitors were covered with two layers of aluminum foil. The foil was fastened in place with Duco Cement, the centers of the foil layers being insulated from each other and the bearing screw by small pieces of Scotch tape, as shown in Fig. 1.

Hardware cloth was tacked with solder to the bottom lip of the chassis at one-inch intervals to form a bottom shield. The pilot light, "S" meter, and headphone leads were bypassed with 0.001-μf. ceramic capacitors where the leads entered the chassis. It was not necessary to bypass the loudspeaker leads additionally, though this might be necessary in other cases. It likewise may be desirable to bypass the "RELAY" (send-receive) terminals, but the writer has no information since these connections were not used and did not require bypassing.

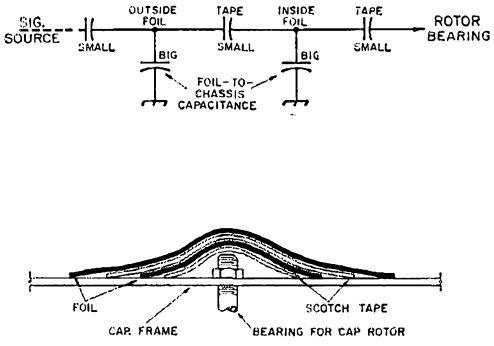
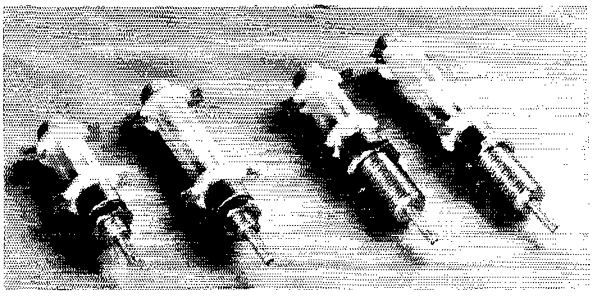


Fig. 1—Method of using foil and Scotch tape to shield the rear bearing of the tuning capacitor. This avoids the necessity for drilling to attach a shield or for soldering the shield to the capacitor frame. The two layers of foil are insulated from each other. Their edges may make contact with the capacitor frame but if not the foil pieces act like a two-section attenuator having the equivalent circuit shown at the top.

Altogether, the above measures permitted the writer to be sure that the *only* signal path to the receiver was through the coaxial connector — where an antenna relay, t.r. box, or duplexing bridge can control the receiver input.

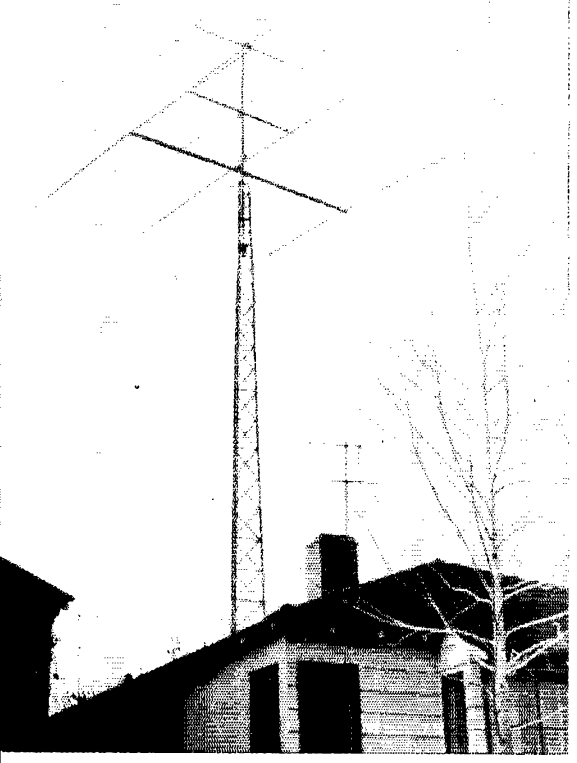
• New Apparatus

Slug-Tuned Coil Forms



A NUMBER of features are incorporated in the slug-tuned ceramic coil forms (type number prefix CSA) recently introduced by Waters Manufacturing, Inc., Wayland, Mass. The winding areas are ribbed, a convenience for running leads to terminals. Insulating rings cemented on the forms at the ends of the winding space are equipped with two double soldering lugs each, so that four terminals are provided for either two separate windings or for a tapped single winding. The double-lug feature permits soldering a coil lead to one part of the lug while the connection to the external circuit is made to the other part. As shown by the photograph, two types of mounting bushings are available, one a standard-length screw type and the other a "deep-well" type which allows the slug to be retracted farther than normal, thus increasing the possible inductance-adjustment range.

In either the standard or retractable bushing types there are three form diameters — $\frac{1}{4}$, $\frac{3}{8}$, and $\frac{1}{2}$ inch — and each diameter is available in three winding lengths, $\frac{5}{8}$, $\frac{7}{8}$, and $1\frac{1}{8}$ inches. There are also four types of slugs — three varieties of iron to cover the frequency range from audio to above 250 Mc., and brass. The ends of the forms are circular so that two forms can be stacked end to end (a collar is available to slip over the ends to complete the assembly) to form a transformer with separate slug tuning of both coils.



W6FHR's welded tower. The tower is 60 feet high and is broken into six 10-ft. sections. A 15-ft. rotating mast extension supports the 10- and 15-meter beams above the 20-meter array.

Safe Tower for a City Lot

Welded Sections in a Self-Supporting Sixty Footer

BY LEWIS H. ABRAHAM,* W6FHR

FOR YEARS I have owned a multiband transmitter but have operated only a single-band antenna. This wasn't too confining when sunspot activity was low. But then the m.u.f. began to move up. My pole was capable of handling a 15-meter beam over the old reliable 20, so up it went. I had no other choice. Living in the city on the usual 50-ft. lot, the only room I had for expansion was up.

Soon 10 meters turned hot too, and I had to face the fact that if I wanted an additional beam on my Christmas tree I would have to start from the roots up. I had pushed the old pole as far as it would go. For a thousand reasons I couldn't abandon either 15 or 20 meters. Thus the seed was sown for a new support.

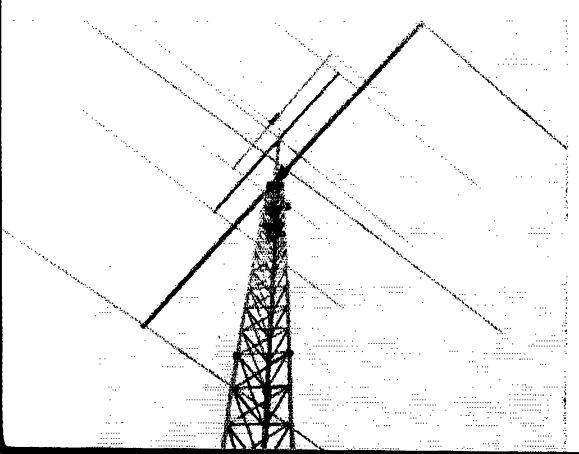
Having experimented with various antenna arrangements and finding, to paraphrase the song, "You Gotta Have Height," I set about examining ways and means of gaining a little more altitude at the same time I took on 10-meter capability. Two requirements were obvious immediately. The tower had to comply with building codes, and it had to be self-supporting with full-size three-element 10-, 15- and 20-meter beams.

As a first step, I began to explore available towers for amateur use. For one reason or another, none of these met the requirements. One or two commercial towers designed for nonamateur use were available if one were willing to part with about one kilobuck. Even so, these required too much room because of their base dimensions. Some of the other less expensive towers would not pass the Los Angeles Building Department requirements without extensive modification. These requirements aren't the toughest in the country.

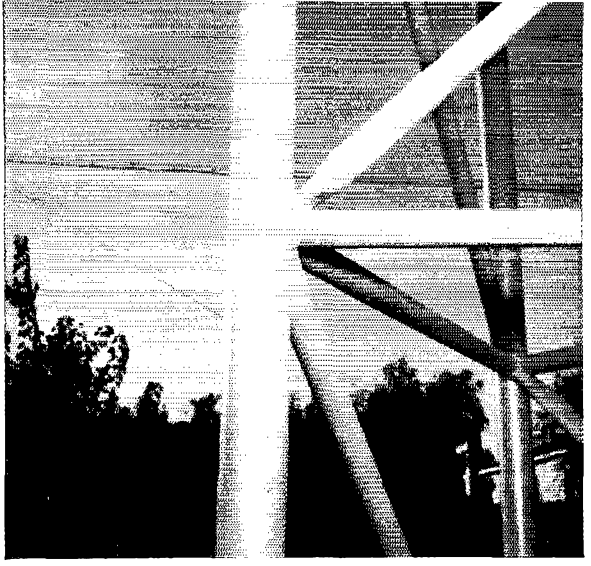
Safe Construction

While not wishing to belabor the point too much, the importance of approval by local building and safety authorities cannot be over-emphasized. The job of these departments is to assure the safety of the buildings occupied by you and your neighbors. While some of the restrictions may seem severe or arbitrary, they are a result of long years of experience that have involved some pretty sad cases. The average amateur is not capable of judging the integrity of a structure.

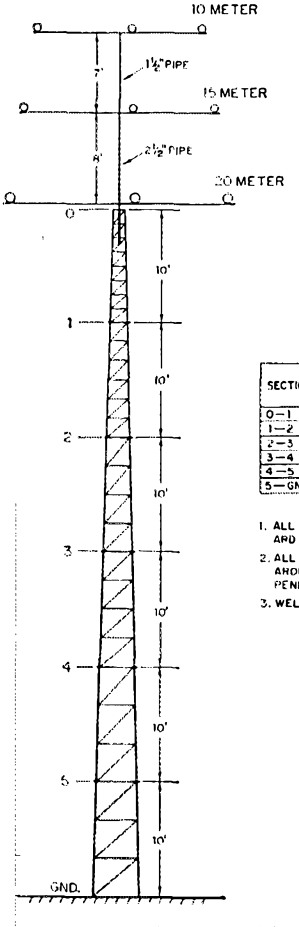
*11339 Gladwin St., Los Angeles 49, Calif.



Upper section of the tower. The lowermost triangular plate supports the prop-pitch motor; the upper two are fitted with bearings.



A typical welded joint. The ends of the diagonal members are flattened to fit into the corners.



SECTION	VERTICAL MEMBER SIZE	BRACING SIZE	BOLTS AT JOINT
0—1	1"	3/8"	2—1/2" DIA.
1—2	1 1/4"	1/2"	3—1/2" DIA.
2—3	1 1/2"	3/4"	4—1/2" DIA.
3—4	2"	1"	3—5/8" DIA.
4—5	2 1/2"	1"	3—3/4" DIA.
5—GND.	2 1/2"	1 1/4"	2—1" DIA.

1. ALL PIPE SIZES SHOWN ARE STANDARD IRON PIPE SIZES.
2. ALL JOINTS COMPLETELY WELDED AROUND PERIPHERY, COMPLETE PENETRATION.
3. WELD FILLETS 3/16".

Fig. 1—Essential dimensions of the 60-ft. tower plus 15-ft. rotating mast. This sketch shows the actual number of crossbraces used in each side of each 10-ft. section.

Only one weak member can bring a tower crashing to the ground. The author knows of several such incidents. In one, the family dog was killed. It might have been a member of the family or a neighbor instead.

An approved structure, properly maintained, usually will be safe. Building-department approval can be insurance as well as assurance. If an unapproved structure causes property damage, or injury, you have little legal status and may be considered negligent — a very vulnerable position in the eyes of a court of law. Unless an "Act of God" is clearly involved, it is pretty hard to prove that somebody hasn't been negligent when a structure collapses.

Although I had built three towers previously, each time vowing, "Never again!," the prospects of working all bands with increased height goaded me on. Once again I forgot my old scars and let my enthusiasm prevail. Thus began the dream of Number Four. Armed with a copy of the Building and Safety Code, a well-oiled slide rule, and reams of paper, I set about the design of an edifice to rival all save Babel. This was to be my last tower — the ultimate.

From previous tests [1], 7 to 8 ft. seemed to be a satisfactory vertical spacing between beams. Wanting the lowest antenna at about 60 ft., this put the 10-meter beam at a height of around 75 ft. Thus the height was settled.

Constructional Details

Because of space problems, only a 4-ft. square could be allocated for the base. To use readily-available structural steel shapes would mean that the tower would have to be square in cross section. Tapering would add to the difficulty of construction, although tapering is very desirable from aesthetic considerations. Bolting the members together would mean drilling about 400 holes. This prospect almost scuttled the project before it was started. Upon consulting a local welder, it appeared that welding the members together

[1] Orr, *Beam Antenna Handbook*.

would offer no particular difficulties, although it would take the job out of the do-it-yourself class.

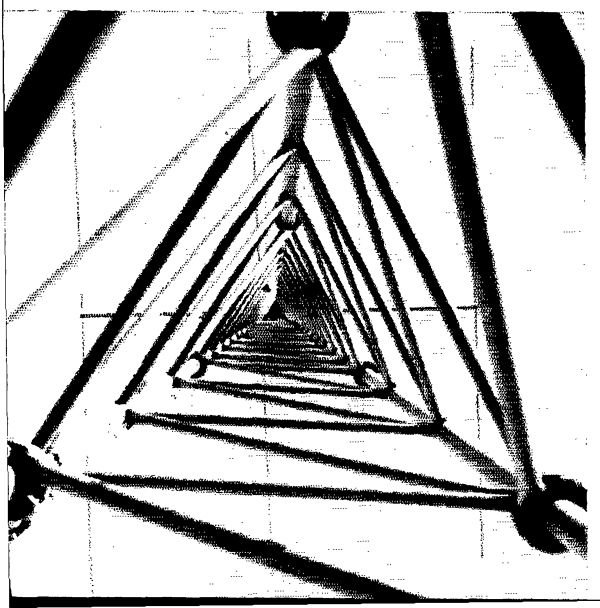
Once having decided on this method of assembly, other possibilities appeared. The tower could be made of pipe, instead of angle stock, and the cost of welding could be at least partially offset by using a triangular rather than square cross section. Tapering would present no special problem. The final design is shown in Fig. 1.

In order to facilitate transportation from the welder to the station site and to permit erection without the need for a crane, the tower was designed to break into six 10-ft. sections. The three vertical members or legs of each section terminate at both ends in joining plates or flanges. These provide a means for bolting the sections together. The flanges are drilled for joining bolts according to the chart of Fig. 1. It is important, of course, that pairs of flanges that will be bolted together when the tower is assembled be accurately matched as to bolt-hole pattern. This can be done most easily by clamping the mating pairs of flanges together and drilling the bolt holes and pipe-hole centers simultaneously through the two flanges. After the vertical pipes have been cut to the lengths of 10 ft., the flanges are welded onto the ends, keeping the surfaces of the flanges accurately at right angles to the axis of the pipe, and the pipe centered on the flange.

When the three legs of a section have been prepared, jigs of plywood sheet are drilled and bolted to the ends to hold the legs in the correct position with the proper taper. The horizontal spacing between legs in each section is 6 inches less at the top than at the bottom. Since the top jig of any section becomes the bottom jig for the next section above, proper orientation of the bolt holes is assured.

When the jigs have been bolted firmly in place, the cross bracing can be cut to fit and welded in place. Fig. 1 shows the number of cross braces required for each section. The horizontal members are added first, and then the diagonals. Fig. 2

Worm's-eye view of the welded tower, showing the joining flanges.



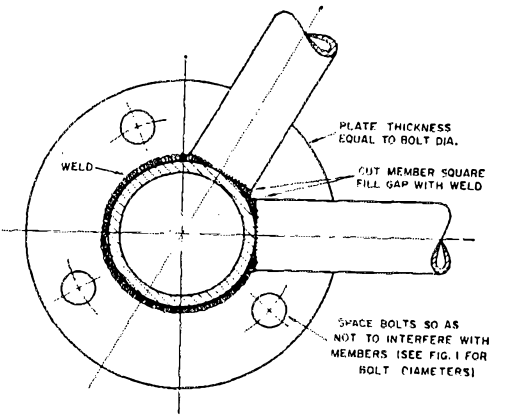


Fig. 2—Detail sketch showing how section assembly flanges and crossbraces are welded to the vertical pipe legs. The flanges are of ordinary low-carbon steel. The outside diameter should be equal to the outside diameter of the largest vertical pipe at the joint, plus six times the diameter of the bolt used at the joint (see chart of Fig. 1). Ample wrench clearance will be provided if the center line of the bolt circle is laid out midway between the pipe and outer edge.

shows a typical joint between a leg and two horizontal members. The ends of the horizontal members are not saddled to fit the pipe legs, but are cut square and the gaps are filled with weld. The diagonals are also cut square, but the ends are flattened somewhat to fit in the corner formed by the vertical and horizontal members, as shown in the detail photograph.

After assembly, each section should be given a coat of primer and one or two coats of paint. Dull grey makes a neat-looking installation.

Mast Support

Three triangular steel plates are welded into the top section of the tower. The first is at the top, the second is at the third horizontal brace from the top (3 ft. 9 inches), and the third plate is at the fifth horizontal brace (6 ft. 3 inches from the top). The bottom plate supports a prop-pitch motor, while the other two are fitted with bearings for the mast that carries the antennas. The bearings are of the plain sleeve type made of 3¼-inch o.d. × $\frac{5}{32}$-inch wall mechanical tubing cut to a length of about 2 inches and welded to the triangular plates. A snug fit at these bearings is desirable to minimize vibration. (Standard pipe diameters are usually inside dimensions.) While ball bearings or other low-friction-type bearings are often considered, they are not very weatherproof, and since they are precision devices they are easily jammed, causing considerable difficulty. For the small amount of usage these crude bearings receive, they are quite adequate and only an occasional greasing is necessary. As a matter of fact, mine have not been greased in over a year and they are still working perfectly.

The rotating mast is made up of two sections

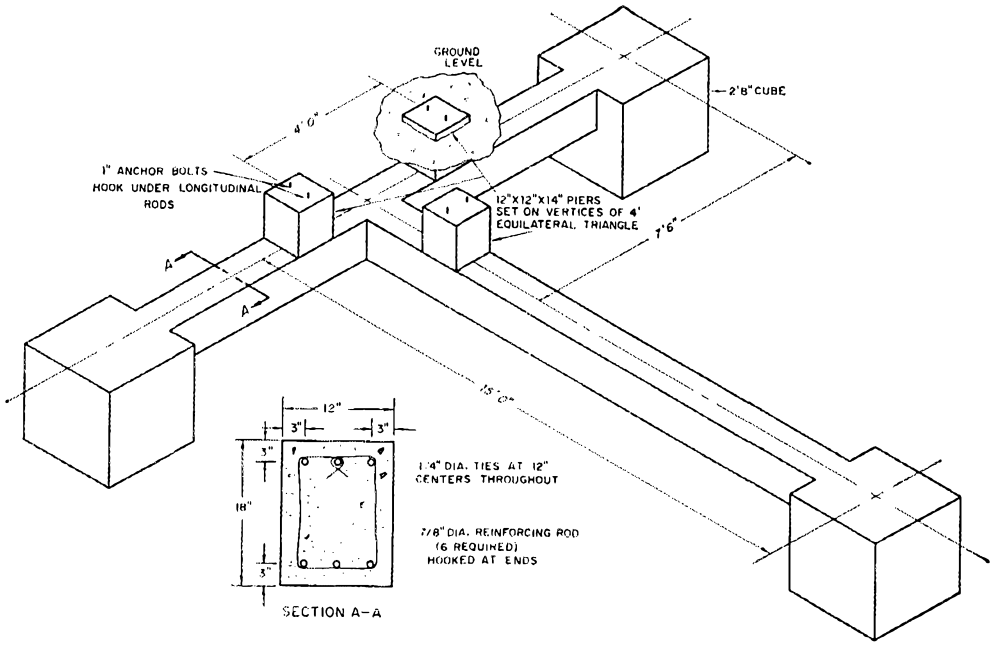


Fig. 3—Details of the concrete foundation. The unit is buried at such a depth that only the tops of the piers appear above the surface of the ground. The asymmetrical pattern is easier to construct than one having three equally spaced legs and may be placed closer to a building or other boundary.

of pipe. The lower section is of 2½-inch pipe and is approximately 15 ft. long. The top section is of 1½-inch pipe and is about 8 ft. long. In joining the two sections together, pieces of welding rod are used as centering spacers and then the two sections are welded together.

Foundation

In checking the design requirements for a conventional foundation, the specifications turned out to be an underground structure worthy of any Pharaoh. They called for a block of concrete 5 ft. square and 10 ft. deep. This hole would have attracted all of the swimming-pool salesmen in town. Discarding this monstrosity, the unconventional design shown in Fig. 3 was devised. This any Sunday contractor can handle. It involves some reinforcing steel, but this is small cost compared to moving about 30 tons of dirt, much of which would have to be passed up from the bottom of the hole with a bucket. This T-shaped design requires only 4 cubic yards of concrete and, buried a foot under the lawn, the foundation is completely invisible except for the three small piers on which the tower is mounted.

It is not necessary to use wood forms for the concrete, except for the piers, if the excavation is made with reasonable care. The excavation itself may serve as the form. The cross-sectional detail of Fig. 3 shows how the reinforcing rods are arranged. These reinforcing rods extend into the cubes and their ends are bent into hook shape. The rods are bonded together every 12 inches with ¼-inch tie wire. The ties wrap around the group of six rods and their ends are anchored by bending them around the upper central rod. Smaller wire should be used to bind the tie wire to the reinforcing rods where they intersect. The complete foundation, with the possible exception of the cubes, should be poured at the same time; that is, before the concrete starts to set, since dry concrete and wet concrete do not cohere.

Assembling the Tower

The bottom section of the tower weighs about 300 lbs., while the top section weighs approximately half of this. Nevertheless two men (admittedly with some experience) had no trouble in assembling the tower and mounting the antennas in a single week end. The base section was first pushed up by hand and bolted to the foundation. A pipe gin pole with a short boom welded to the top end served as a support for a block and tackle. (See Fig. 4.) The gin pole was clamped about half way up on the base section, and the next section was hoisted into place and bolted fast. With each succeeding section, the gin pole was moved up a section on the tower and the above process repeated. The horizontal members of the tower are used for climbing and yet they are spaced wide enough at the bottom to discourage children from attempting it.

Feed and Adjustment

The antennas were cut to formula dimensions and the resonances checked reasonably close to the calculated figures. Little interaction between antennas was noticed. Gamma match is used on all three arrays. The reactance tuning capacitors of the 20- and 15-meter beams are accessible from

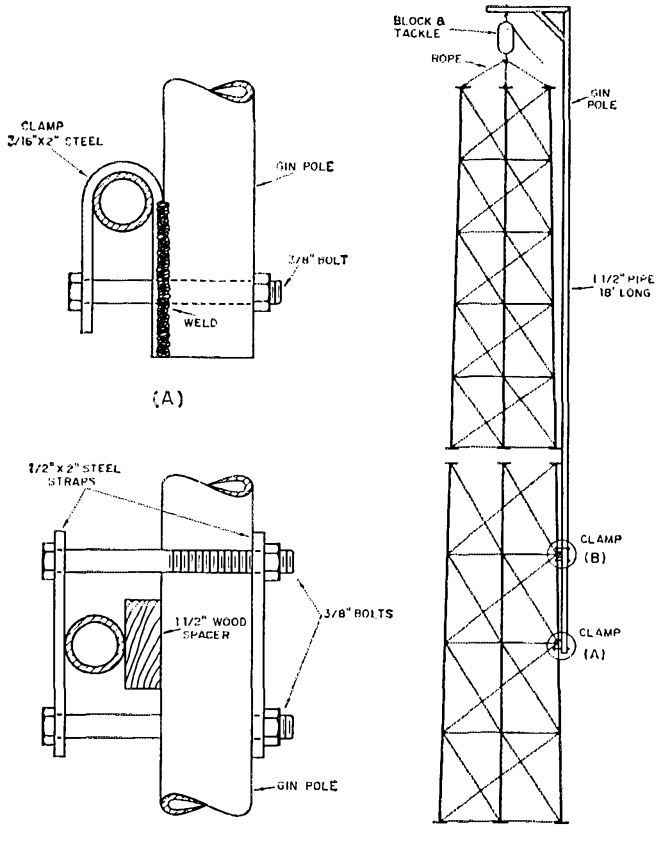


Fig. 4—Method used to assemble the tower. The bottom end of the gin pole is clamped to the bracing members as shown in details A and B. The gin pole is moved up on the tower as sections are added.

all three arrays. The reactance tuning capacitors of the 20- and 15-meter beams are accessible from the top of the tower. To adjust the capacitor on the 10-meter beam, a small 1 r.p.m. motor originally designed to turn a barbecue spit was used. It worked perfectly. A single 52-ohm coax line is used to feed the antennas. Relays at the top of the tower switch the line from one to another.

To those who are interested in cost, the pipe amounted to $225. Welding required about 40 man hours. While this is not an inexpensive installation, it is cheaper than a comparable manufactured tower. Furthermore, it is exactly what I wanted and I have the assurance that it will stay up — and it's legal. All in all, it was worth the effort. Besides — this is my last tower!

Hamfest Calendar

(Continued from page 10)

in Biloxi. Open house, swap table, bingo and dancing on the twenty-third. Hidden transmitter hunt, mobile rig judging, speakers on the twenty-fourth. Registration is $1.00. Write to the Biloxi ARC, P.O. Box 1574, Biloxi.

New Jersey — The Central New Jersey VHF Society will hold a hamfest on Sunday, August 24, at Voorhees State Park, Route 513, off Route 69 near Clinton. There will be fixed stations on two and six meters to talk mobiles in. Bring the family and enjoy a good old-fashioned outing. Donations $1.00 per call. Games and prizes for the children. Facilities for outdoor cooking. Rain date is Sept. 7. Contact Richard Plue, 311 Fairview Ave., Dunellen, N. J.

Pennsylvania — The Third Annual Picnic of the Pack Rats will be held on Sunday, August 10, at Fort Washington State Park, Flourtown. $1.00 per family. Contact Francis D. Brick, W3SAO, 829 W. Fishers Ave., Philadelphia 41.

Pennsylvania — The third annual ham picnic of the four York County radio clubs will be held at Atland's Ranch, one mile south of U. S. Route 30, 10 miles west of York, on Sunday, August 24. Registration begins at 10:30 A.M. Basket lunch with free soda for the family. Auction, games and prizes. Eastern Pa. phone net meeting is scheduled. Mobile talk-ins on 50.55 Mc., 145.62 Mc., 29.5 Mc., and on 75 meters. Swimming facilities available. Picnic will be held rain or shine. Transportation from nearby York Airport will be arranged if requested in advance. Tickets $1.00 in advance or $1.25 at the gate, per ham, including guests. For further info and tickets, write John Zett, W3FLD, 2740 Grandview Ave., York.

Tennessee — An all-day hamfest will be sponsored by the Frye Amateur Radio Club of Chattanooga on Sunday, August 3, at Warner Park. Plenty of prizes. Total Registration is $1.00, plus an optional $1.25 for meal.

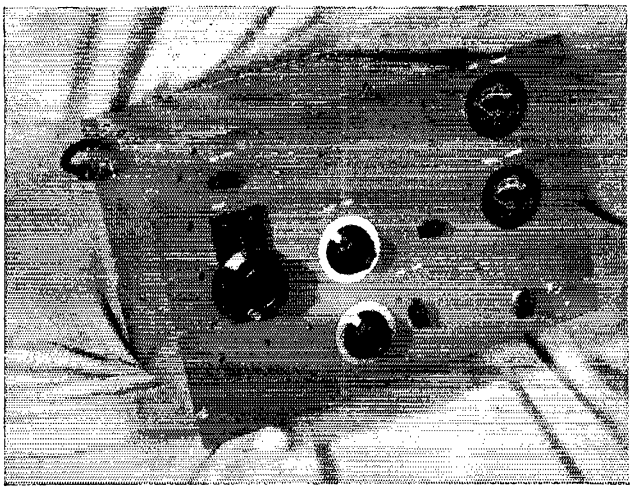
Texas — The Central Texas Amateur Radio Club and the XYL Club of Waco are holding their third annual family-style picnic-hamfest on Sunday, August 31, at the Cameron Park Club House. The program begins at 10 A.M. Registration is $1.50. Transmitter hunts on 75-, 10- and 6 meters. Bring your lunch, or eat at local restaurants. Write to Robert K. Jefferies, W5WIY, P.O. Box 1032, Waco.

Virginia — The Eighth Annual Hamfest of the Shenandoah Valley Amateur Radio Club and the Blue Ridge YL Club will be held Sunday, August 3, at the Dickey Ridge picnic area, on the Skyline Drive. The picnic area is about four miles south of the Front Royal entrance to the drive. Registration begins at 10 A.M. Registration is $1.00 total, plus an optional $1.25 for meal only. Swap tables. Mars meeting. Mobiles check in on 29.2 Mc. or 3835 kc.

West Virginia — The Black Diamond Amateur Radio Club is sponsoring a picnic at Bass Lake Park in Hinton on Sunday, August 31. There is no fee or registration charge.

Alberta — The Northern Alberta Radio Club will sponsor a hamfest in Edmonton on Saturday, August 23 and 24. Banquet, picnic and special events. For further info contact the Northern Alberta RC, Box 163, Edmonton.

British Columbia — The British Columbia DX Club will host Pacific Northwest DXers at its annual convention August 23-24 at the Hotel Grosvenor in Vancouver. Speakers, demonstrations. XYLs welcome. Contact Vic Waters, VE7ALR, 3692 Quesnel Drive, Vancouver 8.



W4SUD's all-purpose 813 amplifier. The output-capacitor switch (coarse loading) is above the turns counter for the variable inductor. Dials near the center are for the plate tank capacitor C_4 (above) and the grid tank capacitor C_1 (below). To the right of the dials are the controls for the plate padder switch S_3 (above) and the grid band switch S_1 (below). The toggle switch below the meters is the mode switch S_4 with the meter switch S_5 to the left. Ventilating holes are drilled in the cover in the area above the tube. The output connector is on the left-hand wall of the shielding box.

An All-Purpose 813 Amplifier

Flexible Unit for C.W., A.M., or S.S.B.

BY R. A. THOMASON,* W4SUD

IN THESE DAYS, the well-equipped amateur, be he traffic man, DXer or rag chewer, must be prepared for c.w., conventional a.m. and s.s.b. In the 813 amplifier shown in the photographs, provision has been made for convenient changing from one mode to another as well as to any of the bands from 80 through 10 meters.

The circuit is shown in Fig. 1. A turret-type grid circuit is used and the output circuit is a pi network designed to work into coax cable. The inductor is the rotary-type variable. Provision for neutralizing is included. R_1 is a parasitic suppressor.

For Class C c.w. or phone operation, S_4 is open. The 90 volts of fixed bias, furnished by a small bias supply and regulated by the VR90, is augmented by a drop of about 50 volts across the grid-leak resistor R_2 at a normal grid current of 15 ma. This brings the total bias to 140 volts. With S_4 closed, the grid leak is short-circuited and the 90 volts of fixed bias alone remains for AB_2 s.s.b. operation. (The author also prefers AB_2 for c.w. operation because it preserves the keying characteristics of the exciter better than with Class C operation.) R_3 should be adjusted so that the VR90 just ignites with no excitation.

Screen voltage is regulated at 750 volts by a string of five 0A2s for s.s.b. operation. When the grid drive is increased for Class C operation, the screen current increases, increasing the drop across the screen resistor R_5, and the screen voltage falls to 400. The regulators then lose control and the amplifier is ready for plate-screen modulation.

The screen is protected against excessive input, should the load or plate voltage be removed, by the overload relay K_1. The tripping point is set at 40 ma. by the variable shunt resistor R_4. One meter, M_1 measures cathode current, while the other meter, M_2, may be switched to read either grid current or screen current.

Forced-air ventilation is always advisable for a medium- or high-power amplifier if it is buttoned up tight to suppress TVI. A surplus 100 c.f.m. blower does the job more than adequately.

Construction

The amplifier is built on a 13 × 17 × 4-inch aluminum chassis fastened to a standard 12¾ × 19-inch rack panel. The r.f. output portion is enclosed in a 12½ × 13 × 8½-inch box made of aluminum angle and sheet. The VR tubes, relay, blower and meters are mounted external to the box.

The grid tank-circuit components are mounted underneath the chassis and are shielded with a 5 × 7 × 3-inch aluminum box. A standard chassis of these dimensions might be substituted. The bias and filament transformers are in a second

*626 Eastwood Drive, Owensboro, Kentucky.

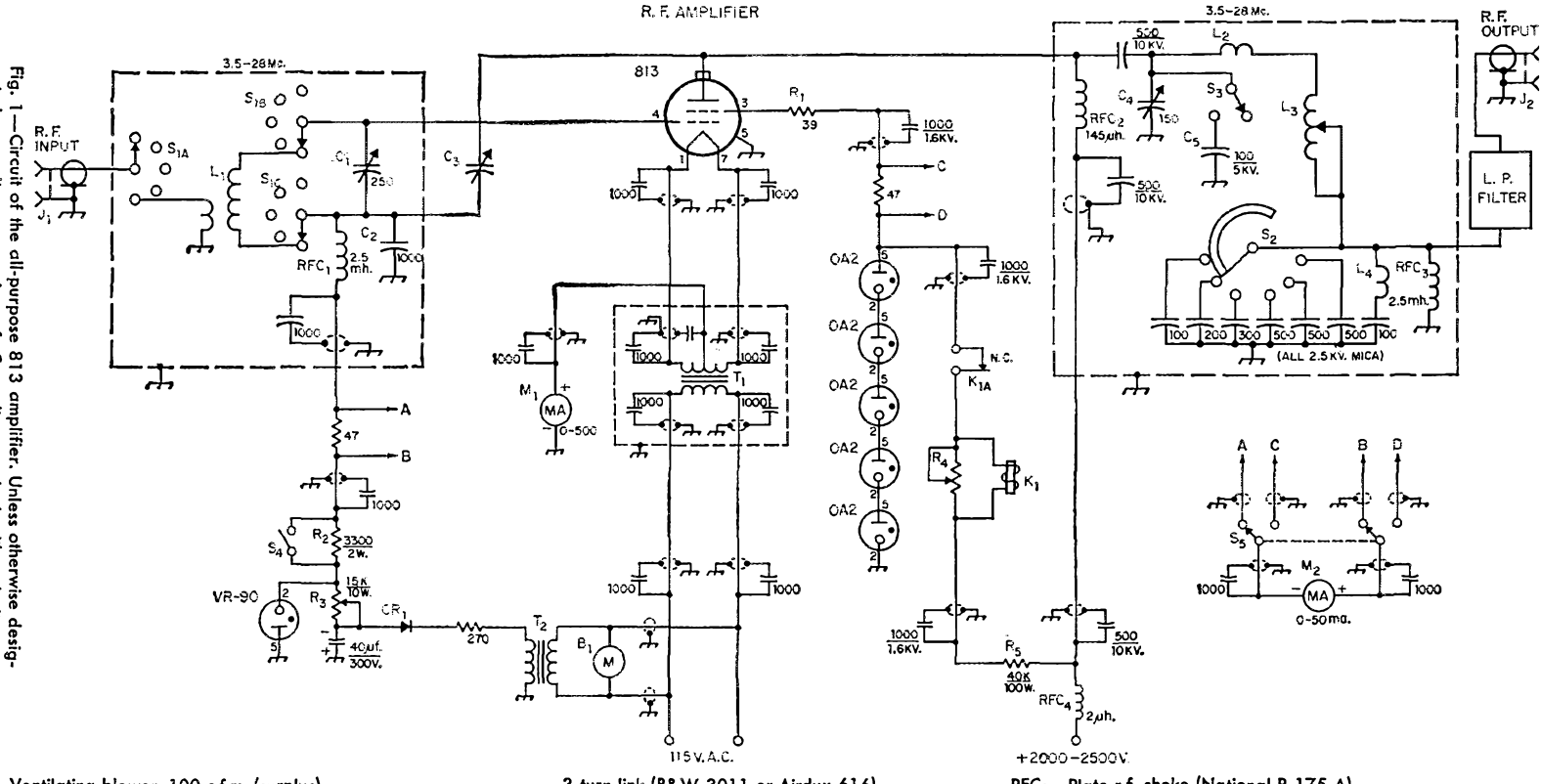
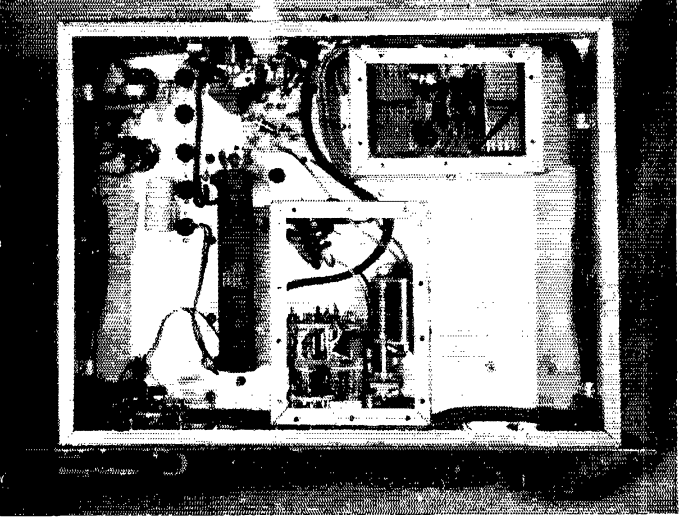


Fig. 1—Circuit of the all-purpose 813 amplifier. Unless otherwise designated, capacitances are in μμf. Capacitors marked with polarity are electrolytic. Other capacitors not listed below should be ceramic. Resistances are in ohms.

B_1—Ventilating blower, 100 c.f.m. (surplus).
C_1—250-μμf. variable (Hammarlund MC-250-M).
C_2—1000-μμf. mica.
C_3—Neutralizing capacitor, 10 μμf. maximum (Johnson 159-250).
C_4—150-μμf. 6000-volt variable (Johnson 153-12).
C_5—100-μμf. 5000-volt fixed capacitor (surplus vacuum, Amperex VC-100, or two 200-μμf. 5000-volt micas in series).
CR_1—130-volt 50-ma. selenium rectifier.
J_1, J_2—Coaxial receptacle (SO-239).
K_1—Screen overload relay, 2500 ohms, 7 ma. (Potter & Brumfield KCP5).
L_1—3.5 Mc.—32 turns No. 20, 1-inch diam., 2 inches long, 5-turn link (B&W 3015 or Airdux 816).
—7 Mc.—18 turns No. 20, ¾-inch diam., 1⅛ inches long, 3-turn link (B&W 3011 or Airdux 616).
—14 Mc.—10 turns No. 18, ⅝-inch diam., 1¼ inches long, 2-turn link (B&W 3006 or Airdux 508).
—21 Mc.—7 turns No. 18, ⅝-inch diam., ⅞ inch long, 1-turn link (B&W 3006 or Airdux 508).
—28 Mc.—5 turns No. 18, ⅝-inch diam., ⅝ inch long, 1-turn link (B&W 3006 or Airdux 508).
L_2—3 turns 3/16-inch copper tubing, 1-inch diam., 1¾ inches long.
L_3—15-μh. variable inductor (B&W 3852).
L_4—See text.
M_1, M_2—3½-inch d.c. milliammeter.
R_1—39 ohms, ½-watt carbon.
R_2—3300 ohms, 2 watts.
R_3—15,000 ohms, 10 watts with slider.
R_4—2000-ohm 4-watt variable resistor (Mallory M2MPK).
RFC_1, RFC_3—2.5-mh. r.f. choke (National R-50 or similar).
RFC_2—Plate r.f. choke (National R-175-A).
RFC_4—V.h.f. choke (National R-60).
S_1—Rotary switch: 3 wafers, 3 poles, 11 positions per pole, 5 positions used (Centralab PA-0 wafers, PA-301 index).
S_2—Rotary switch: single pole, 10 positions, progressively shorting, 6 positions used (Centralab PA-2042).
S_3—Rotary switch: s.p.s.t., ceramic (antenna link switch from BC-375 tuning unit, or Communications Products Model 65).
S_4—S.p.s.t. toggle switch.
S_5—D.p.d.t. rotary switch (Centralab 1405).
T_1—Filament transformer: 10 volts, 5 amp. (Thordarson 21F18).
T_2—Bias transformer: 120 volts, 50 ma.; 6.3 volts, 2 amp., filament winding not used; could be used for pilot light (Merit P-3045).



Bottom view of the all-purpose 813 amplifier. The grid tank-circuit components within dashed lines in Fig. 1 are enclosed in the box at lower center. Input links are wound over ground ends of grid coils. Filament and bias transformers are in the second box. The large resistor to the left of the grid box is the screen resistor. The variable resistor in the upper left-hand corner is the relay shunt R_4. The selenium bias rectifier is fastened against the left-hand wall of the chassis.

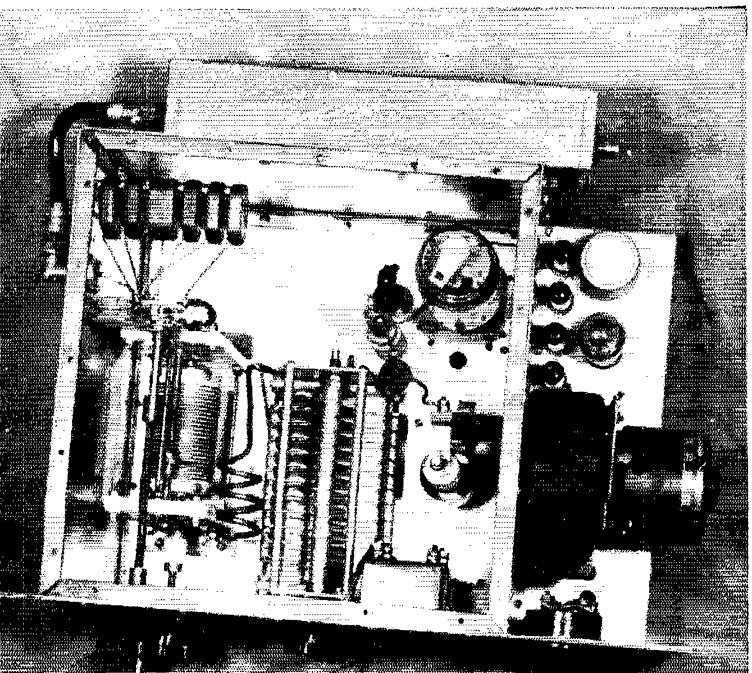
box measuring 6 by 3 by 3 inches. This type of construction, together with the use of shielded wire for all power circuits, was followed to reduce TVI to a minimum. Each wire was bypassed at both ends with 0.001-μf. ceramic disk capacitors. L_4 can be adjusted to series resonate with the 600-$\mu\mu$f. capacitor at the frequency of the most troublesome channel. A Bud low-pass filter completes the TVI treatment. As a result, the amplifier is completely free of TVI on all channels even in this fringe area.

Adjustment

In the pi network, the output capacitors are fixed. However, the adjustment of the network is similar to that of the more conventional arrangement using a variable portion of the output capacitance. The only difference is that the "fine" loading adjustment is done with the variable inductor.

The inductor is fitted with a Groth turns counter, making it easy to return to the proper setting for each band. Until the settings for each band have been found, S_2 should be turned so that all of the output capacitance is in circuit. The inductor should be set near maximum for 80, and approximately half maximum for 40. On the higher-frequency bands, the inductor should be set so that the circuit resonates with the tank capacitor near minimum capacitance. Loading should increase as the output capacitance is decreased. A change in output capacitance will require a readjustment of C_4 for resonance. When the loading is near the desired point, final adjustment can be made by altering the inductance slightly.

A 20-A or similar exciter is well suited as a driver for this amplifier on all modes. The 813 runs cool at 500 watts input on a.m. and c.w. and at 1000 watts p.e.p. on s.s.b. I believe it is a good compromise between the full legal limit and low cost.



This view shows the placement of components on the chassis. The 813 socket is mounted on spacers over a large clearance hole in the chassis. The several mica output capacitors are assembled in a stack on a threaded rod fastened to the left-hand wall of the shielding box. The neutralizing capacitor and the 80-meter plate paddle are to the right of the tank capacitor. To the right of the box are the five 0A2s (the front one hidden), the screen overload relay and the VR90, the blower and meters.

A Directional Coupler for 144 Mc.

Reliable S.W.R. Measurement at Low Cost

WITH MORE and more antennas being fed with coax, a reliable means of measuring standing-wave ratio and power in the transmission line is a must if we are to achieve optimum antenna and loading adjustment. This is particularly true at 50 Mc. and higher, yet few of the devices that can be bought or built for these purposes are reliable for v.h.f. service. V.h.f. men who want to be sure that their equipment is working in tip-top order will be interested in the experience of W3GKP reported below.

For some time Bill had been unhappy about the state of the amateur art as regards standing-wave indicators for v.h.f. use. Most of the circuits in the *Handbook* and other amateur literature are not well suited for use above 30 or 54 Mc. He did not try any of the lumped-constant circuits involving reactive components or potentiometers, because of pessimism regarding the outcome.

Lumped circuits using only resistors, as in the bridge shown in Figs. 21-36, 21-33 and 21-35 in the '56, '57 and '58 editions of the Handbook respectively, can be used at 144 Mc., provided the equipment is built with more attention to v.h.f. requirements than is shown in the *Handbook* examples. For several years W3GKP used such a bridge, built by and on "permanent loan" from W3GZQ. In this the standard R, is built into a coaxial plug and connected into circuit by a connector of the same type as is used for the unknown. The W3GZQ version is symmetrical electrically and mechanically, and it works much better at 144 Mc. than a 75-ohm model copied from the *Handbook*.

The standard supplied with it consists of a 47-ohm ½-watt resistor filed to 51 ohms, mounted in a PL-259A plug with the shortest possible leads. As a check W3GKP made another standard, selecting a resistor that matched the original at d.c. and mounting it in the same manner. When these are checked against each other on the bridge, a detectable but negligible reading is obtained. With the aid of laboratory equipment Bill then compared both standards with a General Radio 874-WM 50-ohm termination. With either standard a negligible reading was obtained, demonstrating the worth of the bridge as a device for adjusting antennas. But something that could be driven by the transmitter, and left in the circuit at all times, was desired. This led to an investigation of the directional coupler shown symbolically in Fig. 1.

As seen at A, a directional coupler is a 4-terminal device having the property that most of the power introduced at Arm 1 is delivered to Arm 2, except for a small sample that is delivered to Arm 4. There is no output from Arm 3, unless power is introduced at or reflected from Arms 2 or 4. Such devices can be constructed using

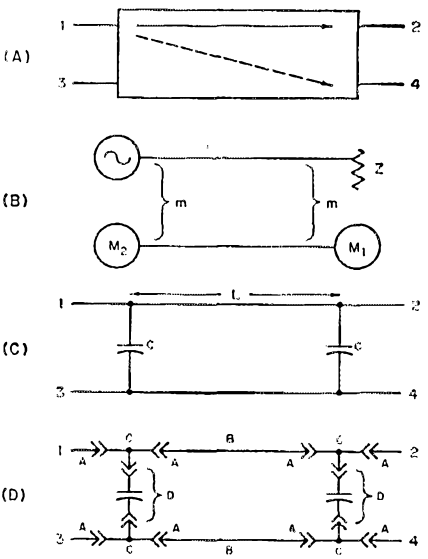


Fig. 1—Development of the 144-Mc. directional coupler. Basic idea of the bridge is shown at A. Mutual coupling, *m*, between main and side lines, limits directivity (B). Maximum directivity in bridge made of coaxial lines (C) is obtained by introducing coupling capacitances at points so that L is ¼ wavelength. Bridge made up from standard coaxial fittings is shown schematically at D.

lumped circuit elements, coaxial cable, waveguide, or combinations of these.

A coaxial version might appear as shown at B, which is intended to portray only the inner conductors. Most of the power flows down the main line to the load, Z. A small portion is coupled by m to the side line, and meter M_1 gives a reading proportional to the power flowing toward the load. If the main line is terminated properly by Z, M_2 will read zero; otherwise it will give a reading proportional to the power reflected by Z. If the generator is a transmitter and Z is an antenna, the ratio of the power readings at M_1 and M_2 is a measure of the standing-wave ratio, and the difference between the power readings is proportional to the power delivered to the antenna. It should be mentioned that this happy state of affairs results only when Arms 3 and 4 are terminated in matched impedances. This places some special requirements on the indicating devices, M_1 and M_2.

The ratio of power delivered to Arm 2 to that delivered to Arm 4 is termed the coupling. Due to unavoidable variations in the construction of the device, some power may be delivered to Arm 3, even when Arm 2 is properly matched. The ratio of the power to Arm 4 to that to Arm 3, when Arms 2 and 3 are matched, is termed the

directivity. Both the coupling and the directivity may be expressed in decibels. Ideally the directivity should be infinite. Reverting to 1B, the coupling, m, between the main and side lines may be effected at two or more discrete points or distributed over some distance. In addition, it may be inductive, capacitive, resistive, or combinations of these.

Fig. 1-C shows a directional coupler made of coaxial cables, coupled by capacitors, C. If the distance L between coupling points is $\frac{1}{4}$ wavelength, and the capacitors are equal, the coupler should perform as described. Fig. 1-D shows a fairly practical form, which can be constructed using standard fittings. In this sketch, A are PL259 plugs, B lengths of RG-8/U cable, C M-358 T fittings, and D modified PL-258 junctions.

The PL-258 junctions (he used Amphenol 83-1J) were modified to form a capacitive rather than a direct connection. Examination of one of these will show that its innards are retained by a spring C-ring at one end. If a hacksaw cut is made into the body opposite the gap in the ring, in the plane of the longitudinal axis and at about 45 degrees to the transverse axis, the ring will pop out intact when encountered by the saw blade. The insides can be poured out neatly. If the cut is made into the opening of the C ring, its removal can be effected with a scriber. Parts are the C-ring, two insulating beads and a double female contact. The contact has two flanges near the center, which prevent it from falling out through the holes in the beads. W3GKP cut the contact in half between the flanges, filed the rough ends until he had a smooth flat surface extending over the entire area of the flange, and cemented the two contact pieces back together, with a bit of insulation between.

The smoothing can be done nicely by chucking the contact in a drill press and bringing it down on a flat file. The insulation used was transparent plastic 1/16 inch thick, cut from the lid of a small parts box. This was coated with GC cement, and the assembly clamped lightly in a vise to assure a uniform film thickness. After it dried, the plastic was filed down even with the metal, and the whole assembly coated with cement. It was found that this would stand having a plug inserted, but not removed, so when it is finished the T-fittings should be attached and left on.

On the first attempt W3GKP used RG-8/U cables having a tip-to-tip length of 12¾ inches when completed. These gave maximum directivity at 121 Mc. The next attempt to hit 144 Mc. was made with cables 10⅝ inches long. For testing, Arm 1 was driven with a General Radio 1021 generator, the attenuator of which was adjusted to a suitable level and left fixed. The output from each of the other arms was measured with the following GR equipment: an 874 20-db. pad for matching, an 874-MR mixer, a 1216 i.f. amplifier, and 1215 oscillator. Relative output was read from the i.f., which is calibrated. The unused arms were terminated in 874-WM 50-ohm loads. Fig. 2 shows how the coupling and directivity varied with frequency.

This looked like a usable device. With a coupling of 33 db., 1 kilowatt at 144 Mc. in the main line would result in ½ watt in the side line, indicating that the device should be usable with amateur power levels with a simple terminating resistor. Lower coupling might be useful for low-power operation. While best directivity was obtained at or slightly below the low end, it looked good enough over the entire 144–148-Mc. range.

The computed relationship between s.w.r. and apparent directivity for an ideal coupler is shown in Fig. 3. Judging from this, a directivity of 20 db. would result in an s.w.r. error of 1.2:1. By shooting for a null it should be possible to adjust an antenna system to less than 1.5:1. The points indicated by X's in Fig. 3 show the directivity measured for various standing-wave ratios. The 2:1 point was obtained by paralleling two 874–

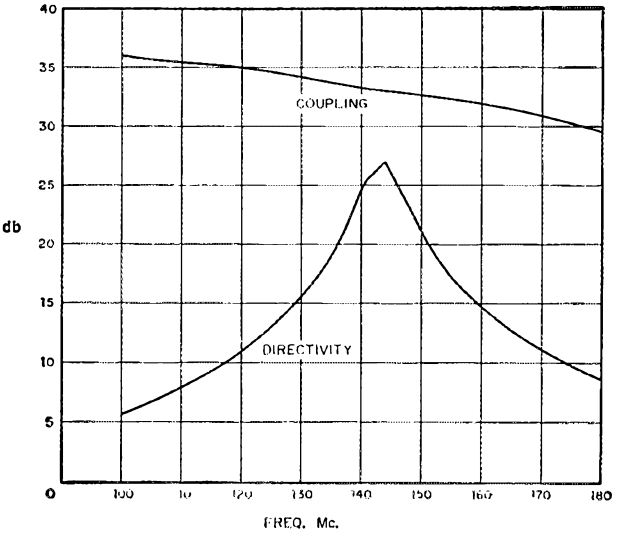


Fig. 2—Coupling and directivity of the 144-Mc. bridge, as measured with laboratory-type equipment by W3GKP.

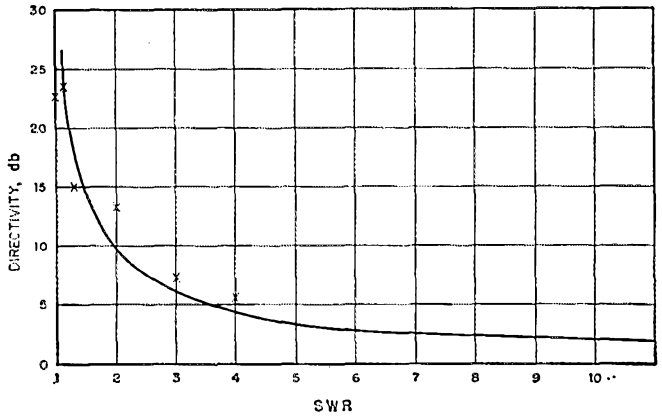


Fig. 3—Computed relationship between s.w.r. and apparent directivity in an ideal coupler. Points indicated by X show measured directivity.

WM units on an 874-T fitting. Ratios of 3:1 and 4:1 were obtained by shunting this with the home-made standards. A single 874-WM was used for 1:1. For 1.2 and 1.25, an open- and short-circuited 874 10-db. pad was used. A plot of the same points, in different form, is shown in Fig. 4, along with the open- and short-circuit points, both of which read well under 1 db. The solid curve is intended to show the variation expected, and it looks as if the coupler favors something under 50 ohms.

The standard resistors used with W3GZQ's bridge were checked, and it was found that his read about 17 db. and Bill's about 22 db. At this point the pin in the plug came loose and broke the resistor lead, so another had to be made. Using the coupler, quite a few resistors were tried. Nominal 47-ohm resistors were consistently better than 33- or 56-ohm units. Most 47-ohm resistors read 20 db. or better.[1] It was found that the match could be improved by surrounding the resistor with a shield connected to the ground terminal. Using this procedure, another standard was made which read 26.5 db., which is as good as the coupler. A further check was made with Arm 2 loaded with a Bird wattmeter, a reasonably good termination over the range from 30 to 500 Mc. The directivity was similar to the curve of Fig. 2.

The next step was to construct a voltmeter which would present the proper termination to the side line. The best arrangement evolved to date is shown in Fig. 5. The 500-$\mu\mu$f. silver-mica capacitor is the smallest physically made by Elmenco. The resistor is selected for best match. Final adjustment was made with the 1N34A crystal diode loaded with the meter, by dressing the 800-$\mu\mu$f. disk ceramic toward or away from the hot end of the rectifier. Two of these were made which, when checked on Arm 2 of the coupler, showed directivities of 28 and 23 db. Since Arm 4 is more critical than Arm 3, the 28-db. unit is used at Arm 4.

Figuring that the diode should have a constant load on it, Bill made up some constant-resistance pads for full-scale ranges of 200, 500 and 1000 microamperes, in addition to the basic 100-microampere range. These were put together in a hurry from standard resistors, and no attempt was made to get the loss just right. The coupler was then driven with the 144-Mc. transmitter, and terminated in the Bird wattmeter. The diode terminating units were attached to Arms 3 and 4.

[1] Presumably the impedance of the main line is lowered by the coupling capacitors to the point where it works best at 46 ohms or so. This may explain the good luck with 47-ohm resistors. If true, this is an argument for looser coupling, or possibly for use of higher-impedance coax in the main line section. It would not be too difficult to experiment with hand-made coaxial sections having impedances between about 55 and 60 ohms.

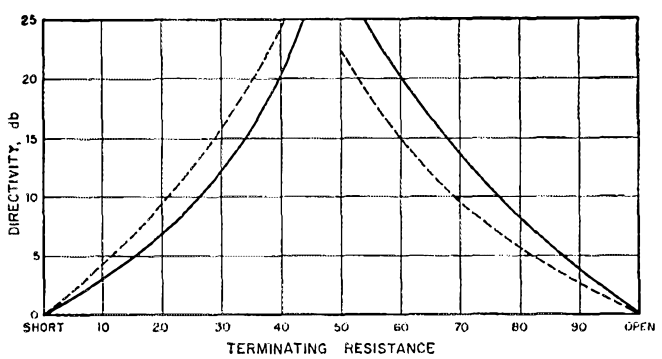


Fig. 4—Directivity for various terminations. Solid line shows expected variation.

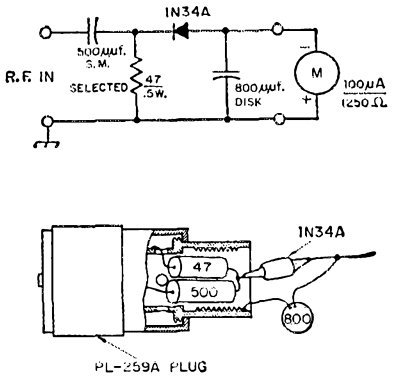


Fig. 5—Schematic diagram and mechanical arrangement of voltmeter.

The power was varied, and the forward diode was calibrated. Arms 1 and 2 were reversed to calibrate the reverse diode, the resulting curve leaving something to be desired. A step at about 20 watts was due to a change in scale on the wattmeter, and other steps showed up as a result of lack of agreement between the microammeter pads.

Subsequently a proper switch box was made, containing the 100-microampere meter and a group of pads, giving 100, 200, 500, 1000, 2000 and 5000 microamperes full scale. These present constant resistances to both diodes, and are constructed with selected resistors. Duplicate positions are provided for "forward" and "reverse." This was calibrated against the Bird wattmeter, taking care to eliminate the step at 20 watts, by reference to the manufacturer's calibration sheet for this particular meter. Fig. 6 is the result.

When the transmitter was fed through the coupler into the station antenna, there resulted currents of 330 microamperes (38 watts) forward, and 30 microamperes (1 watt) reverse, for an indicated directivity of 16 db., and an s.w.r. of 1.35:1. Using the forward-power indication, adjustments were made on the 829B amplifier, which brought the output from 38 watts up to 55, with an input of 120 watts.

The coupler has been left in the line continuously since it was completed some months ago, and Bill says that he wouldn't know how to get along without it. In rainy weather, for example, when a diode voltmeter on the transmission line gives abnormally high or low readings, the directional coupler indicates only slightly increased forward and reverse power. The net power to the line remains unchanged.

— *E.P.T.*

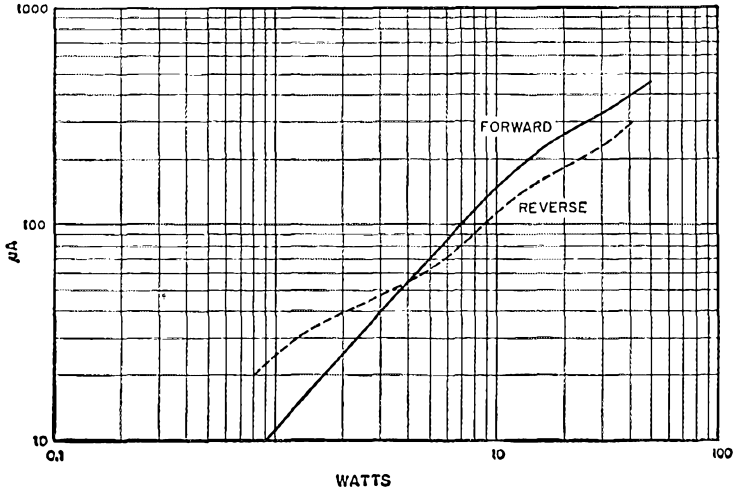


Fig. 6—Forward and reverse calibrations of the final form of the directional coupler.

Strays

If you didn't hear the signals from the various earth satellites put up last year and early this year and want to know what they sounded like, there is an interesting recording now available from Taben Recordings, Box 224E, Ardmore, Pa. Prepared by Tom Benham, W3DD, of Haverford College, the recording not only has samples of signals from the first five successful satellites but has a running commentary by Prof. Benham on the characteristics of the "birds" and interpretation of the transmissions. The price is $3.95 for either a 4-inch reel of magnetic tape (2 tracks) or a 10-inch LP disk.

—•••—

We have new claimants for the longest QSO of record. K4MVF and K4THQ talked on six meters for 30 hours and 30 minutes.

The American Radio Relay League, Inc.

International Geophysical Year Propagation Research Project

Wethersfield, Connecticut, U. S. A.

I G Y

This is to Certify that ... W1 H. F. ... operating Amateur Radio Station ... has qualified for the

Consistent Reporting Award

by submitting, during the three month period ending March 31, 1957 ... or more v.h.f. u.h.f. activity reports meeting the standards for International Geophysical Year Research established by the ARRL-IGY Propagation Research Project.

Similar contributions for additional three-month periods are certified to by the endorsements attached above.

April 30, 1957 (Date)

Mason P. Southworth (ARRL-IGY Project Supervisor)

REMEMBER the ARRL-IGY Propagation Research Project? [1,2] You may not have seen very much about it lately in the pages of *QST*, but this doesn't mean that nothing's been going on. Far from it! PRP's hard core of some 550 amateur observers representing nearly 50 countries has been sending in semimonthly v.h.f. activity reports — many of them ever since we kicked off on January 1, 1957 — in a way that is a real credit to the ham tradition.

No matter what the propagation conditions — bad, calling for a discouraging string of negative reports, or good, meaning long lists of calls worked and heard — we have been able to count on reporting that is both regular and enthusiastic. In fact, we get the impression that some observers blame themselves somehow whenever conditions aren't all that they might be and the log is a short one! Sickness doesn't usually keep PRPers from their appointed task, either, whether it be the sort of sudden "cold" which has kept many a v.h.f. man home from work when the band was wide open, or even a stay in the hospital. Equipped with a portable ham setup by friends, K8CIC kept up his reporting while in the latter situation. One note on his log said he wasn't "too sure about some of these times as was under ether!"

The chief task of PRP observers, of course, is to supply us with reports of the ionospheric DX which they work and hear on the bands above 50 Mc. This information, after some processing, is fed to the International Geophysical Year data centers, and will be available to scientists in all the IGY countries. In addition to these worked and heard reports, we are collecting "negative" reports. These are just what the name implies — reports of the specific times when the reporter

[1] Southworth, "The ARRL-IGY Propagation Research Project," *QST*, Sept., 1956.

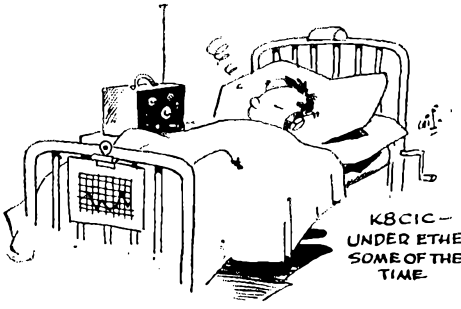
[2] Southworth, "PRP — A Progress Report," *QST*, Apr., 1957.

Another Peek at PRP

ARRL's IGY Propagation Research Project in High Gear

BY
MASON P. SOUTHWORTH,* W1VLH

* ARRL-IGY Project Supervisor.



was active but observed nothing. Then, too, there are several stations that have been making continuous or "beacon" transmissions for the benefit of other hams. W5FHS, working with a group of hams all employed by the United Gas Corporation of Shreveport, La., went so far as to obtain permission to use company property to put a 24-hour-per-day, unattended beacon on the six-meter band. Fifty-Mc. enthusiasts owe this group a special debt for their continuing efforts to keep this signal on the air. W1REZ and W4FJ have contributed notably in scheduled 144-Mc. transmissions, and there are many others who are helping whenever they can.

Data Processing

Things haven't stood still at PRP Headquarters, either. For one thing, all that we talked about in the future tense a year ago can now be put in the present or past. Report evaluation, coding, and transcription — the first operations performed on the incoming logs — are well in hand and up to date. (At least they're up to 1½ months behind the present, which is about as close as overseas mail deliveries allow. For this reason, "now" at the PRP office is usually about 45 days ago.) During evaluation, each individual item on each report is examined for propagation type and accuracy as far as possible. The entries surviving this check (those listing ionospheric propagation plus the "nil" and beacon reports) are transcribed onto special forms. In this step, many of the data are coded, and all are arranged in a systematic form suitable for punched card presentation.

Before punching any cards, two more items of information are added to the sheets for each heard and worked report. These are the latitude and longitude coordinates of both stations. It has turned out that to keep track of the geographical locations of essentially all the v.h.f. hams in the world has been quite a project in its own right. Mrs. Jane DeFranco, who handles the PRP coordinate file, is convinced that amateurs are nomadic mountain goats who wander from one hilltop to another! A second problem has to do with stations which can't be located in our atlas collection or on any of our charts; what's the most polite way to write to a fellow and tell him he isn't on the map? In any event, our coordinate file has provided a fine testimonial to the widespread interest in v.h.f. Not only is it bigger than we expected, but it's still growing.

Now at last we're ready to make some punched cards. This is handled by a handy-dandy little IBM machine with Mrs. Hazel Horan at the controls. Each worked, heard, negative and beacon report rates a card of its own, each one listing all the pertinent information such as date, beginning and ending times, calls and coordinates of the stations, antenna bearings, signal report, type of propagation and type of report. As you might imagine, these cards run to quite a volume, reaching as high as 30,000 per month during the sporadic-*E* season. All must, of course, be verified as well as punched.

After each month's cards are complete, we sort them out according to report and propagation type and put them into chronological order. This isn't quite the job it sounds, because we have a sorting machine that runs cards through at the rate of 650 each minute. Another job done at this point is to examine all the "worked" cards and pair up those that report the same contact (where both stations are PRP observers). This not only cuts down duplication in the results, but lends further confirmation to the doubly reported items.

Now the cards are ready for a trip to Boston, Mass., where the Air Force Cambridge Research Center puts them through its digital computer. The station coordinates already on the cards are used here to compute the distance between stations and sometimes the coordinates of the path midpoint. These items go into spaces reserved for them on the original cards, as well as onto a new duplicate card deck which is prepared. Another machine takes one of these card decks and automatically makes up a listing of all the information it contains. It is these listings which, at present, are being sent to the IGY world-wide data exchange centers.

Results

The question "What have you learned from all this?" is sometimes asked, and it is a little hard to answer without seeming to hedge. Actually, the IGY is primarily a period of data collection and reduction, not one of detailed study. The time for this will be the years to come . . . quite a few of the years to come, judging by all the information now being gathered. So we don't feel too bad about saying that this is the way it is in

our case. Like the IGY projects in other fields, we're concentrating on collecting and processing.

What does PRP hope to achieve eventually? In brief, our aim is to (a) document v.h.f. amateur observations in a (b) manner which lends itself to scientific study. We feel that (a) and (b) are equally important. Gathering the data is obviously necessary, and this is where the hundreds of PRP observers come in, but putting what you gather into a useful form (and one which *will* be used) is also vital. Therein lies the reason for the use of modern punched-card tabulating techniques with a card layout designed to permit the extraction of a maximum amount of data. We aim to make PRP data not only available, but available in a form which will insure its use. Our extremely detailed records of auroral and sporadic-*E* openings, for example, can readily be checked and compared with the data taken by other IGY projects. Our F_2 skip m.u.f. observations can and will provide some very interesting correlations with the predicted values and those measured at the (relatively speaking) handful of professional observation points.

A good deal of emphasis has been placed on transequatorial scatter propagation. Not only did "*TE*" start the powers that be thinking about sponsoring an amateur program such as ours, but this mode shows promise of being one of the most interesting and controversial things in the propagation field. Prior to early 1957, everyone thought of *TE* as being something unique to Central and South America. After all, it was there that all of the long, north-south evening contacts had been made. Since then, however, PRP with the help of its observers has demonstrated that *TE* works just as well between Africa and southern Europe and Australia and Japan. The latter path has even been termed "monotonously consistent" by one observer. Comparison of data for these various parts of the world should be of great help in solving the *TE* riddle, especially since the only professional IGY stations studying this phenomenon are in South America. There also may be some connection between *TE* and the very long distance contacts such as Japan to South America. This is the impression one gets from scanning the PRP logs during such openings. Later and further study will be most interesting here, also.

The three NBS-CRPL beacon stations[3] (CE8AE, OA3AAE and OA3AAF) have certainly done their part to make PRP reports interesting. These stations have been audible at times and in places (particularly in the U. S.) which are at some variance with South American amateur results. Furthermore, the many ways in which they are received (strong and steady, weak and steady, weak and fluttering, alternately fluttering and steady) add spice to the puzzle. Here again we have much to learn, and PRP data can and will expedite that learning.

[3] Bowles and Cohen, "N.B.S. Equatorial Region V.H.F. Scatter Research Program for the IGY," *QST*, Aug., 1957.

Observers Still Needed

One nice thing about PRP observing is that it doesn't interfere with your operating habits. Log sheets are provided on which to report, and they act as guides to insure our getting the required information. Beyond this, you are free to follow your inclinations. If working stations is your goal, we certainly want those worked reports. If you just like to listen, we are glad to receive all the heard reports you can supply. If you seldom hear anything (which we hope isn't the case) we'd like your negative reports. In fact, even if you don't like to listen, let alone operate (why are you a ham, then?), you could run a beacon station for us!

For these reasons and others, only a very few stations have dropped out of PRP once they actually began to report. We must admit, however, that the number of reporting stations has been something of a disappointment compared with the amount of v.h.f. activity today. While there are enough fellows actively participating to do an adequate job, all right, there might well be more. A goodly number have been content to receive our monthly *PRP News* for free and let their more enthusiastic brethren do the reporting. This doesn't seem quite fair, so a warning has gone out that stations never heard from will be dropped from our mailing list. This in turn will make room for new — and, we hope, more active — PRPers during the final months of the IGY. There's time left, by the way, to earn one of our handsome PRP Consistent Reporting Award certificates!

How about you? If you're on v.h.f. and willing to help out PRP we'll be more than happy to send you our monthly *News*. Even more important, you'll be doing something for the IGY and for amateur radio. Our address is: ARRL-IGY PRP, 530 Silas Deane Highway, Wethersfield, Connecticut, U. S. A. Why not send us your name right now?

Strays

GB3ENT will be on the air on August 4, operating from the annual Show and Sports exhibition which is arranged as a part of the August Bank Holiday. Special QSLs will be issued.

—···—

On about the second of June a Collins 75A-3 receiver, serial number 193, was stolen from the ham shack of the MIT Radio Society in Cambridge, Mass. The receiver was badly in need of repair. Any information on this receiver should be addressed to Harold G. Fritz, Secretary, MIT Radio Society, Cambridge, Mass.

• Recent Equipment—

The Viking Courier

THE Viking Courier is an r.f. amplifier using a pair of neutralized 811-As, and covering a continuous frequency range of 3.5 through 30 Mc. in four overlapping segments. The package, which includes power supply, measures only 15 inches wide, $11\frac{5}{16}$ inches deep and 9 inches high. Its 58 lbs. however, tells you that it must be out of the low-power class. A c.w. man or sideband can push the input to 500 watts (p.e.p. on s.s.b.). Anyone having a flea-power a.m. rig can boost his carrier output to 65 or 75 watts using the Courier as an a.m. linear.

Circuit

The grid circuit is a conventional balanced-tank arrangement using a split-stator tuning capacitor. A double-gang rotary switch (the only band switch in the unit) shorts turns at both ends of the tank coil to reach the higher frequencies. Since the two 811-As are in parallel across one half of the tank circuit, a small fixed capacitance is connected across the other half to compensate for the input capacitance of the tubes. A single coupling link coil serves for all bands.

In the pi-network output circuit, the tank (input) capacitor and rotary variable inductor are ganged to a single control. The tuning range is continuous; thus no switching. The loading (output) capacitance is supplied by a 700-$\mu\mu$f. variable capacitor and a bank of fixed capacitors that may be switched in parallel with the variable to total a capacitance of over 4000 $\mu\mu$f. This network will feed loads ranging from 18 to 600 ohms on 3.5 Mc. if the s.w.r. does not exceed 3 to 1. At 7 Mc. and higher, the range increases to cover load resistances from 20 to 2000 ohms.

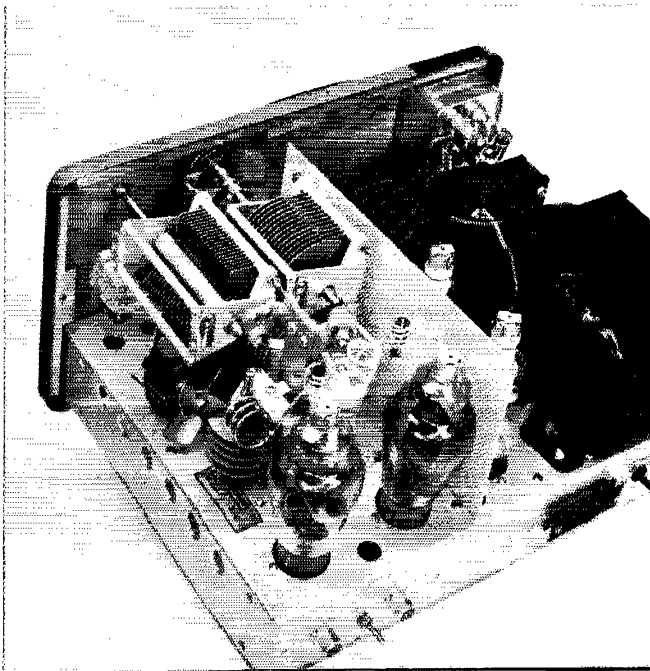
It is apparent that the designers have gone to considerable care to assure parasitic-free operation. There are v.h.f. suppressors in each of the plate leads, each of the grid leads and one in the plate side of the neutralizing-capacitor lead. A resistor across the grid-circuit r.f. choke takes care of low-frequency parasitics.

Power Supply

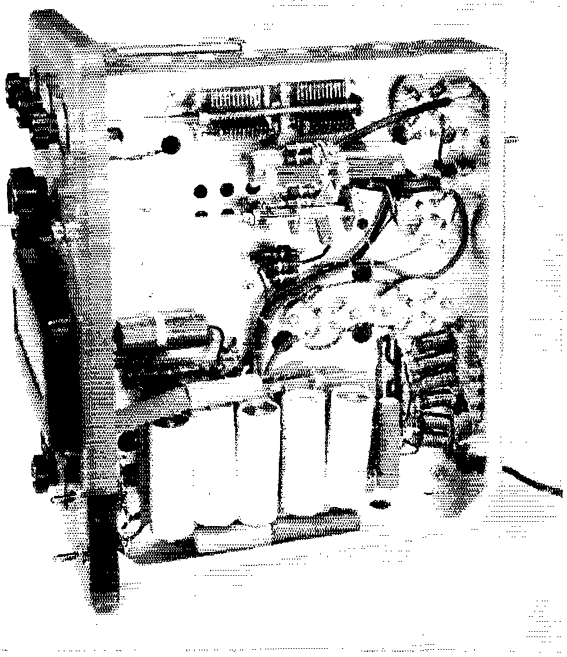
The high-voltage supply uses a pair of 866-As and delivers approximately 1500 volts at 350 ma. The input choke of the single-section filter is connected between the plate-transformer center tap and ground, placing it in the negative side of the output. The filter capacitance is made up of five 80-μf. 450-volt electrolytics in series.

A low-voltage winding on the filament transformer and a selenium rectifier supply about 95 volts of fixed bias. A rotary switch selects the proper biasing system for Class B or Class C operation. The same switch also transfers the meter to show either grid current or cathode current. This is accomplished in four switch positions — two for Class B and two for Class C.

Those who have operated r.f. amplifiers not biased to plate-current cut-off are familiar with the noise that such amplifiers generate in break-in operation with plate voltage applied continuously. This noise is apt to be bothersome when a t.r. switch is used. The problem is overcome in the Courier by an arrangement that permits applying cut-off bias to the amplifier during stand-by periods. This is accomplished through two terminals at the rear of the transmitter.



The Viking Courier is a compact package. The power supply is to the right and the r.f. section to the left. The rotary inductor is below the tank capacitor (right), and a ventilating fan is below the variable output capacitor (left). The separate 10-meter coil can be seen between the two 811-As in the foreground. The small coils around resistors in the plate leads and the larger one near the neutralizing capacitor are parasitic suppressors.



Bottom view of the Courier. The grid tank capacitor, coil and switch are at the top, filter capacitors at the bottom. The coils in the lower right-hand corner are in the TVI filters.

The biasing arrangement is shown in Fig. 1. With Terminals A and B shorted, and S_1 (a pole of the mode-meter switch) closed, the d.c. grid return is grounded for zero-bias Class B operation. When the short is removed from Terminals A and B during stand-by periods, the full 95 volts from the bias supply is applied to the grids, cutting off plate current completely. A switch may be used to short the terminals, or it may be done with a relay tied in with the transmit-receive control system. Cutting off plate current during stand-by periods also increases tube life.

For Class C c.w. operation, A and B are shorted permanently and S_1 is opened. This inserts the grid leak R_1. Also, the voltage divider consisting of R_1 and R_2 applies 10 to 14 volts of bias which is sufficient to cut off plate current when the key is open.

As in some of the other Johnson transmitting units, terminals are provided for connecting a remote switch to control the high-voltage supply, and to operate an external antenna relay simultaneously with the plate power switch.

All power wiring is shielded and all power leads that leave the chassis, including leads to the meter and panel lamps, are fitted with v.h.f. TVI filters. The complete unit is shielded by the standard Johnson one-piece perforated metal cabinet, and the seam between the cabinet and panel is sealed with electronic weatherstripping. A small fan that comes on with the filament and bias supplies keeps the unit at comfortable temperature.

Driver Requirements

Class C c.w. operation requires a driver delivering about 50 watts. At some sacrifice in output, the Courier can also be operated as a Class B c.w. amplifier with a driving power of 25 to 30 watts. However, when this is done, break-in operation may not be too convenient, since it may be necessary to provide for opening Terminals A and B, Fig. 1 (or for turning off the high-voltage supply) during stand-by periods. This noise may not be a serious factor if a separate receiving antenna, or an antenna relay, rather than a t.r. switch, is used. A p.e.p. driving power of 15 to 20 watts is required for s.s.b. operation.

The instruction manual is quite complete in details of operation of the Courier with various driving units, particularly for the lower-power units in the Johnson line. There is also a good section on neutralizing triodes. — *D. H. M.*

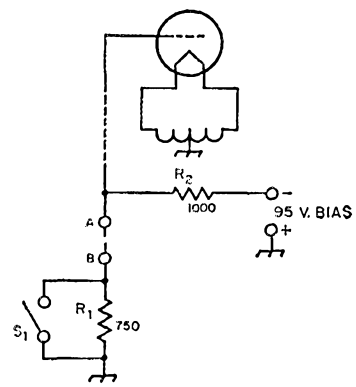


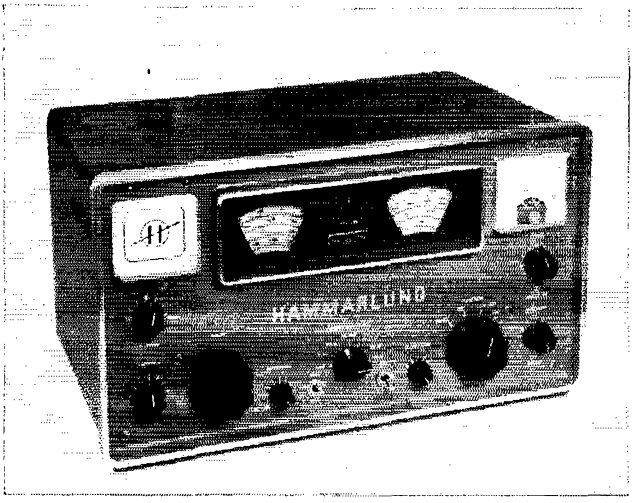
Fig. 1—Essentials of the Courier biasing system discussed in the text. *A* and *B* are terminals at the rear of the unit. S_1 is part of the mode-meter switch. R_1 is the grid leak used in Class C c.w. operation.

The Hammarlund HQ-110

COMMUNICATIONS receivers are not all alike. One of the newer models with its full share of innovations is the Hammarlund HQ-110. Second item in the all-new Hammarlund line that began with the HQ-100,[1] the 110 is an amateur-band double-conversion job in the medium-price range. It has calibrated tuning ranges for 160, 80, 40, 20, 15, 10 and 6 meters.

After the first quick look, one's reaction is likely to be "What is a ham-bands-only receiver doing with two dials?" And even after you've operated the 110 for a few hours, you're likely to reach for that right-hand knob for bandspread tuning. But it isn't a tuning knob, old man —

[1] "The Hammarlund HQ-100" — Recent Equipment, Jan. 1957, *QST*.



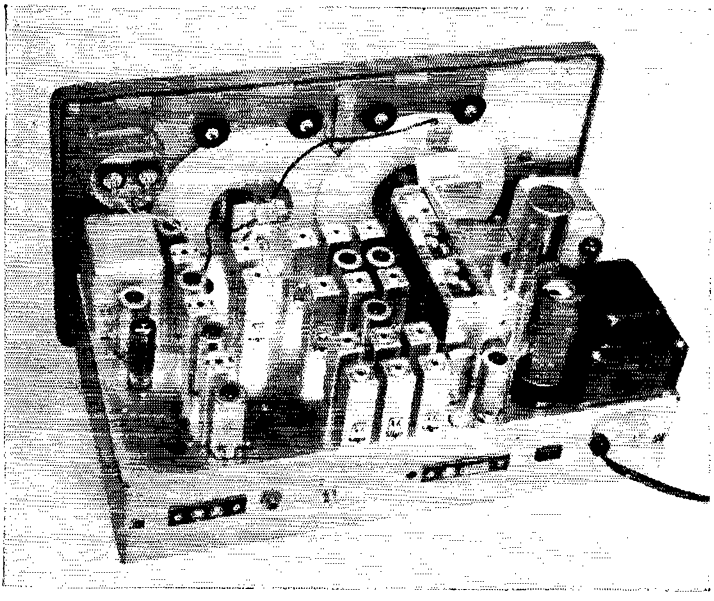
The Hammarlund HQ-110 is probably the first amateur-bands-only receiver to be equipped with two dials. Reasons are given in the text.

it's the function switch. Even though there are two dial windows, all the tuning is done with the knob on the left side of bandswitch.

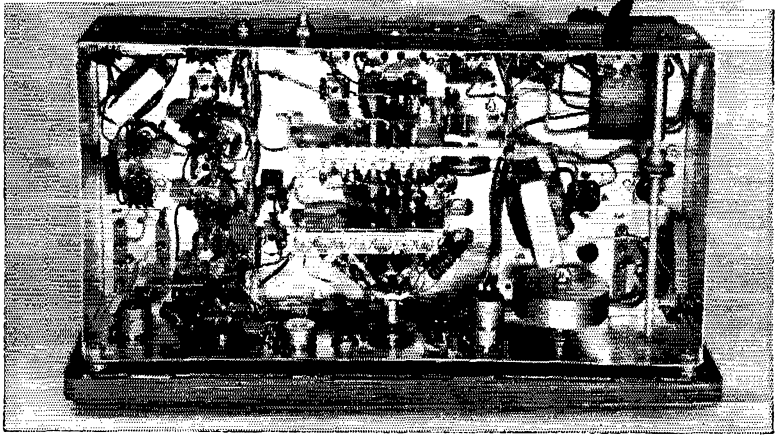
Those two dials require a bit more discussion. The tuning capacitor is turned through a smooth-running friction-drive dial (left side of the panel) which is calibrated for the 160-, 80-, 40-, and 20-meter bands. Now, to that other window. In back of it is another dial, cable-driven from the first one. This second dial has calibrated ranges for 15, 10 and 6, plus a 0–100 logging scale. This rather neat trick results in dial readability far exceeding that obtainable with any simple single dial having 8 scales.

Each division on the 160-meter scale indicates 2 kc. On 80, 40, 10 and 15 each represents 5 kc. The 10-meter range has 20 kc. per dial marking, and the 50-Mc. range 50 kc. Because the spacing of the marks is considerable, and the dial is easily read, the frequency can be read much closer than the above increments would indicate. Accurate frequency logging is made possible through the use of the built-in 100-kc. crystal calibrator and movable cross-hairs on both dials. These are manipulated by means of a "calibration set" knob in the middle of the recessed portion of the panel containing the dial openings.

Receiver controls are conveniently arranged, though they take some getting used to. Reading from upper left down around the U arrangement, they are c.w. pitch, antenna trimmer, tuning, sensitivity, manual-a.v.c. (toggle switch), bandswitch, limiter on-off (toggle switch), audio gain, function switch, and *Q*-multiplier selectivity and frequency controls. The S-meter is at the upper right. In the corresponding spot at the left side



Interior view of the 110. Switched coils in the r.f. portion of the receiver occupy the center of the chassis, with the tuning capacitor at the right. Black discs above the dials bear against the celluloid dial scales and keep them spaced a constant distance from the dial windows. Rear wall has socket for remote control of the transmitter.



Bottom view of the receiver. Large flywheel, lower right, helps to give the tuning dial a smooth "feel." Oscillator trimmers, lower center, are slug-type plastic variety, for high stability. All coils except for the 50-Mc. range are in individual shield cans mounted topside.

is a space for an electric clock and timer, an extra-cost accessory not included in the receiver tested. We understand that nearly all purchasers either get the clock-equipped model, or eventually order the conversion kit available to take care of buyers who were economy-minded at first and turned down the clock feature. The function switch has positions for send, receive, c.w. — s.s.b. and calibrate. The on-off switch is on the sensitivity control rather than on the audio gain, where one normally looks for it.

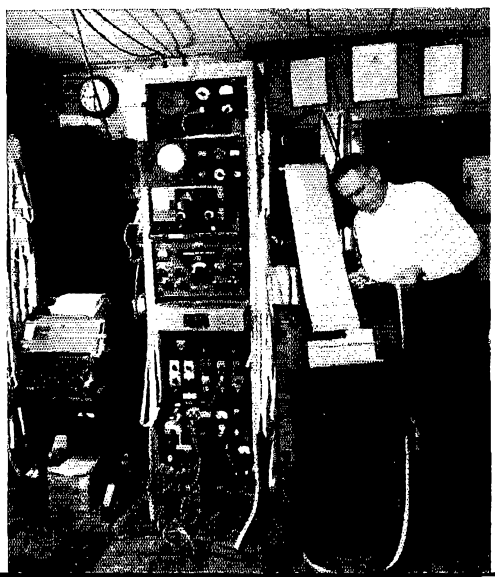
The HQ-110 features a die-cast aluminum panel which lends a feeling of solidity to what is in reality a very light receiver. That light weight, incidentally, is welcome for Field Day and V.H.F. Party trips to choice locations. So is the over-all power consumption of only 80 watts. And anyone who has fussed with the innumerable screws that hold some receivers inside their cabinets will take kindly to the arrangement for getting at the 110. Just two screws, both on the back, need be removed to slip the perforated housing off, for tube changes and other servicing.

Though we do not ordinarily attempt to evaluate the performance of equipment described in these pages, we know one question everyone will ask about the HQ-110, so we will attempt to answer it fairly. "How does it work on 6?"

As might be expected, the r.f. gain is lower on 50 Mc. than on other bands. The S-meter readings are bound to be low on that account. But you can hear noise from the antenna, and side-by-side tests with converter-receiver combinations having much more gain show that just about any phone signal that can be heard on the hot combination can be heard on the 110 alone. Only your next-door neighbor will read S9 on the meter, but you'll hear the weak ones he's working, if your antenna system is as good as his.

With double conversion on all bands from 7 Mc. up, the HQ-110 is free of image troubles, and its dial mechanism allows reasonably comfortable tuning right up through the 50-Mc. band. Appreciable hum modulation shows on 6, probably the result of the hot-cathode oscillator circuit, and therefore subject to variation from one 6BE6 to another. This makes the 110 something less than ideal as a weak-signal c.w. receiver, but its stability, both mechanical and electrical, is adequate for 50-Mc. operation. — *E. P. T.*

Strays



Last month we reported that WØBP had Worked All States using radioteletype. This month we show you a picture of WØBP and some of his equipment. Top to bottom in the rack are audio panel and speaker, a high-speed tuning indicator, a Johnson Navigator modified for f.s.k., and a Collins 75A-4. Down below that are various control, switching and patching arrangements. At the left is a model 15 page printer, while at the right is a model 28. Out of sight to the left in this same room is another rack containing S-76 and BC-779 receivers, a panadapter, power supplies, terminal units, etc. Over in the transmitter room, separated from the operating room by a glass partition, there are three separate kilowatt rigs. And one of WØBP's antennas is a version of a "vertical fan" described by him in QST way back in November, 1920. One of his antenna grounding switches is a Wireless Specialty dating back to 1914.

Results of Armed Forces Day 1958

CERTIFICATES of Merit have been mailed to two hundred and seventy-eight contestants in recognition of making perfect copy of the Secretary of Defense's International Morse Code message to radio amateurs on Armed Forces Day 1958. The message was transmitted at 25 w.p.m. by military stations on 17 May 1958. Certificate winners of the c.w. message are as follows:

K1AWM, K1BBK, K1BDD, W1BCS, W1BDI, K1CUE, W1DWO, W1GHZ, W1IKE, W1KDQ, W1MCG, W1MEG, W1MIX, K1RRD, W1SDO, W1SMU, W1TEC, W1WPR, W1WTJ, W1ZR, W2BXW, W2CCD, W2CKF, K2CQP, K2CXO, W2DRV, W2GVU, W2HX, K2ICF, W2JCA, W2JOA, W2KLD, W2KSL, K2KUC, W2KW, W2LRW, W2NNK, W2NUI, W2NVB, W2PF, WN2PVQ, K2QEK, K2RAR, K2RRH, K2SOX, W2VPH, W2WH, W2WNW, W2ZMK, K3ACJ, W3ADE, W3BFF, W3BKE, W3CA, W3DWP, W3ECP, W3EJQ, W3ELI, W3GQC, W3HCE, W3JBP, W3JH, W3JZG, W3LQV, W3LXQ, W3LXU, W3LYN, W3QCB, W3WHK, W3WLO, W3ZNK, W4BCT, W4BIH, K4BLF, W4CMV, W4CQI, W4FJ, K4FEQ, W4GSP, K4HOE, K4IVZ, K4JKR, W4JUQ, W4BRG, W4LYV, W4NHT, W4ODA, W4OXX, W4PMR, K4PSE, K4TDR, W4USA, W4VHX, W4WV, W5ANR, W5ARK, K5CSA, W5DIW, K5DMR, W5EGD, W5EGK, W5GKV, W5HDX, W5HFN, W5HKP, K5HVP, W5JET, W5JPC, K5JGZ, K5LAP, K5LTK, K5MBK, W5MFX, K5MMO, W5NDV, K5OEA, W5PCL, W5PYU, W5SPZ, W5SYE, AA5USA, K5WBA, W5YOK, W6AAB, W6ANX, W6AWP, W6AXV, W6CBF, W6CBX, K6CHR, K6CVZ, KN6DBL, W6DTY, K6DYX, K6EA, K6ESO, K6EWY, K6EXX, W6EYY, W6FAH, K6FP, W6FHI, W6FYN, W6FYW, K6GZ, W6HSA, W6HUF, K6JFY, W6KF, W6KG, K6LDO, K6LLU, K6MTB, W6MYT, W6NCL, K6NRK, K6OHM, W6OWP, W6OZ, K6PWO, K6PXJ, W6PYN, K6PWO, W6QIE, W6QIL, W6RDK, W6THQ, K6VCT, K6VJV, K6VTK, W6WPI, W6YCF, W6ZPX, A7CZY, W7EBS, W7ETO, W7EYX, W7FIX, W7JU, W7KOK, W7LBK, W7LFA, W7LJW, W7MFZ, W7MTY, W7OEB, W7VI, K8AIR, W8BWK, W8CKW, W8DAE, K8DEY, W8HS, W8HZA, W8IJV, W8IQA, K8KLC, W8LEX, W8LFX, K8NAI, W8NEM, W8QLJ, W8TZO, W9ABH, W9CVZ, W9IDO, W9JAM, W9JFG, K9KMT, W9LBV, W9LRV, W9NOE, W9RXR, WØARO, WØECE, WØFDJ, WØGKK, WØHIC, WØJHY, KNØLZJ, WNØOJQ, WØPDN, WØPXH, WØQVA, WØTUT, KP4DJ, KP4KD, KH6BLT, KH6FX, KH6UK. Allen, B.B.; Barlog, E.J.; Booth, D.G.; Borneman, U.; Borum, R.J.; Bradley, F.; Cadwell, R.G.; Camm, J.E.; Cohen, B.; Danell, D.; Dennis, H.P.; Dunn, J.A.; Gamboa, H.M.; Greenhalgh, B.N.; Hammond, C.; Harbin, C.L.; Harrell, W.; Heisler, D.E.; Henry, C.R.; Hill, A.E.; Hinkle, W.F.; Holum, G.O.; Hughes, R.S.;Hutton, W.L.; Jarrell, G.W.; Johnson, G.M.; Kauffman, E.; Knight, L.E.; Long, W.; McAdams, F.; Nehlsen, H.W.; Nelson, E.K.; Norman M.L.; Petrowski, J.; Powell, C.A.; Reding, P.G.; Ripkin, S.; Rogers, D.E.; Saxon, H.; Shryack, L.A.; Simpson, W.G.; Spivey, F.V.; Taylor, T.; Van Hise, C.A.; Wagner, J.E.; Weeks, L.E.; Weiler, F.W.J.; West, L.; USMC Trng Ctr, Zanesville, Ohio; Hilton, G.M.; Harton, D.L.; Galloway, W.E.

Military to Amateur Contacts

Operating on military frequencies AIR, NSS, and WAR worked amateurs in the 80-, 40-, 20- and 15-meter bands, using c.w., a.m., s.s.b., and RTTY. The three military stations made a total of 1407 contacts. Reports from outlying military stations participating in the Novice phase of this test have not been received and are not included in the above total.

Radioteletypewriter Receiving Competition

The radioteletypewriter receiving competition featured a message from the Secretary of Defense transmitted at sixty words per minute. A total of one hundred and forty contestants received a certificate of merit for perfect copy. RTTY winners of certificate of merit are as follows:

W1BDI, W1DNK, W1MCG, W1OUG, W1UHE, K1WAR, W1ZXA, W2ANB, W2ATQ, K2CQP, K2CXO, K2EW, K2HHH, W2ICA, W2JAV, W2KLD, W2LRW, W2ORX, W2PAU, W2RUI, K2VAM, W2WRQ, K3ACJ, K3DUI, W3MHD, W3PYW, K3WPL, W3WTW, W4AIY, W4AWM, A4EHU, W4FJ, K4HIA, K4IVZ, W4JUQ, K4PSE, W4OYG, W4RRH, W4TOY, K5BSS, W5FEM, KZ5FW, W5GMM, W5GNE, W5JBW, K5NAN, K5NAZ, K5OEA, W5RMQ, W5SQB, W5SYE, W5TVG, W5TYI, W5ZMK, W6AEE, W6ANX, W6ASJ, W6AXV, W6BIK, W6CBF, W6CBX, K6CHR, K6CHU, W6CG, W6CQI/6, W6DOU, W6FHI, W6FLW, W6FYM, W6FZC, K6GB, W6ILW, W6IZJ, W6JCK, K6JPR, W6LFF, W6LX, K6MTB, W6MTJ, K6NRK, W6NRM, K6NRR, W6PGP/8, W6SCQ, K6SNA, W6SXG, W6UJX, K6USN, K6WGB, W6YNS, W6ZVV, W7BEG, W7CBE, W7CCB, W7CSC, W7DDY, W7JHC, W7KQK, W7LPM, W7MEV, W7PQJ, K7WCV, W8AIR, W8CKW, W8CRY, W8DOO, W8AYT, W8IJV, K8KLC, W8KVV, W8LEX, W8PFE, W8QMI, K9AFE, W9CWH, W9GRW, W9NOE, W9PUD, W9PVN, KØAKG, WØHFU, KØHXM, WØHZR, WØIQC, WØJHS, WØLFI, WØLFH, WØUSN, WØYKZ, KP4KD, Goodman, D.J.; Cobb, E.R.; Johnson, G.; Rood, O.; Thomas, C.; Sanzaro, R.; Ungari, J.A.; PMS&T Worcester Polytec.

The military departments are pleased with the continued increase in participation in these tests and appreciate the interest shown by the amateurs participating. Congratulations to all winners of the Secretary of Defense Certificates and it is hoped that next year's participants will exceed the present record.

The 1958 Novice Roundup Results

BY RONNIE GANN,* W1FGF

CONFUCIOUS SAY: 𝄞𝄢𝄞𝄢𝄞𝄢𝄞𝄢𝄞𝄢 (Man who do not believe '58 Novice Roundup best yet, better should join honorable ancestors than to pound brass.) I'm speaking of course, about Max Confucious, WN1QST. He owns a delicatessen here on LaSalle Road.

Anyway, Max was right. A real crazy scene was dug by all. Logs were submitted from over 85% of the participating sections with a few of the contestants racking up 10,000 points or better. In there pitching for the DXers were KG4AS, WL7CEE and WH6CJJ. It seems most of the boys favored 80 and 40 meters, although 15 was the scene of some pretty bloody battles, too!

Interest reigned high among Non-Novices this year, and apparently some got a bit overzealous. A few scooted up into the Novice band with their half-gallons and caused a bit of QRM, not to mention shattered ear drums! So to all up-and-coming Novices reading this. . . . "We apologize, and promise to watch ourselves next year."

Tyro Topics . . .

"Working the NR was just about the most fun I have had. Most of the fellows were very helpful." — *KN8GJD* . . . "My greatest thrill of the contest was when a call to a CQ was received from W1AW. Thanks a million for the contests that are sponsored by the League." — *KN8GPC* . . . "Sure enjoyed the contest, tnx for a lot of fun!" — *KN8HGT* . . . "Thot SS was fun, but this NR sure had that beat! Many tnx to U for giving the rock-bound Novices a chance each year to show wat they can do." — *KN2ZIS* . . .

* Communications Assistant.

Champ Greets Champ: K6SXA, last year's national high scorer, congratulates this year's top man, KN6ZBV (seated) is real happy about the whole deal . . . and he should be! Whipping out 22,995 beautiful points with 315 QSOs, and being top man in the nation, Dave certainly made the most of his Globe Chief 90, NC-300 and 3 element beam. Sac Valley adds another fine operator to its amateur ranks.

"—YOUR FORTY-HOUR TIME LIMIT IS UP, TRIGGER

"Please excuse all my mistakes." — *KN2EKM* . . . "Anybody who can stick out 40 hours of this is NUTS!" — *KNØLTB* . . . "I'd like to thank the Generals who consistently slowed down for us. It sure helped a lot. Still think the League should give a TWEHDC award, (To Whom Everything Happens During Contest)." — *KN1CRB* . . . "Please send me complete instructions on Husband Recapturing!" — *WN7HXE*.

Our Turn, Now . . .

"Hellllp" — *W1FGF* . . . "Have received about 100 QSL cards stating I was their first Maryland QSO, and they're still coming in!" — *W3MSR* . . . "Most of the Novices I heard on in the contest were bang-up good operators." — *W0JHY/5* . . ."Just loads of fun. Wish I could get that Utah station's address." (C'mon WN7JBV) — *K2APG* . . . "Just keep up the good work of helping the Novices and we'll have scads of good operators." — *K8IID* . . . "I was surprised at the number of Novices in there that could handle a fast bug." — *K2UZJ* . . . "Seems like the Novice operators get better each year." — *W4OMW* . . . "Vy nice NR as usual. Made 68 people happy with another multiplier . . . now comes the QSL cards!" — *VO2NA* . . . "Think we'll have a swell bunch of operators hitting the big contests before long." — *K8BPX* . . . "Boy, I really enjoyed this one!" — *K6RFT*.

A look at the call-area leaders will show a lot of hard work and nose-to-the-grindstone brasspounding by these people. A standing ovation, men.

KN1CEC	11,514-187	KN6ZBV	22,995-315
WN2DYC	12,720-215	WN7HXE	10,560-182
KN3AHQ	10,824-246	KN8GSS	15,848-273
KN4OKZ	20,590-345	KN9IND	15,984-276
KN5KYR	17,748-306	KNØKLB	6900-150

WH6CJJ 1891-61

With the large number of logs submitted, only 14 participants racked up 10,000 points or better. Listed below in descending order are their calls and scores:

KN6ZBV	22,995	KN1CEC	11,514
KN4OKZ	20,590	KN4OUZ	11,368
KN5KYR	17,748	KN3AHQ	10,824
KN9IND	15,984	WN7HXE	10,560
KN8GSS	15,848	KN5JPS	10,400
KN9JLR	14,310	KN1CAU	10,300
WN2DYC	12,720	KN4PPX	10,229
KN8HKB	12,220	WN2RFS	10,100

KN5JPB 10,094

Nice goin' fellas!

There were well over 250 logs submitted from Novice participants alone, not counting the non-competing stack. The continuous rise in contest operating by the Novice has been, in a word, "fantabulous," and we can well predict record-smashing participation next year. You non-Novices did us proud again this year, in giving up your time to help pull the new fellas up through the ranks. Here's how things shaped up. Calls are listed alphabetically.

W1AMY 130, W1AW 1 1925, W1BDI 650, W1DGL 266 W1FGF 340, W1HV 572, W1JFL 150, W1KGJ 451, W1KVG 135, W1KYM 2059, W1NJL 360, W2BVE 100, W2CVW 36, W2EWZ 990, W2FEB 1484, W2ILL 900,

W2RJJ 1296, W2UAL 18, W3ARK 8160, W3FHR 4320, W3GEU 156, W3MDO 1716, W3MSR 24,567, W3SEB 1178, W4KFC 4620, W4OMW 1496, W4UOW 3492, W5FCX 232, WØJHY/5 140, W7FKF 1058, W7YAQ 221, W7ZVY 66, W8BMX 6512, W8CWE 2187, W9LNQ 7682, W9YT[1] 368, W9YYG 1103, WØVFE 275, K1AYW 360, K1BAZ 1460, K1BEB 5740, K1CBI 314, K2APG 1500, K2ITZ 175, K2IYC 360, K2PTS 4012, K2PTU 528, K2TBU 2600, K2UBW 105, K2UCF 494, K2UTV 2116, K2UZJ 152, K2VNS 290, K4CEF 2607, K4IEX 533, K4JOS 585, K4MOF 2280 K4QPJ 30, K5BQS 4026, K5EJC 5000, K5ESW 1518, K5GFC 3024, K5GHP 260, K5HD 1152, K6DJC 7592, K6KZY 135, K6PUB 1080, K6RFT 407, K6SXA 351, K8BPX 176, K8BXT 9486, K8EJL 1500, K8GUV 49, K8HFO 1144, K9AUE 4720, K9AWV 96, K9DWK 3922, K9HCP 2070, KØCQA 20, KØEKR 1536, KØGIC 2184, KØGSV 288, KØGVE 110, KØIDV 280, KØJOQ[1] 150, KL7CDF 2914, VE2AJD 616, VE3DDU 555, VE3DNR 224, VO2NA 1496.

SCORES:

Scores are grouped by ARRL Divisions and Sections. The operator of the station listed first in each section is award winner for that section. *Example of listings:* KN4OKZ 20,590-345-58-36, or, final score 20,590, number of stations 345, number of sections 58, total operating time 36 hours.

ATLANTIC DIVISION

Eastern Pennsylvania

KN3ALL.....7488-183-36-40
KN3BKL.....2068- 84-22-20
KN3AEJ.....1491- 56-21-18
KN3ALS.....848- 38-16- –
KN3BIC.....560- 30-14-11
KN3CFZ.....465- 21-15- 5
KN3BPL.....224- 32- 7-10
KN3BIE.....217- 16- 7- 4
KN3DAO.....80- 10- 8- 2
KN3ASH.....19- 12- 4- –

Md.-Del.-D. C.

WN3MNE...2997-111-27-14
KN3AZH.....2828-101-28-32
WN3MEO.....203- 19- 7-10

Southern New Jersey

KN2KCR....2940-140-21- –

Western New York

KN2DTW....4998-119-42-34
WN2TPV....2914- 69-31-18
KN2LMG....1232- 41-22-16
KN2DLY....1104- 48-23-18
KN2JIZ.....966- 59-14-12
KN2AOQ.....752- 32-16- 7
KN2BQB.....308- 18-11- 4
WN2IKG.....80- 10- 8-10
KN2CSE.....12- 6- 2-12

Western Pennsylvania

KN3AHQ...10,824-246-44-38
KN3BDM....6435-150-39-38
KN3BZV.....1656- 72-23-13
KN3BTC.....836- 38-22-17
KN3CCZ.....176- 34-14-11
KN3AUE.....286- 22-13-14
KN3CEP.....162- 18- 9-14

CENTRAL DIVISION

Illinois

KN9IND...15,984-276-54-39
KN9JLR...14,310-270-53-40
KN9ISP.....6820-140-44-23
KN9JDC....5852-118-44-40
KN9HRC....3360- 86-35-30
KN9HLT....2627- 71-37-25
KN9IWS....2100- 60-30-15
KN9JOO....1932- 54-28-23
KN9JDF....1421- 49-29-11
KN9KEP.....936- 42-18-24
KN9JZL.....836- 29-19-18
KN9LIG.....714- 27-17-20
KN9IEK.....544- 48- 8-14

Indiana

KN9KQV....7040-160-44-29
KN9IGP....2208-138-16-20
KN9JQW....1200- 60-20-17
KN9JWH....611- 47-13-18

Wisconsin

KN9LEK....5285-151-35-35
KN9JIG....3520- 88-40-31

Running 70 watts input to his homebrew rig, KN4OKZ slammed out a big 20,590 points to win laurels for the Virginia Section and place second nationally. He's following right in his Pop's footsteps too, for Ken's dad is W4KFC, a well-known contest man in the realm of Hamdom.

WN7HXE. Three children, an understanding OM, five cats, fourteen hands, a heap of patience, 10,560 points and top banana for the Washington Section. What a gal! FB, Della.

KN9JSZ.....952- 68-14-25
KN9IZT.....217- 11- 7- 8

DAKOTA DIVISION

North Dakota

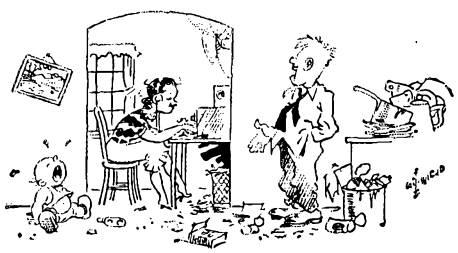
KNØMIK.....448- 22-14-24
KNØMBN.....96- 6- 6- 9

South Dakota

KNØMRN....6192-129-48-24

KN8GJD.....5487-162-31-29
KN8GPC.....4346- 96-41-33
KN8HEQ....3640- 89-35- –
KN8ESE.....2250- 65-30-14
KN8GMK....1007- 53-19- –
KN8HKM....880- 55-16-21
KN8HWM....741- 47-13-20
KN8IFF.....555- 37-15-14
KN8ESY.....180- 15-12- 3
KN8HCE.....152- 9- 8- 9
KN8HLR.....48- 8- 6- –
KN8EXF.....39- 3- 3- 1

...I DON'T GIVE A HOOT ABOUT THE NOVICE ROUNDUP!



Minnesota

KNØKEE....2520- 72-35-13
KNØLQF....1848- 56-33-12
KNØLBA.....24- 6- 4- 1

DELTA DIVISION

Arkansas

KN5JPB....10,094-191-49-19
KN5JWW....2142- 63-34- 9
KN5KIZ.....570- 30-19- 4

Louisiana

KN5MPM....9200-200-46-39
KN5KMW...8684-157-52-13
KN5LRQ....6720-145-42-24
KN5MQM...3185- 91-35-19

Mississippi

KN5KGF....8183-167-49-19

Tennessee

KN4RSY.....390- 26-15- 9

GREAT LAKES DIVISION

Kentucky

KN4PPK.....3572- 79-38-27
KN4QCM.....799- 47-17- 5

Michigan

KN8GSS....15,848-273-56-40
KN8EET.....9280-145-58-37
KN8EPZ.....7296-172-38-24
KN8HJS.....6762-151-42-39

Ohio

KN8HKB...12,220-235-52-29
KN8EZJ.....8850-167-50-39
KN8GWK....5632-113-44-31
KN8HTK....5146-151-31-31
KN8HGT....5115-150-31-30
KN8GUV....4212-108-39- –
KN8IAZ.....1025- 41-25-16
KN8HWH....940- 32-20- –
KN8IAS.....816- 48-17- 9
KN8EII.....602- 43-14-10
KN8GNG....306- 24- 9- 9
KN8GZL.....16- 4- 4- 1
KN8GVO.....6- 3- 2- 4

HUDSON DIVISION

Eastern New York

WN2NPN....3852-107-36- –
WN2LDU.....400- 25-16- 7

N. Y. C.-L. I.

WN2DYC...12,720-215-53-35
WN2GRG....8400-190-42-22
WN2MSZ....2646- 83-27-15
KN2DAI.....2380-109-20-33
KN2ZIS.....2075- 83-25-37
WN2KYV....1120- 36-20-25
WN2HQN....1056- 41-16-10
WN2JMP....1007- 53-19-28
WN2HPT.....969- 36-19-15
WN2THZ.....210- 15- 7- 3
WN2HLI.....154- 14-11- 9
WN2STM.....9- 3- 3- 1

Northern New Jersey

WN2RES...10,100-202-50- –
KN2ZDZ....9000-165-50-38

(Continued on page 150)

1957 PHONE SWEEPSTAKES RESULTS CORRECTION AND RECAP

Contest fans are aware that Sweepstakes certifications are issued on a "local" basis, i.e., to club and ARRL Section winners. Yet editorial mention is often made of new contact and scoring records, licensing area leaders, or the country's "top ten."

In our portrayal of the phone SS in June *QST*, section winners were correctly identified. But in working on Minnesota leader WØEDX's score, we overlooked a mathematical error that inflated the actual tally as not intended by either Al or our checking department. To those who wrote, to WØEDX, and to all others concerned, we extend our sincere apologies for the slip.

By way of reconstructing, then, we find Los Angeles winner K6EVR pacing the crowd with 170,520 points. Californians long have had a penchant for monopolizing the voice portion of the SS and 1957, it seems, was no exception. In fact, Sixes now have registered the top A-3 total in nine of the twelve postwar SS's.

Meet K6EVR, top phone scorer in the 1957 Sweepstakes. Although first licensed in 1954, 19-year-old Ronald has rolled up some impressive tallies in the SS, the Novice Roundup and DX Tests, and is DXCC-210.

An all-time high of 22 amateurs posted above 100,000 points under a scoring system that has remained basically unchanged for years. Following K6EVR came Connecticut's W1YWU with 156,366 points, while the 152,643 points of Mississippian W5DQK captured show position nationally. The fourth-ranking score of 147,861 came from East Bay's W6PQW, all of whose 815 QSOs were made on ten meters with 90 watts input. Other six-digit men were: W7BSW 133,-152, K6BWD 129,384, W2VCZ 124,830, WØEDX (whose contact total of 854 was tops) 124,611, W6BSY 121,800, W8AJW 121,764, W7CAF 121,440, W5MYI 121,095, W5VU 108,570, W9OHO 106,812, W6HM 106,128, W7BJV 105,216, WØVQC 105,053, W3MSK 104,244, K2BHP 102,900, W7CBP 102,837, W1FZ 102,-711, W7BLX 100,022.

—...—

The 25th ARRL Sweepstakes is set for November 8–9 and 15–16. QRV?

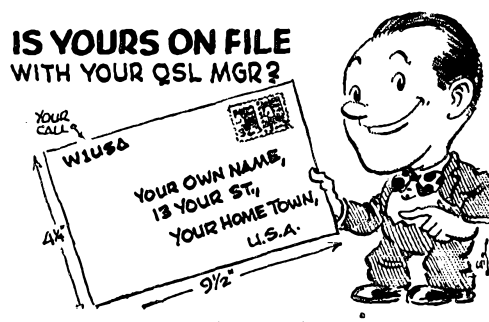
—...—

As ships dock at Stateside ports, foreign entries resulting from the 1958 ARRL International DX Competition continue to pour in. Besides those shown in July *QST*, c.w. scores ranging from 100 to above 400 thousand are claimed by CR6AI, HA8WS, JA1VX, JA3AB, KC4USB, OE1RZ, OE3RE, OE6HV, VK2APK, VK2GW, ZL3OB and ZP9AY. DXers reporting from 50,000 up to 100,000 points include DJ3KR, HA5DH, I1BLF, OE3VP, OK1AEH, VK5MY, VK9XK, ZE6JX, ZL1MT and ZS6AJO. Final standings coming up!

Silent Keys

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

W1AQU, Wilbur H. Roberts, Lowell, Mass.
W2AYK, Lionel Samuel, Pelham Manor, N. Y.
K2DSD, Dante D. Petretti, Tujunga, Calif.
K2IRC, William T. Emmons, Eatontown, N. J.
W2ZL, George J. Eltz, Avon, N. J.
KN3AZT, Fred E. Lotz, Wilkinsburg, Pa.
W3CLV, Hervey E. Heller, Baltimore, Md.
W3HVK, Robert J. Phelps, Phoenixville, Pa.
W3VXE, Merle H. Sexton, Union City, Pa.
W5AEP, Thomas A. Black, El Paso, Texas
K6GEA, Lester B. Eaton, Glendale, Calif.
W7OHS, Gilbert I. Noble, Richland, Wash.
W7TES, Reno W. Diedrich, Bellevue, Wash.
W9ADS, Arthur L. Bennett, Indianapolis, Ind.
K9HDY, Harry M. Blackburn, Bedford, Ind.
W9ZHJ, Paul A. Townsend, Evansville, Ind.
WØDJY, Cecil E. Leonard, Belle Plaine, Iowa
VE3BCW, F. Manley Haines, Willowdale, Ontario
VE3QO, Walter H. Colton, Oshawa, Ontario
VE8AC, E. A. Kirk, Dawson, Y. T., Canada
EA4BH, Luis S. Garcia Vigueras, Madrid, Spain
G5UX, George A. Hume, London, England
KL7PC, Sigurd Hopstad, Bethel, Alaska
VK5BY, D. R. Whitburn, Fullarton Estate, S. Australia



(See page 23)

Election Notice
14-Mc. Phone Expansion Proposed
V.H.F. C.W. Segments Proposed

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. Cooke, 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., WØIC, and Carl L. Smith, WØBWJ. *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. BUDLONG
Secretary

July 1, 1958

14-MC. PHONE EXPANSION PROPOSED

In 1956 the League requested the Federal Communications Commission to amend the amateur rules to provide that holders of the Amateur Extra or Advanced Class license might use voice emission in 14,300–14,350 kc. FCC has not as yet acted on our request. Responsive to a decision of the Board of Directors, an amended petition has now been filed which would delete the license restriction and therefore presently consists of a straightforward request to make the 20-meter voice band 14,200–14,350 kc. The text follows:

FEDERAL COMMUNICATIONS COMMISSION

Amendment of Sections 12.23 and 12.111 (d) of the rules and regulations

Amendment of petition

On September 27, 1956, the American Radio Relay League, Inc., filed with the Commission a petition seeking amendment of sections 12.23 and 12.111 (d) of Part 12, Rules Governing Amateur Radio, concerning the expansion of the 14-mc. radiotelephony subband. The Commission has not as yet acted on the petition.

The petition requested the expansion of the 14-mc. radiotelephony subband so that it would become 14,200–14,350 kc., and presented arguments in support thereof.

The petition also included the request that the use of the proposed new radiotelephony segment 14,300–14,350 kc. be limited to holders of the Advanced or Amateur Extra Class grades of license.

As directed by its Board of Directors, the League now amends its petition by withdrawing the proposal for a restriction to certain classes of amateur license. The amended petition, therefore, seeks only the expansion of the 14-mc. radiotelephony subband so that it will read 14,200–14,350 kc.

THE AMERICAN RADIO RELAY LEAGUE, INC.
BY PAUL M. SEGAL
Its general counsel

A. L. BUDLONG
General Manager
May 21, 1958

V.H.F. C.W. SEGMENTS PROPOSED

Responsive to a decision of the Board of Directors, the League has filed with FCC a petition for amendment of the amateur rules to provide exclusive c.w. segments of 100 kc. at the low ends of the 50- and 144-Mc. bands. In accord with ARRL's request for preferential attention, the Commission promptly issued a notice of proposed rule making to accomplish the changes, with a date of August 29 by which comment may be filed. The text of both the League's request and the Commission's notice follows:

FEDERAL COMMUNICATIONS COMMISSION

Amendment of paragraphs 12.111 (h) and 12.111 (i) of the rules and regulations; limitation to A-1 emission of the lower 100 kilocycles in the 50- and 144-mc. amateur frequency bands

Petition for rule making

Pursuant to § 4 (d) of the Administrative Procedure Act and § 1.702 of the Commission's Rules and Regulations, The American Radio Relay League, Inc., requests that paragraphs 12.111 (h) and (i) of the Commission's Rules and Regulations be amended to provide for only A-1 emission in the lower 100 kilocycles of each the 50- and 144-mc. amateur bands.

This request is filed pursuant to decisions of the Board of Directors of the League at its meeting in May, 1958. As the Commission is aware, the ARRL Board of Directors is composed of sixteen amateurs nominated and elected by some 70,000 licensed amateurs to represent them in the formulation of League policy.

1. The contributions of the amateur radio service to knowledge of propagation characteristics in the v.h.f. portion of the spectrum are a matter of record. The most recent examples are the two-way 144-mc. communication between California and Hawaii in July, 1957, and innumerable instances of intercontinental two-way communication in the 50-mc. band during the past year. Additionally, nearly 1,000 amateurs are enrolled in an intensive project, as part of the International Geophysical Year program, to gather further data on propagation phenomena.

2. The principal raw material for such studies, and therefore for contributions to the art, comes from long-distance amateur contacts. It is well established that, watt for watt, A-1 emission is a far more effective medium for marginal work over great distances than A-3 emission. It is also well known that a weak, distant c.w. signal is obliterated by voice signals from local amateur stations. It is more to the credit of the amateurs who, under the handicap of local voice interference, have accomplished the distance records on c.w. so far obtained.

3. The League believes that such experimental long-distance attempts at communication should be provided every opportunity for success, and therefore proposes the establishment of exclusive c.w. segments of 100 kc. each at the low end of the 50- and the 144-mc. amateur bands.

4. In the case of the 50-mc. band, there is technical justification for selection of the low end for the exclusive c.w. segment. For example, in F-2 layer work, such as is now going on widely as the result of the current solar activity peak, and (although not quite to the same extent), in sporadic-E propagation, the lower the frequency the better the chance of making distant contacts. In the case of the 144-mc. band, the location of a proposed c.w. segment is not subject to the same technical justification, and our selection of the low end is purely a matter of consistency with other amateur band suballocations.

5. The League's proposal does not derive from the usual considerations applying to suballocation between types of emission on the lower-frequency amateur bands. It stems from a need to provide experimentally-inclined amateurs the proper tools with which to accomplish successfully the studies they are undertaking, particularly in connection with the IGY. If anything, the exclusive c.w. segments proposed should benefit voice operators as well, for they will provide space where foreign voice stations may be received without local A-3 interference.

6. The League requests that preferential attention be given its petition and hopes that immediate and favorable action will be forthcoming from the Commission in order 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.

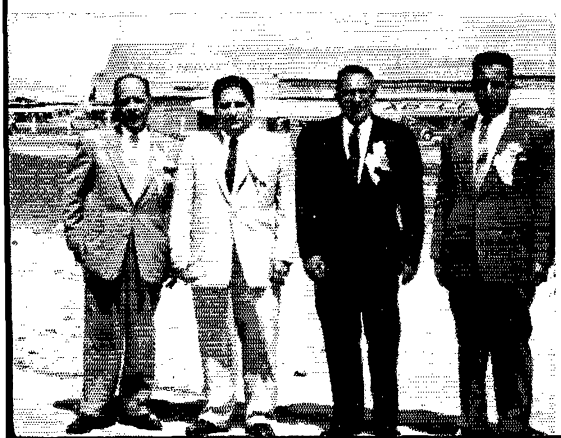
THE AMERICAN RADIO RELAY LEAGUE, INC.
BY PAUL M. SEGAL
Its general counsel

A. L. BUDLONG
General Manager
May 21, 1958

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D. C.

In the Matter of

Amendments of Section 12.111 of the Commission's Rules, Amateur Radio Service, to provide that only A1 emission may be used in the lower 100 kilocycles of the 50 and 144 Mc amateur bands. — Docket No. 12485



Leading Mexican amateurs and officials of the *Liga Mexicana de Radio Experimentadores* at their 26th national convention at Mexico City in May: Lt. Colonel Mariano Yustis C., XE1BX, administrative manager; Juan Lobo y Lobo, XE1A-XF1A, well-known DXer; Ing. Manuel Medina, XE1N, who this year retired after many distinguished years as society president; General (retired) Alberto Najera, XE1H, newly elected president of LMRE.

QST for

Notice of Proposed Rule Making

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

2. The Commission has received a petition filed by the American Radio Relay League, Inc., to amend Sections 12.111(h) and 12.111(i) of the Amateur Radio Service Rules to provide that only A1 emission may be used in the lower 100 kc of the 50 to 54 and 144 to 148 Mc amateur bands.

3. The Rules now provide for the use of A1, A2, A3, and A4 emissions and narrow band frequency or phase modulation for radiotelephony in the pertinent portion of the 50 to 54 Mc. band. In the 144 to 148 Mc. band the Rules now provide for the use of A0, A1, A2, A3, and A4 emission and special emission for frequency modulation.

4. In support of the request petitioner states that the contributions of amateurs to the general knowledge of v.h.f. propagation characteristics are a matter of record; that nearly 1,000 amateurs are enrolled in an intensive project as part of the International Geophysical Year program to gather further data on propagation phenomena; that long-distance amateur contacts contribute to such knowledge and that A1 emission is a more effective medium for long-distance communication than is A3; and that such long-distance communication attempts should be given every opportunity for success. Petitioner further states:

> The League's proposal . . . stems from a need to provide experimentally-inclined amateurs the proper tools with which to accomplish successfully the studies they are undertaking, particularly in connection with the IGY.

Petitioner, in justification of its selection of the lower 100 kc of the involved bands for exclusive use of A1 emission, states:

> In the case of the 50-mc. band, there is technical justification for selection of the low end for the exclusive c.w. segment. For example, in F-2 layer work, such as is now going on widely as the result of the current solar activity peak, and (although not quite to the same extent), in sporadic-E propagation, the lower the frequency the better the chance of making distant contacts. In the case of the 144-mc. band, the location of a proposed c.w. segment is not subject to the same technical justification, and our selection of the low end is purely a matter of consistency with other amateur band suballocations.

5. The sought amendments would result in the removal from other than A1 emission of only two and one-half percent of each of the amateur bands in question and would therefore not appear to materially affect the present usage of these bands. Furthermore, the proposal is generally consistent with the availability, from a historical standpoint, of all bands for A1 emission and only some bands for other types of emission.

6. Accordingly, the Commision proposes to amend Sections 12.111 (h) and 12.111(i) as set forth in the Appendix hereto.

7. Authority for the amendments herein proposed is contained in Section 4(i) and 303 of the Communications Act of 1934, as amended.

8. Any interested person who is of the opinion that the proposed amendments should not be adopted or should not be adopted in the form set forth herein, and any person desiring to support this proposal may file with the Commission on or before Aug. 29, 1958, a written statement or brief setting forth his comments. Replies to such comments may be filed within 10 days from the last date for filing original comments. No additional comments may be filed unless (1) specifically requested by the Commission, or (2) good cause for the filing of such additional comments is established. The Commission will consider all such comments prior to taking final action in this matter, and if comments are submitted warranting oral argument, notice of the time and place of such oral argument will be given.

9. In accordance with the provisions of Section 1.54 of the Commission's Rules, an original and 14 copies of all statements, briefs, or comments filed shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION
MARY JANE MORRIS
Secretary

Released: June 13, 1958

APPENDIX

IT IS PROPOSED TO AMEND SECTION 12.111 AS FOLLOWS:

1. Amend Section 12.111(h) to read as follows:
(h) 50.0 to 54.0 Mc. using type A1 emission. 50.1 to 54.0 Mc. using types A2, A3, and A4 emissions and narrow band frequency or phase modulation for radiotelephony, 5110 to 54.0 Mc. using type A0 emission, and on frequencies 52.5 to 54.0 Mc. special emission for frequency modulation (radiotelephone transmissions and radiotelegraph transmissions employing carrier shift or other frequency modulation techniques).
2. Amend Section 12.111(i) to read as follows:
(i) 144.0 to 148.0 Mc. using type A1 emission. 144.1 to 148.0 Mc. using types A0, A2, A3, and A4 emissions and special emission for frequency modulation (radiotelephone transmissions and radiotelegraph transmissions employing carrier shift or other frequency modulation techniques).

LOUISVILLE EXAMS

FCC has, effective August 1, added Louisville, Kentucky, to those cities where its traveling engineers conduct examinations four times yearly. The next examinations in Louisville will be some time in August and November, details available from the Chicago district office (826 U. S. Courthouse). Henceforth, the Conditional Class examination will not be available to applicants residing within 75 miles of that city.

RADIOASTRONOMY

In 1956 FCC solicited comments from interested parties on a petition from radioastronomy groups to restrict radio operation in certain bands in order to prevent possible interference to scientific efforts to receive signals from outer space. Frequencies in our 50- and 5650-Mc. bands were among those throughout the spectrum where such protection was sought. The League's comment at that time (p. 54, November 1956 *QST*) was to the effect that no rules changes were required, and any interference problem could be handled as an individual matter on a cooperative basis.

FCC has now issued a further notice of proposed rule making which provides in effect that, with a few exceptions, future applicants for radio facilities within a designated area around the proposed national radioastronomy observatory at Green Bank, W. Va., will have to clear such applications through radioastronomy authorities. One of the exceptions is the amateur service. FCC says, "Because of the variable frequencies on which they operate, their intermittent use and their low power, amateur stations have also been excluded . . . (from the proposed requirements)."

21-KMC. FILING

Responsive to an FCC proposal, and in accord with instructions of the Board, the League has filed a brief statement with the Commission indicating concurrence with the idea of shifting our 21,000-Mc. band so that it would be 22,000–23,000 Mc.

Strays

Congratulations to VE1BZ, newly appointed Lieutenant Governor of Prince Edward Island.

Late National Convention News

PROGRAM details for the 10th ARRL National Convention in Washington, D. C., August 15–17, 1958, are nearing completion at press time and we publish below the names of chairmen, masters of ceremonies, speakers and subjects at the various technical and operating sessions and meal functions. See page 66 of July *QST* for a general outline of the overall program.

Military Luncheon — Saturday — Master of Ceremonies will be George W. Bailey, W2KH, past president of ARRL, and secretary of IRE. Military pays tribute to amateur radio. Awards will be made by Army Signal Corps, Air Force and Navy to amateurs who have made outstanding contributions to the military. Awards will also be made at this luncheon for the three best exhibits. In attendance will be a galaxy of brass and you will see more stars than you can from a Sputnik!

DX Luncheon — Sunday — Vic Clark, W4KFC, of the DX committee announces a get-together of the DX gang with Leonard Chertok, W3GRF, as luncheon chairman. Guest speakers Bob White, W1WPO, DXCC Awards, ARRL, Bill Leonard, W2SKE, and Don Chesser, W4KVX.

ARRL Luncheon — Sunday — Master of ceremonies Paul A. Smith, W4ZZA, office of the Secretary of Defense, will introduce your League officials. Here's your opportunity to get acquainted with the boys from Headquarters.

Buffet Dinner Dance — ARRL Atlantic Division Director, Gil Crossley, W3YA, will serve as master of ceremonies, and ARRL President Goodwin L. Dosland, WØTSN, will extend a brief welcome at this, the first social function of the convention. This is a Friday get-together for cocktails out-of-doors, then dining and dancing in Washington's largest ballroom — 11 piece orchestra — the chance to get together to meet everybody — bring the XYL — stag or drag.

RTTY Dinner— After the party Saturday, the RTTY boys have their own private dinner and then break up for the free entertainment for all. Frank White, W3PYW, will introduce RTTY guests.

Single Sideband Dinner — One of the biggest attractions is the s.s.b. get-together Saturday night. You don't have to be a sideBander to attend. Ladies invited. Those attending this dinner will not have to leave the room for the free floor show that follows. Master of ceremonies will be the popular Lt. Gen. Francis W. Griswold, KØDWC. Guest speaker will be Rev. Father Daniel Linehan, S.J., W1HWK, Geophysical Laboratories, Boston College.

Hiram Percy Maxim Memorial Banquet — Herbert Hoover, Jr., K6EV, will act as master of ceremonies for the banquet honoring the founder of the League, W1AW, one of the all-time great amateurs. Fred Schnell, W4CF, former ARRL traffic manager, who knew Mr. Maxim personally, will give an interesting résumé of his life in ham radio. Other head table guests will be hamdom's best known figures. We are keeping the name of our famous guest speaker a secret — Washington protocol. The annual ARRL Merit Award will be made by Goodwin L. Dosland, WØTSN, ARRL President. Grand Climax of the Convention!

Entertainment — On Saturday night there will be a floor show with many well known top entertainers, supported by an 11-piece orchestra. Free for all registrants.

QCWA — A get-together after the Friday night buffet, for coffee-and. Anyone in ham radio 25 years or longer may attend. Chairman "Mac" Williams, W3ER, announces that short talks will be made by John DiBlasi, W2FX, QCWA national president; Ralph G. Barber, W2ZM, QCWA National secretary; Fred W. Huff, W2AMB, QCWA national treasurer; Granville Klink, jr., W3AFV, chairman, Washington chapter QCWA.

Wouff-Hong Initiation — Famous amateur radio secret fraternity again meets to initiate. Admission by secret word, your Wouff-Hong certificate, or small fee. A fine cast will enact the ceremony at the stroke of midnight Saturday.

Military Session — Robert McCormick, W3YAG, chairman. Moderator, Col. E. S. Van Duesen, W3ECP. The office of the secretary of defense has authorized the participation and support of his office and the services in the convention. An official military session of all Air Force and Army MARS members with Naval Reservists will be held in the auditorium of the Pentagon. Transportation by military busses. Welcoming address will be given by an official of the office of the Secretary of Defense. Program will be presented by top officials of the services. Forum will follow official presentations.

Technical Session — Carl Brown, W3LUL, chairman, and G. M. Thynell, W3TCU, co-chairman. "The Grounded Grid 4-1000A Amplifier," by Rex Bassett, W4QS, Bassett Industries; "Single Sideband" by Fritz Franke, Hallicrafters; "Application of a Small High Perveance Tetrode" by W. B. Hall, RCA; "Receiver Design" by Frank Roberts, W1JVG, National Co.

Novice Session — Ivan H. Loucks, W3GD, chairman. "Outfitting the Novice Station" by Lewis G. McCoy, W1ICP, technical department, *QST*; "Increasing Your Code Proficiency" by John A. Morrisey, W4HEL, Capital Radio Engineering Institute; "Operating Procedures, Good and Bad" by Karl R. Medrow, W3MCG, Naval Research Laboratories.

V. H. F. Session — Rick Emerson, W3OJU, committee chairman, has appointed Sam Harris, W1FZJ, session chairman. "The World Above 50 Megacycles", a color film produced by Antique Wireless Association, ARRL affiliate, narrated by Henry Blodgett, W2UTH; "F_2-Layer Observations for International Geophysical Year, 1957–1958" by Harry Wilson, EI2W; "W1MHL/1 Contest Operation" by Robert P. Rafause, W1RUD.

V. H. F. Forum — An open forum Saturday evening with Edward P. Tilton, W1HDQ, V.H.F. Editor, *QST*, as moderator. There will be discussion of v.h.f. topics by prominent v.h.f. men. A v.h.f. award as well as awards for best designed amateur v.h.f. gear.

Mobile Session — Jim Roberts, W3YAR, IBM, chairman. "Mobile Emergency", a mobile unit display, will be described by Clinton R. Spencer, jr., W3QQH, Phil-Mont Mobile Radio Club; "Mobile Antenna Problems" by Rex Bassett, W4QS, Bassett Industries; "Mobile Communications" by Gay Milius, W4NJF, Cmdr., USN. Andy Anderson, W3NL, editor of *Auto-Call*, will also address the session.

TVI Session — Nate Coffey, W3OBR, chairman. "TVI — Past, Present and Future" by Philip Rand; "Cooperation by 800 TVI Committees and the FCC" by Frank Kratokavil, FCC. Session followed by an open forum headed by Warren McDorman, W3KAN, past president Washington TVI Committee.

RACES Session — Cecil Harrison, W3PG, chairman. Walt C. Lockhart, jr., W3PWB, cochairman. "The Place of the AREC in RACES" by George Hart, W1NJM ARRL National Emergency Coordinator; "RACES Communication for Region II" by Austin Sparks, communication officer, Civil Defense Region 11; "RACES — Antennas and Their Use" by John Barolet, antenna engineer USN; "New York State RACES Communication VHF Teletype" by Vincent Kenny, W2BGO, N. Y. State Civil Defense. Other speakers from FCDA headquarters.

YLRL Session — Elizabeth Zandonini, W3CDQ, chairman, Irene Akers, W3RXJ, co-chairman. "YL Activities" by Eleanor Wilson, W1QON, YL Editor *QST*. "YLRL and You" by Claire Bardon, W4TVT; "YLRL Contest" by Kay Anderson, W4BLR, of YLRL's of Richmond. Betty Frederick, W3PVII, past president of YLRL will also address the session.

SSB Session — Sam Newman, W3HN, chairman. "Systems Aspects of the modern SSB Amateur Station" by John Hunt, Collins Radio; "Application of Transistors to SSB" by Tom Stuart, WØREP, Hallicrafters Co.; "The Amateur's Ideal SSB Receiver" by Stuart Seeley, W2ZE, RCA; "Carrier Suppression-Transmission Techniques" by Walter A. Zarris, E. F. Johnson Co.; "Mobile SSB" by Werner Brack, Eldico Electronics, "Ceramic Tube Application SSB" by Ray Rinaudo, Eimac.

Antenna Session — Chester Buchanan, W3DZZ, NRL, chairman. "Stacking of Arrays" by Mike Ercolino, Telrex; "Mobile Antennas" by Rex Bassett, W4QS, Bassett Industries; "Multiband Antennas Using Lump Constant Traps" by Andrew A. Andros, WØLTE, Hy-Gain; "Multiband Antennas Using Linear Traps" by Dr. Leo C. Haughawout, W6FTU, Gonset.

Contest Session — Don McClennon, W3EIS, NRL, chairman. Various phases of contest operation will be discussed by Phil Simmons, W1ZDP, assistant communications manager, ARRL; Larry LeKashman, W9IOP, Electro-Voice; Don Chesser, W4KVX; Harry Miller, WØCDP. An open forum will follow the session.

RTTY Session — Frank C. White, W3PYW, chairman. "Good Keying Practices Employing Local Loops for Teletype Signal Generation" by Philip Catona, W2JAV; "Net Operations and Working DX on Radio Teletype" by Boyd Phelps, WØBP; "Useful Features Needed in Radio Teletype Converters for Amateur Radio Use" by Frank C. White, W3PYW.

DX Session — Vic Clark, W4KFC, CAA, chairman. "The New Story of DX" by Bruce L. Kelley, W2ICE, "The Why of DXCC Countries" by Bob White, W1WPO, DXCC Awards, ARRL; "Navassa Island Expedition" by Wayne Green, W2NSD. Colonel Lloyd Colvin, W6KG, will also address the session. An open forum will follow.

Communication Session — Leo Young, W3WV, Chairman, Edgar Lindauer, W3UE, co-chairman. John Morgan, W4KX, SCM of Virginia will act as moderator. "History and Background of ARRL Communications" by Ed Handy, W1BDI, Vice President and Communications Manager, ARRL; "Message to All SCMs" by Lou Croneberger, W3UCR, SCM Md.-D.C.; "Regional Net Operation" by Edgar Lindauer, W3UE; "National Traffic System and Organization" by George Hart, W1NJM, NTS manager, ARRL.

FCC Session — John Gore, W3PRL, chairman. "Part 12 of Rules and Regulations" by William Grenfell, W4GF, Chief, Amateur Radio Service Section, FCC; "Monitoring Problems and Official Observer Participation" by Irv Weston, Chief, Monitoring Division, Field Bureau, FCC.

Public Relations Session — Pierre Portmann, W3RGX, chairman. "Future of Amateur Radio" by George Bailey, W2KH, ARRL Past President and Secretary IRE; "The Amateurs' Need for Public Relations" by Gilbert Crossley, W3YA, ARRL Director; "Getting Publicity for Your Club and Amateur Radio" by John Huntoon, W1LVQ, ARRL Assistant General Manager. There will be additional speakers from the Department of State and the office of the Secretary of Defense.

ARRL Forum — Col. Edwin Van Deusen, W3ECP, chairman. Gilbert Crossley, W3YA, ARRL Director, will serve as moderator. This forum is the focal point of the entire convention. It is here that hamdom tells the ARRL, its national organization, what's on its mind. Recommendations developed at the individual sessions will be presented to the League for discussion. The session will include a dramatic presentation "The Collapse of Time" by J. Lewis Powell, office of the Assistant Secretary of Defense. ARRL president Goodwin L. Dosland, WØTSN, will speak on "The ARRL and the Amateur." A. L. Budlong, W1BUD, Secretary and General Manager of the League, will address the session on "The 1959 International Radio Conference and the Amateur."

Get your registration in now — $5 up to August 1, $7.50 thereafter. Reserve also for such meal functions as you wish to include — the July *QST* story lists the various luncheons and dinners, with the before-and-after August 1 prices.

Headquarters for convention activities is the Sheraton-Park Hotel, completely air-conditioned. Again, see July *QST* for details. Bring the ladies — see page 55 of July *QST* for that special program.

Hams Across the Sea

BY ARTHUR S. LUKACH,* W2DPP

For years I was an armchair traveler. With a copy of the *National Geographic Magazine* and a map of the world in front of me I would soar away on a flying carpet to the four corners of the earth and relive some of the scenes seen in its magic pages. More recently I started to collect international plane timetables and became intrigued by the short time required to reach faraway places. Gradually the pressure increased until one night I spread a map on the table, turned to the XYL and said, "Let's take a trip." I knew before I spoke that the answer would be, "When do we start?"

At this point I would like to make a frank statement — as much as I enjoy traveling, I like ham radio more. The thought of not being able to operate the rig for a period of five or six weeks had a dampening effect on my otherwise exuberant spirit. Then up spoke the XYL again and said, "I suppose you'll spend all your time visiting your DX friends." That chance remark is the reason for this article.

Time compresses quickly when you leave Idlewild Airport in New York bound for Vienna. I had hardly unpacked at the famous old Sacher Hotel when the phone rang and a voice said, "Hello, Arthur, this is OE1FT." Incidentally, you have no idea what a wonderful feeling it is to hear someone call you by your first name in a strange city.

We made an appointment for the following day at which time I had the pleasure of visiting Franz, inspected his station and talked shop. Fortunately the weekly meeting of the Vienna Radio Club took place the following evening. Their quarters consist of two rooms located on the ground floor of a neat-appearing building. The front room facing the street had a plate glass show-window on the inside of which were posted

*295 Fifth Ave., New York 16, N. Y.

Left to right—G2AHL, G2MI and G6CL, of the Radio Society of Great Britain.

a number of rare QSL cards. A full-time secretary, OE3WB, is the oldest member in the club and a licensed ham since 1926.

What with my poor German and the fact that a number of those present spoke English fairly well, we were able to converse without too much difficulty. When OE1ER, who owns a very modern electrical supply store, heard that a W2 ham was at the club, he insisted that I visit him the following day. His station was very complete and up-to-date. Subsequently I called on OE1PC who is a teacher at one of the local high schools. From there I had no difficulty in contacting the States. It is interesting to note that all of the amateurs I visited lived in apartment houses. Central heating is a rarity and most of the rooms had their own stoves — either coal or oil.

The following observations apply not only to OE hams but also to those visited in the countries described below. All of them were troubled with BCI and some TVI. I say some TVI because TV sets were still too costly for the average family. Because of this interference problem, a number of the amateurs have taken to narrow band f.m. or do not operate their transmitters until late at night. It seemed that more of them transmitted on 28 and 21 Mc. than on 14. Beam antennas were very rare — most of the rigs I saw used either dipoles or ground planes. The receivers were either of the army surplus type (a number of them of German manufacture) which had been converted to the amateur frequencies or of the home-made variety. I saw no receivers of American make and was told that they were far too expensive, what with the initial cost plus a high duty. While on the subject of receivers, I was, of course, asked what I used. When I said a Collins 75A-4, I was looked at with great awe and I had the feeling that they thought I was a millionaire on a holiday! I hastened to inform them that a large number of hams in the United States were also using them. None of those that I met on my trip were operating single sideband. The power line voltage in most of the cities was 220 and there were numerous complaints about the voltage drop, particularly during the evening hours.

My next stop was Salzburg, Austria, which is a short distance by train from Vienna. This is a small, very ancient and picturesque city noted for its annual music festival and as the home of Mozart. I had been advised that if I did nothing else, I must contact Hans Wieder, OE2HW. Dutifully, I dialed his number from my hotel room. As the dial tone stopped, a voice said, "Welcome to Austria. This is OE2HW." Since I had not said a word, I assume this was his standard salutation. He said he would call for me in half an hour and escort me to his apartment.

One of the interesting things about ham radio is the fact that you never have the slightest idea what your contact looks like. Hans was 62, white hair, tall and full of enthusiasm. In fact, his enthusiasm for amateur radio had overflowed into his family, and both his daughter, Inge, and his son-in-law, Karl, were also hams. Retired now, he has two other hobbies, mountain climbing and photography. He was truly one of the OE oldtimers, licensed since 1927.

The following night, the XYL and I were invited to attend a meeting of the Salzburg Amateur Radio group, which was held in the beer stube of a small hotel. When I asked why they happened to choose this particular room, the answer was, "One of our members owns the hotel." A wonderful spirit seemed to pervade the group, which was exemplified by an incident that took place while I was there. I noticed that a collection was being taken, and when I asked the purpose, I was told that a Yugoslavia ham had informed one of the members over the air that his daughter had been stricken with polio and he had no funds to pay for her medical treatment.

From Salzburg to Munich, in Germany, the route led through the heart of the Bavarian Alps — a thrilling panorama of snow-covered peaks and broad green valleys. Munich, the capital of Bavaria, is a large and bustling metropolis which still shows some signs of Allied bombing. It is also the headquarters of the very active DARC, the Deutscher Amateur Radio Club, which claims almost 9,000 members. I was fortunate in being able to meet DL3JE, their very able vice-president, who is also head of the Air Traffic Control School at the Munich Airport and DL3TJ, an instructor in the same institution. After visiting the latter at his apartment and making a number of contacts to the States, we embarked on an extensive sightseeing tour. Our first stop was at the famous Siemens & Halske Electric Museum. This concern would correspond roughly to our General Electric Company. The next morning I was shown through the school at the airport and then spent an hour in the traffic control tower. It is interesting to note that English is the universal language used on the Continent in all contacts between ground and planes. The following day we drove out into the suburbs to visit a famous abbey noted for the wonderful beer that is brewed by the brothers. I need hardly add their reputation was well deserved.

When it was time to depart, DL3TJ and 3JE were at the airport to say goodbye. They pinned

a DARC badge on my lapel and waved a fond farewell as the plane taxied to the runway.

The advantage of traveling by air in Europe is that different countries are only hours apart. From Munich to London the time was four hours. I had heard so much about the Radio Society of Great Britain and particularly Arthur Milne, G2MI, that it was pleasant to contact him by phone. He suggested that I meet him in front of a well-known church a few doors removed from their headquarters. When I asked how I would recognize him he said, "It should not be too difficult — I am 6 feet 2 inches in height."

The RSGB rooms occupy the entire top floor of an office building at 28 Little Russell Street in the Bloomsbury section of London, close to the British Museum. There I had the pleasure of meeting G6CL, their secretary, and G2AHL, his able deputy. We went to the roof for a wonderful view of the city, and thereafter talked about ham radio in our respective countries. Their organization has close to 10,000 members, and their patron is none other than H.R.H. the Duke of Edinburgh. I glanced through a number of copies of their very excellent monthly magazine and before I left joined RSGB as a regular member.

From London I headed north to the land of windmills, canals, tulips, and bicycles. I had become very friendly with PAØRL over the air, and he was the first person I looked up after my arrival. From him I learned that there were about 115 active amateurs in Amsterdam, most of whom were members of RCA — the Radio Club of Amsterdam. As far as I could learn, only a very few were on s.s.b., the balance working n.b.f.m., a.m. and c.w. Although there is only one television channel in operation, the matter of TVI continued to plague the group.

I visited PAØJD, one of the first licensed hams in Amsterdam. While there I contacted PAØYJ and PAØQK. After I had given the former my call, he came back with "Hello, W2DAY PAY PAY, you are the first W2 I have ever worked without QRM, hi!" On one day PAØJD, myself and the two XYLs took a trip to Volendam and the Isle of Marken where the men still wear the familiar wooden shoes and baggy trousers and the women's colorful costumes are all identical.

Over the years I have had many contacts in Denmark, and I looked forward with great anticipation to my visit in Copenhagen. I also wanted to find out whether it was really true that in this country the women smoked cigars! I found out soon enough. At a restaurant on my very first night, the adjacent table was occupied by a middle-aged couple. When they finished their coffee, the lady opened her bag, took out a large cigar, her husband lit it for her and she puffed away contentedly.

There are approximately 1,700 amateurs in Denmark, of which about 800 live in Copenhagen or the general vicinity. Not all of this group is active at the present time. I had the pleasure of visiting OZ4H, the QSL manager for Denmark. He lived in an apartment with his wife, sister and mother, the latter a delightful elderly lady of 72. After coffee had been served and remembering what I had seen the previous night, I offered her a cigar. She accepted it, smelled the tobacco, lit it, puffed for a few minutes and said, "Sehr gut." Then her daughter and I followed. I asked OZ4H how many cigars his mother smoked. "Too many" was his reply — "10 or 12 a day!"

In talking to amateurs in the various cities, I found that they were keenly interested in radio developments in our country and asked innumerable questions about our latest receivers and transmitters. In Germany, the DARC even went so far as to translate and mimeograph some of the more important articles from the pages of *QST*. But as they remarked, often 12 months elapsed before they were received by the local chapters. With a very few exceptions, none of the hams I spoke to subscribed to *QST* and I soon discovered the reason. The wages received in Europe are a very small fraction of those obtained in the United States, and the subscription price of $5.00 loomed as a large sum. When I told them that in the future I would see that they received all of my old copies, the looks of appreciation were so heart-warming that I decided upon my return to make a plea to all the readers of *QST* to do the same thing. The cost of mailing from this country is very low — I have already sent 10 copies in unsealed envelopes marked "Printed Matter" and in no case has the postage exceeded 10¢. I was told repeatedly since ours is a technical magazine, old copies are just as welcome as the latest issues. Let us all resolve to put some of our good DX friends on our mailing list and strengthen still further the wonderful bonds we now enjoy with those across the sea.

I cannot begin to describe the grand feeling in being able to meet face-to-face for the first time persons who heretofore were simply a distinctive voice or the sender of the coded word. The easy introduction, the use of first names and our great common interest, all created the atmosphere of old friendships of many years' standing. Ours is indeed a unique and wonderful hobby and I came away with the thought that perhaps in our own small way, we amateurs were making a very worthwhile contribution to international understanding and good will — both of which are so vitally important in the troubled world of today.

This is DL3TJ, of the Deutscher Amateur Radio Club.

Correspondence From Members-

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

NOVICES

Presque Isle, Maine

Editor, *QST:*

In the June issue of *QST* K2VBL turns thumbs down on Novices and classes them as a nuisance. I for one would like to be marked as regarding this as a very short attitude. I will agree that the 15-meter band is too wide, that the QRM on novice bands is terrific and that Novices (and Generals) get out of hand and band at times, but please don't forget that we all had to learn sometime. I will defy the man who says he can learn all from the book without experience.

I was studying diligently for my General ticket in my spare time and recently decided to pick up a Novice ticket to get on a little earlier. Since my ticket I have had many enjoyable hours on the air and have learned more about theory from actual experience than from many hours of study.

As an employee in the electrical power industry in a supervisory capacity for the past 13 years, I see the dire need for more young men to become electrically-minded. The spark and initiative they need comes from just such a medium as the Novice ticket. Don't forget that a percentage of these youngsters will become our fine electronic experts and technicians of the future. I also find that all Novices are not youngsters. I think that to discourage Novices is to chop at part of the foundation of a strong organization and to help weaken the technical strength of our nation for the future. . . .

— *M. S. Mosher, KN1GNB*

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160-64 27th Avenue
Flushing 58, New York

Editor, *QST:*

K2VBL's letter came as close to my thoughts as any I've ever seen in your magazine (but then again, I know you hold back from print many good letters because they dare disagree with your policy) and was quite surprised you printed it. I am dead-set against your pampering of the Technician Class licensees. These guys are "eating too high off the hog" for no justifiable reason. And they are enjoying this state of affairs through the efforts of the League.

The Novice matter can be cleared very simply by remembering that they *are only Novices*, and as such should concern themselves with attaining 13 w.p.m. rather than WAC and DXCC. Take away 15 meters from them and get them back to 80 and 40 meters; they'll get that 13-per much faster then, with the incentive (a forgotten word these days in ham radio) of DX laying just above 13 per.

— *Al P. La Placa, K2DDK*

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10504 Holly Drive
Everett, Washington

Editor, *QST:*

When the Novice Class license was first proposed, I was one of those who opposed the idea. Now that we have had the Novice with us for several years, I feel that my opposition was mere prejudice with no facts to support it. The presence of hundreds of top-notch operators who have come up through the Novice ranks is ample proof that my attitude was unreasonable. I wish to apologize to all Novices, past, present and future.

It is evident from letters recently published in *QST* that there are those who would like to see further restrictions placed on Novice operation, particularly in the 21-Mc. band. This is undesirable because this is the band that offers reasonable assurance of DX contacts to the Novice licensee. These letters also cite certain bad operating practices observed on the Novice bands. Because the average Novice is unable to receive International Morse at the normal speeds found on the General bands, it is evident that these habits must have been acquired by listening on the various phone bands.

It is not for us to propose restrictions or to criticize, but rather to offer a helping hand and by example assist these newcomers to become the type of operator that will bring credit to the amateur fraternity — the type of operator that we all wish we could become.

— *Robert C. Olin, W7ALU*

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868 E. 7th Street
Brooklyn 30, New York

Editor, *QST:*

I don't see what all these Generals are griping about. I will admit that there is quite a bit of un-understandable hash on the air due to inexperienced Novices and that the Novice test is so simple that most any darn fool can pass it but there are many Generals that are just as much at fault when it comes to causing QRM. If these Generals would just show some courtesy and knowledge of operating procedure, about half of this junk on the air would be cleared up. . . .

— *Kim Boriskin, KV2MGS*

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Box 262
Matador, Texas

Editor, *QST:*

Just a good word in favor of the Novice. Some of these so-called nuisances will one day be electronics engineers. All they need is some place to stir up their interest, and what better place is there than in amateur radio as a Novice?

Sure, the Novice will make some mistakes, but haven't we all at one time or another?

— *O. W. Killingsworth, W5ZUQ*

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531 Ocean Avenue
New London, Conn.

Editor, *QST:*

One has to start somewhere in the game of ham radio and I say that the Novice license is the best first rung on the ladder to General and above. I'm an ex-Novice myself and I am absolutely certain that I could never have passed the General test without the practical experience gained as a WN. K2VBL mentions the harmonics, chirps, and break-break. Just how does he know for certain that the Novice is specifically responsible for the last malpractice on the bands? He cites no proof whatsoever. Besides, an ex-WN/KN has to learn from someone . . . could be an oldtimer, General or Extra Class? Who knows? . . .

— *Tracy Levy, Jr., K1GZO*

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R.F.D. #1
Stony Point, N. C.

Editor, *QST:*

Since when should a 10-year-old boy be prevented from getting an amateur license because of age? I have heard many adults using the terms break-break-break-break. Some of the Generals on the air are more child-like than a lot of 10 year olds I know. The way for the General to stop these terms is for them to help these new amateurs instead of criticizing and writing *QST* with these foolish criticisms. . . .

As for the "Video Rangers," they will drop out when their licenses run out. If these "Video Rangers" were shown the correct operating tactics we would have a greater percent of hams sticking with amateur radio. Instead of

criticizing their TVI from improperly built rigs, the Generals should take time out and help and show them the correct procedure. In order to enjoy ham radio in the future the Novices must be given help instead of discouragement.

— *Charles Blair, KN4RSH*

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San Antonio, Texas

Editor, *QST:*

Whatever hobby, profession, sport, or club you find, if you do not bring in new blood and expand the group it will wither up and eventually die. Amateur radio is the same way. This is the purpose of the Novice class license — to train people to be good General class hams. In the matter of youthfulness, let me say that we know several hams under 21 who can send and receive faster code than many of the oldsters. . . .

— *David K. Ferry, K5HLF*
— *Joe Hester, KN5QJR*

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1122 North Cole Road
Boise, Idaho

Editor, *QST:*

Although I don't think the Novice should be done away with, I believe some changes should be made to discourage the "Video Rangers." Here are a couple of them: (1) raise the code speed from 5 to say 10 w.p.m. to encourage listening around the bands, which in turn should give the prospective Novice an inkling of how to operate and promote the idea that there are other letters in the alphabet besides CQ CQ CQ de KN7XXX, etc. (2) I believe the written exam should be stiffer so as to teach Mr. Prospective Novice how to keep his 6L6 from radiating on every band except his own. — *Bob Wilcox, W7FTK*

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Box 55
Carlinville, Illinois

Editor, *QST:*

Perhaps there are more Novices who believe that they are licensed so they can work rare DX only on 15 meters. Perhaps you, as such an influential organization, should write me and tell me what happened to the old idea that I had that the Novice license was granted for people to get their code speed up by ragchewing, not so they could develop keys that are stuck sending CQ DX. Perhaps you should publish your answer, as I am sure that there are many more Generals like myself who are entertaining this notion as I am. — *G. Huff, K9AUB*

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9 Cross Avenue
Methuen, Mass.

Editor, *QST:*

. . . Is it possible for a person to make the marked distinction between a General and a Technician class license and say that the Technician is a mistake, when the only difference is several w.p.m. in speed? Is it likely that the Novice with his few-kilocycle band gives such tortuous treatment to the General with his band-sweeping v.f.o.? Calling the Novice tortuous, has K2VBL ever considered the bold General licensee who with his mighty multi-hundred-watt transmitter slams down on the Novice band, drowning out our mere 75-watt maximum? The Novice and Technician have, in my opinion, inducted many of the young generation (true particularly in my case) to take an active interest in the field of amateur radio. . . .

— *Felix J. Gollucci, Jr., KN1EKT*
Felix J. Gollucci, Sr., K1GQJ

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135 Gibson Road
Bristol, Rhode Island

Editor, *QST:*

Evidently K2VBL has never been a member of a model airplane club and seen the warped, wrinkled and non-flying models turned out by the Novices in model aircraft building, and seen master model builders put aside their exact scale model to teach the Novice just how to open a tube of glue, explain just what is dihedral, how to do this and how to that until the meeting was over and the master builder had not improved his model, but he had improved a Novice.

If the chirps are bothering you, get the call, correspond with the offending Novice and offer to solve his problem. If you hear disturbing harmonics, again follow the above suggestion; the letter you receive in return profusely thanking you for taking time to assist a member of the proletariat will make up for a solid week of chirps.

. . . One Novice (in our club) has constructed a binary computer; another has been awarded a full scholarship; the club vice president is a Novice/Technician; so are the activities manager; the club paper's editor and the public information officer — and the club membership is predominantly General Class! . . . — *Nelson G. Beals, W1MUZ*

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906 West Sugar Street
Mt. Vernon, Ohio

Editor, *QST:*

In regards to persons yelling "break, break," I noticed a great influx of that type of individual back in '53 when the hitherto "restricted" bands were thrown open to all classes of licenses much too soon for anyone who took their Novice exam to have qualified for their General — so I feel he should have qualified his statement.

About doubling the number of hams in the U. S. — good! The military services recognize the value of the hams as do private industry and a lot of people in the electronics field have their tickets to thank as a stepping-stone to a wide-open field. Also due to the large number of hams our Government is the only one in the world that backs us up to the hilt and the more amateurs on the air the stronger front we present when commercial and foreign interests try to take our bands from us. . . . — *A. A. Watts, W8OPU*

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East Beach Road, R. D. 1
Bradford, Rhode Island

Editor, *QST:*

. . . The real culprit is the chap who long since has received his General and continues to act like a Novice, sending 5 w.p.m., clicks and squawks, holding his key down, emitting lengthy CQs on a busy frequency, etc. Some never seem to learn either to operate properly or to adjust their rigs to emit a legal signal.

These are the birds that should be expelled from the fold, not the true enthusiastic Novice.

The answer is to tighten up in the General exams and let the Novice have his practice band until he really and truly qualifies. . . . — *Bob Sweeny, W1FEQ*

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5371 Montgomery Avenue
Philadelphia 31, Penna.

Editor, *QST:*

. . . I'm 15 years old and I've been a ham since 13. I learned many things as a ham that I wouldn't learn in school 'til 11th grade, in both science and math. I am a normal teenager, like rock-and-roll, parties, dances, cars, etc. I feel that I have learned very much from ham radio. All that and enjoyment, too. But, about the Novice, that's just a starting point. Many of todays best operators and contest winners once held WN/KN tickets.

I'll allow the fact that many Novices are poor operators. But, many Generals (maybe even you or I) are also poor operators.

Hams are known for fair play. But, Mr. K2VBL, you're not giving the Novice even a half-fair chance. If you really believe what you wrote, that's your privilege, and I think that no one could change your opinion of the Novice. But, as a favor to today's and tomorrow's Novices, give them a fair shake and don't try to convince other hams that Novices shouldn't be. . . . — *Bill Axelrod, K3DDW*

THE HBR-14, AGAIN

RFD 1, Box 78-2
Atwater, California

Editor, *QST:*

There are thousands of hams in this country and probably most of them have something they would like to say or

(*Continued on page 148*)

Hints and Kinks For the Experimenter

INEXPENSIVE AND RUGGED MECHANICAL CONSTRUCTION FOR CUBICAL QUAD ANTENNAS

THE CONSTRUCTIONAL details shown in Fig. 1 provide for the most simple, rugged and inexpensive cubical quad design that we have found. The method uses standard parts, completely eliminates welding and makes less difficult the job of attaching element supports to the boom.

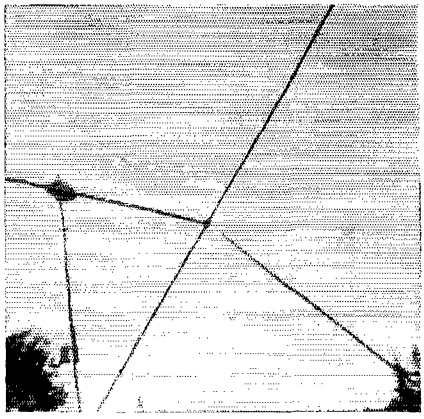


Fig. 1—VE3VU uses readily available "KEE" clamps and simple homemade bushings to mount the bamboo spreaders for his cubical quad antenna. Construction requires no welding or special machine work and cost is kept to a minimum. Method of construction may be applied to either single-band or multiband quads.

Readily available "KEE" clamps of the type used in making pipe frameworks were obtained at a cost of $1.72 each. These clamps have four 1½-inch diameter openings spaced 90 degrees apart and another 1½-inch opening through the other axis, thus providing mounting holes for the antenna supports as well as a socket into which the boom may be slipped. Aluminum tubing, 1½ inches in diameter, was used for the boom and 8-inch lengths of this same material were used in assemblying the bamboo supports. Each section of pipe is firmly locked in place by tightening up on the Allenhead screw already included for that purpose.

Plastic resin is used to pack the space in between the bamboo rods and the short aluminum supports. After the resin had set sufficiently to withstand drilling, each arm of the assembly was drilled (through the aluminum, the resin and the bamboo) to accommodate a bolt which adds mechanical strength to the junction.

Electrical details of the antenna are standard and require no additional description at this time. However, the fact that the installation has withstood 80-miles-per-hour winds is of interest. Although ours is a single-band affair (14 Mc.), it is obvious that supports for additional antennas could be easily mounted merely by slipping some more "KEE" clamps along the boom.

— Frank Kehoe, VE3VU

SPLICING 300-OHM LINE: AN ADDITIONAL HINT

I HAVE had excellent results splicing 300-ohm transmission line by extending the system described by W9BPS on page 53 of *QST* for January, 1958. The method used here assures a strong, weatherproof joint and makes use of some ordinary kitchen-type wax paper and an electric flatiron. The XYL may immediately say "No dice," but you may guarantee her that the surface of the iron will not be damaged. The steps to be followed in making the joint are as follows:

1) Proceed through B (Fig. 4) of W9BPS's instructions.

2) Strip wire from scrap pieces of 300-ohm Twin-Lead, leaving only the insulation.

3) Cut insulation into 2- or 3-inch lengths.

4) Place one piece of insulation on each side of the spliced area and cover with a fold of wax paper (double thickness) as shown in A of the accompanying sketch, Fig. 2.

5) Apply heat — medium setting of the flatiron will do — to the wax paper until the insulation becomes molten.

6) Remove heat, allow insulation to cool and set, discard wax paper, and trim joint as illustrated in B of Fig. 2.

— Denzil O. Cooper, WØTXP

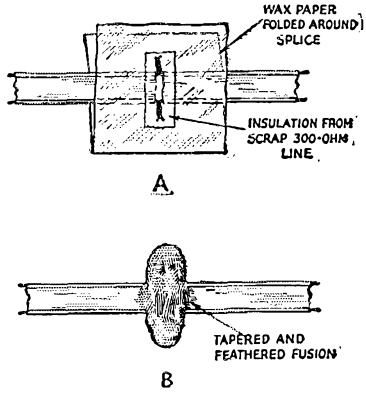


Fig. 2—(A) Sketch showing how WØTXP prepares a spliced 300-ohm line before applying heat with a flatiron. (B) The sturdy, weatherproof joint after excess insulation has been trimmed away.

REMOTELY-CONTROLLED COAXIAL SWITCH

ANYONE who has to jump up to manipulate coaxial connectors each time the band of operation is changed may have given thought to the installation of a remotely controlled coaxial switch. These same operators may be interested in the homemade affair illustrated in the accompanying photograph, Fig. 3. It is simply a B & W type 550A coaxial switch coupled to a Ledex solenoid-activated slave switch.

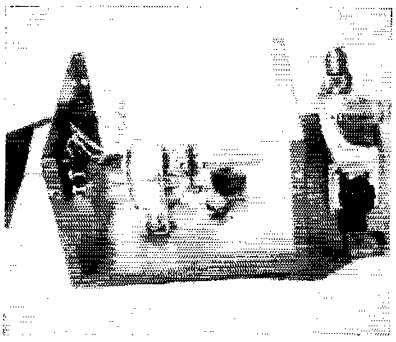


Fig. 3—The cover has been removed in this view of the remotely controlled coaxial switch. The coaxial switch is mounted on the right wall of the U-shaped structure and the electrically operated solenoid is bolted to the inside bottom surface. A terminal block for control wires is at the left.

The Ledex is a 12-position pulse-operated solenoid operated from 115 volts a.c. It comes mounted on a base complete with line cord, selenium-rectifier power supply and a 12-position rotary control switch. The master or control switch may be remotely located with respect to the solenoid and is connected to the latter through a five-wire cable. The slave switch automatically follows the control switch regardless of which way it is rotated.

The 12-position switch has a 30-degree index while the B & W switch has five positions (plus one for the input cable) with 60-degree indexing. By coupling the two switches together and moving the master control switch two positions at a time, the B & W coaxial unit will switch five different antennas or, at the sixth step, completely disconnect all antennas.

The stop on the B & W switch must be removed because this switch may be required to rotate through a full 360 degrees depending on which way the remote control switch is turned. The solenoid shaft may be coupled to the switch more readily if the rear wafer, which is not needed, is removed so that the rear shaft guide may be moved forward toward the front of the assembly. A standard ¼-inch solid shaft coupler may be used to gang the two switches.

If the unit is to be mounted outside near the antennas, it is advisable to use a weatherproof housing around the solenoid switch. Of course, with the assembly located adjacent to the antennas, it is necessary to use only one coaxial feedline between the shack and the antenna farm. Short lengths of coax may be run between the coaxial switch and the individual antennas.

— Russell Wellner, W9QNO

FIXED-STATION OPERATION WITH A MOBILE ANTENNA

WE RECENTLY moved into a new home and although the main equipment was set up and ready to go, I lacked time to work on a permanent antenna installation. Casting about for a temporary radiator, I spotted the family bus adorned with a 40-meter mobile antenna. A high-*Q* loading coil is used with the antenna, and reports with my 12-watt mobile rig had been pretty good. So why not hook the fixed-station transmitter to the mobile antenna?

A 25-foot length of coaxial cable was run from the shack to the car in the driveway. The mobile rig was, of course, disconnected from the antenna and a straight adapter connector (PL-258) used to couple between the coax cables running from the fixed-station rig and to the whip.

The home station runs about 70 watts for voice-modulated operation and reports are nearly as good with the mobile antenna as with the regular antenna used at the previous location. Obviously, there is some operating inconvenience caused by connecting and disconnecting the coax each time you want to operate fixed-station, but the idea does provide a suitable answer for temporary operation and it may solve the problem when a landlord absolutely forbids even No. 37 wire strung around the premises. Naturally, one should avoid slamming the car door on the coaxial extension.

One final word of caution: Don't drive off before disconnecting the coax! It is reportedly very hard on a transmitter to be dragged down the street at the end of a 25-foot length of cable!

— Richard F. Van Wickle, W6TKA

ANOTHER METHOD OF INSTALLING "PROXOS"

THE "Proxos" proximity relay switch described in *QST* for March, 1957, appears to have great merit as a neat and clean way to turn on automatically the oscillator or v.f.o. of almost any transmitter. Perhaps, though, it would be convenient to replace the "feeler" wire with a small metal plate, the plate being located near the knob (or paddle) of the key. When the fingers are moved to the knob, "Proxos" would switch on the oscillator, while the key would control the buffer in the usual manner. When the fingers are moved away from the knob, the oscillator would switch off.

It is estimated the oscillator would normally start about ½ second before the first transmitted character and hang on about ½ second after the last, but, of course, this would depend entirely on how fast the fingers were moved in the region around the sensitive plate.

— W. A. Monahan, jr., W6GTR

SNAP-ON CABLE CLAMPS

Ordinary snap rings such as used with punched loose-leaf note paper make ideal clamps for securing coaxial line and multiwire conductors. They may also be used as a substitute for lacing cord or other binding in the construction of a multiwire cable. Cables or wires held by the clamps may be easily moved or serviced merely by opening the rings, performing the necessary operation, reinserting the conductor/conductors and snapping the rings closed. Small screw eyes may be used to fasten the rings to wooden surfaces.

The snap rings are available in a variety of sizes and can be obtained quite inexpensively from stationery supply stores.

— *William A. Cline, W2DMU*

RG-8/U IN THE GAMMA-MATCH CAPACITOR

AMATEURS WHO contemplate installation of a gamma match may be interested in construction which uses RG-8/U coaxial cable as the inner or variable element for the gamma capacitor. The mechanical details are not difficult to duplicate and the assembly may be easily adjusted and waterproofed.

Details of the capacitor are shown in Fig. 4. The fixed section of the capacitor is an appropriate length of aluminum tubing having an inside diameter that will fit snugly over RG-8/U after the latter has been wrapped with good quality tape and then coated with plastic spray. Dimension A controls the length of the gamma rod, and the capacitance is determined by dimension B; the capacitance will increase as B is made longer.

One inch of the outer jacket must be removed from the input end of the coaxial element (Section C) in order that a copper band for feedline termination may be soldered in place. Be careful not to damage the shield braid when the insulation is being removed because the copper feedline terminal must be soldered to the exposed shield. After the coaxial section has been prepared and then inserted in the aluminum tubing, adjust at D for a spacing that will prevent shorting between the shield braid and the aluminum tubing.

The inner conductor of the coaxial feedline is terminated at the copper terminal provided and the shield for the line is attached to the boom. The coax line should be taped or clamped to the boom to relieve strain at the termination points. Coarse adjustment of the capacitance is made by varying the length of dimension B. Start with more than enough coax encased in the tubing and then clip off short pieces as adjustments and measurements proceed. Fine adjustment may be made by loosening the clamp at the outer end of the gamma bar and then sliding the bar back and forth over the coaxial element.

After the assembly has been adjusted for proper performance, it may be waterproofed by plugging the open end of the gamma bar with an ordinary cork and then coating the entire unit with plastic spray.

— *Wm. J. Engle, jr., W3KKO*

"UMBRELLA FOR TWO;" NOVEL GROUND-PLANE ANTENNA FOR 144 MC.

I HAD wanted to build a cheap-and-easy ground-plane antenna ever since the two-meter craze hit the Beaver Valley Gang. However, it took some activity on the part of local canines to get me started. After they had torn the XYL's umbrella to shreds, they left me with the prettiest set of ready-made two-meter radials you ever saw!

Paint was scraped from the inside ends of the ribs and these thoroughly cleaned areas were bonded together (soldered) with a length of flexible shield braid. A hole to accommodate the vertical section of the antenna was drilled in the top of the umbrella assembly. A 20-inch length of brazing rod fed with coaxial cable was used as the radiator.

One of the nice features is that I can still open and close the umbrella for convenient installation and transit. Furthermore, you don't have to be a drinking man to get the materials!

— *Rollyn W. McMahan, W3ECQ*

TIME SIGNALS ON THE GONSET SUPER 6

Some operators may not be aware that the Gonset Super 6 converter may be used for receiving time signals transmitted by WWV and CHU (Ottawa, Ontario, Canada).

The 7335-kc. signal from CHU may be received by adjusting the converter for 40-meter operation and then tuning just above the high end of the band. Transmissions at 14.67 and 15 Mc. from CHU and WWV, may be picked up with the converter switched to 20 meters.

The 14- and 15-Mc. signals are easy to find if you keep your eyes on the 10-meter dial scale while tuning. CHU's signal will appear with the pointer set at 29.3, and the 15-Mc. signal from WWV will show up at 29.7.

— *Dr. Julian E. Greenbaum, W1LIG*

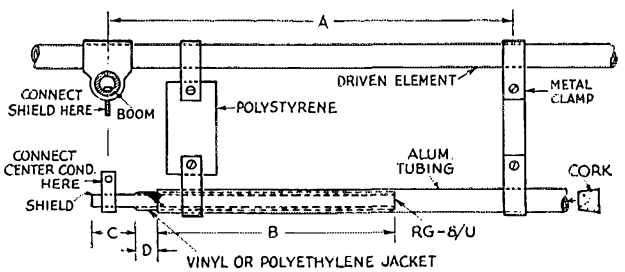


Fig. 4—Sketch showing the details of W3KKO's gamma matching section. The gamma capacitor is made from a length of aluminum tubing and a section of RG-8/U coaxial cable. Although the inner conductor of the coaxial cable is not used, it need not be removed.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Whew:

Warm, eh? Or are you a KL7? This is a good month to pass up polemics and grind out something innocuous for the file. It's time for our photofiscal triennial, anyway, the presentation of snapshot statistics calculated to allay such queries as "*Where* did I see that picture of FD4BD?" So, picking up where we last left off (August 1955 *QST*) we add three more years to your DX family album directory:

1955

July: OZ2KR, I1ER, CT1CO, OE5AH, YK1AA, 3V8AS, EA9DF. *August:* SM2VP, VP8AQ, KC6ZB, CR7DK, CX2CF. *September:* F3BR, CR9AH, JA1ATF, VR3A, Aland OH1s NK PI RX SS ST, SV group, HB1HT & Co. *October:* 4X4FV, SU1IC, LX1AO, FK8AH, VS5CT. *November:* OA5G, HR group, HB9 group, VS2DW, EA0AC. *December:* PX1EX crew, SU1AS, DL3BJ, PA0JA, HZ1AB.

1956

January: JA6AO, MP4QAL, KR6LJ, HP1EH, 4X4BL, HA5BB & friends. *February:* HB9KB & 3A2s, VP1EK, FD4BD, KX6AF, OQ5BI. *March:* KG4 group, OK1CX, IS1EHM, VU2SX, DU1FC, YN1RA. *April:* VP8AZ, HR1MO, OA0AL. *May:* YN1KK, JA1CV, OQ5BI, VK5ZR, EI Field Day, ZE6JL. *June:* FB8BR, OD5BS, JA1CV. *July:* AP2RH, HI8FR, KR6QC, OY7ML, XZ2KN. *August:* I1CW, LU5DC, SP5KAB, CT1NT. *September:* VQ5GC, JA1s AGU AEA, ZM6AS, FM7WN, EI5C & staff. *October:* F9MS, KA2NY, ZD3A, VP5DX, ZS5MP, DJ2LK, 4S7MR, Aland OH1s RT ST SU, ZB2s T & R, HC1ARE. *November:* VS1CZ, ZL2GX, HB1CZ/vs, ZP9AY, FL8AB, SP3PL, ZD4 hamfest, VS6 clubbers. *December:* SM8KV/LA/P, 4S7PT, WL7BUS, KG1s AG AX.

1957

January: HB1CM/HE, 3A2BH with HE9RDX, HK3AB, AP2U, UA3EG, VR2AK, ET2US. *February:* PY2CK with W1FH, ex-VR3D & Pacific friends, SM5KP with Gs 2MI 2PL 3HLS 4ZU, CR5SP, 4S7GE, VQ5EK. *March:* UR2-KAA, ZD9AE, YO3RD, CR9AH with W2APF. *April:* M1B, MD5s ADZ AMO DNQ, SP6BZ, CR7BS, VS2EF, CN8JX. *May:* BV1US, UA1AB, HI8SKE, HS1MQ, EA6-AM. *June:* UA0KAD, YO3GM, DL4ZC's DXCC[2], HH2Y, XW8AC, Warsaw CCIR meet. *July:* XZ2AD, OH3AA (OH3OD), KW6CA, DL9AU, FK8AS. *August:* CR7s DQ LU, IT1ZGY, UP2AS, OA7I, RAEM, IS1ZTG, SM1-BJA. *September:* HS1A, I5FL, M1H, T19CR, LZ1KPZ, CR4AD. *October:* OH2s IK KQ on Alands. VE3AHU/SU, I5REX, HB9EU, SP5HH, HK7LX. *November:* HZ1AB, 4X4CJ, TF3KG, W6AM, OA5G, XZ2TH. *December:* HB1CZ/vs, PJ2AX, YO2KAC, HR2WC, LX2GH.

1958

January: LX1DC, FE8AE, DU6IV, GC2RS, EA6AF, VR2BC, SP1DC. *February:* HB1CZ/vs, UR2AO, OQ5HP, HL2AM, W4LVV's DXCC[2], OH1s RX ST & Co. on Alands, JT1AA, W6AM. *March:* FR7ZC, ZE1JUM, FQ8AP, VQ3GC, 4X4DK, SU1IC, UO5AA. *April:* PX1YR, LU3ZS, VU2EJ, UA3BJ, OA4FM, FK8 PY ZS6 SV1 groups, OY1R. *May:* FL8AC, VP8BS, W6GPB's DXCC[2], W1BB, LZ2KSB. *June:* TF2WCC, VE8AT, PY1CK1Ø (PY7SC), UA1DG.

Zooks! how time flies. Another fast pictorial DXCC for your "How's" picture gallery and here are the guys, gals and groups responsible:

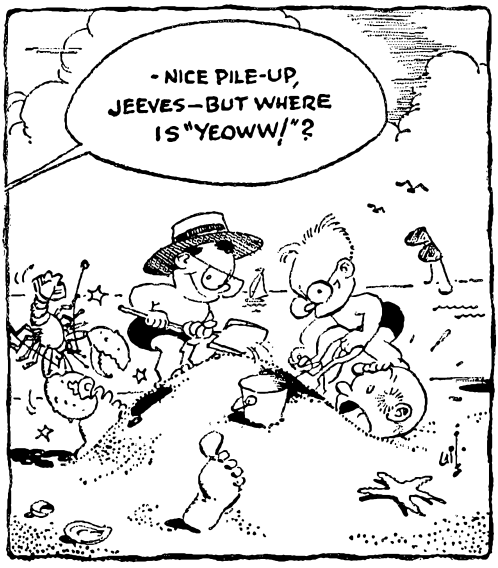
W1s BB BDI FH HDQ ICP NS QON QPN TS VG WPO WPR YYM ZDP, W2s BIQ BVS GKP IWP MUM OHF, K2s BKU BSM IXD KHZ LHW OAH TCD, W3s BQA GHS GLE VKD, W4s CBQ HYW KFC LHT SET TFB ZMC, W5s ALA ERY RS, W6s AM ITH KG KQY MUR YY ZEN ZZ, K6s DV TJK, W7s ADS DJU PHO, W8s DAW DLZ HCW NBK OHV, W9s ABA EU FDX MQK RBI WHM, WØs QGI UQV VFM YFE; AP2RH, CN8MM, CR6AI, DUs 1CE 7SV, HE9RDX, I1FT, KC6AA, LX1AI, OK1s JX MB, SVØWO, UC2AF; Milwaukee Radio Amateurs' Club, West Gulf DX Club; William Rice and S. S. Lawrence.

A special salaam to W1s ICP VG WPO, W3s GHS VKD, W6YY, K6DV, W7PHO, W8DLZ and W9WHM, each responsible for three or more productions. Applause, too, for the dozens of loyal contributors whose proffered pix didn't quite make the team.

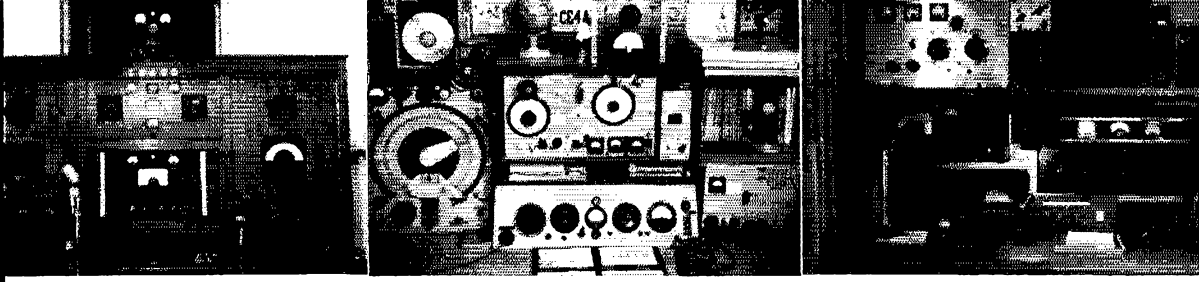
Factors in the selection of "How's" photos include reproduction quality, fame of station or operator, DX and ham atmosphere, general topicality, and make-up balance. Their appearance is an important part of our all-out effort to maximize enjoyment of amateur radio through heightening your DXperience. Got some likely prospects for publication? Send 'em along!

What:

Our simmering summer DX world awaits the marketing of nonstick watercooled headsets and truly nonskid knobs. Meanwhile the season's soaring temperatures and sagging prop conditions continue to drive DROMs to the mountains and the shore. Luckily, however, enough persistent perspirers do remain at their dials to keep your "How's" Bandwagon rolling at a smart clip through thick and thin. Pull up some shade, a julep and a breeze, and help us winnow the mail. . . .



*4822 West Berteau Avenue, Chicago 41, Ill.



The operating positions of 9G1BQ, DL3TG and VQ4KPB, left to right, are interesting arrangements thoroughly worked by North Americans. The 9G1BQ console houses c.w., a.m. and s.s.b. gear for several bands, 14 Mc. preferred, including SX-24 and Eddystone receivers. DL3TG's layout (photo courtesy W7DJU) is an excellent example of European home-brew precision and utility. VQ4KPB's outfit hits 10 through 40 meters with a 30-watt 807 final modulated by 807s, the receiver an AR-88.

20 c.w., habitat of the decidedly DXotic, interests W1s AZW BFK CTW MBX TS TUW, K1CBR, W2HMJ, K2s KAT LAK QXG RQC (56/40), UPD (127), UYG, W3LOS (61/35), W4s SMU TVQ, K4s HXF (151/129), IEX JOS RJM, W5QMJ, K5s IID (48/25), IZM (65/28), KIZ, W6s AM JQB KG RLP (205/185), ZZ, K6s ALH (55/37), SHJ SXA THZ TXA (135/103), W7DJU/GYR, W8s BMX CSK IBX JGU (212), K8EGX, W9DMY, KØDQI, KA8AF and VE7CQ with this arresting array: **AP2AD**, **CE9AK** (14,030 kc.) 2 GMT, **CN2AQ**, **CN8s** BK (60) 7, EM GU HW (40) 22, **CRs** 4AH (83) 4, **6AI** 6CK (25) 3, 7CI 7DQ (60) 4, **9AH** (49), **10AA**, **CT2BO** (21) 1, **DM2s** ADL AEJ AIG AJB AOH, **DUs** 1DR 6IV 7SV (92), **EAs** 6AW (70) 2, 8BF 8CP 9AP (5) 1, 9BM (70) 21, **ET3PRS** (60), F9QV/**FC** (66), **FA8TT** (60) 6, **FB8s** XX (12), ZZ, **FF8BX**, **FK8AS** (13), **FL8AC**, **FQ8AP** (49), **FY7YI** (48) 1, **GCs** 2FZC (30) 6, 3AAE (93) 2, **GD3FBS** (10) 6, **HAs** 1KSA 5AM 5DH 5KBP 5KBR 5KFR 8CZ 8WZ, **HB1FE** (40) 6 just Switzerland, **HC1s** LE MD 4, **HE9LAC** (51) 22, **HK0AI** of San Andres, **HLs** 1SK (3) 16, 1US (4) 15, 2AJ (80), 9KR, **HP5CC**, **HR2FG**, **HS1s** C (20), E, **I5LV** 21, **IS1MM** (32), **IT1s** AGA TAI (50) 7, JAs in all call areas save Nos. 6 and Ø, **JT1s** AA (57), YL, **JZØHA**, Ks 2ILQ/**KG6** (80) 6, 4AQL **KG6** 4QLY **KG6** 6TSQ/**KG6** (30) 5, **KAs** 2FEC 2MS 2SH 7FH 7TB 8KW 8RA, **KB6BJ** (81), **KC4s** USB (80) 7, USH USK (28) 15, **KC6s** JC (17), ZD (40) 13–16, **KG6s** AAY (87), FAE (91), NAA, **KM6BK**, **KP6AL**, **KR6s** CI FH QW RY SS, **KV4AA** (80) 20–22, **KW6CE**, **KX6s** AF BP (18), BT, **LA2JE/P**, **LZ1s** KBA (61), KNB KSP (118) 10, **OA4s** FM (38), FT, **OQ5s** CP EH, **OR4VN** of Belgium's antarctic effort, **OX3s** DL (31), UD (15, 69), **PJs** 2ME of Sint Maarten, 3AB 5CB, one PX1AA (80) of doubtful pedigree, **PZ1s** AP (30), AR, RAEM of Moscow, **SM1BVQ** (69) 2 of WGSA desirability, SM8AQT/**LA/P** (50) 21 'way up north, **SPs** 2AP 3PH 4JF etc., **ST2AR** (77), **SVs** 1SK ØWB ØWE (324) 5, ØWP, **TF5TP** (58), **TG9MR**, **TIs** 1WS/mm 2PZ, **UA9s** CM JF KCA KCC (110), KCK (97) 2, KOH (58) 2, KYB OI, Antarctica's UA1KAE and UA1KAE/4/7 outposts, **UAØs** IJ JA JB JD JF JK JZ KAR on Dickson isle, KCO KFC KFG KIA KJA KJB KJF KJV KKB KKC KKD KQB KSB KUA LB LE LI, **UB5s** AQ BB BO FO KIA ND UF UW VU WF, **UC2s** AA AQ AT AU (16), AX BL CB KAR (80), **UD6s** AM (16) 0, BG, DD (120) 1, KSK, **UF6s** AF (125) 1, FB (27), **UO5s** AK IT (70) 1, KAA, **UP2s** AA AT AW (62) 3, **UQ2s** AH (40) 4, AJ (20) 7, AK (10) 6, AN BA, **UR2s** AN (70) 7, AO BV, **VE8s** AF AT FO NH PB, **VK9s** AD (30) 6, NT (40) 13, RR (70) 8 of Papua, XK (20) 11, **VKØKT**, **VPs** 1BS 2LS 2SI (35) 2, 3AD 3YG (58) 12, 5BH 5BL 5RS 22–0, 6PJ (58), 7BT (1) 1, 7NM 8HR (57) 4, **VQ3s** CF HD, **VQ8s** AJC AQ ASR, one **VR5AZ**, **VSs** 1FZ (46) 12–13, 1GX 2DW (29) 2FK 6DK (20), 6DZ 6EC (20), 9AJ 9AP, **VU2s** AJ RM (71), Ws 1RHO/**KG6** 4WHF/**KG6** ØBKL/**KG6** ØOWY/**KW6**, **XEs** 1H 1YF 3BL, XQ8AG (80) 17, **XW8AI** (77) 10, **XZ2TH** 11, **YOs** 2BM 2CD (4) 21, 3GK 3ZA (19), 6XU (50) 8, YS1O (20) 3, YV5GO, **ZCs** 3AC 4RF 5AL, **ZDs** 2CKH 6DT (54), 7SA (80) 12, **ZEs** 1JV 5JU, **ZKs** 1AK (39) 2, 1BS (109) 4, 2AD 3–4, antarctic-based **ZL5s** AC of Camp Hallett, AD and AE of Scott, **ZSs** 2MI (20) 14 of Marion isle, 3B (68) 6, 4S7ZE, **4X4s** CK JO, **5As** 2TY (6), 4TC 5TH and **9K2AQ** (76) 2. Enough targets to take one's mine off heat and humidity!

20 **phone** keeps K2s QXG* UPD YFE, W6s OBH RLP YY, K6s SHJ TXA, W8s IBX JGU (now 100 on A3), KML and HK7LX well entertained, asterisks denoting sideband users: **BV1s** TC US, **CR6AU**, **CT3AF** (140), **EA6AR**, **FF8AP** (170), **FG7XE**, **FK8AU** (170), **HK7LX** (175), **HL9s** KR KS (140) 6–15, KT, JA1GC, **KA2KM**, **KC4USH***, **KG6s** AAY (250), AGY AHU (230) 14, FAE*, **KR6JN**, **KX6s** BT BX (250) 6–15, CE (210) 7, **PJ2AN**, **SP7FI** (160), **SVØs** FR WB WE* (324) of Rhodes, WN, **UAs** 1CC (130), ØLA, **VK9s** BS CP (180) of T.N.G., YT, **VKØs** KT (190), TC, **VPs** 2DA 3VN, **VSs** 1HX 2BS 2DW (170) 15, 2FR, 4JT* (304) 10, 5JL (97), 6AZ* (300) 10–11, 6DJ 9AJ, **VU2RX**, W4HXI/**KW6** (240) 14, XE1WX, **XW8AI** (160), YN1AP* (305), YV5ABD, **ZD1FG**, **ZK1BS*** (305) 13 and **ZS2MI**. Some of these were hooked c.w.-to-phone style by Ws 2HMJ 8BMX, Ks 4IEC and 5IID . . . . . K2QXG's protest should be heeded by sideband DX: "S.s.b. boys run on for hours without identifying themselves. Not worth the time and effort to find out who they are, so I'm back to c.w. this month." Come, come, now — *at least* every ten minutes, gang.

15 c.w. rides out the season's propagational vicissitudes in fine form with W1s CTW (143 on 21-Mc. c.w., 148 total), MBX, K1CBR, W2s JBL OQH, K2s LAK PPT RQC UPD YFE, W4SMU, K4s IEX LAY (60 on 15), MOF PHY RXQ, W5KLB, K5s IID IZM KIZ, W6ZZ, K6s SXA (145), TXA, W7QNI, W8s CSK YGR, K8EGX, K9GSG, WØQGI, KØJZW, KG1CK, VE7CQ and KP4KD (124 on 15 c.w., 228 total) collecting delectables like **CE2AT**, **CN8s** AB EE (30) 22, FM LC, **CRs** 6AI (32), **7LU** (40), **CTs** 1TT 3AB, **CXs** 1FB 2FD 9AM, **DMs** 2ACN 17, 2AEH 2AHM 3KDA, **EA9AP** (71), **EL1K** (30), FA8RJ 20, **FB8XX** (85) 11, **FE8AH** (48), **FF8s** AJ (39), BZ, **FM7WT** (23) 0, **FQ8AP** (5), **GCs** 2FZC (55), 8DQ, **GD3FXN** (50), **HAs** 3MA 5BI 23, 5DH (40) 17, 8CG, **HC1s** AGI LE, **HK1FF** (52), **IS1CXF** (30), **IT1s** AGA 18, AI, **JAs** 3AB 3CS 15, 5DF 6PA 8GA, KA2YA 6, **KB6BJ** 11, **KC4USB** (28), **KGs** 4AS 6FAE (72), **KM6s** AX 19, BK, **KP6AL** (45), **KW6AB**, **KX6BQ** (10) 22, **LJ2F** (94), **LZ1KNB** (60), **OA4s** AK AS BP, **OD5s** BZ (48), LX, **OYs** 1R 7ML 5, **PJ2s** AF AL 20, BA CJ (65), ME, **PZ1AO**, **SPs** 1JV 1KAA 2BE 2GS 6NF 7HX 23, 8CP 9AC 9CS, 9JA 9QS, **SVØs** WP (10), WY (70), **TF3AB**, **TI2s** LA (30) 22, RO (39), **UAs** 1BU 1KBB 2KAW (98), 3BF 3FG (40) 18, 3HI 22, 4KCE 4NB 6KDE 6KTB 9CM 23, ØGF ØKIA, **UB5s** CI CL KCB UW, **UC2s** AA AX (30) 20, CB, **UF6FB**, **UI8JE**, UJ8AF, **UO5AA** (18), **UQ2s** AE/mm AN, **UR2s** BU (20) 20, 2KAA, **VPs** 5NY of Turks, **6JR** 6NG 7NG (12), 9DU 13, 9IVM, VQs 2AB (41), 2AC 4KPB (4) 22, 4RF, VR3A, VS9AO, **WH6CIZ**, **WL7CCJ**, **WP4ALQ**, **XEs** 1YF 17, 2FA, **YO3AQ**, **YV5BJ**, **ZB1s** DC DS DZ (30) 20, GUH, **ZC4s** IP (86), RF (22), ZE2JS (85), **ZPs** 5HK (70) 22, 9AY (15), **4X4s** AC 17 and IV (15).

15 **phone** finds favor in the receivers of W1MBX, K1CBR, W2s LKW OQH, K2s KAT LAK UPD* UYG TFE, W4SMU, K4s IEX MOF PHY RXQ (87/41), W5KLB, K5s IID IZM KIZ, W6ZZ, K6s ICS SXA TXA, W8s IBX (114/97), KML, K8EGX, K9s GSG ISP and KØJZW, mainly thanks to **CE3RC**, **CN2BK**, **CN8s** AB FA FV HW JC JS MM, **CP1AM**, **CRs** 4AI 4AS 8SP of Sao Thome, **CT1GE**, **DU1GF**, **EAs** 6AR 6AY 9EI, **ET2US**, **FO8AK**, **FQ8HG**, **GD3UB**, **HCs** 1PJ 2KU 5MT, **HH1SRL**, HI8GA, **HKs** 1EQ 3QV 4DF 5BZ 5ED ØAI* (443), HL9KT, **HP3RL**, **HRs** 3VM 8SM, **HS1E**, IT1CDS, **JT1AA** (90) 2, **KAs** 2ML 2RB 7TB, **KGs** 1DL 15, 1EE 4AL 4AQ* 6AGY, **KM6s** AX BK, **KR6s** CP RB, **KX6s** AF BT, **OAs** 4CS 4IGY 4V 5N, **OE1s** FF HE, **OQ5RT**, **OX3DL**, **SVØWS**, **TF2s** WCW* WCY, **TG9s** AD AL MB (73), **TI2s** AAL HP* LA and YL PP, **VKs** 9AD and 9RH of Norfolk isle, VKØs KT and TO of Macquarie, **VPs** 1BS 2LB (75), 4TE* (448), 5BH*, 5FH 6WS 6ZX, **VS2s** DW EV FR, **VS9O** (330) 22–23, **XE1DT**, XQ8AG, **YN1s** CJ FS (240) 3, MF, **YS1s** LA MS (240), **ZA1AB**, **ZB1s** DC RT, **ZB2Z**, **ZP5MN**, 4X4FV, **5As** 4TH 4TM 4TZ 5TC and 5TY, asterisks signifying s.s.b. endeavor.

15 **Novice** news, or lack thereof, reflects the ebb of the m.u.f. WN6YKS, **KNs** 1CNZ (six continents worked now), 1GUX 2HIY (25 worked), 5LZA 9KXM and ØLTB (109/50) nevertheless prevailed upon Pegasus for **CN8LC**, **CT1s** IQ TT, **CX5CE**, DM2AEH, EI5D, **HI8BE**, **JAs** 1VX 4JU, **JT1AA** (132) 10–11, KA2YA, **KGs** 1CK 4AS, **OK1MB**, **SP6EG**, **TF2WCT**, **UA9s** CR JF, **UC2AX** 3, **VK5s** LG QR, VQ4FK, **WH6CQG**, **WL7CEE**, YU3VV, **ZE1JY** and **ZL3OB** . . . . . **KNØLTB**, leading known Novice DXCC possibility, takes his General exam and keeps plugging for needed QSLs. "I think many Novices can learn from th-

success that KNs 4RID 5LMJ 5LZO 8GHG and others have had that a good antenna is half the battle. The other *half? A resolution to quit calling CQs and listen once in a while!*" Tony, on behalf of all the WN/KN gang, praises the many DX stations who patiently patronize 15-meter beginners. K6DV echoes likewise.

10 phone features fleeting DX openings and present pickings are slim. K1CBR, K2YFE, W4YQB (123/114 on 28-Mc. phone), W5KLB, K5KIZ, W6ZZ, K8CFU, K9s GSG and ISP keep the ball rolling with **CN8IV**, **CO5CN**, **CP1AM**, **CR6s AI CA** (420), **CR7DK** (420), **FM7WT**, **HC5MT**, **HK7LX** (470), **KC4USW***, **KH6s** CHU SP SY UG, **KX6BY**, **KZ5IF**, **OA4IGY** some 20 *miles from* Lima on Sput-watch, **PZ1AE**, **TI2RLA**, **VKs** 3ATN 6KW, **VPs** 2LB 3HAG 5CB 6KM 9HH, **VQ2AV**, **VS9AP** (470), **ZDs** 2NWW 7SA 8JP, **ZE2JK** (460), **ZSs** 4F and 6AJH . _ . _ . _ K8EGX keeps ten c.w. in the running with multiband specialist **VP2SI**.

40 c.w. suffers from static in its attic but W2s HMJ JBL, W3MQY, K4IEX, K5IZM, K6DV, W7DJU, K8EGX and VE3BOH (ex-VE8OW) stick it out for such as **CT2AI** (30) 0, **DM2AVN**, **FG7XA** (20) 3, **HA1VP**, **JAs** 1AEA 1AEW 1ON 1PS 6MF/1 7IL 7JA, **KB6BJ**, **LZ2KSB**, Fernando de Noronha's **PY7SC** (9) 0, **SP9RF**, **VE8PB**, **VPs 2SI** 4, **7NG**, **YS2AF**, **YU1HKL** and bona fide **ZA1KC** (15) 23. Eleven years of concentrated 7-megacycling produced 107 countries confirmed at W3MQY, Bob's main route to DXCC . _ . _ . _ KN7s CAD and DBV give the 40-meter Novice slant, nailing **VK3XB** (149) 9–11. KN7CAD also bagged **JA1BXS**, and K6DV learns that *more JAs are beginning to chase Yank Novices*, transmitting just below the 7150-kc. mark . _ . _ . _ K4MOF hears **KZ5RD** and **VP7BO** pursued on 7-Mc. phone. S.w.l. C. V. Edwards, still stationed in British Guiana, logged **VPs** 2GT 2GV 3EFG 3HAG 3IG 3VN 3YG 4MM 4TF 6HR 6KM, **CT1IC**, **OA4GR**, plus Statesiders K9KJD W4LX, W5s BBN KKT LFE RF, W6QUU and others on phone. . _ . _ . _ Eighty? Only K8EGX with **VP2SI**.

Where:

Europe — Rhodes DX scholars at SV0WB accept QSL inquiries only pertaining to contacts dating after November, 1957. W4BVD confirms their address as USCG Courier, WAGR-410, APO 223, New York, N. Y. . _ . _ . _ An additional DM bureau is mentioned by WGDXC's *DX Bulletin:* Box 37, Strausberg 1, D.D.R. But, so far as we know, the regular Halle bureau is best yet . _ . _ . _ YO3FN assures W9TKV he QSLs "200 per cent" but insists that cards be sent direct to the address following. Nino's 60-watt three-stager and dipole are regularly workable on 7000–7020 kc., 0300–0600 GMT . _ . _ . _ "Niko of ZA1KC QSLd direct, much to my surprise, even before I sent my own card." This from fortunate W3MQY who raised Niko on 40 c.w. Incidentally, ZA1KB specifies the same mail QTH . _ . _ . _ As a rule I1ER ships a registered batch of QSLs Statesward once each month to confirm all new W/K contacts. "Conditions now down for U. S. QSOs — only sporadic openings on 15, few signals at all on 10." . _ . _ . _ W1TUW relays word from LA5HE, QSL sidekick for LA2JE/P of Svalbard: "Occasionally I receive QSLs by air for LA2JE/P contacts not included in my log extracts. These I check with Odd on my next schedule. In such cases the gang must be patient." . _ . _ . _ Yes, *never* give up! W1BIH, assisted by RAEM, secured a UA1KEC Franz Josef Land pasteboard after a nine-year vigil.

Africa — "OQ5DG will be off the air for about a year while I'm in the States on furlough. I'm up to date on confirmations for all cards received prior to the 1958 DX Test and will finish the job beginning in July. I hope to return to the Congo in mid-'59; meanwhile, QSL inquiries will be answered from California." Marlowe's current QTH follows . _ . _ . _ From ZD7SA QSL expediter CN8GU via W1ZDP: "I return to the States around August; at that time CN8JX probably will take over for Bob. The boys should submit standard-size s.a.s. envelopes when forwarding their confirmations. QSLing for ZD7SA *and* myself is quite a chore, believe me — mailed out 250 cards today."

Oceania — "ZK1AK appreciates IRCs from all who expect direct replies," declares K0DQI . _ . _ . _ Volunteers W7PHO: "VR1C is mailing me his logs and I'll handle his QSL situation from here." Favor Bill with the usual s.a.s.e. courtesy, gang . _ . _ . _ In WIA's *Amateur Radio* we note that VK3RJ's bureau handled some 45,000 QSLs during the twelvemonth ending February 1958, about 12 per cent over the preceding year.

Asia — AP2U, now inactive for undefined reasons, advises WGDXCers he will gladly entertain QSL inquiries regarding his past activity . _ . _ . _ From the all-caps mill of KR6RY: "I QSL 100 per cent, via bureaus only, including each initial phone and c.w. contact and each different operator worked at club stations. Right now I'm at QSL No. 1650 after operating here since September 1, 1956. I'll QRT around mid-February of next year but my home QTH at W7LQN will remain good indefinitely." . _ . _ . _ KA2AL dismantled for Stateside return in June and expects to *become a Texas Five shortly*. Bob will accept QSL inquiries via his K9ALM home address . _ . _ . _ "We have QSLd 100 per cent so far, with the exception of the 1958 ARRL Test, and we still need several states for WAS," chorus W7NIO and K4BTE, co-ops of KA9MF . _ . _ . _ "The KA4AS boys — Ron, Bill, Baker and Dan — are all back in the States now and KA4FT, myself, has been transferred to the KA7 area. I have all logs for both stations and will accept correspondence concerning overdue QSLs." Frank's new address follows . _ . _ . _ From ex-YI3AA (G3JFT-GW3JFT): "So far as we know YI3AA has QSLd all stations worked. If any deserving party still has not received a card, reapply to me with full QSO particulars."

South America — "I am having PJ5AB cards printed for shipment to the numerous stations I worked while in Aruba," assures W9OFO . _ . _ . _ VP6PJ, according to W6PLG, deems one VP4AR a privateer . _ . _ . _ W3GHS, aiding the KC4USB QSL cause, informs: "All cards re*ceived here for* KC4USB will be answered as soon as Steve returns with his logs around January, 1959." . _ . _ . _ W6OUN, contrary to some erroneous advices, never has filed HK0AI loggery. Bill relates, "HK0AI QSLs still go to Isla de San Andres via the Republic of Colombia. IRCs are appreciated but not necessary and all replies are forwarded via bureaus." HK0AI's sister and QSL manager pleads for patient understanding because "It's very difficult to be the only active HK0."

Hereabouts — W4RQR, Caribbean s.s.b. ambassador of good will, informs us of his new address: 5804 Accomac St., Springfield, Va. Bob is hospitable to QSL inquiries concerning early-'58 sideband activity at VPs 4TE 5AB 5BH 5RS 6LT, FG7XE and FM7WT . _ . _ . _ Bear in mind the desirability of s.a.s.e. when accepting W8VDJ's VP2DA QSL assistance, urges WGDXC . _ . _ . _ Abetted by W6TNS, KG1CK launched an assault on his QSL backlog in June . _ . _ . _ W7QNI believes it cannot be overemphasized that *overseas stations often appreciate* W/K QSLs as much as we savor theirs. It's a poor reflection on the state of the art's ethics when any European must work several stations in a given state before a WAS-clinching pasteboard finally appears. August 10th through 16th is International QSL Week, you know. Let's clear all debits, now — and stick with that everlovin' GMT, eh? . _ . _ . _ W1s CTW LLF TS TUW WPO ZDP, W2s BUI HMJ, K2UPD, W3s MQY VKD, W4TVQ, K4s HXF IEX RXQ, W5ERY, W6s AFI AM JQB KG RLP YY, K6s ALH ICS,

The lure of high adventure** led K6BAZ to a position with the Scripps Institute of Oceanography at the age of 18. After* **preliminary voyaging in Alaskan waters Doug headed for IGY doings in the south Pacific aboard** ***Spencer F. Baird **in October of last year, accompanied by a Viking I, SX-99 and a cache of spare parts. Exciting months that followed saw stops at Fakarava, Tahiti, Rapa (shoreline at center), Chile, Peru and Easter Island. As CE0AG on Easter, K6BAZ piled up some 700 QSOs in three short days. K6GKU supplied valuable assistance at home base and routed most QSLs through bureaus. K6BAZ weds this month and then is off to sea again, this time to India.**

W7s AMM QNI, W8s BMX CSK, K8HFO, W9s DMY DRS IRH NN TKV, WØQGI, KØDQI, DL4s XC YK, EI9Y, DeRidder DX Club, Motor City Radio Club, Newark News Radio Club, Northern California DX Club, Southern California DX Club and West Gulf DX Club direct your attention to these postal possibilities:

BV1USC, Maj. M. S. Arbogast, Army Sec. SFAAT, Unit 5, U. S. Army Elem. MAAG, Taiwan, APO 63, San Francisco, Calif.
CN8HA, Lt. Comdr. G. E. Olson, SC USN, Navy No. 214, Box 8, FPO, New York, N. Y.
DL4ADI, J. Bensler, 176th Sig. Co. (Rep.), APO 46, New York, N. Y.
ex-DL4DM, SFC C. S. Self, Aviation & Meteorological Det. 5, AEPG, Ft. Huachuca, Ariz.
ex-DL4FF, Capt. H. Z. Kaklikian, Hq. 16th Sig. Bn., Ft. Huachuca, Ariz.
DL4ID, M. Dorworth, 229th Sig. Co. (Spt.), APO 46, New York, N. Y.
ex-DL4RE, Maj. H. M. McDonald, Post Signal Officer, Ft. Hood, Texas
ex-DL4UI, CWO C. Thomas, Sig. Section, Ft. Harrison, Ind.
DL4USA, Hq. 160th Sig. Gp., APO 46, New York, N. Y.
DM3KPN, P. O. Box 145, Werdau, Germany (D.D.R.)
EA7FM, Box 479, Seville, Spain
EA8CP, Box 215, Santa Cruz de Tenerife, Canary Islands
ET2TO, H. T. Orr, 821 26th Ave. N.E., Minneapolis 18, Minn.
ex-F7CG, Maj. F. Ivey, Hq. 6th Army Sig. Section, Presidio of San Francisco, Calif.
FO8AP, Michel Brun, Papeete, Tahiti
FY7YI, Paul Canavy, Cayenne, French Guiana
HH5RL, Roland Lamy, Le Borgne, Haiti
HS1E, USA CAN Stn., APO 74, Box B, San Francisco, Calif.
K4AQL/KG6, M/Sgt W. Willis, 27th Comm. Sqdn., Box 163, APO 334, San Francisco, Calif.
ex-KA2AL (to K9ALM)
KA4AS (to KA4FT/KA7)
ex-KA4-5-7EB, Lt. E. A. Bates, U. S. Army Elem. NSA, Ft. Meade, Md.
KA4FT/KA7, F. A. Treadwell, U. S. Army Sig. Research Unit No. 3, APO 929, San Francisco, Calif.
KC6ZD (via W3ZJU)
KR6HP (to K2LEQ)
KR6JL (to W5ORH)
KR6JR, J. R. Hunt, 1962nd AACS Sqdn., Box 231, APO 239, San Francisco, Calif.
KX6CH (via K6GMQ)
LB9OE, R. Hansen, Halal Shipping Ltd., Camp Aden, Aden
MP4BCJ, S. J. Sabo, jr., 38 E. Munson Ave., Dover, N. J.
OA4BW/8 (to OA4BW)
OK3AB, Gajaua 7, Bratislava, Czechoslovakia
OQ5DG, M. H. Schaffner, 6443 E. Eberle, Lakewood, Calif.
PJ5AB (to W9OFO)
PY3AFO, N. C. Rockett, Arroio Grande, Rio G. do Sul, Brazil
SP5AA, E. Pokropek, Box 40, Warsaw 12, Poland
TG9MB (via TG9MG)
TG0AA (via TG9MG)
UA4KAB, Box 158, Stalingrad, U.S.S.R.
VK2AYY/LH (to VK2AYY)
VK4AL, E. Brown, Clontarf Beach P. O., Redcliffe, Queensland, Australia
ex-VK9JF (via VS1FJ)
VK9RR, R. Hooper, Box 56, Port Moresby, P. T.
VK0KT (W. Ks via W2SSC)
VP2AB, J. Brown, jr., P. O. Box 19, St. John's, Antigua
VP2DA (via W8VDJ)
VP5CB, MCB 7, FPO, New York, N. Y.
VP5RD, Box 21, Kingston 5, Jamaica
VP7BT (via VP7NM)
VP8CR, L. W. Barclay, 67 Oakleigh Park Dr., Leigh-on-Sea, Essex, England
VP8CV, P. O. Box 188, Port Stanley, Falkland Islands
VP8DF, P. O. Box 195, Port Stanley, Falkland Islands
VQ2FC, V. P. Cotton, P. O. Box 17, Broken Hill, No. Rhodesia
VR1C (via W7PHO)
VR4JB, P. O. Box 49, Honiara, Guadalcanal, Br. Solomons
VS9O (via RSGB)
XE1RM, J. A. Romero, Box 726, Guadalajara, Jal., Mexico
XEØDOT (to W6ATO)
ex-XW8AG, R. Maspimby, 9 rue Ornaud-Bernard, Toulouse (H.-G.), France
ex-YI3AA (to G3JFT)
YO3FN, N. Oneci, P. O. Box 11, Bucharest, Roumania
YVØAB (via KV4AA)
ZA1KC, Box 42, Tirana, Albania
ZB1RT, FASRON Special 201, Navy 240, Box 14, FPO, New York, N. Y.
ZD1EO, E. Owen, c/o Army P. O., Freetown, Sierra Leone
ZD1FG, A. Torrie, UNESCO, T. A. Mission, Teachers College, Hjala, Sierra Leone
ZD8JP (via RSGB)
ZL1ARB/mm, *HMS Rotoiti*, GPO, Auckland, N. Z.
ZL2GH, B. E. Attewell, 785 Childers Rd., Gisborne, N. Z.
ZP5HZ, c/o U. S. Embassy, Asuncion, Paraguay
ZP5MQ, c/o U. S. Embassy, Asuncion, Paraguay
ZS1O, J. F. Lategan, Box 17, Stellenbosch, C.P., So. Africa
3A2CF (via RSGB)
3V8BX, Box 303, Tunis, Tunisia

Whence:

Oceania — Further notes on K6BAZ's Polynesian patrol: "On November 10th we stopped at Fakarava atoll, roughly 16°S and 146°W. There I traded cigarettes, clothing and fishhooks for the use of a grass radio shack. I was set up in two hours, knocking off numerous W/Ks on 10 and 15 meters. Two days later we headed for Tahiti, truly the Jewel of the South Pacific, where I found the island's mains carrying 250-volt d.c. My 750-watt 110-volt a.c. putt-putt was worth its weight in pearls! Then it was back to the ship for more maritime-mobile QSOs while en route Rapa. Here it was impossible to land gear, so I operated aboard the *Baird*. Some 25 days later, after stops in Chile and Peru, we anchored off Easter. The many caves on the island are sacred to the natives so I settled for a tumbledown shanty for my CEØAG ham shack and QSOd one station after another, 15 to 17 hours per day, for the next three days — busy! Then, homeward bound." . . . . . Cocos correspondence from W3VKD has VK9JF dismantling in favor of probable VS2JF work. "Mike will leave his rig behind but it is not known if his replacement is interested in hamming. Meanwhile, VK9LE will be active on 28 Mc." . . . . . VR1C's return to the air was facilitated by a rig and v.f.o. courtesy WØGFQ, says W7PHO . . . . . W9IRH finds that KM6BJ formerly signed KH6ASG . . . . . "Other duties, a term in the hospital, power-supply troubles and the oppressive QSL burden have limited the activity of FW8AA," informs W8KML . . . . . KB6BJ (W3PZW) effuses to W1ZDP: "DXing is good out here. This morning I went up to No. 89 with VP7BT and a possibly phony HB1." Hi! . . . . . W6YY finds Macquarie adequately represented by VKØs KT and TC on 14 and 21 Mc., phone and c.w. . . . . KICBR discovers that Kent county, R. I., is at high premium for VKs and ZLs in search of WANE certifications . . . . . Check with ZL1s APM or TB for data on the Auckland Branch (NZART) Certificate newly available world wide. Briefly, the deal calls for contacts with 15 or more Auckland NZART members but, "No QSLs need be sent with applications if a confirmation is held by each Auckland station. If the applicant has not received a QSL we will endeavor to obtain one for him. Special stickers for 'all phone,' 'all c.w.,' and for each additional five stations will be supplied." Candidate ZL1s include BC CE DH DD GH GI GX HL IG LR LT LZ MQ MT OF QR RV TB TL UP UR VA VZ WE AAZ ACI ACP ADA AFI AFO AFW AFZ AHZ AIV AKU AMM APL and APM.

Amateurs of the Ukraine, in mid-1955, took the lead in dissolving a four-year Russian embargo on outside-the-Curtain QSOs. Two representative operators in the region are UB5TV (left) and OM Tura of club-collective station UB5KDK. UB5TV's Dnepropetrovsk station—exciter, final amplifier and HRO, left to right—is widely worked on several bands.
(Photos via W7DJU and W6YY)

Asia — Ex-YI3AA departs the restive Middle East and laments: "Tried for almost a year to get back on the air in Iraq but was informed that no more licenses will be issued. They also declare that the country's post office no longer will handle literature dealing with amateur radio." Meanwhile unorthodox HND9A continues activity on 20. Garry's next assignment may be North Africa where he hopes to concentrate on s.s.b. . . . UA0JF assures W6KG there is no Wrangel Island hamming at present. UAØKSI rumors notwithstanding . . . K4SCW (ex-D4ACI-KH6AVO) sailed an LCU from Rotterdam to Turkey where he will linger for a while. Dick has gear along but hamming authorization is doubtful. K4SCW, a ham since 1932, has his XYL enthused as K4TGI (ex-W5UGD-KH6AWL) . . . Pleasantry from W6YY: "VS1JF tells me he is going to the Maldives for a six-month RAF tour in the near future." . . . XW8AI chases Mississippi Fives for WAS purposes according to WGDXC, and W6YY finds neighbor XW8AJ also collecting States around 14,023 kc. . . . KR6RY, except for rebuilding sprees and typhoon sessions, has operated almost daily on 20 since September, 1956. George has an ARC-5 on 3.5 Mc. driving a DX-35 which pushes a grounded-grid 813 final at 400 watts. His receivers are a BC-1004 and an R-45, the antenna a 30-ft.-high ground-plane, and some new 10- and 15-meter radiators are on the drawing board. . . . Near-by KR6JR uses his old W5DKK layout, a 10-B exciter driving linear 813s in push-pull on c.w. and sideband, with telling effect . . . Regarding the Shiznoka-A certification mentioned on page 91, May *QST*, W7DJU specifies SARC candidates JA2s AP BP RY CQ DK DW FR GH HE JW JZ KB MZ NH RW SG TE TH UJ WB XZ YB and ZV . . . Not even an attractive prefix will turn the tide when the fates refuse to smile. HK7LX sighs, "I called BV1US every morning for a full month but he didn't come back. Still hoping!" . . . Notes on Yanks in Japan: "Practically all American forces now have been withdrawn from the KA4 area," writes KA4FT/KA7. "It probably will be four or five months before I can get quarters on my new base to get on the air as a KA7. We no longer can obtain licenses to operate from private rentals." . . . From KA9ME (K4BTE and W7NIO, proprietors): "We've been lucky with our DX-35 on 20 c.w. for the past four months, working some 55 countries and 38 United States. Operating here is loads of fun but the local Siberian QRM is *fierce*. We'll have a BC-610 soon and are erecting a four-wavelength Vee. Look for us around 14,030 kc.!" . . . Ex-KA4-5-7EB now returns to K3CJW. . . . KA2AL (K9ALM) terminates his APO 994 activities with a DX score of 127/109, plus phone WAC and WAS certifications. "Will miss those FB VK/ZL chin-waggings I enjoyed in Japan!" Bob expects to try DX life as K9ALM/5 for a spell . . . West Gulf DX Club gleanings from the Orient: XV5A, concluding his U.S.A. visit, plans to try a KWM-1 in Laos. No fun being rare DX when you're on the ITU-FCC taboo list! . . . CR9AH is outfitting CR8AC with a BC-342. . . . VS9O's Oman agenda stresses 21, 330-kc. phone operation with a kilowatt around 1800 GMT. . . . VS1FJ hopes to interest Indian nationals on the Nicobar Islands in amateur radio. . . . VS1HX is mulling over Spratleys Islands DXpeditionary possibilities . . . HKARTS confirms CR9AL's return to CT1BH.

Africa — From Eritrea, ex-DL4FF-KZ5TO communicates: "I'm on the air here as ET2TO and expect to be active during one month in every six." Tom inquires as to the ethics of "broadside" DX QSOs; *i.e.*, a DX station's calling CQ, scanning the band, logging all answers, answering with reports in chain-fashion; then repeating the process with another batch, etc. Offhand this would seem a DXpeditious way to handle pile-ups. But, as we all know so well, many an overanxious DX chaser calls rare DX merely because he hears others calling, banking on being able to tune in the rarity, or trusting that a prompter will nudge him if he scores. Page 46, February 1948 *QST*, warns: "Cards from stations known to practise such a business are very likely to bounce when turned in for awards." Have those RSTs acknowledged! . . . From W6YY's DX news bureau: "VQ8AQR, now VQ8AQ back on Mauritius, leaves only VQ8ASR on Rodriguez." John is shipping Chagos operative VQ8AJC a new v.f.o. to eliminate his present Rate 4 drift . . . CN8GU, when not tied up with ZD7SA QSL matters, fattens a strapping 194/92 DX tally amassed in five short Moroccan months. Ray tells W1BIII that ZD7SA expects to remain on St. Helena "for a long time." . . . Via W6RLP: "ZD1FG has his new 100-watter from England and will be back on the air when he receives a shipment of tubes from me for use in his prewar-style HRO. He'll be quite busy but expects to find time for some 20-meter phone and c.w. activity." . . . WGDXC DX detectives find that F2BR is none other than ex-FB8BR.

Europe — LA5HE writes W1TUW cheerily: "There will be two hams on Svalbard next year — LA2GD and a professional operator who has no ham ticket as yet." LA6CF aims for Bear at the same time . . . W1TYQ has the current HV1CN schedule as 0600-0640 GMT daily except Thursdays and Sundays, mainly 20 phone . . . W3GHS, a winner in the Munich EYMA 800th-anniversary competition, journeyed with XYL W3INL to Bavaria's beverage

CE3DZ becomes the first South American to join our exclusive "DXCC[2]" society, following in the footsteps of DL4ZC (W6KG), W4LVV and W6GPB (see p. 59, April 1957 QST). Alfredo's 100-plus QSLs from ARRL DX Century Club members in as many countries include souvenirs from WØMCF/C1, CE7AA, CM9AA, CN8MI, CP5EX, CRs 6AI 7BC, CTs 1JS 3AN, CX1FY, DL7AA, DU7SV, EAs 1BC 6AF 8BC 9AP ØAB, EI4X, ET2AB, F8BS, FA8IH, FE8AB, FF8AG, FG7XA, G6ZO, GC4LI, GI4RY, GM3SM, GW3ZV, HA4SA, HB9J, HC2KJ, HP1BR, HZ1HZ, I1AIV, IS1AHK, JA6AD, KGs 4AF 6ABI, KH6IJ, KL7PI, KP4CC, KR6SC, KS4AI, KV4AA, KZ5CP, LA7Y, LU7CD, LX1AS, MP4BBE, OA4AK, OE3VP, OH2RY, OK1FF, ON4-FQ, OQ5RA, OX3MG, OZ3FL, PAØGN, PKs 4DA 6HA, PY1AJ, SM5LL, ST2NG, SV1RX, TA3AA, TF3EA, TI2TG, UA9DN, UC2AA, VE7GI, VK2DI, VPs 2LU 6CDI 7NM 9BM, VQs 2GW 3HJP 4EI 8CB, VR2BZ, VSs 1GX 6AE 7NG, VU2JP, W6AM, YI3BZL, YO2BU, YU3EU, YV5AE, ZB1AJX, ZC4IP, ZDs 2DCP 6BX 9AA, ZE2JN, ZK2AA, ZL2GX, ZSs 2X 3K,4X4RE and 9S4AX. Any other DXCC[2] qualifiers out there?

center in late July as guests of the management. *Prosit, Fritz und fraul* . . . W1GKK finds W4SSG among those officiating at SVØWB DX festivities on Rhodes . . . Rather rare Russian areas noted workable by W1TS: UA3KGA, Orel; UA3YR, Bryansk; UA3KUA, Murmansk; UA6WA, Mahachkala, Dagestan; and UAØKIA, Magadan, Okhotsk . . . EI9Y, qualifying for DXCC-190 at W1WPO's DXCC desk, reports that a session of influenza and a sprained ankle complicated his rebuilding projects. Jim will use a Geloso v.f.o. to push a 5763 driving parallel 6146s. "Must continue to depend on my ground-plane — no room for beam types here." . . . SP4JF's 180-watt 6146s and long-wire antenna beat a loud tattoo on 20 where K6JAJ finds Tad ever ready to chew the rag. SP4JF was a BC station in Bialystok and is the most active DXer in Poland's rarest call area . . . While visiting in Spain WØELA was grieved to learn of the passing of EA4BH-EA9DD. Luis's son Alberto now studies radio with a view toward perpetuating his father's call on DX bands. WØELA further learned that ex-EA9DC holds out somewhere in the Canaries. . . . W1FII, another visitor to Spain, headed back toward Rhode Island via France, Italy, Austria, Switzerland, Liechtenstein, Germany and other stops. Marty encountered 10-meter man CX8BM in Madrid and heard that EA9s not located in Ceuta or Melilla may become CN9s . . . A W8FAZ translation of Russia's *Radio* specifies these requirements for Master of Amateur Radio Sport, Short Waves: "Take first or second place in DOSAAF SSSR championship or in unionwide and international competitions; twice in three years take third place in the same tests; establish a new unionwide record; conduct two-way radio contacts with amateur stations of fifteen union republics in three hours, and 100 oblasts in 12 hours; conduct 300 two-way radio contacts with not less than 100 different contestants in 12 hours; uncover two hidden transmitters operating in the 80-meter band and located not less than four kilometers from the starting place in a time of not more than 60 minutes." Numerous subordinate titles requiring lesser communications skills also are available . . . W3RPG offers mimeographed copies of OH2YV's AHC specifications (see p. 76, April *QST*), asking only for s.a.s.e. or just stamps to cover mailing . . . W1CTW advises that ex-AG2AF now leaves the National Co. in favor of France . . . DM3KPN drops over to Lychen now and then with a portable rig to help make the rare "C" district available to WADM hunters. This month he may do it again, according to W9DRS's correspondence. You'll find only two resident "C" DMs in

(Continued on page 146)

YL News and Views

CONDUCTED BY ELEANOR WILSON*, W1QON

YL Certificates and How to Obtain Them

Interest of both YLs and OMs in awards and certificates issued by YL clubs and nets continues to grow. In an article which appeared in July, 1957, *QST*, Phil Simmons, W1ZDP, listed 60 certificates and awards issued by various clubs and groups which are available to all amateurs. The information which follows here is concerned with certificates available to YLs and OMs which are issued by *YL* clubs only.

Space limitations preclude giving complete rules for each certificate, but sufficient information is given to help you trace details on the particular ones which may appeal to you.

YLRL Awards

The best known YL awards are those issued by the Young Ladies Radio League — namely, YL-WAS, YL-WAC, and the YL Century Certificate. A few months ago the YLRL augmented the popular three with the addition of the DX-YL award. Complete rules for the YLCC, YL-WAS, and YL-WAC awards may be found in the YL column for September 1957, with the detailed rules for the DX-YL award announced for the first time in the May 1958 column.

YL Century Certificate — The YLRL requires proof of contact with 100 licensed YL operators anywhere in the world. All contacts must be made from the same QTH or within a 25 mile radius. Endorsements are issued for confirmed contacts with each additional 25 YLs. Award custodian is Katherine Johnson, W4SGD, Box 666, Fuquay Springs, No. Carolina.

YL Worked All States — Proof of contact with a licensed YL operator in each of the 48 states is required. This award parallels the ARRL's WAS. QSLs should be sent to Grace Ryden, W9GME 2054 No. Lincoln Ave., Chicago 14, Ill.

YL Worked All Continents — Proof of contact with a YL in each of the six continents should be sent to Barbara Houston, KØLYV, 1385 Northview Drive, Marion, Iowa.

DX-YL Award — Issued to YLs only. A YL who contacts 25 other licensed women operators outside of her own country on or after April 1, 1958, is eligible. A copy of the log of contacts should be sent to Kay Anderson, W4BLR, 5210 Raleigh Road, Richmond 23, Va. QSLs not necessary. Stickers issued for each 10 additional contacts.

Unless specifically stated otherwise, the YLRL awards (excepting the DX-YL award) and all of the certificates that follow are issued to all amateurs, YL and OM.

Club Certificates

East:

RIYL Certificate (Rhode Island YL Club) — Contact any ten YLs in Rhode Island. Send confirming QSLs to Ruth Sherman, W1WED, 128 Massasoit Drive, Warwick, R. I.

Penn-Jersey YL Club Certificate — issued to U. S. hams for contacts with 10 club members. Foreign stations must work only 5 members. Send list of stations worked with name, date, time, and band to Carolyn Currens, W3GTC, P. O. Box 523, Norristown, Pennsylvania.

Georgia Peach YL Certificate — Contact 10 members of the Georgia Peaches YLRC. Send proof of contact to Peggy Butterfield, K4KKR, 2203 Terry Mill Rd., Atlanta, Ga.

Floridora YL Certificate — Contact 10 club members (not during net time). QSLs should be sent to Shirley Hill, W4WPD, P.O. Box 11185, Produce Station, Tampa, Fla.

Mid-West;

LARK Certificate (Ladies Amateur Radio Klub of Chicago) — Contact 10 LARKs (resident, non-resident, or honorary members). Send list of contacts, dates made, and frequencies used to Gladys Jones, W9MYC, 4232 Hampton Ave., Western Springs, Ill.

HAWK Certificate is issued by the new Hoosier Amateur Radio Klub of Indiana to any amateur who works 10 members. Cross-band operation or contacts made during nets not valid. Send QSLs to Adah Elliott, W9RTH, 721 Centennial St., Seymour, Ind.

TYLRUN Certificate — The Texas YL Round-Up Net offers its YL-OM certificate to any YL or OM who confirms contacts with 25 full members of the net. Contacts made during regular net meetings will not count. QSLs should be sent to Helen Douglas, W5LGY, 1501 Monroe St., Commerce, Texas. Stickers given for additional 25 contacts.

YL-OM 10CC Certificate — offered by the Texas YL Round-Up Net to YLs only. YLs must contact 1000 different licensed male operators. QSLs not necessary — send a list of the 1000 contacts, verified in writing by three licensed amateurs, to Lyn Ohlson, W5RYX, 7614 Maxwell Ave., Dallas 17, Texas.

GAYLARK Certificate — A brand new certificate offered

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

Interested in amateur awards, Susi Liebig, DJ2YL, of Braunschweig, Germany, has for a starter collection DXCC, WAC, DUF, WASM, S6S, and a certificate from Paraguay. In the last ARRL DX contest, Susi worked more than 300 W and VE stations. She has been operating since 1953, primarily DXing on 10, 15, and 20.

by the Gulf Area YLARKlub. Send log data of contact with six GAYLARKs to Phyllis Riblet, W5CXM, 8902 Ilona Lane, Houston 25, Texas. Contacts with members valid after 1-28-58. Include 10¢ for handling.

West;

Chirp-tificate is offered by the Camellia Capital Chirps YL Club of Sacramento, Calif., upon confirmation of contact with six club members. Send application to Wanda Gluck, W6ENK, 7317 Walnut Rd., Fair Oaks, Calif.

Lads N' Lassies Certificate — The Los Angeles YLRC offers this certificate (one of the oldest of the YL club certificates) to any amateur upon proof of contact with 10 members of the club. Send QSLs to Gilda Shoblo, W6KER, 3715 Liberty Blvd., South Gate, Calif.

Others:

WAYL (Worked All YL) — The South African Woman's Radio Club offers this certificate to any amateur who has worked YLs in ZS, ZE, CR, VQ, and OQ lands since July 1, 1952. Amateurs outside the mentioned countries need only 10 QSLs for confirmation. Stickers are issued for additional 20 and 50 confirmations. Send QSLs to Mrs. Margery Snyman, ZS1RM, P. O. Box 80, Strand, Cape Province, Union of South Africa.

Triple K (Key Keen Klub) is a new certificate issued by the South African Woman's Radio Club to YLs only (anywhere in world) for c.w. contacts. Proof is required of 100 contacts using International Morse Code. A certificate with one sticker lettered "K" will be issued if the log submitted is in order. Two additional "Ks" will be issued for additional 500 and 1000 c.w. contacts. Apply to WAYL Custodian ZS1RM.

PARKA Certificate issued by the Polar Amateur Radio Klub of Alaska. Submit proof of contact with seven members of PARKA (cross band contacts not accepted) to Geraldine Nichols, KL7ALZ, Box 4017, Spenard, Alaska.

Grandmothers' Certificate — a new certificate issued to any amateur who contacts 10 or more YLs who are grandmothers or great grandmothers. Send list of stations worked, frequencies, and dates to Mary Meyer, W9RUJ, 16520 Patricia Lane, Brookfield, Wisconsin. (All YLs who are grandmothers are invited to register with W9RUJ — no dues.)

SWOOP (Suffering Wives of Operators' Protectorate) — The San Francisco YLRC sponsors this organization designed to make XYLs feel welcome at hamfests and conventions. SWOOP certificates for distribution to XYLs at such events may be obtained from Esther Given, W6BDE, P. O. Box 84, Montara, Calif.

Many of the clubs require that postage for the return of QSLs to the applicant be included when application for an award is made. Write to the custodians listed with the individual certificates for more detailed information.

National Convention Coming Up

August 15, 16, and 17 are the fast approaching big dates for the ARRL Tenth National Convention in Washington, D. C. There is still time to make plans to attend the affair, if you hurry. Pre-registration prices terminate Aug. 1.

Chairman of the YL Program, John DeBardeleben, W3CN, and his committee of Washington Area YLRC members have planned a program which they feel should well please all of the YLs and XYLs who attend. Events for the ladies include special breakfasts, luncheons, teas, and dinner-dances, a wide choice of sightseeing tours (one to the White House), bridge parties, two fashion shows, one American and one Chinese, and a non-radio hobby exhibit. For licensed YLs there will be a special YLRL Forum with several guest speakers, and undoubtedly they will want to take in many of the general amateur sessions.

A nursery for small children will be available at the Sheraton-Park Hotel, scene of the Convention. YLs will operate amateur stations set up at the nursery and at Ladies Headquarters to expedite locating possible lost harmonics and friends.

One lucky lady conventionnaire will go home with a mink scarf!

The general registration fee for ladies is $7.50 ($5.00 before Aug. 1). Checks should be made payable to the Federation of Radio Amateur Clubs, Inc. and mailed to P. O. Box 3726, Washington 7, D. C. Fees for tours, special breakfasts, luncheons, etc. may be paid upon registering in person at the hotel.

CU there!

Mrs. Floy B. Norman, K5LOV, of Gallup, N. Mexico, reaped some nice publicity for ham radio recently when articles appeared in N. Mex. newspapers publicizing the schedules she keeps daily with her son W5CIN in Farmington. A member of MARS, Mrs. Norman works in the Bureau of Indian Affairs in Gallup.

The President of the new Hoosier ARK, Adah Elliott, W9RTH, welcomes YLs to club membership. An affiliate of the Indiana Radio Club Council and the YLRL, the HAWKs meet three times annually with dues at $2.50 for Indiana YLs and $2.00 for out-of-staters. Formerly WØRTH, Adah has been on c.w. since 1941. She's EC for Seymour, Indiana.

Dorie Silva, ex W7VYG of Oregon, is now K6UZA of Paradise (Calif.). The XYL of W6VXC, Dorie is Secretary of the Camellia Capital Chirps YL Club of Sacramento. She operates on several bands from her garage shack.

Left: A YL's dream come true—working DX on the beautiful tropical isle of Samoa. Stateside operators will recognize KS6AF as Evelyn Scott, ex W6NZP, now K6KGM, of Long Beach, Calif. Under the shade of coconut palms at Pago Pago, Evelyn worked 15 and 20 meters at every opportunity before moving on to more DXing from New Guinea and Australia. Right: Estelle Black, KN5MTF, of Dallas, spends all spare minutes on 40 c.w.—7.196 Mc. to be exact. Since becoming a Novice, Estelle has worked 40 states but wonders how she's done it, for she definitely prefers long ragchews to quickie QSOs. A member of WHOOT (Dallas YL club), Estelle's daughter is K5EGB and son-in-law is W5WKH.

KEEPING UP WITH THE GIRLS

Three more YLs were added to the DXCC roster in May, according to W1WPO of Hdqtrs. Chata, W1RLQ, Dora, K4CYF, and Dena, W5DRI, made the grade. . . . New officers of the South African Woman's Radio Club are Pres. and Editress ZS6YL; V.P. ZS6AIL; Secy. ZS6GH; Asst. Editress ZS6KK; Contests and Awards ZS1RM. . . . Some So. African YLs heard regularly on DX bands are ZS4HZ, ZS5s AD, BP, FN, GJ, and ZS6VI, Votie, a new YL who is sightless. . . . Fifty-five YLs registered at the Oregon Amateur Radio Convention held in Salem, Oregon, on May 3 and 4. Forty-one at the YL luncheon heard YLRL President, Beth Taylor, W7NJS, give a history of the club and an account of present and proposed activities. . . . Wanda, K6ENK, takes over editor duties of *YLRL Harmonics* from Betty, W9STR. . . . Helen, W1HOY, lacks only New Mexico and Idaho for WAS on 6 meters. . . . There are about 60 YLs in DL land, according to a check by DJ1TE, Christe. . . . Martha Edwards, ex W6QYL, is now OD5CH in Lebanon. . . . While studying nursing in Illinois, Jeanne, W8UVV/9, keeps skeds with her mother Wave, W8FPT, in Michigan. . . . The only active YL in Poland is SP5YL. Sophia, age 23, is studying engineering in Warsaw and has been active on 15 and 20 meters since May 1957. . . . ZS6KK, Marie, won both the phone and c.w. trophies in the South African Radio League Contest. . . . The Camellia Capital Chirps are preparing a cookbook of recipes submitted by YLs the world over. . . . CE4EV, Harriet, is returning to the States after four years "temporary residence" in Chile. . . . K2CUQ, Evelyn, is active in the N.Y.S. CD Radiological Information Net. . . . We regret to report the passing of Manila Beebe, W7JWC, the XYL of W7IGM. Manila was licensed in 1946 and had many friends around the world.

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K6POG relates that K6PGO, K6OPG, and K6POG are all YLS and that both K6OPG and K6PGO are "Mary."

New officers of the Chicago YLRL are (left to right) Secy-Treasurer, Peggy, K9GUB; Pres. Lillian, K9JVL; and V. Pres. Charlene, K9CMZ. K9JVL also replaces June, K9CQF, as editor of the club paper *Queen's Key*. Members have their own club station, W9DEQ, at the Gompers Park Field House, 4222 West Foster Ave., Chicago.

August, 1933

. . . Technical articles: A Simple 1750-Kc. Auxiliary Transmitter, New Pentagrid Tubes and Coil-Switching in the Amateur-Band Superhet, "Five-and-Ten" Oscillator-Amplifiers Transmitters, The Tool-Box 56-Mc. Transceiver, Modernizing the Long-Wave Receiver, Automatic Overload Protection and Push Button Control, and several pages of ideas for the experimenter.

. . . Operating Information: Ten-Meter Band Hot!, Amateur Radio at a Century of Progress (World's Fair), More on the new QSL Bureau system, descriptions of various amateur stations, IARU News, the Communications Department pages and Station Activities. Calls Heard, incidentally, showed that a number of the signals being heard on 28 Mc. were actually harmonics from 14-Mc. stations.

. . . New regulations were announced, with most changes effective Oct. 1. Phone privileges were extended, and pure d.c. required on 14 Mc. and below. Amateur mobile authorized on aircraft only, on 56 and 400 Mc. only. Class A, B and C licenses introduced, license term to be three years.

. . . Also of interest are the number of advertisers of 25 years ago that are still with us. Among them; reading from page 1 of the 1933 issue: Hammarlund, National, Candler, Port Arthur College, Walter Ashe and Collins Radio.

CONDUCTED BY EDWARD P. TILTON,* W1HDQ

ELSEWHERE in this issue will be found the full text of the ARRL petition to FCC for 100-kc. segments at the low end of the 50- and 144-Mc. bands for c.w. emission only. Also reproduced in its entirety is the *FCC Notice of Proposed Rule Making*, Docket 12485, which starts the legal machinery moving toward the establishment of these exclusive c.w. subbands.

As might be expected, opposition to this proposal has developed in some quarters, but we wonder if those who object to the idea of the c.w. segments understand fully the reasons for the ARRL request. If you are one of the objectors, please turn to "Happenings of the Month" in this issue, and read the ARRL petition and the FCC notice carefully. From these it should be obvious that this is no rehash of the old phone-c.w. argument. Narrow slices of our two most-used v.h.f. bands were not asked for in order to provide more territory for c.w. men. Though it is to be hoped that the subbands will result in more use of c.w. on 6 and 2, that is not the main objective in asking for them.

The principal reason for the c.w. segments is to make it possible for serious v.h.f. operators to do a more effective job in weak-signal communication. It is well known that c.w. has a tremendous advantage over phone in weak-signal work. So great is this advantage that a 10-watt c.w. station can work over as great a distance as a 500-watt a.m. phone. Surely we should do everything possible to take full advantage of this superiority. The catch is that to make c.w. pay off it must be free of competition from voice on the same or closely-adjacent frequencies. This is why we have exclusive c.w. segments in all our lower bands.

Why should we be so concerned with weak-signal communication? Every occupant of our v.h.f. bands should understand that he is using spectrum space that is subject to heavy pressure from other services. The day may come when we can make a good case for retention of our v.h.f. bands only if we can show that we have made the best possible use of them. The record of amateur radio in this respect is one in which we can all take pride. It shows that nearly all forms of long-distance propagation in the v.h.f. range were discovered and first exploited by amateurs. The worth of amateur radio data for scientific studies is widely recognized, but we cannot sit back and rest on our laurels forever. Our record in the future should be equally good. It can be, for there is much left for us to do.

*V.H.F. Editor, QST.

There are still many unknown or little-understood angles in the v.h.f. propagation picture, and amateur observations can be of real value in

1	WØZJB	11	W2IDZ	21	K6EDX	31	KØGQG
2	WØBJV	12	W1ILL	22	W5SFW	32	W7FFE
3	WØCJS	13	WØDZM	23	WØORE	33	WØPFP
4	W5AJG	14	WØHVW	24	W9ALU	34	W6BJI
5	W9ZHL	15	WØWKB	25	W8CMS	35	W2MEU
6	W9OCA	16	WØSMJ	26	WØMVG	36	W1CLS
7	W6OB	17	WØOGW	27	WØCNM	37	W6PUZ
8	WØINI	18	W7ERA	28	W1VNH	38	W7ILL
9	W1HDQ	19	W3OJU	29	WØOLY	39	WØDDX
10	W5MJD	20	W6TMI	30	W7HEA	40	WØDO

W1FOS	47	W4HHK	42	W7JPA	44	WØZTW	47
W1CGY	46	W4FNR	42	W7JRG	44	KØJJA	47
W1LSN	46	W4AKX	42	W7BOC	42	WØIBL	46
W1AEP	46	W4RFR	42	W7FIV	41	WØJOL	46
W1SUZ	46	K4DNG	41	W7CAM	40	WØUSQ	45
W1RFU	45	W4OXC	41	W7MKW	40	WØFKY	45
W1ELP	44	W4ZBQ	41	W7UFB	35	WØQVZ	45
W1KHL	44	K4GYZ	41	W7QDJ	34	KØAKJ	44
W1LGE	43					WØOFZ	44
W1FZ	43	W5VY	48			WØYJF	44
W1FVZ	41	W4LFQ	47	W8WPD	47	WØURQ	44
W1IKO	40	W5GNQ	46	W8NOH	47	WØBTG	43
W1CLH	40	W5EXZ	45	W8OJN	46	KØGKR	43
		W5VV	45	W8SQU	46	WØJHS	43
W2RGV	47	K5HVA	44	W8HXT	46	WØIPI	43
K2JNS	46	W5FSC	45	W8NQD	45	KØDXS	43
W2AMJ	46	W5ONS	45	W8UZ	45	WØWNU	42
W2BYM	46	W5JLY	45	W8RFW	45	KØCLJ	41
W2FHJ	46	W5ML	44	W8LPD	44	WØPKD	41
K2CBA	45	W5FXN	43	WBHJR	44		
W2SHV	45	W5JME	42	K8ACC	44	VE3AET	47
K2AXQ	43	W5CVW	41	W8ESZ	42	VE7CN	44
K2ITQ	43	W5FAL	41	K8CIC	42	VE1EF	42
K2ITP	43	W5HEZ	41	W8EVH	42	VE3AIB	37
K2LTW	41	W5BXA	41	W8YLS	41	KL7AUV	36
W2ORA	40	K5ABW	40	W8INQ	40	EI2W	35
K2VIX	40	K5CYK	40			VE3BX	33
				W9BRN	48	VE3BHQ	32
W3TIF	47	W6WNN	48	W9ZHB	48	VE1QY	32
W3KKN	45	W6UXN	48	W9QUV	48	VE1PQ	31
W3KMV	45	W6BAZ	48	W9VZP	47	VE2AOM	31
W3RUE	44	K6JCA	47	W9RQM	47	VE3DER	31
W3NKM	41	W6JKN	46	W9QKM	47	VE4HS	30
W3MQU	41	W6ANN	45	W9JFP	47	SM7ZN	29
W3MXW	41	W6NDP	45	W9DSP	46	CO2ZX	27
W3OTC	41	W6ABN	45	W9AAG	46	XE1GE	27
W3FPH	40	K6GTC	44	W9UIA	45	VE1WL	28
W3LFC	40	K6RNQ	43	W9UNS	45	PZ1AE	26
		W6GCG	43	W9MHP	43	ZS3G	25
W4AZC	47	K6HYY	43	W9SWH	43	SM6ANR	23
W4EQM	47	W6NIT	42	W9KLR	43	SM6BTT	23
W4UCH	47	W6IWS	41	K9EID	43	VE1ZR	23
W4UMF	47	W6CAN	40	W9MFH	43	VE3OJ	22
W4FBH	46	K6ERG	40	W9JCI	42	CO6WW	21
K4DJO	46	W6BWG	40	W9SWH	42	LA9T	20
W4EQR	46			W9EPT	41	LA7Y	18
W4LNG	45	W7BQX	47	W9IMG	41	KH6UK	17
W4CPZ	45	W7DYD	47			VQ2PL	16
W4FLW	45	W7INX	47	W9QIN	47	JA1AUH	16
W4MS	44	W7YJE	46	WØNFM	47	LU9MA	16
K4HOB	44	W7ACD	46	WØTKX	47	JA8BU	14
W4QN	44	W7FDJ	46	WØKYF	47	ZE2JV	12
						JA1AAT	12

future propagation studies. The ARRL IGY Propagation Research Project is currently providing a great reservoir of amateur communication data for this purpose, but we can do our best work only if we are able to exploit weak-signal possibilities to the fullest extent. This means consistent and widespread use of c.w. during marginal conditions.

Anyone who has attempted DX work on 50 Mc. recently knows that band occupancy has reached a point where the low edge (the most useful spot in the band for observing the beginning and ending times of openings, and their geographical distribution) is nearly always jammed with strong phone signals. How many more West Coast 50-Mc. men could have worked into Europe last winter, had not the signals of EI2W, CT1CO, and the LAs and SMs and other Europeans not been smeared by Ws crowding the low edge of the band on phone? How much oftener could Easterners have worked into Hawaii, had it not been for the mass of phone QRM on the signals of KH6NS and KH6UK? Might not many other American areas have worked into Japan, Australia or New Zealand, except that Ws were so busy working each other on voice, mostly in the first 100 kc.?

If we were concerned merely with open-hand conditions, the problem would not be so serious, for the percentage of time that our bands are open for DX is certainly small. Effective use of the c.w. segments need not wait for either 6 or 2 to be open. One of the most intriguing possibilities of our v.h.f. bands lies in the utilization of the various forms of scatter. These are available at any time or season. Tropospheric scatter is good for distances of 300 to 500 miles at any time, on both 6 and 2, if optimum c.w. techniques are employed. Ionospheric scatter is a practical matter for well-equipped 50-Mc. stations, and it works around the clock and calendar, over distances of 600 to 1200 miles. Meteor scatter is a c.w. operator's game, on either 50 or 144 Mc., but more so on the higher frequency. Moonbounce, if we are ever to get to it, is a c.w. proposition.

In all forms of band openings c.w. gets through first, and works longer, than voice. The fellow who gives up on either F_2 or sporadic-E skip when phone ceases to be readable misses the best part of the fun. The v.h.f. man who struggles in an attempt to copy the garbled voice of a distant station during an aurora is cutting himself off from the best that this weird form of communication has to offer. Yet all these marginal forms of communication can be done effectively on c.w. only on channels that are free of phone QRM.

We should have had such channels throughout the history of v.h.f. endeavor. It is of extreme importance that we have them now. There must be far more work in the world above 50 Mc. than chewing the rag and collecting QSL cards. We should lose no opportunity to build up the record of amateur accomplishment in our v.h.f. bands, as we may someday need it sorely in our continuing battle to maintain our rights to segments of the spectrum above 50 Mc. If narrow slices of both bands for the exclusive use of c.w. will help the cause along, they are a small price, indeed, to pay.

2-METER STANDINGS

		U. S.				U. S.	
States	*Areas*		*Miles*	*States*	*Areas*		*Miles*
W1REZ	28	8	1080	W5NDE	8	3	520
W1AZK	23	7	1205	W5FEK	8	2	580
W1KCS	22	7	1150	W5VY	7	3	1200
W1RFU	22	7	1120				
W1OAX	22	6	800	W6NLZ	9	3	2540
W1AJR	21	7	1130	W6DNG	9	3	1030
W1FZJ	21	6	1120	W6WSQ	8	4	1380
W1HDQ	20	6	1020	W6AJF	5	2	640
W1MMN	19	6	800	W6RRZ	4	2	360
W1IZY	18	6	750	W6PJA	4	3	1390
W1UIZ	17	5	680	W6ZL	3	2	1400
W1AFO	17	6	920	W6BAZ	3	2	400
W1ZJQ	17	6	800	W6MMU	3	2	388
W1PHR	16	6	780	W6ORS	3	2	365
W1BCN	16	5	650	W6LSB	2	2	360
W1KHL	16	5	540				
				W7VMP	11	5	1280
W2NLY	34	8	1390	W7LEE	6	3	1020
W2CXY	34	8	1200	W7JRG	4	3	1040
W2ORI	34	8	1200	W7LHL	4	2	1050
W2AZL	28	8	1050	W7JIP	4	2	900
K2GQI	27	7	950	W7JU	4	3	353
K2HEJ	24	7	1060	W7YZU	3	2	240
W2BLV	23	7	1020				
K2HOD	23	7	950	W8KAY	36	8	1020
W2DWJ	23	6	720	W8WXV	35	8	1200
W2OPQ	22	7	1050	W8LOF	31	8	1060
W2SMX	22	6	905	W8RMH	31	8	1000
W2AMJ	21	6	960	W8PT	31	8	985
K2CEH	21	8	910	W8SVI	30	8	1080
K2IXJ	21	6	925	W8SFG	30	8	100
W2CBB	21	6	800	W8WRN	28	8	680
W2LWI	20	6	700	W8EHW	27	8	860
W2AOC	20	6	770	W8SRW	27	7	850
W2PAU	20	6	880	W8BAX	26	8	950
W2RXG	20	6	700	W8JWV	25	8	940
W2UTH	19	7	880	W8ILC	25	8	800
W2AZP	19	7	650	W8LPD	25	8	750
W2RGV	19	6	720	W8DX	25	8	720
W2LHI	18	7	620	W8LCY	21	7	610
K2RLG	17	6	910	W8NOH	19	7	660
W2SHT	16	6	650	W8CZV	17	7	970
W2PCQ	16	5	650	W8RWW	17	7	630
W3RUE	30	8	950				
W3GKP	29	8	1020	W9KLR	38	8	1160
W3BGT	28	8	740	W9WOK	32	9	1050
W3TDF	27	8	880	W9GAB	32	9	1075
W3SGA	26	6	550	W9AAG	30	8	900
W3IBH	23	7	650	W9ZIH	29	8	830
W3FPH	21	8	—	W9RRM	27	8	850
W3KCA	21	7	—	W9UCH	27	8	750
W3LNA	20	7	720	W9EVJ	26	8	850
W3LZD	20	7	—	W9EQC	26	8	820
W3KWL	19	7	740	W9ZHL	25	8	760
W3NKM	19	8	660	W9EHX	24	7	725
W3BNC	18	7	750	W9BPV	23	7	1000
				W9UED	22	7	960
W4HJQ	35	8	1140	W9KPS	22	7	690
W4HHK	35	9	1280	W9PBP	20	8	820
W4AO	29	8	1100	W9MUD	19	7	640
W4LTU	27	8	1160	W9LF	19	6	—
W4UMF	27	8	1110	K9AQP	18	8	725
W4MKJ	24	8	725	W9ALU	18	7	800
W4JCJ	22	6	660	W9JGA	18	6	720
W4EQM	21	8	900	W9MBI	16	7	660
W4DWU	20	6	675	W9DDG	16	6	700
W4OLK	19	6	720	W9JIY	16	7	560
W4TLV	18	7	1000	W9LEE	16	6	780
W4JEV	18	7	850	W9DSP	15	6	760
W4IKZ	18	6	720				
W4VLA	17	7	825	W0IHD	27	7	890
W4WNH	17	7	750	W0GUD	25	7	1065
K4EUS	17	6	660	W0SMJ	24	8	1175
W4AIB	16	7	720	K0DOK	22	8	920
W4CLY	15	5	720	W0BFB	21	8	1060
W2BHS/4	14	7	650	W0INI	21	6	830
W4ZBU	14	5	800	W0TGC	21	8	—
W4TCR	14	5	720	W0RUF	19	7	700
W4SOP	13	5	680	W0UOP	18	6	—
W4CPZ	12	5	650	W0ONQ	16	6	1000
W4MDA	11	5	860	W0RYG	17	6	925
W4KCQ	11	5	860	W0ZJB	15	5	1200
W4KCQ	10	4	860	W0USG	14	6	750
W4LNG	10	4	800	W0IFS	14	5	—
W4GIS	9	2	335	W0QAC	14	5	725
				W0RYG	14	5	600
W5RCI	33	9	1215	W0MVG	13	5	700
W5DFU	25	9	1300	W0TJF	13	4	—
W5AJG	22	8	1280	W0IC	4	2	950
W5JWL	18	6	1150				
W5LPG	16	6	1000				
W5VKH	15	5	720	VE3DIR	26	8	925
W5MMW	14	5	700	VE3AIB	26	7	910
W5ML	14	4	760	VE3BQN	17	7	790
W5PZ	13	5	1255	VE3DER	16	7	820
W5KTD	13	5	900	VE3AQG	16	7	800
W5FSC	12	5	1390	VE3BPB	13	6	715
W5ABN	12	5	780	VE2AOK	12	5	550
W5QNL	10	5	1400	VE1QY	11	4	900
W5CVW	10	5	1180	VE7FJ	2	1	365
W5SWV	10	3	600	KH6UK	1	2	2540

Members of the Spartanburg (S. C.) Amateur Radio Club, with some of the 6-meter portable stations built recently as a club project. Equipment was used effectively in connection with the Peach Blossom Golf Tournament. Self-contained and operated from small dry batteries, they could be deployed anywhere on the course to supply a constant flow of information far more effectively than the 75-meter mobiles formerly used.

Front row, l to r: K4HDX, K4LML, K4INO, K4MYR, W4NTO. Back row: K4QZ4, K4BEW, Don Deakin, and K4LEI.

Here and There

Here's a really weird one that happened May 25. W5LFM, San Antonio, Texas, tells us that W5KRH and K5HVC worked JA1US and heard JA1OW on 50 Mc. from just before to a few minutes after midnight! Signals were weak, with rapid fading that is characteristic of transequatorial scatter. Their beams were aimed west, whereas the direct path of Japan would be northwest. The character of the signals suggests the TE mode, and inasmuch as Japanese stations have had considerable success with what might be called transequatorial backscatter, it would appear that something of this sort was responsible for these W5-JA contacts. This is typical of the kind of observations that make amateur radio data so valuable for propagation studies. One thing we can be sure of: just about anything can happen on 50 Mc., and if you are consistently active, and wide awake in the process, it can happen to you!

On 144 Mc. the big news in June was a tremendous tropospheric opening early in the month. W9GAB, Beloit, Wis., calls it the best for north-south work in his experience, bringing in Arkansas, Mississippi, Louisiana, Texas, Tennessee and West Virginia. W8BAX, Columbus, Ohio, reports Kansas, Minnesota and Nebraska worked June 3. It swung to the East June 4 and 5. W1RFU, Wilbraham, Mass., heard stations as far west as Wisconsin June 4. WØSMJ, Indianola, Iowa, picked up Maryland and West Virginia. K8AXU was operating from a 4000-foot elevation near Elkins, W. Va., for this one, the night of June 3, and he gave out many first contacts with his state. Among them was WØINI, Pleasant Hill, Mo.

W3GKP, Spencerville, Md., heard his first W8s before 1930 EST. W9GGH, Kenosha, Wis., was heard on s.s.b., S7, shortly after. W9WOK, Barrington, Ill., was heard at 2000 on voice, saying that the band was open for 350 (!) miles in all directions. He was worked on c.w. at 2004. WØSMJ was raised at 2045, for a new state for both, followed by KØEMQ, Cedar Rapids, at 2102. The next hour was spent in digging for new ones, and in sending QSTs regarding stations and frequencies. WØRUF, Ste. Genevieve, Mo., was heard S7 on voice at 2300. In the midst of a CQ he faded down too weak to read, and the next two hours were spent in frantic attempts to get him on c.w. Finally WØRUF heard W2CXY on c.w., and he changed over, working W2CXY, W4AO and W3GKP, in that order. Bill finally getting him for No. 29 at 0127. The following evening conditions were somewhat similar, but the opening did not extend so far south or west. KØEMQ and WØBFB, both in Iowas, were worked, but the band was full of W8s and 9s, mainly, through 2300 EST, when W3GKP called it a night.

W5KTD, Shreveport, La., began hearing DX from the north around 2130 CST June 3. He worked W9AAG, Woodhull, Ill., at 2135, W9WOK at 2158, W8PT, Benton Harbor, Mich., at 2205, W9REM, Downers Grove, Ill., at 2240, and KØEMQ, at 2314. All were worked on c.w., with signals running about 569, with little fading.

K2GQI, Matawan, N. J., reports WØBFB and WØRUF worked at 2330 and 0105 EST, respectively, for states No. 26 and 27. W1OAX, Coventry, Conn., spent a lot of time looking for W9s, but heard none. His best DX was W9NVK, Racine, Wis., worked at 0042 on the 5th, near the end of the 2-day session.

W8PT pushed his states total up to 31 with W5JWL, Gurdon, Ark., and W5KTD worked, beginning at 2205 EST on June 3. Also worked were W5LPG, Holly Sorings, Miss., WØVMN, Leon, Iowa, KØEMQ, WØUFP, Hutchinson, Kan., who used a 522 at 15 watts input, WØRUF, and WØEMS, Omaha, Neb. Jack heard 7 call areas in this one night, missing only W1, 6 and 7!

Almost lost in the noise connected with the best opening on 144 Mc. thus far in 1958 was the fact that early June was also the occasion of the first of the major daylight meteor showers, the June Perseids. Only results reported to date are successful skeds kept by W9GAB, Beloit, Wis., with W7-JRG, Billings, Mont., K4EUS, Chester, Va., and W1MMN, Orange, Vt. These put W9GAB into the select circle of 2-meter men having 9 call areas worked.

The life of a sideband enthusiast on the v.h.f. bands is no bed of roses. Take it from W5KPZ and K5BEL, who have been using s.s.b. on 50 Mc. for some months now. Both have made a few contacts, local and DX, but they find it discouraging that so few fellows recognize the signal for what it is, or make any effort to tune it in properly. K5BEL says that his contacts with W7MAH and K4EYE on 2-way s.s.b. have demonstrated the value of sideband for getting through under marginal conditions. W5KPZ and K5BEL make a practice of giving long calls when on s.s.b., so that anyone would who like to work them will have ample time to tune the signal in. They ask that you be on the watch for them, when 6 is open to the Dallas area.

Your conductor can vouch for the effectiveness of the s.s.b. at W7MAH, Reno, Nev. He was heard often during the F_2 season, and we occasionally tuned him in just to listen to the difference between his signal and that of the a.m. stations. When W7MAH went off, you could crank up the gain and hear a mass of heterodynes on the same channel, but when his s.s.b. rig was on there was nothing else audible on the frequency.

Quite a few d.s.b. signals are heard these days on 6, but a true evaluation of any of these has not yet been received. We hear K1ACD, Orange, Conn., giving his a workout frequently, but Jay says he, too, is having trouble finding anyone who will tune him in.

The densely populated area around Toronto has been good v.h.f. country for many years, but the coverage enjoyed by these VE3s has been largely confined to the area between the Great Lakes and across into adjacent U. S. call areas. Recently there has been growing interest in working up to the northeast, to Ottawa and Montreal. VE3BQN, Toronto, has been getting into Montreal regularly since he put his pair of 4X150As on 144 Mc., though hearing the VE2s has been another matter. To further this work, VE3BQN is keeping nightly schedules with VE2FF and other interested parties in that direction. He transmits nightly in a northeasterly direction at 1900 local time for 5 minutes, and then listens for a like period at 1905. His frequency is 144.217 Mc.

August Events

August is a big month for the v.h.f. fraternity. First, there's the National Convention in Washington, D. C., Aug. 15–17. The National Capital V.H.F. Society, as part of the Foundation of Amateur Radio Clubs, Inc., has charge of the v.h.f. program. Rick Emerson, W3OJU, promises that v.h.f. men will find plenty to interest them. See you there!

About the time you read this, v.h.f. men all over the Middle West will be taking off for Turkey Run State Park,

(*Continued on page 142*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
PHIL SIMMONS, W1ZDP, Asst. Comm. Mgr., C.W.

ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., Phone

Cogent Quotes. Every so often in the flow of operating reports and letters across the desk, comments pop up that seem significant even beyond the correspondence considered by itself. This month we propose to share a few of these comments with our readers to consider each and make of it what you may.

"Let's have a personal program for monitoring one's own signal. Most fellows surely wouldn't put out rotten signals if they knew how they sounded." — *Stan, W6ADB.*

For those who question what is *real* DX, let them realize that any country *you* haven't worked is DX for you.

W8KBL suggests more v.h.f. listening with the b.f.o. on. This locates carriers you can work, often DX, if you use a little c.w. W8KBL also says, "You stand a better chance of gaining code proficiency when you actually use it in your operating."

W9HOV in *Ham-Gab:* When they run out of contests, they will have a contest for those who have been in 25-or-more contests.

Listen much, transmit on the air no more than necessary. "I counted one ham CQing 23 times with his call but thrice. Such operating wastes time; those disgusted pass on to someone else."

WØUOL in *Midwest Relay* reviews some controversial aspects in the origins of the word "ham" and in conclusion: "Everyone knows ham radio as slang for the radio experimenter and operator. Let us look to the future, be proud of our name, and strive through our radio efforts to make it more esteemed to the public."

"I like the BPL card better than any other piece of wall paper I have." — *K4KNP.*

FCC Reports More Amateur Operator License Suspensions. Additional Public Information releases of the Federal Communications Commission provide details on current license suspensions. In connection with FCC actions taken the pertinent regulations may well rate review by other amateurs to avoid more citations and penalties.

We should also mention that during June three amateurs, additional to those listed, submitted their Conditional Class licenses for cancellation rather than appear for personal examination as they had been requested to do by the Commission under the provisions of Sec. 12.45(a) of the amateur rules.

FCC ordered (May 13, 1958) that the Novice Class amateur operator license of Steve S. Sampson, San Francisco, California, be suspended until July 22, 1958, his license to be returned to the offices of FCC at Washington for the period of his suspension, *it appearing that the licensee* on numerous occasions and particularly on Jan. 7, 1958, operated his station WN6QOR in the 3.5 and 7 Mc. bands using A-3 emission contrary to the terms of his license, in violation of Sec. 12.23 and 12.28 of FCC rules, *it further appearing* that said licensee (1) sent call signs not assigned by proper authority to his station, in violation of Sec. 12.158 of FCC rules, and (2) that while engaged in operating on Jan. 7 he did not have in his possession, or posted in his radio station, his amateur radio operator and station licenses, a violation of Sec. 12.25 and 12.68 of FCC rules.

FCC ordered (May 22, 1958) that the Technical Class amateur operator license of Harvey J. Beaudry, Jr., Oakland, California, be suspended for a period of three months *it appearing that the licensee* on various occasions between July 31, '57 when his Novice Class license KN9ELS expired and Nov. 14, '57 when he was granted a Technical Class amateur license, operated an unlicensed radio station in the 3.5–4 Mc. band using A-3 emission and the self-assigned call K9ELS/6, violating Sec. 301 and 318 of the Communications Act, *it further appearing* (1) that after receiving Technician Class license K9ELS, he operated on various occasions using A-3 on the 3.5–4 Mc. band contrary to the license terms, violating Sec. 12.23 and 12.28 of FCC rules and (2) that he failed to keep a complete and proper log, violating Sec. 12.136 and (3) that he operated *at a fixed location other than that authorized in his station license,* a violation of Sec. 12.64 and 12.93, FCC rules.

FCC ordered (May 22, '58) that the Technician Class amateur operator license of Gary B. Jones be suspended for a period of three months, *it appearing that the licensee* on various occasions June 9, '57 to July 17, '57 operated an unlicensed radio station in the 3.5–4 and 7–7.3 Mc. bands using A-3 emission and the self-assigned call W6EBU, a violation of Sec. 301 and 318 of the Communications Act. *It further appearing* (1) that after obtaining Technician Class license W6QDJ he on various occasions operated A-3 in the 3.5 and 7 Mc. bands contrary to his license terms in violation of Sec. 12.23 and 12.28 FCC rules and (2) that he operated his amateur station at a fixed location different from that authorized in the station license, violating Sec. 12.64 and 12.93 FCC rules.

FCC ordered (May 16, '58) that the Technician Class amateur operator license of John L. McPherson, Jackson, Miss., be suspended until Oct. 22, 1961 (3½ years) his amateur operator license (of K6UXD) to be turned in to the FCC, it appearing (1) that FCC issued to B. L. Pedersen, San Fernando, Calif. a Novice Class operator-station license KN6UXC and Technician Class license K6UXC and *it further appearing* (1) that these licenses were issued by FCC on the basis of information and statements in the application and certifications which were false and (2) that B. L. Pedersen did not execute and file with FCC the applications, nor take the code examination Sept. 13, '56 as certified and (3) that John L. McPherson did on Sept. 13, '56 and other occasions, participate in arrangements wherein by fraudulent means, in violation of Sec. 12.162, the above-mentioned licenses were issued.

FCC ordered (May 22, '58) that the Technician Class amateur operator license of Harold W. Casto, Mountain View, Cal., be suspended for a period of three months, his license returnable to FCC for the period of the suspension, *it appearing that the licensee* during the period July 7 to July 18, '57 operated an unlicensed radio station, using A-3 in the 3.5 and 7 Mc. bands and the self-assigned call sign KØCQA, a violation of Sec. 301 and 318 of the Communications Act and *it further appearing* (1) that after obtaining Technician Class license W6QCU he operated his station using A-3 in the 3.5 and 7 Mc. bands contrary to this

license, violating Sec. 12.23 and 12.28 FCC rules and (2) that he operated his amateur station at a fixed location other than that authorized in his station license, violating Sec. 12.64 and 12.93.

— *F. E. H.*

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for May traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W2KEB	301	1785	1348	343	3777
W3CUL	203	1091	1224	147	2665
W6IAB	49	1259	1054	205	2567
W7BA	14	1016	986	29	2045
W0SCA	36	920	903	4	1863
W8UPH	25	681	615	62	1383
W0CPI	6	654	614	40	1314
W9CXY	6	645	624	21	1296
W0PZO	2	652	637	3	1294
W4PL	14	624	596	19	1253
W5RCF	12	572	513	59	1156
W9DO	18	535	506	47	1106
W9NZZ	244	407	0	405	1056
W1UEQ	669	139	90	44	942
W0LGG	32	463	421	26	942
W0LCX	30	452	423	29	934
W0OHJ	2	465	457	8	932
W0BDR	5	494	401	19	919
W6GYH	259	312	288	6	865
K6HLR	55	386	308	73	822
W0IA	22	379	366	5	782
K2PHF	336	232	191	1	760
W7PGY	38	361	313	42	754
K9GDF	97	326	275	46	744
W0BLL	1	367	364	1	733
W9GAR	3	333	332	4	672
K5FPA	14	314	300	7	635
W6ZJB	183	271	121	40	615
K0CLS	92	269	226	15	602
W6GQY	349	120	49	76	594
W1YRC	19	282	257	28	586
W0BPJ	3	291	287	4	585
W1EMG	2	290	264	23	579
K4ELG	33	262	223	39	557
W0TOL	54	286	204	9	553
K6GK	3	266	150	116	535
W5FPI	12	252	240	28	532
W4QDY	209	167	118	36	530
W0KQD	58	236	209	27	530
W4IWM	8	256	237	19	520
W4WQT	256	4	256	4	520
K9GDQ	31	245	204	40	520
K2SIL	46	243	206	21	516
K4ONQ	17	249	235	12	513
K4DSN	31	240	233	7	511
K4SJH	32	263	195	19	509
Late Reports:					
W0PZO (Apr.)	6	791	754	14	1565
W7APF (Apr.)	16	463	463	0	942
W0IA (Apr.)	28	325	322	2	677

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
K6MCA	145	541	563	10	1259

BPL for 100 or more *originations-plus-deliveries*

K6GZ	276	W4SHJ	119	K0LNQ	104
K1BCS	249	W9PCQ	119	W0VPQ	104
W5ZIN	149	K2QRW	114	W1YRH	103
K2UTV	142	K4AVU	110	W1EAE	102
W2BVE	136	K4HQK	110	W6YDK	102
K2RKL	130	W9ETM	109	W1CMH	101
W8CWE	130	K6YBV	107	K0JCF	101
K4KBT	127	W0QVN	106	Late Report:	
K0IDV	124	W4PED	105	K9GDQ (Apr.)	134
W8WGU	122	K2VIX	104		

More-Than-One-Operator Stations

KGIDT 249	K2HHJ/2 153	K4OSQ	101
	W1AW 133		

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W1BTV, W1FYF, K2SIL, K4SJH, W5DWB, K5MZS, K6YBV, K0GCN, KN0MMZ, W0SCT.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

RTTY NOTES

The East Coast RTTY Net meets with W1BGW as NCS, 3620 kc. 7 P.M. EDST each Wednesday. Before the net opens 15 seconds of "mark" are sent by the NCS with request for all stations to zero beat the net frequency.

Weekly meetings of the Forty RTTY Net are at 2 P.M. CDST Sundays, 7140 kc. Stations are called in order, any messages to be indicated on responding. After roll call traffic exchanges are directed by NCS W0BP. Bulletins of amateur interest and a round-table ragchew follow. A score of stations are active in each of these nets. Several licensing areas report into the 7-Mc. TTY net. W0BP has reminded netters to note times and frequencies of section nets that operate daily in the ARRL National Traffic System to permit free transfer of any traffic in and out of the RTTY net. Members in the far west can report in on 21,090 kc.

The Twin City "RATS" have elected W0HZR the "Quick Brown Fox," W0AUS "Lazy Dog" and W0LFI "RY" for the year. The group welcomes visitors at meetings, which will be held on each second Monday starting in September.

Tests have been conducted from W0BP using 850 cycles compared with narrow shifts. A surprising number of operators using straddle-tuned receivers, mark and space half the total shift each side of their 2550-cycle filter midpoint, report satisfactory printing. Further shift-reduction runs are planned. 170 cycles, one-fifth the customary f.s.k., is the most popular narrow shift when stability problems are considered.

Early contacts by KR6GF were with KR6JL and W0BP. A new radio-letter amateur radio RTTY service came about from a KL7OOT-W0BP relay of long-tape punchings (Model 19 on 14.32 Mc.) and from 400 miles inside the Arctic Circle.

W9BQC/9 put on a fine demonstration at the Starved Rock, Illinois Hamfest, and W9s ROQ QKE SPT GLR WMR were on deck there for the Sunday Net. Speaking of demonstrations, an excellent RTTY showing was made by W6PHS/6 at the Pacific Division Convention at Fresno in early June. W6CQI/6 was on from Palo Alto, with W6MXJ and K6OUR of San Francisco, W6ASJ of Piedmont, and W6VPC on from Oakland. Lots of visitor traffic was handled and that for San Francisco and Oakland was relayed on the 147.29-Mc. channel. The Northern California Amateur Radio Teletype Society, with over 80 members, now has distributed over 300 Model 26's. The Society's history and progress were recounted in a bulletin by President W6VVF, sent to the conventioners. W6s CBF FYM MTJ NRM CKQ, K6ZLB and others helped make the W6PHS/6 work a success.

VK3KF has been active Monday, Wednesday and Thursday on 21,090 kc., using a borrowed Model 15 and a tachometer to get the speed down around 368 o.p.m. W6KUY/MM aboard the SS *Pacific Transport* worked RTTY all the way across, docking at Yokohama June 14. KR6AK often works the gang starting at 0300 GMT, 21,080 kc.

The first two-way RTTY QSO between U.S.A. and Australia was recorded May 24 when VK3KF, with 100 watts on 21,083 kc., worked W6CG. He had worked KR6AK the previous day. The second and third contacts went to K6OWQ and W8GIG.

W3PYW and others in the Washington area have big plans in connection with the National Convention. All RTTY operators present are urged to get together at the RTTY dinner the evening of August 16.

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

Training Aids Notes

Our Training Aids section announces the availability of a new film Coded F-35 and titled "Get the Idea." This movie is another product of the Phil-Mont Mobile Radio Club, whose other production, "Every Single Minute," is also available to ARRL affiliated clubs.

"Get the Idea" presents some good basic conceptions on phone operating procedure, both commercial and amateur. We're certain affiliated club groups viewing this motion picture will find it very enjoyable and beneficial. It has sound, is black and white and runs approximately 17 minutes.

Now that we're getting plenty of material for this column (thanks, fellows!), we can start looking it over and getting a little choosy about what we use and when we use it. That's what happens, you know. When you get prosperous, you get particular.

The working informal policy we have used is to give highest priority to reports of amateur participation in actual communications emergencies. When the emergency is widespread and amateur participation extensive, and illustrative material is available, we often are able to submit an upfront feature article on it. Reports on drills and special nonemergency activities come second, but when you include a usable picture it "ups" the priority to the extent that we may use the picture with a suitable caption. Other material, such as new ideas for organization, progress reports, reports of meetings or gatherings, take a third priority rating as a general rule.

In all material, we have to insist on using editorial prerogative in consonance with the space we have available. This space problem is a critical one. Some issues of *QST* have more space available than others, so occasionally we have to cut something out, or add something, depending on whether we have more or less space. We deplore interference from the simple mechanics of magazine editing, but this is a very practical problem and we have to deal with it.

You may think that it is very easy to draw the line between emergencies and non-emergencies, but this is not the case. It is sometimes very hard to determine whether an activity can be classified as emergency or not, and becomes harder every day as more and varied material is received. In recent and subsequent issues you will come across some typical examples. In one issue we had an emergency in which a boy was stung by a bee at a fair in which amateurs were helping out with communications. In another we had the rescue of a dog from a snowbound house. There have been plenty of examples of amateurs assisting in getting medicines for sick people, of assisting in searches for lost people, of locating missing persons, and even of collecting money for various causes, both good and questionable; also, of AREC or RACES groups alerted against the possibility of a communications emergency that never materialized. We remember one case where amateurs mobilized to assist a maritime mobile thought to be in distress in a storm until nearly the whole 75-meter band was in an uproar, only to discover later that the boat had never been in distress at all. His rig just hadn t been working. Was this an emergency? We thought not, but others argued very strongly that it was.

What we ought to do is formulate for ourselves a policy definition on just what constitutes a communications emergency, and then stick to it. This is hard to do, and often seems unfair. From a detached standpoint, a communications emergency would seem to be one in which normal (commercial) means of communication are not available or are overloaded, and in which amateurs provide communications facilities on a temporary basis until normal service can be restored or until the emergency is over, whichever is sooner. Two things are requisite: an emergency situation and a lack of communications. If either is lacking, it is not a communication emergency and does not deserve to be treated as such.

Such a policy may seem unfair when a group is alerted for a pending emergency and loses time and sleep in monitoring and preparing, only to have no communications emergency develop, while another group is not called into action until a communications emergency exists, then does a sloppy, makeshift, haphazard job of communications. The latter group has performed in a communications emergency, the former has not — but which group deserves the greatest credit?

As often as not, the information submitted is incomplete, inconclusive and incomprehensible. We don't require you to be journalists, but we do need all the facts: when, where, what, how and who? We're not interested in details of the emergency situation, except to know what it was; what we want to know about is what the *amateurs* did. And if what they did could have been accomplished just as well (or better) by commercial means (even if it does cost some money!), then it just wasn't really a communications emergency. This doesn't mean you shouldn't report it, only that it will take a lower priority in this column than those activities that qualify as communications emergencies.

Now that we are getting considerable material, we are going to get a little tougher about this distinction. We'll open up another category: the non-communications emergency. That is, the emergency in which amateurs participated by communicating, but in which their services weren't really required by the situation. If it isn't clear from the material you send in, we'll just assume that their services were *not* required. This should get us into a lot of interesting arguments, because we cannot engage in extensive inquiring correspondence on these subjects. We hope you'll make it clear, one way or the other, and that you'll check your reports to see that the five one-word interrogatives above are answered.

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The University of Connecticut Emergency Net had a good workout on April 21 when it was called upon to assist in a forest fire near the Mansfield Hollow Conservation Dam Basin. Two-meter portables were used to maintain communications with Storrs, 4½ miles north. *W1s* DHP and YWU handled the two portables on the scene. Several other operators, with their stations, stood by to help if needed. — *W1DHP, OPS Connecticut.*

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On May 3, AREC and RACES members in the Belleville, Ill., area, responded to a tornado alert. Mobiles were manned by *W9s* TWT UOR QDM RQR NXY BA and K9BTR. Radio Officer W9BA activated the Communications Center, assisted by Alternate RO W9RQR and by *W9s* JMY RSZ, *KN9s* LDN MHR. Out-of-town contact was effected by W9EVN and W9END when the twister struck Collinsville. Although damage was slight, there was need for emergency communications facilities. The communications center, serving Belleville, East St. Louis and St. Clair County operated under the call of K9KHN. — *W9BA, EC St. Clair Co., Ill.*

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A severe wind and rain storm along the South Shore of Nova Scotia on Apr. 2 disrupted communications facilities and brought the AREC into action. VE1ABJ and VE1LB handled train dispatch orders between Bridgewater and Middleton. Fifty-four messages were handled between Middleton and Lunenburg for Canadian National Telegraph and six to other points, through a hookup that included *VE1s* KE MA and VN. VE1DW handled Yarmouth traffic while VE1ADH looked after Halifax traffic. The operation was continuous from 1245 AST until 2130 AST at which time commercial communications were restored. — *VE1G.1, EC Western Nova Scotia.*

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After a very heavy rainfall on May 9, Nonconnah Creek in Memphis overflowed, disrupting communications. The Red Cross requested aid from the amateurs, and in a matter of minutes mobiles W4BAQ, K4CTA and W4WTJ were on the scene. W4EM was set up at headquarters and with K4KQM maintained communication with all units. A mobile was assigned to the fire station at Willow Road, which was used as boat headquarters, and one mobile was assigned to the CAP rescue unit. Other mobiles taking part were *W4s* JMB ADM CLQ WTI WBK YMG, *K4s* JSF LZR PPZ RGB UEB PYH VVL ASK EQX and BOM. Fixed stations included *W4s* JMB FRB, *K4s* EJU and GPZ.

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On May 23 at 1930, the Long Beach, Calif., Civil Defense Net was called upon to patrol the Signal Hill oil fire area. The fire department requested that the mobiles, operating on 29.4 Mc., patrol the Signal Hill area to keep out spectators, report any small fires, supply road blocks with material and communication and place in custody all vehicles which ran or avoided road blocks or in any other way endangered their lives or those of other personnel on the hill. Participating stations were *W6s* KQI ROJ ZVD, *K6s* CBN HAZ IPJ KYH PFM QBZ and YFG. — *K6KYH and W6RUC, EC Long Beach, Calif.*

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On June 4, W9JFS, hearing about the tornadoes in Wisconsin, contacted W9SAA in West Bend, Wis., to obtain further information for the Salvation Army, which he then gave to W9ZAD in Milwaukee for delivery to Salvation

Army headquarters at that point. Via amateur radio, contact was also maintained between Milwaukee, Chippewa Falls (Wis.) and Davenport (Iowa), also through W9JFS.

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On June 4, K6VDG heard K6YVB calling "CQ Emergency" on 6 meters. On answering the call, K6VDG was told that there was a car accident on the Hollywood Freeway and a lady was badly injured. Even while this information was being passed along, K6ZGK called the police and told them where to go. — *K6VDG.*

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The St. Paul, Minn., Mobile Radio Club was able to offer some valuable assistance during the extensive tornado activity in Wisconsin on June 5th and 6th. While KØGVX operated Red Cross headquarters station WØDKI in St. Paul, WØs PDN EZV GUS and HKF operated mobile in the disaster area, maintaining contact with WØDKI via W9FYS in River Falls, Wis. Much traffic was passed, both of an emergency and personal nature. EC WØPDN gives us the following additional list of amateurs who took part: *WØs* IPN EXC THY, *KØs* HUA GCN.

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On June 7, K5EOI and K5GHK assisted in obtaining a special antitoxin needed to save the life of an Air Force technical sergeant bitten by a coral snake. Information that the serum was needed came from W5JHS, and before long amateurs from Florida to Texas were calling their hospitals in an effort to obtain it. The needed medicine was finally located in New Orleans and flown by Navy jet to Eglin Air Force Base, Florida, in time to save the sergeant's life.

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Members of the Midwest V.H.F. Association (St. Louis area) were alerted for a number of tornadoes in April and May, but no emergency communication resulted. Nevertheless, the turnout for these alerts was always good; these fellows are *ready*, and we feel sorry for any tornado that dares show its ugly funnel around St. Louis. Operation, including most of the alerting, is all conducted on six meters. Such alerts (the real thing, not drills) were called on April 5 (26 participating), May 3 (29 participating), May 4 and May 31.

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On March 18 WØIRM, while driving to work, noticed a large dump truck on fire. He called KØBFS on the six meter net, who notified the fire department by landline. Once the firemen arrived at the fire scene, KØBFS provided communication between them and the chief in Mounds, for a very impressive demonstration of amateur radio emergency facilities.

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On April 19, 200 explorer scouts and senior girl scouts participated in the largest scout-c.d. drill ever conducted in the state of Illinois. The problem was a simulated atomic explosion in Waukegan, and scouts were dispatched on search and rescue missions. Each search party was equipped with hand-carried portables, plus mobiles on two and ten meters. Four amateurs and a number of restricted permitholders took part.

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The El Paso (Texas) 10-Meter Emergency Net mustered 35 members on a moment's notice in a simulated emergency test on April 28, spotting portable and mobile stations all over the city. K5DHL, net control, had established his own portable station at the control point within 45 minutes after the drill was called, and other portables were set up at strategic points. Messages from field stations to the mayor, the chief of police, officials of the fire department, Civil Air Patrol, CAA, newspapers, military reserve units and the Red Cross, said: "We are taking this opportunity to acquaint the City of El Paso with the fact that we are available with our 20 mobile units, five portable units and 30 fixed stations which are capable of keeping the city in constant communication day or night with any or all parts of the United States." Amateurs of the group canceled engagements, skipped dinner, got up from sickbeds and otherwise inconvenienced themselves to make the test a success.

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A school evacuation drill was the problem of 22 mobile units of the Pueblo, Colo., Amateur Radio Association on April 30. In addition to manning the control center, amateurs ranged far and wide to report on traffic tieups, transportation shortages and other problems. The drill was not an unqualified success from an over-all standpoint, but the communications facilities provided by the amateurs were exemplary.

The SWANI Radio Club of Woodstock, Ill., maintains an active RACES group and AREC organization under the direction of W9KMN (standing in picture) in full cooperation with both civil defense and Red Cross. Seated is K9DZF, SWANI club publicity director, at the controls of his rig.

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Cleveland is not especially noted for its serious emergencies, but nevertheless the Cuyahoga County AREC organization, under EC W8AEU, is one of the most active and efficient units in the country. Not only that, but each activity is fully reported. Here are a few of the highlights in recent months: On April 1, a demonstration for the boy scouts in which six amateurs participated. On April 16, a practice run for the severe weather network in which 88 stations took part in 34 communities on nine different networks on 2, 6 and 10 meters. On April 16, a fund drive of the American Cancer Society supported by 14 AREC mobiles and a portable station, all on 6 meters; 23 amateurs took part in this one.

On May 1 it was a parade celebrating Loyalty Day, in which the AREC supplied communications using 6 mobiles on 10 meters spread throughout the parade. A hand-carried unit was located in the lead car and later transferred to the reviewing stand, enabling the mayor to keep tabs on progress. Another such unit was at an elevated observation post to keep officials informed on parade quality. A fixed station stood by to furnish telephone communication in case of emergency, and this station was not idle. Thirteen AREC members participated in this one.

On May 30, another parade honored the National Guard. Nine amateurs took part using four mobiles, a hand-carried portable and a fixed station. And finally, on June 7, fourteen AREC members provided communications for a sports-car race, using nine mobiles, three hand-carried portables and one portable rig. Although temporary telephone lines were used, the AREC units were useful as back-up and in reporting from positions where telephones were not available.

Maybe the above will give some of our ECs who are trying to keep their AREC units active something to think about.

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While on a recent visit to New Mexico for the purpose of attending the Rocky Mountain Division ARRL Convention, it was our pleasure to observe some of the finest net operation we have ever heard in amateur circles. This was executed by the Caravan Club members who were set up at Santa Fe and on all approaches thereto to guide incoming conventioneers to the convention headquarters. Nothing particularly unique in this alone, although we must comment that it was exceptionally well executed and might well be a more common practice. What impressed us was the procedure used by the members of the Caravan Club in communication with each other. Although we cannot give any details at the moment (not enough room), in essence the procedure is clipped and to the point, leaving out all nonsense, wasted words and unnecessary transmissions. Procedural breaks and signals are used and observed by all;

but this did not prevent extension of courtesy to outside stations who broke in or to visiting mobiles not familiar with the procedure. The important aspect of this type of operation is less the details than the mien, which impelled even outside stations to make their transmissions short and to the point. We wish more amateur nets sounded like this.

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We received 25 April SEC reports, representing 6689 AREC members. This is an increase of three reports and about 500 AREC members over April of last year. What's more, five of the SECs reporting for April were from sections not previously reported in 1958: Western N. Y., N. C., E. Pa., Vt. and B. C. Other sections reporting for April: Md.-Del.-D.C., Conn., NYC-L.I., Ga., Santa Barbara, Tenn., E. Bay, Mont., Colo., Nev., N. M., Ala., San Joaquin Valley, E. Fla., Wis., N. Texas, S. Texas, Santa Clara Valley, Mich., Maritime.

RACES News

The May, 1958, issue of "The Monitor," a monthly paper published out of Dallas, Texas by W5RYP and W5ZYA, contains an interesting item on the Dallas RACES plan. This plan is comprehensive but still in proposal stages, but it is interesting and encouraging to know that the Dallas gang and some other Texas cities are starting the ball rolling even though there is as yet no coordinating state plan in existence. We wish the Dallas gang success in getting the plan approved to give greater stature to the state of Texas in the RACES program. So far, RACES is one thing Texas is not biggest in.

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Among the agencies asked to participate in the filming of the USO-Armed Forces Religious Emphasis Day in Philadelphia on April 20 was the Philadelphia Civil Defense Council, which was asked to provide mobile radio communications for the roving camera crews of the United States Army Pictorial Service. A RACES mobile was assigned to the director of the movie and other mobiles were dispatched as needed to points needing coverage. Although not a RACES drill as such, the activity was good practice and represented a real situation rather than a paper drill. The first mobile checked in at 0900 and the last checked out at 1815. Frequencies on the Phil-Mont Mobile Radio Club were used on ten meters, and that of the Mobile Sixers Radio Club on six meters. About ten RACES mobiles took part. — *W3PST, RO Philadelphia, Pa.*

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On May 1, WØDCW was designated to organize communications coverage for a C.D. drill involving the evacuation of school children from Jefferson County, Colo., to Glenwood Springs, 130 miles away, and return the next day. The main problem was to keep the children in contact with their parents. KØDCW set up control on forty meter phone and three mobiles accompanied the convoy to Glenwood Springs. Several fixed stations at each end and along the route also assisted in maintaining contact between the control station and the convoy mobiles. About 10 amateurs participated. Everyone proclaimed the operation a great success.

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The Peoria (Ill.) Civil Defense Director called K9YDY, net manager of the 12 County Support Area Net at 1855 on May 5, asking that he alert as many stations as possible in 45 minutes for a practice alert. At 1902 K9ESP was contacted and the ball started rolling until by 1940 twenty-four stations had reported in and seven mobiles were ready to roll anywhere needed. This drill was a complete surprise to everybody, so the showing of 24 out of 52 stations on the roster was considered a good one.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

These frequencies are employed throughout the United States by amateurs using radioteletype.

CALIFORNIA FLOOD EMERGENCY

Scattered reports indicate amateur operation during the floods of early April in California was quite extensive. There is more to come(we hope), but here's what we have so far.

The Turlock Amateur Radio Club and the Stanislaus County RACES organization set up an emergency control station at a school west of Turlock, using the call W6BXN and two-meter equipment. Operation started on April 5 and around-the-clock watches were maintained for several days. The first day private cars were used, but later the National Guard supplied jeeps and drivers. Services performed included communications connected with obtaining information for plotting the edge of the inundated area, measuring check points for the rise or fall of the water, helping people get transportation to leave the area, and many others.

In Redwood City, the South County Amateur Radio Society was asked to activate the control center and have mobiles patrol the Redwood City area, reporting flooded areas, washed out roads, blocked creeks, downed electric and telephone lines and hazards to life and property. The control center was activated at 1415, April 2. A mobile was dispatched to the home of K6TWH, who was instructed to activate the Red Cross station, K6OTR. This station broadcast an appeal to all amateurs for mobile equipment, and very shortly units began checking in. Communications links were established between police, fire, Red Cross and other services. Amateur radio operators from throughout the area called the NCS, offering their assistance and reporting flooding conditions in their areas. Several mobiles from other areas assisted, a total of 9 mobiles and 15 relay stations participating in the operation. Stations were released and net control closed operation at 0045, April 3. The county CD Director called the amateurs "the heart of our communications system." The following amateurs participated: *W6s* TYC, VQV AFV, *K6s* IEE MPN DZR RZF VIN QAX TKF HEG TWH LHV OEJ BXN UWM JTC TLD TNM, WN6WIG. — *K6IEE, RO, Redwood City, Calif.*

In East Contra Costa County, a state of emergency was declared on April 2. K6ILH and W6AIL called the AREC in for assistance. W6OHR, K6JAV and W6KLM, all mobile, made checks of the flood areas and reported to headquarters any high waters or floods that were not properly posted on the highways. Other amateurs who served as relief operators at the e.w. communications office included *W6s* QEN DEX, *K6s* KRF ZPB IMV AQ KYT and IRB. K6AXV stood by on 50 Mc. until midnight to receive traffic for his area. County officers estimated that amateurs increased the efficiency of communications operation by at least 25%, largely due to the jamming of facilities at the county offices by incoming calls. Other amateurs who participated: *W6s* LKE HOF PIR LGW FAR IHR RVC EFI KTF CGS FKX, WN6UFK, *K6s* AXV PIL POU OGU JAY RPY TPO ZWJ. — *W6LGW, EC East Contra Costa County, Calif.*

In Menlo Park, the c.d. net control station, K6YQT, came on the air at 2000, April 2. A mobile was kept near the banks of the creek and continuing reports were sent into the city as to the height of flood waters. This operation was handled on six meters by *K6s* MMT SVK KEV and GDH. At the same time a 2-meter link was established with W6WWJ, the Redwood City base station and with K6OTR, the Red Cross station. City officials expressed their satisfaction and gratification with the efficiency of the operation. — *K6GDH, Asst. EC, Menlo Park, Calif.*

From W6KZF's "Short-Ray-Vues" in Mission Trail Net's "Blazer," we have information of services performed during the emergency by that group; At 2141, April 2, W6NTU advised W6CXO that three people had called to him for help across a raging stream. W6CXO (W6JWF operating) telephoned the Alameda County Sheriff's Office, which dispatched rescue units. These units approached from a direction that would make rescue impossible, this despite W6NTU's warnings that they could not make it through flood conditions; so, after coming within three miles of the victims, the sheriff's office advised that they were sending a helicopter at dawn. Since the condition of the victims appeared to be bad (two elderly ladies and one elderly man), broadcast stations in San Francisco and San Jose broadcast bulletins all night, at W6NTU's request, giving encouragement to the victims in case they had a radio turned on. Just when things looked bad, W6NTU came on with the information that a vehicle had arrived across stream and was picking up the victims, and at 0330 set out for Liver-

more, after asking for an escort. The following other net members participated in the emergency: *W6s* RHA ZLO JCU KZF and K6OSX.

Another emergency handled by the Mission Trail Net had to do with several missing buses, two trains and a number of private cars, all stalled by a rock slide on Highway 50 west of Echo Summit. K6MIDA took information from W6TXR. W6JCU acted as liaison and relay for several hours. As a result of this effort, the Highway Patrol cruised the highway on both sides of the slide and got all buses and private cars to safety. Other amateurs working in this emergency were *W6s* KZF UW EPG USO, *K6s* SXX JIM YBV LCF KLO, *W7s* CML TQE, K7AGE/m.

TRAFFIC TOPICS

Experiencing some difficulty in obtaining new traffic "blood" for our nets by conventional means, we have embarked on a more literal and scientific approach. In the dark recesses of a certain nameless medical laboratory, Dr. H. R. Messej, W1QTC, has been researching on a project designed to bring more traffic converts into the amateur ranks. The exact details are top secret, shrouded in mystery, but we can tell you that by both fair means and foul (mostly the latter) he has acquired a supply of blood from some of the more active traffic men and has already developed a serum. When injected into guinea pigs, the effect is encouraging: their front paws twitch as though trying to operate keys, their eyes go blank (i.e., radiogram blank), and they squeak in a manner highly reminiscent of a 75-meter phone net. The effect wears off after a certain length of time, after which re-injection is necessary for continuation. The good doctor is now looking around for human volunteers among the amateur ranks, but all approached so far have turned livid at the thought of such a fate.

Eventually, we are confident that the experiments will prove to be successful and the serum, which we call "traffic juice," will be available for distribution to the field, free of charge, of course. We hope to have supplies of it, along with the means for administering it surreptitiously, available for our agents at meetings of DX, RTTY, s.s.b. and YLRL groups at conventions and hamfests. Meanwhile, W1QTC will work on a new method of oral consumption such as in scotch or bourbon, to assure widespread assimilation by amateurs nationwide.

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August 1 is the date that all nets in our present registry are placed behind the "discontinued" tab. They are then restored to the active part of the file only as they are re-registered. Get a copy of CD-85 so you can be assured of a place in the first *QST* net listing (November *QST*) and in the annual net directory issued about the first of December. However, this year we want to give fair warning that social and ragchew nets with no other purpose will *not* be registered.

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Net reports. The Early Bird Transcontinental Net reports 31 sessions and 716 messages handled. Transcontinental Phone Net handled 5426 messages in May, broken down as follows: 1st Call Area, 2167; Second Call Area, 2382; 4th, 8th, 9th and 0th Call Areas, 877. The Interstate Single Sideband Net conducted 31 sessions, handled 721 messages, averaging 52 stations per session, and 1560 check-ins; three emergency sessions were held. The North Texas Oklahoma Traffic Net had 31 sessions, handled 361 messages in 834 check-ins.

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National Traffic System. Seems as though we operators who work in The System ought to set the example for other traffic men. Recently we have noticed many NTS operators, most of whom certainly know better, using procedure not recommended by ARRL, or leaving out things which *are* recommended by the League. Minor things, mostly, and usually a result of habit rather than ignorance — such as leaving out or otherwise neglecting the "check" of a message, omitting the AA separation between the parts of the address or the AR at the end of the message on c.w., or using the word "SIG" before the signature. Many messages come through in non-standard form, mostly as a result of incorrect MARS refiling, and remain in that form because no one takes the trouble of changing it to amateur form along the way. Remember, it is wrong to change the content of a message, but desirable to correct its form. These things have all been covered in this section of *QST* in the past. Naturally, you have a right to agree or disagree and use the procedure you think best; but you are perpetrating a disservice both to yourself and The System if you ignore the facets of logic on which most of our procedure is based. Trouble is simply that so many traffic men are stubborn individualists and they'll b'god keep right on using the procedure they are used to. We don't suppose we'll ever change this, but we do hope that our newer traffic men (those inoculated with "traffic juice") will study up on procedure as recommended by the League and use this rather than imitating incorrect procedure as practiced by some of the old timers.

Here's WØTOL, manager of the NTS Tenth Regional Net, at his neat and business-like operating position in Manhattan, Kans. "D", in addition to being TEN Manager, is NCS on QKN (Kans. C.W. Net) and Central Area Net. He's ORS, of course, and has been an amateur since 1926. Ex-calls include W9BYY and W9AIJ.

May reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
EAN	25	1246	.909	49.8	96.7
CAN	31	1335	.807	43.1	100.0
PAN	31	1269	.530	40.9	90.3
1RN	27	471	.370	17.4	88.4[1]
2RN	54	556	.357	10.3	99.3
3RN	44	281	.319	6.4	86.4
4RN	52	485	.243	9.3	52.7
RN5	54	772	.408	14.2	84.4
RN6	20	495	.568	24.8	59.6[1]
8RN	47	119	.162	2.5	86.5
TEN	93	978	.381	10.5	54.7
ECN	16	54	.196	3.3	70.8[1]
Sections[2]	972	7365		7.6	
TCC (Eastern)	64[3]	227			
TCC (Central)	62[3]	1225			
TCC (Pacific)	107[3]	957			
Summary	1466	17835	EAN	10.5	CAN
Record	1466	18192	.909	22.1	100.0

[1] Regional net representation based on one session per day. Others are based on two or more sessions.

[2] Section nets reporting: WVN (W. Va.); QMN (Mich.); QKN & QKS (Kans.); AENP Morning, AENP & AENB (Ala.); CWX (Colo.); CN & CPN (Conn.); FMTN, Gator & FN (Fla.); MSPN Noon, MSPN Evening & MSN (Minn.); WSN (Wash.); KSB, KPN & KYN (Ky.); S. Dak. 75 & S. Dak. 40; Iowa 75; TLCN (Iowa); MDD (Md.-Del.-D.C.); GSPN (N. H.); ILN (Ill.); SCN (S. C.); SCN (Calif.).

[3] TCC functions reported, not counted as net sessions.

The Rocky Mountain Net is shortly to become the Twelfth Regional Net of NTS; this was decided upon during a recent personal visit to the region. The new regional net, most of which will be hacked out of the present Sixth NTS Region, will consist, tentatively, of the states of New Mexico, Colorado, Utah, Arizona and Wyoming. We hope by the time you read this the new RN will be in full official operation, complete with manager, who has not at this writing been officially appointed. We suspect that the new RN will have a pretty rough go of it in the beginning, particularly starting as it is during the summer, and therefore urge all concerned to assist this region in becoming a solid part of NTS in full status. This means that it must have a

full complement of section representatives, net control stations and area net liaisons. NTS is expanding; it's up to you fellows in the Southern Rockies to get behind this movement and show that sparse ability is not necessarily proportional to sparse population.

W9DO has honored the following with hard-earned area net (CAN) certificates: W4RCM/5, K4ONQ, W5RCF, *W9s* MAK ZYK, *WØs* KJZ LGG DDT TOL GXQ LCX. PAN has tried operating on 7060 kc. to get away from QRN and short-range propagation, but it isn't working out too well; W6PLG is taking over as acting manager while K6DYX travels during June and July. W2BZJ has received his 2RN certificate. W3LXU, the 13-year-old Western Pa. iron man, is handling representation from that section single-handed, in addition to 3RN NCS and Eastern Area TCC assignments. W4SHJ is still working on Canal Zone and West Indies representation on 4RN. RN5 certificates have been issued to *W4s* CJW PVG YRO and W5GX. K6SXA is handling RN6 during W6CMA's temporary absence. ECN is making contact with its Maritime section on 40 meters for the summer.

A.R.R.L. ACTIVITIES CALENDAR

July 26–27: CD QSO Party (phone)
Aug. 6: CP Qualifying Run — W6OWP
Aug. 20: CP Qualifying Run — W1AW
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. 8–9, 15–16: Sweepstakes Contest

OTHER ACTIVITIES

The following lists date, name, and sponsor. Details will be presented in future issues of *QST*.

Sept. 6–7: LABRE DX Contest (c.w.), LABRE.

Sept. 6–7: Virginia Free-for-All QSO Party, W1KX.

Sept. 13–14: LABRE DX Contest (phone), LABRE.

Sept. 27–28: VE/W Contest, Montreal Amateur Radio Club.

Oct. 4–5: VK/ZL DX Contest (phone), NZART.

Oct. 11–12: VK/ZL DX Contest (c.w.), NZART.

Oct. 11–12: Pan American Contest (phone), Radio Club Peruano.

Oct. 18–19: Pan American Contest (c.w.), Radio Club Peruano.

Nov. 22–23: 21/28 Mc. Telephony Contest, RSGB.

Transcontinental Corps. W3WG reported by telegram, so we have no roster this month for the Eastern Area. WØBDR submitted his usual detailed report despite a recent illness. Pacific Area TCC positions are all filled except for one on Saturday and two on Sunday. K6HLR has received his TCC certificate.

May reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern.....	64	96.9	1579	227
Central.....	62	96.8	1972	1225
Pacific.....	107	96.3	1883	957
Summary.....	233	96.6	5434	2409

The TCC roster: Central Area (WØBDR, Dir.) — W9CXY, *WØs* LCX BDR SCA LGG. Pacific Area (W6BPT, Dir.) — W5DWB, *W6s* EOT ADB PLG BPT VZT HC UTV, *K6s* DYX EWY HLR GES GID, W7GMC, *WØs* KQD WMK.

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. The notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate the Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Yukon*	Aug. 11, 1958	W. R. Williamson	Mar. 17, 1949
West Indies	Aug. 11, 1958	William Werner	Aug. 10, 1958
Idaho	Aug. 11, 1958	Rev. Francis A. Peterson	Oct. 10, 1958
Vermont	Aug. 11, 1958	Mrs. Ann L. Chandler	Oct. 10, 1958
Nevada	Aug. 11, 1958	Albert R. Chin	Oct. 10, 1958
Santa Clara Valley	Aug. 11, 1958	G. Donald Eberlein	Oct. 15, 1958
Rhode Island	Aug. 11, 1958	Mrs. June R. Burkett	Oct. 15, 1958
Arkansas	Aug. 11, 1958	Ulmon M. Goings	Oct. 15, 1958
New Hampshire	Aug. 11, 1958	John Arthur Knapp	Oct. 26, 1958
Kansas	Aug. 11, 1958	Earl N. Johnston	Oct. 29, 1958
North Dakota	Aug. 11, 1958	Rev. Casper F. Bonifas	Resigned
Western Massachusetts	Sept. 10, 1958	Osborne R. McKeraghan	Nov. 10, 1958
Southern Texas	Oct. 10, 1958	Roy K. Eggleston	Dec. 10, 1958

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Santa Barbara	Robert A. Hemke, K6CVR	May 9, 1958
Eastern Massachusetts	Frank L. Baker, jr., W1ALP	June 15, 1958
Western New York	Charles T. Hansen, K2HUK	Aug. 10, 1958
Northern Texas	L. L. Barbin, W5BNG	Aug. 10, 1958

W1AW OPERATING NOTE

The W1AW summer schedule, as shown on page 80 of last month's *QST*, is still in effect. See that issue for full information on when and where to look for the ARRL Headquarters station.

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 August 20 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 August 6 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 EDST. 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 June *QST*
Aug. 4:	*Let's Go Microwave*, p. 11
Aug. 12:	*The Versatile S.W.R. Indicator*, p. 15
Aug. 13:	*Crystals Where You Want Them*, p. 19
Aug. 19:	*A Transistorized Grid-Dip Meter*, p. 31
Aug. 21:	*A Weather-Resistant Quad*, p. 42
Aug. 26:	*Board Meeting Highlights*, p. 64A
Aug. 29:	*So You Know Your Field Day Rules*, p. 68

DXCC NOTES

Announcement is hereby made of the addition to the ARRL Countries List of Chatham Islands. These islands are located in the South Pacific Ocean approximately 420 miles east of New Zealand. Addition is made by virtue of point 2 as explained in the May 1955 *QST*, page 68.

DXCC credit will be given starting October 1, 1958 for creditable confirmations dated on or after November 15, 1945. This is to permit foreign amateurs to start receiving credits at the same time as those in the U.S.A. Confirmations received prior to October 1, 1958 for this country will be returned without credit.

DX CENTURY CLUB AWARDS

HONOR ROLL

W6AM......279	W6MX......272	W7AMX....268
W8HGW 277	W6DZZ.....272	W6CUQ....268
W1FH... ..277	W6RW......272	W6TS......268
KV4AA.....275	W2AGW....271	W2BXA....268
ZL2GX.....275	W3JNN.....271	W9YFV....268
W9NDA.....274	W2HUQ.....271	W3BES.....268
PY2CK.....274	W5ASG.....271	W9RBI.....268
W3GHD.....274	G2PL.......269	W6GFE.....268
W8BRA.....273	W8JIN......269	W8KIA.....267
W6ENV.....273	W3KT......269	ZL1HY.....267
W6SYG.....273	W1ME......268	W6TT......267
W8NBK.....272		W6ADP.....267

Radiotelephone

PY2CK......273	W1FH......262	W9RBI.....256
W8GZ.......266	W8HGW....261	W6AM......253
VQ4ERR....264	W8BF......256	CX2CO.....252
ZS6BW......263	W3JNN.....256	W9NDA....251
	CN8MM....256	

From May 1, 1958 to June 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

W6CYV.....250	XZ2TH.....108	K6GLC.....103
W0YCR.....179	W8DDK....107	W9RCQ.....103
W8AJH.....153	VK7CH.....107	W9SOA.....103
3V8AB......144	K9ATZ.....106	VE3BZ.....103
W9WBL.....129	W9LQF.....106	ZL1CH.....103
W8RSW.....124	KA2AL.....106	W3IPO.....102
W5KLB.....119	GI3JIM.....106	W5ZWR.....102
ZS4MG.....115	W1KYK....105	W9GIH.....102
W6CHL.....113	K2VFR.....105	W4HZZ.....101
W9ONB.....113	W9CMQ....105	W6HOH.....101
W5CRK.....111	OH1OY.....105	W0QPL.....101
CT1GE......111	VK3CN.....105	W3KA......100
W9TJG.....110	VS1FJ......105	W4RKB.....100
DJ3JZ......110	ZS4PB......105	W5EGB.....100
W3MQY....109	W1BPW.....104	K6CHR.....100
W7OCL.....109	W8DUA.....104	K6GSL.....100
K4PDV.....108	W0DAO.....104	K6TXA.....100
F9IF........108	KL7BHF....104	W8VVD.....100
G4LX.......108		W8VZ......100

Radiotelephone

W8HGA.....120	W1JYH.....105	W0VBQ.....102
OK1MB.....116	W8RNB.....105	DL6PC.....102
ZL4BO......116	W3ROA.....103	LU9DM.....102
W4IYC......112	W4SBX.....103	W1KRS.....101
W3GEN.....111	W9UZC.....103	W9ICF.....101
W1UQW....110	3A2BF......103	KA2AL.....101
W8HOY.....110	W2CCO.....102	W4RVL.....100
W5BQJ......106	W8UPN.....102	W5NW......100
VE5JV......106		ZL4IG......100

ENDORSEMENTS

W9HUZ.....261	K2GFQ.....247	W0NTA.....231
CN8MM....261	W8TMA....245	W0NUC.....231
G6ZO.......260	W8MPW....244	W4GXB.....230
W5JUF.....259	W7GXA.....241	W6KEV.....227
W0DAE.....259	W3DRD.....241	W6KZL.....225
W2QHH.....258	W0QVZ.....240	CO2BL.....222
W4DQH.....255	W4LYV.....238	W9WHM....221
W8KML.....253	W4LVV.....237	G3AAE.....221
W1JYH.....251	W3OP.......233	K2CPR.....220
W6LDD.....250	W5BZT.....233	W5NW......219
ON4AU.....250	W8QJR.....232	W2ZGB.....218

ON4NC.....217	ZL4BO......171	SM6VY.....143
W2DEC.....214	DL1YA.....170	VE1NH.....143
W1LZE.....210	HP1BR.....170	W4QT......141
W1TX......210	W5GNG.....168	K6LGF.....141
K6EVR.....210	W9BBU.....164	W2FXA.....140
W9EU......210	ZL1AJU.....163	W4IEH.....140
W6KEK.....200	W1ICW.....162	W0OJW.....140
G8KS......200	W4CKB.....161	W3RBW.....133
I1ZFD......200	K4LPW.....161	K4JOU.....133
W1LOP.....197	EA1AB.....161	W8LQA.....133
W6NJU.....193	TG9AD.....161	MP4BBE....133
F3FA.......193	W1LQ......160	W5DNF.....131
W4THZ.....191	W2OTC.....160	ET3S.......131
W7KKT.....191	W3GEN.....160	K2CF.......130
EI9Y.......191	W9HQF.....160	W5BQJ.....128
W2IRV.....190	ON4GC.....160	K2JGG.....127
W2SUC.....190	W7QON.....158	W1AF.......121
W2YTH.....190	W2ROM.....157	W1OOS.....121
W3HIX.....190	W8WFB.....155	W5BLA.....121
W3WGR.....190	K2CWR.....153	W1ACB.....120
W6CG.......190	W8TUO.....153	W1HWH....120
K6ENL.....190	KL7PIV.....153	W1OOA.....120
K9BVR.....190	W3WSF.....152	W2AWH....120
OK1CX.....190	G2BVN.....151	W4OMW....120
W2EQS.....187	W1WAI.....150	W9LSV.....120
W3NCF.....186	W4UKA.....150	W9MUJ.....120
W9DYG.....182	K9AGB.....150	W9YFD.....120
W4BYU.....181	KP4YT.....150	VE2YU.... 120
CN8JX.....181	SM5KV.....150	W8LOF.....118
DL3FM.....181	W3BYI.....148	W4LCY.....116
W3SOH.....180	K4LNM.....147	W0DEI......114
W6LTX.....180	W5QVZ.....146	W9PIO......114
F8EJ.......180	VE5JV......146	W0RZU.....113
W4GRP.....176	K5ADQ.....143	W1YXD.....113
I1ALU......173	W0DSP.....143	TG9AZ.....112
VE3PK.....173	W0VBK.....143	PA0KE.....111
W8MWL....172	G3GIQ.....143	W5DA......110

Radiotelephone

W8BKP.....232	W6AED.....169	W0ZSZ......141
W8QJR.....230	CE3DY.....164	I1RC........137
KH6OR.....230	W0JYW.....162	W1FPH.....136
W6GVM....224	F3DJ.......161	K5BEU.....132
W5JUF.....215	F8XP.......161	W3DRD.....132
CO2BK.....213	W7EMP.....160	W4GRP.....131
9K2AZ.....200	ON4PJ.....160	DL1WP.....130
W9JJF......196	ON4YI......160	K6EVR.....127
W2WZ......194	TG9AD.....160	W3BIW.....124
W4DQH.....189	W2YYL.....152	VE1NH.....122
W9YSX.....184	I1CQD.....152	W9PQA.....121
W1GOU.....180	W1LSZ.....152	W5UBW....120
W3HIX.....180	W8ZET.....151	K0ACC.....116
W0VSK.....180	W8TMA.....150	W1YXD.....113
CX3AA.....173	W5GNG.....147	W9BAE.....112
W5VU......170	W1LLF.....141	W5WJQ.....110
W5PQA.....169	W8CQL.....141	W7SFK.....110

W/VE/VO Call Area and Continental Leaders

W4TM......261	VE4XO.....118	VE7ZM.....242
W0ELA.....256	VE5QZ.....147	VE8AW.....195
VE1PQ.....192	VE5RU.....147	VO6EP.....190
VE2WW....210	VE6NX.....200	ZS6BW.... 265
VE3QD.....210		4X4DK.....255

Radiotelephone

W2BXA.....215	VE1CR.....120	VE6NX.....112
W4HA......220	VE2WW....138	VE7ZM.....206
W5BGP.....228	VE3QA.....195	G2PL.......242
W7HTB.....199	VE4RP.....102	4X4DK.....245
W0AIW.....233	VE5RU.....143	ZL1HY.....246

• 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. PFN meets Mon. through Fri. on 3850 kc. at 1800. E. Pa. Net meets Mon. through Fri. on 3610 kc. New appointments: K3AFP as EC for Juniata Co., PVY as EC for Carbon Co., K3ANS as OPS. The Mt. Airy V.H.F. Club was host to *QST*'s v.h.t. editor, 1HDQ, at its May 27 meeting. KN3CTC qualified at 20 w.p.m. GQC nabbed a Utah QSL for WAS after 22 years of trying and his jr. operator dropped the "N" from his call and now is K3ALS. K3BED has a 110-watt a.m. rig on 220 Mc. using p.p. 8025s. AMC left for Utah on May 30 for an extended trip to Utah. PDJ has a 10-meter mobile in his Volkswagen. Phila. Co. EC, VSD, reports that c.d., AREC and RACES drills on 2 meters Wed. at 2000 need more operators. Contact him for information. ACH is in Panama on business. FYR received WAS and is now on 75 meters with a long-wire and an old Viking II. FCI has a two-element 20-meter *beam* and was *elected president* of *his* high school student council. New officers of the Anthracite Wireless Assn. are KJJ, pres.; IGH, vice-pres.; ZRQ, secy.-treas. YUW spends most of his time chasing DX and is going mobile after graduation. The Lehigh Valley ARC has received its former call, W3OI. New officers of the Oxford Circle RC (Phila.) are: K3ALU, pres.; K3CTS, vice-pres.; K3BHX, secy.; K3ALD, treas. The average age in the club is 14! The Frankford RC entertained the Potomac Valley RC (Washington, D. C., Area) at their annual joint meeting on May 18. Before a dinner for about 100, trips were made to the antenna farms of ALB and DHM. OP was the first Pennsylvania recipient of the Worked All Connecticut Award. The Quakertown ARC school finished with 13 Novices on the way. BUR reports that he has bugs in his KWS-1. HNK figures that more power would triple his traffic total. New officers of the North Penn. ARC: YWW, pres.; PNL, vice-pres.; GTC, secy.; JLI, treas. K3ASH moans that 50 watts on 40-meter phone leaves much to be desired. UIU worked NSS and WAR on Armed Forces Day. CMN had his operating curtailed when his club took back its Viking II. ELI was QRT but is back in action. AREC activity *is picking up, but we still are shy ECs for many counties.* Contact DVB or JNQ if you are interested. Traffic: W3CUL 2665, WHK 304, TEJ 270, PDJ 87, HNK 78, ZRQ 78, BFF 61, K3ALD 56, W3CMN 52, NF 44, IVS 40, AMC 39, FCI 23, K3ANS 20, W3ID 15, WQL 12, NQB 10, BNR 8, EPL 7, ADE 6, FCI 6, UIU 5, ELI 4, PVY 4, BES 3, BUR 3, QLZ 3, LHA 2, YUW 2.

MARYLAND-DELAWARE-DISTRICT of COLUMBIA—SCM, Louis T. Croneberger, W3UCR—Asst. SCM for Delaware: Ray de Courcelle, 3DQZ, SEC: CXG. Section Nets: MDD, 3650 M-S 1915 EST; MEPN, MWF 1830, SS 1300 EDST; DELEN, 3905 Sat. 1830 EDST. On May 14 the SCM and SEC were guest speakers at the HCARA. CXG spoke on "State RACES Operation and SEC Activities." UCR spoke on "Section Activities and ARRL Appointments by the SCM." The RCARA was host for the first quarterly meeting of the Foundation of Radio Amateur Clubs on May 9. ZM, of the FCC, was the guest speaker and Al spoke on the "1959 ITU Conference." HCL showed the slides of his 10,000-mile trip around the U. S. at the May 2 WRC meeting. 4ZM spoke on "Energy Transfer from Rig to Antenna" at the WRC May 16 meeting. Officers elected were CN, pres.; 4ZM, vice-pres.; Pete Oliva, corr. secy.; CDQ, rec. secy.; and K3AKB, treas. New officers of the NRLARC are CMX, pres.; PBW, vice-pres.; and RBW, act. mgr.; DHQ was reelected secy. The RCARA had films of "The Battle of Italy, WW II," presented by QFS at the May 23 meeting. The WMRC and the Philmont MRC had their annual "Midway Philly Meet" at Havre de Grace on May 18 with over 100 in attendance. EIS, of Beltsville, has been judged winner of the "Frederic A. Leonard, W3AZG Memorial Trophy," awarded to the highest scoring entrant during the 1957 ARRL Sweepstakes. This award *is open only to Atlantic Division participants* and will be presented at the ARRL National Convention to be held in Washington Aug. 15-17. WLO was winner of the Delaware QSO Party, with QQV the runner-up. NNM is the new NCM for the MEPN, PY1RHW was a visitor to the shacks of CDQ and BKE/TSC. KN3DRW is now on 40 and 15 meters with a Viking I and an HQ-100. TSC had the top YL score for the third call area in the YL/OM Contest, with JWM the runner-up. Babe has been licensed only a little over a year. Congratulations, girls. JVZ was operated on at the Washington Co. Hospital. W5HQN, ex-AFY, was a visitor at LZY's. GVL is to study at the U. of Pa. and BFW at M.I.T. in the fall. BFW and his band are making a boat trip to Europe, including a tour of Germany and France. JPU is a new General Class licensee and KN3DRK a new Novice in the Hagerstown Area. KN3s CVZ and DYW are on 2 meters nightly, confusing all who work them from the same Washington QTH. K3CAV now is General Class. K3BUV now is representing Harford Co. in the MDD. The 10th ARRL National Convention plans are progressing according to schedule. A complete radio (ham) communications system within the convention plus a mobile "talk-in-service," which *will be in operation from noon* Thurs., Aug. 14, through 1830 Sun., Aug. 17, will be provided. The following frequencies will be used at K3CSH: 3.820, 3.835, 7.250, 14.225 (a.m./s.s.b.), 29.640, 50.4 and 145.32 Mc. It would be appreciated if the Washington Area stations unable to attend the convention would monitor the above, to be of assistance if required, through Mon. noon. Station activity reports should reach the SCM by the 5th of each month for the preceding month. We would like to hear from all areas of the section and would be pleased to receive meeting notices, bulletins, etc., from club secretaries. CU at the ARRL NATIONAL CONVENTION AUG. 15-17, in Washington, D. C. Traffic: (May) W3UE 268, NNM 197, PQ 118, K3WBJ 90, W3WV 73, COK 54, ECP 39, QCW 36, TN 33, CN 31, CQX 22, EAX 13, LGS 7, UCR 5, OYX 4. (Apr.) W3WSE 4.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. PAM: W2ZI. RMs: W2YRW, W2HDW and W2Z1. New appointees: W2BZJ, Pennington, as RM, K2QOS, Trenton, has a new beam on 6 meters. W2ZI, chief operator at State Hq., reports Operation Alert 1958 the best exercise this year. Operators at Hq. were W2SUG, W2BZJ, W2ISZ, W2ZI, K2DSL, K2CLD and W3BCJ. K2SOW, a 14-year-old Princeton ORS, has just passed the Extra 1st-class exam. K2QOS advises that a new club is being formed in the Trenton Area—the Penn Jersey V.H.F. Club. NJN held 31 sessions and handled 293 messages. K2CPR now has 3-band DXCC (7,14 and 21 Mc.). K2HHJ and K2JKA have been appointed Asst. ECs by K2SOL, Gloucester Co. EC. W2RG is confined in the Copper Hospital, Camden, after having had a heart attack. K2JKA, K2SOL, K2PQD and K2HHJ set up a rig at Camp Roosevelt and originated 149 messages. The SJRA has set Sept. 7 as its picnic date. K2UQD is picnic chairman. W2LBX and W2OSD have set up a RACES station in Delaware Twp. Merchantville High School has an active school station with many supporting operators. W2YRW has received the "Early Bird Net" certificate for his consistent activities. W2ADA, Burlington Co. Radio Club program chairman, has been providing many interesting and instructive programs. The club meets the 1st Fri. in Moorestown. K2VQH, K2ZIO, K2ZOM, K2UFF and W2MEO have signed in the Camden County RACES. Traffic: K2EWR 280, W2HDW 234, W2RG 185, K2HHJ/2 159, K2JGU 154, W2BZJ 87, W2ZI 37, K2SOL 17, K2QOS 14, K2SOW 12, K2CPR 4, K2SOX 4.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2PPY. V.H.F. PAM: W2LXE. RMs: W2RUF and W2ZRC. The NYS c.w. meets on 3615 kc. at 1800, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3509.5 and 3993 kc. at 0900 Sun., TCPN 2nd Call Area on 3970 kc. at 1900. SRPN on 3980 kc. at 1000, LSN on 3970 kc. at 1600. The New York State Phone Net Picnic will be held Aug. 9 at Green Lakes State Park near Syracuse. Contact W2IEP for details. W2SSC made WAZ. W2VRG and K2GUG outfoxed the

(*Continued on page 90*)

THE HORSEPOWER RACE

IN THE past several years a change has developed in the manner in which various manufacturers specify the power ratings of their amateur transmitters. The old method, which is largely outdated, specified the DC Power input to the final amplifier. The new trend, caused primarily by the growing movement towards SSB operation, seems to lean toward rating equipment in peak envelope power, commonly referred to as P.E.P. Some manufacturers specify P.E.P. input, while others specify P.E.P. output. At any rate, this change produces a certain degree of confusion in the amateur's mind when he begins to compare the relative merits of various commercially built amateur transmitters or linear amplifiers.

TO ILLUSTRATE various forms this confusion may take, let us consider two examples. One transmitter, which on meter peaks indicates 625 to 650 watts, is rated by the manufacturer at 1000 watts P.E.P. input. The second rig indicates 1000 watts input on the meter, and is rated by its manufacturer at 2000 watts P.E.P. input. As illustrated by this example, one manufacturer considers P.E.P. to be approximately 1.5 times as great as D.C. input, while the other uses a factor of 2 to 1. Obviously, this difference in yard sticks can make it difficult for the amateur to determine how loudly a transmitter will talk.

BASICALLY, it should be readily apparent to each of us that the most important consideration, when discussing power, is how much *output* we get before generating excessive distortion. For example, an amplifier with 1000 watts DC input, which is 50% efficient, gives us 500 watts to the antenna; while a rig which is 66⅔% efficient can produce the same signal *output* with only 750 watts DC input. It would seem, therefore, that the premium should be on efficiency, rather than on meter input, much of which is burned up in the form of plate dissipation.

MOREOVER, it seems to us, that since 1000 watts is the maximum indicated power input the amateur can utilize, any talk in excess of this figure, regardless of how the input power is stated, has little or no meaning.

IN LINE with the thinking outlined above, we at Hallicrafters have chosen not to add to the confusion by rating our new HT-33A linear amplifier in P.E.P. input. We do state that this final runs conservatively at the maximum legal limit of 1000 watts DC input. Moreover, and this is the important point, the HT-33A can deliver *more output to the antenna*, no matter how it is measured, than any other commercially manufactured amateur linear amplifier now on the market. In addition, it does this with third and fifth order distortion products down in excess of 30 db. It is the feeling at Hallicrafters that this is the type of information today's amateur demands.

— TOM STUART WØREP

Bill Halligan Jr. W. J. Halligan W9AC for **hallicrafters**

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★ HOW TO BECOME A RADIO AMATEUR

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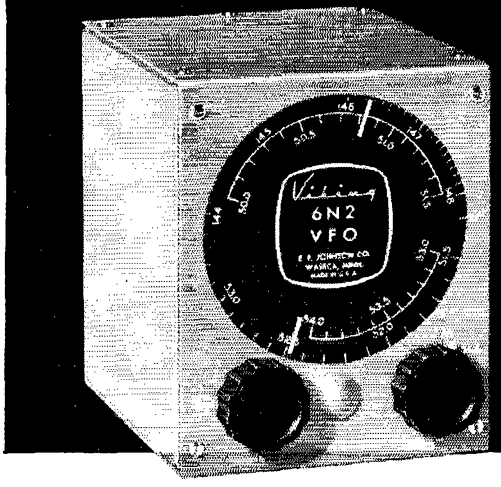
Anyone starting out in amateur radio will find these publications a necessary part of his reading and studying for the coveted amateur radio operator's ticket. Written in clear, concise language, they help point the way for the beginner. Tried and proven by thousands upon thousands of amateurs, these ARRL publications are truly the "Gateway to Amateur Radio."

$1.50

POSTPAID

The American Radio Relay League, Inc.—West Hartford, Connecticut

NEW FOR VHF!

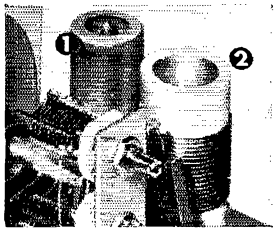


VIKING "6N2 VFO"

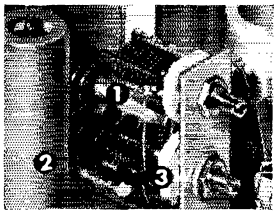
Here's good news for VHF operators: the Viking "6N2 VFO"—exceptionally stable, compact, and packed with outstanding new features! Designed to replace 8 to 9 mc. crystals in frequency multiplying 6 and 2 meter transmitters, including types using overtone oscillators, the Viking "6N2 VFO" provides rock-solid 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.
240-133-1 Kit..... Amateur Net **$34.95**

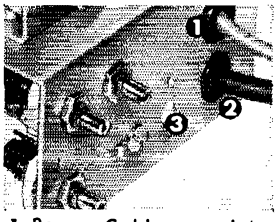
240-133-2 Wired and tested... Amateur Net $54.95



1. Shielded 6BH6 Series Tuned Oscillator Tube.
2. Rigid Ceramic Insulated Inductor.



1. Heavy Duty, Double Spaced Tuning Capacitor.
2. OA2 Voltage Regulator Tube.
3. Ceramic Insulated Air Dielectric Trimmers.



1. Power Cable, complete with Octal Plug.
2. Coaxial RF Output Cable with ½" Spaced Crystal plug.
3. Adjustable Output Tuning.

VIKING "6N2" TRANSMITTER

This compact VHF transmitter punches your signal out with 150 watts CW and 100 watts phone input. Instant band-switching 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

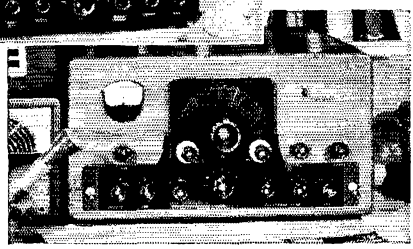
E. F. Johnson Company

2822 Second Avenue Southwest • 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**

for flexibility and performance

VIKING "PACEMAKER" TRANSMITTER/EXCITER

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

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

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

VIKING "KILOWATT" AMPLIFIER

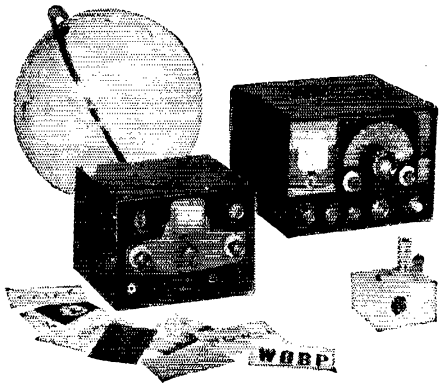
Here's the finest power amplifier ever designed for the amateur service! A sparkling concept of contemporary transmitter design and engineering craftsmanship, the Viking "Kilowatt" is the only amplifier that gives your signal the authority of maximum legal power in all modes. Class C final amplifier 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**

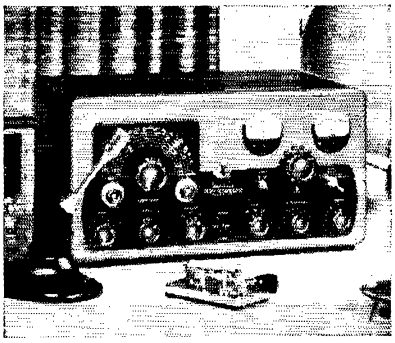
VIKING "ADVENTURER" TRANSMITTER
Perfect for the novice or experienced amateur! 50 watts CW input—instant bandswitching 80 through 10 meters. Crystal or external VFO control. Rugged 807 final amplifier tube—wide range pi-network output. Clean, crisp keying. TVI suppressed. Complete with tubes, less crystals.

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

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

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

—you can't beat a Viking!



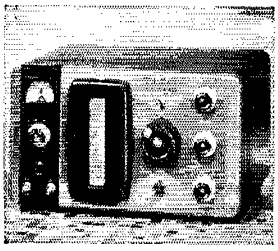
More than one-half kilowatt of power and operating convenience!

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

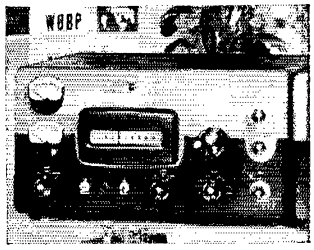
Dollar-for-dollar and feature-for-feature . . . Viking amateur transmitters are your best buy!

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.

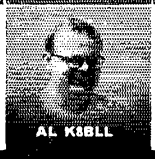
Cat. No.	Amateur Net
240-352-1..Kit	$244.50
240-352-2..Wired	$289.50



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 AB_2 linear, 20 watts Class C continuous wave. Employs two 4-400A tetrodes in parallel, bridge neutralized—wide range pi-network output. With tubes.

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

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



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!

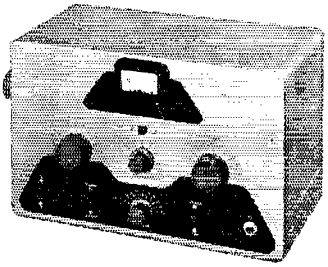
HEATH *hams work to bring you*

ROGER MACE (W8MWZ)
SENIOR HAM ENGINEER
HEATH COMPANY

HEATHKIT 50-WATT CW TRANSMITTER KIT

MODEL DX-20

$35.95



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

HEATHKIT "APACHE" HAM TRANSMITTER KIT

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

MODEL TX-1 **$229.50** Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.

Fresh out of the Heath Company laboratories, the brand-new "Apache" model TX-1 Ham Transmitter features modern styling and is designed as a handsome companion to the also-new Heathkit "Mohawk" receiver. The "Apache" is a high quality transmitter operating with 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, the "Apache" features built-in switch selected circuitry providing for single-sideband transmission through the use of a plug-in external sideband adapter. These Heathkit adapters will be available in the near future. A compact, stable and completely redesigned VFO provides low drift frequency control necessary for single-sideband transmission. An easy-to-read slide rule type illuminated rotating VFO dial with vernier tuning provides ample bandspread and precise frequency setting. Simple band-switching control allows flip-of-the-wrist selection of the amateur bands on 80, 40, 20, 15 and 10 meters (11 M with crystal control). The "Apache" features adjustable low level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL-34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation. The final amplifier is completely enclosed in a perforated aluminum shielding for greater TVI protection and transmitter stability. Cabinet comes completely preassembled with top hatch for convenient access without taking chassis out of cabinet. Die-cast aluminum knobs and front panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. Incorporates all the refinements necessary with many "plus" features for effective and dependable communications. Shpg. Wt. 115 lbs.

...top quality at lowest prices!

HEATHKIT "MOHAWK" HAM RECEIVER KIT

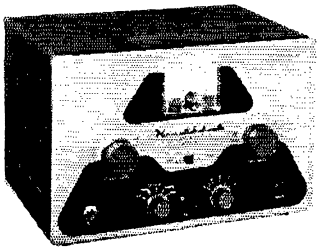
- All Critical Circuits Prewired and Aligned
- Crystal Controlled Oscillators for Drift-Free Reception

MODEL RX-1 **$274.95** Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.

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

HEATH COMPANY A Subsidiary of Daystrom, Inc. BENTON HARBOR 9, MICH.

HEATHKIT PHONE & CW TRANSMITTER KIT



MODEL DX-40 **$64.95**

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

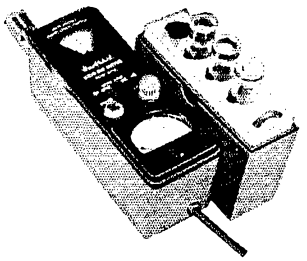
HEATHKIT DX-100 PHONE & CW TRANSMITTER KIT

MODEL DX-100 **$189.50**

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

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

more fine ham gear from the pioneer



HEATHKIT GRID DIP METER KIT

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

MODEL GD-1B **$21.95**

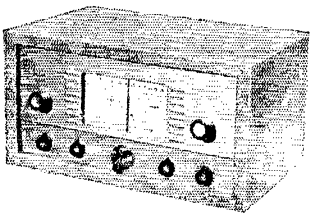
Low frequency coil kit: two extra plug-in coils extend frequency coverage down to 350 KC.
Shpg. Wt. 1 lb. No. 341-A **$3.00**

HEATH COMPANY A Subsidiary of Daystrom, Inc. BENTON HARBOR 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 5¼" speaker—head phone jack and AGC. Has built-in BFO for CW reception. An accessory power socket is also provided for connecting the Heathkit model QF-1 Q Multiplier. Will supply 250 VDC at 15 ma and 12.6 VAC at 300 ma. Shpg. Wt. 12 lbs.
Cabinet: Fabric covered cabinet with aluminum panel as shown part 91-15A. Shpg. Wt. 5 lbs. **$4.95**

MODEL AR-3
$29.95

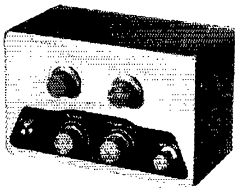


ALL-BAND RECEIVER

HEATHKIT ELECTRONIC VOICE CONTROL KIT

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

MODEL VX-1
$23.95

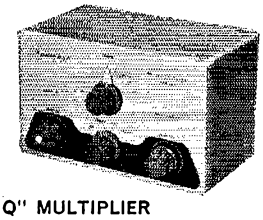


ELECTRONIC VOICE CONTROL

HEATHKIT "Q" MULTIPLIER KIT

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

MODEL QF-1
$9.95



"Q" MULTIPLIER

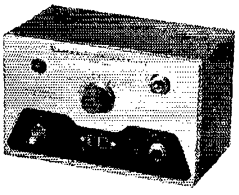
NOTE: $10.65 WHEN ORDERED WITH AR-3 BECAUSE OF EXCISE TAX.

...in do-it-yourself electronics!

HEATHKIT "AUTOMATIC" CONELRAD ALARM KIT

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

MODEL CA-1
$13.95



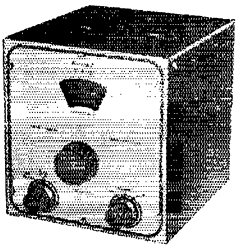
"AUTOMATIC" CONELRAD ALARM

HEATHKIT VARIABLE FREQUENCY OSCILLATOR KIT

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

MODEL VF-1

$19.50



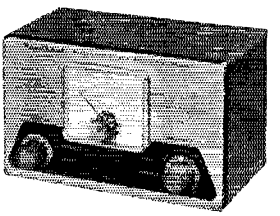
VARIABLE FREQUENCY OSCILLATOR

HEATHKIT REFLECTED POWER METER KIT

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

MODEL AM-2

$15.95



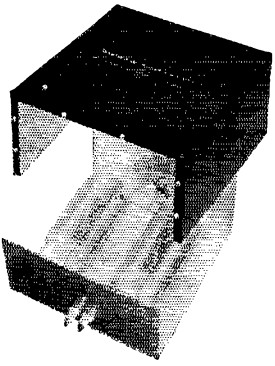
REFLECTED POWER METER

HEATHKIT BALUN COIL KIT

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

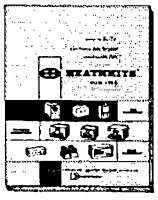
MODEL B-1

$8.95



BALUN COIL

save ½ or more . . . with HEATHKITS



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

☐ **Rush Free 1958 catalog.**

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BENTON HARBOR 9, MICH. a subsidiary of Daystrom, Inc.

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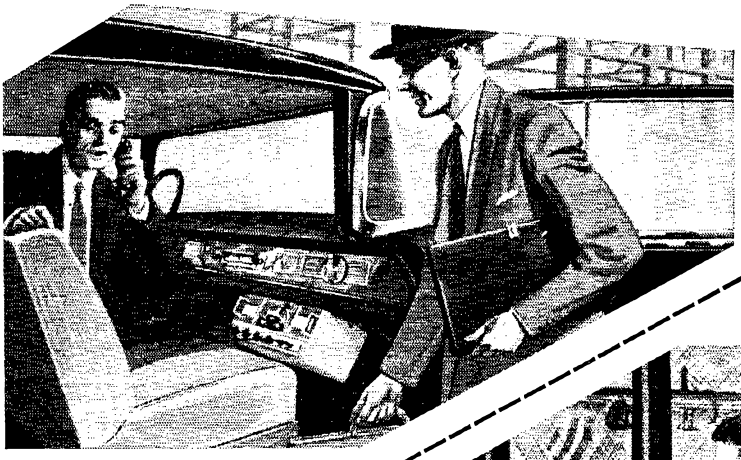
QUAN.	ITEM	MODEL NO.	PRICE

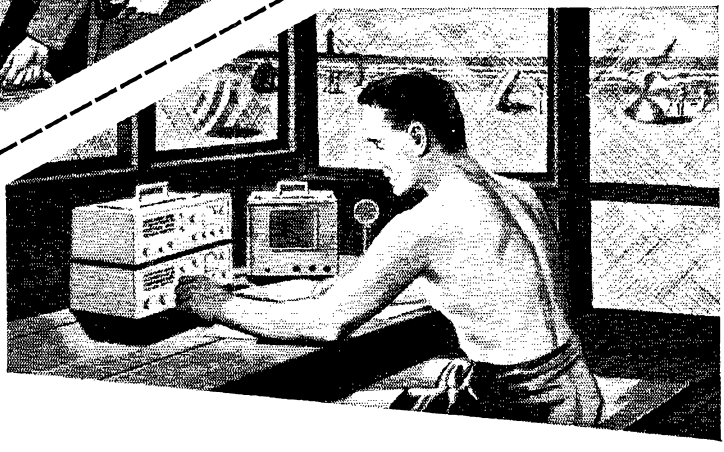
$_____enclosed. Parcel post, include postage—express orders are sent shipping charges collect. All prices quoted are Net F.O.B. Benton Harbor, Mich. and apply to Continental U.S. and Possessions only. All prices and specifications subject to change without notice.

Miniaturization



for work

...for play



Electronic engineering and research have made possible totally new techniques in miniaturization—the art of getting the most into the least amount of space. Mallory has helped pioneer this field.

With miniaturization comes the necessity of getting maximum reliability into compact assemblies—not only for dependable performance, but because these compact assemblies don't always lend themselves to easy maintenance.

Instruments—that new receiver—a personal BC portable—or civil defense gear—may be an example of how miniaturization can deliver more performance in less space.

Whether you buy or build equipment—for work or for play—you can count on the contributions Mallory has made to the state of the art. Tiny Mallory TT, TAP, TAW and TNT capacitors—miniature Mallory-developed Mercury Batteries—special transistor-taper controls—and many other developments assure maximum dependability for a weekend of rag chews, relaxation or emergency communications.

See your Mallory Distributor for all your component needs.

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P.R. MALLORY & CO. Inc.
MALLORY

Station Activities

(Continued from page 84)

Erie County c.d. by hiding a 2-meter Gonset in a boat and pretending to be fishermen. K2PVN and K2YKB were the only winners. The NYSPTEN announces new certificate rules via PVI. (1) 21 call-ins, 7 during each of 3 months. (2) Minimum of 10 pieces of formal traffic. (3) Three months traffic reports to the SCM. (4) Double check by net secretary. This will insure that only capable traffic men and faithful net members get certificates. We regret to report the death of W2AQS. K2KIR will go to M.I.T. in the fall. W2PTD received a card from JT1AA. W2EUP reports that he and W2ATC set up a station at the U. of B. Engineering School Open House to handle traffic. W2EUP received his WAS and he won the c.w. contest at the RARA Hamfest. The RARA Hamfest was the best yet, with over 450 in attendance. W1DX was among the main speakers. W2EMW got YLCC and worked 2 new ones for 224. K2UNR has a new Tri-Band beam to hunt DX. The Willimantic Jay-Cees gave K2UZJ the W-Conn. award. K2CUQ worked 7 new states on 6 meters during May. W2LXE has his kw. on 2 meters and worked Iowa for a new state. The Syracuse VHF Club reports feverish contest activity. K2SYN and W2HSG would like reports of Novice activity in the Syracuse Area for their column in the *RAGS Review*. K2LHK, K2VWX and K2MLT helped KN2HPL get on 40-meter c.w. by donating an Adventurer, an NC-101X and an antenna. KN2HPL is blind and anyone wishing to help get him on 6 meters should contact K2MLT. W2QYT reports c.d. activity using 15 mobiles for the Memorial Day Parade. The AWA received a nice letter of praise from ARRL regarding its fine club shows. K2TQC has been appointed ORS. K2SIL made BPL. Traffic: (May) K2SIL 516, K2IYP 379, W2RUF 373, K2RYH 149, K2UNR 116, K2GWN 94, W2ZRC 85, K2RTN 78, K2JBX 74, K2GQU 53, W2BKC 52, K2OE 52, K2MES/2 47, K2UZJ 47, W2DSS 34, K2BBJ 32, W2FEB 28, W2RUT 25, W2RQF 21, K2UNZ 20, W2QCI 12, W2EUP 11, K2QDT 11, K2CUQ 5, W2EMW 5, K2HUK 5, W2MTA 1. (Apr.) W2ZRC 131, K2KJZ 36, K2BBJ 24, K2LGJ 7, K2RIR 6, K2TVF 5, W2EMW 2.

WESTERN PENNSYLVANIA—Acting SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: GEG and NUG. PAMs: AER and TOC. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. A new ORS is WRE. Winners in the Pennsylvania QSO Party in the order listed: YOZ, GYP, EPL, DQN and out-of-state winner 4 APM. The Breeze-Shooters Picnic at North Park was a huge success. The McKean Radio Club has purchased a large commercial trailer and leased some land for a club-house location. JWZ pledged Delta Chi Fraternity at Lehigh. QCN is repairing 2-meter audio and l.f. monitor equipment. WIQ is considering taking a rest from traffic-handling. BZR graduated from high school and nursed a case of poison ivy after felling trees at the Coke Center RC. K3DUI will be coming home from the Navy soon. EIS is adjudged the winner of the "Frederic A. Leonard, W3AZG" Memorial Award Trophy donated by GJY to 1957 SS entrants in the Atlantic Division. The next Memorial Award Trophy for the coming 1958 Sweepstakes donated by GJY will honor the late Raymond R. Rosenberg, NCJ. BSF now runs a kw. with a home-brewed linear amplifier. The Etna RC now is a full-fledged ARRL affiliate. DER can be heard on 14-Mc. c.w. with a Globe Scout borrowed from ETF. K3BPE is studying hard for his General Class license. GJY is building a new final using the new RCA-7094. The Shaler High School ARC is affiliated with ARRL now. KTM's son received the call KN3DPB. NKM has worked WAZ plus 215 countries with 183 confirmed for DXCC. BEX has 96 confirmed and is waiting patiently for four more confirmations to make DXCC. UEN is home from the hospital and doing well. UEJ has a new Communicator III. New calls around Washington County are KN3DMJ, KN3DHJ and K3DXV. The Weinels Area RC is conducting code classes for Novices. BSO is taking a navigation course given by the U. S. Power Squadron. LMM was hospitalized. Up Erie way: New officers of the Radio Association of Erie are BPB, pres.; NFM, vice-pres.; K3CLC, secy.; JOQ, treas.; KNQ and KLD, directors. We regret to record the passing of YXE. K3BOQ passed his General Class exam. The 6-meter group assisted the Erie Exchange Club in the collection of funds for the Retarded Children. ALD, stationed in Iceland, has his new call, TF2WCZ. RFX was the main speaker at the ATA's June meeting and spoke on Sports Cars. Traffic: W3LXU 482, WIQ 153, BZR 78, UHN 12, TOC 8, WRE 7, KUN 4.

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

(Continued on page 98)

FIELD ENGINEERING with a Future!

Edward K. Doherr, W1EEE, Assistant Manager Government Services Division

Resourceful field engineer——now Raytheon executive

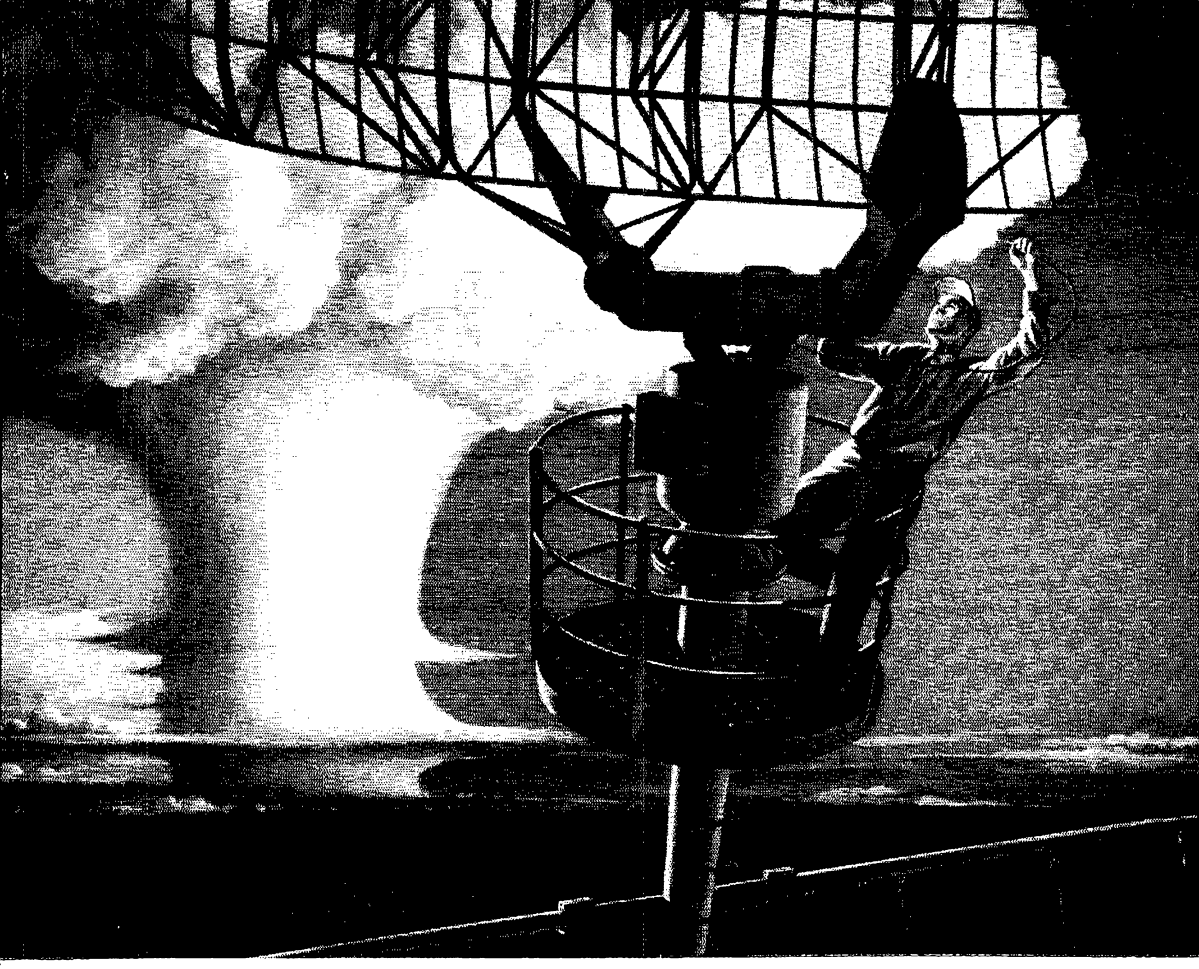
Ed Doherr's imagination and quick action probably saved the life of the Air Force pilot in the story at right.

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, W1EEE; now Asst. Mgr., Government Services Div.*

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HQ110 • 20 monthly payment $11.30. $22.90 down. CASH PRIZE $229.00. Designed all the way with the amateur in mind. Smart, modern receiver packed with all the features an amateur wants. Clock timer $10.00 extra.

HENRY HAS THESE HAMMARLUND ITEMS IN STOCK FOR IMMEDIATE SHIPMENT

HQ160 RECEIVER	$379.00
HQ100 RECEIVER	169.00
MATCHING SPEAKER	14.95
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Complete stock of all transmitters, receivers, antennas, rotators, towers, parts, accessories, equipment. Henry has ALL the new equipment first.

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Nets: ILN, 3515 kc., Mon. through Sat. at 7 P.M. The Hamfesters Radio Club station (Chicago) has now been assigned the call W9AA. Cy Reed, past-president, had requested that this be done and the club accepted it in his honor. The ILN wants more down-state stations to check into the net. What say, gang? K9LFU's XYL is sweating out her Technician Class exam and in the meantime is planning lace curtains for the OM's shack. FDL's XYL gets a new piano when her General Class ticket arrives. K9GUA is sporting a new dual band quad. DRN is on s.s.b. on 2 meters. BON has a new mobile rig. K9IDJ is now General Class getting ready for DX-chasing. BA has been appointed RO for the combined Belleville, East St. Louis and St. Clair County C. D. Communications Center. 5ZWR is now K9MHW. TZN reports that because of a torn hand ligament his traffic total is not up to par. New Novices heard in the Chicago Area are KN9s MDE, MDF, MDL, MDM and MKA. A new DXCC members is ICF with 100 QSLs on 10-meter phone. MAK reports that the ILN in 29 sessions handled 313 messages, and CSW states the North Central Phone Net total was 590. CZB became the proud father of a daughter on May 6. The SWANI Club has resumed its popular transmitter hunts. By the time this report is printed the Springfield and Sangamon County RACES program will be in full force with 6-meter Communicators. The May 5 Practice Alert saw many RACES organizations operating en masse and from all reports the results were gratifying. There were too many letters received by your SCM to make a listing of their operations. The Joliet Ham Club has a new 600-watt transmitter and at a cost of only $42.00. New appointments: K9ISP and K9JIN as OOs; K9ERH and K9GDQ as ORSs. 1LVQ spoke at the May 23 Hamfesters (Chicago) meeting. The League's Board approved the application of the St. Clair Amateur Radio Club, Inc., and also the Ottawa Radio Club, Inc., as duly affiliated societies. The downstate gang was active with the tornado that struck near Belleville on May 3. ESD received his WAZ by receiving JT1AA's QSL. Mr. and Mrs. Carl Mosley (of the beam that bears his name) were guests of the Hillsboro Radio Club during the regular May meeting. UQT is back on the air with a lot of power and says that the signal reports are great. NIU and NGG are celebrating their 25th year of hamming. Congratulations, fellows. K9HZG soon will be leaving for the land of the W4s. K9JVL, K9CMZ and K9GUB are the new officers of the Chicago Young Ladies Radio League, Inc. KN9JLD, NCS of the Regional Novice Net, is in need of members in the northern part of the State, and also is asking each member to get two new members to help enlarge the net roster. KQL and UYP have gone mobile on 6 meters with home-brew transmitters. Traffic: (May) W9DO 1106, K9GDQ 520, ERH 389, W9MAK 341, FAW 253, PCQ 151, CSW 69, K9ISP 48, W9TZN 16, K9MHW 14, W9BA 9, SKR 6, NN 4, PRN 3, FDL 1. (Apr.) K9GDQ 374, KN9JLD 29, K9GSR 2, W9ICF 1. (Mar.) K9GSR 3.

INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM: Seth Lew Baker, 9NTA. SEC: CMT. PAMs: BKJ KOY, SWD and UXK. RAMs.: DGA, JOZ and TT. K9DGO was appointed OPS and OBS. QW1 is a new OBS. The Martinsville ARC, elected ZSK, pres.; K9JKJ vice-pres.; and JVN, secy.-treas. The Old Post ARC of Vincennes elected GZT, pres.; DAN, vice-pres.; K9HIO, treas.; and GCQ, secy. The TARS Hamfest will be held Aug. 24 at Bauer's Grove near Evansville. Governor Harold Handley proclaimed June 22 through 28 as Amateur Radio Week in Indiana. The Duneland ARA is now an ARRL affiliated club. The Central Indiana Mobile RC provided communications for the Sports Car Races by stationing units at the starting line and at each turn. KLR worked Maine via meteor scatter for state No. 38 on 2 meters. BUQ has organized a club and started code classes for the boys at the YMCA in Indianapolis. K9HIO hooked Wyoming to round out WAS. Two new Generals in Porter Co. are K9GFR and ISA. EQO has been transferred so he and XYL JYO will be moving to New Albany. K9IXD is on 6 meters with a new Gonset III. K9ELE has a DX100-B on the air. MHP is on 75 meters with a BC-459. GJS is putting up a trap antenna. K9AUE rebuilt his final and can now run 190 watts on c.w. HXR received the Czechoslovakian S6S DX Award.

(*Continued on pag 102*)

TOWERS

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See Page 120

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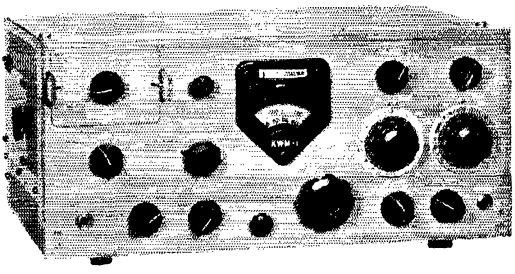

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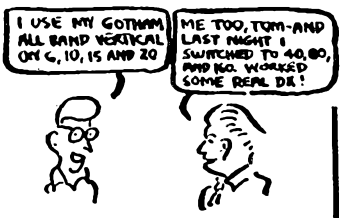

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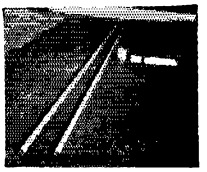

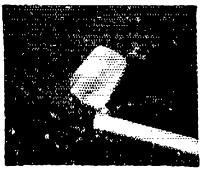

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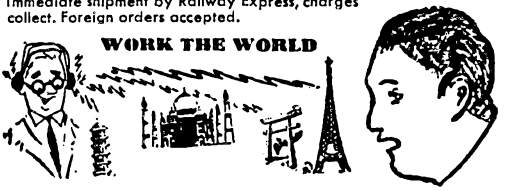

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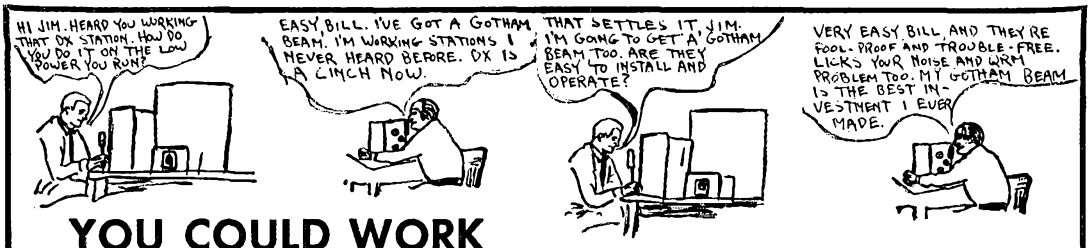

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GAIN. Gotham beams give the maximum gain obtainable. Our 2-element beams give a power gain of four (equivalent to 6 db.); our 3-element beams give a power gain of seven (8.1 db.); and our 4-element beams give a power gain of nine (9.6 db.)

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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.

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YOU WILL WORK THE WORLD

STANDARD AND DELUXE BEAMS. Standard beams in the 6, 10 and 15 meter bands use ⅝" and ¾" tubing elements; the deluxe models for these bands use ⅞" and 1". In 20 meter beams, the standard has a single boom, while the deluxe uses twin booms.

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6–10–15 TRIBANDER.....$39.95
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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.

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Each Two Bander has twin 12' booms, and full-size half-wave elements. ⅞" and 1" aluminum alloy tubing, all castings and fittings are supplied. Assembly is easy.

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A cinch to run up, a section at a time — and just as easy to take down! 40 section, 100 foot vertical radiators are giving excellent service in commercial installations. (For a rugged high Q vertical, use an insulated base and "Glas-Line" or nylon guys, or wire guys broken with egg strain insulators). 18 sections, guyed every 15 feet, have been holding a heavy Telrex full sized 20 meter beam 45 feet up in 75 MPH winds for more than a year!

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Brand new, in original sealed wrapping. (Add $1 per order for packing)

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Be sure to order enough sections, now. You might want to go higher, later, and you'll never see a mast bargain like this again! Use some for guy anchor stakes.

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Universal mounting base. For flat, sloping or peak $1.45
Insulator for base. Heavy ceramic, glazed. 5¼" high 49c
(Or, use a Coke bottle)

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Standard heavy automatic model, FB for VHF arrays, up to 15-20 mini and loaded beams. AR-22—$31.17
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FJI is back on the air after getting up a 120 ft. center-fed antenna at his new home in Princeton. SWD reports 1FN evening traffic as 270 and morning 159. JOZ reports QIN traffic as 187. RFN traffic, as reported by TT, is 71. K9DGO has volunteered to help collect reports and promote liaison between the various 6-meter nets. He would like reports from all net controls on 6 meters. ETM and NZZ made BPL. Traffic: (May) W9NZZ 1056, ZYK 417, K9EOJ 217, W9VAY 199, JOZ 197, ETM 177, TT 175, SWD 95, K9AYI 82, W9TQC 80, EHZ 72, BKJ 64, FJI 58, RTH 51, WID 51, CDW 44, CC 42, K9EOI 38, W9EJW 36, BUQ 34, BDG 30, K9GBB 28, W9GJS 26, SNQ 25, DOK 24, QYQ 24, K9DGO 23, W9SVZ 21, MMY 19, K9AOM 18, W9TQX 17, HUF 16, IMU 16, YYX 14, VNV 13, K9IXD 12, W9HRW 11, ZSW 10, WAU 9, ENU 8, MHP 8, NTR 8, WHL 8, NTA 7, STC 7, DGA 6, PQZ 6, QR 6, K9DWK 5, BSU 4, W9MLF 3, CYZ 2, K9GSV 2. (Apr.) W9SYM 10, K9DCX 8, W9NTR 8, ZYU 8, K9BXF 7, HIO 5.

WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH. PAMs: NRP and AJU. RMs: K9AEQ and W9FFC. New appointees: LQC, KKM, FMD, K9BCE and K9ANV as ECs; NLJ as ORS; K9ELT as OBS. CXY is now TCC for PAN. K9CMW has WAS. BEN certificates went to K9DTK and K9ERO; WIN certificates to GYA and K9LMX. DYG's DX now is at 184/197. Fred is the new WIN NCS and a member of 9RN. MWQ has a new HQ-160. SAA is busy with the BEN and slow-speed nets. Nine daily skeds keep K9GDF busy with traffic. GFL is getting his kicks building a DX-100. K9CEF is happy with his Wausau Hamfest prize, an SX-100. K9GSC has a new LA-1 linear amplifier. New Oshkosh Club officers are KKK, pres.; 1DTM/9, vice-pres.; DTV, secy.-treas. Watch for NLJ/ø in North Dakota during the next SS Contest. ADM is building an amateur TV station. K9-CMW has a vertical working on all bands. K9IQO made several Texas contacts on 50 Mc. The WVRA station now has a BC-612 and a BC-610. K9GAJ is working southern states on 6 meter. V.H.F. Net operators put on a successful v.h.f. demonstration at the high school at Fond du Lac. The Milwaukee Club's new officers are FDX, pres.; MOT and RKP, vice-pres.; QYW, secy. CUW, treas. QYW has DXCC. The Southeast C.D. Reception Area station, headed by RO NRP at Watertown, handled 95 pieces of traffic during the May 6 and 7 Alert. Operators were WAQ, LUB, PJT, K9s DEZ, GJC, DID, GWG and BVS. The club at the Milwaukee Bay View High School has affiliated with ARRL. VCH, ex-KA4AS, has a new DX-100 and an HQ-110 with an 829-B on 6 meters. The following supplied communications for Sharon, Wis., when storms knocked out the power: LST, HGE, DOW, YLV, K9s CTY, AQB, KKH, BKW, EOR, BOD and LOC. K9BSW demonstrated his 27-tube receiver at the Madison Club meeting. Traffic: (May) W9CXY 1296, K9GDF 744, ELT 309, W9DYG 60, SAA 46, KQB 34, K9DTK 31, AEQ 29, W9FXA 21, VHP 16, GFL 14, NRP 10, RTP/9 10, VCH 9, K9CJL 8, W8RMF/9 7, K9IQO 5, W9MWQ 5, K9GSC 4, CEF 3, W9GIL 2, SIZ 2. (Apr.) K9AEQ 65.

DAKOTA DIVISION

NORTH DAKOTA—Acting SCM, Arnold L. Oehlsen, WØYCL—HVA and PHC did a stellar job as net controls for RACES participation in Operation Alert 1958. KLP has moved to Bismarck for the summer. KØIICZ is going into the Army in July. The Jamestown Amateur Radio Club has a club project building 6-meter transceivers. Three of the Jamestown group used these transceivers for local communications for Operation Alert. These were KØCNC, KØGRM and AZV. Another member of the club, KØEOZ, worked Oklahoma City on his 6-meter transceiver using a ground-plane antenna. KØGRM is a new net control on the 75-Meter Phone Net. KNØ-OLM is a new Novice in Jamestown. KØPZN and KØPZO (OM and XYL) are new hams in Devils Lake. Traffic: (May) KØCNC 66, WØYCL 44, KØIAB 17, WØKTZ 5. (Mar.) KØAJW 1.

SOUTH DAKOTA—SCM, Les Price, WØFLP—The following was sent in by SCT: The Prairie Dog ARC operated its emergency truck at Centerville during the 75th Jubilee with the call OJY. Operators were SCT, KØGDS, KØEWJ, KØBQL, YIM and KØMDF with ZVV, MMQ and son, KØCFX, EWH, the XYL of KØEWJ, LXD, KØJOK and WUU assisting. Nets reports: 75-Meter Net—35 sessions (ZLB 7, GWA 2, EXX 2, YVF 3, SCT 16, KØCRD 2, DHA 1); QNI 741, high 29, low 10, average 21.17; QTC 82, high 9, low 0, average 2.34; informals 72, high 6, low 0, average 2.05. SD 40-Meter Net—25 sessions (NNX 3, EXX 1, SCT 1, KØLXF 20); QNI 415, high 24, low 7, average 16.6; informals 40, high 5, low 0, average 1.6. K5EEV visited SCT and KØEWJ in May. EWJ is using a kw. transmitter 5EEV has for sale. JOZ is on the air mobile for the summer. LMB was home for Memorial week end from 7-Land. SCT is operating 2 meters with a dual ten-element beam, 6N2 and S-102. KØPRZ, living with brother-in-law HVY, is

(*Continued on page 104*)

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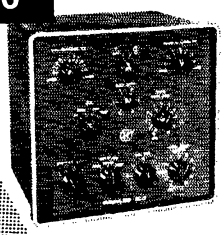
Since 1910

HC-10



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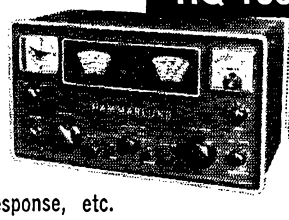
Harrison is the best place to get this sparkling new receiving equipment by one of the oldest and best manufacturers.

Want to turn your present receiver into the sharpest, slickest, SSB/CW, AM/MCW job, one which can hold its own with the very best of them? Just plug this new HC-10 Converter into the 450 to 500 KC IF output tube socket, and connect your speaker!

It has T-slot filter, vernier passband tuning, noise limiter/squelch, linear product detector, stable BFO, adjustable decay AVC, IF amplifier, internal power supply, etc., to add every modern feature to your receiver. Uses 10 tubes.

TRY ONE, and you'll be convinced! It's well worth the $149 investment. Especially when you can get it for only $27.56 down, and 12 monthly payment of $11, which includes all carrying cost.

HQ-100



Excellent performance at lowest price! Covers .54 to 30 MC, with calibrated bandspread of Ham bands. Has Q multiplier, Auto-response, etc. It's yours for only **$14 a month** with down payment of $25 and low carrying cost.

With control clock, add only $10.
Matching speaker — $14.95.
Crystal calibrator — $15.95.

Write For Free Booklet — Listening in on the World at Large with the Hammarlund HQ-100.

HQ-110

Designed with the Amateur in mind! Dual conversion on 6, 10, 15, 20 and 40. Separate linear detector for SSB. 2nd conversion crystal controlled. Crystal carlibrator. Q Multiplier. Top Ham Value! You can be enjoying this FB new receiver while paying only **$19 a month.**

Even less, if you trade in and down payment is more than $25 and the low carrying cost!

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Matching speaker — $14.95.

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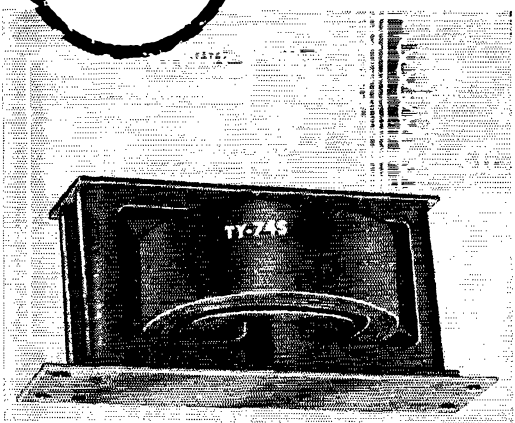
TRANSFORMER NEWS FROM TRIAD



Type No.	*D.C.Volts Output	D.C. Ma.	Max. Watts	Net Price
TY-68S	250	65	16¼	$ 8.34
TY-69S	300	100	30	10.56
TY-70S	325	150	48¾	11.40
TY-71S	375	200	75	12.30
TY-74S	600	200	120	15.00

*Center tap output winding provides half voltage at full rated current, high side full voltage at half current.

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Center tapped output windings are provided so that two simultaneous voltages may be used, if the total power in output watts is not exceeded. Especially designed for mobile transistorized power supplies, these new transformers permit an efficiency of 80 to 85%in the entire power supply.

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only a few miles from PRZ, leading DXer, in Aberdeen. KØMHF is newly-licensed. The Signal Hill ARC met with DQK in April and with CTD in May. RACES Hq. reports 17½ hours operation May 6 and 7 with 156 messages cleared. Operators were ZLB, IEI, BVY and KØESP. Traffic: WØSCT 326, DVB 81, OJY/Ø 79, KØLXF 41, BMQ 32, DUR 23, WØDKJ 12, KØIAW 8, EWJ 7, CWJ 6, DYR 6, KLR 5, LXH 5, WØNNX 4, FJZ 3, WUU 1.

MINNESOTA—SCM, Robert M. Nelson, WØKLG—Asst. SCM: Bob Schoening, ØTKX. Operation Alert '58 was quiet successful in Minnesota, reports PBY, chief for RACES. The State Headquarters Control Station was set up at Mankato this year. Messages pertaining to the simulated "bomb drop" were handled, using the 2-, 6-, 10-, 75- and 80-meter bands. Much was learned but more drills are needed to keep up the interest in the RACES program. KØDUO, OES, is constructing a 40-element beam for 6 meters. He will be running 200 watts s.s.b. soon and wants 6-meter schedules with stations to the east, preferably in the Chicago Area. BP made WAS with "RTTY No. 1" endorsement on it. He is an NCS and is active on the 40- and 20-meter RTTY nets. KØGQU has left for service with the Navy. KØMGT is back in Minnesota, after graduating from radio school at Kansas City, Mo. KØIDV and KØJCF made BPL—again! KØKYK and KNØORK are NCSs on MJN for the summer months. KØDIA and KØIDV, who both have been doing a swell job as net control, have summer jobs. New officers of the Hector Area Radio Club are BHA, pres.; NUI, vice-pres.; KØDHY, secy. Meetings are held the 1st Fri. of each month at Stewart. We still are in need of more Official Observers who will send out cooperative notices and report them monthly via the SCM office. If you think you quality and are interested, please contact your SCM. Meeting at 0645 CST, 7225 kc. Mon.-Sat., the State Side net control is KØGVS, Crookston. Open for traffic the net tunes the whole Novice band. Traffic: (May) WØKLG 304, KØIDV 261, GCN 201, WØRP 134, RQJ 122, KØJCF 113, WØPET 53, OPX 45, JRD 35, OJK 33, KØEPT 32, WØOJG 31, KØISV 27, KYK 27, WØQVR 27, ALW 25, KNØORK 24, KØGVX 20, WØKJZ 20, FGP 19, EMZ 18, WMA 17, UMX 15, KØAEE 14, WØBUO 13, KØIZD 13, WØQVQ 13, IRJ 12, TCK 12, MBD 11, WCD 11, KØGQU 9, KNØMIJ 7, OBM 7, WØYHR 6, KØHJC 5, WØUCV 5, LST 4, KØGKI 2. (Apr.) WØKJZ 27.

DELTA DIVISION

ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR. PAM: DYL. RM: SZJ. It looks as if K5FJA is due our congratulations for having made BPL twice in a row. We are glad to welcome DAG back to the section. Mac has been living in Texas and we missed his traffic-handling while he was gone. GUE is back in Arkansas. Tom was working /Ø while in college at Rolla, Mo. BYJ will be operating from W4-Land during the summer while away at college. WSM has returned from W6-Land where he visited ham friends. A new ham in Little Rock is KN5QVR. Congratulations, Wilma. The club in Osceola elected K5HOL, pres.; HFQ vice-pres.; K5KMK secy.; GWB treas.; DUV act. mgr. The club now has a civil defense trailer van to be outfitted for emergency work. We would like to remind all League Officials in Arkansas to look at your appointment certificates and send them in for endorsements if they are about due. Let us not forget to support the local traffic and emergency nets. We notice there are several of the larger towns that have no representation in the various nets that are established. Traffic: K5FPA 635, W5BYJ 149, SZJ 141, K5IPS 26, W5WSM 10.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—K5MMP has been appointed EC for the Shreveport-Bossier City Area. The Caravan Club of Louisiana elected KQS, caravan master; KAT, asst. caravan master; K5MMP, secy.-treas., and GZT, program chairman. K5ESW has been appointed as OO. K5JJY reports that the radio club at Jesuit High has nine licensed operators and four beginners. K5GPB is on 2 meters with 15 watts. CEZ continues to roll up FB totals in messages handled. He lost a transformer in his DX-100 but kept skeds with a stand-by Eldico TR-75 rig. VAR reports that an informal picnic was held at Fontainbleau Park recently. Among those present were DP, K5BES, NUH, ADU, K5DAC, K5DVQ, AZM and their XYLs and harmonics. An eight-week code class sponsored by the YMCA and operated by the Jefferson Amateur Radio Club, is about completed. MXQ is active on MARS, CAN, LAN and RN5. Incidentally, MXQ sometimes acts as net control for LAN and that net is looking for c.w. outlets over the State. The net meets each night at 6:30 CST on 3615 kc. K5AGJ transmits Official Bulletins on that frequency before the net meets. The Creola Amateur Radio Club plans a hamfest for Aug. 31. K5EFS has been appointed Alexandria Area EC. SUM is fixing marine and mobile equipment in the vicinity of Morgan City. SPZ was back in New Orleans

(*Continued on page 106*)

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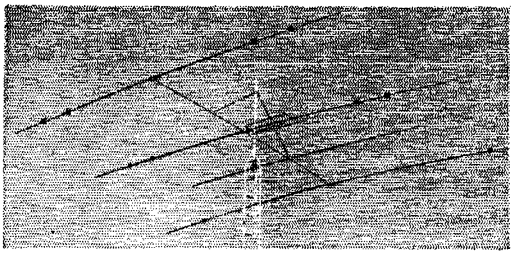
the FULL-SIZE trap tribanders



the 3-element trap tribander

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

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

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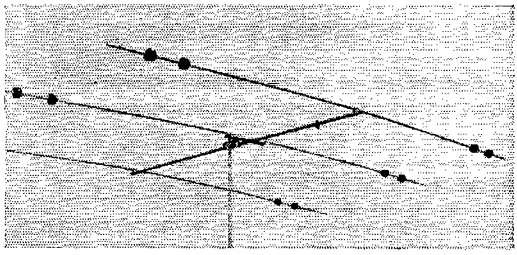
The finest, highest gain, rotatable array available. Heavy duty construction. Uses 36', 2x31" rectangular aluminum boom. F/B Ratio: approx. 25 db. Forward gain: 12 db. average.

the NEW mini-tribanders



the 3-element mini-tribander

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

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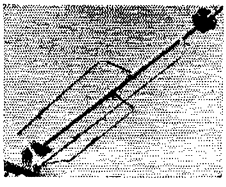
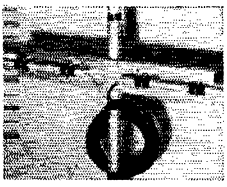
Practically a featherweight; — only 33.8 lbs., easily one-man installed in the shortest possible time and nearly anywhere. Turning radius: 12'11". Top features at minimum cost.

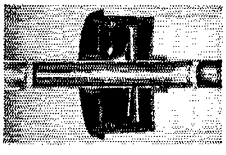
Here's the smallest practical size consistant with efficient operation, to which the trap tribanders may be reduced. Install in the smallest city lots. Light weight & rotatable by most TV rotators. Factory pre-tuned, with dimensions given for quick, easy assembly in a matter of minutes.



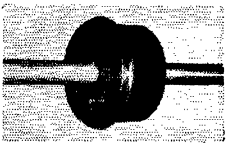
Perfect 1:1 SWR is made possible by the new, pre-calibrated Triaxial Gamma Match System with coaxially formed reactance cancelling capacitor built in. Exceptional band width maintains low SWR over entire band. Coax connector for 52 ohm feed line included. Gamma rod and capacitor section calibrated for exact setting over each band. No external baluns, antenna tuners or matching networks needed.

Split insulated dipole feed with coaxial choke results in SWR of less than 2:1 on all bands. No adjustments needed: simply attach 52 ohm feedline to dipole terminals. Heavy 12 ga. hot dipped galvanized steel channel and polyethylene insulated U-bolts support Hy-gain's driven element. Compare this construction with the flimsy supports using self-tapping metal screws.





The automatic switch action of the Insu-Traps is employed in both series of tribanders. They act as insulators at their resonating frequencies, but allow radio energies of other frequencies to pass, isolating various sections of the antennas. Mechanically and electrically stable, the traps are hermetically sealed at the factory in polyethylene cover and cap, completely weatherproof. Hi-Q coils wound on styron form. Guaranteed for the life of the beam. The Mini-Tribander Traps are specially weight-designed for wind loading efficiency.



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BETTER STILL, COME IN — PLENTY OF PARKING SPACE

on a two-week vacation from Ft. Worth. Some of the calls you might hear on Sun. mornings around 3950 kc. are GAD, JHK, K5MDV, VSQ, QHP, K5CVK, JGW and even FMO. K5GGW heard W6, W1, W2, W7 and W8 on 6 meters May 25. Traffic: W5CEZ 445, K5AGJ 155, W5MXQ 111, VAW 6.

MISSISSIPPI—SCM, John Adrian Houston, Sr., W5EHH—The Biloxi ARC held a picnic on the beach in Biloxi Fri. night May 9. Lighting was provided by the gasoline-powered generator furnished by the club president, SPX. New members are DZZ, RZP, USK, VTI, YEN, W2KOA/5 and Michael Lehman, 12, not yet licensed. The Biloxi ARC operated two stations from the V.A. center on Armed Forces Day. The equipment was furnished by UOO, SPX, KN5LGB and KN5PBX. The stations operated under the calls UOO/5 and SPX/5 and handled 130 messages. Others assisting were AFD, TDU, ISV, RWV, TRF and ex-QYX. The Biloxi ARC will hold a hamfest Aug. 23 and 24. First prize is a DX-100; second, a 17-in. TV set; third a magnetic tape recorder; and many other prizes. For information contact John F. Jackson, 2307 Miller St., Biloxi. K5IHQ is the new net mgr. for MMEN. NRU is the new secretary. The net time has been changed to 7 P.M. CST. The Cleveland ARC is looking forward to a large turnout at the hamfest. Traffic: W5FPI 532, K5IUE 10, MFY 6, W5NRU 6.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: RRV. PAMs: ZZ, UOT, PAH and VQE. RM: NHT. Welcome to DTI, who is back in Tennessee again and on the air from McMinnville. Congratulations to BPL winners PL, 5RCF, WQT and K4ONQ. WQT earned his the hard way with 250 originations in eleven hours. Welcome to new Kingsport hams K4VKA, KN4VOS, VVM and VVN. Kingsport is making plans for its usual FB picnic Aug. 10. TDZ reports that he is building a kilowatt final for 6 and 2 meters. K4ONQ has a new "beautiful" CAN certificate. Congratulations to new ORS K4LPW; also to new ECs BXP, CXY, LQE and K4MYI. CXY is putting up a nice trophy for participation in the Oak Ridge RACES drills on emergency power. Look for the Tennessee Nets: C.w.—3635 kc. at 2000 EST; Phone—3980 kc. at 0645 EST and 0645 1900 CST; S.S.B.—3980 kc. at 1900 EST; Six Meter—50.5 Mc. at 2000 EST (Fri.). Traffic: W4PL 1253, W5RCF 1156, W4WQT 520, K4ONQ 513, LTA 102, LLB 97, W4VJ 63, NHT 48, CXY 15, UIO 44, RRV 34, UVL 32, K4LPW 24, W4PAH 21, GFL 19, JVM 15, K4KJC 15, W4VQE 9, TDZ 4, UVU 2.

GREAT LAKES DIVISION

KENTUCKY—SCM, Albert M. Barnes, W4KKW—SEC: JSH. RM: K4AIS. PAMs: SUD, OGY, K4ECJ and LOA. The Dix Dam Picnic is now history. I enjoyed meeting so many friends, new and old. The communications system is a "Buck Rogers" dream. Everything is used from controlled-carrier via the high lines to u.h.f. microwaves for local post-to-post use. KPN cleared 218 messages in May for an average of 7 per session. High session was on May 18 with 21 cleared. K4MMW, the NCS and also manager of the morning KPN, reports daily morning operation now is at 0730 CST. KYN cleared 390 in 58 sessions, averaging 6.73 per session. High meeting was on May 17 when K4KIO, the NCS, cleared 25 in 73 minutes. Ky. Sideband Net (KSN) is perking along Mon. through Fri. on 3975 kc. at 2000 CST. K4ECJ is PAM for the sidewinders. K4LOA, U.H.F. PAM, reports excellent progress in organizing KY6 for state-wide c.d. emergency work. K4SBZ is a new Junction City ham. K4SPJ is using a Gonset III. K4HTO is putting up a 4-ft. vertical for his dad, JUI. We are sorry to hear of the death of NRH's mother. New OPSs: K4QHZ and K4PGH. New ORSs: K4MHM and K4PNA. The Maysville, Ky., Radio Club holds code and theory classes every Thurs. K4AIS has a new Dow key. BAZ worked KM6BK, a former KYN member. K4JOP has a new 10-meter antenna. K4KIN is on a two-month's cruise in the Pacific. NUQ works into the Bible Study Net on 3855 kc. at 0600 CST. KKG is going s.s.b. Traffic: W4SUD 352, K4AIS 316, W4KKW 180, OGY 124, RPF 96, K4MMW 77, KIO 76, W4HOJ 75, K4WBG 73, W4BAZ 60, K4JOP 58, LHQ 54, MHM 47, CSH 42, KIN 37, W4JSH 34, K4CC 32, W4CDA 32, K4KIS 26, PNA 26, W4NUQ 15, KKG 13, K4QHZ 10, W4NGN 6, SZB 5, K4HOE 4, W4JUI 2.

MICHIGAN—SCM, Thomas G. Mitchell, W8RAE—SEC: YAN. Despite the season slump in news and general activity, our traffic total for May is greater than for April. Perhaps this is like the lull before the storm since every organization and individual seemed to be highly keyed up for Field Day. May BPL certificates were issued to CWE and WGU. The increase in AREC activity noted in this report last month is continuing, according to YAN. The Downriver Radio Club (Wyandott) has elected GUM as president and ARH as record-

(*Continued on page 108*)

NEW GONSET SSB

GSB-100 TRANSMITTER

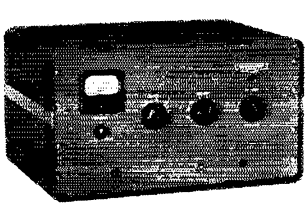
Introducing Gonset's big SSB value, the GSB-100. Completely self-contained with highly stable VFO and power supply, for operation on amateur 80, 40, 20, 15, 11 and 10 meter bands.

Amateur Net $439.50

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

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

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



SSB LINEAR AMPLIFIER

New grounded grid linear amplifier is rated at 1000 watts peak input power. It is designed to operate with GSB-100, or similar SSB transmitters supplying 75–100 watts peak power drive. Amplifier is self-contained, includes power supply, pi-network output, antenna changeover relay. Provides bandswitched operation on 80, 40, 20, 15, 11 and 10 meters. Attractively styled. Same size cabinet and general appearance as GSB-100 Transmitter.

Model #3262

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

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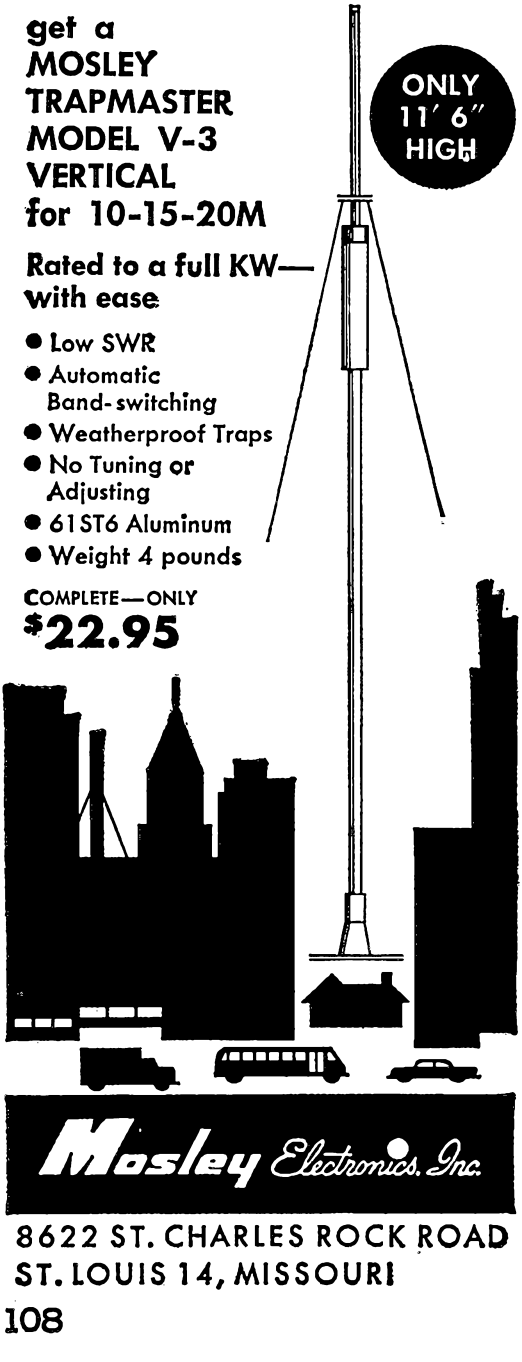

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ST. LOUIS 14, MISSOURI

ing secy. HKT is chasing DX on 15 meters with a new ground-plane and his DX-40. FX has been investigating the subject of VT bleeders and is not too sold on their merits. UCN is off to Hawaii without even a hint as to why or how long, but it is an FB place to be heading for. The Niles ARC received high praise for its installation of an operating amateur station as part of the Tri-County Council Scout-O-Rama held in Berrien Springs last month. The station operated as DUS/8 on 20-meter s.s.b. and received an official message from the Chief Scout Executive to the participating organizations and scouts. This message was relayed over the p.a. system for all to hear. Much interest in our hobby was evidenced by the crowds around the booth at all times. Next month's report will be short because of my vacation. I will hold traffic totals for the following report. Traffic: (May) W8WGU 462, CWE 146, FWQ 118, K8NAW 90, W8DJN 77, NOH 60, FX 57, K8ADD 39, W8WXO 36, VYG 30, K8AXL 27, W8FSZ 18, QIX 17, AUD 16, IZS 16, FDO 15, DSE 12, HKT 12, RHD 7, SCW 5, CRH 4, EGI 3, WVL 3, TIC 2. (Apr.) K8NAW 155, W8NOH 103, QQO 83, FDO 27, IZS 10, RHD 4.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: UPB. RM: DAE. PAMs: HPP, HUX and HZJ. K8DEY has a three-band cubical quad. K8CAG joined the Marines. The Tusco RC worked with broadcast station WJER in getting primary election returns from 119 precincts in Tuscarawas County and did a very good job. Those who took part were BIM, EUK, GAC, GUP, HQ, JHJ, MEI, NYQ, SBM, STR, WFE, WFJ, K8s GID, JOR and JPA. New Knucklehead certificates were issued to DBF, DIM, QDC, QMH, K8s GID, JPA and JSZ. STR made WAS. KN8KFH moved to West Virginia. I wish that I had had the announcement sooner of the Hocking Valley RC Annual Basket Picnic, which was held July 13 at Lake Burr Oak State Park six miles north of Glouster off Ohio route 13. The Clermont County ARC's 1958 officers are PAZ, pres.; K8JTZ, vice-pres.; OWP, rec. secy.; IGE, corr. secy.; QLG, treas.; ZRL, trustee; and WYS, RACES. BPM moved to New York. The Massillon ARC heard Mr. Dashnow speak on Philosophy of Science. FSM and his XYL spent two weeks in Honduras visiting with HR2HA, HR1BB and he showed the club slides and movies of his trip. The South East ARC's 1958 officers are CPC, pres.; JUK, vice-pres.-treas.; and SLR, secy. EI, RJB and K8CSS made DXCC. The Cleveland Area Council of ARC's 6- and 10-meter ground-wave contest winners are as follows: AJH for 10 and PJC for 6 meters. K8JHZ is on 6 meters. JHI moved to Cleveland from KL7-Land. BVN was in Florida. The Cuyahoga County AREC furnished communications for handling the Loyalty Day Parade, with AEU, AJH, AVU, DGK, FAG, INW, LVM, NZI, PZR, TFW, VFU and K8AAG taking part. This organization did the same thing during Cleveland's Memorial Day Parade, with AEU, CPF, DGK, LHX, PZR, VFU, WLH, K8s AAG and ABA taking part. KN8s JOR, JOX and JPA are new hams, while K8s HED and HTI dropped the "N." Dayton ARA's *R-F Carrier* tells us that KTM gave a talk on antenna's common errors and pitfalls and K*Ø*AST spoke on his "Little Giant" antenna. NHW, K8s GAK, GFU and KDW are on 6 meters. GHX, INQ, LPD, MGJ, K8s AEW, AOH, BLS, BOW, CBD and GNJ are on 220 Mc. Ohio Valley ARA's *Ether Waves* informs us that OPA vacationed on the West Coast. DAE is using an SX-96 and a Viking Valiant now. UPH made BPL with over a thousand again. YGR received cards from ZD3 and SV*Ø*. The Van Wert ARC's 1958 officers are DHG, pres.; OWC, vice-pres.; BDC, treas.; OWD, secy.; and SGX, act. mgr. The Columbus ARA's *Carascope* informs us that GZ explained the Windom antenna with formulas. A new appointee is K8BIZ as EC. With that tornado striking in Wisconsin, it brings to mind that we still need ECs for the following counties: Ashland, Brown, Carroll, Champaign, Clinton, Coshocton, Defiance, Delaware, Erie, Gallia, Hancock, Hardin, Holmes, Huron, Marion, Medina, Mercer, Monroe, Morrow, Noble, Paulding, Portage, Preble, Putnam, Sandusky, Scioto, Union, Vinton, Warren and Williams. Let us be prepared for such a disaster if it should strike here in Ohio. If interested, write to D. E. Cartwright, UPB, 2979 Observatory Rd., Cincinnati 8, Ohio, or to me. Traffic: W8UPH 1383, QLJ 210, DAE 132, HXB 74, K8HXF 70, W8CTZ 60, YGR 50, K8DDG 48, W8LT 45, AAU 32, K8CZJ 30, W8GQD 27, WYS 26, AL 24, IBX 21, RO 18, LMB 16, PLQ 16, SJQ 16, DSQ 14, STR 14, K8GCV 13, W8HZJ 10, WTO 8, K8EJL 6, W8FFK 6, QIE 4, K8EVT 3, W8UHW 3, LGR 2, STF 2, K8GPI 1, HEJ 1, W8TDB 1.

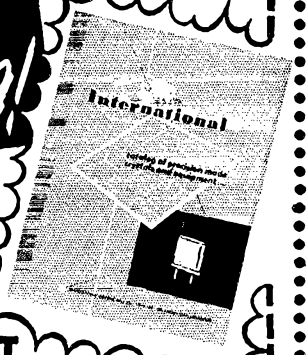
HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy,

(*Continued on page 110*)

International's

NEW 1958 *Catalog!*



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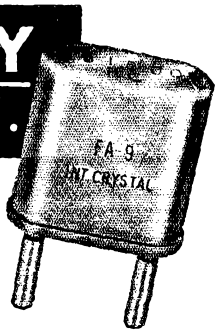

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Prices Pin Diameter .093"
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(FA-9 Fits Same Socket as FT-243)

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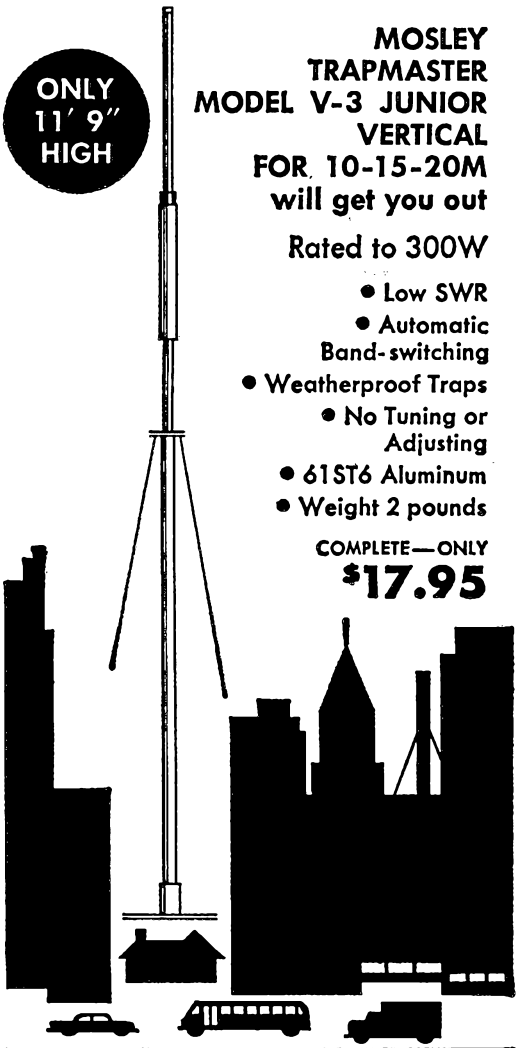

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W2EFU—SEC: W2KGC. RM: W2PHX. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; 1PN on 3970 kc. at 1530; ESS on 3590 kc. at 2100; ENY (emerg.) on 29.490 and 145.35 Mc. Fri. at 2100; MHT (Novice) on 3716 kc. Sat. at 1300. We welcome the Port Jervis CD Club as a new affiliate. Congrats to our scholarship winners—K2HQJ national merit, W2LET to R.P.I., and W2YCZ to C.B.A. in Albany. Among those who recently turned General are K2BIO, W2FOI, W2ROI, W2YDD, W2VDI, W2YDP and W2TGX. New appointments: K2ZAU as OO and K2VTW as OBS. Endorsements: W2PHX as ORS. New officers of the Ulster County Mike and Key Club include W2YOK, pres.; K2BCU, vice-pres.; K2YFA, secy.; W2ZBH, treas., W2PGE, W2BCU and W2VHZ, directors. Nice to hear W2BTV made DXCC on 20-meter phone. W2VP, with a new DX-100, has moved to Milton, N. Y. W2SZ, as area control station for Area IV C.D. RACES, operated three rigs during the two days of Operation Alert. Although the Albany and Poughkeepsie AREC groups were ready, the N.Y.C.-Albany Outboard races were cancelled. The Schenectady Club held its annual dinner at the Locomotive Club on June 2. Look for a copy of the new Albany Club paper, *B Plus*, a fine job. The club's April meeting featured color TV. All roads will lead to Albany on Oct. 11 for the Hudson Division Convention. The chairman is W2GM, who will send you program and ticket information. K2ZAU reports that the Pelham H.S. Club station, K2OXR, will be in operation this fall. W2AZO worked 45 states and 25 countries since receiving his ticket last October. Traffic: (May) K2UTV 236, K2YTD 159, K2UYK 130, W2PHX 128, W2ATA 127, W2EFU 123, K2LKI 114, K2YJL 111, K2SSB 45, K2VCZ 38, K2YZI 30, K2EJV 26, K2HJX 24, K2HNW 20, K2QJL 19, W2SZ 18, K2OKZ 11. (Apr.) W2GTC 10, K2EJV 8, K2VCZ 8, K2SQV 2.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: W2OBW. V.H.F. PAM: K2EQH. Section nets: NLI, 3630 kc. nightly at 1930 EDST and Sat. and Sun. at 1915 EDST; NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EDST; NYC-LI AREC, 3908 kc. Sun. at 1730 EDST; V.H.F. Traffic Net, 145.8 Mc. Mon., Wed. and Fri. at 2000 EDST. BPL cards go to W2KEB and K2PHF, K2QBW, K2RKL and K2VIX, the latter four on originations plus deliveries. K2RKL and K2VIX became the first v.h.f. operators to make BPL in this section. Congratulations to Bob and Frank. W2OBW reports that the NYC-LIPN continues to average a 25-station membership per session. W2AEE handled communications for a cup regatta on the Harlem River. New officers of the Oyster Bay HSRC are K2HVY, pres.; K2ZAZ, vice-pres.; KN2PNZ, secy.; and KN2QFJ, treas. K2SFS completed his modified 2EWL s.s.b. exciter. K2BH returned to New England to 1QGU after ably assisting the NLI Net during his stay here. It is with deepest regret that W2CLC and ex-W2MIX (late K4RFF) are reported as members of Silent Keys. W2LGK is rigging up an S-20R for portable work. W2AOD reports continued activity on 432 Mc. with new stations joining every month. New officers of the Wantagh RC are W2DUS, pres.; W2KJQ, vice-pres.; and K2CCM, secy. K2AED completed a final for d.s.b. K2KRH is now mobile on 10 meters and runs 150 watts on 2 meters at the home station. New officers of the Garden City HSRC, K2VST, are K2TZS, pres.; K2TZQ, vice-pres.; and Diane Meyer, secy.-treas. K2DIX is signing K4JXJ from Florida. K2MEM received his WANJ certificate. KN2MIG would like to know if anyone is interested in joining him on 40 meters for a ragchewing net. New officers of the Bronx HS of Science ARC are K2PRP, pres.; K2IAD, vice-pres.; W2KQX, secy.; and K2QBW, act. mgr. The Eastern Suffolk RC, K2YVA, is sponsoring a 2-meter club project. The newly-affiliated Woodlawn RC announces the following officers: K2VTL, pres.; K2KQH, secy.; J. Lipsig, treas.; and K2JRE, act. mgr. New members are invited. K2VWF is off to W6-Land. A trap antenna is in use at KN2LGL. KN2SDN and KN2SDM make a new husband-and-wife team. W2RDD has a quad on 14 Mc. W2EW is active on the v.h.f. net with his antennas 55 feet in the air. K2RBS is enjoying 50-Mc. work with the local net. New officers of the NYRC are K2EOF, pres.; K2ABA, vice-pres.; W2ATT, secy.; and W2OWL, treas. New officers of the Brooklyn Polytechnic Institute RC, W2BXK, are K2YUX, pres.; K2PUM, vice-pres.; K2YAE, secy.; and K2ZIR, treas. K2AZT installed a discone for 144 Mc. W2JYN has joined the 6-meter mobile gang. New officers of the Fordham RC are K2CON, pres.; K2JBK, vice-pres.; W2KQX, rec. secy.; K2BRK, corr. secy.; K2SOQ, treas. K2MYR, act. mgr.; W2HVC and K2BRK, directors; and J. Kujan, sgt. at arms. K2DCJ became the son-in-law of W2DUS. Hope you are enjoying your summer. See you from the mobile. Traffic: (May) W2KEB 3777, K2PHF 760, K2QBW 441, W2VDT 406, K2RKL 384,

(*Continued on page 112*)

A Clean Sweep in Every Class!

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TRIPLE CONVERSION SSB AMATEUR RECEIVER

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

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GENERAL COVERAGE

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

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AMATEUR RECEIVER

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

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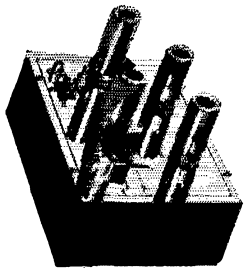

432 MC.

NF. 5 db. Sensitivity: ½ uv. Will give 10 db. or better signal-to-noise ratio. Mod. 400 cps. 30%. Image rejection —40 db. or better. With 14–18 mc. IF output **$69.50**

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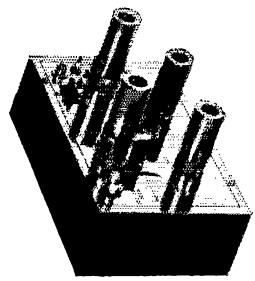
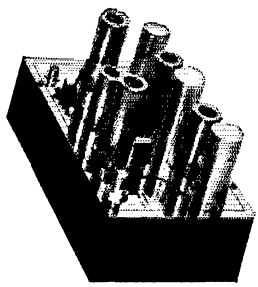
NF. 5 db. Sensitivity: ½ uv. 30% mod. 400 cps. Will give 10 db. signal to noise ratio. Image rejection —50 db. or better. With 14–18 mc. IF output...**$69.50**





144 MC.

NF. 4 db. Sensitivity: ½ uv. 30% mod. 400 cps. Will give 10 db. signal-to-noise ratio. Image rejection —50 db. or better. With 14–18 mc. IF output..... **$69.50**

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NORTHERN NEW JERSEY—SCM, Lloyd H. Manamon, W2VQR—SEC: W2IIN. PAM: W2VDE. V.H.F. PAM: K2KVR. RMs: W2BRC, W2NKD and W2CGG. New ORS appointees are K2VAB and W2YBC. W2GRD has been appointed OO. In looking over the records it is hard to believe that our latest ORS appointment went to K2VAB, age 11. Tex also is quite a traffic man and reports regularly into NJN. K2OBJ has a new GPR-90. K2QYI is installing new full break-in facilities. W2ANG, W2BRC and K2EB have been doing a fine job assisting the staff at Kessler Institute, a research organization in occupational therapy, by interesting the patients in ham radio. Other amateurs assisting in this very worthy project are W2IMU, W2IIDQ, K2YBC. W2AGJ and W2UKQ. K2AGJ is the spark plug of the group and is a YL, as are K2YBC and W2UKQ. The New Jersey Six-Meter Traffic Net report shows that 39 different stations checked into the net during the month of May. K2VNL was acting net mgr. for May. K2TML has been on the sick list but is fully recovered now. We are very sorry to have to report the death of W2ZL. He will be missed by all of us. George was one of the real old-timers in the section. KN2BRT exhibited an amateur station at the Rumson High School Science Show and won first prize for the exhibit. K2KVF now is General Class. K2VNL is working on a new 6-meter rig. K2GVU and K2USA were visited by W1IIDQ recently. K2PIM has a Mosley vertical antenna. W2ZVW worked at W1EIA on Field Day. The Ocean County ARA has issued its second news bulletin under the watchful eyes of W2CFB. The bulletin contains some very good technical articles as well as worthy news items of club members. K2DDM is civil defense officer in Sayerville. The headquarters has some new RACES equipment and activity is picking up. K2MFX is on 10 meters regularly. John has deserted his first love, 6 meters. W2CVW is on 2 meters with a new Gonset III. New calls in the Avenel Radio Club are KN2TZX and KN2TGZ. W2BVE made BPL this month for the first time. K2DHE, Monmouth County RACES officer, held a meeting of County RACES personnel in Freehold during the last week in May. The meeting was well attended. The MARS station at Ft. Monmouth has been completely rebuilt under the guidance of W2GVU. Traffic: W2BVE 417, W2ZVW 160, W2RXL 83, K2VAB 73, W2RZO 59, K2MDS 58, K2QYI 51, W2BRC 47, W2MLW 42, W2KFR 41, W2EWZ 29, K2ZHK 29, W2OXL 25, W2DRV 24, W2CVW 16, W2IUC 15, W2TOD 14, W2GRD 11, K2YBC 9, W2EBG 8, WN2RFS 8, K2BWQ 6, W2CFB 5, W2CJX 4, K2VNL 4, K2YWG 4, W2OPB 3, W2GVU 2, K2JTU 2, W2NIY 2.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—NWX directed the Jasper County Emergency Net during a three-day emergency following a windstorm at Rock Creek Lake. Six mobiles and 19 fixed stations participated. The TLCN held its annual party in Marshalltown May 23 with 32 attending. LGG was chosen manager for her 3rd term. The Iowa 75-Meter Phone Net will hold its annual picnic at Clear Lake Aug. 17. KØAPS received an ORS appointment and CLS renewed his. KØKAQ and KCK are now General Class. They and GBB are using the new family Tri-Band beam. KP1 has a new 75A-4 and a Pacemaker. The Story County Club handled communications for the Iowa State Veishia Parade. The IDM Net has changed its title to Iowa District Midwest Net because of net expansion. QJF, WLR and KØCLI made another expedition down the Cedar River from Waterloo to Cedar Rapids on rafts with a kw. s.s.b. rig. QVN, with the assistance of AUL, SEG and others, directed Operation Alert for the State. QVN made BPL on originations and deliveries during the operation. The Burlington Club operated its club station, KØLDN, during the

(*Continued on page 114*)

TOWERS

ALL THE WAY IT'S E-Z WAY!

See Page 120

ADIRONDACK RADIO SUPPLY 185 W. Main Amsterdam New York

For Every Ham Requirement . . . the complete GLOBE electronics line . . . More "Workable Watts" per Dollar!

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

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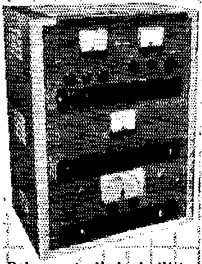

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W/T: $795.00

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

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

Globe Champion 300A

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Kit: $399.00

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

Plate Modulated . . .

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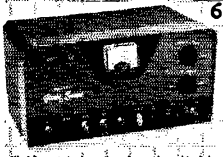

W/T: $119.95

Kit: $99.95

65w CW
50w AM

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

90w CW for 10-160M

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

Bandswitching 6 & 2M Xmttrs

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6M:
70w CW,
60w AM

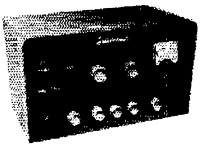
2M:
60w CW,
50w AM

W/T: $139.95 Kit: $119.95

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

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

Sidebander DSB-100



W/T: $139.95

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

Globe's VOX Model 10

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

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VFO 755A

160-10 Meters

W/T: $59.95
Kit: $49.95

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

VFO 6-2

W/T: $59.95
Kit: $49.95

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

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

Power Attenuator PA-1

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

Antenna Tuner with VSWR Bridge

Globe Matcher Sr.

W/T: $79.50

Kit: $69.50

Shielded Cabinet

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

Globe Matcher Jr., AT-3

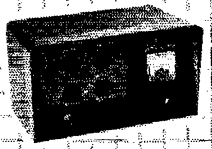
For input to Xmttr. of 100w CW, 75w fone or less. Substantial harmonic attenuation. Unbalanced output. Self contained.

W/T: $15.95 Kit: $11.95

Grounded Grid, Class B or C

Globe Linear LA-1

W/T: $124.50 Kit: $99.50



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

Versatile Modulator

Plate Modulator UM-1

Modulates RF inputs up to 100w.

W/T: $49.95

Kit (less tubes) $32.50

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

Controlled Carrier Type

Screen Modulator Kit

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

Kit: $11.95

6 Meter Converter

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

W/T: $27.50 Kit: $19.95

Code Oscillator Kit

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

Peak Limiting Pre-Amplifier

Speech Booster FCL-1

W/T: $24.95 Kit: $15.95

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

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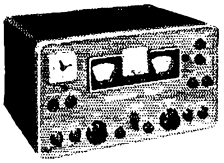
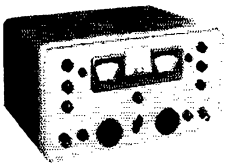
Here's your opportunity to make a "top deal" on one of these fine Hammarlund receivers! We're loaded with a complete stock on all items, and trading high on every deal. Check the features on these Hammarlund units — then check Burghardt's for highest trade-ins, low down payments, and easy terms that will fit your budget!



HQ-170 — Hammarlund's great new communications receiver that combines the most desirable features of the best amateur receivers with the finest of SSB/CW and AM/MCW converters. Just a few of its many outstanding features: 17-tube superheterodyne, dual and triple conversion, 6-10-15-20-40-80-160 meter bands, separate vernier tuning, 60 db adjustable notch filter, 100 KCS crystal calibrator, selectable upper, lower or both sidebands, fast attack AVC — plus much more.....$359.00 NET



HQ-160 — Tops in performance, tuning and dependability! Covers continuously the frequency range of 540 KCS to 31 MCS. 13-tube dual conversion superheterodyne receiver with 14 tuned circuits in the IF — crystal controlled 2nd conversion. Electrical bandspreader — Q-Multiplier — adjustable notch filter up to 60 db attenuation. No finer value in communication receivers.....$379.00 NET

HQ-110 — Every feature you want — at the right price. Full coverage 6-10-15-20-40-80-160 meters. Dual conversion 12-tube superheterodyne. Separate stabilized BFO — separate linear detector for SSB and CW. Q-Multiplier. Crystal calibrator. Auto-response.....$249.00 NET

HQ-100 — An outstanding general coverage receiver at a popular price. 540 KCS to 30 MCS — electrical band spread — Q-Multiplier — auto-response. 10-tube superheterodyne circuit. Voltage-regulated and temperature-compensated for high stability.....$189.00 NET

MATCHING ACCESSORIES

TELECHRON CLOCK-TIMER — Combination clock and automatic timer. Meet pre-arranged schedules with a warmed-up receiver. Space for clock-timer provided in front panel of receivers. $10.00 NET

MATCHING SPEAKER — Extended range. 8-watt capacity. Housed in attractive metal cabinet, 9⅝" high, 9⅝" wide, 7" deep.....$14.95 NET

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Write today for your free copy of Burghardt's newest catalog!

Burghardt RADIO SUPPLY

P.O. Box 746,
Watertown, So. Dakota

Alert. KØBLJ has a new Courier transmitter. Traffic: (May) WØSCA 1863, PZO 1294, LGG 942, LCX 934, BDR 919, KØCLS 602, WØBPJ 585, CZ 460, QVN 176, VWF 145, QVA 112, LJW 84, KØAPS 57, BLJ 51, WØNTB 40, IUY 34, KØAPL 33, WAD 33, WØSLC 32, NGS 30, NYX 29, VQX 25, KØGXC 24, WØMEL 16, UTD 12, KØGOQ 10, INR 10, BPE 9, EXN 9, WØYI 9, KØHBD 8, WØREM 7, PTL 6, CGL 5, FMZ 5, UHO 5, KØIGU 4, BRE 3, WØFDM 3, COD 2, KØHFQ 2, WØHNE 2. (Apr.) WØPZO 1565, KØAAH 2.

KANSAS—SCM, Earl N. Johnston. WØICV—SEC: PAH. PAM: LEW. V.H.F. PAM: ZJB. RM: QGG. There was a large turnout for the Christy Memorial Picnic held at Lake Shawnee, Topeka. This will be an annual event sponsored by the KVRC at the same place and same time each year. The JARS is sponsoring a 24-hour watch on 29.6 Mc. for emergencies. A good many RACES groups participated in the 1958 Operation Alert, which was the most successful ever held. Some organizations had equipment failures which bring out the need for practice alerts more often than once a year. All who participated are to be congratulated. I know the e.d. officials deeply appreciate your participation. HAJ was honored with a certificate for his splendid work with the CKRC. Barney has moved to Kansas City. The Mike and Key ARC of Parsons has applied for a club station license, with KØIRI as trustee. KØJVQ has a new Knight VFO. KØKMZ is a new station in Parsons. KØGOP has moved to Parsons. VGE (LOW's daughter) had a nice write-up in the *Omaha World Herald* May 11 for her work in the 1957 blizzard. Yours truly will be mobiling in Western Canada when you read this, operating 10, 15 and 20 meters, c.w.-a.m. and s.s.b. with an AF67, a PMR-6 and a KWM-1. Traffic: (May) WØOHJ 932, BLI 733, TOL 553, FNS 336, UOL 112, IFR 103, SAF 91, KØBXF 83, IZM 70, HVG 59, IRL 43, WØSYZ 39, ORB 37, TTG 30, ABJ 27, QQQ 24, KØAWO 19, GZP 10, WØHL 6, LEW 5. (Apr.) WØLZJ 8.

MISSOURI—SCM, James W. Hoover. WØGEP—Net reports: MEN—13 sessions; QNI 426, QTC 173; NCS, DWX, OMM, OHC and KØIZM, MON—54 sessions; QNI 282, QTC 237; NCS, OUD, GBJ and RTW. EBE is seriously ill and hospitalized in Springfield. KØIHY has a new mobile installation with an AF-67 and a Super 6. EXN is vacationing and working regular schedules from his mobile with NUE, who can be heard quite readily with his new KWS-1. VVU will be in California for the next few months and will keep in touch with the Missouri gang via 20-meter c.w. After 35 years of other amateur radio activities, BUL set up to work DX and has been enjoying the new experience. Congratulations to the Heart of America Radio Club for the fine *Kansas City Area Amateur Call Book* which has just been published and distributed. Thirty-three stations participated in an unofficial storm warning net Apr. 23 on 3885 kc. KØJAD gathered observations for the Weather Bureau in Columbia. Bad weather stimulated another session on May 31 with 13 stations participating. Some traffic was handled for the Columbia Ground Observer Corps when their commercial power was lost. The St. Louis 6-meter gang has participated in 5 tornado alerts since Apr. 5. Mobiles are dispatched to points surrounding the St. Louis Area and observations are reported to the Ground Observer Corps Filter Center. *The VHF QSO*, publication of the Midwest V.H.F. Association, has detailed reports in the May and June issues. Traffic: (May) WØCPI 1314, GAR 672, KØLNQ 375, WØGBJ 212, VPQ 155, OUD 112, KIK 94, BVL 70, RTW 61, KØHHG 57, LWX 50, WØOVV 38, KNØONK 27, WØOMM 21, YKC 14, KNØLGZ 13, WØWYJ 12, VJD 10, BUL 8, CKQ 7, HUI 5, KØIHY 5, DEQ 4, WØEBE 3. (Apr.) WØKIK 79, OHC 79, OMM 34, KNØOQF 22, WØVPQ 22, KA 12, HUI 11, BUL 7, KNØLRG 6, WØVFP 6.

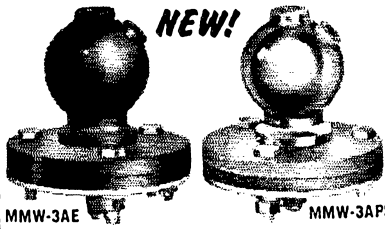
NEBRASKA—SCM, Charles E. McNeel, WØEXP—The Nebraska 75-Meter Emergency Phone Net meets on 3983 kc. daily at 1230 CST and MAO reports QNI 476, QTC 57, with 37 stations on roll call. The Western Nebraska Phone Net, reported by NIK as NCS, meets daily on 3850 kc. at 0730 MST with QNI 625 and QTC 88. The Morning 75-Meter Phone Net reports QNI 569 and QTC 137. New members are MAO, KØGWK, YCY, KØLFF, BOQ and PUT. KPA, NME, YYV, KØJFD, KØEVY, SXR, OVW, GEQ and EXP were in attendance at a farewell dinner in Great Bend, Kans., for WWR, who is moving to Texas and will be on 75 meters soon from his new location. Sutherland is now 100 per cent s.s.b. with all three stations active. About forty amateurs attended the picnic held June 1 at Chadron State Park and all reported a fine time. JDJ, our SEC, attended a club meeting in No. Platte and gave an interesting talk on e.d. and RACES. Traffic: WØMAO 160, DDT 142, KØDGW 119, BFD 96, WØOKO 58, ZJF 56, NIK 51, KØLJW 47, BRQ 30, WØPUT 29, KØKUA 28, HKI 22, WØQKR 17, BOQ 16, KØECA 16, WØZOU 16, LXS 13, KØBRS 12, KJP

(*Continued on page 116*)

HEAVY DUTY

MOBILE BASE MOUNTS

NEW!



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Engineered for Greater Performance

The last word in modern design for strength and service in universal swivel bases. Easy installation, mounts watertight on any surface. With template. Positive locking, any position.

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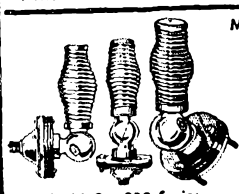
Polished Finish, S. S. Hardware..... $9.25



Model 232-C 232 Series

Model 142 100X Heavy Duty 100 Reg.

Model 140 100WX

NEW MULTI-BAND ANTENNA COILS

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

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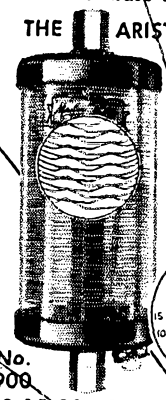
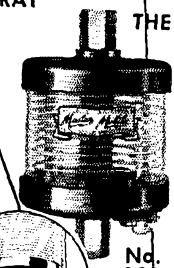


No. 900
10-15-20-40-75 METERS

THE VICTORY



No. 999
10-15-20 METERS

- Rigidly tested & engineered—found to have "Q" of 525
- Handles 500 Watts input
- Operates into a 52-ohm cable
- Positive contact—noisefree, troublefree operation
- Weathersealed
- Factory pre-tuned—no adjustments needed

YOUR CHOICE
Amateur Net
$14.95

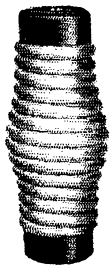
Now! 2 New Coils... just plug in and presto! your coil is ready for operation on the desired band! No switches, no sliding contacts, no loose connections. Built and pre-factory tested in Master Mobile's own laboratories.

NEW! from Master Mobile

Leaders in the Design and Manufacturing of Mobile Communication Equipment & Antennas

NEW HEAVY DUTY

MOBILE SPRINGS

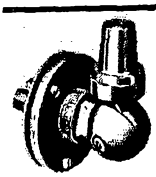


MMW-7 MMW-7SS

PROTECTS YOUR MOBILE ANTENNA

Heavy duty flexible mounting 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

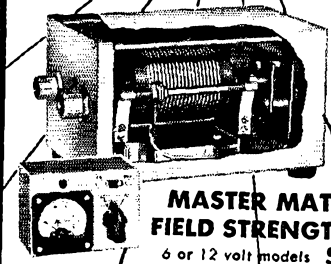
FOR 10 11 12 15 20 40 80 METERS

96" WHIP

SIZE 1⅜"x 19"

NO. B-1080

Positive action, just slide whip in or out to loading point and lock nut into position. **$17.95**

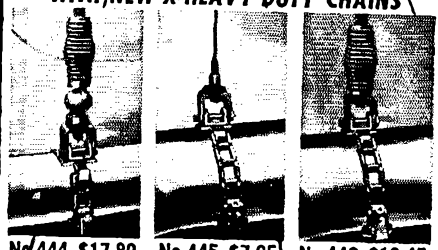


Automatically tunes the entire band from the driver's seat!

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

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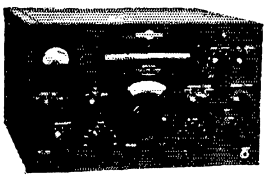
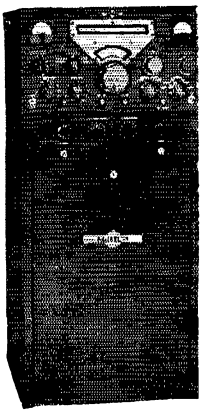
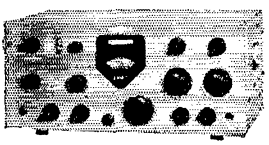


COLLINS 75A-4 This SSB Receiver offers all the proven Collins features — excellent image rejection through double conversion, precise dial calibration and high stability of Collins VFO and crystal controlled first injection oscillator, and the ideal selectivity of Collins Mechanical Filter in the IF strip.
Net Price $695.00

COLLINS KWS-1
Companion transmitter to the 75A-4. Unmatched performance in minimum space for a kilowatt. Extremely accurate 70E VFO, Pi-L output network and Mechanical Filter.
Net price .....$2,095.00.





COLLINS KWM-1
The first mobile SSB transceiver in the Amateur field — 175 watts PEP, 14-30 mc. Fixed station use without modification.
Net price $820.00

Time Payments Arranged at Low Cost Through Our Local Bank on Purchases of $100.00 Net and Over

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12, WØVEA 12, VZJ 12, KØLEQ 10, WØLJO 9, KDW 8, URC 6, AFG 4, OCU 4, WZR 3.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ —SEC: EOR, RM: KYQ. PAMs: YBH and FHP. Traffic Nets: CPN, Mon.-Sat. 1800, Sun. 1000 on 3880 kc.; CN, Mon.-Sat. 1845 and 2130 on 3640 kc.; CVN, Mon., Wed. and Fri. 2030 on 145.98 Mc.; CTN, Sun. 0900 on 3640 kc. AW and YBH made BPL. RM KYQ reports that CN handled 421 messages, including 133 on the second session, during 27 sessions with an average of 12 stations per session. High QNI goes to AW, GVK and KYQ. K1AJJ is trying for a 40-meter WAS. K1BEB made WAC on phone. The CQRC held four meetings on 2 meters with an average attendance of 10. KN1BMM dropped the "N." FYF was off the air three weeks with transmitter trouble. DHP has 32 states toward WAS. MWB has a new amplifier using 810s. KN1DMA, KN1CYU and KN1EJB passed the General Class exam. V.H.F. PAM FHP advises that CVN handled 27 messages during 13 sessions with an average attendance of 9. High QNI was FHP 11, FPF 10, KN1DZI and K1BME 9. FRN has 45 states confirmed on 6 meters. He needs New Hampshire, Vermont and Maine for WAS. RLD attended IBM school at Endicott, N. Y. EJH is busy gardening. PAM YBH reports that CPN handled 281 messages during 31 sessions with an average daily attendance of 28. QNI honors go to DAV, DHP, TVU and YBH 30, K1BEB 28, K1BEN 27, ZQO 26, VQH 25. YOL has a new 50-ft. tower. KUO is busy with a new jr. operator. The Newington Lunch Club celebrated its first anniversary and changed its name to the Propagation and Gastronomical Society of Newington. It meets at the Nutmegger House the 1st and 3rd Wed. of the month at noon. New stations on CPN are HAT and KNM. New appointments: GNS as EC for Bristol, MWB as ORS, K1DLM as OPS, K1BEB as OO. Appointments renewed: FGF and NQO as ECs; YBH as PAM; EBW, ECH and FHP as OPSs; ACR, ECH and TYQ as ORSs. Reports received: OES from K1BML, K1CKZ, FVV, KLK, MWB, VWP and ZTT; OO from K1AJJ, MWB, RAN and VW. Traffic: (May) W1KYQ 453, YBH 391, EFW 388, AW 365, K1AQB 319, BEN 264, W1TYQ 177, GVK 134, K1BEB 106, W1ULY 86, DHP 85, BDI 80, MWB 64, FYF 61, KLK 58, FHP 50, K1DLM 49, W1LV 49, QJM 41, VIY 23, LXV 18, KAM 16, RFJ 16, MDB 14, K1AQE 12, W1EJH 11, ECH 10, AVS 7, OBR 5, KN1DZI 4, K1BML 2. (Apr.) W1EXO 3.

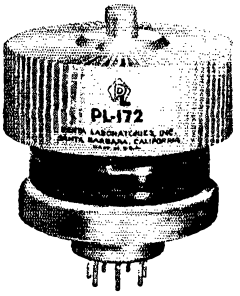
MAINE—SCM, John Fenton, W1LKP—SEC: QJA, PAM: VYA, V.H.F. PAM: JMN, RM: EFR, TKE and AI sent in OPS certificates for endorsement. JAS flew to Detroit May 23 for a regional meeting of the CAP and gave a talk on communications. GHS has a 1st-class commercial phone ticket. TJO is back from Oklahoma. UOT is tops for Maine in the SS. Waterville hams have organized a new radio club which meets every Tue. at the YMCA. Officers are K1BBJ, pres.; K1DAP, vice-pres.; K1DTK, secy.-treas.; and AKR, tech. advisor. K1HHC, a new ham in Princeton, is active on 75-meter phone. EOP is working many VEs on 2 meters. TJB is now married and living at Green Lake. BPM has 46 states confirmed for 10-meter WAS. KN1HKF is a new Novice in Belfast. FVE is operating portable in Brattleboro, Vt. GPY is now on 75-meter phone from Biddeford. RJE is working mobile in Orono. 7EPG is back from Idaho, working for the Dept. of State Inland Fisheries and Game. K1AET, BXU, and HGN joined the AREC. Ex-AQW is now K1AHS. FVE was issued a PTN certificate. SGH and PTN will continue through the summer months. K1AWQ is operating mobile from Biddeford. Kittery hams meet each Tue. at the QTH of WHI. DNA, EBJ, EXD, EIO, WAS, JVU, UOT, GHV, GHS, PLN, K1ADY and yours truly enjoyed the fine hamfest at Concord. BBS and K1ADY attended the YL luncheon in Boston. KN1DIM and GVD are new members of the Bangor AREC. Traffic: (May) W1LKP 236, CEV 86, GPY 48, HYD 47, EFR 42, K1BXI/1 39, W1TGW 37, UDD 37, K1AKO 36, W1QJA 22, K1DVN 20, W1BX 18, FNU 17, JMN 14, K1BYE 13, BAY 11, W1LWO 11, OTQ 10, IZK 9, RJE 7, LHA 5, TKE 4, FVE 3, UOT 3, K1ANM 2. (Apr.) W1FVE 2.

(Continued on page 118)

TOWERS
ALL THE WAY IT'S E-Z WAY!
See Page 120
WISCONSIN DISTRIBUTORS— FOND DU LAC
MILWAUKEE
AMATEUR ELECTRONIC SUPPLY

PENTA BEAM PENTODES

for higher power and better linearity at lower plate voltages



PL-172

PL-177A

PL-6549

PL-175

Here are four tubes for linear amplifier service—higher power output at lower plate voltages with minimum distortion. The PL-6549 and its zero-suppressor-voltage version, the PL-177A, are for 50- to 200-watt peak output service. The PL-172, a 1000-watt type, features the exclusive Penta vane-type suppressor grid which makes possible extra efficiency and linearity. The new PL-175, a 400-watt tube, also has the vane-type suppressor grid, and gives 25 to 30 per cent more output in Class AB_1 linear amplifiers than tetrodes with similar ratings.

RATINGS

Type	FILAMENT Voltage (Volts)	FILAMENT Current (Amps)	Max. Plate Dissipation (Watts)	USEFUL OUTPUT* CLASS AB, LINEAR AMPLIFIER PLATE VOLTAGE IN VOLTS 1000	1500	2000	2500	3000
PL-6549	6.0	3.3	75	96W	140W	210W	—	—
PL-177A	6.0	3.3	75	96W	140W	210W	—	—
PL-175	5.0	14.5	400	—	—	470W	605W	710W
PL-172	6.0	7.8	1000	—	—	1020W	1280W	1540W

*Actual power output delivered to load from typical amplifier.

ASK FOR A FREE COPY of "Transmitting Tubes for Linear Amplifier Service." This nine-page bulletin discusses linear amplifier tube requirements in detail. Graphs, characteristic curves, oscillograph linearity patterns and data show why Penta's exclusive beam pentode designs outperform four-element tubes.

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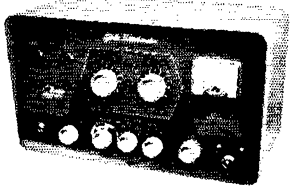
SIDEBANDER
DSB-100 Today!

Stan Burghardt
WØBJV

A Complete Transmitter
for 3 MODE AM - CW SIDEBAND OPERATION from GLOBE electronics



Sidebander DSB-100

Kit: $119.95 W/T: $139.95

Bandswitching 10-80M; 100w PEP DSB Input
Suppressed Carrier; 40w AM Fone; 50w CW

Barefoot or piggy-back, the Sidebander can be used simply with your present AM equipment, using standard crystals and regular VFO. Even more power when used with the King or Champ. 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. New Forward Look.

VOX Designed for the DSB-100, the Globe VOX plugs into socket at rear of Xmttr. Extra contacts for aux. circuits. W/T: $24.95 Kit: $19.95

QT-10 Plugs directly into VOX unit. Wired & tested only. $9.95

VFO 755A Covers 10-160M; output on 40 & 160M. Improved vernier dial drive. 13:1 tuning ratio. Temperature compensated. Stability fine for sideband. Highest output any VFO on market.
Kit: $49.95 W/T: $59.95

GROUNDED-GRID
Linear Amplifier LA-1

Complete with well-filtered power supply, operates Class B or C, with grounded-grid Final. 200 watts input operated AM Class B. 300 watts DC input, or 420 PEP input, Class B linear SSB or DSB. Requires 15 watts RF driving power. 300 watts class C for CW (18 watts driving power). Pi Net output circuit covers 80-10M bands, matches loads 30-150 ohms. 52 ohm Pi Link coupled output on 6M. Extensively bypassed, filtered and shielded for TVI.

Wired & Tested: $124.50
Kit: $99.50

Globe Matcher Sr.
ANTENNA TUNER AT-4

Built-in VSWR Bridge constantly in circuit. For any Xmttr. with final RF input up to 600 watts, 80-10M. Fixed link coupling in output circuit. Coax input, 2-wire balanced output. Special calibrated meter for monitoring actual SWR. RF shielding cabinet.

Wired & Tested: $79.50
Kit: $69.50

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Watertown, So. Dakota

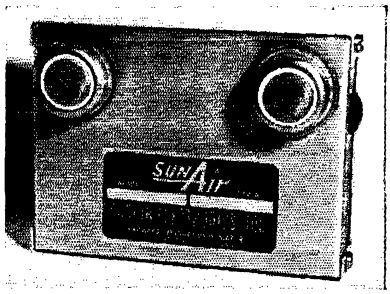
EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointments: CWR Newburyport, YWB Norfolk, SCR and QJB Sector 1-D as ECs; K1AGS and BCR as OBSs. Appointments endorsed: WNP Concord, HLQ Stow, DOF Revere, MB Scituate, QGJ Woburn, VYS Weston, KEK Lynnfield as ECs; KBS as OBS, DOF and QGJ as OPSs, AYG as OO. K1CFF is on 6 meters. KN1EKQ, Norwood, is on 40 meters. On 2 meters: K1COF, ABR, GVF, KN1EKM and W1NX. AJU/6 is in San Diego, Calif. ALP has another grandson. Quite a gang from this section attended the Concord Convention. MIX was second in the New Hampshire C.W. Party. K1BUF is in the hospital. EPE is feeling much better. K1AGS will have a Tri-Band beam. NJL has a new T-R switch and is working DX. ETH is on 15 meters some. K1DGG is Alt. N. C. for the 6-Meter Crossband Net. K1CMS has a Ranger and a 6N2. DIY is making repairs to the rig. K1BEZ, K1BVD and ATK are now General Class. QPU is Asst. EC to DBY. Most every c.d. group was active during Operation Alert 1958. The Framingham Club's new officers are HZA, pres.; FRR, vice-pres.; K1BTF, secy.; ZWJ, treas.; QVK, act. mgr. MEG has a 500-watt job. K1DEY has a DX-100. New officers of the Bedford Radio Club are AQE, pres.; QJB, vice-pres.; WNP, secy.; EIQ, treas. EMG went fishing. MX has a three-band 20-10-meter beam. The Federation of Eastern Mass. Clubs held a meeting. KTJ has a store in Reading now. ALP spoke at the Sharon Radio Club. The club's officers are IAE, pres.; LOS, vice-pres.; DSZ, secy.; K1CNX, treas. GHZ is active on 40 meters. K1AZF visited him and worked W1AZF. DOF reports a club in Revere. K1BCR has a Viking I and a Super Skyrider on all bands. KN1GTN is new in Beverly. The Chelmsford ARA is now affiliated with ARRL. QRA held a meeting and AAT showed some early radio gear. MX's *Sparks & Arcs* is quite a newsy paper. New Novices in Middleboro: KN1GUX, GNS, GXV, HCC and GSW, Lakeville. The T-9 Club met at WNK's and elected IBF, pres.; RCA, vice-pres.; JPS, secy.; ISX, treas. K1CXG is in Methuen. The Barnstable Radio Club has a nice paper, *Barnstable Oscillator*. BGW has been endorsed as OO. RCJ and ZEN are going to the Augusta Hamfest. COL and group were on during the Alert. Area 1 Radio Comm. met at Sector 1-E with CWZ, SPL, QVK, JZQ, VYI, DWY, ALP and QQL present. KNU is Radio Officer for Lawrence. DLY is Deputy R.O. for Winthrop. The ladies took over for their last c.d. drill down there. 6-meter news came from THO. K1CCI is in Brockton. AHB has a new QTH. FWQ is converting mobile to 12 volts. Active mobiles at 7 A.M.: LLY, ENS, ION, MLK, KCO, K1ALA and DZZ. Newly-active are EUT, GEK, JGR, KYE, LHM, LUT, NQU, ZEJ, K1s AJS, AML, ANL, ATO, BEX, BIH, BWU, CDD, CTK, DDY, DIT, DKP, DKT, DNL, DWA, DZU, EGP EGS and GGL. HZ was busy with many things but ham radio. EAE and EMG made BPL. Traffic: (May) W1EMG 579, AWA 317, EAE 279, FJJ 177, QPU 124, MIX 111, K1BUF 110, W1GHZ 104, UKO 85, AUQ 72, LMZ 60, EPE 53, K1AGS 40, W1HGN 38, K1DGI 33, W1ZEN 28, NJL 20, IBE 19, UE 15, LGO 14, ATX 12, BYL 8, K1DGG 8, W1WU 6, AHP 4, SMO 4, K1CMS 3, W1DTH 2, ALP 1. (Apr.) W1QPU 136, NJL 124, WAW 20, ION 12, ETH 9, NTK 9, K1EAV 6, W1JBD 4. (Mar.) W1ETH 1.

WESTERN MASSACHUSETTS—SCM, Osborne R. McKeraghan, W1HRV—RM: BVR. PAM: MNG. The West Mass. C.W. Net meets on 3560 kc. Mon. through Sat. at 1900 EST. The Mass. Phone Net meets on 3870 kc. at 1800 EST. BVR has been reappointed RM and ORS. EKO is now an OO Class I. OSK is a new ORS. The Hampden County Assn. held its annual banquet and business meeting June 7 in Wilbraham. New officers are WFL, pres.; QWJ, vice-pres.; STR, secy., and LRE, treas. The Annual Gabfest of the Central Mass. Assn. was held May 25 in Worcester. New calls heard in the area are KN1HFI in Lee, K1DRE in Leverett and K1HNG in Pelham. EKO has made DXCC. EKO and YQA report that the new radio club formed in the Brookfields is named the Podunk Radio Club. CLO is the president and the name comes from an old-time name of a section of the Brookfields. A radio club has been formed at Commerce High School in Worcester. SPF, EC for the Worcester Area, again is heading up the Emergency Storm Warning Net, which is proposed to make severe storm information available, through amateur radio, to the Worcester Weather Bureau, which has jurisdiction over Worcester, Hampshire and Franklin Counties. Frequencies set up for this net are 51 Mc., 29.2 Mc. and 3900 kc. BVR enjoys operating a new DX-40 strictly for phone he says. UEQ has become a regular in the BPL column. AGM reports his 15-meter vertical is back again and he is going after some of that DX. OSK is working on a new antenna to help put a stronger signal on WMN. Traffic: (May) W1UEQ 942, ZPB 115, BVR 89, TAY 85, OSK 51, DGL 22, HRV 8, AGM 6, KGJ 5, EKO 1. (Apr.) W1TAY 63.

(Continued on page 120)

Transistor Power Supplies* and Components

* Complete Units



D SERIES (Standard)

Continuous operation at 30 watts. Selective taps at 200, 250 and 300 volts; intermediate voltage at ½ selective taps. Both voltages can be drawn simultaneously if total power does not exceed continuous ratings. Positive or negative ground operation. Input and output filtering included except for intermediate tap.

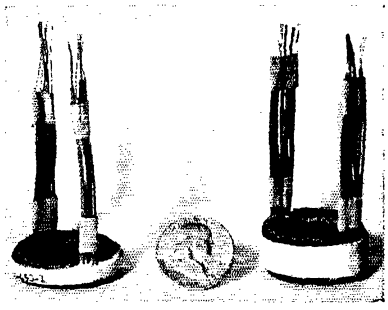
Size: 4⅜" x 3¼" x 1⅛" Wt.: 10 oz. 6- or 12-V Input: **$39.95** 24-V Input: **$61.95**

DA SERIES

Continuous operation at 45 watts. 450 volts and 225 volts simultaneous if total power does not exceed continuous ratings. Intermittent duty to 90 watts, 450 volts at 150 MA; 225 volts at 100 MA (5 min. on, 20 min. off). Positive or negative ground operation. Input (primary voltage) filtering; partial high voltage filtering provided.

Size: 4⅜" x 3¼" x 1⅛" Wt.: 14 oz 12-V Input: **$57.50** 24-V Input: **$79.50**

Toroid Transformers for Transistor Power Supply Application



H SERIES

H-6-450-1	Input: 6-VDC. Output: 450-VAC center tapped...450 and 225 VDC from bridge rectifier...45 watts.
H-14-450-12	Input: 12/14-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...55 watts.
H-28-450-15	Input: 24/28-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...65 watts.
H-6-100-125-150-D	Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA.
H-12-100-125-150-D	Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 125 MA.
H-24-100-125-150-D	Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA.

Without Encapsulation (2 ozs.). 1-10 units: **$16.00 ea.** With Encapsulation (3 ozs.). 1-10 units: **$18.50 ea.**

HD SERIES — 2000 CPS

HD-14-225-300-2-D	Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.
HD-28-225-300-2-D	Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$18.50 ea.**
With Encapsulation (4½ ozs.). 1-10 units: **$21.50 ea.**

HDS SERIES — 2000 CPS

HDS-14-225-300-3-D	Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.
HDS-28-225-300-3-D	Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$21.50 ea.**
With Encapsulation (4½ ozs.). 1-10 units: **$24.50 ea.**

400 CYCLE SERIES

14-115-1.5-400	Input: 12/14-VDC. Output: 115-V at 1.5 amp.
24-115-1.5-400	Input: 24/28-VDC. Output: 115-V at 1.5 amp.

Dim: 3" dia. x 1" thick. Without Encapsulation (12 ozs.).
With Encapsulation (16 ozs.). Per Unit: **$76.00.**

Matched Pair HD Transistors:
12/14-V operation—**$11.00 per pr.**
24/28-V operation—**$21.00 per pr.**

OEM *Prices on Request*

All fully performance tested, 100% guaranteed. Manufactured by makers of world-famous SUNAIR H.F. Aviation Transceivers.

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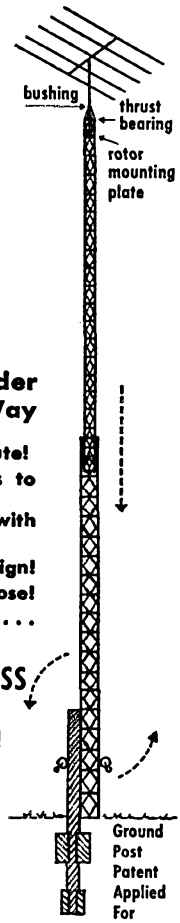
Broward County International Airport
Fort Lauderdale, Florida, U.S.A.

SUNAir ELECTRONICS, INC.

WE'VE GOT "QSHT" *



World famous "Wonder Post" exclusively E-Z Way

- **Crank up or down - 1 minute!**
- **Tilts over for easy access to beam!**
- **Rotor mounts inside tower with thrust bearing above.**
- **Brute steel in attractive design!**
- **30 types from which to choose!**
- **No material lost in moving . . . no guys, no concrete!**

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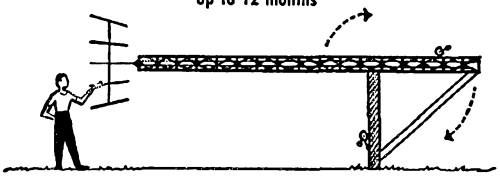
***"QUICK, STURDY, HAM TOWERS"**

E-Z TERMS up to 12 months



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I will use a . . . . . antenna.
(State type and model)
Type of Rotor . . . . . .
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City . . . . . State . . . . .

E-Z WAY TOWERS, INC.
P. O. BOX 5491 - TAMPA, FLA.

NEW HAMPSHIRE—SCM, John A. Knapp, W1AIJ—SEC: BXU. RMs: CRW and COC. PAM: CDX. V.H.F. PAM: TA. Congrats are in order to the Hamfest Committees of the Concord Brasspounders, Inc. OC, for the most successful State ARRL Convention held in May, with special emphasis on the "Old Crow" supper and ROWH initiation, headed up by JNC. ARR is now in Texas with the USAF. CNX and AIJ are new members of the QCWA. KN1DWK has dropped the "N." PFU is doing FB with 200 watts to an 813. In the new gear dept.: VAU has a GPR-90 and a Cushcraft tri-band vertical; MSX has a Viking II. KICLE is on with a DX-100. RXA has a new mobile rig on 10 meters. RVQ is now an OO (Class III and IV) and an OPS. Ex-LXB is now K4VMC in Florida. ONX has added a modulator to his 300-watt rig and is on phone after many years of c.w. only. Thanks to YCZ, Coos Radio Club president, for an FB report of news items. Best wishes to the new Twin City Radio Club, West Lebanon. RFP is club president. Traffic: (May) K1BCS 416, W1HKA 165, QGU 55, ENM 53, MTX 42, CDX 18, YMJ 18, K1BOO 16, W1KVG 12, MOI 12, YHI 10, EVN 9, HQ 8, CUE 3. (Apr.) W1EVN 10, YHI 10, FZ 8.

RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ. PAMs: KCS and YRC. RMs: BBN and BTV. Although this first item has had much local publicity, it bears repeating here because of its general interest. A bill, authorizing the Registrar of Motor Vehicles to issue call letter license plates to amateurs, was passed by the 1958 R. I. General Assembly and Senate and signed by the Governor on May 16. Rhode Island has become the 40th state to receive the plates, which will be available by October of this year. The Providence Radio Association will sponsor an ARRL New England Division Convention on Sept. 28 from 9 A.M. to 10 P.M. at Rhodes-on-the-Pawtuxet. More details later. Speakers at a dinner given by the Roger Williams V.H.F. Society on May 15 at the Meshanticut Green were Mr. Hallenstein, engineer-in-charge FCC Boston, KCS, OLO and VXC. K1BWX, club president, acted as toastmaster. The La Salle Academy High School Radio Assn. is now affiliated with ARRL. YRC and CMH made BPL in May. New Generals at BVARC are K1EBL and K1DVA. Traffic: W1YRC 586, CMH 172, DDD 170, HKN 104, TXL 44, WED 5.

VERMONT—SCM, Mrs. Ann L. Chandler, W1OAK—SEC: EIB. RM: BNV. PAM: ZYZ. Traffic nets: VTN, Mon., Wed. and Fri. on 3520 kc. at 1830 (summer schedule); VTPN, Sun. on 3860 kc. at 0900; GMN, Mon.-Sat. on 3855 kc. at 1700. Net manager ZYZ reports fine net participation on both VTPN and GMN. Route Manager BNV reports VTN is on Mon., Wed. and Fri. to Sept. 15, when the 6-day regular schedule will be resumed. New ECs are K1BGC for Washington and GQJ for Caledonia Counties. EIB reports continued organizing work in the AREC throughout the State. New Novices are KN1s HDB in South Barre and HMS in Barre. K1BGC operated 6-meter mobile in Northfield with the National Guard during inspection. K1CUS and FMK have a new jr. operator. JEV passed the General Class exam at the Concord Hamfest. K1AUE is back from UVM operating 10-meter mobile. UET is back in the State and reported ill. Traffic: W1OAK 174, KJG 60, EIB 29, ZYZ 28, VSA 21, ELJ 17, K1BGC 16, BSU 15, BOL 12, CYY 12, W1ZJL 8, K1AUE 4.

NORTHWESTERN DIVISION

ALASKA—SCM, Eugene N. Berato, KL7DZ—MA/ALZ is the first KL7 to work VK via RTTY and is VK3KF's third RTTY contact, the only RTTY contact made into VK-Land. CRE, ex-W8FGB, now is on 40 through 10 meters c.w. and phone. BYA reports that the Sitka Radio Club should be organized soon. New arrivals in Sitka are CFR, CPH, ENC and BAP. BUS rebuilt a TBX-6 for portable use. New appointments: AH, CDG and AUV as OESs. CDF reports the following new calls on the Arctic Circle: CFS, CFT, CFV, CHA, CHM, CQL and CAV. Armed Forces Day had good ham coverage. DG participated in Kodiak with a new HQ-110C. The Anchorage AARC represented c.d. at Fort Rich with the new club trailer. EARS also had a fine display. BUF is on c.w. and s.s.b. with a 20-A and GG 813s. MD is active on 40 meters. AGU is sporting a new Thunderbolt. CDQ, BVY's son, passed his General Class exam. The XYL PARKA Club held its annual election with BVQ, pres.; BLL, vice-pres.; CCP, treas.; CFJ, secy. Traffic: KL7BJD 200, CDF 81, BYA 39, MD 34, AUV 19, CEJ 7, DG 1.

IDAHO—SCM, Rev. Francis A. Peterson, W7RKI—Get in your nominations for the new SCM, one who can give more time to the job. Glad to hear that VQC is recovering from his accident. His XYL is helping him with the traffic. The Boise Club had a nice hamfest in June. Keep up the good work on the c.d. and FARM Nets in spite of summer QRN. Send in your RACES and

(Continued on page 122)

HARVEY Stocks the NEW CESCO REFLECTOMETERS

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

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

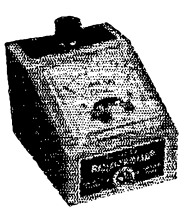
FEATURES:

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

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

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

Amateur and Industrial net
$29.95



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

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

Amateur and Industrial Net
Phase and control unit **$34.95**

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

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

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

MINIBRIDGE
MODEL CL-52-72

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

Amateur and Industrial Net
$12.95

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If You Want to Talk SWAPS and DEALS write . . . or call **W2DIO**

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

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HERMETICALLY SEALED CRYSTALS ½" Spac. .050 or .093

Amateur & Novice — .01% tol. ea. $2.50
Marine & Aircraft — .005 tol. ea. 4.10

Overtones:
10 to 30 Meg. tol. .005% ea. $3.75
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. 5.40

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

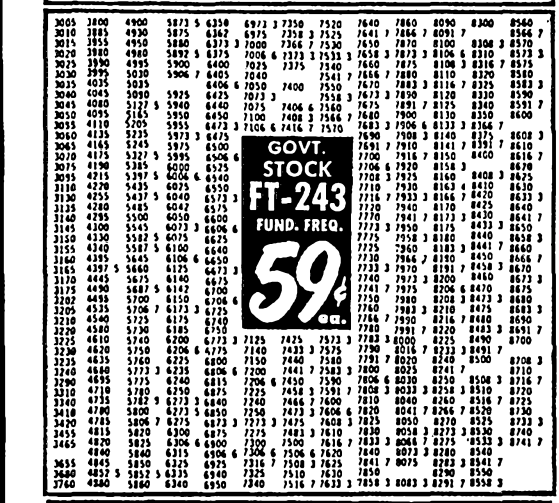
6 Meters { Exam: *8340.6 x 6=50043.6 / Exam: *8340 x 6=50040
Note—3.6 KC difference between the above

This is a must if you want exact freq. on these 2 pop. bands.

Hermetically Sealed for new Gonset.....ea. $2.50
Thin-Line FT-243 for new Gonset.....ea. $1.49
Calibrated FT-243 as exam. above* spec. .....ea. .99
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 or DC-34



1000 KC-DC9-LM-BC 221 Std.....$6.25

FT-243—From 1005-2999. Steps of 5 KC ea.....$1.99

SPECIAL ITEMS

FT-241 SSB. Matched Pairs.....pr. $1.95
FT-241 Single Side Band low frequency Crystals —
370 KC to 540 KC.....ea. 59c
DC 34/35 from 1690 to 4440 KC.....ea. 75¢
AN/TRC-1 FT-241 holders from 729 to 1040 KC—
1000 KC excluded..... 75¢
FT-241 200 KC or 500 KC.....ea. $1.00

Marine & C.A.P.—All Freq. Available
2009—2182—2637 etc. Tol. .005%.....ea. $2.99

OTHER FREQUENCIES AVAILABLE—SEND FOR CATALOG

Include 5c per crystal for postage and insurance. Calif. add 4% Tax. No. C.O.D'S. Prices subject to change. Ind. 2nd choice; substitution may be necessary. **Min. Order $2.50.**

U. S. CRYSTALS, INC.
1342 So. La Brea Ave., Los Angeles 19, Calif.

AREC forms to your EC or to OCR in Boise. GCO now has drapes in his shack. YBA moved to a new QTH under 12-kv. power lines. BDL is building a new mobile and a *QST* mono-match. GGV, Helen, and KN7CXP, Pop, represented Pocatello at the Boise Hamfest. The c.d. group is trying to get more surplus gear for Idaho RACES members. Aren't you signed up yet? Your SCM will try to visit some more of you this summer. Traffic: W7VQC 64, WHZ 13.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WXI —SEC: KUH. PAM: EOI. RM: KGJ. The Montana Phone Net meets Mon.-Wed.-Fri. at 1830 MST on 3910 kc. The Missoula Area Emergency Net meets at 0900 Sun. on 3890 kc. OYP earned his Amateur Extra Class license. SFK and YQZ received Public Service Awards. WIF won an SX-101 receiver in the Hallicratters Contest. K7AXD got married. K7BBQ, BMI, EMH and FIP graduated to General Class. K7AWD, K7BCO and K7-BEN dropped the "N" from their calls. New calls: KN7s CVZ, CWA, CWB, CWC, CWD, CWE and CWF at Wolf Point; K7BXJ at Columbia Falls; KN7DTX at Crow Agency. GBI is in Germany and operates DL4LB. USI got an SX-101 for his birthday. K7ABV received his WAS certificate. AU is experimenting with a flea-power transistor rig. PLN is in the hospital. KN7AES won a science scholarship. IWW and FTV have a new tri-band beam. K7BON was appointed EC for Bighorn County. The 26th Annual W1MU Hamfest will be held Aug. 2-3 at Big Springs, Idaho. Traffic: W7DWJ 34, SFK 12, TYN 9, NPV 8, OOG 8, BKB 5, K7BVO 4, W7TGM 2.

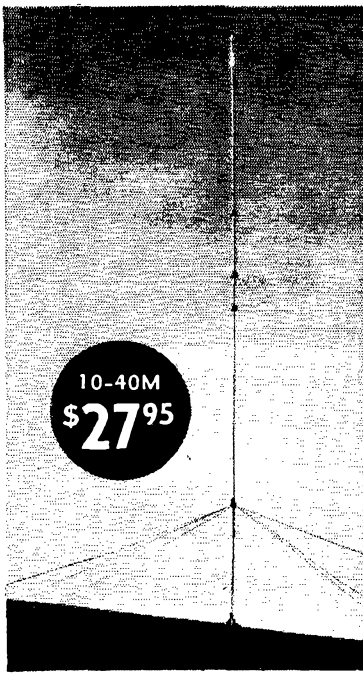
OREGON—SCM, Hubert R. McNally, W7JDX.—These are two active clubs in Coos County, the Coos County Radio Club and the Coos County Teenage Club. The Southern Oregon Radio Club had a nice picnic and also handled election returns during the Oregon primaries. Stations active were FTA, ITZ, DEM, BJO, EFR, DXY, GAJ, ZQM, AHP, KEN, K7ACB, K7CMV and KN7DQK. Four mobiles were used to relay the results from polling places to the newspaper on 75-meter phone. JDX and DEM are poor fishermen as they have caught no salmon yet. ENU is pretty busy these days with a new jr. operator and office work. Summer weather is beginning to show its effect on nets with OSN and the new 6-meter net both slowing down. WNV has moved to a new QTH and will be more active soon. APF and the Mrs. have moved to Anchorage, Alaska, where Don is connected with a radio parts firm. Oregon is losing a fine traffic man and Alaska is gaining one. Nice OO reports were received from PQJ, WNV and BLN. GPC and DAT still are hopping around the State for the telephone company. WFP has been appointed Communications Coordinator for the Mountain Rescue and Safety Council of Oregon. We regret to announce death of UWR, in Portland. He was a retired Associated Oil Company man. Traffic: (May) W7ZFH 60, LT 40, GAJ 31, ENU 24, OMO 22, CUW 18, JDX 14, BVH 13, SPB 8, DEM 2. (Apr.) W7APF 942, ENU 109, GAJ 8.

WASHINGTON—SCM, Robert B. Thurston, W7PGY —Washington Traffic Nets: WSN, 3575 kc. 1900 PST Mon. through Fri.; WARTS, 3970 kc. 1830 PST Mon. through Sat. Attention all Washington section clubs: This section is in need of more active ECs and Asst. ECs who will make the necessary reports monthly. Each club without an active EC is asked to please nominate one and send his name to your SCM so that the appointment can be made. AIB is designing and constructing new switching equipment for the new shack. FIX is off the air for a well-earned vacation. ZFY is going in the Coast Guard for a four-year hitch. OHS joined the ranks of Silent Keys. JEY is moving to a new QTH near Bellingham. OEB received OO and ORS appointments. QLH received his WSN net certificate; he also received a WAS certificate. GJS is on 2 meters now and also is going high-power by midsummer. NWP is looking for more traffic. CZY picks up traffic from KC4USA. EVW is converting a TCS for portable operation. The following are renewing their appointments: GVV (ORS), EVW (OPS), BMK (EC). The Spokane Radio Club handled the communications for the Hydro Races on Lake Chelan. A total of twenty operators participated. Net operation was on 2 meters. ETD, NBD and PXA all work at the Lakeland Village School for the Mentally Retarded. Approximately 140 amateurs attended the Bremerton Hamfest. PGY checks in with RN7 and WARTS. JPH was home from W6-Land and visited PGY and CAM. Plans are being considered to hold the ARRL Northwestern Division Convention next year. There will be more information on this subject later. JNC moved to a new QTH and has a new 50-ft. tower up and ready for the beam. BA received the Public Service Commendation Edison Radio Amateur Award for 1957. FQD has a new Ranger. K7AFU has an umpteen-ft. tower on 10 meters and says it gets results, too. VI and PGY are getting in extra time on the c.w. nets. AUK is working mobile overtime because of traveling for the Coast Guard. Traffic: (May) W7BA 2045, PGY 754, DZX 206, QLH 175, APS 155, AMC 50, JC

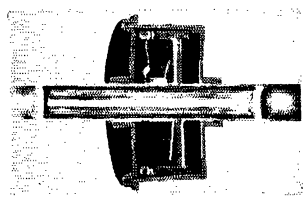
(Continued on page 124)

NOW! 6 METERS* ADDED TO THE hy-gain

MULTIBAND TRAP ANTENNAS!



Shown here are two of the great new hy-gain trap verticals, the 14-AV (for 10-40M), roof mounted, and the 18-AV (for 10-80M), side mounted, each using the sensational Insu-Traps to isolate the various sections of the verticals. 14-AV develops ¼-wave resonance. 18-AV develops ¼-wave resonance on 40-80M; ¾-wave resonance on the 10, 15 & 20 M bands. Each uses new Capacity Hat principle to increase radiating efficiency, and new nylon base insulator for self-support. Less than 2:1 SWR on all bands, single 52 ohm feed line. Combination Guy Wire and Radial Mount Kit available for 14-AV for rooftop mounting. 18-AV comes complete with side-mount bracket fixtures and nylon guring kit, all parts completely weather-treated.



Model LC-80 loading coil for 80M operation of the 14-AV. **$2.00 ham net**

Heart of the hy-gain trap antennas, the Insu-Trap makes possible for the first time a really efficient multi-band antenna system. It acts as an insulator at its resonant frequencies, but allows radio energies of other frequencies to pass freely. This automatic switch action isolates various sections of the verticals to make them the proper length for each band. Completely *mechanically* and *electrically stable*, the entire trap circuit is enclosed in a carbon activated polyethylene cover and cap. Traps are effective over the entire band. Completely weather-proof and air tight. Guaranteed for the life of the antenna. Traps will handle 1 KW.

Also available (not shown), is the model 26-AV vertical for the 2 and 6 meter bands, complete with new decoupling sleeve and ground plane. Overall height and length of ground plane: 5 ft. . . . and the model 12-AV Trap Vertical (for 10, 15 & 20M), using the Insu-Trap principle to isolate sections and develop ¼-wave resonance. Combination Guy Wire and Radial Mounting Kit available for rooftop mounting the 12-AV.

Model 26-AV (2-6M) — **$16.95**
max. ht. 6¼'

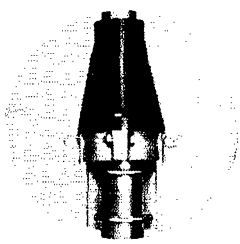
Model 12-AV (10, 15 20M) — **$19.95**
max. ht. 14'

Model 14-AV (10-40M) — **$27.95**
max. ht. 22½'

Model 18-AV (10-80M) — **$69.50**
max. ht. 44'

12-AV Mounting Kit — **$8.95**

14-AV Mounting Kit — **$9.95**



*Available as accessory, specially designed decoupling stub adds 6 meter operation with low SWR to Models 12, 14 or 18-AV. Order Model 6MK: **$4.95** ham net.

Nylon base assembly makes possible the self-support of the Trap Verticals. Cast aluminum mounting bracket is adjustable for various sizes of masts, with weather protected internal coaxial fitting. All electrical connections are factory sealed. Entire unit completely weather-sealed.

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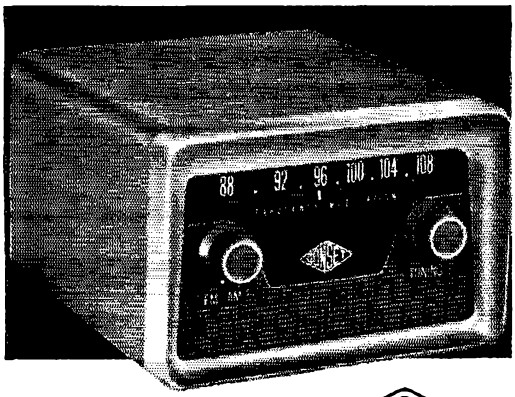

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GONSET

FM CONVERTER

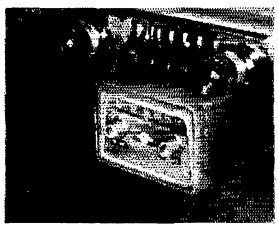
Now!... smooth, static-free reception... the nation's finest music..."living room" listening pleasure—while driving!

QUALITY RECEPTION...

Converter covers standard 88 to 108 mc. FM band, operates with present car radio* and antenna. Brings you all the well-known advantages possible only with FM... virtually constant program level without severe fading or signal drop-out and a minimum of static or man-made noise even when near power lines.

EASY-TO-OPERATE...

No fussy tuning!... merely locate desired signal on the dial, a unique "locking" circuit then positively and correctly tunes the FM station to the point of fullest fidelity. Switch on Converter restores auto set to conventional AM reception, if desired.



EASY TO INSTALL.

Installation is easy, non-technical... do-it-yourself in minutes without altering auto radio. Converter power lead connects to 12 volt power source under dash.

*FM Converter usable only on cars with 12 volt systems.

Model #3239 ..... 84.50

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

GONSET DIVISION OF YOUNG SPRING & WIRE CORPORATION.
Burbank, Calif.

49, AIB 42, GJS 37, NWP 35, USO 33, CTO 24, CZY 22, LVB 13, EKQ 12, EVW 3, JEY 1. (Apr.) W7LVB 54, BXH 25.

PACIFIC DIVISION

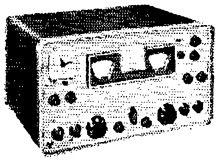
NEVADA—SCM, Albert R. Chin, W7JLV—SEC: JU. VIU received the first VA-JF certificate awarded to a Nevada ham and is working such real DX as FB8ZZ, KC4AF, BV1US and VS4JT. YNO now is married and living in Newport, R. I., awaiting his W/K1 call. JU is keeping all "Smokepuff" skeds with negative results and still is keeping his weekly skeds to Southern California and Tucson. YRY now is breaking in his Hy-Gain 10-80-meter automatic vertical. New officers of the NARA are MAH, pres.; PC, vice-pres.; K7DEF, secy.-treas.; K7ANK, sgt. at arms; TQE, BYR and JLV, board of directors; CX, trustee. New calls in the Reno Area are K7DEF and K7DEG. K7AGZ dropped the "N." ARRL Public Service Awards were issued to PC, AZF and ZVN for their part in the Reno Gas Explosion and disaster of Feb. '57. SNARC Achievement Certificates went to GVB (No. 60) and AGE (No. 61) for working 25 Nevada stations. SCM elections for Nevada are around the corner. Start boosting your favorite candidate.

SANTA CLARA VALLEY—SCM, G. Donald Eberlein, W6YHM—SEC: W6NVO. RMs: W6QMO and W6ZRJ. Endorsements: W6CBX as OO Class I, W6NMV as EC. A section net certificate was issued to K6SRC. W6MMG's ORS and OO appointments were renewed. W6WNI's ORS appointment was renewed. It is reported that W6MXW passed away May 29 of a heart attack. K6HGV got tangled up with 2500 volts but is able to tell about it. K6DHO was elected vice-president of the Mt. View Radio Club. Bob also worked a CN8 for his WAC. K6VJI is back on the air after an illness using a DX-100 on 40 meters and 3.8 Mc. feeding a vertical. W6WNI has his kw. final going; he made 420 contacts in 66 sections in the CD Party. K6BBD, finding his code speed had dropped, is now working on c.w. trying to get his speed back. W6AIT is QRL with garden work so is not QNI the net much. W6DEF is looking for more traffic to originate from his station. K6CQM has traded in his 32V-3 on the Ranger Thunderbolt Combo and with a 40-20-15-meter beam on a 50-ft. tower should be going great guns again. W6QMO reports that the 6-meter division of the NCN has folded from lack of activity. K6GID is building a DSD rig for 3.8 Mc. VE2ACF/W6's basement was flooded but Tom did not lose the records of the San Mateo Radio Club. W6AQR now has his 5th harmonic. W6USE is a new member of the PAARA. Traffic: (May) K6DYX 435, K6GZ 394, W6BPT 328, W6PLG 273, W6QMO 259, W6RSY 226, K6GID 170, W6VZT 152, W6YHM 103, K6DHO 102, K6PQH 78, W6YBV 78, W6OII 73, W6AIT 50, W6DEF 42, W6FON 36, K6HGV 12, W6MMG 9, K6VJI 6. W6ZXS 3, K6CQM 2, K6YKG 2. (Apr.) K6PQH 25, K6LSG 4.

EAST BAY—SCM, B. W. Southwell, W6OJW—SEC: W6CAN. ECs: W6LGW, W6ZZF, W6IUZ, K6EDN and W6JNW. K6IGN is plugging along on 7-Mc. c.w. K6DMI is acting EC of the Richmond Area. K6ESZ operated 75-meter mobile during the RARC Annual Economy Run. W6ASJ has a snappy 2-meter MARS RTTY net operating. W6CBF is flying instead of hamming now that the winter rains are over. W6ITH has left FS7-Land for home. K6SRD made his 100 contacts confirmed on 6 meters for a certificate. K6QHC has a new Lysco all-band v.f.o. rig and made 144,594 points in the April CD Party. The CCRC met at HARC on May 7. The EBRC heard an FB talk on "Test Equipment Uses in Amateur Radio" at its May meeting. W6WLI moved to Marysville the Sacramento Valley section. K6DMW is a new ORS in Albany and checks into NCN nightly. W2JTP visited W6CQK. W6VPC and W6ASJ still are putting out bulletins on 3.9- and 144-Mc. RTTY. OHR won the MDARC hidden transmitter hunt. K6QKD is a new General Class licensee and is looking for an all-band 150-watt rig. K6SCF is on 75-meter mobile with a home-brew rig, and is leaving for a six-weeks visit to JA/KA-Land. K6RMD is portable/7 in Oregon on 6 meters until August. KN6-SRU, a new Novice, is Sheriff of Contra Costa County. K6QXY is active on u.h.f. from 6 meters to infinity, and is looking for klystrons and cavities. K6JPR is working on 420-Mc. RTTY for a u.h.f. link to Lafayette. K6LRF is president of the Laney Trade-Tech. Radio Club. K6OCF is on 6 meters with a Gooney Bird. See your EC and sign up in the AREC. K6KYT has gone to the Worlds Fair in Belgium for Aerojet-General Nucleonics. The NCN 6-Meter Net has been discontinued because of lack of activity. W6AIT put out an FB booklet on NCN history. W6LGW and W6PIR operated portable in Lake County during the East Bay V.H.F. Sweepstakes. WV6-AFF and WV6AFN are new Novices in Berkeley. K6DMI will be mobile in New Mexico and Texas during July and August. K6IGN, the school station, will be QRT because of school vacation. K6OSO received an RN6 certificate. K6QHC has a new rotor for his 21-Mc. beam and has

(Continued on page 126)

ARROW...Hamdom's One Stop Shop



Hammarlund Model HQ-170
Triple Conversion Receiver

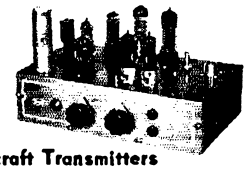
The HQ-170 is "hot". It offers the amateur a practically endless combination of tuning techniques whereby optimum reception of SSB/CW and AM/MCW may be achieved. Using vernier tuning, adjustable bandwidth, and the basic, precision front-end of the HQ-170, the user has full control over SSB signals as well as adjacent, or co-channel signals. Provides 10 db signal-to-noise ratio at 1.5 μv AM or approximately .5 μv CW, or better depending on bandwidth. The front-end provides tuning of the 6, 10, 15, 20, 40, 80 and 160 meter amateur bands. Designed for use with a single wire flat top, a folded dipole, or doublet antenna. Separate antenna terminals are provided for 6-meter reception.

Amateur Net (Less clock)..... **$359.00**
Amateur Net (With clock)..... **$369.00**

Tecraft Converters

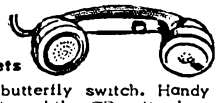
Widely accepted by Hams, CAP & CD everywhere where top quality performance and highest quality is a must. Built with a wide choice of I.F. output frequencies...to suit the tuning range of the receiver. Please specify I.F. frequency required. Shpg. wt. 5 lbs.

CC-50 50-54 mc-6 meters..... **$44.95**
CC-108 108 mc-Satellite Track **$44.95**
CC-144 144-148 mc-2 meters.... **$44.95**



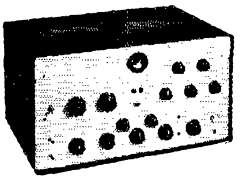
Tecraft Transmitters
For 220, 144 or 50 Mc.

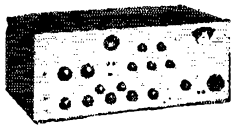
Hi-Level Plate Modulation. Hi-Impedance Mike. Provisions for Metering All Stages. Tuned Antenna Output System to 52/72 Ohm Line. RF Output Indicator. Power Requirement 6.3 V. AC at 250 ma. Tubes: 6AU6 osc.; 5763 Buf/Dblr; 6360 Buf/Mult; 6360 final amp.; 12AX7 speech amp. & driver; 2-6AQ5 modulators. Power Input to Final, 20 Watts. **Complete with tubes, crystal & plugs.....$59.95**
Matching Power Supply.....**$39.95**



TS-13 Handsets

Push-to-talk butterfly switch. Handy units for use in mobile, CD units, ham use, etc. Complete with rubber covered cable and plugs. Shpg. wt. 3 lbs.
Amateur Net **$4.95**





Lakeshore Phasemaster Models II-A and II-B

Band Switching: 160, 80, 40, 20, 15 and 10 meters. 65 watts PEP output from 6146 power amplifier giving sufficient power to drive nearly all types of linear amplifiers including grounded grid finals. SSB or DSB: Suppressed carrier, narrow band phase modulation or break in CW. Voice control and anti-trip circuits built in. Talk-on-frequency or Zero beat. Pi-Network Output: Matches 50-600 ohms impedance coax or balanced antenna output connectors. Voltage regulation of VFO, 9 mc oscillator and 6146 screen. Low pass filter in audio section gives speech cut-off of 40 db at 3800 cps. Temperature compensation in critical 9 mc circuits for improved stability. Novice or CW operation on 160, 80 and 40 meters with direct frequency crystals.

***Built-in VFO** – 100:1 precision dial tuning, anti-backlash gears, no string or cable drives. Frequency stability and reset accuracy better than 100 cycles. Completely independent of Exciter section. Built in regulated power supply. Individual AC power switch allows VFO to be left on if desired.

*Applies to Model II-B only.

Amateur Net Model II-A **$329.50**
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Sub-Miniature
0-200 Microampere
Meter

A high quality instrument made to rigid U.S. Govt. Specs. by International Inst. Co. (Model 100). Only 1" in diameter. Ideal for limited space applications & transistorized circuits. A natural for the transistorized grid dip oscillator. Described in June '58 QST.
Amateur Net $3.95 ea. **2 for $7.50**

2" round 0-500 microamperes. Bakelite case. Made by G.E. and Dejur.
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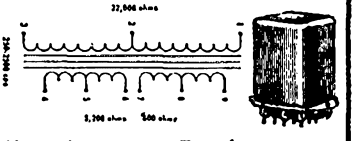
Weston 2" 0-4 amp RF meter Model 507. A giveaway at **$2.95 ea.** **2 for $5.50**

6 Volt Dynamotor

Rated output: 425 volts DC at 375 ma. High efficiency, compact. 4" diameter, 7¼" long. Shpg. wt. 13 lbs. Worth 2 to 3 times this low price.....**$12.95**

12 Volt Dynamotor

Rated output: 625 volts DC at 225 ma. High efficiency; compact; no battery strain; latest design. Brand new, recent military production. 5" diameter, 9" long. Shpg. wt. 16 lbs. Worth two to three times this low price.....**$13.95**



Versatile Miniature Transformer

Same as used in W2EWL SSB Rig – March '56 QST. 3 sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22,000 ohms. (By using the centertaps the impedances are quartered). The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. Brand new. Fully shielded.

Amateur Net, each.....**$1.39**
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"Wonder Bar" 10 Meter Antenna

As featured in Nov. 1956 QST. Complete with B&W 3013 Miniductor. Only 8 ft. long for 10 meters.
Amateur Net.....**$7.85**

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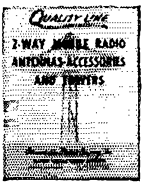

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BEST ENGINEERED - BEST MANUFACTURED

109 countries worked and 57 confirmed. K6GK has a new 20-ft. vertical. W6TI has 260 countries confirmed. Keep the reports coming in and please try to get them to me by the 5th of the month. Traffic: (May) K6GK 535, K6DMW 142, K6OSO 59, W6JOH 21, K6DMI 10, KN6-JKY 9, K6QHC 6, K6OCF 4. (Apr.) W6ASJ 58, K6QHC 14, K6DMI 9, W6CBF 5, K6ESZ 2.

SAN FRANCISCO—SCM, Fred H. Laubscher, W6OPL—W1NJM was the honored guest at a dinner at the famous Fisherman's Wharf June 4. After the dinner date he spoke to the representatives of the Central California Radio Council; a special meeting took place at the National Red Cross Bldg. in San Francisco. W6AJF held the club members' interest with his talk on antennas at the monthly San Francisco Radio Club meeting. K6BJ is in the Oak Knoll Hospital, Oakland, Calif. John had a heart attack recently and was told to take things easy. It seems one just can't keep a good man down and he insisted on dropping into the business office each day so, the doctor decided to put John in the hospital for a complete rest. Latest reports have it that he is getting along nicely. W6ZSE, of Eureka, is in the U. S. Public Health Hospital, 15th & Lake Sts. in San Francisco. He had surgery of a serious nature but reports that he is feeling fine again. The Tri-County Section is very active on the net. W6SLX sends in a new call—KN6ULE. Other new calls from K6EKC lists KN6TPX and two Conditionals, W6NNA and K6VDG. W6GQY tells us that he will be slacking down on traffic because of other commitments but will bounce back full of pep in the fall. W6YC reports that he received No. 28 certificate award from the "Hunters Club Contacts." K6VJV is liaison for RN6 as of June 2 and thereafter on Mondays. He is able to handle 30 words per minute. W6GQA says he handled no traffic in May but was busy building "things." Congratulations to W6EJY, who was married on May 4 to Shirley Phillips. The couple have moved to Marin County so they still reside in the San Francisco section. K6ANP says that Operation Alert was a huge success. For the first time in the history of the San Francisco Civil Defense program all warden communications units reported 100 per cent. K6ANP, EC of San Francisco, was net control station. The Mayor of San Francisco, the Chief of Police, the Chief of the Fire Dept. and Admiral Cook all visited the station and stayed to see how the amateurs put through messages. They were well pleased with the results. Traffic was handled through the Mission Trail Net, the American Legion Net and the Northern Calif. Net. Amateurs who stood by the warden stations were K6LNK, K6LCF, K6AES, W6GHI, K6EJW, K6KTP, K6MZN, K6OHJ, W6OST, W6UDL and W6GHY. W6OPL and W6GGC acted as home station from GGC's QTH. Coverage was had by amateurs in Marin, Sonoma, Mendocino, Alameda, San Mateo, Santa Cruz, Santa Clara and San Benito Counties. Lenny wishes to express his deep appreciation to all who gave him so much cooperation on the Alert. The RTTY group held a meeting and dinner at Millbrae, Calif., on May 23 with a very good turnout. ZL1UB was guest speaker for the evening. Traffic: W6GQY 594. K6VJV 61, W6GGC 26.

SACRAMENTO VALLEY—SCM, LeVaughn Shipley, K6CFF—Hearty congratulations to the Tehama County Radio Club in Red Bluff, affiliated with the League 100 per cent! K6VYV has been working (laboring) back East. So many of us have complained about Delaware for WAS that Steve spent May 6 and 7 in Baltimore trying to accommodate us. Seems he could work Los Angeles, Honolulu and Seattle but not Sacramento. Our vice-director, W6ZF, transmits ARRL Pacific Division News Bulletins on 3540 kc. at 8 P.M. on the 2nd and 4th Mon. of each month. W6QYX really is logging 'em in—in the woods of Shasta County, that is (pine and fir logs). Your SCM had a most enjoyable time recently at the Sacramento Junior College discussing amateur radio. The college has applied for a license and has the nucleus of an FB radio club. Good luck to W6OOR and his boys. It is often said that Fresno knows how. Take it from one who attended the Pacific Division Convention—Fresno does know how. Arrangements were well handled, the daytime program interesting, the displays informative, the entertainment and dance superb. Prizes were numerous and most desirable. The v.h.f. and RTTY demonstrations were exceptionally good, the traffic gang was well represented and their forums also were good. The XYL won a VTVM. Traffic: K6YBV 376, W6ODV 45, W6ZF 7.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The ARRL Pacific Division Convention was held in Fresno June 7-8 with over 500 in attendance. W6BJI won a Morrow receiver. K6QPE won the NC-109. W6PGU got a B&W final coil. K6EDX won the WRL DBS-100. K6MDX is working on projects. W6CF is working on antennas. The 10-2-meter mobile units helped with the Parade Memorial Day in Turlock. K6RLX is going to tour the U. S. this summer. K6GOX is using a

(Continued on page 128)

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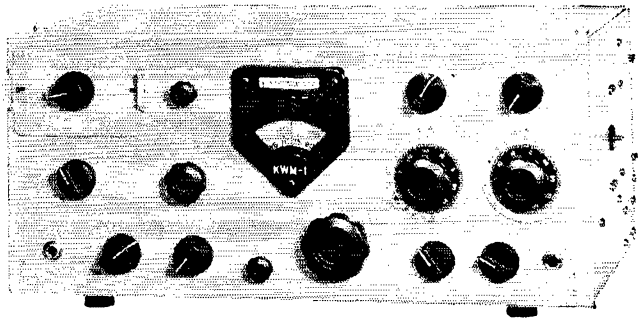

Component and accessory features of the Collins KWM-1 Mobile/Fixed Transceiver make it one of the finest mobile rigs available—and excellent for fixed use, too. The KWM-1 has 175 watts PEP input on SSB, and 160 watts on CW. Receiver/transmitter tuned to same frequency so you don't have to zero in. Covers amateur bands between 14–30 mc in 100 kc segments with 10 segments. A DX Conversion Adapter, interchanges with normal crystal box and provides seven transmitting frequencies within the band. It also allows reception over a 100 kc band in or out of the band. Another interchangeable crystal box provides Novice operation of the KWM-1. Switching is easy with crystal switch, automatic antenna switching control and logging scales on PA Load and Tune controls. Front panel meter acts as an S-meter on receive and as the tuning meter on transmit.

The Collins KWM-1 Transceiver is the most compact unit available for mobile operation with anywhere near the power—the only one available for SSB.

Remember, you go mobile first class with the Collins KWM-1 Mobile/Fixed Transceiver.

Mobile or fixed, the KWM-1 measures only 6¼" high, 14" wide and 10" deep. Electronic Supply's price is just **$820.**

Collins 75A-4 SSB Receiver and KWS-1 Transmitter also available for immediate delivery.

Collins accessories available include:

516F-1 60 cycle 110 (or 115) vac Power Supply for fixed or portable operation.....**$136.00**

516E-1 12 vdc Power Supply completely transistorized....**$262.00**

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312B-2 Speaker Console having 5" X 7" speaker and directional RF wattmeter.....**$185.00**

Mobile Mounting Tray for snap-in installation which automatically connects power, speaker and antenna.....**$86.00**

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★ Self-supporting up to 32, 40 and 48 ft.; may be extended to 150 ft. with proper guying.

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★ Base area over three times that of usual towers (19½" min.)- decreases stress and allows greater stability.

★ Combination of U Channel Beaded Type leg material plus wide base mean added strength and durability. Approximately 35% stronger than tubular leg design.

★ Heavy commercial galvanize coating means extra long life. Construction allows easy painting both inside and outside legs at later date.

★ Complete riveted construction with aircraft rivets of extreme high tensile strength far surpasses normal, weld-type construction.

★ Easy to erect; — the higher you go the lighter the sections. Rotator and RotoBrake easily installed. Built-in thrust bearing and rotor mounting plate.

★ Self-supporting and handsomely styled.

★ Anchor Base Type Spire eliminates use of guywires, allows relocation of tower if desired.

CONCRETE MOUNTED GLOBE SPIRES

Include Bearing Plate, Rotor Plate and three 4 ft. stubs for mounting in concrete.

32 ft.—Cat. No. 69A091	$ 49.95
40 ft.—Cat. No. 69A092	68.75
48 ft.—Cat. No. 69A093	99.50
RotoBrake Mounting Plate (Cat. No. 69A097)	1.65

ANCHOR BASE MOUNTED GLOBE SPIRES

Include Anchor Base, Bearing Plate, and Rotor Plate.

32 ft.—Cat. No. 69A094	$ 71.50
40 ft.—Cat. No. 69A095	91.95
48 ft.—Cat. No. 69A096	129.95
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Gonset linear on 6 meters. K6IEG, K6BGO and K6HII helped in the c.d. drill in Coalinga with good results. The Pleasant Valley ARC held Field Day near a swimming pool on top of Kettlemen Hills, using one c.w. and one phone rig. The Sanger Radio Club boasts 8 members with Ray Hauck as president and meets the 1st Tue. of each month. K6GMY moved from Stockton to Fresno. W6-AXZ is active and is bothered by key clicks. WV6ABP is the newest Novice in town. KN6VLY is the XYL of K6AHQ. The FCC inspector gave tests at the convention and had 26 customers. W6UBK won a TR switch at the convention. W6QON is heard back on 75-meter mobile. The club 6-meter project is coming along nicely. W6NKZ has a new Cadillac and is installing a 75-meter mobile in it. W6IFE and his XYL were seen at the Fresno Convention. W6JPU had his car broken into and lost a Handset and would have lost the converter if W6PSQ hadn't stepped in. The would-be souvenir hunters got away. Traffic: W6ADB 150, W6EBL 12, K6RLX 11, K6EJT 9, W6ARE 8, W6JPU 4, W6EUH 3.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: HUL, PAM: DRC, V.H.F. PAM: ACY. Just a reminder for all official appointees: You should submit an activity report to either the SCM or the SEC each month. ECs report to the SEC, all others to the SCM. Congratulations to PCN, elected net manager of the North Carolina Net (c.w. 3509.5 kc.). I would like to remind all net members to inquire of your net managers or secretary as to the requirements for net certificates. They are available upon request of your net official through the SCM. 'Tis interesting to note that of the 2200 amateurs in the section only 110 belong to state nets (less than one-half of one per cent). You should do something about this condition. We have c.w. nets, phone nets, Army MARS, Air Force MARS and a teletype net. Take your pick—North Carolina has it. 9QNI/4 has moved from the State and now is operating from Virginia. UJR is the new Radio Officer for Cleveland County. It is very hard to use 2 meters here in the mountains, but we keep trying. Maybe one of these days it will work out. Traffic: W4GXR 271, DSO 145, RRH 71, BAW 54, ZWF 4.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE, PAM: YOS, RM: AKC, K4OZC passed the General Class exam and is active on 15 meters. K4QZA has a new DX-100 to celebrate the dropping of the "N" in his call. K4QVN has departed for Hawaii and K4RSW will leave for Germany in August. K4RLX is sporting a 10-meter beam and is firing up s.s.b. K4GJP is building a new quad. K4POP is mobile in his Jeepster. K4GJP and K4PQJ have accumulated new gear. K4OCZ and MYY have been busy relaying messages from the Boy Scouts Camporee to parents. K4GMV and DXK both have new YLs and K4DFW has a new jr. operator. K4ASA made an illustrated lecture on mobile operation to the Dreher ARC which also received the call K4VLU. K4UNP is a National Honor Society member at Dreher High and goes to Clemson next fall. K4CIY is the new EC for Conway and ZRH is the new EC for Charleston and Beaufort Counties. YOS is monitoring the nets and working portable from his summer job in Virginia. 0HMG reports there are now 65 s.s.b. stations on 75 meters in the State. Don't forget Pawley Island's Hamfest Sept. 5 and 6 and the Rock Hill Hamfest in October. Subscribe to the bulletin *Scarab* and keep up with all activities in the State. Traffic: (May) W4PED 298, K4AVU 216, W4AKC 185, K4GAT 148, BVX 112, HQK 110, W4CHD 41. (Apr.) K4GAT 161, W4DAW 55.

VIRGINIA—SCM, John Carl Morgan, W4KX—VSN has merged with VN until September, according to LW. ZPE reports that the Virginia 2-Meter Net still is alive and lively, and K4EUS says there's somebody on 145.35 Mc. every night at 2000. The Arlington Co. AREC Net now is active alternate Fri. at 2000 local time. K4EYE reports frequent AREC/RACES drills in the Bristol Area. The Tidewater Mobile Club again is furnishing communications for the Annual Intl. Cup Boat Regatta, this year to be held at Elizabeth City, N. C. IA is leaving Virginia and is off the air. EV will be sorely missed on VN and MW. Welcome to 0KRN, now chief engineer at WAFC in Staunton. The collegians now are back at their home QTHs. CXQ again is in the NCS harness on VN. UHG operated /4 at Hampden Sydney. VQZ is staying at M.I.T. where he plans /1 operation on 2 meters. School work QRMed the activity of APM, PVA, K4PEJ and K4DSD. K4JKK says summer WX is good for his lawn-mower repair business but is hard on hamming. K4QER now is General Class, but lets OM K4QES have free run of the rig during VN/4RN times at least! K4AFT complains that the early morning nets on daylight time have him dragging! Your SCM plans to be on hand at the National Convention in Washington, and hopes to see most of the Virginia gang there. Tentative plans are

(Continued on page 130)

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Hallicrafters SX28A w/spr.	100.00
Hallicrafters S38D, like new	39.95
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Heath AR-3, with cabinet..	24.95
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National HRO50T1 complete	375.00
National HRO60 complete..	495.00
National NC173 o. k.	138.50
National NC183D xlnt.	295.00
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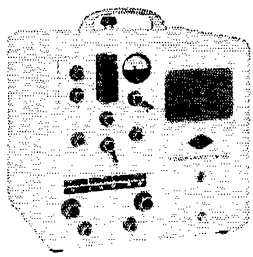

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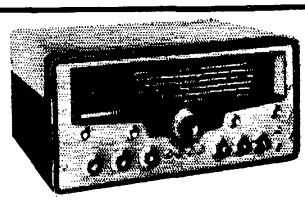

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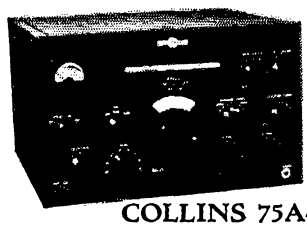

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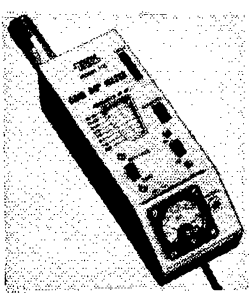
Passband tuning; double conversion; precise dial calibration; AVC for ssb; mechanical filter in IF strip. **$695** less spkr.



GRID DIP METER

The EICO Model 710 Grid Dip Meter is an instrument of excellent versatility and usefulness for servicemen, as well as amateurs and experimenters. Supplied with complete set of coils for entire band coverage.

Kit **29.95** Wired **49.95**

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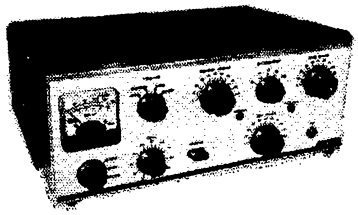

CW TRANSMITTER

The EICO Model 720 is a very "clean" 90 watt CW, 80 through 10 mtr. bandswitching transmitter. 6146 final amplifier for full 90 watts cw input. Wide range, high efficiency variable pitch Pi-network for matching a wide variety of antennas for 50 to 1000 ohms. One knob bandswtching—no coils to change.

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HIGH LEVEL CLASS B Universal Modulator

The EICO Model 730 is a high level class B universal modulator for phone operation, capable of delivering 50 watts of undistorted audio signal, more than enough to modulate 100% the EICO 720 transmitter at full input. The 730 can be used to modulate any transmitter having an RF input up to 100 watts.

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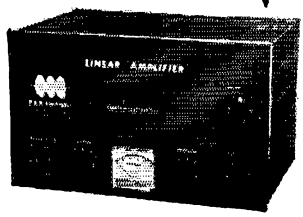

Easy to assemble. Operates on 75 thru 10 meters. Has TVI suppression; meter circuit for RF voltage input, plate current. RF amps output; low Z input, 400-watt P.E.P. input with only 20 watts drive; pi-net, output; four Mod. 1625 Tetrodes. Especially effective for SSB; also AM, PM, CW signals. Complete with power supply, tubes. Only.....$149.95
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in the works for another "Virginia Free-For-All" to be held in September. Traffic: (May) K4ELG 557, W4QDY 530, APM 425, K4KNP 349, AET 251, QES 192, W4SHJ 186, BZE 68, K4JKK 68, W4IT 62, YVG 47, K4EZL 32, MEV 31, W4KX 28, 1A 18, K4DPX 17, PTG 15, DSD 13, HP 12, W4CXQ 9, K4ECD 5, W4LW 4, BRF 1. (Apr.) K4EZL 36, PEJ 15, W4UHG 5, AAD 4.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—Asst. SCM Festus R. Greathouse: 8PZT. SEC: KXD. PAM: FGL. V.H.F. PAM: K8AON. RMs: W8GBF, HZA PBO and VYR. The V.H.F. Weather Net did a fine job of handling emergency traffic during the period of high water on Big Sandy River. HZA was in the hospital with a back injury. K8EAB has a DX-100. Winners of the W. Va. QSO Party were JCK first and GNZ second. New officers of the Tri-State Club are AFB, pres.; EEJ, vice-pres.; ELS, secy.; BDD, treas.; and FNI, prop. mgr. The Clarksburg Radio Club operates station TPW. MIP is not too active because of illness. FUM is doing a fine job as Caphell County EC. CRM is on 75-meter phone. K8CQN and JNF have been working good 6-meter DX. New officers of the V.H.F. Weatherbird Club are K8CYW, pres.; K8ARF, vice-pres.; and K8HRO, secy.-treas. The club meets the 3rd Sun. of each month at East High School in Huntington. FNI received a certificate for the highest West Va. score in the recent YYRL Contest. YBN has moved to Kentucky. K8DUO is on phone with a DX-100. K8DJT and his XYL, K8GXQ, are now in Waco, Texas. K8BLR is active in the V.H.F. Net. IEQ has a new Gonset III on 6 meters. BIT has his General Class ticket. K8KKU got his Tech. Class ticket. KN8JSY is the XYL of WHQ. Traffic: W8FNI 242, HID 81, VYR 59. GNB 47, BWK 35, CSG/KLI 14, FNI/8 4, HRO 4.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, B. Eugene Spoonemore, WØDML—SEC: NIT. PAMs: CXW and IJR. OOs: OTR and RRV. New ECs: KØDXF and DQN. New OBS: KØBTU. New OES: KØDIQ. New QTH: KØCOI, Dillon instead of Leadville, UPS, KTX, KØKZY and Ben's son David worked over the LCARC power plant. KØAYK made a trip back to Council Bluffs. ZFM has worked 20 states on 6 meters. *The El Paso Radio Club News* states that KØGBS and the club have FCC Novice and Technician Class exams for those wishing to take them. ZJO gave a talk to the Western Slope Radio Club, according to the *RF Carrier*. IQV has a new DX-40. There were 450-plus copies of the May issue of the *Roundtable* mailed, according to BWJ, advertising manager. KØDCW wishes to express, on behalf of the Jefferson County Evacuation Communications Net, a great deal of thanks for the fine cooperation of all amateurs in maintaining 7230 kc. as a clear channel for its May c.d. drill. KØEVG reports that SZH and KØJFO are new members of the LCL-YL Net. New 6-meter stations are KØIVC, JGW, OKO and OKP. WMK is running 750 watts with a pair of 813s, a nice weapon against summer QRN. KØGUY is using DX-35 and NC-48. TVR runs a Gonset transmitter and receiver mobile. Traffic: (May) WØIA 782, KQD 530, KØDXF 189, DCW 122, KZL 100, DCC 79, WØDQN 66, KØEVG 37, WØQOT/ 33, VLS 31, KØWDZ 27, WØCBI 17, NIT 15, ENA 10, RRV 8. (Apr.) WØIA 677, WMK 372, NVU 51, KØGUY 11.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: Col. John H. Sampson, jr., 7OCX. SEC: FSC. RM: UTM. PAM: BBN. V.H.F. PAM: SP. OCX attended graduation exercises at the United States Military Academy at West Point. His son was one of the graduates. The UARC (Salt Lake) is building the "Clubsaver" 2-meter portable transceiver which was described in *QST* as a club project. ZKL now has a DX-100 and should be working all bands soon. The Beehive Net members had an outing at Saratoga Resort. LQE, the former SCM, is back in Utah and should be here until August. KN7DOV recently received his license. EII has a new Globe Chief 90A. JQU has been appointed ORS. Send your monthly reports to the SCM. Join the AREC. Traffic: W7OCX 26, QWH 3.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAM: ZU. V.H.F. PAM: FPB. RM: DWB. The New Mexico Breakfast Club meets Mon. through Sat. on 7272 kc. at 0700. The NMEPN meets Sun. on 3838 kc. at 0730 and Tue. and Thurs. at 1600 on 3838 kc. The RMN meets Mon. through Fri. on 3570 kc. at 1900. Please try to check in on these nets. K5KBJ, Roswell, received his sheepskin from State College in Ag. and was voted the only cowboy ham. ZU and his XYL, of Roswell, left in June for Alaska via the Alcan Highway. K5IQL, Roswell, mobiled to California on 6 meters. K5ONT visited in Roswell on the way to Hobbs to see how MARS operated from BIH's QTH. On May 23 Albuquerque mobiles spent 5½ hours helping the sheriff's department search for a 13-year-old girl lost in the mountains. LFH recently gave a talk to clubs on satellite tracking, with the assistance of K5IVR. This year's alert went very well in Albuquerque, Santa Fe, Los Alamos

(Continued on page 132)

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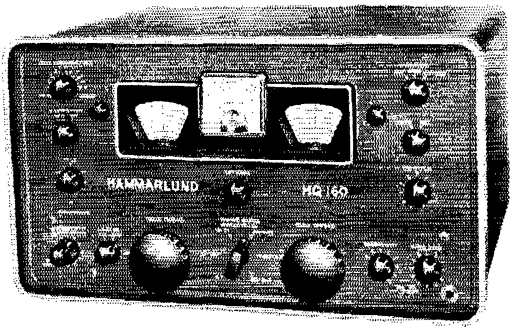
A quality-communications receiver offering all the advantages of receivers costing hundreds of dollars more, PLUS several all-new features for better performance. Biggest value ever for amateur and short-wave listener alike.



SPECIFICATIONS: General Coverage: 540 KCS to 31 MCS continuous tuning. • 5 KCS dial markings up to 10 MCS, and 10 KCS markings above 10 MCS. • 13-tube, dual conversion, superheterodyne with automatic noise limiter. • 14 tuned circuits in IF. Crystal controlled 2nd oscillator. • 60 db slot filter. Adjustable plus/minus 5 kc of center frequency. Adjustable depth. • Q-multiplier: Peak and frequency controls. • Separate linear detector for CW and SSB. • Separate, adjustable B.F.O. marked for upper and lower sidebands. • Electrical bandspread. Improved dial readability. • Built-in crystal calibrator (100 KCS). • Dial resets on both dials. • S-meter for easy tuning and read-out of signal strength. • Exclusive Auto-Response for optimum listening.

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- Carry more current for any given inductance without increase in size
- Provide higher current and lower inductance
- Lower in cost than any other chokes with comparable features

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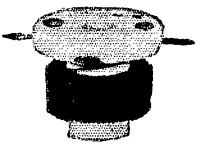
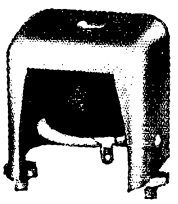


LATTICE WOUND CHOKE



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TRANSMITTING CHOKE

● Here's a new line of R.F. chokes engineered to provide superior performance in any circuit for which they are applicable. Employing enamel covered wire, precision wound on special machinery, they can carry more current for any given inductance. Each type is manufactured in a variety of sizes to meet almost any requirement.

See these new chokes at your distributors, check their specifications and current ratings, then compare their prices with other chokes. You'll agree they are the best buy on the market.

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BUD RADIO, CORP.

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and Roswell. Different sections of the rest of New Mexico were on stand-by basis. Traffic: (May) K5GYZ 24, DAB 17, GFC 15, W5YC 5, GD 4, ZU 3, K5DAA 2, KBJ/5 2. (Apr.) K5GFC 14.

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. Congratulations to the Sheridan gang on a well-planned hamfest. New officers of the Casper Amateur Radio Club are LKQ, pres.; BHH, vice-pres.; and NNX, secy.-treas. QPV has a new KWS-1 and a 75A-4. More than 20 Sheridan hams are constructing 2-meter rigs for emergency communications. ZHN is chairman of the construction project and the receiver was designed by LRU. Stations participating in the recent e.d. exercise included YWW, MNW, AUI, EUZ, YJG, AYU, DW, AEC, HCA, YWY, 5DDG/7 and LKQ. YWW is now on 2 meters. BZC has moved to a new QTH. Traffic: W7AXG 41, DXV 24, BHH 6.

SOUTHEASTERN DIVISION

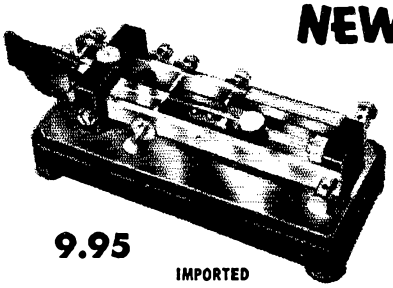
ALABAMA—SCM, Clarke A. Simms, jr., W4HKK—SEC: EBD. PAMs: DGH and K4BTO. RM: RLG. Congratulations to PVG and OKQ, new ORSs, and to K4-KBT for making BPL. K4PFM has made WAC, WAS and has 60 countries confirmed in one year while handling over 400 messages and taking his turn as NCS of AENP. BWG continues code classes for the Jasper vicinity. Welcome to KN4YBF, the son of CEF and TZU, located in Ider and Ft. Payne, respectively. Every licensed operator in Dekalb County has joined the AREC. Wish we had more 100 per cent counties. In fact, wish all counties had an AREC program. If your county is not yet active, please inquire for details to get organized. Write to S. D. Christian, EBD, 8436 No. 7th Ave., Birmingham, Ala. K4ANB now is working 15 meters with a new beam up 50 ft. K4KJD had a nice birthday surprise June 8 when a large group from over the State dropped in with several pieces of new equipment for his station. Traffic: W4RLG 492, K4KBT 176, KJD 142, PFM 134, W4YRO 103, KIX 84, PVG 49, MI 34, K4AOZ 32, JDA 30, W4CRY 18, CIU 17, CEF 13, K4PHH 12, W4RNX 10, IPF 9, K4KAK 9, W4RTQ 8, WAZ 7, K4ANB 6, W4HKK 3, K4MQH 2, W4ZSH 1.

EASTERN FLORIDA—SCM, John F. Porter, W4KGJ—SEC: IYT. RM: K4SJH. PAM: TAS: With band conditions changing for the worse on 80 meters the Florida Net (FN-CW) will change from 3675 to 7105 kc. for the summer and fall months. The net will maintain its regular time, 1900 EST Mon. through Sat. and liaison to the 4RN. BJI, Polk County EC, has accepted the post of chairman of Red Cross Radio Communications. K4-CIT is operating amateur TV in the Daytona Beach Area. The Jacksonville Amateur Radio Society is sponsoring on-the-air code practice sessions Mon. and Fri. at 2000 EST on 3675 kc. RNS has qualified for her WAC certificate. LJM has a new Communicator III. COZ as a v.h.f. converter for his NC-300. IYT and yours truly made the Silver Springs Hamfest and had a wonderful time. PFX has a new DX-100. The Manatee Amateur Radio Club now has a new club room, thanks to the local Police Dept. at Bradenton. The Miami Springs Radio Club set up a complete station at the Governors' Conference in the Americana Hotel and handled 129 messages. The Dade County C.D. Communications Department graduated more than 50 new amateurs from the class completed in June. A new class will start for both Novices and Generals in September. The hurricane season is here, fellows, so let's get our emergency equipment in good shape. Contact your local EC for information on how you can help out. The AREC is for every ham whether a member of the League or not. Don't forget, *Florida Skip* has been out for a year now so send in your renewals. Traffic: W4IWM 520, K4DSN 511, SJH 509, KDN 225, ILB 200, LCF 187, AKQ 153, OSQ 129, RBJ 113, W4TAS 91, K4AHW 90, COO 76, BLM 69, W4-IYT 69, K4EXN 62, BNE 53, AEE 48, MEU 44, BR 33, W4LDM 33, K4ODS 30, W4FE 25, BWR 23, DVR 23, K4JJZ 17, W4SJZ 15, K4IWT 11, MTP 11, SLR 11, W4BJI 10, KZT 6.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: PQW. RMs: AXP and BVE. Among the Western Florida hams attending the Mobile Hamfest were PQW, DDD, SOI, OOW, MFY, RKH, GSK, CUC, 5HRY, IDX and SZH. Okaloosa County RACES participated in Operations Alert May 6-7. Among those active were JFL, MFY, SJT, JUA, FEJ, BZW, RKH, BPJ, BVE, CUC, GSK, UBR and UXW, Pensacola, Ft. Walton and Panama City hams furnished communications for a boat cruise of about 60 boats May 31-June 1. Those heard were DDD, PIQ, IVD, OOW and QQO in Pensy; MFY, SMM, RKH, BPJ, GSK, SJT, JUA and 5HRY in Ft. Walton; QVL in Seagrove Beach; and COH and HQG in Panama City. O1D is back on with a new Globe

(Continued on page 134)

SAVE 33⅓ - 50% on LAFAYETTE KEYS and AMATEUR EQUIPMENT



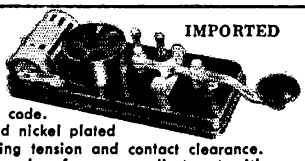
NEW! SEMI-AUTOMATIC "BUG"

SUPER SPEED TELEGRAPH KEY

Fully the equal of keys selling at almost twice the price! 7 adjustments for speed and comfort, so important in developing the right timing when using a "bug". Heavily weighted with solid steel block in base. Speed adjustable 10 wpm to as high as desired. ⅛" silver contacts; weight scale for reproducible speed settings. A real bargain for radio amateurs and professional CW operators! 6⅞" long x 3" wide x 2¼" high, exclusive of knobs and feet. Shpg. wt., 3½ lbs.

MS-435 Semi-Automatic "Bug" ..... Net 9.95

NEW! CODE PRACTICE SET

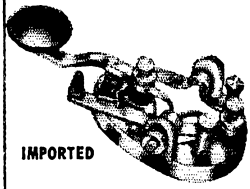


Economical and practical code practice key and buzzer unit for learning code. Telegraph key chrome and nickel plated with both adjustable spring tension and contact clearance. The high frequency buzzer has frequency adjustment with locknut to keep tone constant. Screw type pin jack terminals for headphone connection. Works with inexpensive 1½ volt battery. Heavy black molded phenolic base and buzzer housing. Base 6¾" x 2¾" x 1⅜", overall length 8½". Shpg. wt., 2 lbs. **MS-438** Code Practice Set (less battery) . **1.95**

BATTERY Burgess 2 ..... **.13**

MS-369 Stethoscope Headset **1.69**

NEW! LAFAYETTE "BRASS-POUNDER'S" KEY

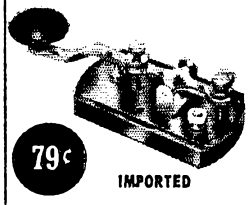


- *With Ball-Bearing Pivots*
- *Solid Polished-Brass Base*

A better quality precision-made key designed for hard usage. Polished brass base; spring tension and contact clearance adjustments; 3/16" silver contacts. Base 3" x 2"; overall size 5" long x 2⅜" wide x 1-1/16" high. Shpg. wt., 1½ lbs.

MS-428 Telegraph Key ..... Net 1.95

SAVE ON NEW! TELEGRAPH KEY

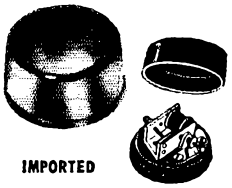


LAFAYETTE SPECIAL

Economical and practical code practice key. Solid, heavily chrome and nickel plated metal parts, molded phenolic base. Adjustable spring tension and adjustable contact clearance. A real buy! Base 3¼" long x 1-13/16" wide. Overall length 5"; height 1⅜". Shpg. wt., 12 oz.

MS-319 Telegraph Key ..... Net .79

NEW! high frequency CODE PRACTICE BUZZER



Reg. Value 2.50

Adjustable frequency buzzer ideal for individual or group code practice. Black molded phenolic housing — Works with 1½ volt battery. Screw adjustment for changing tone. 1⅞" diam. x 1-1/16" high. Shpg. wt., 6 ozs.

MS-436 Buzzer ..... Net .79

NEW! Miniature *Panel Meters*

- D'ARSONVAL MOVEMENTS
- JEWELLED BEARINGS
- ONLY 1-9/16" SQUARE FACES
- ACCURACY 2% OF FULL SCALE

UNUSUALLY LOW-PRICED FOR SUCH EXCELLENT QUALITY

Ruggedly built miniature panel meters having zero adjustment screws, silvered dials, black numerals and clear glass fronts. Shpg. wt., 8 oz.

"S" METER — Standard "ham" signal strength indicator. A 0-1 ma dc meter calibrated in S units from 0-9. Scale terminates in + 10 and + 30 db calibrations and also fully calibrated linearly 0-5 and 0-10.

TM-11 S Meter ..... Net **$3.95**

VU METER — Volume level indicator calibrated in standard — 20 to +3 VU and 0-100% ranges. Indicates output level with complex audio wave-forms. Standard VU meter damping.

TM-10 VU Meter ..... Net **$3.95**

0-1 DC MILLIAMMETER — Calibrated in .05 mg divisions on a linear scale.

TM 400 ..... Net **$3.75**

0-50 DC MICROAMMETER — Calibrated in 1μa divisions on a linear scale.

TM-20 ..... Net **$4.95**

0-150 AC VOLTMETER — Rectifier type, 1000 ohms/volt.

TM-300 ..... Net **$3.75**

0-15 DC VOLTMETER 1000 ohms/volt

TM-100 ..... Net **$3.75**

0-200 DC VOLTMETER 1000 ohms/volt, linear scale

TM-101 ..... Net **$3.75**

IMPORTED

NEW MINIATURE HIGH SENSITIVITY MULTITESTER

20,000 OHMS PER VOLT DC — 10,000 OHMS PER VOLT AC

A terrific buy in a hand-held, compact, light, accurate, completely wired instrument. Has a 36 μA movement, 1% precision resistors and simple selector switch with calibration markings protected against wear. Scales: Volts DC and AC; 0-5-25, 100, 500, 1000; Ohms: 0-6K-600K-60 Meg; DC Current: 0-50 μA- 5-50-500 MA; Decibels: —20 to +64 in 5 ranges. Size 4⅝" x 2⅞" x 1¼". Shpg. wt., 1 lb. Complete with batteries and test leads. Imported to save you money.

AR-660 Miniature Meter..... Net **22.50**

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A Complete Transmitter with

3 MODE OPERATION

AM - CW SIDEBAND

$119.95 Kit $139.95 Wired & Tested

Bandswitching 10-80M, 100w (PEP) DSB input, suppressed carrier, 40w AM; 50w CW

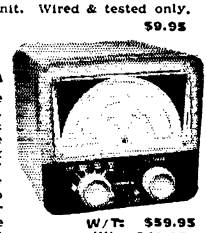
Sidebander DSB-100

Barefoot or piggy-back, this unique sideband Xmttr. 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 35 db 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 & filtering assures powerful communication punch and narrow band width. Provisions for Antenna Relay Control. Ceramic switches throughout. Forward Look.

VOX Designed for the DSB-100, the Globe VOX plugs into socket at rear of Xmttr. Extra contacts for aux. circuits. W/T: $24.95 Kit: $19.95

QT-10 Plugs directly into VOX unit. Wired & tested only. $9.95

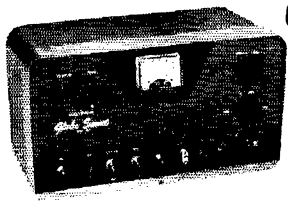
Globe's VFO 755A



Ideal for use with the Sidebander, the 755A is well-filtered and self-contained. Covers 10-160M, with output on 40 & 160M. Improved vernier dial drive with shock absorption. 13:1 tuning ratio. Voltage regulation. Approx. 50V RF output; will drive oscillator stage of any Xmttr. on market; plugs into Xtal. socket. Temp. compensated for stability for SSB or DSB. Calibrate switch for zero beating. New Forward Look.

W/T: $59.95 Kit: $49.95

Globe Scout 680A



6-80M Transmitter 65w CW; 50w AM

W/T: $119.95 Kit: $99.95

Plate Modulated

The Scout Xmttr., housed in the Forward Look cabinet, TVI-shielded, is bandswitching 6-80M, with built-in power supply. High level modulation maintained. Pi-Net output on 10-80M; Link-Coupled on 6M, matching into low impedance beams. New type, wide view shielded meter. Kit complete with all parts, tubes, pre-punched chassis & detailed instructions.

Power Booster PB-1

For All 680 Series Scouts

W/T: $21.95 Kit: $14.95

The PB-1 allows straight through operation on 6M; 50% more power output, while attenuating harmonics and further suppressing TVI.

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Scout in P. C. APE reports the 2-meter C.D. Net in Tallahassee is going strong. New officers of the Eglin Radio Club are SMM, pres.; MFY, vice-pres.; RKH, secy.-treas.; BPJ, act. mgr.; K9KPU, editor. PIQ and QQO are now Gen. Class in Pensacola. K4OPS has moved to Pensy from Tallahassee and is on with a DX-40 and a trap vertical. PLI reports only 2 openings on 6 meters in May. PAA keeps getting the DX with a new Viking 500. Traffic: W4BVE 21.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: K4AUM. PAMs: LXE and ACH. RM: PIM. GCEN meets on 3995 kc. at 1830 EST Tues. and Thurs., 0800 Sun.; ATLCW on 7150 kc. 2100 EST Sun.; GSN Mon. through Sat. at 1900 EST on 3595 kc., PIM as NC; the 75-Meter Mobile Phone Net each Sun. at 1330 EST on 3995 kc., UUH as NC; Atl. Ten-Meter Phone Net each Sun. at 2200 EST on 29.6 Mc., VHW as NC; GTAN each Sat. at 1000 EST on 7290 kc., K4ORR as NC; GPYL Net each Thurs. on 7260 kc. at 0900 EST, K4IFF as NC. The GPYL has K4GCK, K4CYV, K4HSC/4, KN4TYE and K4UCB as new members. Three Georgia Peaches won prizes at the very successful Atlanta Hamfest. On May 18 the South Georgia Rag Chewers had a fine picnic at Thomasville, Ga. K4LBC moved into his new shack and the same day high winds destroyed his antenna. K4SDL has dropped her "N." K4DWF graduated from GMA. FGH has a "Thunderbolt" on the air. BXV was the nation's southernmost ham for a few minutes while he was in Key West, Fla. K4CZQ's No. 2 girl was born May 29. ISS finished modification of the BC-625. The Albany Radio Club enjoyed a nice weiner roast at Chehaw Park this month. K4LEM worked all Government stations on Armed Forces Day. The Georgia Tech. IRE Chapter's officers are VZR, pres.; HBO, vice-pres.; TKG, secy. K4ANZ won an HQ-160 at the Atlanta Hamfest. Traffic: K4MCL 283, LVE 277, W4ETD 163, K4OQY 154, FCI 101, CZQ 85, KZP 66, W4ZWT 47, K4KIV 37, HOU 28, LEM 22, W4BXV 14, K4APC 5, W4IPV 2.

CANAL ZONE—SCM, P. A. White, KZ5WA—The annual Canal Zone Civil Defense Practice Alert was conducted May 6. VR, EP/M, QA/M and KJ/M provided communications on 28.9 Mc. RU, RM, BG and JJ operated portable transmitters on 28.9 Mc. to provide walkie-talkie links to field units in the Emergency Net, which fired up to aid the Control Point Commanders and the Civil Defense Director, Mr. Phil Dade. W3ACH, here on business, maintains schedules on 15 meters back home through HG, W3RIH and W3GXR. RM is Stateside on business for the Panama Canal Company. HO and WZ have new Mosley tri-band beams up. CN will have a new Phasemaster II S.S.B. exciter and high-powered final. BB has a fine collection of c.w. DX QSL cards gathered mostly on 20 meters since he arrived here. EL is on vacation in Puerto Rico and the U. S. New stations in the Canal Zone are RD and LLN. New operator licensees are Kenneth Schroeder and Ross L. Orbach. Traffic: KZ5HA 90, JS 90, HO 70, VR 34, EL 27, WA 15, BB 12.

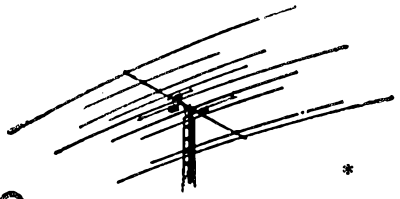
SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6HLR. PAMs: W6ORS and K6BWD. BPL was earned this month by K6MCA, W6GYH, K6HLR and W6ZJB. Congrats! K6KYJ is getting the rig working again on 80 and 40 meters. K6MKG is the new EC for the Barstow-Victorville Area. New officers of the San Gabriel Valley Radio Club are W6SRE, pres.; W6UXV, 1st vice-pres.; W6GMC, 2nd vice-pres.; W6BUK, secy.; K6OON, treas. K6PLW is back on the air both at home and mobile. K6IYJ picked up a new one, FF8. K6OQD received a Public Service Award. Congrats, Jean! K6DDO and W6QL worked hard and completed WAZ. Nice going, fellows! K6QMK is putting up a new eight-element beam on 6 meters. K6QPG and W6PHO are doing bang-up jobs as OO working on those harmonics. K6EA is working as relief "Sparks" on the SS *Catalina*. Congrats to the Ramona Radio Club, which received a "Certificate of Award for Community Service," in connection with the 1958 Community Chest Campaign. K6HSQ has moved into the Los Angeles section from Texas, where he was W5DAO. Wha' hoppen to W6CMN? Support your section nets—on c.w., the Southern California Net at 1930 PDT on 3600 kc.; on phone, the Southern California 6 Net on 50.4 Mc. at 1900 PDT. Traffic: (May) K6MCA 1259, W6GYH 865, K6HLR 822, W6ZJB 615, K6OZJ 407, W6BHG 262, K6PQM 211, K6KZY 209, K6JQB 192, K6HVC 138, W6HJY 78, K6OQD 57, K6QMK 44, W6JQB 35, K6GCC 34, W6BUK 25, W6VSH 20, W6USY 18, K6GUZ 12, K6COP 7, W6CIS 6, K6IYJ 5, W6SRE 5. (Apr.) W6VSH 8.

ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: YWF. PAM CSN, 3895 kc: NYT. Look for SUI, Phoenix, on 420-Mc. TV. When in Yuma County remember they monitor 3885 kc., the frequency used by the Yuma County

(Continued on page 136)

PLYTUBULAR CONSTRUCTION



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- No Traps, Coils, Baluns or Gadgets
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AIR IS THE BEST INSULATOR

THE 9L-101520RG IS A BETTER BEAM ON 10, 15 AND 20 THAN THE AVERAGE STACKING OF THREE SEPARATE SINGLE BAND BEAMS HAVING 8 DB GAIN AND 24 DB F/B. ALL THREE TUNERS REACHABLE FROM THE TOWER FOR UNITY MATCHING.

PLYTUBULAR CONSTRUCTION IS A PROCESS OF FABRICATING MULTI-PLY ALUMINUM BOOMS AND ELEMENTS, PERMITTING SMALLER DIAMETERS FOR GREATER STRENGTH AND LESS ICE LOADING, WIND LOADING, VIBRATION AND TORQUE.

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6L-1520RG	15-20	165.00

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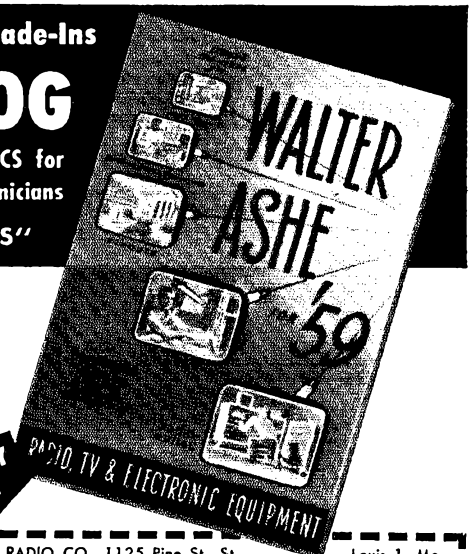

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Net. The *Desert-Rabbit* is published each month by the Yuma County Radio Club. Its editor is CIX; asst. editor KN7DHJ; production IPA. 9PMV/7 is a new call in Yuma. K7BDD is sporting a new HQ-160. May 30-31 and June 1 the big Montezuma Well Hamfest was held with the usual large turnout. W5- and W6-Lands were well represented as in the past. This is the last year that this get-together will be held at Montezuma Well. Next year it will be put on by the Prescott Radio Club at a new location. Traffic: W7OIF 24, CAF 6.

SAN DIEGO—SCM, Don Stansiter, W6LRU—W6IAB, at Camp Pendleton, made a traffic count for May of 2567 with only one operator, the highest single-operator count ever made in this section. W6ISQ enjoyed a vacation in New England and visited ARRL Headquarters while he was there. K6RQM has a new three-element beam on 21 Mc. K6EQL has a new tri-band quad operating. KN6IYK sends in a nice traffic report, with 4 net affiliations in the 2-meter band, from Anaheim. The June meeting of the San Diego DX Club was held at the home of W6KYG in Poway. W6CDF is back in town after a trip with the Navy in the Pacific. The Helix Club held Field Day in the Laguna Mountains at an elevation of over 6000 feet. W6OME flew to Annapolis to see his son graduate from the Naval Academy. K6IIR graduated from Pt. Loma High School and plans to attend Cal. Tech. W6JWS lost the "N" in his license. He is building a Heathkit Apache. W6AKY recently celebrated his 81st birthday. W6LRU vacationed in the High Sierras for two weeks with his father. W6MIT was inducted into the Army on June 30. W6RAN becomes the 10th member of the San Diego DX Club to work 200 countries. K6BPI received an ARRL special award for work done when a small child was lost in the desert area last January. New Novices at Dana Junior High are KN6UKQ, KN6UNS and WV6ABA. Traffic: W6IAB 2567, W6EOT 411, W6YDK 308, KN6IYK 115, W6KVB 25, K6EQL 13.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, Ray A. Thacker, W5TFP—Asst. SCM: E. C. Pool. 5-NFO, SEC.: BNG. PAMSs: K5AEX and IWQ. RM: ACK. New appointees are ONL and ONQ as OOs, PVT and ONQ as OBSs, K5-DNQ as ORS. ONL is new to this area from St. Louis. K5s EVU and EVS recently were honored during Armed Forces Day by Dyess Air Force Base in Abilene for the very commendable job of traffic-handling and services rendered. K5DNQ, working away at the ZLs on 15 meters with the tremendous power of three watts, actually made a QSO! HTH reports things are as usual with the Amarillo boys. LR is now a proud OM! His XYL has the call KN5QFA. AAU advises there are 15 stations on 6 meters in the Denton Area. GVS reports from Midland a new Novice call, KN5QPK; also that GBQ is the new EC and that ODH is back on the air after a hospital session. PXV is new to the Dallas Area from Nebraska. GY sure is doing a bang-up job of traffic-handling on c.w. KN5POP reports eighty contacts in fourteen states so far. NFO, our assistant, suggests that we need more OBSs in the Panhandle-South Plains Area. If interested, contact either of us and we will put you to work!! The Dumas ARC is now an ARRL Affiliated club! Have you "browsed" through the FCC regulations lately? Traffic: W5GY 255, BKH 250, SMK 192, BOO 111, K5HTH 58, PXV 36, ILL 27, EMR 21, W5AYX 20, K5DNQ 18, ACD 16, BZH 16, W5RVI 12.

OKLAHOMA—SCM, Richard L. Hawkins, W5FEC—SEC: LXH. PAMs: K5INC and MFX. RM: JXM. The new PAM for 7.2 Mc. is K5INC. A new OPS is GOL. K5EGS is being transferred out of the State. IWL won first place in the SS Phone Contest for Oklahoma for the third consecutive year. The Bartlesville Club received favorable comments from the public on a display in a downtown window featuring amateur radio. The Bartlesville TVI committee has been doing an FB job. 4RCM/5 has left for KL7-Land. PWN now has a refrigerated air-conditioned hamshack. The Sooner Nooner Net had 663 check-ins, 110 messages handled and 27 sessions. KCG is now on 50 Mc. K5BKF resigned as secy. of the OCARC TKC was on two weeks Naval Reserve duty. EHC's station was struck by lightning. HXT has a new vertical. Skip and noise are disrupting the nets, making it doubly important that good operating procedures and techniques be used. Oklahoma Hams of the Month: IWL and K5BNQ for their good operating and general hard work on behalf of amateur radio. Traffic: W4RCM/5 170, W5KY 67, MGK 50, K5INC 44, EGS 41, W5CCK 34, FKL 29, FEC 28, QBX 24, VLW 24, MFX 23, K5CBA 18, DJA 17, W5GOL 15, ERI 14, PNG 12, BBA 10, EHC 9, 1ER 9, IWL 9, K5BNQ 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF, RM: FCX, PAM: ZIN. It is with deep regret that we record MRV and CVE as Silent

(Continued on page 138)

QUICK QUIZ

Q. What are the procedures to be followed in renewing an amateur station and operator license?

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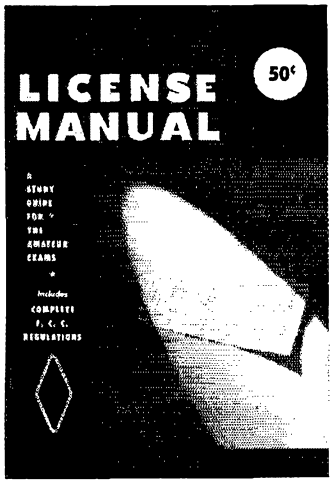

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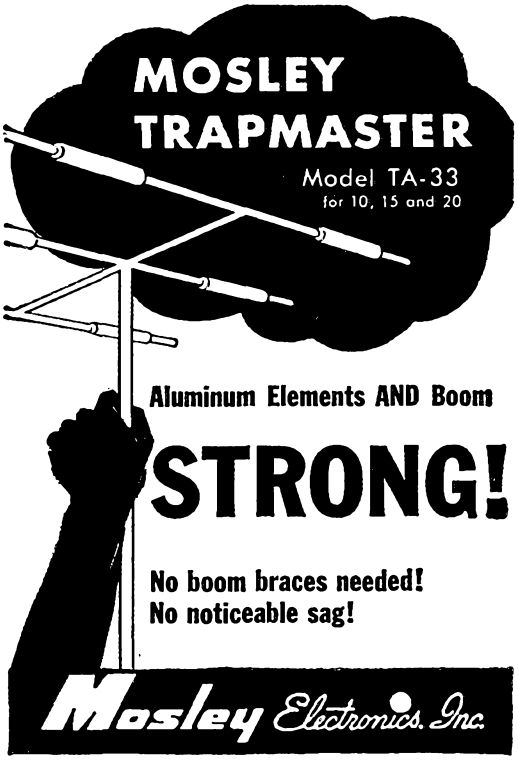

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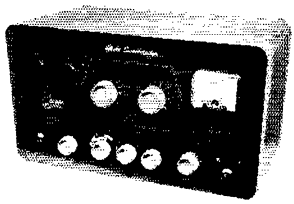

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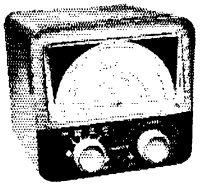

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Keys. They will be missed by their many friends. K5LIU made 130 contacts in 43 sections in the April CD Party. She has moved to a new QTH at La Marque where she will have more room for antennas. EEY and family have moved to San Diego, Calif. RPH and his XYL are moving back to Corpus Christi after serving in the Air Force in Little Rock, Ark. TEL greeted friends in South Texas while on furlough from the Canal Zone. BOY is operating as XE6BOY while vacationing in Mexico. The STS C.W. Net is meeting with the NTX during bad band conditions for the summer. K5BYV was heard mobiling in Corpus Christi while on vacation. K5CPA is a recent graduate from Roy Miller High School. K5PEQ is the new activities manager for the Baytown Amateur Radio Club. K5BJU has a new Thunderbolt. BOY also is burning up the airways with a new Thunderbolt. LRQ and family are vacationing in North Texas. K5OQN worked 70 stations on 6 meters May 25. He worked 180 stations in 22 states during May. Congratulations to ZIN on making BPL for the second month. The 7290 Net had 43 sessions, with 1172 stations and 742 messages. EDG sent 10 ARRL bulletins in May on c.w. How about some news as things are getting dull because of vacations. Traffic: W5UMY 241, ZIN 217, FCX 214, EGD 199, K5BYV 174, W5NXZ 30, QLT 7.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCM: Aaron Solomon, 1OC. SEC: AEB. PQ is the second to make the WAZ Honor Roll for the Maritimes, not PZ as originally reported. New calls include PB, AET and VO2EB. OD has moved from Oromocto to Sydney. OC recently vacationed in the VE7 district. Aaron reports that he was able to arrange schedules with EL1H for direct handling of emergency information. VJ, ex-VE0NE, has been posted to Churchill, Man. Newly-elected officers of the FRAC are LS, pres.; OQ, vice-pres.; VU, secy.-treas. ES now has a DX-40. DX addicts are reminded that they should keep in touch with FQ if they expect to receive those rare cards. Brit has many awaiting delivery. A stamped self-addressed envelope forwarded to him will do the trick. OM and WL have a 6-meter circuit set up with ABV on Sable Island. Don't forget the Convention to be held at Truro during the Labor Day week end. Please assist the Truro Club by registering in advance. See you there. Traffic: VE1VN 66, ABJ 32, OM 22, GM 16, AAR 12, VO2NA 9, VE1AEB 6.

ONTARIO—SCM, Richard W. Roberts, VE3NG—My sincere thanks to all who so kindly helped to reelect me as SCM. By the time you read this you will have had a wonderful time on Field Day. Some of our clubs were absent from Field Day this year because the date conflicted with that of the North Bay Hamfest. Our National Holiday also fell on that week end. KM has returned from W6-Land; he also visited the Sault Ste. Marie Club. The Hamilton ARC is going great guns with plans for the ARRL Ontario Convention to be held Oct. 18. RH is in good health again. More than 50 mobiles are active on 75 meters in the Metro Toronto Area. The Quinte ARC has its club transmitter on the air with the call BSQ. The St. Clair Valley ARC has an FB program lined up for the balance of '58. Movies are on loan from the U. S. Army. The Nortown ARC elected BQT, pres.; HB, vice-pres.; EGW, rec. secy.; BOF, corr. secy.; KA, treas. VE8OW/VE3BOH has returned from the Arctic. The St. Thomas Civil Defense group visited the Sarnia Club recently. The Ottawa ARC held a successful dinner June 6. CJ heads the Ontario Amateur Radio Federation (for TVI). The secretary is DAR. DSX visited AJR at Leamington. Traffic: (May) VE3DCX 256, BUR 129, NG 94, DPO 88, AUU 70, EII 66, DTB 59, BJV 57, BZB 39, KM 38, AML 37, EAM 24, EAU 22, AOE 13, AES 12, DEX 9, DH 6, SG 6, DLC 5, CE 4, ELC 4, AVS 3. (Apr.) VE3SG 2.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—APR snagged HH7OG on 75-meter phone. He also received appointment as Sherbrooke Area EC. AHK, AGI and AOL are consistent mobiles on 75 meters. VE is planning to go to 2 meters. JA is back on 75 meters. S.s.b. notes: JS has a fine signal using a KWS-1, AN is on with 100 watts, IQ is using home-brew, BG is active, QA is proud of WAC using 2OA. WW is the first VE2 to apply for a WAZ certificate. YU led all VEs in the RSGB Phone Contest. GE is rebuilding to reduce the big local signal from YA. The South Shore Club arranged a fine evening to celebrate BG's 50-year ham anniversary. APO, at Terrebonne, is a newcomer. ATL hopes to join APC for a Volkswagen trip to Washington, D. C. AWR, at Rawdon, is hooking DX on 80-meter c.w. ABE and NP discuss astronomy during weekly skeds. AWK expects to take a 2-month vacation to Edmunston, N. B. AZS likes the new AR-88 for DX. Traffic men are bemoaning the poor 80-meter early evening conditions and c.w. men may move to 7 Mc. AAR also held the experimental call

(Continued on page 140)

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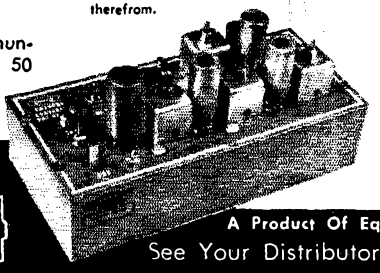

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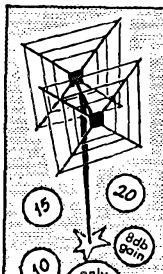

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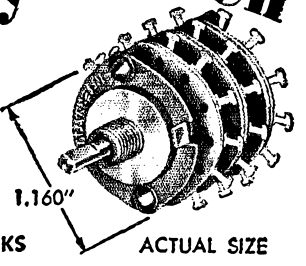

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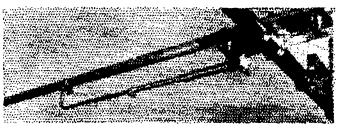

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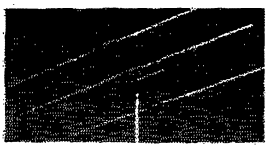

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VE9JZ and could operate on 152-174 Mc. with F-3 emission. ATL reports success with the DX forecasting project—87 per cent accurate. APC expects to join the 2-meter gang with an eight-element beam and rotor. NV and AIO do a great deal of careful listening for rare 20-meter DX which pays dividends. VA took time off from QSL Bureau chores to build a very fine exciter. UL reported erroneously last month as moving to VE3, remains in the VE2 district. Traffic: VE2DR 91, EC 23, APR 11, YF 6.

ALBERTA—SCM, Gordon W. Hollingshead, VE6VM—PAM: OD, Circle Aug. 23 and 24, the dates of the Edmonton Hamfest, which it is promised will be the best ever. Your attendance is a must. 2-meter activity in Calgary is due for a big increase. PQ and his construction group are completing their gear. AX has been appointed EC for the Calgary district. The RTTY demonstration by DZ, EN and HM on C.D. Exercise Co-op II, was a big success. MJ now is mobile on 75 meters. Traffic: VE6HM 226, OD 17, TT 8, MJ 5, BL 2, VM 2.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—Hope you all had a good Field Day and found a good location. TF, our Route Manager, and some of his stalwarts are keeping the BCEN (on 3650 kc. at 1830 to 1930 Mon. through Fri.) going along steadily even under poor summer conditions. ALE will have finished his stint as radio operator on the Mt. Fairweather Expedition so lend him your ear for some humorous recounts of the antics. KX worked VK3KF for the first VK/VE RTTY contact during May. TF is looking for members for 3650 kc. It has been proposed that the BCARA Open Forum be held in Nanaimo Aug. 9 and 10. More information can be had from ALE, the BCARA secy, or the Nanaimo gang whose newsy paper adds spice to anyone's reading. However, the editor, AIK, says he is running out of spice. We hear there will be a DX Club Convention in Vancouver during August. If you want any information perhaps it can be obtained from ALR. It could be that it is by invitation only or I have not had any information about it as yet. Hearty congrats to TF on getting his A-1 Operator certificate. Traffic: (May) KG1DT 335, VE7TF 86, ALY 31, AAF 16, AEC 12. (Apr.) KG1DT 235.

MANITOBA—SCM, James A. Elliott, VE4IF—The May e.d. exercise was quite successful with several of the local hams participating. K6SMR, ex-VE4AIY, 4RX would like VE4 contacts on 20,-15-and 10-meter phone and c.w. JW has found out the secrets of the DX-40. The Dauphin gang is preparing for the hamfest to be held Aug. 30 and 31. Get your reservations in soon to XP. This is the BIG EVENT of the year. Let's swamp them, gang! We wonder what effect the "Great Mortan," 2AHZ has had on the northern tribes? Have been wondering what Four Pussy Willows is growing in his "rock" garden. Glad to hear that XW will be flying again soon. JQ has been working into the net with his mobile. According to TJ, 20 meters is the best DX band these days. Old-timers who have held tickets for 25 years or more and who are interested in joining the North West Old Timers Association, please contact your SCM. Traffic: VE4GE 17, QD 14, JY 10, AY 9, KN 9, AN 8, IF 6, RB 6, JW 4, IW 1.

Image Transmission

(Continued from page 15)

mission. For instance, a club could build a picture transmission unit as a club project, and this could be used to make recordings of the members' slides. Armed with recordings of the pictures he wished to transmit, the individual ham would then only have to build receiving equipment.

Local air tests were made over 1-mile and 7-mile distances on the 11-meter band, under a variety of transmission conditions. K4KYY played the video tape through his plate-modulated a.m. rig, and the signal was received on the NC-300 at W4JP, the University of Kentucky's station. These tests yielded information about the signal-to-noise ratio required for faithful picture reproduction. The figure of interest is the ratio of the sync pulse amplitude of the receiver output signal to the receiver peak noise output when receiving the unmodulated r.f. carrier. When this ratio was greater than about 26 db., the received picture quality was equivalent to

(Continued on page 142)

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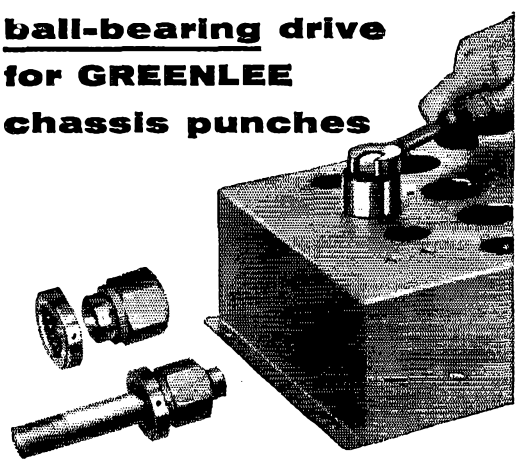

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that observed when monitoring transmissions with the picture received fed directly with the outgoing picture signal. With a 20-db. ratio the quality was still good, but with some snow present. When the ratio dropped to about 12 db. the picture contained considerable snow, but call letters could still be distinguished. In all these tests the black level was set at 50 per cent of the sync level.

K4KYY and PJ2AO tried valiantly to make a satisfactory long-distance test, but 11 meters had slipped a little too far into the summer slump for success. Phone signals were only slightly above the noise, and the signal received at W4JP from PJ2AO, who had recorded and played back the signal sent by K4KYY, was well down into the noise. While this test didn't produce conclusive results, the successful operation of conventional a.m. facsimile systems indicates that long distances can be covered if the signal-to-noise ratio is sufficiently high.

The World Above 50 Mc.

(Continued from page 75)

Indiana (near Terre Haute) for the annual Turkey Run V.H.F. Picnic, July 27. See W9ZHL for details.

The Mt. Airy V.H.F. Club of Philadelphia invites you to their Third Annual Picnic. It's Aug. 10, at Fort Washington State Park, Flourtown, Pa.

The Keystone V.H.F. Club is pushing the York area hamfest Aug. 24. They will have 6-meter communication for talking in mobiles. Event is held at Atlands Ranch, off Route 30, about 10 miles south of York, Pa.

V.h.f. activities, including a 6-meter transmitter hunt, will be a featured at Cameron Park Club House, Waco, Texas, Aug. 31, when the Central Texas Amateur Radio Club throws its annual hamfest.

Then, of course, there's the Perseids meteor shower, best of them all. Last month we ran some tentative plans in these pages. W6LIT confirms, with no essential change, the schedule printed therein. He will be monitoring 7002 kc. continuously from 2100 MST Aug. 9 on for schedule information. This is a real chance to catch Wyoming and Idaho on 144 Mc. if you get to Don in a hurry.

W7VMP is back in business at Phoenix, Ariz., for the summer, with two of the Fenwick trio still on the job. (W7VMP, himself, is living in California this summer.) Charlie and Bob will keep the Fenwick kilowatt hot on 6 and 2 through the summer, and they are open for Perseids skeds. There is some talk about a trip to the Four Corners (Utah, Colorado, Arizona and New Mexico come together at one spot in the wide-open spaces) area for some 144-Mc. shenanigans.

The World Above 220 Mc.

Throughout all the early days of v.h.f. development, one of the great problems was maintaining activity, so that when you had an opportunity to be on the air you'd find someone to talk with. In most areas we're "over the hump" as far as 6 and 2 are concerned. At least during the times that most hams are free to operate, there is something doing on 50 and 144 Mc. in the more populous areas, though there is still room for improvement.

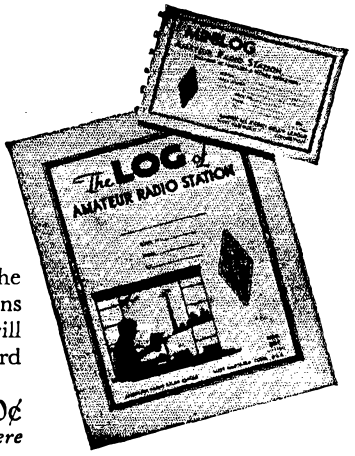
But on the bands from 220 up we have the age-old problem everywhere, with the possible exception of a few spots where heavy population densities make it possible for the 220-and-up enthusiast to find activity running spontaneously. One way to help the cause along is to set up regular operating schedules for the higher bands. If you can (and *will*) be on the air at specified times, send us the details of your schedule, and we'll publish it here. The rest is up to you. Remember there's a time lag between the time you write your letter and appearance of the information in these pages — so don't work the schedule for a week or so and then give up. That won't help anyone, including you.

Here's one such 220-Mc. sked. VE3BQN, Toronto, has a go with W3ARW and others in the Scranton area each

(Continued on page 144)

working

Mobile or Portable THIS SUMMER ?



Then, your log-keeping needs can be met by the ARRL MINILOG. Convenient, pocket-size, it contains proper headings for all necessary entries. MINILOG will help you comply with FCC regs, provide a lasting record of the many pleasant QSOs you'll enjoy this summer.

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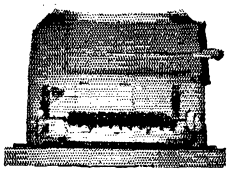

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Friday and Saturday at 2330 EST. If the attempt fails on 220, they try it on 144. Frequencies: VE3BQN — 220.05 Mc., W3AEW — 220.08 Mc.

W8VCO, Toledo, Ohio, wonders why we don't have more information on 420-Mc. activity in these pages. So do we! All its takes is letters from you fellows who are doing the good work. W8VCO backs up the information from W8JLQ, recently published, with the statement that there is activity in Toledo and Detroit regularly on 432 Mc. He has worked W8s UST RQI JLQ VCR, Toledo, and VOZ, Van Buren, and DX HRC UCT RLT and K8AIY, Detroit. His rig uses a 2C39 tripler driving another as an amplifier, delivering about 12 watts input. This feeds a 16-element array, which will soon be replaced with a 48-element job.

The San Bernardino Microwave Society lost no time in converting from 3300 Mc. to the new band at 3500 to 3700 Mc. Equipment described in W6BGK's article in June *QST* was modified for the new band at once, and the first 2-way QSO over any distance was made on June 5, by W6IFE/mobile and W6SDE, over a 5-mile circuit. W6IFE used a 2C40 lighthouse oscillator, but W6SDE had the 726A and juice-can polaplexer.

Tests made on the beer-can model show that it can be made to work on the new band, but the new version is less critical to build and adjust, according to W6OYJ. Ed says that they have come across a new can used for a chocolate drink that is just the right size, 2 1/32 inches in diameter and 3¾ inches long. Two of these soldered together work nicely with the dimensions given in the article. It may not be necessary to fiddle with the repellor voltage, when this version of the polaplexer is used.

The best distance worked on the new band was upped to 11 miles on June 9, when W6IFE/6, Box Springs, Mtn., near Riverside, worked W6RNA, Arlington. New record will be coming up shortly.

OES NOTES

K1BML, Bethlehem, Conn. — Improved mobile coverage on 144 Mc. with folded-dipole halo.

K1CKZ, Norwalk, Conn. — "Converted" DX-20 to 50 Mc. by removing all low-frequency components and installing almost completely new circuit for 50 Mc. Used International Crystal Mfg. Co. FO-6 oscillator, 6CL6 buffer and 6DQ6 final amplifier. Shielded wiring and all circuits on one frequency helped TVI situation, making installation of high-pass filters on TV receivers effective in every case.

K2AZT, Baldwin, L. I. — Discone installed for general-purpose work on both 220 and 144 Mc. Working crossband 50–220 with W2SEU and K2IMV.

W4AZC, Birmingham, Ala. — Phase-modulated exciter, crystal-controlled, giving good results on 50 Mc.

Worked *47th state* on 50 Mc. June 16: K4AWB/4, Greenville, S. C., 260 miles. This was first time S. C. had been worked from Birmingham area, yet K4AWB/4 worked a total of 14 Alabama stations, including K4SRU, who was running less than 5 watts input. Distances is about 260 miles.

K5DCQ, Irving, Texas — Worked XE1PY and XE1FU on 50 Mc. May 25, and heard KZ5PW May 27. Band open for Es almost daily in May.

K5HTH, Amarillo, Texas — First good Es April 28. DX heard or worked nearly every day thereafter. Season seems better than 1957.

K6QMK, Pacoima, Cal. — Last LUs and ZLs worked in early May. Single-hop sporadic-*E* good after middle of month. New social and traffic net organized on 50 Mc. May 18, consists of two divisions, for metropolitan and valley areas.

W7EPZ, Billings, Mont. — Addition of K7CML and K7CMU, Miles City, brings Montana's 6-meter population to about a dozen.

W9JIY, Indianapolis, Ind. — Members of Central Indiana Mobile Radio Club used 6 effectively in providing communication for sports car races May 10 and 11.

Skeds with K9GWP and W9ULH on 220 working well. Hearing W8s CSW WRN GHX and IGH on 220 Mc., but no contacts. Heard tone-modulated signal near 220.5 Mc. from 2055 to 2205 CST, traveling from east around to southwest before fading into noise. Signal was frequency-modulated and keyed, as if for telemetering. Any info on this one?

W9LST, Clinton, Wis. — Operation on 50 Mc. paid off in successful emergency work following severe storm May 31. Mobile stations K9s AQB KKH BKW EOR and W9YLV worked with fixed stations W9HGE W9DOW K9LOC

(Continued on page 146)

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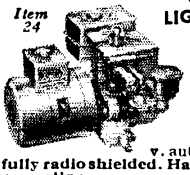

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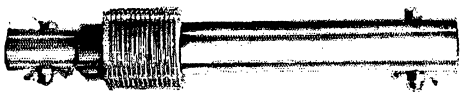

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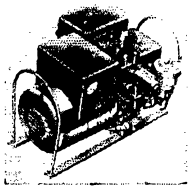

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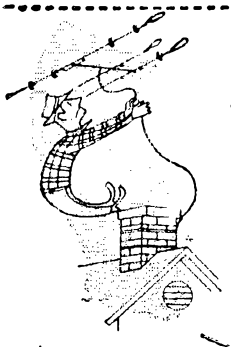

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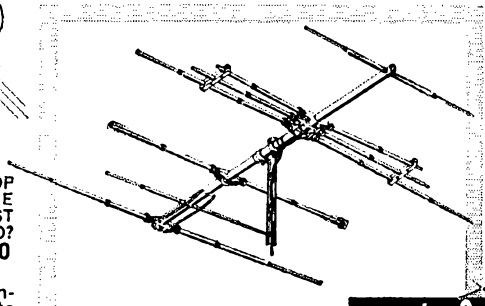

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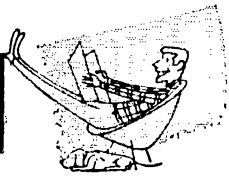

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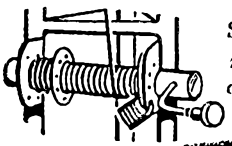

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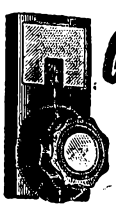

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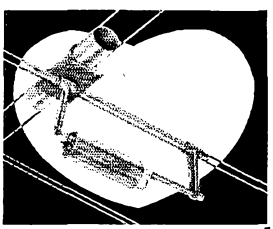

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KØDUO, St. Paul, Minn. — Would like 6-meter schedules to east, preferably near Chicago. Will have large array in operation before Aug. 1. Address: 97 N. Oxford St., Apt. 2.

WØKLQ, Jefferson City, Mo. — Etching several crystals to get them off the surplus frequencies helped greatly in making contacts during 50-Mc. openings. See W2IHW's article in January *QST* for details.

Putting the DX-40 on 50 Mc.

Many requests are received at ARRL Headquarters for 6-meter conversion information for various commercial transmitters. Unless someone has done the job, and sends in a step-by-step procedure that is acceptable, we normally cannot handle these requests. *QST* has carried such conversions for the Viking I (Dec., 1952), and the Heathkit AT-1 (May, 1957). A conversion of the Viking Adventurer is ready and will appear soon.

Here is the procedure used by W5BRQ, Vicksburg, Miss., to put his Heathkit DX-40 on 6. First the 40-meter oscillator coil was removed and replaced with 10 turns of No. 26 enamel on a National XR-50 form, close-wound. (The XR-50 is slug-tuned, ½-inch diameter.) Next the 10-meter buffer coil was replaced with 10 turns of No. 16 enamel, close-wound, ¼-inch diameter.

The last three turns were then clipped from the 10-meter section of the final tank coil, at the bottom of the coil and to the rear of the bottom coil spacer. The three short ends were soldered together, and to the lead going to the final-stage tuning capacitor.

The final amplifier plate choke was replaced with an Ohmite Z-50 (7-μh.) r.f. choke, and an 8.4-Mc. crystal placed in the crystal socket.

To tune the rig up for 6-meter operation, the oscillator plate circuit is tuned to the third harmonic of the crystal. Check this with a grid-dip meter or absorption-type wavemeter. Adjust the "drive" capacitor for maximum grid current to the final, about 3 ma. in this instance. Tune the final amplifier to 50 Mc. in the manner described in the instruction book. Check with grid-dip or absorption wavemeter to be sure signal is on the right frequency.

Because of the relatively minor changes involved, the rig can be put back into service on the lower frequencies with a minimum of trouble.

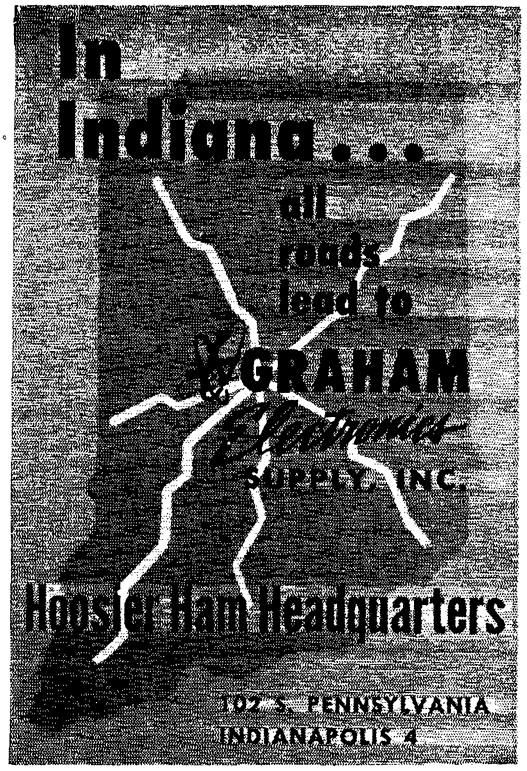
How's DX?

(Continued from page 69)

your *Call Book* . . . . . DL6ZZ credits DL2RO-G2DC with much assistance and encouragement in furthering his hamming aspirations, this in a letter via VE3BWY (ex-G6WY) . . . . . So. Calif. DX Club operatives have G3ZY preparing for a 3A2CF foray to occur between the 5th and 17th of this month, 10, 15 and 20 meters.

South America — Since activating a year ago HK7LX has rung the WAS bell and has reached 129/104 on the DX ladder, all via 10- and 20-meter phone. BERTA and WBE sheepskins also are applied for . . . . . From HKØAI's sister Iris via W6OUN: "It's impossible for Victor to make schedules because he never knows when he will be called to work. He usually is on after 10 A.M. except Tuesdays and Thursdays, sometimes after 8 P.M. on Sundays." . . . . . The Galapagos plans of WØs AGO LUX and WGF (licensed as HC8s with the same suffixes) go forward apace. Next month may be *it* . . . . . LU3DAB-LU3ZS, operating as OA4BW/8, tells W2HMJ of intentions to operate with CP and ZP credentials . . . . . From down south s.w.l. C. V. Edwards advises that VP3IG is a fresh B.G. candidate who may be found on 40-meter phone almost any Sunday . . . . . UA1KAE/7 of Russia's antarctic crew gave 78°24'S-86°35'E as a QTH when QSOing W6KG . . . . . A convincer from FL8AC made it 258/241 for diligent DXcavator CE3DZ . . . . . W9OFO made arrangements to operate as PJ5AB on Aruba in late May and then carried through nicely. "I set up headquarters at the Basi-Ruti Hotel and, with the fine cooperation of PJ2AA, I was able to operate a rig on 20-meter sideband. Unfortunately my stay in Aruba was short but it was a thrill to be able to have the fellows wait in line to talk to you!" . . . . . Through herculean efforts by PY1CK and friends, Brazil's Trindade Island was activated for DX-chasers over a four-day stretch in early June. W1ZDP and W6RLP observed PYØNA busily parrying pile-ups on 10, 15 and 20 meters, mostly 15, employing phone-to-phone, phone-to-c.w. and c.w.-to-c.w. techniques. Another Trindade trip may ensue this month or next — PYs 1HQ 2CK and 7AN are most eager for their turn. PYØNA scored 800 QSO's with 65 countries.

(Continued on page 148)



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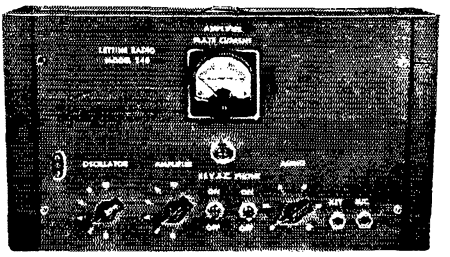

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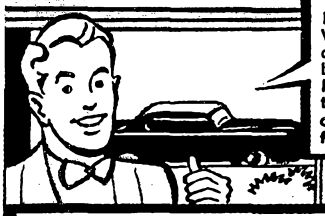

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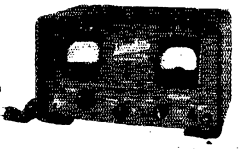

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Hereabouts — Just f.y.i., W6KG relays CM8EM's info as to the significance of Cuban prefixes. CM stations hold Class B licenses which limit their phone activity to 7 Mc, whereas COs can use all phone ranges . . . . . W4CYY, now recovering from a stairways tumble, reports a lively time and flock of DX hounds on hand at the Charlotte Swapfest in late May . . . . . W4RQR checked out 600 s.s.b. contacts as VP5BH's Caymans guest just under the DXCC status-change deadline, K4UYM assisting. Also in May W4RQR played an encore at VP6LT who, says Bob, now is infected with s.s.b. fever and hopes to do a little Caribbean DXpediting on his own . . . . . Norway, Paris, Denmark, Naples, Sweden, Poland, Mexico, Peru and China are less than 200 miles apart — in W1APU's native Maine, that is . . . . . KP4KD, our nomination for most-active Puerto Rico amateur of all time, assesses: "My DX-station card file, which excludes W, K, VE, KP4 QSLs, has grown to 3884 postwar, a bit large to handle." KP4KD leads W2QHH 453 to 375 in the most-KP4s-worked race inspired by the WPR certification . . . . . W9s KA and NN call your attention to the 6th Annual W9-DXCC Meet and Banquet to be held at Chicago's Hotel Sheraton on the 13th of next month. Check with chairman W9NN regarding advance registration for this famed function. Deadline: August 30th . . . . . W1TUW finds W6MHB keeping touch with DX pals as VP7BT on 20 c.w. . . . . W8QZR is all set to sign an undisclosed FP8 call from the 19th to 26th inst. on 80 through 10 meters with 65 watts and a multiband doublet . . . . . W6JQB, who handled the ARRL Hq. DXCC desk as W1QMI a decade ago, cooks on 20 c.w. with a new DX-100 and Windom wire. Al continues a long career of service to ARRL and its membership, now as SCM, Los Angeles Section . . . . . W8BGU yearns for the current whereabouts of HZ1AB operator Ken, vintage January 1948 . . . . . W6ZZ's WAVKCA requirements are completed by VKØKT . . . . . W8JIN maintains his impressive lead in Ohio Valley Amateur Radio Association's band-countries roster with an exospheric 1360 total. W8s JJW SDD and EV follow Jim with 773, 732 and 605 band-countries, respectively.

Ten Years Ago in "How's DX?" — Our August 1948 prelude deals with the Chicago relocation of Jeeves & Co., and not without some misgivings on the part of our gentleman's gentleman . . . . Eighty meters sleeps 'neath blankets of QRN, but 40-meter stalwarts stalk CT3AB, VK9s GW LM and VR2BA . . . . Twenty c.w. is fine for C's IJC 2HK 8LS 8YR 8YCW, EK1GW, ET3s AD AJ, FE8AB, FM8AD, FT4AN, Js 2BNR 2COM 6BMC 6KDV, KA1s ABT AK, KH6KH, KB6, MI3US, NY4JB, PKs 1AT 2KK 6XA, TA1s C AB, VRs 2AZ VR1 5PL 6AB, W6ODD YS, YA3B, YI2AM, ZC1AL ZC6 and ZD9AA . . . . Cs 1HK 1HY 7HH, ET3AE, HL1AB, J5LQK, Ws 6JIM, C1 and ØOZW, KS6 are 14-Mc. radiotelephone desiderata detectable . . . . Ten c.w. is on summer furlough but sporadic 28-Mc. phone openings feature AR8AB, MI3ZJ, UB5KAG and VS7PS . . . . "Tidbits" reports W6ODD heading for FI8 regions, W9UXY off to Turkey, KG6DG en route Ponape, and WØSO battling his 2000-QSL TA3SO backlog . . . . Photos of ZP8AC and HE1EO keep Jeeves company as he installs an underground diamond.

Correspondence from Members

(*Continued from page 61*)

describe in *QST*. Please allow me a little space to say hats off to Ted Crosby, W6TC. The many, many hours he must have spent designing the HBR-14 (*QST*, July 1957) were well spent. I know Ted has been swamped with mail, troubles by the bundle, and is perhaps a little discouraged.

The HBR-14 is not a project to be undertaken by the inexperienced builder or casual "kit enthusiast." It is a full-fledged and marvelous receiver. It works at least as well as he claims. I, for one, say thanks for a wonderful job of designing.

Having built the HBR-14 myself, with virtually no trouble, may I say this to prospective builders: Study the schematic and learn how the receiver works. Study the photographs and then follow the original layout as closely as possible. Take your time, be careful, and follow good wiring practices. In corresponding with Ted since completion of my receiver, I've found out that there is a reason for everything from specific component placement to specific component value.

Receiver articles are very rare items these days. It will be a long time before there is another one described that can match the HBR-14. All equipment at K6AOV is home-built; the HBR-14 is at the top of my "proud" list. I say not only hats off to W6TC for an excellent job, but also to ARRL and *QST* for recognizing and publishing it!

— *Jack Robinson, K6AOV*

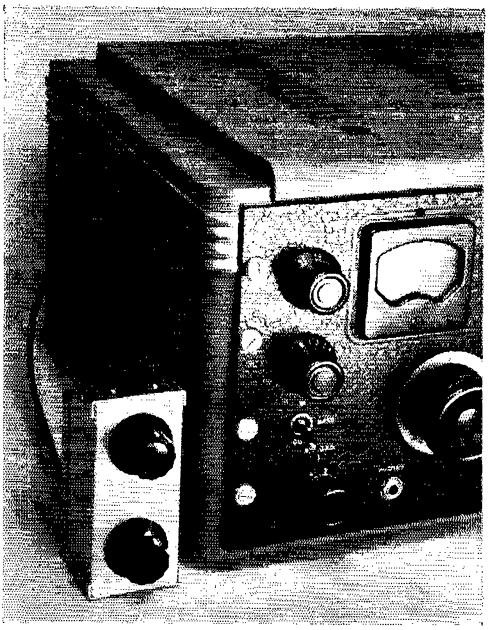

Fig. 5-65 — View of the *Q* multiplier showing its single connecting cable to the receiver. The box can be placed in any convenient spot on or around the receiver.

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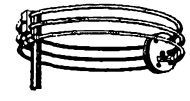

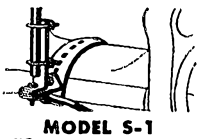

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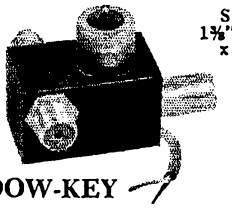

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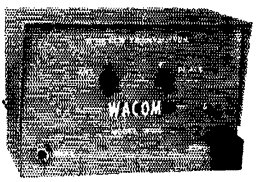

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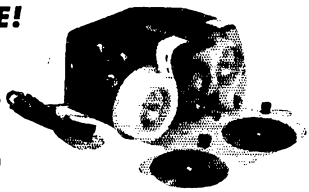

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WN6OUL....3332- 78-34-21
WN6DOP....921- 33-19-24

WEST GULF DIVISION

Northern Texas

KN5K8I....9310-190-49-17
KN5LKN....216- 24- 9- 7

Oklahoma

KN5JPS....10,400-200-52-35
KN5JQB....3230- 85-38- 9

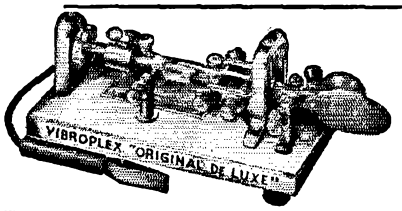
Southern Texas

KN5JCQ....2112- 66-32-18
KN5KFK....288- 18-16-11

[1] Multiple operator station

[2] KN1DYD, opr.

VIBROPLEX



MAKES SENDING *Twice* AS *Easy*

That's because its semi-automatic action actually **performs all the work** for you — automatically. And that's not all: it gives you freedom from nervous and muscular tension and arm strain, so common to old-fashioned keys. No special skill necessary. Anyone can use it. Even beginners master it in minutes. Precision machined. Vibroplex is built for long life and rough treatment. With patent jewel movement, touch control and other exclusive features, it offers you the easiest and best sending of your life. Over 40 years of daily use on land, sea and in the air proves it. No other key can match this record. What it has done for so many, it will do for you. Take a tip from a user and get your Vibroplex today. At dealers or direct. You'll be glad you did. FREE folder.

Choice of five models, standard or deluxe, priced from $15.95 to $29.95. Left-hand models, $2.50 more. Carrying case, $6.75.

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833 Broadway **New York 3, N. Y.**

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We are now manufacturing Amateur and Commercial antennas—Write for free brochure describing our new Beam Antenna series.

LINDSAY ANTENNA & SPECIALTY PRODUCTS Ltd.
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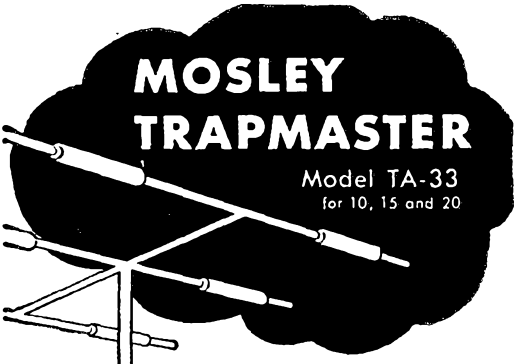
MOSLEY TRAPMASTER

Model TA-33
for 10, 15 and 20



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Every beam is factory pre-tuned. The especially designed Mosley Traps make any deviation impossible—rain or shine!

Mosley Electronics, Inc.
8622 St. Charles Rock Road • St. Louis 14, Mo.

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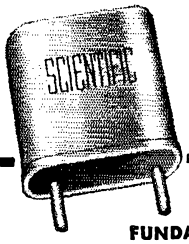

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ALL AIRCRAFT VHF 30–60 MC
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SPECIAL 100 FC—1 ppm/1° F $6.95

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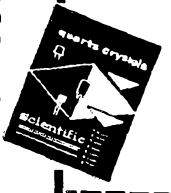
- Fast Delivery—One day for small orders
- All Crystal Types—Civilian and Military



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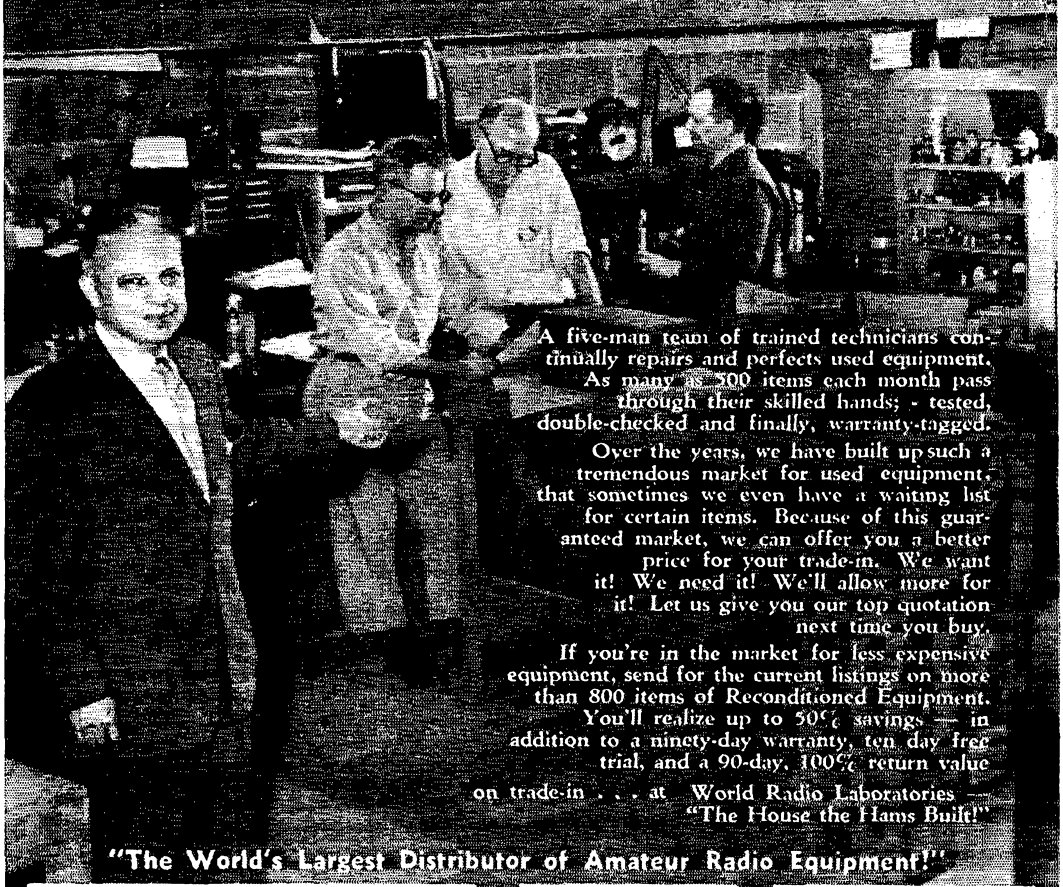
SAYS LEO I. MEYERSON, WØGFQ, WORLD RADIO PRESIDENT



A five-man team of trained technicians continually repairs and perfects used equipment. As many as 300 items each month pass through their skilled hands; - tested, double-checked and finally, warranty-tagged.

Over the years, we have built up such a tremendous market for used equipment, that sometimes we even have a waiting list for certain items. Because of this guaranteed market, we can offer you a better price for your trade-in. We want it! We need it! We'll allow more for it! Let us give you our top quotation next time you buy.

If you're in the market for less expensive equipment, send for the current listings on more than 800 items of Reconditioned Equipment. You'll realize up to 50% savings — in addition to a ninety-day warranty, ten day free trial, and a 90-day, 100% return value on trade-in . . . at World Radio Laboratories "The House the Hams Built!"

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HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) **A special rate of 7¢ per word will apply to advertising which in our judgment, is obviously noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 7¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**

(8) No advertiser may use more than 100 words in any one issue nor more than on ade in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used FM communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E., Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YIY, Troy, Ill.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

WANTED: All types aircraft & ground transmitters, receivers ART-13, RT/ARC1, R5/ARN7, BC610E, ARN6, BC7883, ARC3, BC342. Highest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system alternator, regulator & rectifier, $45.00. Also Leece-Neville 12-volt 100 amp. system, alternator, regulator & rectifier, $85.00. Good condition. H. A. Zimmerman Jr., K2PAT, 115 Willow St., Brooklyn 1, N. Y. Ulster 2-3472.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lysco Master Mobile Morrow, National and other ham gear. II & II Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill

WANTED: Receiver R5/ARN-7, MN-62A transceivers, RT18/ARC-1, AN/ARC-3, BC-788C, 1-152C, Collins, Bendix equipment, test sets, dynamotors, inverters. We pay highest prices. Advise quantity, condition, price in first letter. Aircraft Radio Industries, Inc., 70 East 45th St., New York City. Tel. LExington 2-6254.

MULTI-BAND Antenna. 80-40-20-15-10, $21.95. Patented. Send stamp for information. Lattin Radio Laboratories, Owensboro, Ky.

SAN FRANCISCO and vicinity. Communication receivers repaired and realigned. Guaranteed work. Factory methods. Special problems invited, any equipment. Associated Electronics, 58 South P St., Livermore, Calif. W6KF, Skipper.

RECEIVERS: Repaired and aligned by competent engineers, using factory standard instruments. Authorized Factory Service Station for Collins, Hallicrafters, Hammarlund, National. Our twenty-first year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

RADIO magazines. Buy, sell or trade. Bob Farmer, Plainview, Texas.

TECHNICAL Manuals TM11-273, 120 pages covering BC-312 receivers and BC-191 transmitters, $2.50. ID-60/APA-10 Panadaptor maintenance manuals, $2.75. Both postpaid in U. S. A. Electronicraft, Bronxville, N. Y.

AMATEUR Paradise Vacation Spot: Livingstone Lodge and Lodge Cabins, Mascoma Lake, Enfield, N. H., gateway to White Mountains. For couples and Family Groups, 100 acres, eleven buildings. Main Dining Lodge, fine sandy beach, boats, sport , skiing, Dartmouth golf & tennis, churches, LaSalette Shrine, Fishing, 29th year, 75 and 40 meter rig in Lobby. American plan, $40 per week up. Children half that. Booklet. Write A1 Q. Livingstone, W2QPN.

"PIG-In-A-Poke"? Not if you visit Ham Headquarters, USA, and pick your choice from the hundreds of "Like-New" bargains in the world-famous Harrison Trade-In Center. Greater values, because tremendous turnover means lower overhead! Terms. Trades. Send us postcard for mouth-watering photograph and price-list. For the best in new and used equipment it pays to come to Ham Headquarters, USA! BCNU. Bill Harrison, W2AVA, 225 Greenwich St., New York City.

QSLS? SWLS? Finest and largest variety samples 25¢ (refunded). Callbooks (latest), $5.00. "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Michigan. Printing press for sale, cheap 8 x 12 C & P. Details on request. (Religious QSL samples, 10¢).

QSLS. Reasonable, 3 Week Delivery. Samples dime (coin). Dick K6GJM, Box 294, Temple City, Calif.

QSLS-SWLS. High quality. Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

QSLS-SWLS, 100, $2.85 up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS, SWL's, VHF's, XYL-OM's. (Sample assortment approximately 9¢ea.) Covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fatabulous, DX-attracting, prototypal, snazzy, unparagoned, cards Rogers. KØAAB, 737 Lincoln Ave., St. Paul 5, Minn. Also glamorous, pulsating (Wow!).

QSLS, Taprint, Union, Miss.

QSLS. Plain and fancy samples 10¢. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests Bob Wilkins Jr., KN6ZMT, Creative Printing, P.O. Box 1064-C, Atascadero, Calif.

QSL-SWL samples free. Bartinoski W2CVE Press, Williamstown, New Jersey.

QSLS-SWLS. Samples free, Spicer, 4615 Rosedale, Austin, Texas.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢ with catalogue, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave. Toledo 14, Ohio.

QSLS, Sharp! 200 one color, glossy, $4.75 Multi-color samples dime, K9DAS QSL Factory, Edward Green & Sons, 4422 Marquette Dr., Ft. Wayne, Ind.

PHOTOGRAPHIC QSLS — Picture post-card type, your shack, home, mobile, etc. You send photo. 1000, $12.00. Raum's, 4154 Fifth St., Phila. Penna.

QSLS-SWLS, 100, $2.50. Samples 10¢. QSO file cards, $1.00 per 100. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS, Newest designs, glossy stock, 2 colors, 100 for $2.50. Sample brochure free. One week service. Box 671, Hawthorne, California.

QSLS of distinction. Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Meshoppen, Penna.

QSLS. Twenty exclusive designs in 3 colors. Ruth $3 for 100 or $5 for 200 and get surprise of your life. 48 hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS. High gloss, 3 colors, samples 10¢ (refunded). K2VOB Press, 62 Midland Boulevard, Maplewood, N. J.

FREE Samples. QSLS-SWLS, Backus, 703 Cumberland St., Richmond, Va.

QSL-SWLS that up returns! Samples 25¢ deductible. Log file cards $2.00 per 200, $6.50 per 1000.C. Fritz, 1213 Briargate, Joliet, Ill.

QSLS for economy-minded hams. $4.65 for 500. Free brochure. K9EUF Print (Charley Vorderberg), 1839 46th St., Rock Island, Ill.

QSLS. 100 for $3.00. glossy. Samples free. R. A. Larson, 32 Midland Ave., Stamford, Conn.

QSLS. Samples 10c. SPA Print, Box 181, Hot Springs, Ark.

QSLS, Neat, Attractive. Samples 10¢. Woody's. Box 164, Asher Sta., Little Rock, Ark.

QSLS — We've printed a million! Samples 10¢. VYS QSLS, 1704 Hale, Ft. Wayne, Ind.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS: 4 colors, 100, $3.00. Samples 10¢. Dick, W8VXK, 1018 Arthur, Mt. Pleasant, Mich.

QSL Special. See page 144 this issue. Nat Stinnette, W4AYV, Umatilla, Fla.

QSLS: Cartoons, colors, something different. Samples 20¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

QSLS Samples dime. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS, samples dime. Eddie W. Scott, W3CSX, Fairplay, Md.

DIFFERENT QSLS. 100 Kromekote, $2.50, plain, $2.00. Sample free. Grossenbacher, K5OF8, Box 340, Eagle Pass, Texas.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢

QSLS for economy-minded hams: $4.65 for 500. Free brochure. Charley Vorderberg, K9EUF, 1839 46th St., Rock Island, Ill.

QSLS, SWLS, Tackards, glossy, colors, 100, $2.75 up. Samples 10¢ refunded. W1GKH Press, 27 Liberty St., Danbury, Conn.

QSLS. Personal photo at rig, your design, 5¢ each (includes two sides). Request details. Samples. Free bonus: 100 letterheads with order of 500 cards. Olsen QSL Photoprint, Box 57, Somers Point, N. J.

QSLS. We've printed a million! Samples 10¢. VYS QSLS, 1704 Hale, Ft. Wayne, Indiana.

FREE! 100 "Thingloss" Anglecall QSLS. Order 100 "Hevigloss" red, blue, green (black back). Radoprint, Ojai, Calif.

ANY Photo on stamps, 100 for $2.00, 200 for $3.00. Ideal for QSLS. Send photo (returned): K9BDR Enterprises, Mark, Ill.

QSLS. Glossy. Samples 10¢. WIOLU Press, 30 Magoun, Medford, Mass.

YOUR QSL made into a laminated plywood plaque, $3.00. Satisfaction guaranteed. Solomson, 46 Cornhill, Boston 8, Mass.

HAMFESTERS Radio Club announces its 24th Annual Picnic to be held Sunday, August 10th, 1958, at Santa Fe Park, near Chicago. See July Hamfest Calendar or write W9PBM.

PERSONAL: All hams! Don't forget you have an appointment with me at the stroke of midnight at the ARRL National Convention in Washington, August 16, 1958, to obtain your certificate of the Royal Order of the Wouff Hong. This is the hour and moment of truth. Signed, "The Old Man".

"THE Saga of Telegraphy". LP recording & brochure. Historical. $3.75. Ralph Graham, W4RJX, Box 3556, Arlington 3, Va.

HAM Licenses, Resident courses, Novice and General classes, 3 evenings weekly, Delehanty Institute, 117 East 11th St., NYC 3, GR 3-6900.

COAXIAL Cable, 53 ohms, 100 ft. $4.35. Postpaid. Satisfaction guaranteed. Van Dick, Riverlawn Drive, N. J.

416B Owners, brass mounting plate, machined ¾ — 40 hole, $2.50. Robert B. Flint, W9YBV, RR #2, P.O. Box 290A, Bridgeport, Ind.

VR6TC QSL to W4TAJ with self-addressed envelope.

CALL plates. Deluxe 8" x 1¾" 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.

BARCO'S in Sandusky, Ohio, for your best deal in Ham Gear. National, Hammarlund, Hallicrafters 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 and high fidelity. Partly wired kits same price. Finest checking equipment. Also equipment designed and built, factory standard workmanship. Have kits sent direct to us. Surplus gear converted. (Licensed ham since 1924, Ex W9AXJ). Money back guarantee. KØKJX. L. P. Jackson, 645-A Marshall Ave., St. Louis 19, Mo. Tel. WOodland 2-2048.

MOBILE Batteries, Vita-Plate Special Service Types, 6 and 12 volt for all cars. Used by Police and Fire Departments. Free data. Cornell Communications, 1340 Ford Rd., Cleveland 24, Ohio (Paul, W8EFW).

S.S.B. Transformers identical and exact as used in W2EWL exciter (see *QST* March 1956). Brand new 3 for $4. No C.o.ds. please. S. Tucker, W2HLT, 51-10 Little Neck Parkway, Little Neck 62, N. Y.

FOR Sale: Hallicrafters SX-99 with matching speaker, in exc. condx, one year old. Price only $120. Write Harry Bergman, 88-30 199 St., Hollis 23, L. I., N. Y.

YOU asked for it! A broad band I.F. coupler tuned to 455 Kc for double sideband reception. This unit will plug into the mechanical filter socket of a 75A-4. Only $12.95 postage prepaid. Busacker's, 1216 West Clay, Houston 19, Texas.

BARGAINS: Send for list of reconditioned receivers and transmitters with new guarantee. 10% down with up to 24 months to pay. In stock, new Collins, Johnson, Hallicrafters, WRL, National, Hammarlund, Gonset, Elmac, Drake, Central Electronics, B&W, Hy-Gain, Mosley and Gotham beams. Shipped on approval. Write Ken, WØZCN or Glen, WØZKD, for your best deal. Ken-Els Radio Supply Co., 428 Central Ave., Ft. Dodge, Iowa.

NEW Mercury outboards and boats. Will take ham gear on trade. Write: Boyd Reter, KØIMO, Boyd's Marine Shop, Clinton, Iowa.

WANTED: Aircraft, Airline, Military, Electronics gear and test equipment. Collins, Bendix, ARC, Airforce, Narco, BC348, BC-611-F, ARN6, ARN14, ART13, 51R3, MN62A, others. We pay C.o.d. advise price condition. Ritco, Box 156, Annandale, Va., Phone Jefferson 2-5805.

PITTSBURGH Hamfest: Biggest yet! 21st annual hamfest of the South Hills Brass Pounders & Modulators, Sunday, August 3, 1958. South Park Totem Pole Lodge. Contests for young and old. Swap Shop. Preregistration, $1.50. Write or call William E. Guthrie, W3LDB, 4949 Roberta Drive, Pittsburgh 36, Pa. $2.00 at door.

VACATIONS. Modern housekeeping cabins, American plan; ham with my equipment. Lighthouse Lodge on Big McKenzie Lake, Spooner, Wis., Tony, W9HZC.

TWO-WAY Communications, Mobile, Industrial, Aviation. Free catalog. RCE, 520 S. Virginia, Reno, Nev.

MINIATURE 1" meters: Popular ranges available from stock. Free literature. Alco Electronics, Lawrence, Mass.

SELL: Dyna Labs Gaussmeter Model D-79 with instruction book, carrying case, two probes. In new condex, not adaptable our special research problem: $225.00, prepaid for cash. Lampkin Laboratories, Inc. RFD #1, Bradenton, Florida.

KIT wiring. Rates reasonable. Write: John Hjelm, WØDBT, 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 File Cards, $4.00. Free Flyer. "DX Radio Coop", Box 5938, Kansas City 11, Mo.

OLD QSTS wanted. Need December 1915 and January through July of 1916. Will pay cash or will trade Bound Volumes I (yes, Dec. 1915 thru Nov. 1916), 18 (1934), 19 (1935), 20 (1936), 21 (1937), 23 (1939), 24 (1940), 28 (1944). L. A. Morrow, W1VG, 99 Bentwood Rd., West Hartford 7, Conn. Phone ADams 2-2073.

CODE Practice tapes, name your speed. $3.75 each. Bob, W4BJN, 931 Maple Ave., Dayton, Ky.

FOR Sale: National NC-300 receiver, brand new condx. Total use 5 hours; $255. George Schwartz, W1VDW, 371 Highland St., Newtonville, Mass.

PENETROX anti-corrosion beam lubricant (recommended in Bill Orr' ("Beam Antenna Handbook") $1.00 postpaid. Culbertson, W6TTY, 2515 Novato, Palos Verdes Estates, Calif.

FOR Sale: Viking II, SX-96, Heath VFO, D-104, B&W Balun coils. W1YOD, Roger Strickland, Portland, Conn. Tel. Diamond 6-5320.

QRG Calibration log book — P.O. Box 123, Boston 1, Mass. 43 perforated "work sheet" 8½ x 11 band spread dial charts — 26 pages illustrated text. Range: .10 Mc to 30 Mc plus 2 and 6 meter bands. Correct wave length shown every 10 Kc. $2.00 U.S.A., $2.50 foreign.

VAN Sickle will trade photographic, boat or radio on new KWS-1 Collins. Gene, W9KJF, 4131 N. Keystone, Indianapolis, Ind.

SMALLEST "Shielded" D'Arsonval meters available. 1" round or rectangular. Standard Ranges available, $4.95 postpaid. Alco Electronics, Lawrence, Mass.

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", chock full of bargains in ham gear, tubes, relay racks, transformers, etc. Barry Electronics Corp., 512 Broadway, New York 12, N. Y.

SSB — Latest diagram, template, 3 xfrms, disc ceramic & mica condensers, coils, L1 thru L7 for "W2EWL Special" (Mar. 1956 *QST*). $10.95 postpaid. A Vitale, W2EWL, E. Glen Rd., Denville, N. J.

RUBBER Stamps for Hams, sample impressions. W9UNY, Hamm, 542 North 93, Milwaukee, Wis.

HEATHKIT AT-1 transmitter for sale, $18. In good shape. Jack Hoffman, KN9LD, Nelson, Nebraska.

QST'S Wanted: All prior to Nov. 1921, Feb., March and July 1922; January 1924; state amount, price and condx. Carl Schardt, W8CTU, 13701 Maplerow Ave., Cleveland 5, Ohio.

WANTED: Coil No. CNA-47159 for my Model RAS-5 National receiver. Loyal R. Parker, Heppner, Oregon.

COLLINS 75A3 rec. 8pkr 100 Ka. cal. and product det. in FM socket; 32V3 trans. D104 mike on stand; Bud low-pass filter, spare 4D32 final tube. Equipment used 100 hours, looks brand new. Price: $725. Macdonald, 140 Rum on Road, Massapequa, L. I., N. Y.

ELMAC AF-67 transmitter, PMR-7 receiver, and James 6-12-110 volt mobile power supply for sale: $325. All brand new, never used. Marshall Lincoln, KN9KTL, 3858 Forest Grove, Indianapolis 5, Ind.

FOR Sale: National NC-88 in good condition, $80. Also a Globe Scout 680 in good condition, $90. John Poertner, K9CPS, Route 2, Keup Road, Cedarburg, Wis.

SELL: Meissner 150B phone — c.w. xmttr with signal shifter VFO, in excellent condx. In metal cabinet with tubes, spare condensers, resistors, key, mike. Has 1600 volt power supply 813 final, pair 811 mod. and instrx manual. Best offer over $150 buys. H. Kazanowski, W3PSK, 108 Mackin Ave., Lancaster, Penna.

FOR Sale: Gonset Commander Model B with Gonset VFO, perfect working condx, $90; home brew power supply for above, $12; Heathkit AT-1 transmitter with built-in modulator, $25; Heathkit AC-1 antenna coupler, $7.50; Morrow 5 BR-1 mobile converter, $30; Instructograph code instructor with 10 tapes, $25. Will ship on receipt of payment or substantial deposit, if you pay charges. G. H. Wagman, K2EWA, 62 Farms Road Circle, Milltown, N. J.

SX-100 with matching speaker, mint condx, $185, prefer not to ship. Bud KW low pass filter, $10; JT-30 mike, $5; UTC univ. mod. xfrmr 8-19 30 watt, brand new, $5. All items F.o.b. Jim Eckenwiler, W8DQN, 1366 Grant St., Akron 1, Ohio.

ATTENTION DX'ers! Sell 57' Aermotor tower, worked 253 countries, $195. F.o.b. QTH or delivered Chicago area. W9ABA, 1606 Lake Ave., Wilmette, Ill.

COLLINS 75A4, used 30 hours, brand new condition. Will ship C.O.D. collect, in original packing. Best offer over $500. Frank Fairchild, 23 Wood Ridge Lane, Sea Cliff, N. Y.

WANTED: Parts for half KW transmitter, K1DVO.

SALE: BC-696, $8; BC-459, $8; BC-455, $7; 80 M ARC-5, $7; Clamptube modulator, rack and control unit for above (on chassis), $11; power supply, bridge rectified — 600V-400 Ma. Fullwave rectified; 300V 200 Ma. and 150V-200 Ma. Regulated, $20; excellent station. You pay postage. Jon Barton, K4OCZ, 2504 Edgewood, Anderson, S. C.

FOR Sale: 2,000V CT 1 A trans. 4X500 with skocet, 4X150s, 4-65s 814s. J. Lewis, K4ULC, 518 E. Gore Ave., Orlando, Fla.

SELL Precise Model 909 VTVM with hi voltage and RF probes. Factory calibrated Jan. 58, $34.50. Millen absorb. Freq. meters, 4 units, 1.5 to 40 Mc. New condx. $11.50 F.o.b. Spokane. Zimmerman, K4HPF, 8109 Maple Fairchild, AFB, Wash.

FOR Sale: DX-100 with modified keying in excellent shape, $175. Almost new HQ-110 in original carton, $200. WØGML, A. Verne Roberts, 5520 Porter, Wichita, Kansas.

FOR Sale: Surplus dynamotors, 12 volt DC to 400v 200 Ma. New, $11.00, two for $20.00, express collect. Ross, RD2, Box 880, Orlando, Fla.

SALE Best offer! BC348Q, 32V3, like new, Navy CFD20080A supply, Eldico TRITV factory wired (No blown parts but requires changes) VHF 152, DB22A, DB23, Elco 5 in. scope 425; Altronics-Howard telewriter Mod. A, prop pitch motor converted with Harrison conversion selsyns indicator, complete but never used with spare pitch motor. W3CUL, 265 Waverly Rd., Morton, Penna.

WILL Trade brand new Mercury outboard motors, cameras, appliances or TV for good ham equipment. What have you? Blough Miner Co., 7511 Madison St., Forest Park, Ill.

HAVE 416Bs, 417As, 723A/Bs lightnouse tubes, pencil triodes, etc. Trade any or all for one or pair of 4X250Bs and sockets. K6ALH, 178 Fulton St., Redwood City, Calif.

SELL 75A2 with Universal Prod. detector, $325. Misprinted in my first ad. Harry Taubin, W2GCW, 731 Gerard Ave., Bronx 51, N. Y.

WILL TRADE: Busch Pressman 2¼ x 3¼ Kodak Ektar f:4.5 101 mm lens. Built in Kalark synchronized range-finer, plus Kalark flash attachment with one film pack adapter and three cut film adapters. Condition good. Also Federal enlarger Mod. 331 with f:6.3 Fedar lens. Needs new base and bellows. Will trade for used radio equipment, up or down. Sammy Farrell, McGehee, Ark.

SELL: 10 mtr. mobile complete, cheap: Motorola 69-20 xmttr and police cruiser rcvr with Morrow 5 band converter and all cables and controls from antenna to mike. Have 12 volt car. Also DB22A. Make offer all or part. W9GBS, 6020 N. Neva, Chicago, Ill.

WORKED All States? Mount your QSLs 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 affixing to cover, $1.00 extra. Hanover Electronics, 126 East 37th St., N. Y. C. or your dealer.

SELL: Holmes Institute (CREI) Course, "Practical Techniques of Supervision & Management", 41 latest lessons, plus 10 extra lessons, all textbooks. Cost new, $150. First $50 takes it. W3FEP, 3053 Marmion St., Winston-Salem, N. C.

NC300-Calibrator-Speaker; 20-A factory-wired and 458 VFO-KW linear complete, with all power supplies, commercial components throughout. Best cash offer. Tim Williams, 179 Beach St., Berea, Ohio.

75A-4 Receiver, used ten days, late serial no., $549.50; Pacemaker, new model, in warranty, never used, $395.50; Drake low-pass filter, $9.95; Kay Electric mega sweep and mega marker, both, $259.50. Write W4JSH, 480 Skain Ave., Lexington, Ky.

SELL: Four months old Matchstick, $97; new HQ-100, $125; spotless NC125, $125; need G66B, G77A. Jones, W2AEV, 111 Hillside Rd., Farmingdale, N. Y.

KEYER-Amplifier-Modulator, TG-10 code practice unit. Like new, 20 watts, 110V AC, $25. Also first class at $5.00 each: Vibroplex Champion bug; Ward Leonard KW antenna relay, 110V AC, 4" spacing; VEC vest-pocket transistor code practice oscillator; CML 6 meter converter; 304TH's; 6 volt dynamotor, 425 volts at 375 Ma. Shaw Manual antenna rotator, W30PH.

NEW 4X250B and PT8315 transformer, $20 each. Other power supply components. Jim Connor, KØADL/1, 16 Hartwell, Littleton, Mass.

S-85 *Hallicrafters* receiver, $80. Little used. *Mark Yurman, 981* Carnegie Ave., Plainfield, N. J.

SELL: AF67 — Gonset Super Six — two PE103As — mike — Tribander and 75 meter hellwhips — Master Mobile and HWM-1 mounts — Write for details. Box 136, Batavia, N. Y.

TRADE Or Sell: Triplett 'scope. Mod. 3441, new condx. Wanted: 3000 volt 500 Ma. power supply or Triband beam, tower & rotator. Anthony J. Gasbarre, 841 Sewanee Pl., Shreveport, La. (K5MNM).

SELL: BC-779 receiver with RME 152A converter, excellent, best offer over $100. M. Lisansky, 436 Beach 69th St., Arverne 92, N. Y.

CLEANING Shack! Send stamped envelope for free list. W2VMX, 435 Washington Ave., Linden, N. J.

HALLICRAFTERS SX-100 for sale, top condition, $190. KN2GID, Sanford Emil, Hillcrest Road, Warren TWSP, Plainfield, N. J.

FREE Kilowatt station brochure less items sold piecemeal. W3BJI, 1804 Maltravers Road, Glen Burnie, Md.

FOR Sale: NC-300 with spkr, xtal calibrator, 2-meter conv., A-1 condx, $350; Viking Valiant 3 months old factory-wired A-1 shape, $450; *Johnson* Matchbox, $35, Hy-Gain 3-el. Triband beam, never used or assembled: $85. Prefer pick-up deal but will ship — you pay freight. James E. Munroe, Jr., W1JPJ, 73 High Street, No. Attleboro, Mass.

SELL: Globe Scout, 65A, good condition, $70. Will ship. KØEGO, Oelwein, Iowa.

FOR Sale: S-38D, In vy gud shape: $40. U pay shppg. Woody Demitz, 4533 Pershing, St. Louis, Mo.

ANTENNA: Sell or trade new Hy-Gain 1-element Tribander for two 20-meter Mark hellwhips or similar. K2RVY, Mel Weiner, 5714 Farragut Road, Brooklyn 34, N. Y.

WANTED: Home brew 2-meter transmitter 25-? watts. Prefer equipment described in ARRL Handbook. John Moffit, Mechanicsville, Iowa.

TRADE: *Remington automatic 22 rifle, 8 x 25 French binoculars*, value $47, new, 1500v, 400 Ma power supply, built-in cabinet with switch for 700 v., 1000 v., 1500 v. I need Heath reflector meter, Johnson Matchbox, or any gear to trade. Tom Reed, 3226 Westridge, Houston 25, Texas.

TRADE: *New, (2) 829-Bs, (2) 805s, (1) 815, (2) 811-As, (2) 807-Ws*, (1) 4-125A, 2 used 4-125As. Want: 75 meter mobile ant., receiver (BC-348, BC-342, BC-312, etc.). Q multiplier. Earl Stodden, W9SMH, Galena, Ill.

SELL: HT-32, $520; HT-22, $625; 75A4, $525; Drake receiver, $220; NC183D, $250; L&W 2-meter SSB, $60; E-V mobile mike, parts for Mosley VP 15 and 20 meter beams; Mohawk Midget tape recorder. Dr. Lamb, W3VDE 1219 Yardley Rd., Morrisville, Penna.

G-E 155 Mc. FM equipment — 60 watt base station, complete $250; 25 watt mobile unit, $65, also ARC4 12 volt converted 2 meters, $30; *ARC4 not converted, $15; APQ9 converted 420 Mc, $15; BC788* converted, 420 Mc, $15. W2KZ, 61 E. Depew Ave., Buffalo 14, N. Y.

SELL: Full size Telrex 20 meter beam plus prop pitch motor and pair of 60 cycle selsyn motors, $95. RAK 8 receiver, 15 Kc to 600 Kc, $20. All shipped F.o.b. K2ZVA, Paul Kroll, 3527-203 St., Bayside 61, *Queens*, L. I., N. Y.

GONSET G66 with universal power supply, $150; NC125, $130. Both in excellent condition. Norman A. Welte, W7HJM, Hingham, Mont.

HALLICRAFTERS HT-30 SSB exciter, $250; Gonset Model 500W, linear amplifier, $200. Will sell both together for $400 cash. Will set up at your QTH in Chicago area. George L. Johnson, W9LQX, 5617 Peck Ave., LaGrange, Ill.

WANTED: Good communications receivers and xmttrs, also mobile equipment. Will swap for HT17, Novice xmttr; Simpson 260 multimeter, Gruen Veri-Thin gold watch, 35 mm camera, many others. Send for list. Martin Schiff, 12 Burbank St., Yonkers, N. Y. Tel. DE 7-2990.

FOR Sale: Like new 400C Globe King with 40 meter coils, WRL VFO 755 and Brute Force filter, $325; Gonset Tri-Band conv, $18; excellent Super Six conv., $30. All for $350. W9EWU, Herman Nobe, 812A South Church St., Belleville, Ill.

SELL SSB, 10-B exciter; 457 VFC, 4-65s, PP linear amplifier, 200 Ma, 2000 volt power supply, $300; RME VHF 152A 2, 6, 10-11 meters converter, $50. Clayton C. McFadin, W5MGR, 715 Northwest, McComb, Miss.

HQ129X receiver, late series, like new with speaker, $150; DB20 Preselector, $20; SCR 522 transmitter and receiver, $20; 1 each 6 volt and 12 volt Vibrapack for receiver or low power transmitter, $7.50; TV set, 7 in., suit case style, $35; 813 tube, $5. 4X150A tube, new, $7.50. M. D. Welch, 2637 49th Ave., S.W., Seattle 16, Wash.

BARGAINS: With New Guarantee: KWS-1 $1,399.00; Collins 30K-1 $550.00; Johnson KW and desk like new $1195.00; S-72 $49.50; Hallicrafters HT-30 $349.00; HT-31 $299.00; HT-4 with speech amplifier and antenna tuner $695.00; NC-98 $119.00; NC183D $329.00; NC-300 $319.00; HQ-129X $159.00; Lysco 600 $69.00; Eldico SSB-100 $395.00; BW 51-SB $195.00; BW 51-SB-R $185.00; BW L-1000-A $295.00; Ranger $199.50; Phasemaster II $239.00; Gonset Linears (2M) $99.00 — (6M) $119.00; Globe King 500 $425.00; Globe King 500A $455.00; Communicator II 6 meter $179.00; *Johnson Rotomatic* $125.00. *Free trial, terms, write Leo*, WØGFQ for best deals. World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa."

WANT To buy couple V-70-D tubes. For sale: General Electric transformer 4300 volts, 450 Ma. center tapped, $20. Latest Meissner Signal Shifter kit, never wired: $25. W4NRH, Box 595, Lancaster, Ky.

FOR Sale: Brand new Telrex 3-element 20 meter beam. Make offer; brand new Johnson Matchstick. Make offer. Johnson Kilowatt amplifier with Ranger. Make offer. W. A. Kuehl, W9EZN, 6647 Kenton Avenue, Lincolnwood, Ill.

SELL Or trade: 500 watt 813 Handbook rig, custom job, exact parts as per article. 250 watt hi-voltage and lo-voltage supplies all in 5 ft. cabinet; 300 watt coupler, spare 813s, $250 cash or trade. What have you? WILIL, Risley, Brainard Hill Rd., Higganum, Conn. Tel: DI 5-2747.

HQ-129X, matching speaker, built-in crystal calibrator, Q-multiplier. Perfect condition: $165 delivered. K9CEF, Route 1, Casco, Wisconsin.

SELL Viking Ranger, HQ-100 receiver, four months old. Both for $350. *WINFY, 166 Henry Law, Dover, N. H.*

OLD QSTS for sale. One of few complete files in existence. Issue #1 December 1915 to 1958. Every copy good to excellent condition. Sell single copies or otherwise to highest bidders. Will hold bids 30 days. All inquiries answered. W6SN.

"VOICES of the Satellites." Authentic recordings of radio signals from man's first five satellites with clear explanation of what they mean. A collector's item. Everyone from nine to ninety will be thrilled to meet these space travelers. $3.95. 5 in. reel or 10 in. LP disk. Taben Recordings, Box 224-B, Ardmore, Penna.

SELL: SX-42 $150, BC779A, $125; SX28, $75. W2HMA, 96 Melrose Ave., Irvington, N. J.

2 METER Transceiver, Abbott TR-4, with spare tubes, $20 f.o.b. Also 808s, 1616s. Hugh Richards, Jr., Box 631, Ft. Myers, Fla.

TELREX 3-element, 20M, full-size beam. Model 503-A. Best offer. W2ZGB, 178 Colonial Rd., Summit, N. J.

SELL: Telrex 3-el 20 M beam, $50; new radio tubes, original cartons, cheap; new IRC volume controls; Volumes 1-3 RCA Picto-O-Guides, $5; *Stancor 5x 6V, battery eliminator*, $15. *Calvin Evans*, 327 W. Spring, LaGrange, Indiana. "W9LTR".

BRAND New, never used; Collins coax relays in sealed bags (as supplied with KWS-1) $7.50 each; Drake or Amphenol 300 HP filters, $2; National AM-5 dial, $1.75; RAD rt. angle drive, $2; National Select-O-Ject, $15; 807s, $1.50; 808s, 808s, 826s, $1. Slightly used: Bud 100 Kc. freq. calib., $6. Send check or m.o. for speed. Bob, K2HKP/K2GXI, 48 Thatcher, Buffalo, 15, N. Y.

HQ-100 rcvr with clock-timer and manuals, $149, operating condx and appearance as new. K6VRM, 5641 Dorset Way, Sacramento, Calif.

INVERTER Wanted: 110 volts DC to 110 AC; 250 or more watts continuous. George Farris, K2KNW, 894 Colvin, Kenmore 23, N. Y.

SELL: Viking I with TV suppression and VFO, $195; Magnatape Twin-Trax tape recorder, professional model with mike, $100; Elmac A54, $50. Local sale preferred. William Peet, W3DIY/2, 57 Kings Rd., Little Silver, N. J.

YOUR Call Letters block engraved on tie bar and lapel pin set, $4.95. Individual tie bar or lapel pin, $2.50 each. Heavily silver-plated, individually gift boxed. An ideal gift. Money back guarantee. Prices include postage and federal tax. Check or money order to Hewlett Sales Co., 1199 East Broadway, Hewlett, L. I., N. Y.

SALE: Gonset Communicator II, 2 meters, 12 volts. Keller, 514 Stevens Rd., Morrisville, Penna.

FOR Sale: Estate of KN1DHR, SX101, $275; DX-20 with Dow coax relay, $30. Write W1GKL, 22 Lyman Rd., West Hartford, Conn.

FOR Sale: Reconditioned 55 ft. self-supporting crank-up tilt-over E-Z Way tower with telescoping motor shaft, $175. W1LOP, 71 Hillidale Rd., West Hartford, Conn.

WANTED: B&W 51SB, RME DB23; clean looks and in top working condx. Metropolitan area only. Write W2GYQ, Marc Felt, 50 Prince Lane, Westbury, L. I., N. Y.

CLEANING SHack: Have hundreds of excellent tubes, resistors, capacitors, fantastically cheap. List free. Richard Light, K2UOY, 640 *Riverside Drive, N. Y.*

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., Scarsdale, N. Y. Tel: SC 3-4083.

DX-100, must sell, late model, new condition, everything A-1. First $150 takes it. Will ship prepaid. W9DRC, 900 W. Laramie Lane, Milwaukee 17, Wis.

COLLINS KWS-1. In excellent condx, extra pair final tubes; $1395. Joe Brand, K60JC, 7926 Coldwater Canyon, North Hollywood, Calif.

SELL: Elmac AF67 xmitter, 12 volt dynamor power supply plus Elmac PS2V AC power supply; PMR6A rcvr 12 volt supply; Webster Bandspanner antenna 12 volt relay, $300; Sonar VFX 680 exciter, $20; National NC-183 rcvr w/speaker, $125.00; Meissner 150B xmttr, UFO xciter plus home-built 6N7X-807 exciter, needs work done, $65; Triplett #630 Multitester, $35; Millen Grid Dip meter #90651, $45; Jones MicroMatch coupler and indicator, $25; all in new condx. No shipping, sorry. Pick up deal on what you want. W2PLB, Charlie, DI 2-7914, 314 East 52nd St., Brooklyn, N. Y.

FOR Sale: SX-100, R46B matching speaker, both for $175; complete dual power supply, 400V 250 mils; 1800 V 200 mils. All on one chassis with panel. Rack or cabinet mounting. Ideal for 300 watt rig. $50.00. W2MJB.

PENTA 4-400s, $40; Elmac 4-125s, $15; and 4-1000s, $35 and 4-65s, $8; G66B and 3-way power supply, $180; Gonset Tri-band beams; WO-88 'scope, $115; Model A Slicer, $50; GPR90-X, $395; TR switch, $8. 2 Kw Amertran, Leece-Neville 6V-100A alternator. F. Baker, W8QJR.

COMPLETE Ham station. Viking Ranger, SX-99, Bud low pass filter, Dow antenna relay, crystal mike, cables and connectors, Wonderbar antenna with coils and mounting brackets, 100' coax. Less than one year old. Original cartons, instruction manuals. Cash and carry, $325. Marvin Wallach, K2GFZ, 84-25 Elmhurst Ave., Elmhurst, N. Y.

NC-300 or SX-101 wanted. Need not be in operating condx but must be mechanically OK and present good appearance. Will pay $200. WØZHJ, 2444 "D" St., Lincoln, Nebr.

FOR Sale: Globe King 500C, new condx. Used only five hours, push-to-talk mike, guaranteed perfect shape. Price, $600.00. W8CHP, Box 261, Charleston, W. Va.

SELL: KW amplifier, 813s in cabinet, KW modulator, 3000 volt pwr supp, speech amplifier: $400 takes all! 75A4 w/spkr, $500. Need cash quickly for college. Make any reasonable offer. K5AGI, 1710 Emerson St., Monroe, La.

FOR Sale: HRO-60, calibrator and speaker. W5ONQ.

TRADE New Johnson Viking mobile, mobile VFO, and 12 volt dynamotor, all kit form and in factory cartons for DX-100 or Viking Ranger. K4IFP, 1105-47th St. West, Birmingham 8, Ala.

FOR Sale: KW8-1/75A4 in like new condx, complete with instrux manuals and in original cartons. Loaded with extras, such as new style tuning knobs, matching speaker and additional 800 cycle filter for receiver, $1995.00. W. W. Stuats, Ripley, West Virginia.

SELL: 853A A-1 condition, $50, 20W 40 meter xtal xmttr, $15. Both for $60. K2PGP.

LINEAR Amplifier, pair 803 s, GG, complete shielding, metering, blower, pi-net, spare 803s, $25; 3 KV power supp. components for above, $35; 144 Mc Tecraft conv. 26-30 Mc IF, $25; 144 Mc. RF section, 829B final, 7" panel, 2 meters, no surplus, $25; Field Strength meter, battery operated 3.5 thru 144 Mc., $10; Monitone and 100 Kc. standard, a beauty at $20; Millen freq. meter 130-170 Mc., $5; vacuum variable, 20-700 $\mu\mu$fd. $35; Panadapter SP44, $75; all F.o.b. C. Jaray, 215 Main St., Port Washington, L. I., N. Y.

SELL: 300W rig, June 1954 QST, with 'scope, variac control, 250 w. mod. in 6 ft. enclosed cabinet, SX71 receiver, in exc. condx, both $300 cash and carry. PE 103 dynamotor, $15. A. Heath, 655 Leigh Terr., Westwood, N. J. Sell: 300 QSTs, 1932-1957. Best offer.

SELL HRO-M, $63; Collins TCS rcvr, $32; 40-watt 6-meter xmttr w/modulator, $48.50; Heath TV sweep generator, $27.50; 300 watt Eldico c.w. rig w/VFO and pwr supp., $125; 150-watt mod. w/ps, $50; Jackson #636 tube tester, $22. Will trade, want SX-71, 129X, Preselector, HRO coils. Don Maxwell, 110 Fayette St., Charleston, W. Va.

SELL Collins 32V3 and 75A1, $600; xmttr separately, $475. Misc. xfrmrs, meters, etc. cheap. W6BZU, Peterson, 1830 Clayton Way, Concord, Calif.

SELL: Ronar 12-V MR-3 rcvr, $17; Viking Whipload Six loading coil, $8; Mallory G346R 12-V Vigrapack, $4. Express collect. W2KDB, Eglit, 2 Rogan Lane, West Islip, N. Y.

FOR Sale: Harvey-Wells xttr TBS-50D, 80 thru 2 meters, $70; APS-50 pwr supp, $20; RME MC-55 converter, 80 thru 10, 6 or 12 volt, $40; four new 813s, best offer. All equipment guaranteed excellent. Want VFO and rcvr, 75A2 or NC300. G. Staves, W3JIC, 525 S. Rolling Rd., Baltimore 28, Md.

WANTED: 6-meter Gonset Communicator III. Will trade factory-wired Globe Scout 65A, JT-30 Astatic mike, 5 x 8 printing press with type, etc. and Col .45 automatic. K9ELK, Herb Whipple, Box 900, DeSoto, Mo.

FOR Sale: DX-35 in vy gud condx. Shipped express collect. First $50 takes it. W5GIF, Box J, Centreville, Miss.

WRL Screen modulator, $7.00, in exc. condx, w/manual. Jim Wurtz, 2861 Gonzaga, RichNond 10, Calif.

CANADIANS! Set of 8 Marconi manuals, brand new, for first and second class commercial license, cost $15. Sell for $10. Never used. VE3EGG, Ernie Crump, 64 Barrie, Galt, Ont., Canada.

FOR Sale or trade for SSB gear; SX42, VHF-152A, 10B with VFO, TBY with 4 volt pwr supp, 3-30 Gonset converter, 10 meter mobile xmttr, with dynamotor. K2POE, 1152 Park Ave., Vineland, N. J.

SALE: SX-101, $330; HT-32, $550. Will ship. Units perfect. Used less than 40 hours. Will sell separately or together. Don Goodrum, K4DBH, 2819 Plantation Dr., East Point, Ga.

FOR Sale: BC312N and BC314D receivers with pwr supp; Q multiplier, 100 Kc. freq. std. Sold as one unit: $50. No shipping, sry. George Rehl, W8DQY, 324 Orange St., Galion, Ohio.

NEW: NC-300 C2 converter (with guarantee), $30; NC-300 (4 months old), $300; will deliver up to 100 miles. Larry Kohlman, K2BVC, 330 Beechmont Dr., New Rochelle, N. Y.

WANTED: BC946 rcvr, front end coils for BC-453, two 40 MEL, 40 OE8, 40 BVL. Gene Bradley, 706 Oak, Warren, Ohio.

SELL San Francisco Bay Area only, 62 ft. Vesto tower stacked 10 over 20 meter beam selsyns, prop pitch motor, best offer. Will answer all inquiries. Tel. LUcerne 1-4035. W6GIB, 8438 Alma Ave., Castro Valley, Calif.

MOBILE Station complete, $55; Gonset 3-30 Mc, post mount, Lysco xmttr, Mallory Vibrpack, whip, mount, coil, T17 Mic, 75 M xtal, and coax 6V. Also Geniac, $13; Heathkit VFO $13. Send postage. K2ABY, Bethpage, L. I., N. Y.

SELL: Collins 75A4, $495; Hallicrafters HT-30 SSB exciter, $295; HT-31 500 watt linear amplifier, $195. All in like-new condx with instrux books. W6UGH, 8209 Nada, Downey, Calif.

SX-28 in fine condx, $125; Heath AT1, 30 watt xmttr, like new, $20. Rev. Battin, 616 Glenwood, Elgin, Ill.

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.

FOR Sale: 100 Kc-10 Kc. xtal frequency standard as in QST, June 1955: $25. W9ODT, 528 E. 4th St., Lockport, Ill.

HAVE Three new Ellac 4-250A and two 4-125A. Need NC-300-CI, NC-300C-2 or XCU300. Make offer. W3ZYK, Mechanicsburg, Penna.

WANTED: Coils "AC and AA" for HRO50. Trade complete dark-room outfit for 12 volt Communicator or DX-100. Write for details. K9MFX, Lawrence Smith, Rt. #2, Nevada, Iowa.

SELL: Elmac PMR-6 rcvr with 6V Vibrapack; BC-453 rcvr, PE-103, Browning freq. meter. Make an offer! Robert Titterington, W8YBP/4, RFD 1, Box 11-A6 Portsmouth, Va.

SELL: Hallicrafters S-53A with Heath Q-multiplier. Best offer. Bill Goodman, 114 East Wayne Ave., Easton, Pa.

32V3 excellent condition, $495. Need Pacejaker and audio amplifier for Johnson kilowatt, also Model B slicer. Lewis West, W9AIO, 3414 W. St. Louis, Wichita 12, Kans.

FOR Sale: Portable mill, pica type, $25; portable radio, needs batteries, $5; Timex magnetic recorder, $20; 2-station intercom, $10. Postage extra. V. R. Hein, 418 Gregory, Rockford, Ill.

WANT: Good homebrew 2 meter rcvr and xmttr. Both must be in A-1 shape with pwr supplies and ready to go. Must also be neat-appearing. Xmttr must run at least 40 watts out. Absolutely no junk wanted. N. K. Thompson, W1LWV, 99 Water, Millinocket, Me.

SELL: Globe Scout 680, in perfect condx. Only 16 hours use. To the most reasonable offer. Wilson Routt, RFD #3, Nicholasville, Ky.

FOR Sale: Steel tower, 90 ft. guyed, Jonts mfgd., 10 ft. sections. Will hold any combinations of antenna, in perf. condx: $75; 3-el. 20M beam, $25; 4-el 15 meter beam, $30, aluminum fittings, gamma matched, ready to instal. Parts alone worth twice the price; prop pitch motor selsyns and xfrmr, $20; Westinghouse plate xfrmr, 2000Vdc after filter 750 ma CCS, perf. condx, steal at $60; plate xfrmr 3000 VDC after filter, 750 Ma CCS, 110 220 prt., brand nu, nev. used, $75; Thord. Multimatch mod. xfrmr, 500 watts aud. output, like new, w/manual, $50; 2 factory sealed Elmac 4-250A tunes, $27.50 eac. $50 takes both. First check or m.o. gets any item. All letters ansd. F. R. Smith, W8HMI, RFD #3, Paw Paw, Mich.

DX-100: Exc. wiring, very clean, $180. E. Getchell, Causeway St., Medfield, Mass.

WANTED: Johnson Matchbox (275 watts) K2VNS, Levy, 1675 West Ninth, Brooklyn, N. Y.

ALUMINUM for the Hams who want the best for less. Write for list of angle, channel, plain and perforated sheet, castings, fasteners, beam kits, etc. VHF collinear arrays, $14.20 up. Six and ten meter beam specials, $15.95. Dick's W8IJL, Cherry Ave., Rte. 1, Tiffin, Ohio. Successor to Radcliff's.

CRYSTALS Airmailed. Novice, net, general; FT-243. Any kilocycle, .01%, 3500 to 8600, $1.00; thin Gonset, $1.45; 1700 to 3499, $1.75; 8601 to 21,500, $1.95; new crystals. Guaranteed. Marine, C.A.P., MARS, etc. Write for frequency listings and brochure. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

HAMMARLUND HQ150, $175. New set, with factory guarantee. Howard W. Smith, Hiawassee, Ga.

PLAN Now for ARRL Hudson Division Convention, Albany, N. Y., October 10-12. Watch for Announcement.

KW Final parallel 4-250As, vacuum variable, see ARRL Handbook (1957) page 210; 44 ft. Vesto tower. Will ship it knocked down frt. collect; PP 813 modulator, 600 watt Multimatch xfrmr; 6 ft. cabinet, misc. pwr supply parts, etc. K8DGM, 225 Vincent Blvd., Alliance, Ohio.

SELL Transmitter: 10 thru 80 meters, 813 final, KW supply, VFO, $225. Bob Snicer, 217 Osborn Rd., Albany 5, N. Y.

DX-40 For Sale: new this year, in perfect condx. J. T. Morey, W2HXF, 210 Mountain Ave., Princeton, N. J.

SACRIFICE: Hy-Gain 152T2 2-el. Triband beam, brand new and in original cartons, $45; Donner 40 ft. crank-up tower, brand new, $45. S. E. Schwars, 1726 Shirley St., Camarillo, Calif.

LOW Mileage 65B Scout, $69; WRL mod. 755VFO, $49, with manuals, factory-wired. New Drake KW lo-pass, $12; new ARC5 7-9.1, $8; shipped postpaid anywhere in the USA. Fred Krauss, W88PR, 95 Morris, Salem, Ohio.

SELL: 75A3 32V3 in A-1 condition, like new appearance, reasonable. W2OGE, 6 Clinton, Warwick, N. Y.

SELL: NC-109 rcvr six months old, $215; Harvey-Wells xmttr complete band-switching 80 thru 2 meters; pwer supply, APS-50, $90. Chicago area only. G. H. Duffner, Jr., W9FBM, 8454 So. Dante Ave., Chicago 19, Ill.

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SELL KWS1, 75A4 (both with Collins vernier knob), matching deluxe speaker, with 24-hour tumbler clock installed; 2.1, 3.0, 6.0 Kc filters; all modifications with two minor exceptions incorporated. Cash package price, $1,795.00. Used less than two months a year ashore because of shipboard Radio Office position where maritime mobile never permitted. Steve Fox, W2ALZ, 14 Beekman Pl., Glen Rock, N. J.

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FOR Sale: Viking II with VFO and NC183, all in good condx, $295. Estate of W5VLZ. Write Mrs. S. G. Swartz, Rt. 2, Box 34, Las Cruces, N. M.

TUBES: Brand New 4D32's $22.50, 4-125A $15.00, 4X150A $12.50, 813 $7.50, 814 $3.50, 815 $1.75 832A $4.75, 3E29(829B) $6.00, 5894 $10.00, 446B $4.50, 2E26 $2.25, 211 $1.00, 5814 $1.00, RK25 $1.50. ART-13 transmitter, perfect condition $125.00. VHF 152 converter 10-6-2 meters $42.00. Stancor 500 watt modulation transformer $40.00. Superior 1126 powerstat 15 amp $25.00. 1130-0-1130v — 500MA Kenyon $25.00. 2MFD-3000v oil filled condensers $6.50. Stancor 250 watt modulation xmfer $18.00. ART-13 modulation transformer, $8.50. Close circuit T.V. camera $75.00. New batteries for BC611 $1.75 pair. All guaranteed, C.O.D's OK, Bill Slep W4fhy, Box 178 Ellenton, Florida.

KITS Wired — 20% of kit price. Transmitters designed, built. Surplus conversions, 6m VFO, new design, with power supply, $39.50; 1 KW dummy antenna, cabinet, $5.75; complete 100 watt 6 or 2m phone xmttr with mike, xtal, power supply, TVI-suppressed, $99.50; transmitter power supplies, $10 up; new, all guaranteed 1 year. Catalog sheets, bargain lists. Graduate engineer (licensed ham since 1924, Ex W9AXJ). Money-back guarantee. K9KJX, L. P. Jackson, 645 Marshall, St. Louis 19, Mo.

HQ-129X for sale, $125, plus transportation. P. F. Williams, 25 Denison St., Hartford 5, Conn.

SELLING: 840B, $60, AT-1, $17. K5JTP.

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ELMAC PMR 6A rcvr with TNS, $75; 12v powr supp, $15; Johnson mobile xmttr, $70; mobile VFO, $25; dynamotor with filter, 12v — 400v/400 Ma., $10 or $170 take all. F.o.b. New York City, Bill Herzog, W2KOO, 3132 104 St., East Elmhurst 69, N. Y.

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SELL: DX-100. Also build all kits. Write for information. George, K2PGC, 7 Thurston Ave., Trenton, N. J.

ART-13 for sale, with 110 V AC power supply. Make an offer, located West Orange, N. J. J. F. Metzger, 4105 Black Point Road, Honolulu, 15, T. H.

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FOR Sale or trade: Viking Adventurer xmttr, like new condx, $40 or will trade for two-meter rcvr or two meter converter. W4DSO, P. O. Box 444, Morganton, N. C.

WANTED: Hallicrafters portable receivers models S-72 and S-72L, new or used. State condx and price wanted. Grote Reber, P. O. Box 2, Green Bank, W. Va.

FOR Sale: HQ-129X, exc. condx, $145 less spkr. Will be willing to ship freight collect, also C.o.d. with a 925 deposit. Clyde Lawrence, Box 983, McCall, Idaho.

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HALLICRAFTERS SX-28A w/matching spkr, in gud condx, both in appearance and working order. $125. Gerst, 2674 W. 25th, Cleveland 13, Ohio.

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SELL: Surplus 3-6 Mc. rcvr, 115 ac. speaker, $10; code machine, no tapes, no key, $8. Wanted: S-53A. Deal on Holiday flash camera, closeup lens, gadget bag? WN6UTJ, 2501 Fremont Dr., Sonoma, Calif.

SX-71 with xtal calibrator, $140; 75 watt Handbook xmttr, $35. For complete details write to Don Uber, W1FGW, 132 Woodbridge St., South Hadley, Mass.

SELL: HRO-5, rack cabinet, spkr, p/supp, coils E, F, G, H, J, JA, JB, JC, and JD. In mint condition: $125. Bob Noon, Rte #2, Coffeville, Kans.

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CANADIANS! For sale: xmittrs Heathkit DX-100, Hallicrafters HT-9 rcvr; Hammarlund HQ-129X. Requested Viking Ranger. VE2OU, P. O. Box 355, Riviere du Loup, Que. P., Canada.

GLOBE Scout 65A, $75; Heathkit VF-1, $17 and AC-1, $10; ARC-4 two meter transmitter, $50; lo-noise two meter converter, $30, 150 volt regulated power supply, $10; two meter walkie-talkie, $10; Par-Metal cabinet for 8¾" panel, $5:3C24, $1; 2E26, $2; various QSTs and Radios, 1930 to 1942, broken runs, about 100 in lot: $25. Make an offer. Roger Shultz, 33 Valley View Place, Tiffin, Ohio.

FOR Sale: 350-500 W. 6-meter xmttr, commercial cabinet, chassis rack mounted, 304TL final, 829B driver, PP203A, 300W modulator, 5 pwr supplies, $200 cash. T-90 Harvey-Wells Bandmaster, Z match and pwr supply, $200. Cash. Sorry, cannot ship. Wm. E. Barefoot, W3UQJ, 1408 Whiteford Rd., York, Pa.

TUCSON Area: For sale — one Telrex 3-el. 10-meter beam and TR4 rotator, in perfect condx. Best offer over $50. Almost new Triplett meters, one each 0-500 Ma. 0-25 Ma. $5 each; several KBs and other equipment. Sorry, no shipping. W7PQ, phone MAin 4-2946.

SALE: Gonset 2-meter VFP Preamp and canvas case for Communicator II, like new, reasonable. Storch, 5 Winfield Terrace, Great Neck, L. I., N. Y.

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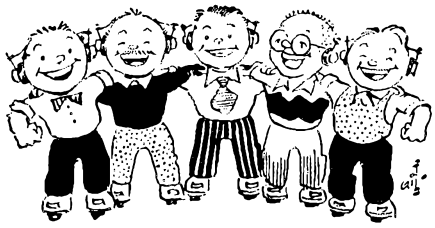

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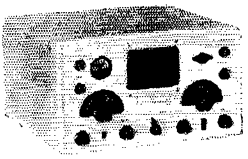

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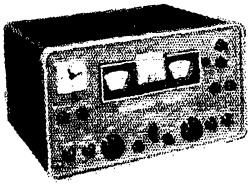

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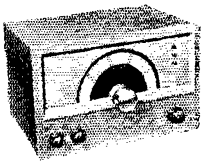

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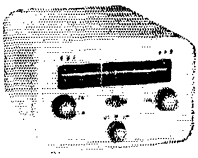

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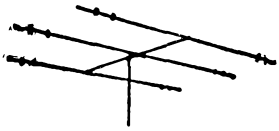

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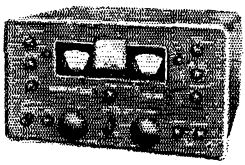

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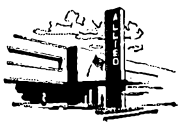

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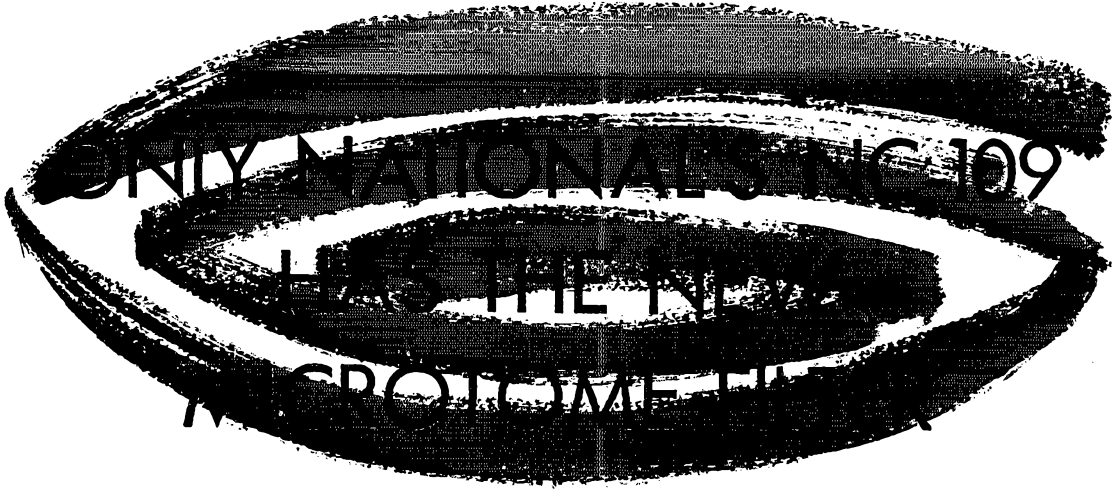

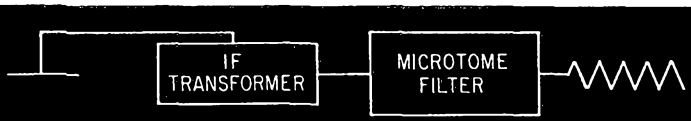

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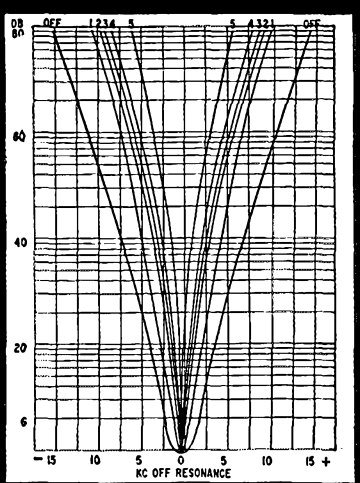

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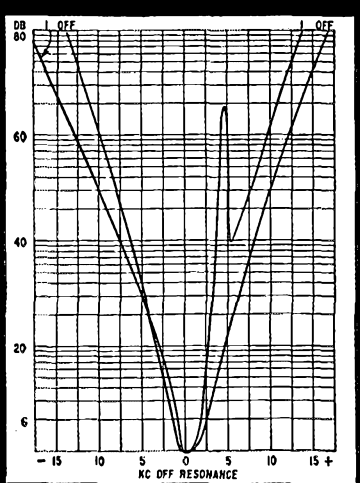

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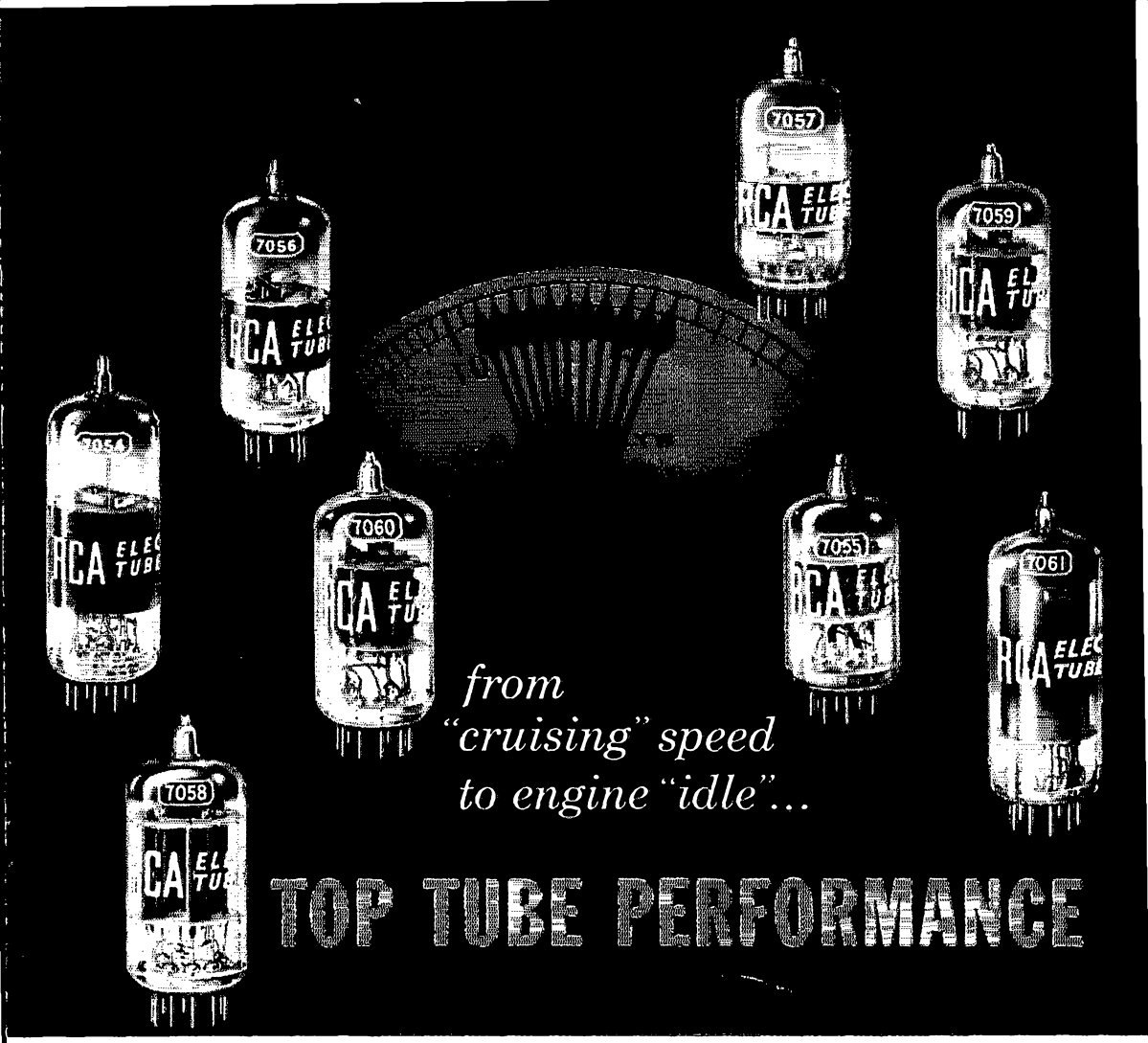

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