CHICAGO, ILL., U.S.A.
May 1957
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QST

devoted entirely to

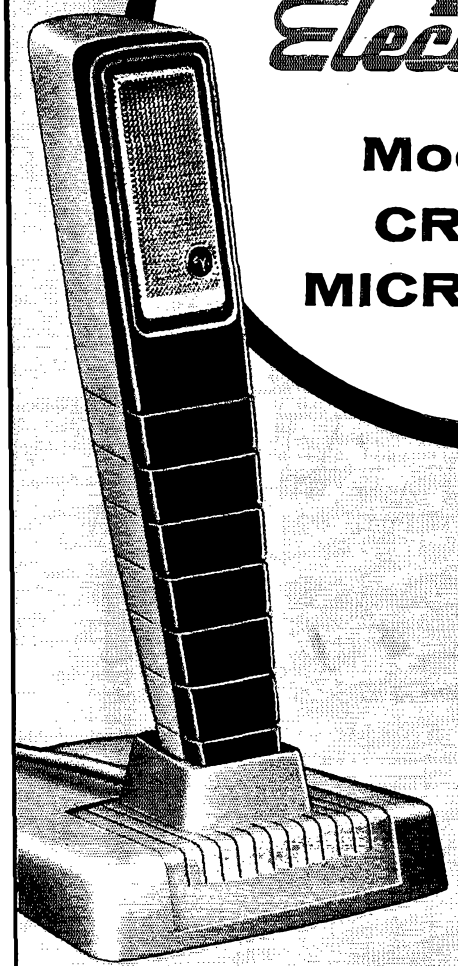
amateur radio

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

The Best $13.50 in Your Shack!

Electro-Voice

Model 927 CRYSTAL MICROPHONE



The E-V Model 927 is the ideal all-purpose microphone. In addition to amateur radio use, it's excellent for public address, call and paging systems, home recorder, dictating machines . . . EVERY communications purpose.

Also Available—E-V Model 727. It's styled like model 927, but it has long-lived *ceramic* element. *Amateur Net $13.50.* With on-off switch in microphone, Model 727S, *Net $14.70.*

Never before has $13.50 bought so much for your shack! Strikingly modern in appearance, outstanding in performance, the E-V 927 is truly the star performer in the popular price class. Small wonder, though, because it's the result of the same world-famous engineering and "know-how", the same exacting workmanship and advanced design that have made Electro-Voice mikes the "choice of the TV and broadcast networks."

Omni-directional, The Electro-Voice 927 has high level, can be used with any standard amplifier, is easy to hold or mounts firmly in its own die-cast slip-in stand for desk use. As in all E-V microphones, the response curve is flat for highest articulation through QRM and QRN. Frequency response: 60 to 6,000 cps. Peak free, all voice power goes into the antenna, 100% modulation becomes a reality not at a peak value only. The streamlined microphone case is made of sturdy die-cast metal and plastic in metalustre medium gray. $1\frac{7}{16}$" wide X $1\frac{11}{32}$" deep X $7\frac{11}{16}$" long. Weight: 14 oz. with cable. Complete with desk stand and 5′ cable, *Amateur Net $13.50!* With on-off switch in microphone, Model 927S, *Net $14.70.*

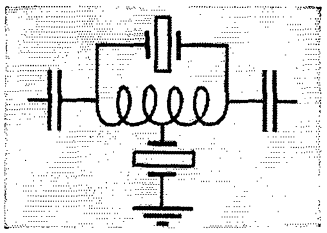
See Your E-V Distributor!

Write for "A B C's of Microphones", Dept. Q75!

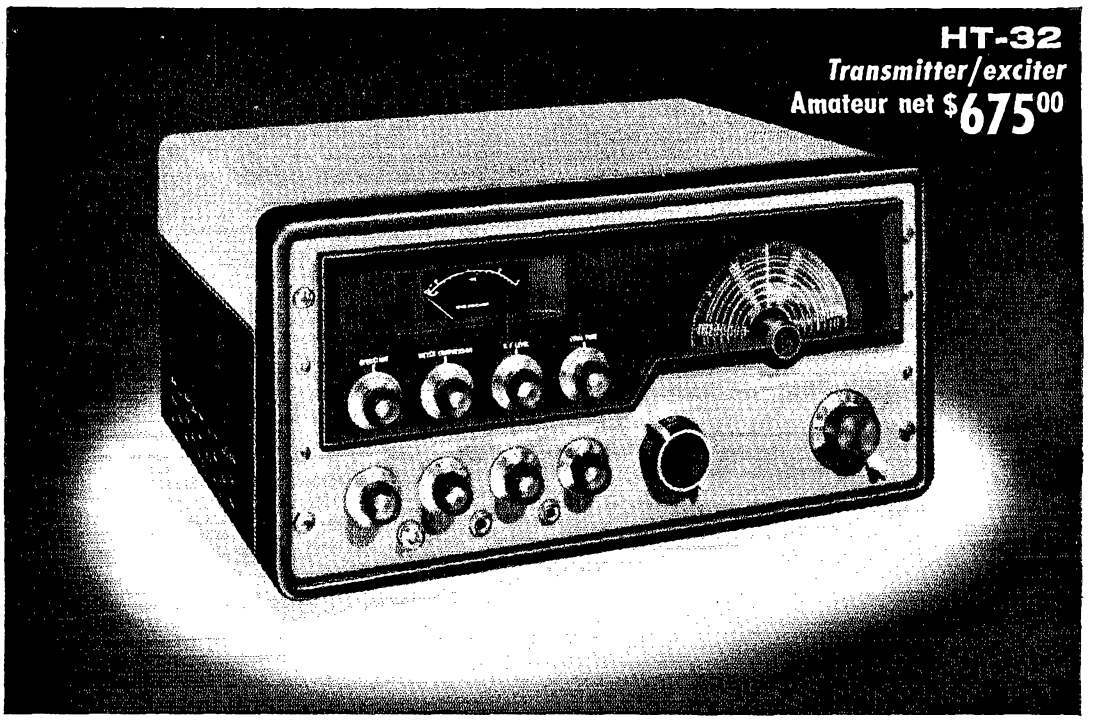
Electro-Voice

ELECTRO-VOICE, INC. • BUCHANAN, MICHIGAN

Export: 13 East 40th Street, New York 16, U. S. A., Cables: ARLAB



From this exclusive HIGH FREQUENCY filter originates the cleanest signal on the air!



Hallicrafters new HT-32 transmitter features 5.0 mc. quartz crystal filter... new bridged-tee modulator...high stability...gear-driven V.F.O.

• Forget your old ideas about SSB signal clarity! The HT-32 establishes *entirely new standards* with two major achievements of the world famous Hallicrafters laboratories—yours exclusively in the HT-32:

1. 5.0 mc. quartz crystal filter. Result of a 3-year research program, the crystal filter system now is commercially practical at *high frequencies*. System cuts unwanted sideband 50 db. or more!

2. New bridged-tee modulator. Temperature stabilized and compensated network provides carrier suppression *in excess of* 50-db. Patented diode application develops sideband energy from audio voltage. World's most stable modulator.

These and many other features make your decision *clear*—compare the HT-32 with any other transmitter available. Your supplier has all the details. Stop by and see him today.

ADDITIONAL FACTS ABOUT THE HT-32

- SSB, AM or CW output on 80, 40, 20, 15, 11-10 meter bands.
- High-stability, gear-driven V.F.O.
- 144 watts peak power input.
- Distortion products down 30 db or more.
- Complete band switching.
- C.T.O. direct reading in kilocycles.
- T.V.I. suppressed.

NEW
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hallicrafters
CHICAGO 24, ILLINOIS

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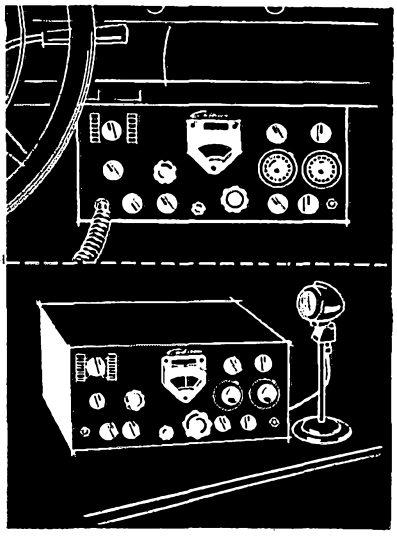
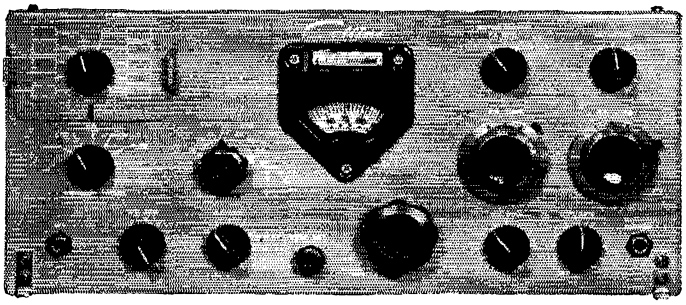
NEW *from Collins*



FIRST *Mobile SSB Mobile Transceiver*



KWM-1

for complete Mobile, Fixed use

NEW and FIRST — that's the best description of the revolutionary KWM-1, the first mobile transceiver and the first to offer SSB. And this 14-30 mc 200 watt package* is equally adaptable to fixed use with simple removal from a convenient mounting tray under the dashboard.

Utilization of common components in both transmitting and receiving functions results in a saving of both space and cost and, in the case of frequency-determining components, assures exact coincidence of transmitted and received signals. Frequency stability and readability is comparable to that of the KWS-1/75A-4. The panel meter serves as an S-meter during receive and multimeter during transmit. Break-in CW using VOX circuits is built-in, as is a side tone for monitoring CW. Ten 100 kc bands are available anywhere in the 14-30 mc range.

These are a few of the features in the all-new KWM-1. Ask your Collins distributor for details. Limited quantities available in August.

*PEP Input

NET PRICES

KWM-1 Transceiver	$770.00
516E-1 12 vdc Power Supply	248.00
516F-1 115 vac Power Supply	103.00
312B-2 Speaker Console with directional wattmeter	146.00
312B-1 Speaker in cabinet	25.00
351D-1 Mobile Mounting Tray	22.00

Collins CREATIVE LEADER IN COMMUNICATION COLLINS

QST

MAY 1957

VOLUME XLI • NUMBER 5

PUBLISHED, MONTHLY, AS ITS OFFICIAL ORGAN, BY THE AMERICAN RADIO RELAY LEAGUE, INC., WEST HARTFORD, CONN., U. S. A.; OFFICIAL ORGAN OF THE INTERNATIONAL AMATEUR RADIO UNION

OFFICES

38 La Salle Road
West Hartford 7, Connecticut
TEL.: ADams 6-2535 TWX: HF 88

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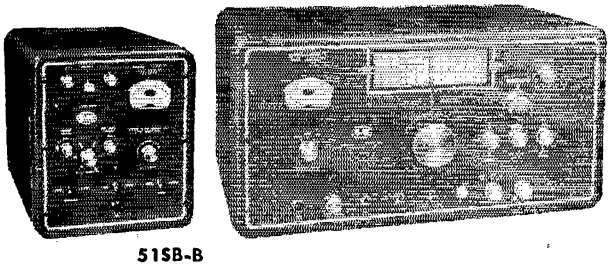
B&W TRANSMITTER GROWS WITH THE RADIO AMATEUR

5100-B

Start with basic Transmitter

Ideal for the oldtimer and beginner alike. It's a complete medium powered transmitter as it is . . . over 140 watts AM phone . . . 180 watts CW. Completely self-contained including power supply, VFO, and integral band-switching. Covers all ham bands 80 through 10 meters. YOU CAN ADD SSB AND A 1 KW FINAL TO THE 5100-B AT ANY TIME.

Net Price . . . $475.00



51SB-B

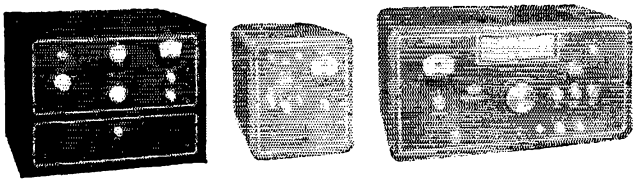
*If you have a Viking I or II, Collins 32 V series, or other commercial or composite home-built rig, get the Model 51SB. It's similar to the 51SB-B, but contains a power supply which you'll need with transmitters other than the 5100-B.

Net Price . . . $279.50

Add SSB Generator

If you want to enjoy top quality single sideband, just plug the 51SB-B into the back of the 5100-B transmitter* and you're on the air with a commanding signal. The many features of the 51SB-B include voice-operated control, selectable sideband with a flip of the switch, speaker deactivating circuit, and TVI suppression.

Net Price . . . $265.00



L-1000-A

All these B&W units are housed in attractive cabinets with a blue-grey wrinkle finish. Panels are finished in the distinctive B&W rich semi-gloss grey, with white lettering and border stripes. They're expertly engineered to assure you of long, trouble-free operation as well as ease of control and tuning.

and then tie in 1 KW Final

When you're ready to go the limit—1 kilowatt of power—all you need to do is to add the L-1000-A. This grounded grid linear amplifier will stand out in signal eloquence whenever the going gets rough. The pi-network output gives you precise adjustment of tuning and loading from 80 to 10 meters. It's rated at 1000 watts peak envelope power SSB, 875 watts CW, and 375 watts linear AM phone.

Net Price . . . $460.00

Prices subject to change without notice

B&W

BARKER & WILLIAMSON, INC.

Bristol, Pennsylvania

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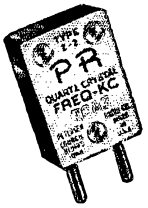
AMATEUR



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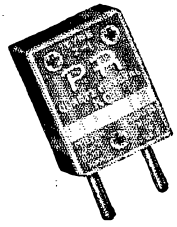
Rugged. Low drift, fundamental oscillators. High activity and power output. Stands up under maximum crystal currents. Stable, long-lasting, permanently sealed.....**$2.95 Net**

20 Meters, PR Type Z-3

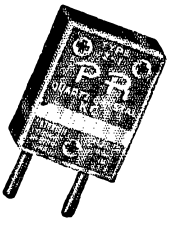
Harmonic oscillator. Low drift. High activity. Can be keyed in most circuits. Stable as fundamental oscillators. Fine for doubling to 10 and 11 meters or "straight through" 20 meter operation.....**$3.95 Net**



COMMERCIAL

COMMERCIAL, PR Type Z-1

Designed for rigors of all types of commercial service. Calibrated .005 per cent of specified frequency. Weight less than ¾ ounce. Sealed against moisture and contamination. Meets FCC requirements for all types of service.



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Type Z-1, AIRCRAFT

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

Type Z-1, MARS and CAP

Official assigned transmitter frequencies in the range.
Calibrated to .005%. 1500 to 10000 Kc. $3.45 Net

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

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

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

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members. 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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Saskatchewan	VE5HR	Harold R. Horn	1044 King St.	Saskatoon

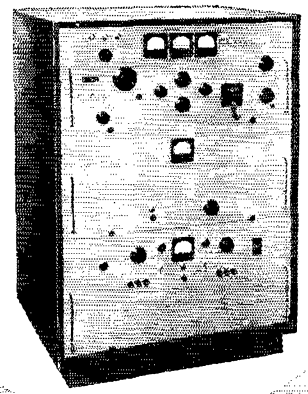
* Official appointed to act temporarily in the absence of a regular official.

communications transmitter . . .

This is a DARN GOOD transmitter, but generally accepted to be too expensive for most Hams. It is available for CW, FSK, A-2, AM or SSB with the SBE-1 exciter. Conservatively rated for 1000 watts output CW or FS and 750 watts phone in the 2-32 mc range. Complete details are in . . .

BULLETIN Q174

GPT-750

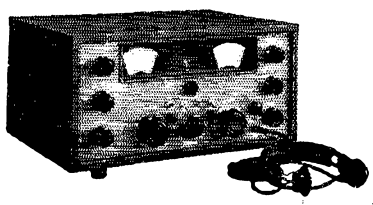


communications receiver . . .

This is the receiver they are talking about all over the industry. It has caused more excitement in a shorter time than anything to come along in quite a time. The specs you all know — they are in . . .

BULLETIN Q179

GPR-90

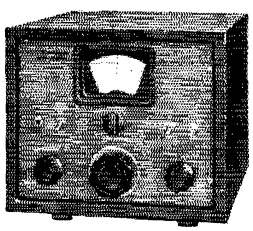


single sideband adapter . . .

You wanted SSB — here it is, an electrically band-spread, filter type slicer for accurate and simple tuning of SSB signals. Details are in . . .

BULLETIN Q194

GSB-1



We're working on RF matching transformers, wide band antennas, new SSB transmitter and a lot of other stuff — want a job?

The TECHNICAL MATERIEL CORPORATION

TMC Canada, Ltd.
OTTAWA, ONTARIO

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.

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

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Vice-Director: Carl C. Drumeller W5EHC
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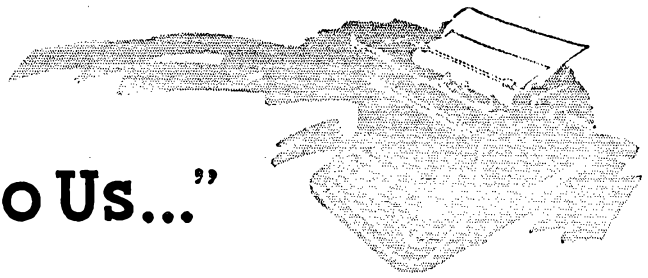


"It Seems to Us..."

TECHNICAL CONTRIBUTIONS

Amateur radio is proud, and justly so, of its extensive record of technical contributions to the electronic art. However, in recent years we have occasionally heard the view expressed that, because of the billions of dollars now being poured into elaborate research programs by the industry, the day of the amateur contributing anything useful to the advancement of the art is past.

Posh!

The facts are that right at the present moment amateur radio is taking advantage of probably the greatest number of simultaneous opportunities in its history to demonstrate ability to perform technical research work; many of them are part of the world-wide coordinated scientific effort making up the International Geophysical Year program. Here are the several fields in which there is opportunity for individual and group amateur participation:

1) The assistance of amateurs operating on bands above 50 Mc. is sought for participation in studies of sporadic-*E*, transequatorial scatter, auroral and meteor propagation conditions. This work is being accomplished for the IGY program by the League, under contract with the U. S. Air Force. Expanded knowledge of radio propagation is not the only objective; additionally it is hoped to gather data on the geographical distribution and motion of sporadic-*E* clouds, and therefore on the movements of air masses in the upper atmosphere. Amateurs are asked to monitor v.h.f. bands and report intercepts of other stations at unusual distances, as well as two-way contacts. Interested hams should write the ARRL Propagation Research Project, 530 Silas Deane Highway, Wethersfield, Conn.

2) The several earth satellites to be launched during the IGY will carry 108-Mc. telemetering transmitters. Elaborate and precise radio-tracking installations are being set up by Project Vanguard at various locations, but it is realized that anything can go wrong and therefore the Naval Research Laboratory solicits the assistance of amateurs in setting up additional "Minitrack" systems to keep watch on the 20-inch sphere. This is a club or group job, as it requires a bit of space and a modest investment — although the usual "reduction to amateur practice" is still being accomplished to cut costs considerably without appreciably affecting the usefulness of measurements and recordings. See page 38, July, 1956, *QST*.

3) A third project which should have considerable amateur interest is "Operation Smoke-Puff," outlined in this issue. Radio communications have always been dependent upon the varying reflective power of several ionized layers in the upper atmosphere. Now man is attempting to establish an artificial reflecting layer by firing a rocket into the stratosphere to release ionized gas. The assistance of amateur stations, in the southwest, capable of operating any band between 14 and 148 Mc., is requested in attempting to bounce signals off the artificial layer. So put down your science fiction book, turn to page 11 and read how you can be a part of a *real* project.

There are others. One is mentioned in the box on page 61, where the help of amateurs is solicited for another kind of propagation study headed up in Belgium. One more, though not yet fully organized, is the proposal to use a network of amateur stations for rapid communication between teams of volunteer amateur astronomers in "Moonwatch," a program of visual search for the earth satellite. Others are in the formative stage, such as a plan to have amateurs monitor and record telemetered information from transmitters carried by balloons into the stratosphere to record cosmic-ray data.

These kinds of tasks are peculiarly suited to be handled by the amateur service. To create a duplicate of the facilities being made available by amateurs could break the national budget! It is once again an affirmation of the wisdom of the continuing U. S. Government policy of fostering an amateur radio service.

BOARD MEETING

In May the Board of Directors of ARRL will meet to examine the record for 1956, and to come to decisions charting a continuing course for the future. The director of your division is *your* voice in League affairs. Communicate to him your views on matters of the day so that he may be informed, as is required of him in the By-Laws, "as to conditions and activities in his territorial division, and as to the needs and desires of the members therein in order that he may faithfully and intelligently represent the true interests of such members."

HAMFEST CALENDAR

Alabama — The Birmingham Amateur Radio Club is holding its annual hamfest, May 5, at the Alabama State Fair Grounds, Birmingham, Alabama. For further information, write the Birmingham Amateur Radio Club, Hamfest Committee, P. O. Box 603, Birmingham, Ala.

Alabama — The Mobile Amateur Radio Club, Inc., will hold their annual hamfest on May 25-26, at the Ft. Wright Armory, 1600 Hurtel St., Mobile, Ala.

Arizona — The annual Montezuma Well Hamfest will be held June 1-2. Tickets may be obtained from George Olson, W7OAS, 210 East Moreland, Phoenix, Arizona. Pre-registration tickets must be obtained by May 15. Tickets are $1.00 per call. Saturday night: campfire and movies. Sunday noon: potluck dinner. There is plenty of space to camp out. Those who wish to stay in motels should make reservations early.

California — The 15th annual Fresno Hamfest will be held on May 11. Registration will be at the Fresno Memorial Auditorium. Technical talks, hidden-transmitter hunts (on 75, 10, 6, and 2), code-speed contests, mobile judging, and an XYL luncheon will fill the day. In the evening a banquet will be held featuring good food, entertainment, and awards for contests and hunts.

For further information and advance registrations, write to: Steve Weber, W6QON, 1448 East Richert, Fresno, Calif.

Florida — The Daytona Beach Amateur Radio Assn., with the cooperation of the Daytona Beach Chamber of Commerce, will hold a whole-family all-day hamfest on May 19, centered about City Island Recreation Hall, Daytona Beach. If the XYL doesn't like hamfests, send her to the beach or on a boat excursion. Early reservations suggested for boat trip with power for portable rigs, $1.50. General registration, $1.50. For further information contact W4TNR, Secretary, Daytona Beach Amateur Radio Assn., P. O. Box 7155, Daytona Beach, Fla.

Florida — The annual hamfest of the Silver Springs Radio Club, Inc., will be held at Silver Springs, Fla., June 1-2. Preparations are being made for over 400 amateurs and their families. There will be entertainment for all members of the family at this famous resort, 5 miles east of Ocala.

Georgia — The Atlanta Radio Club's annual hamfest will be held June 2, at the American Legion Post No. 216 in Atlanta. For tickets or reservations, contact H. R. Holley, W4LDD, 1188 Ogilvie Dr. N.E., Atlanta.

Illinois — Again this year the Quad City Amateur Radio Club is sponsoring its big annual Mississippi Valley Hamfest, on Sunday, May 26, at the Rock Island County Conservation Club Grounds on Big Island, Milan. There will be plenty of fun for OM, YL, XYL, and Junior Ops. Tickets are $1.50 advance registration, or $1.75 at the gate. For advance registrations, write to Art Strobbe, W9BUE, 714 — 5th St., Rock Island, Ill.

Indiana — The Clifty Falls Picnic, sponsored by the Madison Amateur Radio Club, Madison, will be held at Poplar Grove, Clifty Falls State Park, near Madison, on Sunday, May 26, from 10:00 A.M. to 4:00 P.M. There will be no registration fee, just the usual State Park admission charge. The event has been planned as a family affair with each family being asked to bring their own picnic lunch. There is plenty of shelter so picnic will be held come rain or shine. The Park is centrally located from Cincinnati, Indianapolis, and Louisville. For information, contact Marvin F. Klaes, KN9GBD, 201 W. Main St., Madison, Ind.

Kansas — Tenth Annual Christy Ham-Vention will be held May 26, at Osage City, Kansas. Registration of 75¢ includes an auction, mobile hunt, and XYL Radio Hat Contest.

Kansas — The Central Kansas Radio Club will hold their annual hamfest on June 9 in Kenwood Park — same place as previous years. The hamfest will be held rain or shine, since other provisions are made in case of rain. The registration will be $1.00 each for licensed hams and XYLs.

Kansas — The Hi-Plains Amateur Radio Club will hold its Eighth Annual Hamfest in Plains, Kansas, on May 19. Registration fee for the day will be $1.00 for each person and is not limited to hams. All are invited to attend and participate. Everyone is asked to bring a covered dish and his own table service for the noon meal. Coffee and iced tea will be provided. For further information please write Zelma Cook, WØNIQ.

Louisiana — The Amateur Radio Club of Southwest Louisiana will hold its annual hamfest May 4-5, at Lake Charles, Louisiana, with a Saturday night fish-fry and Sunday barbecue. Hams from several states are expected to attend. Reservations may be made by writing W5BWZ, Forest Gaspard, 3719 Vanderbilt Dr., Lake Charles, or on 3850 kc. Sundays at 2:00 P.M. CST. Registration is $1.75 and covers everything except hotel accommodations. Invitation is extended to hams, their families, and friends.

Massachusetts — Sunday, May 26, at Norumbega Park, Newton, Route 128 near Route 1. Bring your family to the first hamfest-picnic sponsored by the Federation of Eastern Massachusetts Amateur Radio Associations. Talk-in transmitters on 10, 6, and 2 meters. Bring picnic lunch; fireplaces and tables available — also refreshments, amusements and playground for children. Prizes for winners of contests such as hidden transmitter hunt and best mobile installations, commercial and homebuilt. Registration starts 9:30 A.M., wind-up events at 4:30 P.M. Fee $1.00 per amateur; write W1PJ, 46 Lexington, Everett, Mass.

Massachusetts — The Central Massachusetts Amateur Radio Association will hold their annual Gabfest at the Stoddard Army Reserve Training Center, North Lake Ave., Worcester. The date is tentatively set for May 11, 1300 to 2400 EST. Smorgasbord dinner at 1800 EST. Registration and dinner $3.50 in advance, $4.00 at door. Registration only, at door, $1.50. For further information, write to Harry Miller, W1DRD, 141 Austin St., Worcester 9, Mass.

Nebraska — The Dawes County Amateur Radio Club of Chadron is holding its annual picnic on June 2 at the Chadron State Park, 10 miles south of Chadron on Highway 19. Signs will mark the way through the park. Bring enough food for your family. Food will be set on tables and served "family-style." The coffee and soda pop will be furnished by the club. Swap session. Come rain or shine as arrangements will be made to be indoors if the weather is inclement. Everyone welcome.

New York — The Rome Radio Club, Inc., will hold the fourth annual "Ham-Family Day" on May 26. There will be an auction, entertainment for the XYLs and Junior Ops, and a transmitter hunt. Tickets are $4.00 for adults, $1.25 for children under 12.

Oklahoma — The Northfork Amateur Radio Club, 5th annual hamfest on May 4-5, Quartz Mountain State Park, Southwestern Oklahoma. Plenty of fun for everybody. Send pre-registration of $2.50 to Vern Street, K5DUX, Carter, Okla.

Pennsylvania — The 3rd annual hamfest of The Breeze Shooters' Net will be held May 12 at The Lodge, North Park, near Pittsburgh, Pa. Gifts for the kiddies, technical demonstrations, and other activities. Bring a basket lunch. Come rain or shine, we'll have a good time. Large indoor facilities. Registration free. Donations accepted.

Rhode Island — The 36th Annual Dinner-Dance of the Providence Radio Association, May 18, at Rhodes-on-the-Pawtuxet. $3.50 per person for a fine dinner, dancing, and other attractions, carrying on a traditionally wonderful evening. Limited to 150 couples. Tickets available by mail — P. O. Box 2603, Elmwood Station, Providence 7, R. I.

Tennessee — The third annual West Tennessee Hamfest will be held May 12, in Paris Landing State Park located on beautiful Kentucky Lake near Paris, Tennessee. It will be a family-picnic affair with playground equipment available for the children, and picnic areas, swimming facilities, fishing, and boating will be available for those who like that sort of entertainment. A station will be set up in the park to guide any mobiles as they approach the hamfest. An added attraction will be a grab bag, so bring along a piece of gear you want to get rid of. A display of emergency gear will be set up on the scene for each ham's inspection.

Virginia — The Blue Ridge Amateur Radio Society, Inc., will hold its third annual hamfest on May 19, at Lakeside Amusement Park, Salem, Va. Registration starts at 7:00 P.M., Saturday, at club station with refreshments, and activities for YLs and XYLs. Registration will continue Sunday at 9:00 A.M. Program at 11:00 A.M. with several outstanding speakers. Special features for the ladies and children, dinner at 1:00 P.M. Dinner $1.50 for adults, children $1.25. Registration fee $1.25. Make checks payable to Blue Ridge Amateur Radio Society, Inc., and mail to W4FNT, Box 2002, Roanoke, Va.

Ontario — The North Shore Radio Club will hold its annual banquet May 4, at the Genosha Hotel, Oshawa. All radio amateurs and their friends are invited to attend. Registration opens at 5:00 P.M., and dinner is at 7:15 P.M. Good entertainment. Tickets $3.50 from any club member.

(*More page 82*)

"Operation Smoke-Puff"

An Opportunity for Amateurs and SWLs Living in the Southwest to Participate in Some History-Making Experiments

BY O. G. VILLARD, JR.*, W6QYT (Trustee, W6YX)
and R. S. RICH*, W6OPX

• Not too long ago a man-made ionosphere would have been a good subject for science fiction. Today there is an exceedingly strong presumption that temporary ionization has already been produced in the *E* region. To confirm it, amateurs are being invited to participate in a series of experiments planned to start this summer.

To get in on "Operation Smoke-Puff" you need three things: equipment capable of operating on any or all bands between 14 and 148 Mc., a location inside the "circle of opportunity" shown in Fig. 1 of this article, and a postcard. For instructions on using the last named, read on.

AN EVENT of great interest to radio amateurs — in fact, to all users of the ionosphere for long-distance communication — occurred on March 12, 1956. On that date an Aerobee rocket, fired from Holloman Air Force Base, New Mexico, into the *E* layer of the ionosphere, apparently created a man-made cloud of ionization by releasing some eighteen pounds of nitric oxide gas.[1]

That an ion cloud appeared there can be no doubt, for it was detected simultaneously on the screens of at least two different radars (one of which, incidentally, was operated by A. M. Faries, W6OOU). The fact that the cloud showed up shortly after the release of the gas is highly significant. However, no scientist will allow himself the satisfaction of claiming that his experiment was a success so long as there exists the possibility — however remote — that the observed result might have been caused by chance. In the present instance, the observed cloud could have been produced at precisely the right moment by an errant meteoroid or some gremlin-like sporadic-*E* event.

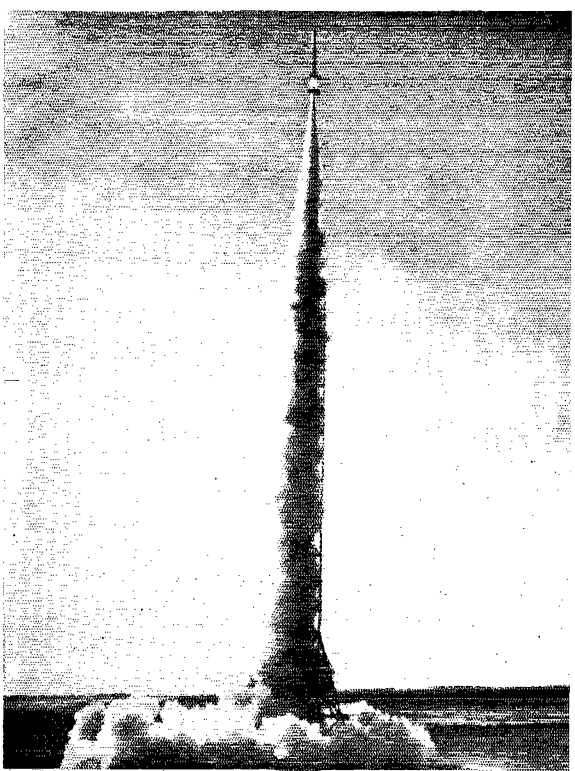
However, the presumption that the experiment succeeded is very strong. If ions can be produced in later tests, it will be possible to say that the March rocket firing represents the first time that man has ever created ionization in the ionosphere in an experiment expressly designed for that purpose.

It would appear, in any event, that a certain milestone in man's control of his environment has been passed, and that new vistas of opportunity appear ahead. A few years ago when Professor V. A. Bailey of Australia took out a patent on a method for lighting up the night sky, by making the ionosphere glow like a neon lamp, many thought him visionary; one wonders how the doubters feel about it now?

But before there can be any stampede to take out licenses under Professor Bailey's patent, much invention, research and hard work remains to be done, and the doing of it provides the reason for this article. The U. S. Air Force proposes to continue with tests similar to those performed in March, and would like to invite radio amateurs and short-wave listeners to participate in the task of determining (a) whether ion clouds are really formed (b) how large they are, and (c) what becomes of them after they are formed. All these things can be explored quite effectively simply by seeing to what extent the cloud is capable of reflecting radio waves from one point to another.

Since the present assault is on the *E*-region of the ionosphere, the reflecting cloud will be at a height of approximately 70 miles. Owing to the earth's curvature, such a cloud will only be able to reflect signals between stations whose locations

An Aerobee Rocket leaving the launcher.



*Radio Propagation Laboratory, Stanford University, Stanford, California.

[1] F. E. Marmo et. al. "Formation of an Artificial Ion Cloud; Photoionization of NO by Solar Lyman Alpha at 95 km." *Journal of Physical Chemistry*, Vol. 25, No. 1, p. 187, July, 1956.

are inside the fuzzy circle of Fig. 1. This circle is centered on the rockets' launching point, the Holloman Air Development Center near Alamogordo, New Mexico, and is deliberately made a bit generous in size to account for the possibility that some clouds may drift appreciably during their probable lifetime of ten or twenty minutes. The aim, as can be seen, is to generate an artificial patch of "short skip."

Stations at locations within this circle wishing to participate in the tests will be advised by mail of the expected dates and times of rocket firings. They may then listen to the range count-down station, which operates on 4870 kilocycles and should be audible over most of the area at most times of day. This station broadcasts the status of the test (whether it has been delayed or not) and gives the number of minutes until the expected firing time, followed (for a period) by the number of minutes after the rocket has gone off.

The best frequency band for getting a bounce from the ion cloud will depend on the time of day. Tests are planned for morning twilight, noon, and evening twilight, and some may even occur at night. In general, the 14, 21, 28, 50 and 144 Mc. bands may be useful. It is proposed to designate a particular frequency in each band as the one to be used by stations participating in the test. All participants will be sent a list of each others' call letters, so as to save time in checking to see if a particular station lies within the circled area.

A postcard to the authors of this article is all that is required to participate. If you live within the indicated area, your name will be placed on a mailing list and you will receive a questionnaire, some detailed suggestions, log sheets and information as to test times. You will also be advised, after each firing, whether the experiment went off as planned. (Rockets have been known to misfire or release their gas at the wrong altitude!)

The ionization experiments are being designed at the Geophysics Research Directorate, Air Force Cambridge Research Center, L. G. Hanscom Field, Bedford, Massachuetts, by a group headed by Dr. Murray Zelikoff. They will be performed at the Holloman Air Development Center. Since these experiments represent only one phase of the activities of Dr. Zelikoff's group, and only a small part of the heavy schedule of experimentation at the Holloman Air Development Center, readers are urged to contact the authors of this article for further information and not to contact either the Geophysics Research Directorate or the Holloman Center directly.

The Stanford University Radio Propagation Laboratory is a contractor of the Geophysics Research Directorate, and will be concerned with detection of the ion clouds by radar techniques. The authors have been asked by the Geophysics Research Directorate to coordinate amateur observations of the clouds.

Smoke-Puff Contests

In the thought that it would make these observations more enjoyable, it has been decided to

Fig. 1 — Communication by reflection from the artificial ion cloud should be possible within the area bounded by the diffused-outline circle.

make each ion cloud test a sort of ad hoc sweepstakes contest, wherein participants would exchange serial numbers and earn a score proportional to the number of stations contacted, the total number of contacts, and the number of bands used. Contestants on a given frequency band may contact each other more than once, but not more often than once every three minutes. The three highest-scoring participants (phone, c.w. and listener) in each rocket firing will receive certificates from the U. S. Air Force, and it is hoped that once each year the highest-scoring participants in these three categories for that year will receive some suitable recognition.

Reports will, of course, be welcomed from those who for one reason or another do not wish to participate in the contests.

It is expected that there may be several ionization-producing rockets fired per year, and it is hoped that amateur participation can begin by July, 1957.

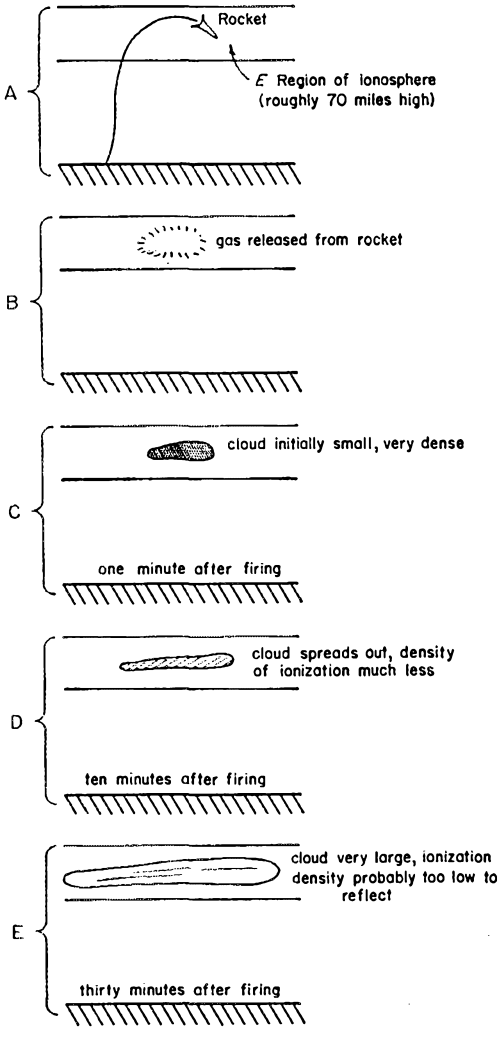


Fig. 4 — Life history of a typical ion cloud.

How the Clouds May Behave

It is not at all easy to predict in advance the radio reflecting power of an artificial ion cloud. This is another reason why the experiments will be so interesting. A rough representation of the probable life history of a typical cloud is shown in Fig. 2. The cloud starts out small, with the ions and electrons very densely packed. The gaseous material then diffuses rapidly outward; as the cloud grows larger, the density of the ionized material rapidly falls off. Eventually the man-made ionization becomes so weak that it blends into the normal background level of the ionosphere.

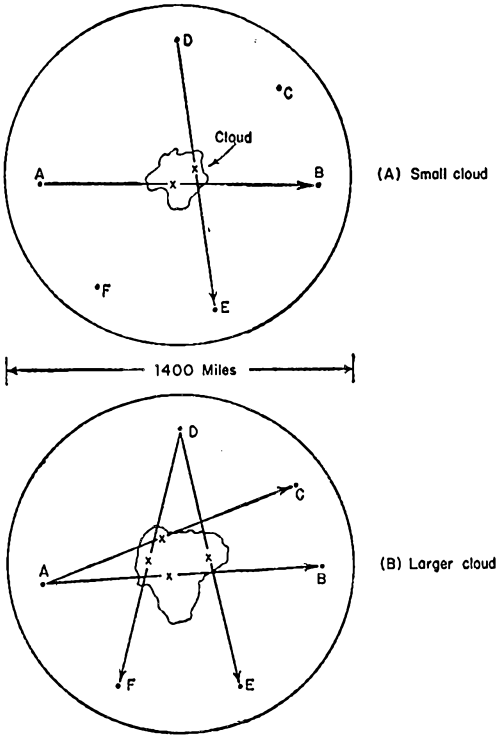


Fig. 3 — Effect of cloud size on radio area coverage. The ion density is assumed constant in both cases shown.

Note that the cloud is expected to be relatively thin and horizontal. (It is known, for example, that ionospheric wind motion has a relatively small vertical component, and that the ionization accompanying long-enduring meteor trails tends to be layer-like.) The man-made clouds, however, may not have heard of this expectation, and so may behave otherwise. However, if they do behave like little chunks of ionosphere, their reflecting power will be in accordance with the following discussion, and there is good reason to think that they will behave more or less this way no matter what their actual shape.

Whether a cloud will reflect a particular radio frequency over a given oblique path will depend on cloud size, ion density, and path length. The effect of cloud size is illustrated in Fig. 3A, which

shows a plan view of what might be the situation shortly after gas is released from the rocket. A pancake-like cloud has swelled to a size sufficient to make it a moderately large reflector. The outer limits of the circle represent, as in Fig. 1, the maximum range over which signals can be bounced from a given cloud. A station near point A should be receivable at B, and one at D receivable at E, and so forth. Stations anywhere along the periphery of the circle should be able to communicate with other stations roughly opposite to them. But, since the cloud is small and presumably flat, it should not be possible for A to communicate with C, for example. If the cloud expands to an appreciably larger size, as in Fig. 3B, and still has sufficient ion density, station A should be audible at point C, and Station D at point F, etc.

The effect of radio frequency on the reflecting power of a given cloud is shown in Fig. 4. For this discussion the cloud size is unimportant, so long as it is larger than the minimum amount required

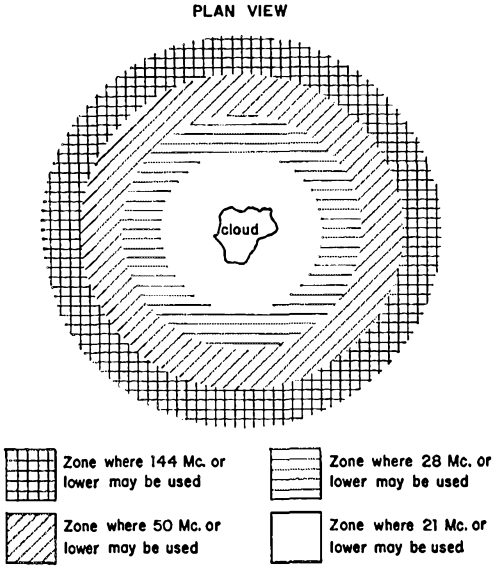


Fig. 4 — Typical area coverage of different radio frequencies reflected from a given ion cloud.

to make the signals strong enough to be heard. (It is also assumed that the reflection occurs roughly at the center of the cloud, as in Fig. 3A, which will be a good approximation so long as the cloud does not swell up to enormous size.) Fig. 4 shows a plan view of the areas from which oblique bounces via the cloud can be carried out. At the lowest frequency, 14 Mc., the skip distance is essentially zero, so that any two stations at opposite corresponding locations along any given diameter will be able to communicate with each other. On the other hand, the skip distance is large at 144 Mc., so that only stations out near the edges of the circle will be able to communicate with their opposite counterparts, as in Fig. 3A.

Note that since the cloud is small, it is still necessary for the 14-Mc. stations to be somewhere along a diameter — i.e., a line passing through the center of the cloud.

Figs. 5A, 5B, and 5C show in more detail what happens along any given line of diameter as the cloud swells outward and its density shrinks. The horizontal bars represent those regions at one end of the line from which communication will be possible to corresponding points at the opposite end, in the various frequency bands. Note that in 5B 144 Mc. has dropped out entirely, and even 14 Mc. shows an appreciable skip distance.

Recognizing Cloud Reflections

From these drawings, one can estimate the probable effect of the cloud on transmission at the various frequencies. All participating stations should initially have their beams pointing in the general direction of Alamogordo and the cloud. Transmission should open up more or less simultaneously on all frequencies which a given cloud will actually reflect. Unfortunately, there is no way of knowing in advance just how high the highest frequency will be. Thus it will be best to start out at a relatively low frequency, say 14 or 21 Mc. As soon as cloud-reflected signals are identified, an attempt should be made to operate in the highest available frequency band, since as the cloud decays the high frequencies may be expected to drop out first. Once transmission on any given band has disappeared, it is not at all likely to recur; hence it is important to switch to the next lower frequency band without wasting time.

A cloud-reflected signal will fade, and this fading may help to distinguish such signals from ground wave or extended tropospheric propagation. The fading may possibly be somewhat more rapid than normal ionospheric fading, and this may help in recognition. Be suspicious of signals arriving from directions other than that of Alamogordo during the first few minutes of cloud life. (Such signals might be long-range ground scatter propagated by the *F* layer, for example.)

Hams and listeners having tape recorders can provide a further service by recording the outputs of their receivers and sending in the tapes. The recorder can simply be left running during the period of the test. The recordings will be analyzed for fading rates and other data and will be quite valuable. Tapes will be transcribed and returned promptly.

Listeners are cordially invited to participate in the contest, too. In addition to amateur signals, listeners may also be able to monitor certain radars which will be in operation during the cloud tests. Frequencies and details of these transmissions will be provided by mail.

Mexican ham and listener participation in the tests is especially sought. Coverage south of the border is urgently needed. In this connection, it might be noted that XE stations should have a definite advantage over Ws in the contest, in view of the greater population density to the north.

Negative reports, incidentally, will also be use-

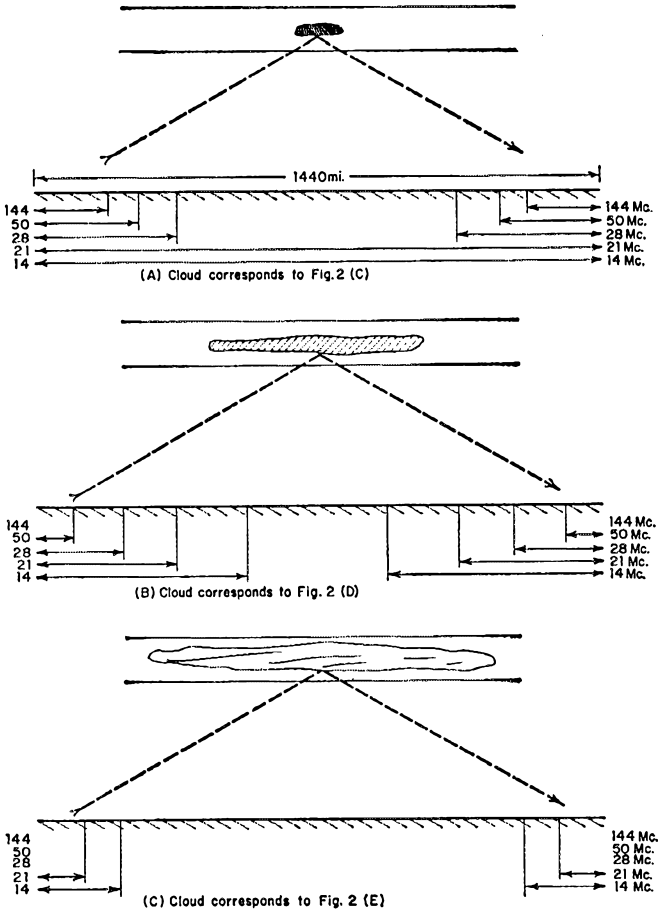


Fig. 5 — How the area coverage varies with time, for different frequencies.

◆

It would appear from Fig. 5 that stations along the outer periphery of the circle might have an advantage in the contest, because transmission at any given frequency ought to remain open longer for them. On the other hand, being farther from the cloud, they will not receive so strong a signal, and hence will have to work harder to make a QSO. Then, too, the cloud may drift.

All in all, it does not appear that any particular area is especially better off than any other, except for the Mexican portion of the circle in Fig. 1.

It is to be emphasized that all predictions of cloud behavior can be regarded as highly unreliable. For example, the cloud may act more like a meteor trail than a piece of ionosphere, in which case the skip distance effect may not be at all pronounced. Putting all the reports together and sorting out what happened will be a jigsaw-puzzle job!

It's a challenge, though, and a wonderful opportunity to show what skilled amateur operating can do. Here's a chance for hams to perform a real service in furthering upper-atmosphere research, to take part in some history in the making, and to have fun at the same time. V.h.f. men may get a made-to-order opportunity to add some elusive states (and Mexico) to their WAS list. Anyone for Smoke-Puff, gang?

ful. In the event of a successful firing, they will be invaluable. However, experimental rockets are by no means completely reliable and, like electronic equipment, occasionally misbehave. For this reason, it is requested that no reports be sent in until participants receive notification that the particular rocket firing went according to plan.

Multiband radio club participation will also be welcomed. If sufficient interest is shown, a separate certificate may be added for this category.

Strays

W1SAD says that the scouts have a logged-all-states and all-call-areas award on a continuing basis, and had a stepped-up competition during February. So, to help them for the awards, please send along your QSL to those who forward you a report. Additionally, Merit Badge counselors in each council will be glad to get your old *Call Books* and *Handbooks*, to be used by the scouts in their competition and study.

KN5HQL, Freeport, Texas, worked KN2STF of Freeport, N. Y., for his first N. Y. QSO.

—···—

W9MWD made a recording of W5QOC's signals and played it back to him. W5QOC in turn recorded that and played it back to W9MWD who again recorded W5QOC and played it back, and W5QOC recorded that and played it back and then W9MWD . . . and W5QOC . . . well, heck, this went on for an hour and proved that

Single-Side-Band Ideas for the V.H.F. Man

Three Ways for Putting S.S.B. on 50 and 144 Mc.

BY E. P. TILTON, W1HDQ*

In v.h.f. work, perhaps even more than on lower bands, anything that improves the signal-to-noise ratio of a given circuit makes a marked improvement in the ease of communication. The noise level, rather than interference from other signals, is usually the villain to beat in working over extreme distances on 50 Mc. and higher. With conventional voice techniques, any signal that is less than 6 db. or so above the noise is bound to be rough going. Experienced operators know that little or no margin over the noise is required for solid copy on c.w., and many contacts are made in this way that would be impossible with any kind of voice.

In the past two years or so experimentation with s.s.b. on the v.h.f. bands has shown that its operating effectiveness lies somewhere between double-side-band a.m. and c.w. How much it has over a.m. depends on how well it is utilized, but there is plenty of practical experience to show that it does have appreciably better get-through power. We don't get this for nothing, of course. We buy it with more critical adjustment of our receivers, and with extra care in the design, construction and adjustment of our transmitters. S.s.b. is far from "taking over" in v.h.f. work, but there is certainly room for it, and its employment is a logical move for those who want to do the best possible job in voice communication.

There are ways of generating "side band" on the v.h.f. bands that are not too complex. We have a contribution in that department from W4UCH that is now undergoing testing in the ARRL lab. If it works out well you'll be reading about it in *QST* before long. Meanwhile, here are some methods that involve v.h.f. adaptations of gear designed for s.s.b. work on lower bands.

Revamp or Heterodyne?

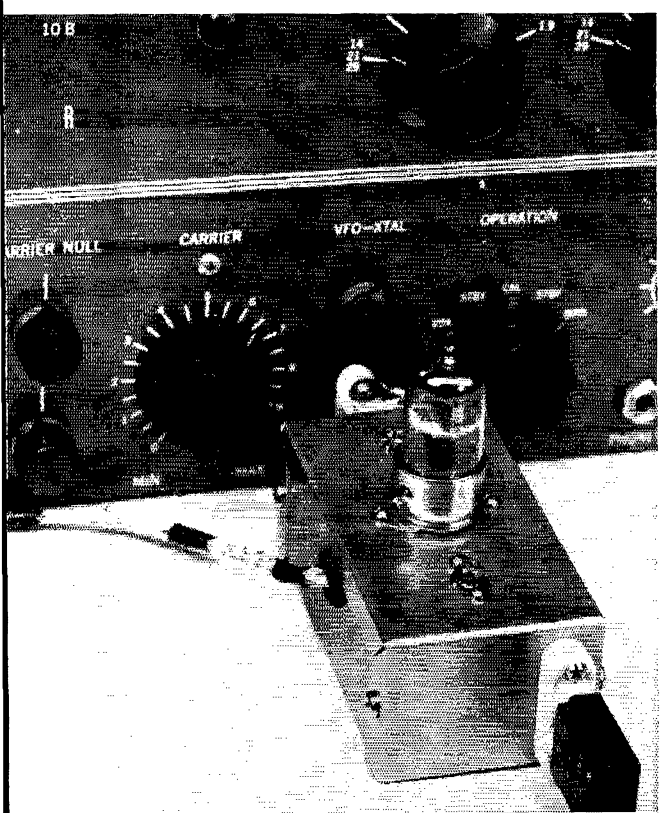
If you have a side-band rig working on lower frequencies, putting s.s.b. on a v.h.f. band is fairly simple. In some instances you may be able to develop 50-Mc. output from the rig as it stands, with fairly simple modifications that will not impair its operation on the frequencies for which it was intended. Such a conversion of the Central Electronics 10A and 10B exciters is described herewith.

But perhaps you are unwilling to alter the existing exciter. Then the way to get to a v.h.f. band is by means of an external heterodyning unit. Two such setups are described here, one for 50 and one for 144 Mc. Both methods, or variations of them, are being used widely for s.s.b. operation on 6 and 2 meters. If your s.s.b. job on a lower band is working satisfactorily, heterodyning it to 6 or 2 is easily done.

14 to 144 Mc. — W2EWL

A system for heterodyning the 14-Mc. output of an s.s.b. exciter to 144 Mc., currently in use by W2EWL and several other W2s is shown in Fig. 1. Tony is a long-time s.s.b. enthusiast who gave the mode a big boost with his "Cheap and Easy S.S.B." in March, 1956, *QST*. He works all the s.s.b. angles, being well known for his mobile side-band work, too.

The 2C51 dual triodes shown are similar to 12AT7s, and the latter



The 10B exciter, ready for 50-Mc. operation. A 6U8 oscillator-buffer at 41 Mc. plugs into the crystal socket. Power is taken from the socket on the back of the exciter.

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

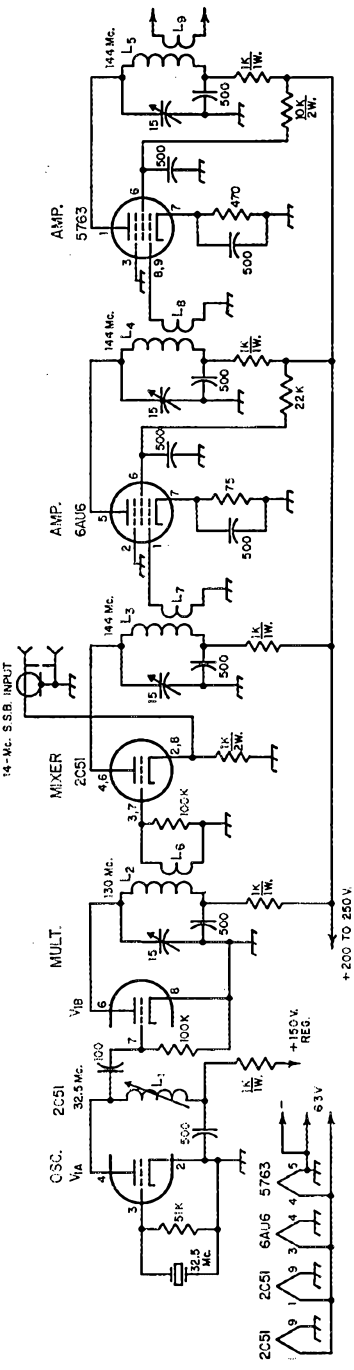


Fig. 1 — Heterodyne unit used by W2EWL to convert the 14-Mc. output of a conventional s.s.b. exciter to 144 Mc. 500-$\mu\mu$f. capacitors are Erie button by-passes. Resistors ½-watt unless specified.
L_1 — 1.61 to 3.12 uh., slug-tuned.
L_2, L_3, L_4, L_5 — 5 turns No. 16, ¼-inch diameter, 1 inch long.
L_6, L_7, L_8, L_9 — 2 turns No. 22 insulated wire at cold end of coils shown.

could be substituted if the pin numbers are changed. The first tube is an oscillator-multiplier, with output on 130 Mc., using a 32.5-Mc. crystal. This feeds a mixer that has its triodes connected in parallel. The 14-Mc. s.s.b. signal is injected at the cathode of this stage. Output at 144 Mc. is s.s.b. This is amplified by a 6AU6 and a 5763. The final stage, not shown, is an 829B, with 22½ volts bias on the grids and 255 volts regulated on the screen.

50-Mc. S.S.B. with the KWS-1

Several owners of the Collins KWS-1 are using the exciter portion of the transmitter to get on 50 Mc. The information given in Fig. 2 was supplied by W1CLS. A somewhat similar arrangement is being used by W1CGY, though he mixes 21-Mc. output from the KWS-1 and a 29-Mc. injection frequency. Both have had excellent results, including crossband QSOs with European stations. Also worthy of note has been the two-way work of W1CLS and W6NLZ, another user of a modified KWS-1. These two have demonstrated the ability of s.s.b. to get through solidly under conditions that are marginal for a.m. Their first two-way transcontinental s.s.b. contact on 50 Mc. was maintained for some time after all the a.m. stations had given up, and the only other work being done was on weak-signal c.w.

W1CLS uses an oscillator-buffer 6U8 on 22 Mc. The 28-Mc. s.s.b. signal is taken from the 6CL6 stage in the KWS-1, and fed into the screen circuit of a 5763 mixer. The 50-Mc. output of this stage is amplified in a 2E26 stage. A 6146 amplifier may also be used, in which case the bias shown is raised to minus 45 volts. The final stage of the W1CLS rig has taken several forms. A pair of 4-125As in a rig formerly used on a.m., and a single 4-400A amplifier have both worked out well, delivering peak output up to around 500 watts.

50-Mc. S.S.B. with the Central Electronics 10B Exciter

A step-by-step procedure for developing 50-Mc. output with the Central Electronics exciter must inevitably start much like the famous recipe for rabbit stew — "First catch your 10B!" But this shouldn't be hard, because these pioneer commercial s.s.b. units, the 10A and 10B, are everywhere, including the used-equipment market.

The basic circuitry is the same in both units. The s.s.b. signal at 9 Mc. is mixed with the output of a crystal oscillator or v.f.o., operating on a frequency that will add to or subtract from 9 Mc. to give a frequency in the desired band. Plug-in coils in the plate circuits of the 6BA7 mixer and 6AG7 output amplifier are changed in changing bands. A later model, the 20A, has a band-switching turret, which makes the substitution of 50-Mc. coils a bit more difficult, so we won't go into that here.

Output of sorts can be obtained with the 10A and 10B merely by injecting a 41-Mc. signal into the mixer grid, in place of the usual crystal or v.f.o. energy, and substituting 50-Mc. coils for those designed for the lower bands. There

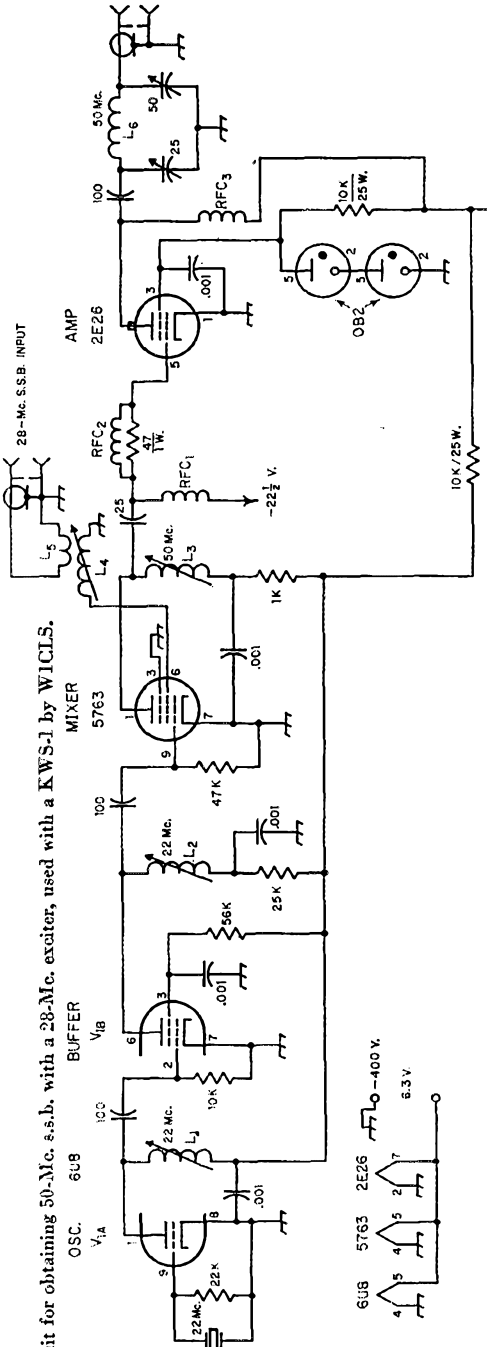


Fig. 2 — Heterodyne circuit for obtaining 50-Mc. s.s.b. with a 28-Mc. exciter, used with a KWS-1 by WICLS.

L_1, L_2 — 15 turns No. 20 enamel, close-wound on ½-inch slug-tuned form. (National XR-50.)
L_3 — 7 turns 1⅛ inch long, same as L_1.
L_4 — 11 turns, same as L_1.
L_6 — 3 turns No. 18, 1-inch diameter, spaced ⅛ inch. (B & W No. 3014 or AirDux 808.)
L_5 — 3 turns No. 20 enamel, wound over cold end of L_4.
RFC_1, RFC_3 — 7-uh. r.f. choke (Ohmite Z-50).
RFC_2 — 3 turns No. 18 on 47-ohm 1-watt resistor.

is very high circuit capacitance associated with the plug-in coil circuits, however, so some modification of these is desirable, in the interest of improved efficiency. This can be done readily enough, without affecting the performance of the exciter on the lower bands. The model we worked over in the ARRL lab was a 10B, but the procedure may be followed for the 10A as well.

Working over the Coil Sockets

The variable capacitors connected across the tuned circuits (C_{30} and C_{36} on the 10B diagram) are 380-$\mu\mu$f. jobs; thus their minimum capacitance is rather high for 50-Mc. work. Also, the leads from the coil sockets up through the chassis to the capacitors on the front panel are not the sort of thing that is recommended for v.h.f. operation. The circuits can be resonated at 50 Mc., but the resulting coils are almost direct shorts across the socket terminals.

Fortunately, the circuit components are connected to various terminals on the coil sockets, with jumpers wired between the terminals. It is thus a simple matter to cut out the parts of the circuit that you don't want for 50-Mc. operation, merely by cutting the jumper wires and putting corresponding jumpers into the coils for the lower bands. A step-by-step process for this is given below, and the resultant circuits are shown in Fig. 3. Tuning capacitors, small mica trimmers, are made integral parts of the plug-in assemblies for 50-Mc. use.

1) Disconnect leads from Pin 6 of socket for L_8 (mixer plate coil) and connect them to Pin 5. Leave no connection between Pins 5 and 6 at the socket.

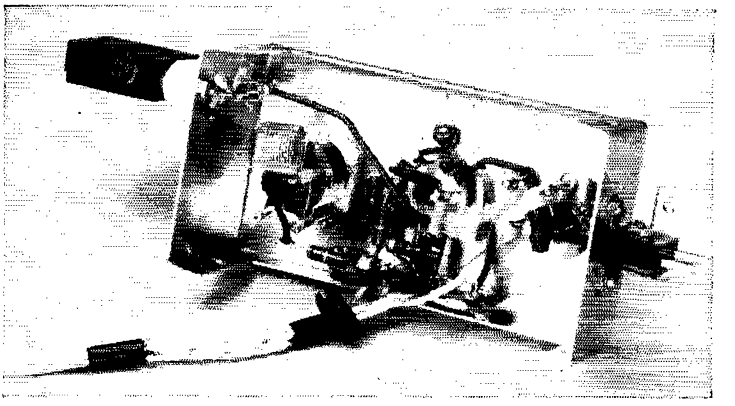
2) Disconnect the leads that go to C_{31} and the 6BA7 plate from Pin 5 and connect them to Pin 6 instead.

3) Install jumpers between Pins 5 and 6 in all mixer plate coils used in the 10B on lower bands.

4) Disconnect lead to C_{36} from Pin 5 of socket for L_9 (amplifier plate coil) and connect it to Pin 4. Cut jumper between Pins 4 and 5 in the exciter.

5) Install jumper between Pins 4 and 5 in all amplifier plate coils used in the 10B on lower frequencies.

Making these changes allows the use of fairly effective tuned circuits at 50 Mc. (see coil data under Fig. 3) and does not affect the operation of



Interior of the oscillator-buffer unit for furnishing 41-Mc. excitation to the 10B mixer.

the 10B on the bands for which it was designed.

The 41-Mc. Injection Unit

We now need a source of 41-Mc. energy to mix with the 9-Mc. s.s.b. signal generated in the exciter. This can be provided in several ways, the main considerations being that the frequency must be highly stable, and the injection signal must be free of subharmonics. We tried a few arrangements before we had something entirely satisfactory.

First an oscillator-doubler setup was tried. A 12AT7 was operated as a third-overtone oscillator, with a 6850-kc. crystal oscillating on 20.55 Mc. The second triode section doubled to 41.1 Mc. The assembly looked exactly like the one in the photograph, but it didn't work as well. We got a 50.1-Mc. s.s.b. signal all right, and we had it on the air one night, but the efficiency was very low. When the energy was fed into an amplifier grid circuit, it was found that several frequencies were present. (Lesson No. 1 on mixers in transmitting service — watch out for those *wrong* frequencies!) In addition to the desired 50.1 Mc., there was a husky output at 47.55 Mc., and some more on 41.1 Mc.

The 47.55 Mc. came from the mixing of the third harmonic of 9 Mc. with the 20.55 Mc. riding through from our external oscillator. The 50.1-Mc. carrier nulled out nicely, but the 47.55-Mc. signal stayed on the air, as did the 41.1-Mc. one. And though the levels of the signals that resulted in these frequencies were low to start with, the resultant outputs from the mixer and amplifier were only about 6 to 10 db. below the desired one.

These frequencies could be trapped out, of course, but it seemed better to avoid generating one of them in the first place. The oscillator-buffer circuit shown in Fig. 4 is the result. An 8200-kc. crystal oscillates on its 5th overtone, 41 Mc., in the triode portion of a 6U8. The pentode section is an amplifier and isolation stage.

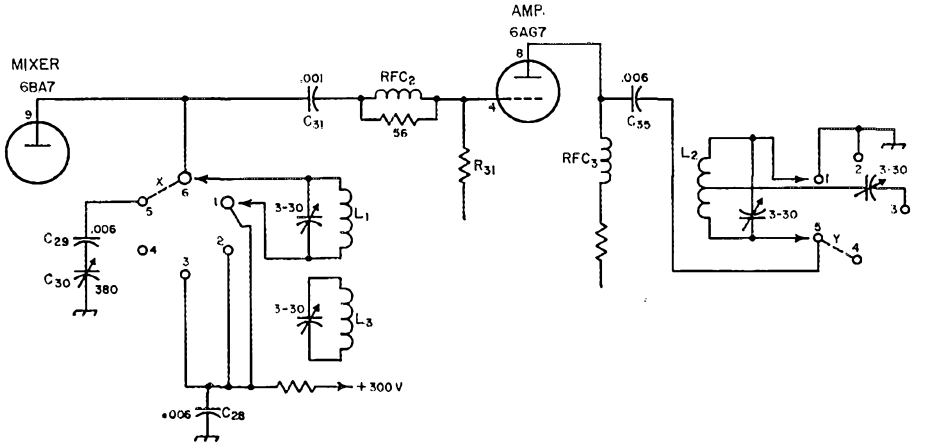


Fig. 3 — Plug-in coil circuits of the 10B as they appear after the conversion process. Jumpers X and Y, shown in dashed lines, are installed in the 10B coils for lower frequencies, and are omitted from the 50-Mc. coils. Parts numbered, but not appearing below, are original components in the exciter.

L_1 — 3 turns No. 16, ½-inch diameter, spaced wire diameter, 6-pin base.

L_2 — 5 turns No. 18, ⅝-inch diameter, spaced ⅛ inch. Tap at 1½ turns from cold end. 5-pin base.

L_3 — 10 turns insulated hookup wire ½-inch diameter, closewound. Insert first turn between turns of L_1 and cement in place. Tune to injection frequency; see text.

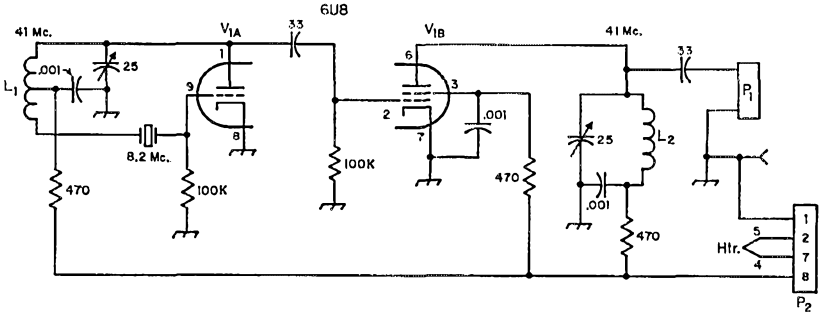


Fig. 4 — Circuit of the 41-Mc. injection unit used with the 10B exciter to obtain 50-Mc. output.

L_1 — 10 turns No. 24, 32 t.p.i., ½-inch diameter, tapped at 3 turns from crystal end.
L_2 — 7 turns, same as L_1. Both B & W No. 3004.
P_1 — 300-ohm line plug (Millen 37412).
P_2 — 8-pin plug. (Fits octal socket on back of 10B.)

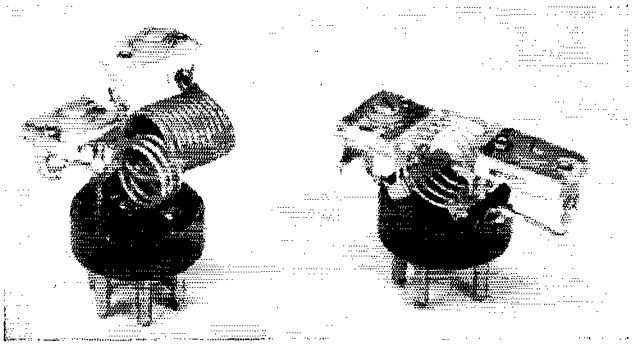
The circuits are assembled in a small Minibox, and provision is made for plugging the output into the crystal socket on the front of the 10B. "Why not use the v.f.o. socket on the back of the exciter?" everyone asks. Possibly this would do, but the leads looked a bit long for 50-Mc. operation, so we used the crystal socket. A Millen 37412, 300-ohm line plug is mounted on the end of the Minibox, with one terminal hooked to the coupling capacitor from the 6U8 pentode plate circuit. The other pin is connected to the box. An additional connection is needed to ground the crystal oscillator circuit in the 10B, so this is done by means of a clip that fastens to a lug mounted under one of the crystal socket screws on the exciter front panel. The crystal socket was changed to a Millen 33102, to provide a place for this grounding lug. The ground connection is made with a small-size Johnson inductance clip, or a small alligator clip would do.

For those who don't like the rather critical adjustment procedure for obtaining 5th-overtone oscillation with a surplus crystal, the oscillator circuit could be changed readily to a simpler alternative shown in Fig. 1, page 16, January, 1956, or June, 1955, *QST*, page 40. Either will work nicely with International Crystal Co. or other v.h.f. overtone crystals. The injection frequency should be 41 to 45 Mc., depending on the frequency you want to use in the 50-Mc. band. Word of caution: Not all 8200-kc. crystals oscillate on 41 Mc. or higher when used on the 5th overtone. By a process of selection, from about a dozen on hand, we now have several nice band-edge spots, from about 800 cycles inside the band to a kilocycle or two. There were others, however, that put us on 49.99 Mc. or less.

Originally the oscillator-buffer unit was supplied with 300 volts, plus, from the power socket of the 10B. This worked fine, as far as output and stability were concerned, but it was rough on the triode section of the 6U8. Later, an 0A2 voltage regulator tube was installed under the 10B chassis, and the regulated 150 volts for the 6U8 was taken out through the conveniently-empty Pin 8 of the power socket. At this voltage, the combined current drain of the triode and pentode of the 6U8 is about 12 ma. In this condition the stages can run all day without strain, and stability is of a very high order.

Adjustment and Operation

If the 5th-overtone oscillator is used, the first step is to adjust the feedback (by means of the coil tap) so that the oscillator takes off on the desired frequency, but does not self-oscillate. This is an individual matter with various crystals and layouts, and admittedly is a ticklish proposition at the 5th overtone. However, surprising as it may seem, once the job is done the resultant stability is excellent. The crystal gets rather low excitation at the 5th overtone, so the crystal current is low. Output is also low, but is adequate for this application. The stability of the oscillator



Plug-in coils for 50-Mc. operation have their own tuning capacitors. Coil of insulated wire inserted in the mixer plate coil, left, is a 41-Mc. trap.

as shown is such that there is no observable warm-up drift, even when the heater and plate voltage are applied simultaneously, at a cold start.

Substituting a v.h.f. crystal in the simpler circuit will result in perceptible warm-up drift, but the oscillator runs all the time after the exciter is turned on, so the stability should be adequate when a regulated supply is used.

The plug-in coils for the 10B were made by guesswork and then resonated with a grid-dip meter at 50 Mc. Adjustment made in this way was close enough so that 50-Mc. output was obtained when the injection unit was plugged in and tuned up on 41 Mc. Only a minor readjustment of the trimmers was needed for maximum output.

When power is applied to the 10B, the 6AG7 may show signs of oscillation. This is apparently the result of ineffective grounding of the metal tube shell through the base pin provided for that purpose. Oscillation was eliminated by making a solid external ground to the metal shell. The rim of the shell, just above the bakelite base, was cleaned of its black paint, and a strap of flashing copper ¼ inch wide was wrapped around this part of the tube and bolted to the chassis. This slows down tube changing, but it stabilized the 6AG7 stage in fine style.

If the 6BA7 mixer in the 10B is socked hard enough with 41-Mc. energy to get full output on 50 Mc., there will be an appreciable amount of output from both mixer and amplifier on 41 Mc. as well. Don't rely on the tuned circuits to take care of this; they won't handle two frequencies that close together. The 41-Mc. energy can be removed by the insertion of a trap at that frequency in the mixer plate circuit. It will have no effect on the 50-Mc. operation, except possibly to improve the efficiency slightly at the desired frequency. The trap is inductively coupled. Tune it for minimum 41-Mc. energy in the 6AG7 output, with the 50-Mc. carrier suppressed.

From here on, operation of the equipment is the same as on lower frequencies, and the Central Electronics instructions apply. It is not our purpose here to go into an involved discussion of s.s.b. techniques, for they are the same regardless of frequency. Plenty has already been written on s.s.b. exciters and linear amplifiers, and it applies on 50 Mc. and higher frequencies just as well as on 4 or 14 Mc.

At W1HDQ the 10B was first operated by itself, feeding the antenna directly. With no more than a watt of output the signal was copied readily at distances of 30 miles or so under normal conditions. It was then run into the 4-250A amplifier normally used on a.m. and c.w., though we had no suitable bias or screen supplies for operation of the final at optimum conditions as a linear. Running essentially Class A, however (no grid current, and no fluctuation in plate current), the 4-250A delivered about 40 watts peak output, while running at 1100 volts on the plate. At this moderate power we had many nice contacts at distances of 100 miles or more under wintertime dead-band conditions. A feature of the first night's operation was an hour-long two-way on s.s.b. with W1CLS whose Collins KWS-1 exciter modification was described earlier.

While the output of the 10B is apparently not quite enough to push the 4-250A to full ratings, we have developed up to 200 watts of s.s.b. output, which is a very respectable s.s.b. signal on 50 Mc. This was done by raising the plate voltage to 2500, without modifying the screen supply to bring the screen voltage to the optimum for Class AB_1 operation. Probably the ideal low-cost amplifier for the 10B on 50 Mc. would be something like a pair of 6146s, which should deliver up to 100 watts or more peak output when operated as a Class AB_1 linear.

Watch for Spurious Frequencies!

As mentioned earlier, the mixer produces sum-and-difference frequencies, not only for the two signals you *intend* to feed into it, but for all the harmonics and subharmonics that may be present in either energy source. If the beat products are far removed from the desired frequency, the tuned circuits will take care of them reasonably well. But there is always a possibility that some combination you didn't reckon with will show up at a spot close to the desired frequency. When that happens, you have to get rid of it at its source.

The operation of any heterodyne setup should be checked carefully for these unwanted frequencies. A sensitive wavemeter of the Little Gem type will usually show up any wrong frequencies more than 10 per cent removed from the desired frequency, but it cannot be trusted inside that limit. One good check is to listen across the v.h.f. range and trace down any unwanted beats.

Try to avoid producing them in the first place. This is relatively easy if no frequency multiplication is done in the injection stages. A good insurance item is the use of a high-*Q* tuned-circuit filter in the line between the exciter and amplifier. Anything that will pass only the desired frequency will do the trick. Suitable coaxial tank circuits for this purpose can be made for either 50 or 144 Mc.

Strays

W8LOJ has been presented with an especially-engraved loving cup bearing the magic letters WAC. The award was made by fellow club members on behalf of ex-neighbors and friends on the occassion of W8LOJ having worked all channels, two through thirteen!

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K2EE wonders whether 8TM (Seneca Vocational School) was the first public school in the U. S. to teach wireless. He has a photo showing a graduating class of 1917 and would like to hear from others who know of similar public school courses along about that time.

Putting the Heathkit AT-1 on 50 Mc.

BY MEARL ROGERS,* K9AOB

THE FOLLOWING METHOD of making use of the Heathkit AT-1 transmitter on 6 meters may be of interest to Technician licensees and others who have these rigs left over from their Novice operating days. The simple process outlined enables the owner of an AT-1 to go on 6 with a minimum of effort, and almost without cost. The entire process should not take much over an hour, unless hand-wound coils are used in place of the ready-made Miniductors specified. The rig can be put back into service on the lower frequencies in a matter of minutes.

It will be noted from the revised diagram, Fig. 1, that only four connections need be unsoldered from their original places. Points where the circuits are broken are indicated by an X on the schematic. The 6L6 final tube operates as a doubler, as it does on all bands from 40 through 10 meters. A new coil, L_1, is added across the "driver" tuning capacitor. It is wired directly to the terminals, and the combination should tune to 25 to 27 Mc.

The 50-$\mu\mu$f. "output" tuning capacitor is moved from its present position to a spot on the front panel directly above it, where it will then serve as a reactance-tuning capacitor in series with the output link, L_3. A 15-$\mu\mu$f. tuning capacitor, C_1, is mounted in place of the "output" capacitor, and it serves to tune the special 50-Mc. tank coil, L_2. Connect L_2 directly to the terminals of C_1, with the shortest possible leads.

The output coupling link, L_3, is inserted inside the ground end of L_2. Connect a length of RG-58/U or RG-59/U coax from L_3 to the coaxial output terminal, as shown.

* 144 N. 25th St., New Castle, Indiana.

Operation on 50 Mc.

The "grid" and "plate" positions on the meter switch are used as before, in tuning up on 50 Mc. A crystal between 8.34 and 9 Mc., or between 12.5 and 13.5 Mc., is used. The band switch should be in the 80-meter position. Grid current of a little more than 1 ma. can be expected under normal conditions. One station locally is using a Heathkit v.f.o., quadrupling from its 6-Mc. output. Be certain that the right harmonics are being picked off at L_1 and L_2. Check with an absorption-type wavemeter to be sure that the oscillator plate circuit is tuned to the third harmonic of the 8-Mc. crystal, or the second harmonic of a 12-Mc. one. The frequency here will be 25 to 27 Mc. in either case. The output frequency should, of course, be between 50 and 54 Mc.

Tune the oscillator plate circuit ("driver") for maximum grid current, and the final plate tuning, C_1, for minimum plate current. When you are sure that the correct frequency is being developed, connect a coax-fed antenna or antenna coupler and tune the 50-$\mu\mu$f. variable for the greatest power delivered to the antenna. Retune the plate circuit for maximum output again after setting the series capacitor.

If the rig is to be used on c.w., it is desirable to have it wired up so that only the output stage is keyed. The instruction book gave you the option of this or oscillator keying when you built the rig. If it is to be used on phone, a modulator capable of delivering 15 watts or so of audio will be required.

(*Continued on page 158*)

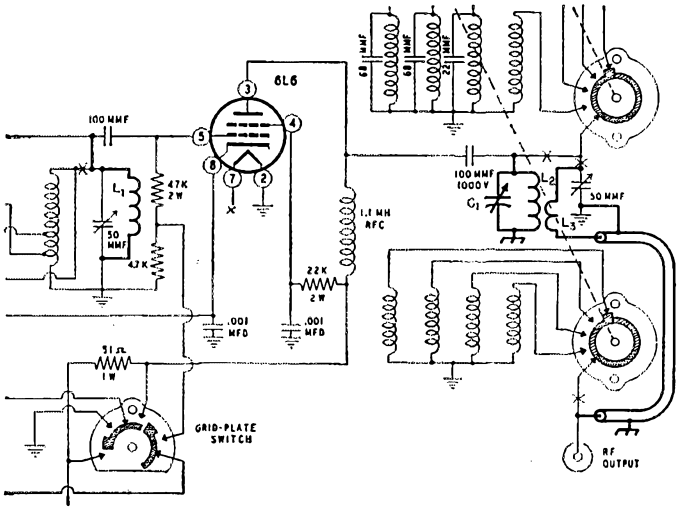


Fig. 1 — Changes in the AT-1 required to operate it on 50 Mc. Points where the circuits are broken are indicated by "X." Band switch is left in the 80-meter position.

C_1 — 15-$\mu\mu$f. variable, mounted in place of "output" capacitor.
L_1 — 4 turns No. 3010 B & W Miniductor (No. 18 wire, ¾-inch diam., ½ inch long.
L_2 — 5 turns, similar to L_1.
L_3 — 6 turns No. 3003 Miniductor, or Air Dux No. 608 (No. 20, ½ inch diam., ⅜ inch long.) inside L_2.

Mechanical Considerations in the Construction of Beams and Towers

How To Choose Adequate Materials and Dimensions

BY WILLIAM NIGHMAN,* W4ZSH

• If you're thinking of building a beam antenna, or a supporting tower, this article should provide the answers to some of the problems encountered in the selection of suitable materials. The important information is in simple tabulated form. Included also is a discussion of the effects of corrosion and the steps that can be taken to retard it, as well as an explanation of the standard system used to identify aluminum of various grades.

THERE have been many novel beams and vertical antennas described in recent years. This article is designed to tell would-be architects how to choose the right materials for the job, how to prevent deterioration caused by weathering, and how to estimate the amount of sag in the elements, and the effects of wind and ice.

Most of us plan to use whatever materials are on hand; for what you still need, "Try the Yellow Pages." Many distributors carry aluminum tubing and structural shapes in stock. A large number of them are beginning to cater to the growing horde of do-it-yourselfers so you will be welcomed even if you buy very little.

Corrosion in Aluminum

Fortunately, the three most common aluminum extrusion alloys are among those that have high strength. These alloys are 6063, 6061, and 2024. All of the calculations found later in this article are based on these three alloys in the fully-heat-treated condition. Be sure to specify one of the following: 6063-T6, 6061-T6 or 2024-T4. Don't forget the "T6" or "T4;" they indicate the heat treatment!

Atmospheric corrosion occurs only in the presence of water and oxygen. Aluminum, oddly enough, corrodes much more readily than iron or steel. The oxide coating which forms is extremely tough and nearly impenetrable so that further corrosion is limited to a very small degree. Alkalies dissolve this protective film and corrosion proceeds rapidly and unchecked. Those of you who have cleaned panels in caustic will have noticed this.

Amateurs who live in seacoast areas may need additional protection for the aluminum portions of their beams. Ordinary paint doesn't stick well to the smooth surface of aluminum. Zinc chromate, available everywhere, etches the surface lightly and "locks" itself on. If you don't care for the resulting chartreuse color you can repaint with nearly any grade of paint.

If there is any possibility of having to dismantle the beam to move to another address, you will be well advised to use plated fasteners. Zinc-coated galvanized screws and bolts are well worth the extra expense. For longer protection, especially in seacoast and industrial localities, cadmium-plated fasteners are recommended. The plating helps to prevent the threads from seizing, so that many hours can be saved when parts have to be removed. A word of warning: Copper or copper-alloy fasteners should never be used in conjunction with aluminum.

Aluminum can be soldered, but few of us know the proper techniques or care to invest in the proper tools. If you ever try your hand at it be sure no strain is placed on the joint and that all remains of any flux are thoroughly removed. Most solders contain lead and tin which are poison to aluminum so don't let the soldered joint go unprotected in outdoor service.

New welding processes make welding aluminum relatively easy for the experienced operator. No flux is required in several of these methods. Areas near the welds will be heated to a temperature high enough to remove the effects of the heat treatment. This situation can be overcome by doubling the cross-sectional area around the weld. The net result will about equal the strength of the rest of the section.

Wherever possible, clamp aluminum over as large an area as possible. Not only will the structure be stronger but the clamps will not loosen with age as much as small bolted connections will.

Corrosion in Steel

Besides aluminum, most distributors will usually have any steel tubing you may require. Unfortunately, it will probably be difficult for you to find out just how strong it is. Steel tubing is not ordinarily heat-treated in the grades you will want. Its strength is determined by its composition and treatment, and may vary from less than that for 6063 aluminum to more than that listed for 2024. In consequence, be sure you know what you are getting in the strength department.

Steel will corrode outdoors whenever the relative humidity is higher than 30 per cent. That eliminates the worries of Arizona residents! Rust is porous and retains moisture like a sponge. Instead of protecting the underlying steel, as the

* 2106 Houston St., Florence, Alabama.

oxide on aluminum does, it actually helps to promote further corrosion by staying moist.

The most-expensive rust-preventive paints are nearly worthless unless the surface is clean to start with. Paint simply seals in the moisture that is present in the rust, and corrosion continues. Then, of course, the paint peels off. Remember that by "moisture" I don't mean dripping wet — just 30-per-cent-plus humidity! So remove all traces of rust with a wire brush before painting. The arguments in favor of using plated fasteners with aluminum are equally valid for steel. In welding steel, it will not be necessary to increase the area of the welded section because the steel will already be in the annealed condition and no further softening will take place. If the welding was done on galvanized steel the zinc will have been vaporized and that section will need extra protection. Be sure all traces of flux are removed before painting.

Both red lead and zinc chromate make excellent primers. Steel held together with aluminum fasteners may promote their corrosion under certain conditions. Better use something else to be safe.

Cross-Section vs. Length

In introducing Table I, there are a few remarks to be made concerning the considerations involved. First, all calculations are based on the "yield strength." This is the strength which a material exhibits at the point when it deforms permanently. The strength required to *break* aluminum is much higher. But since the elements would be distorted to the point of uselessness at the yield point, we had better use the lower strength value.[1]

Secondly, all calculations are based on tubing. Rectangular booms, or booms of other shapes, require individual calculations and can not easily be treated in tabular form.

Lastly, I cannot predict the weather conditions in various parts of the country, so you must help.

Two maximum wind velocities were used — 50 and 75 m.p.h. Winds of 75 m.p.h. are occasionally met with in some localities, so if you have had any severe storms in recent years, and do not live in a sheltered valley, this might be your choice.

Two safety factors were used. There seem to be no figures available on the intensifying effect of wind gusts. However, if the gusts are spaced properly they may cause damage by causing structures to whip. If these oscillations occur at the right moment, even the most carefully designed structure will fail. With elements of the strength usually used in beam antennas, the loading effect of an ice coating is relatively small compared to the wind load for which the structure must be designed. In other words, the weight of a heavy coating of ice in the absence of wind will exert much less force on an element than a wind of 50 m.p.h. or more. However, icing will increase the area working against the wind.

The two safety factors considered are not particularly conservative, so if your pocketbook will let you, use the highest safety factor listed.

TABLE I

Alloy	Diam. In.	Wind Vel. & Safety Factor: 50 m.p.h. S.F. 2 — Maximum Length Ft.	75 m.p.h. S.F. 2	50 m.p.h. S.F. 3	75 m.p.h. S.F. 3
6063-T6	⅜	4.1	2.8	3.3	2.3
	½	5.4	3.8	4.4	3.1
	¾	7.4	5.2	6.1	4.2
	1	9.1	6.5	7.4	5.3
	1½	13.7	10.4	11.2	8.4
	2	17.7	13.6	14.5	11.1
	3	23.7	18.7	19.4	15.2
6061-T6	⅜	4.9	3.3	4.0	2.7
	½	6.5	4.5	5.4	3.6
	¾	8.7	6.1	7.1	5.0
	1	10.7	7.6	8.7	6.2
	1½	16.2	12.2	13.3	10.0
	2	21.4	16.1	17.1	13.1
	3	28.1	22.2	23.0	18.1
2024-T4	⅜	5.5	3.7	4.4	3.0
	½	7.2	5.0	5.9	4.1
	¾	9.8	6.9	8.0	5.6
	1	12.0	8.5	9.8	7.0
	1½	18.2	13.7	14.9	11.2
	2	23.6	18.0	19.2	14.7
	3	31.5	42.8	25.7	20.3

Maximum lengths (in feet) recommended for aluminum-tubing elements of average wall thickness under severe wind loads. Elements supported at one end only. Length values may be doubled for an element supported at its center.

Estimating Element Sag

After having used Table I to determine which size of tubing your beam and locality require, you can now use Table II to see how much the elements will sag.

Booms

Tables I and II can be used for the elements but the boom to support them can not be treated here. The shape of the cross section, its length, the loading, and its fabrication must be known. To build your boom, do two things. Use a lightweight section, aluminum, and make it deep in relation to its width. This will reduce sag and the chances of buckling. A shape similar to an "I" beam can be made by bolting two channel sections back to back. This is an excellent configuration.

Towers

Tubular towers are popular because of their simplicity. To use the next table (Table III) you must measure and then calculate the maximum cross-sectional area of the boom and each of the elements. Use the highest figure, either the boom or all of the areas of the elements added together. This area should be in square feet.[2]

[1] For comparison, typical yield strengths in pounds per square inch are as follows: 6063-T6 — 25,000; 6061-T6 — 35,000; 2024-T4 — 44,000; steel — 20,000 to 60,000; oak — 1800; Douglas fir — 1400; pine — 100.

[2] See Abraham, "Guys for Guys Who Have To Guy," *QST*, June, 1955.

TABLE II

Length (feet)	Tubing Diameter (In.)						
	⅜	½	¾	1	1½	2	3
4	0.4						
5	1.0	0.6					
6	2.0	1.2	0.5				
7		2.3	1.0	0.5			
8		3.6	1.7	0.9	0.4		
9			2.7	1.5	0.7	0.4	
10			4.1	2.3	1.0	0.6	
11				3.4	1.5	0.9	
12				4.7	2.1	1.2	0.5
13					3.0	1.7	0.7
14					4.0	2.3	0.9
15					5.2	3.0	1.3
16					6.8	3.9	1.7
17					8.6	5.0	2.2
18					10.8	6.2	2.7
19					13.5	7.8	3.4
20						9.6	4.1
21						11.6	5.0
22						14.0	6.1
23						16.8	7.3
24						19.9	8.6
25							10.1
26							11.8
27							13.9
28							16.0
29							18.3
30							21.0
31							23.8
32							27.2

Sag (in inches) of aluminum tubing of average wall thickness under no external load, supported at one end, measured at the other.

The wind blowing against this artificial area exerts a force along the top of the tower. The maximum force a tower can sustain for various conditions and factors of safety will be found in Table III.

One assumption was made; the towers are assumed to be guyed at two places, at one third and at two thirds of their height. This leaves the top third of the tower unguyed.

The force exerted by the wind is most important. The *weight* of the beam and rotator are negligible loads when there is no wind. It is doubtful if any tower has collapsed because of excessive *weight* being placed at the top.

To use Table III, multiply the area (in square feet) by 10 for a 50-m.p.h. wind, or by 22.5 for a 75-m.p.h. wind. This will give you the wind load in pounds. Choose an alloy, tubing size, wind velocity, tower height and safety factor. Then the number in the table must exceed your calculated one to be safe.

All of the tables are for aluminum. What about steel? Steel elements of the same dimensions will weigh about three times as much as aluminum tubes. So it boils down to the fact that steel elements should be about 25 per cent shorter than those listed in Table I.

Table II lists the sag of tubes. Steel tubes will sag an equal amount because although the elasticity of steel of the same dimensions is about one third that of aluminum, its weight is about three times that of aluminum. If they are not as strong as aluminum they will sag even more. One interesting thing is that a smaller wall thickness in a given tube size will sag less than a thicker-wall tube! Of course, it won't be nearly as strong in a wind.

Table III is concerned with maximum wind loadings of towers. Steel towers will support more or less wind loading in direct proportion to the differences in the yield strength of the steel and the aluminum alloys. The actual weight of the beam and rotator are of minor consequence. Almost any tube of reasonable size will support the heaviest beam in a calm, and so no further maximum top-weight loading calculations were made.

Aluminum Classification Systems

In the early days of the aluminum industry, when the effects of alloying elements were just beginning to be exploited, a classification system was evolved. This system relegated the various types of alloys to a number series so that the knowing purchaser could tell from the alloy type the principal alloying element. In the course of time, this method became outdated because of the newer alloy developments. Some of these new alloys had no logical place in the tables, some old ones were modified, and others lapsed into obsolescence. Further, new concerns preferred their distinctive numbering systems (R317, Reynolds, or K399 for Kaiser, etc.) for the publicity value.

At an ever-accelerating pace, therefore, the old designations became confused and meaningless. The Aluminum Association, composed of industry representatives, adopted a new system of classification which is supposed to infuse new life into the old idea of meaningful trade designations for aluminum alloys. Here is how it works.

Each alloy has a four-digit number. The first digit represents the principal alloying agent. The second indicates the number of times the alloy

(*Continued on page 154*)

TABLE III

Alloy	Diam. In.	Tower Height (Ft.)					
		*30		*50		*75	
6063-T6	¾	2.1	1.4	1.3	0.8	0.8	0.5
	1	4.3	2.5	2.7	1.8	1.7	1.1
	1½	17.7	11.9	11.2	7.4	7.1	4.7
	2	46.1	30.8	28.8	19.2	18.5	12.3
	3	143.0	95.1	89.5	59.6	57.2	38.2
6061-T6	¾	2.9	1.9	1.8	1.2	1.1	0.8
	1	6.1	4.1	3.8	2.5	2.4	1.6
	1½	25.0	16.7	15.6	10.4	10.0	6.6
	2	64.5	43.0	40.4	27.0	25.8	17.2
	3	200.0	133.0	125.0	83.5	80.0	53.4
2024-T4	¾	3.7	2.5	2.3	1.5	1.5	1.0
	1	7.7	5.1	4.8	3.2	3.7	2.0
	1½	31.4	21.0	19.6	13.1	12.6	8.4
	2	81.1	54.1	50.8	33.8	32.5	21.6
	3	252.0	168.0	157.0	105.0	100.0	67.2
Safety Factor		2	3	2	3	2	3

*Top one third of tower is unguyed.

The maximum force (in pounds) an unguyed section of tubing of constant cross section can withstand when rigidly held at one end, the force being applied to the other perpendicularly to the axis.

Who's Afraid of a Receiver?

BY BYRON GOODMAN,* W1DX

• There is a growing tendency these days to accept a communications receiver as a strange piece of complicated gear with "innards" no one but a man from Mars should touch. W1DX diagnoses this condition as "receiverphobia" and tells why and how to avoid catching it.

THE SAD ungrammatical answer to the above question is "Too many." Ask the hams of any representative group how many of them ever dig into their receivers for any reason whatsoever, and you're likely to find that most of them are literally scared to death of the mere thought of action. This isn't just an idea we're pulling out of the air; be perfectly honest about it and you will admit we're describing the situation as it is.

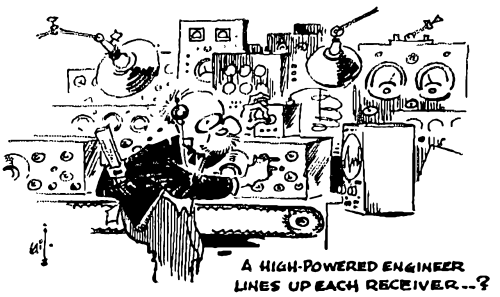
Perhaps you're beginning to wonder why anyone should want to touch a receiver. After all, a good receiver should be in top working condition all the time, shouldn't it? Phooey! Why should it? Even the best receivers can stand touching up from time to time. Years ago the author was visiting a W2 friend of his who claimed he had a good location for 7-Mc. DX but it was no good for 14 Mc., and he had the cards to prove it. This we had to see, because it just didn't make sense. Listening around on the two bands did indeed show a marked difference in the way the bands sounded; 40 was "hot" and 20 was dead. The W2 was a sharp one, and even had a small antenna coupler between antenna and receiver. When asked if he had checked the front-end alignment on 20, our friend replied that the receiver trimmers were sealed and the guarantee would be void if he broke the seal. (You old timers will recognize the receiver.) As we took leave of our friend we went out on a limb and said, "Break the seals, align the front end, and watch 20 come alive." A few days later we got a card from him, admitting he had screwed up his courage, broken the seals and aligned the front end on 20. Our pal concluded by enumerating the several new countries he had worked on 20 (including a couple *we* could have used nicely!)

One more fr'instance. Less than a year ago a friend built a new preselector which he connected ahead of a current model of a good receiver. Our friend was lavish in his praise of the preselector's performance, claiming that 10- and 15-meter signals practically inaudible on the straight receiver were loud and clear when the preselector was hooked in. We couldn't believe the receiver was *that* bad, so we asked him to check the front-end alignment on 10 and 15. The subsequent red-faced report was that the preselector didn't do as much good as he thought; the receiver front end had been out of adjustment.

But if you had wanted the story of somebody's life you would have bought a copy of *True Confessions*. You want to know about receiverphobia. We just threw in the examples to show how two hams, who weren't afraid to tackle their receivers, avoided holding to erroneous conclusions about frequency-sensitive locations and superlative preselectors.

Let's examine the possible causes of receiverphobia and then talk about cures and the benefits of shaking off the affliction. What's so sacred about a receiver? Why shouldn't any ham worthy of the name tackle a receiver as readily as he will a transmitter? For one thing, many operators are afraid to touch a receiver because they're afraid they'll spoil the dial calibration. (This is the same dial calibration they grouse about because it isn't accurate to 100 cycles!) Then there is the fear that the receiver will be thrown so far out of alignment that no one would ever be able to put it back. And, last but not least, there is the ham who throws up his hands on the basis that "the thing is just too darned complicated." We're not talking about making any extensive receiver modifications, so the old it-will-lose-its-resale-value argument doesn't apply.

Let's examine these "reasons" for not touching a receiver. Do you think some high-powered engineer lines up every receiver at the factory?



Of course not. It's someone who was taught the job, and chances are he or she knows very little about receiver theory and design. He or she merely follows a set routine, not at all unlike the alignment procedure outlined in most instruction books. Throw the receiver too far out of alignment? You could only do that by changing something very drastically, not by twisting a few trimmers. After all, most receivers coming off an assembly line are not close to alignment, except through chance or a complicated system of subassembly testing. Production receivers have to be brought into line by the hired hands mentioned above.

As for the last argument, "complicated" is a relative term. A hand-cranked phonograph is

* Asst. Technical Editor, *QST*.

sheer magic to a native of OQ5, but it is only a curiosity to any high-school student who has his room cluttered up with hi-fi gear. Sure, a modern receiver looks complicated to someone with no electronic background, but it uses tubes and components quite similar, except in size and shape, to those used in a transmitter. The wiring diagram is really no more complicated than that of a modern band-switching transmitter; the sad truth is simply that most of these schematics are laid out so poorly that they look ten times more involved than they really are. We don't suggest that the manufacturer does this deliberately to justify some of the current prices; we suspect that worrying about clarifying the schematic in the instruction book is merely considered an unimportant waste of time. If so, it's too bad, because we might have a more technical breed of ham if things were made a little easier for him at the start. If the schematics were laid out with fewer long leads running all around the drawing, and each stage were set off just slightly from the others, a tyro would have considerably less trouble following the signal through from antenna to output. And surely some of the switched circuits could be less complicated-looking! Granted it takes some planning to organize a schematic so that it is relatively easy to follow, but it would be a big help to newcomer and old timer alike.

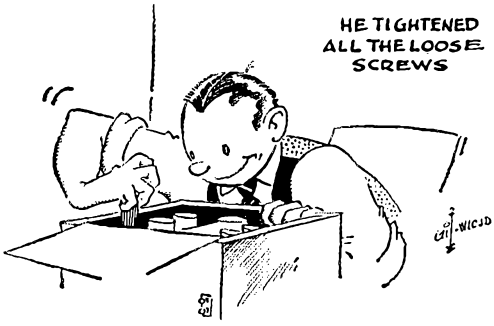
The Solution

There are two ways you can go about ridding yourself of receiverphobia. The long, but more satisfying, way is to learn what makes receivers tick. Find out from various texts just what superheterodynes are, the principles behind them, and some of the variations (single and multiple conversion, various detectors). Learn to visualize what is happening in your receiver[1] as you tune across a signal; pay no attention to what the signal is saying, at least while you're analyzing receiver operation. Visualize the actions of the controls as you observe the effects, and if you don't know the answers, go back to the texts.

But maybe you have only 60 or 70 more years to live, and you would like a short cut to curing your receiverphobia. OK, take the plunge. Lift the lid! Don't touch anything yet; just dig into the instruction book and find the section where it talks about alignment. From the diagrams in the book and the lid-up receiver, locate a trimmer adjustment on an i.f. transformer. Check to make sure you have an alignment tool (insulated screwdriver or wrench). If you haven't, go out to a radio store and get one. Turn on the receiver and tune in a signal. Check the location of that i.f. trimmer adjustment against the book just once more, grit your teeth, and *turn* the adjustment a little! Nothing real serious will happen, except that the signal you had tuned in may get a little weaker (or stronger). You will find that you can peak a signal or drop it down by your adjustment of the i.f. trimmer.

[1] As described in McCoy's, "Let's Listen," *QST*, March, 1953.

This is the same sort of operation you perform when you peak the drive in your transmitter, but this is a *receiver* and you've taken the big step. (Don't fool with crystal filters unless you know your stuff; they can be tricky.) And don't be like one fellow we heard of; his receiver wasn't working too well so he tightened all of the loose screws, most of which were trimmers!



Again referring to the instruction book, read about front-end alignment and repeat the experiment. You will find that trimmers on the r.f. and mixer circuits change the signal strength, while oscillator trimmers change the tuning and, consequently, the dial setting for a given frequency.

Checking Performance

One point that bothers many amateurs, and rightly so, is how to determine when their receivers have deteriorated in performance. To some extent the ability to spot such things depends upon how much you want to learn about receivers and what happens inside them, but we can pass along a few simple checks and you can be your own judge as to whether or not you want to do something about them.

Take the matter of hearing the weak ones. This is described by hams as "sensitivity" or "signal-to-noise ratio," but it means "hearing the weak ones." If your receiver has an antenna trimmer, as most of the current models do, the increase in noise you hear as you swing the trimmer through resonance (with the antenna connected) is a pretty fair measure of how good the front end of the receiver is. If you're in a noisy (electrically) location, the front end doesn't have to be as good as it does in a quiet location, because the local electrical noise is the limiting factor. Suspect the front-end alignment of your receiver if the noise doesn't peak up with the antenna trimmer the way it did when the receiver was new.

Many owners of two-dial complete-coverage receivers align the front ends of their receivers *in the ham bands* as soon as they get their receivers, to insure that the best performance is available where it will do the most good. In most cases this ham-band alignment will not be the same as that described in the instruction book, but all it involves is touching up the trimmers on the r.f. and mixer coils when the receiver is tuned to the center of the ham band for which the band switch is set, with the antenna connected. Refer to the instruction book for the trimmer locations;

don't touch the oscillator trimmer unless trimming the mixer pulls the receiver badly off calibration.

If the ham band falls at the high-capacity end of the band-set capacitor, as is true of the 20-meter band on a number of receivers, the trimmer capacitors shouldn't be touched. Instead, pull the r.f. and mixer coils into line by adjustment of the tuning slugs, if there are any. If there aren't any, you will need a "tuning wand" to check alignment at the low-frequency end of a range. This is an insulated rod with a brass sleeve at one end and a powdered-iron slug at the other. Pushing the brass end in or alongside the coil lowers the inductance, and bringing the iron end near raises the inductance. If bringing either end of the wand near the end of the active r.f. or mixer coil increases the strength of an incoming signal, it indicates that the circuit is not peaked for that frequency. In this case you can change the inductance of the coil by cementing a closed copper loop or a bit of powdered iron slug at an appropriate distance from the coil. Obviously, you don't have to modify the inductance of the r.f. coil if it has an antenna trimmer across it, and probably the best addition to a receiver without an antenna trimmer would be such a trimmer. And, of course, trimming the inductance at the low-frequency end will require resetting the trimmer at the high-frequency end.

Checking frequency calibration is something every ham should know, and it shouldn't be necessary to point out that a 100-kc. crystal oscillator is a ham's best friend for this little task. You can bring a receiver into fair calibration on one of its ranges by bending plates on the oscillator tuning capacitor, but it's a job only for a guy with patience and confidence.

We've already mentioned i.f. alignment; you just peak the trimmers of the i.f. transformers for maximum signal. If the receiver has a crystal filter and you use the filter a lot, be sure that your test signal has been properly centered in the crystal filter before you touch up the i.f. trimmers. Do this by switching the filter in, the a.v.c. on and the b.f.o. off, and tuning slowly across a steady signal (a harmonic from your 100-kc. calibrator makes a good one) for maximum S-meter reading. If the receiver drifts or if the crystal filter is very sharp, it pays to "rock" the tuning a little while you touch up an i.f. trimmer. This merely means tuning back and forth through the peak to be sure that you are not slowly drifting off the peak.

If your receiver has no S meter, and you don't have a voltmeter that can be hung across the a.v.c. line temporarily to act as one, your only recourse is to turn on the b.f.o. and peak the i.f. trimmers by ear. Here again the "rocking" technique is suggested, to eliminate minor drifts of the oscillators.

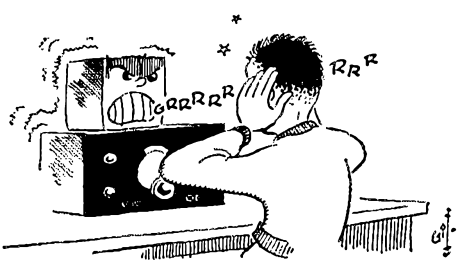
Receiver Faults

We won't attempt to kid you into believing that brand-new receivers don't have shortcomings, because some of them do. One has no right to expect an inexpensive receiver to do everything the expensive ones will. The inexpensive receivers have corners cut right and left, in an effort to bring the price down, but some of these omissions can be corrected by the owners. One fault you will sometimes find in the low-priced receivers is a change in frequency with a change in gain-control setting. This doesn't (or shouldn't) happen in a good receiver. Usually all it takes to correct it is to regulate the anode voltage on the high-frequency oscillator and the screen voltage of the mixer (they're usually the same tube element unless a separate oscillator tube is used). On occasions, the b.f.o. may also require voltage stabilization. If you have a receiver that has this characteristic of frequency change with change in gain, all it may need is the addition of a VR tube and dropping resistor of the right values. Check the receiver voltage chart for the proper value of applicable anode and screen voltages and use a VR tube that comes closest to the value. If, for example, the required voltage is 85, you can get it from a VR-105 and a suitable dropping resistor. If the receiver already has a VR tube and still exhibits the trouble, make sure that (1) the VR tube is lit and (2) the mixer screen voltage is regulated. (It isn't in all receivers.)

If the receiver seems to drift too much, you can try the dodge of propping up the lid, as pointed out in an earlier article.[2] Don't get any big ideas about putting in a compensating capacitor across the high-frequency oscillator, unless you want to run a long series of tests. The trouble with temperature compensation is that you have to find a spot in the set where the temperature varies in the same way that the frequency does. Since the temperature drift may be caused by thermal changes in several components, you can see how tough your chances are of finding the magic spot. Shoot for reducing the temperature rise; your hair will stay dark longer.

Hmmmm — Hum

Some of the inexpensive receivers have a little too much hum in the audio. This might be lack



SOME RECEIVERS HAVE A LITTLE TOO MUCH HUM...

of filter in the power supply, so the first and most logical thing to try is another 20 μf. across the power supply. However, usually life isn't

(*Continued on page 158*)

[2] Goodman, "Getting the Most Out of Your Receiver," *QST*, Jan., 1954.

Simplified Design of Impedance-Matching Networks

In Three Parts — Part III, Some Special Applications*

BY GEORGE GRAMMER, W1DF

• **The concluding article of this series discusses the problem of loads that can vary over a range of impedances, and describes some useful applications of network principles.**

READERS who have followed the discussion in Parts I and II of this series should have no difficulty in perceiving that the same methods can be used to construct more complicated networks, whenever there is occasion for using something more elaborate than the L, pi and T. The L section is the building block in each case, and a great variety of circuits is possible. A few of the more useful arrangements are discussed below. First, however, it is necessary to say something about matching a range of impedances with a given network, the earlier discussion having been confined to the case where the load is a pure resistance of fixed value. The most important practical case is a pi-network tank circuit connected to a transmission line.

Load-Impedance Range

The input impedance of a transmission line will be a pure resistance equal to the line's characteristic impedance, Z_0, only when the line is perfectly matched at its output end. If there are standing waves on the line the input impedance may be reactive as well as resistive, and the resistance will not, in general, be of the same numerical value as the line Z_0.

In this application of the network the design limits for matching will be determined by the range of variation of line input impedance. This in turn is a function of the standing-wave ratio and line length. Considering the line input impedance to be represented by a resistance and reactance in parallel, as in Fig. 13, the extremes of resistance and reactance variation are given by the following table:

S.W.R.	*Min. X*	*Min. R*	*Max. R*
2 to 1	$1.3Z_0$	$Z_0/2$	$2Z_0$
3 to 1	$0.75Z_0$	$Z_0/3$	$3Z_0$
4 to 1	$0.5Z_0$	$Z_0/4$	$4Z_0$
5 to 1	$0.4Z_0$	$Z_0/5$	$5Z_0$

The reactance figures are rounded, but are close enough for design purposes. (The maximum reactance in this equivalent input circuit will be infinite — meaning, merely, that it can be ignored, since it is in shunt with the resistance.) The worst case, so far as compensating for reactance is concerned, is minimum X. It may be either inductive or capacitive.

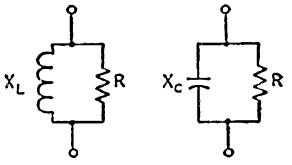


Fig. 13 — Parallel-circuit equivalents of transmission-line input impedance.

The first thing to find, then, is what the maximum s.w.r. will be. This may be a matter of the known characteristics of the antenna system, or an arbitrary limit may be set from other considerations such as line loss. Losses in coax will not be increased intolerably if the s.w.r. is as high as 3 to 1. From the table, the minimum shunt reactance will be $0.75Z_0$ for this s.w.r., and the load resistance will vary from $Z_0/3$ to $3Z_0$. In terms of 52-ohm line, for example, this means that the minimum shunt reactance presented to the output terminals of the network by the line will be $0.75 \times 52 = 39$ ohms, and that the resistance can be anywhere between 17 ohms and 156 ohms. The actual values in a given case will depend on the line length.

The reactance and resistance can be treated separately. If we eliminate the effect of the reactance first, we are then left with a simple resistance load, and this can be handled by the method described in Part II. Fig. 14 shows the two possible cases. If the reactive component of the line input impedance is capacitive, as at A, it is obvious that X_2 and X_C are in parallel; that is, the capacitance represented by the re-

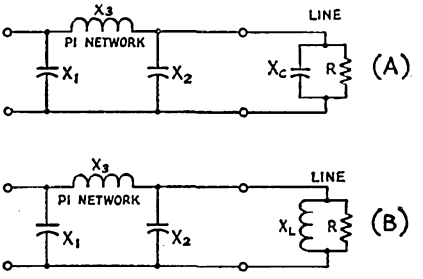


Fig. 14 — Equivalent circuits of line input impedance connected to output terminals of a pi-network tank circuit.

* Part I of this article appeared in March, 1957, *QST*, and Part II appeared in April, 1957, *QST*.

actance X_C adds to the capacitance of X_2. If the pi network has been designed to match R without considering X_C, the presence of X_C will destroy the match. However, this is handled quite easily by reducing the capacitance of X_2 until the total capacitance, both physically in the output capacitor of the pi network and inherently in the line input impedance, is equal to the proper design value. Provided the capacitance of X_2 is continuously adjustable from essentially zero to its maximum value, it will usually be possible to get complete compensation by simple adjustment of the pi-network output capacitance.

If the line input impedance is inductive, as in Fig. 14B, the effect is opposite to that just described — that is, the capacitance of X_2 must be increased to compensate. Actually, enough additional capacitance must be supplied to resonate with X_L at the operating frequency. This forms a parallel-resonant circuit that, in effect, removes X_L from the circuit. The total capacitance required in X_2 then is the original design value for matching R plus the additional capacitance needed to resonate with X_L.

The minimum capacitive line reactance to be expected with 52-ohm line and an s.w.r. of 3 to 1, 39 ohms, is equivalent to a capacitance of 1170 $\mu\mu$f. at 3500 kc. At this frequency, therefore, the actual output capacitance in use in the network will be reduced by 1170 $\mu\mu$f. from the value theoretically required for matching. On the other hand, if the line input reactance is inductive, 1170 $\mu\mu$f. will have to be *added* to the theoretical network output capacitance to compensate. In terms of actual components, the lower frequencies obviously present the most difficult case because low reactances mean large values of compensating capacitance.

The variation in the resistive component of the line input impedance affects both the series inductance and output shunt capacitance of the network. For a 3-to-1 s.w.r. the load resistance may vary over a 9-to-1 range. The extremes of this range call for quite different network values, particularly if a fairly wide frequency band such as 3500–4000 kc. must be covered. Using the earlier example of a tube requiring a 2000-ohm load, and assuming that the operating Q will be 12 at all frequencies, the inductive reactance values required in the network are 172 ohms for matching 17 ohms, and 210 ohms for matching 156 ohms. The corresponding inductance extremes at 4000 and 3500 kc., respectively, are 6.9 μh. and 9.5 μh., so the network inductance should be variable through this range. So far as the output capacitance is concerned, it can be shown that when the virtual resistance R is constant (that is, a constant-Q network) the reactance X_{P1} required for matching in the output L section reaches a minimum value equal to the load resistance when the load resistance is twice the virtual resistance (L-section $Q = 1$). Since the virtual resistance in the example is 13.8 ohms, the maximum output capacitance will be needed when the load is 27.6 ohms, which also is the value of reactance required. At 3500 kc., this represents a capacitance of 1650 $\mu\mu$f.

Fixed Tank Inductance

When a fixed value of inductance is to be used to cover a band it is necessary to resort to the formulas given in Footnote 9, Part II, for an exact solution. When the load as well as the frequency are subject to change it is not to be expected that the approximate method described earlier, for a constant load over a frequency band, will work as well, but it will at least serve as a starting point.

In the example above an inductance of 6.9 μh. obviously should be chosen, since this is the largest value that will work under all conditions at 4000 kc. and provide the minimum desired Q of 12. At 3500 kc. this inductance will have a reactance of 151 ohms. The assumption that Q will be inversely proportional to frequency requires Q to be 13.7 at 3500 kc. and makes X_{S1} 146 ohms, as shown in Part II. This is less than 151, but by such a small margin that it immediately suggests that a higher operating Q will be required, especially with load resistances toward the maximum end of the range where X_{S2} becomes larger. Calculation by the simplified formulas then becomes a matter of trial and error. The actual Q values turn out to be 14.1 when the load is 17 ohms and 16.8 when the load is 156 ohms.

On the whole, it seems desirable to make provision for adjusting the tank inductance values, since this makes for greater flexibility in impedance matching and offers better control over the operating Q. If the inductance cannot be made continuously variable between the limits required for the extreme cases, provision should at least be made for two or more fixed values when attempting to cover a wide band such as 3500–4000 kc.[10] On bands where the width is only a small percentage of the center frequency the problem is of course considerably less difficult. In any case, it is taken for granted that the input and output capacitances will be continuously variable.

The problem of matching a wide range of load impedances over a band of frequencies can be simplified considerably if the network is designed for a fixed value of pure resistance as a load, and then steps are taken externally to make sure that the load presented to the network is the design value. This means that if the actual load is something else, a special matching circuit is inserted between it and the pi-network tank so the tank sees the load it should. The idea is fundamentally the same as that of using a 115-volt lamp on a 115-volt circuit, instead of trying to make the circuit handle all lamp ratings from, say, 32 volts to 230 volts. In other words, you don't have to rebuild the transmitter when you try out a new antenna system.

[10] The writer has used a small tapped auxiliary coil for providing relatively fine adjustment of inductance, with a separate switch, where a large number of taps on the main tank inductance was inconvenient.

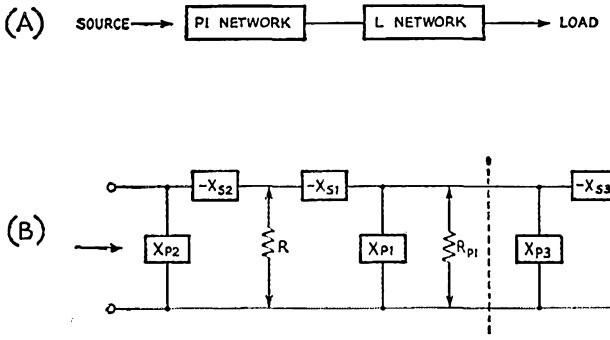


Fig. 15 — The pi-L network. The block diagram at B shows the circuit broken down into its L-section components.

The Pi-L

Adding an L section to a pi-network tank circuit increases the flexibility of the system in handling loads varying over a range of impedances and also adds to the selectivity. This combination has been used in commercially built transmitters (e.g., the Collins 32V series) and has the fundamental form shown in Fig. 15A. It may be broken down into three L networks, two of which constitute the pi network as shown in Fig. 7, Part II (the same notation for components is used here).

The third L is to the right of the dashed line in Fig. 15B; as shown here it is a step-down network looking toward the load. R_3, but a step-up network could be substituted if desired. Each of the three L sections would be designed according to the principles previously outlined, keeping in mind the relationships that must be satisfied between the values of the various resistances, real or virtual.

In Fig. 15B there are two virtual resistances, R and R_{P1}, the actual load resistance being R_3. Suppose that R_3 is 52 ohms, and that the whole network is to be used under the same conditions as the example considered in Part II — i.e., to present a 2000-ohm load to the final amplifier tube. In this case a desirable value of tank Q no doubt would be a determining factor, so let us assume that the design value of Q again will be 12. As described earlier, this immediately sets the value of the virtual resistance R, hence X_{S2} and X_{P2} also would have the same values as in the previous example: R = 13.8 ohms, X_{S2} = 166 ohms, and X_{P2} = 167 ohms.

The network between R and R_3 is obviously a T with a virtual resistance R_{P1}. It was shown in Part II that this resistance must be higher than either of the resistances, R and R_3, being matched. R_3, 52 ohms, is higher than R, so R_{P1} must be larger than 52 ohms if a match is to be possible. Any value larger than this may be selected. If selectivity is the important consideration, a moderately high value of Q will be desirable in one or both of the L sections formed by $X_{S1}X_{P1}$ and $X_{S3}X_{P3}$. We may arbitrarily select a Q (Q_1) of 5 for the $X_{S2}X_{T2}$ network. Then

$$X_{S1} = 5 \times 13.8 = 69 \text{ ohms}$$

from Equation 3B, and from Equation 2A

$$R_{P1} = 13.8\,(25 + 1) = 359 \text{ ohms.}$$

Then from Equation 2B

$$X_{P1} = \frac{359}{5} = 72 \text{ ohms.}$$

Thus 52 ohms (R_3) must be matched to 359 ohms (R_{P1}) through X_{S3} and X_{P3}. Following the same method, the Q (Q_3) of this network is (Equation 5)

$$Q_3 = \sqrt{\frac{35}{52} - 1} = \sqrt{5.9} = 2.43.$$

Hence from Equation 2B

$$X_{P3} = \frac{359}{2.43} = 148 \text{ ohms,}$$

and from Equation 3B

$$X_{S3} = 2.43 \times 52 = 126 \text{ ohms.}$$

Broken down into these components, the complete network is shown in Fig. 16A, where the reactance signs again mean nothing more than

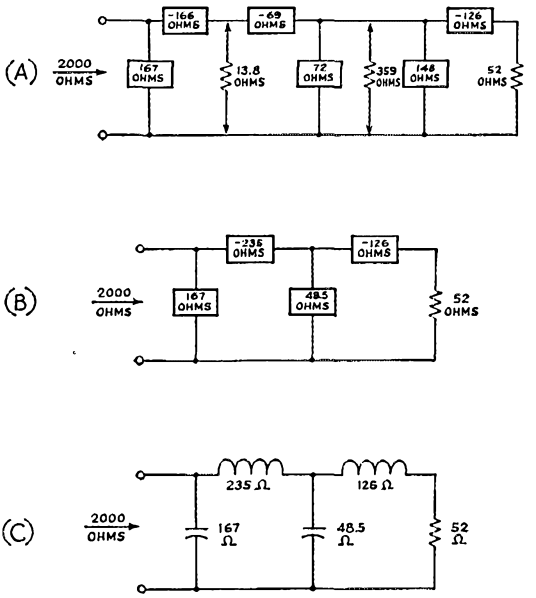


Fig. 16 — Pi-L network example discussed in the text.

that opposite kinds of reactance must be used in each L network. The various physical circuit combinations that are possible can be appreciated by visualizing the output L section in either of its two forms — series inductance and shunt capacitance, or series capacitance and shunt inductance — combined with each of the four forms of the pi network shown in Fig. 9, Part II. However, since it was assumed that the L section was being added primarily for additional selectivity, particularly against harmonics of the operating frequency, the probability is that it will consist of shunt capacitance and series inductance. Added to the pi network using similar shunt and series arms, the final appearance of the network would be as in Fig. 16C.

In Part II it was stated that if the tank inductance — that is, the series arm — of the pi network has a fixed value for a given band, matching can only be effected between two given values of resistance by varying the operating Q of the network. If the output inductance of the pi-L is adjustable, the operating Q can be held constant throughout a band even though the pi-section inductance is fixed. This is because the virtual resistance R_{P1}, Fig. 15B, may be varied at will, so long as it is larger than either R or R_3. Thus in Fig. 16 the pi-section inductive reactance of 235 ohms will represent an inductance of 10.7 μh. at 3500 kc. At 4000 kc. the same inductance will have a reactance of 268 ohms. Of this, 166 ohms will represent the series inductance of the input L of the pi section, for constant operating Q, so the remainder, 102 ohms, is the series inductance X_{S1} of the output L of the pi section. This leads to a new value $102/13.8 = 7.4$ as the Q (Q_1) of this L section and a corresponding value of 770 ohms for the virtual resistance R_{P1}, instead of the 359 ohms shown in Fig. 14. The new values of X_{P1}, X_{P3}, and X_{S3} may readily be calculated from this.

Note that a variable inductance is still required for working over a range, just as in the case of the plain pi network discussed above (this example considers only a frequency range, but similar considerations apply where the load can vary). In the pi-L the variable-inductance element merely may be transferred out of the pi. This is exactly the same thing as the "external" network suggested in the discussion of matching a range of impedances with the pi.

Balun Networks

A common problem is that of matching a balanced or push-pull load to an unbalanced or single-ended source of power. A balanced load, in usual nomenclature, is one having its outside ends equally "hot" (but in opposite phase) with respect to a center point which in the ordinary case may be grounded. We may consider such a load, assuming it to be resistive only, as consisting of two identical resistances in series, each having a value of one-half the total resistance.

Thus Fig. 17A shows a 600-ohm load divided into two 300-ohm sections connected together at Z. If the load is supplied from two d.c. generators each delivering, say, 100 volts, then the potentials

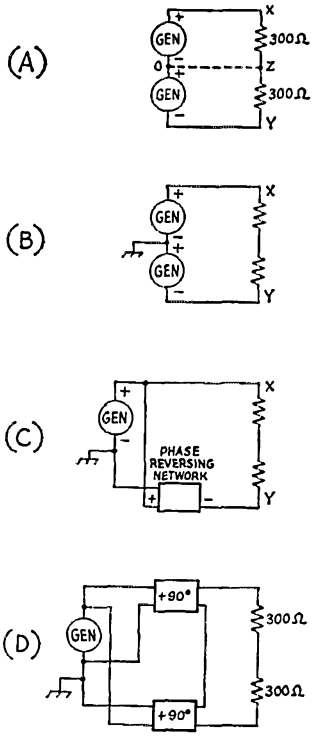


Fig. 17 — Development of the balun network.

at points X and Y will both differ from that at Z by 100 volts. With the polarities as shown, X will be positive and Y will be negative with respect to Z. *As viewed from* Z, this is equivalent to saying that the voltages at X and Y are 180 degrees out of phase, although they are acting in series around the circuit as a whole.

Since the two generator voltages are equal and so are the two resistances, points Z and O are at the same potential. Hence a connection as indicated by the dashed line may be made without disturbing the operation of the circuit.

With this as background, imagine the two 300-ohm resistors in Fig. 17 to represent the input impedance of a matched transmission line. Z is a "neutral" point, and may be taken to be at ground potential if the line itself is reasonably well balanced to ground. When this is so two equal-voltage generators, each having one terminal grounded, can be used to supply power to the line, provided their voltages are out of phase when viewed from the ground point (Fig. 17B). As an extension of this idea, both sides of the line could be fed from a single generator by connecting one side directly to the generator and feeding the other through some sort of network, such as a transformer, that would reverse the phase or polarity without changing the voltage. This arrangement, shown in Fig. 17C, has a fixed 4-to-1 impedance ratio since the voltage that is applied to the load cannot be other than twice the generator voltage.

For maximum flexibility the arrangement

shown at Fig. 17D can be used. There are two networks in this circuit, one for each side of the line. Each provides a 90-degree phase shift, but in opposite directions, so that the total is the necessary 180 degrees. In addition, each network can be designed to give a voltage step-up or step-down — i.e., to match any desired impedance values — along with the proper phase shift. The same impedance ratio must be used in both networks, of course, since the load is balanced. The pi network lends itself nicely to this application.

The question of phase shift through a network has not been considered up to this point, since it is unimportant in the types of applications discussed earlier. It does not in fact require any extended discussion here, even though it is important in the balun, because the case of interest — the one where a plus or minus shift of 90 degrees is obtained — is a quite simple one. In the pi network a phase shift of 90 degrees results when the maximum value of reactance that will provide a match between two resistances is used in the series arm. This value of reactance is equal to the geometric mean of the two resistances to be matched — that is,

$$X_S = \sqrt{R_1 R_2},$$

where R_1 and R_2 are the two resistances. In this case also the shunt arms X_{P1} and X_{P2} have equal reactances of the same absolute value as X_S, but of course of the opposite type. There will be a lagging phase shift through a pi network having series inductance and shunt capacitance, and a leading phase shift through one with series capacitance and shunt inductance.

Suppose that the 600-ohm balanced line is to be matched to a 52-ohm coaxial line. Using the basic arrangement of Fig. 17D, there will be two networks, operating in series insofar as feeding the balanced line is concerned. Each network

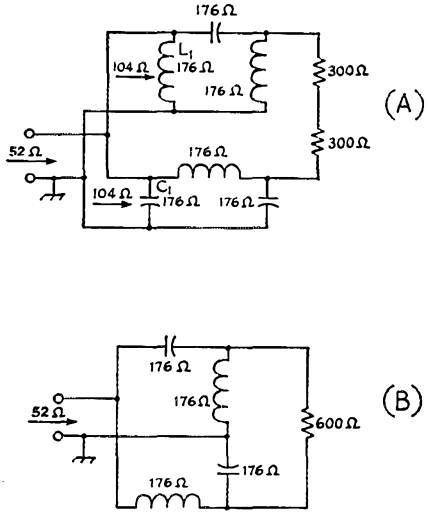


Fig. 18. A — Circuit elements in the balun. B — Actual circuit after eliminating the parallel-resonant circuit formed by L_1 and C_1.

therefore will see a 300-ohm load. On the input side the generator must see a 52-ohm load. What it actually sees is the two networks connected in parallel, so each network must have an input resistance of 104 ohms. Thus each network must be designed to match 300 ohms to 104 ohms.

The circuit configuration that this leads to is shown in Fig. 18A. The reactances required in each network for a match are

$$X = \sqrt{300 \times 104} = \sqrt{31200} = 176 \text{ ohms.}$$

Note that L_1 and C_1 are in parallel, and since they have the same reactances they form a parallel-resonant circuit. Such a circuit has infinite impedance (this is not strictly true if there are any losses in the coil and capacitor, but in actual applications of this circuit it is practically so if the circuit elements are reasonably low-loss) and this being the case, these two components can be lifted out of the circuit without change in its operation. This leaves the relatively simple configuration shown in Fig. 18B.

Pi networks using this design have the minimum possible operating Q (the actual value of Q will vary with the ratio of the resistances to be matched) and so have maximum band width. A balun circuit having fixed values of inductance and capacitance will work well over an entire amateur band if it is designed for the band center and if the actual load (transmission line input impedance) remains resistive and constant over the entire band. It is unfortunate that a practical transmission-line load is seldom that accommodating.

Not-So-Obvious Forms

A few fairly familiar coupling circuits have the interesting characteristic of appearing to be one thing and actually operating like something else. An example is the antenna input circuit on some military receivers such as the BC-348 series where a small variable capacitor was used for coupling adjustment between a low-impedance line and the grid circuit of the first r.f. tube. This looks like a rather makeshift method that could not possibly come close to giving maximum power transfer. Actually it is a form of L network and is capable of providing a quite good match.

The essentials of the circuit are shown in Fig. 19A. L_1C_1 is a circuit capable of being tuned to and around the operating frequency, while C_2 is a variable capacitor having a relatively small maximum capacitance. When L_1C_1 is tuned exactly to the operating frequency it will have a purely resistive impedance of some tens of thousands of ohms, if the circuit losses are low. The impedance Z, looking into the input terminals, is simply the combination of this resistance and the reactance of C_2 in series.

However, if L_1C_1 is *not* tuned to resonance but is tuned off on the low-frequency side, its impedance can be represented by a resistance and inductive reactance in parallel, as shown in Fig. 19B. This will be recognized as an L net-

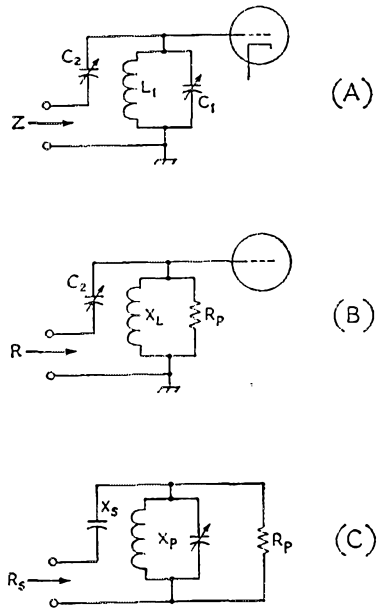


Fig. 19 — Reactance adjustment making use of the properties of a tunable circuit of parallel inductance and capacitance near resonance.

work, and the matching possibilities should immediately be apparent. The inductive reactance, X_L, and equivalent parallel resistance, R_P, of the circuit are both varied by adjustment of C_1. The reactance of C_2, also adjustable, is the series arm of the L network, and so proper adjustment of both C_1 and C_2 will bring about an impedance match between the "tuned" circuit and a low-impedance line. Thus maximum power will be taken from the line when L_1C_1 is not tuned to resonance.

The device of using a parallel LC circuit to obtain smooth variation of inductive reactance can be and has been used in transmitting circuits. In Fig. 19C the LC combination is merely an adjustable X_P, using the notation of Part I for the L network. X_S would be computed in the usual way. For X_P it is only necessary to provide a parallel circuit capable of being tuned through resonance at the operating frequency. Since there will be circulating current in this circuit and consequent higher internal loss than if a simple inductance of the proper value were used, it is advantageous to use a high-Q coil and a high L/C ratio. However, the efficiency is always less than with the simple inductance, if equally good coils are used in both cases.

Conclusion

The design methods that have been described are essentially simple and, once the physical principles by which impedance transformation takes place are thoroughly understood, can be applied without recourse to books or other references if the one basic relationship is kept in mind: The equivalent parallel resistance of a circuit containing resistance and reactance in series is equal to the series resistance multiplied by $(Q^2 + 1)$. Everything follows from that, by elementary algebraic manipulation. You have to know the definitions of Q and reactance, of course, but these are prerequisites for anyone who hopes to undertake the design of coupling circuits — or the design of radio circuits of any type, for that matter.

Strays

Here's the all-ham family of "Bubber" Born, W1ZD, who is director of ARRL's Southeastern Division. From left to right, K1GCF, W1ZD, K1GCT, K1KKU, and KN1KKT. For his organizational activities in amateur radio, W1ZD was recently given a special citation by the Edison Award Committee.

"Generalizing" the 6L6GB Novice Rig

Modulation and More Bands

BY LEWIS G. McCOY,* W1ICP

• Novices and others who have built the simple two-stage 6L6GB rig described in the January issue can easily modify it for phone work and operation in the 10- and 20-meter General-Class bands. This article shows how it's done.

As originally described in January, 1957, *QST*, the two-stage 6L6GB rig had provision for adding bands and a modulator. This article describes the additions needed to operate on 20 and 10 meters, and a modulator capable of plate modulating the transmitter at approximately 40 watts plate input.

Adding 10 and 20 Meters

The addition of 20 and 10 meters is simply a matter of making the correct tap connections to the grid and plate coils. The amplifier stage is run as a doubler on 10 meters, since there is insufficient excitation to operate the 6L6GBs as straight-through amplifiers on this band. This, of course, simplifies the modification as only one additional tap point (for 20 meters) is needed on the grid coil.

In the original unit, S_2 and S_3 are the band-change switches. They are both single-pole, 6-position switches with only three positions being used. In the grid circuit, the 20-meter tap on L_1 is 4 turns from the junction of L_1L_2. To prevent shorting to adjacent turns the 3rd and 5th turns are bent in toward the axis of the coil. This will permit access to the 4th turn for soldering on the 20-meter tap lead.

Of course, you can wire the 14-Mc. tap to any one of the vacant positions of S_2. However, to be consistent, it should be connected to a position between the 21- and 7-Mc. positions. Depending upon how the switch was wired originally, this may require shifting of some of the original connections.

If the switch was wired with 21 Mc. at the 1st position and 3.5 Mc. at the 3rd position, the 21-Mc. tap should be moved to the 2nd position, and the 7-Mc. tap to the 4th position. The new 14-Mc. tap should then be connected to the 3rd position. If a separate switch position is desired for 28 Mc. (so that S_2 and S_3 may be set to similar positions on all bands), the 1st and 3rd positions should be wired together with a jumper wire.

If the switch was originally wired with 3.5 Mc. at the 1st position and 21 Mc. at the 3rd, only the 21-Mc. tap need be moved — to the 4th position. The new 14-Mc. tap is then connected to the 3rd position, and the 3rd and 5th positions

*Technical Assistant, *QST*.

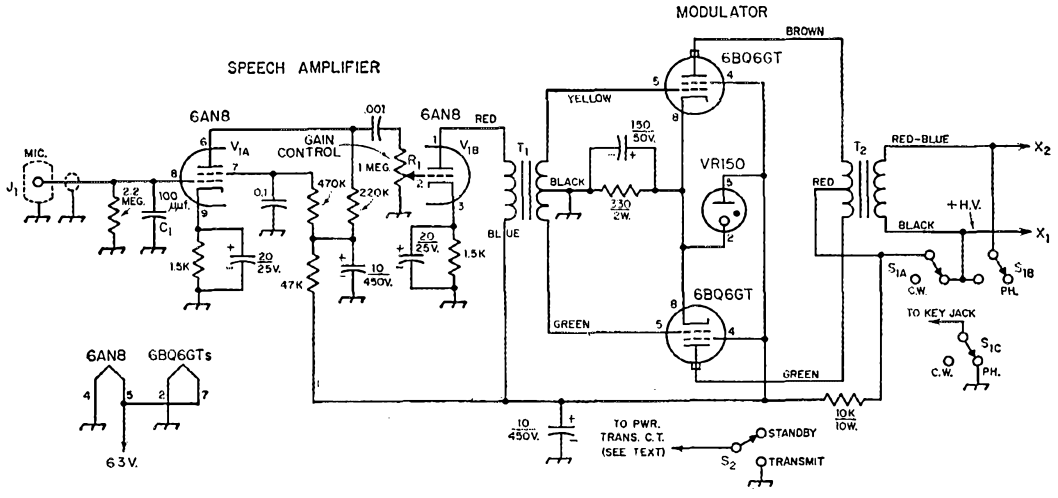


Fig. 1 — Circuit diagram of the modulator unit. All capacitors are in μf. except C_1. Capacitors marked with polarity are electrolytic; others may be mica, ceramic or paper. All resistors are ½ watt unless specified.

J_1 — Microphone connector (Amphenol 75-PC1M).
R_1 — 1-megohm volume control.
S_1 — 3-pole, 2-position wafer switch (Centralab 2507).
S_2 — S.p.s.t. or d.p.d.t. toggle (see text).
T_1 — Interstage audio; single plate to p.p. grids; pri. to total sec. ratio 1 to 3 (Thordarson 20A22).
T_2 — Modulation transformer; 10K primary, 3K secondary (Triad M3X).

wired together if a separate position for 28 Mc. is desired.

Similar procedure is followed with S_3 and the taps on L_5L_6. In this case, the 7-Mc. tap should be shifted to the 4th position, and the 21-Mc. tap to the 2nd position, the new 28- and 14-Mc. taps being connected to the 1st and 3rd positions, respectively. The tap points are:

20 meters, 3 turns from the junction of L_5L_6 on L_6.

10 meters, 2½ turns from the junction of L_5L_6 on L_5.

Modulator Circuit

The circuit diagram for the modulator is shown in Fig. 1. A 6AN8 pentode-triode is used in the speech-amplifier section. This setup provides adequate gain for the usual type of crystal or other high-impedance microphone. The output of the triode portion of the 6AN8, V_{1B}, is transformer-coupled to the grids of the modulator tubes — the 6BQ6GTs, which are operated in Class AB_1. Power for the unit is obtained from the power supply in the transmitter.

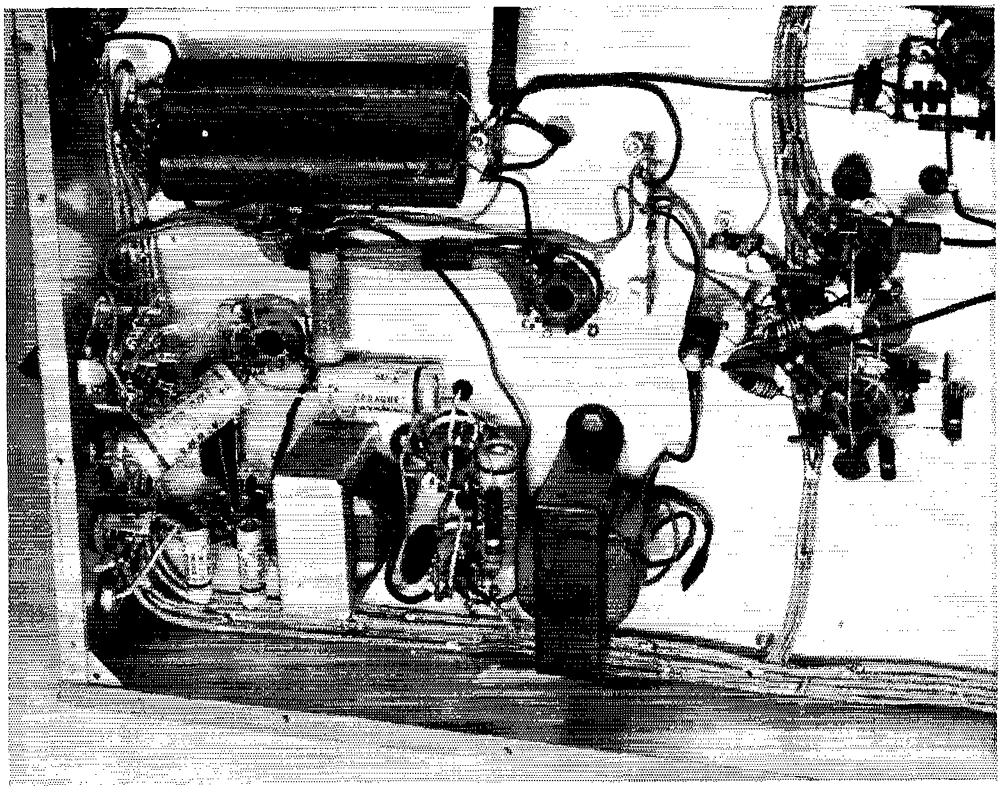
In the c.w. position S_1 disconnects h.v. from the modulator and shorts out the secondary of the modulation transformer. The latter is necessary to avoid undesirable keying transients. In the phone position, S_1 removes the short across the secondary of T_2, applies h.v. to the audio section, and shorts the key jack.

Modulator Construction

The photographs should be followed for layout details of the modulator section. As can be seen in the bottom view, the interstage and modulation transformers are mounted below the chassis. The microphone jack J_1 is mounted on the rear of the chassis, close to the 6AN8. The audio gain control and the phone-c.w. switch are also mounted on the rear of the chassis. There is space on the front panel between the power switch and dial lamp for S_2, the stand-by switch.

Modulator and Stand-By Connections

Referring to the original transmitter circuit, there is a point marked X just below RFC_5 and the 0.01-μf. 1000-volt capacitor. This point should be opened up and we will designate the power supply side as X_1 and the RFC_5 side as X_2. Now, looking at Fig. 1 of the modulator, the output leads should be connected to the similarly-designated points mentioned above. This puts the modulation transformer secondary in series with the power-supply output and the plates and screens of the 6L6GBs. Care should be used in selecting the proper secondary taps as indicated by the color coding in Fig. 1.



Bottom view showing audio components under the chassis. T_1 is to the left; T_2 to the right. The two 6BQ6GT sockets are between the transformers. The two large tubular capacitors above are in the original power-supply filter.

Rear view of the 6L6GB transmitter with the tubes of the modulator unit added. On top of the chassis, the 6BQ6GTs are behind the 6AN8 and the VR-150 regulator. Other components are in the power supply. Along the rear edge of the chassis, from left to right, are the microphone connector, key jack, audio gain control, phone-c.w. switch and a.c. power connector.

In the original transmitter circuit, the center tap of the power transformer is grounded. This lead should be disconnected from ground and connected to the lead to S_2. A standard insulated-terminal tie point can be used to anchor this connection. If a double-pole switch is used for S_2 the second pole can be used to control an antenna change-over relay. The two connecting leads from this pole can be carried to the rear of the chassis where there is sufficient space on the rear of the chassis to mount a 2-terminal strip. The leads between the terminal strip and S_2 should be run in shielded wire and bypassed with 0.001-μf. disk ceramic capacitors at the terminal-strip end. This will prevent harmonics escaping via this route.

Adjustment

Before applying power to the rig the wiring should be carefully checked to be sure no mistakes have been made. If an ohmmeter is available it is always a good idea to check the resistance between the h.v. line and chassis ground. In this unit, the resistance should be on the same order as the bleeder resistor in the power supply — approximately 50,000 ohms.

For phone operation, the power input to the final should be adjusted to about 50 watts, or a cathode current of approximately 125 ma. This, of course, will include the screen and grid currents which total about 25 ma., leaving a plate current of 100 ma. which, at 400 volts, gives a plate input of 40 watts. The total current drain of the modulator with no-signal input was approximately 70 ma. on the unit described here. Under modulation this current increased to about 110 ma. It is recommended that the builder study the modulation section of *The Radio Amateur's Handbook* to familiarize himself with procedures for checking percentage of modulation.

V.F.O. Operation

Several questions have been received from builders of the transmitter asking how to connect a v.f.o. to the rig. The answer will, of course, depend on the type of v.f.o. used. However, many of the commercial units come equipped with a plug designed to fit into the crystal socket of a transmitter. If this type is used, the v.f.o. can be connected to one of the crystal sockets but, in addition, a 0.01-μf. disk capacitor must be connected between the 6AG7 cathode and chassis ground. No other circuit changes are necessary. To return to crystal operation, the 0.01-μf. capacitor must be removed from the circuit.

Strays

The RSGB's London Members Luncheon Club continues to welcome visitors to its monthly meeting at the Bedford Corner Hotel, usually on the third Friday of the month. London visitors may check in by calling G2FUX at Ruislip 2763 or RSGB Hq. at Holborn 7373.

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FCC assigned a rather appropriate call to the new channel 2 TV station in St. Louis — KTVI.

Canadian Director VE2BE points out that effective April 1st, certain call sign changes went into effect for amateurs in Newfoundland and Labrador. Amateurs located in former Newfoundland districts 1 through 5 will now be assigned VO1 calls, all with two-letter suffixes. Amateurs in former Labrador district 6 will become VO2.

• Recent Equipment —

The Hallicrafters HT-32 Transmitter/Exciter

THERE was a time, not too many years ago, when many of the fence-straddling a.m. ops were promising all who would listen to them that they would give s.s.b. a try when someone put the whole thing in a package and made it easy to tune and to change bands. Admittedly, the HT-32 isn't the first commercial attempt at filling this large order, but it is hard to visualize an amateur worthy of the name who won't find the HT-32 a cinch to tune and operate, after a little time spent with the instruction book. But before the old-timers in s.s.b. start sneering that things are being made too easy, we hasten to point out that there are enough circuit innovations in the unit to keep even the sharpest pioneer interested. Some of these points will be discussed after the over-all picture has been displayed.

The HT-32 is a table-top package no larger than some of the current receivers, housed in a cabinet 10½ inches high, 20 inches wide and 16 inches deep. The output stage is a pair of 6146s that delivers 70 to 100 watts peak envelope power on s.s.b., 70 to 100 watts on c.w. and, if you insist, 17 to 25 watts on a.m. The amateur bands 80 through 10 meters (including 11) are covered.

Referring to the block diagram in Fig. 1, the basic s.s.b. signal is generated at 4.95 Mc. The modulating signal passes through a few stages of amplification and is then fed to the bridged-T balanced modulator. This is a new type of balanced modulator that will be discussed a little later. The double-side-band suppressed-carrier signal from the balanced modulator is then passed through two crystal filters which lop off one side-band. (Not shown in Fig. 1 is the circuit by passing the filters that is switched in when a.m. or c.w. operation is desired.) The 4.95-Mc. s.s.b. signal is then fed to the first mixer, where the signal is heterodyned to 9 Mc. By using the two possible oscillator frequencies at this point, the resultant side-band signal at 9 Mc. is either maintained or inverted, through this use of the McLaughlin selectable-side-band principle. The 9-Mc. signal is then fed straight through to the third mixer for 75-meter operation or it is heterodyned to an appropriate frequency in the second mixer. This appropriate frequency is one that will combine with the 5-Mc. v.f.o. to give the proper output frequency. For example, for 7-Mc. operation the 9-Mc. signal is heterodyned to 12.5 Mc. (beating against a 21.5-Mc. crystal). For simplicity in the block diagram, not all of the crystals used with the 6AB4 heterodyne oscillator are shown. Since the v.f.o. has a tuning range of only 500 kc., it is necessary to use five crystals to cover the 11- and 10-meter bands. The big advantage in a system of this kind is the constant tuning rate and practically constant stability; the v.f.o. is always in the same range (5.0 to 5.5 Mc.) and all other oscillators are crystal controlled. The constant tuning rate means that setting up "on frequency" in the 10-meter band is as easy as on 80. The tuning rate of the v.f.o. control knob is 20 kc. per knob rotation.

Following the third mixer, the on-frequency s.s.b. signal is amplified by a 12BY7 driver stage and fed to the parallel 6146 output stage. The grid and plate circuits of the driver stage are

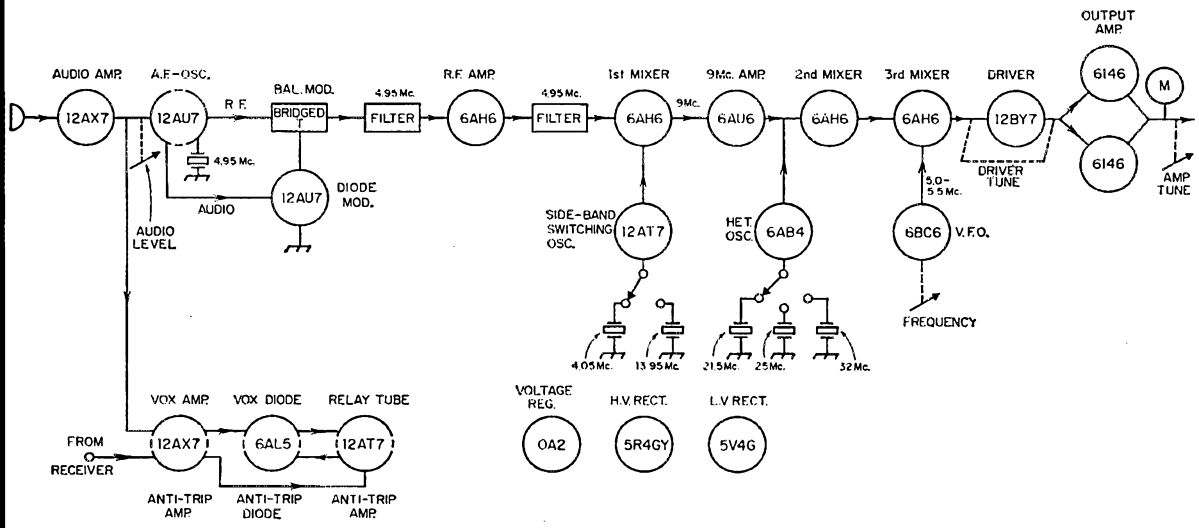
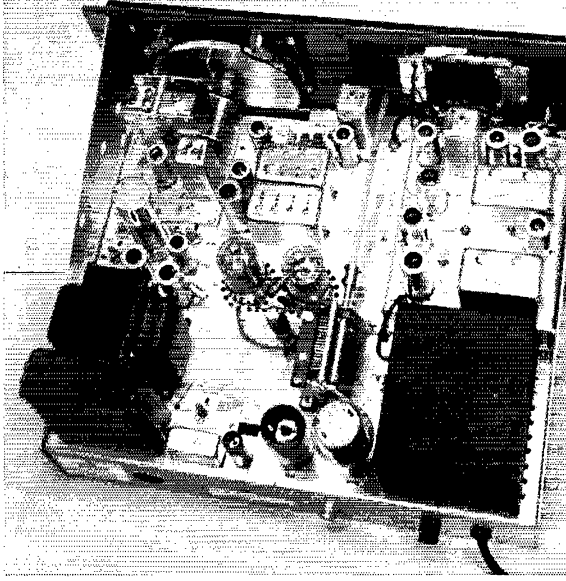


Fig. 1 — Block diagram of the HT-32 transmitter/exciter. The s.s.b. signal is generated through two crystal filters at 4.95 Mc.; then heterodyned several times for side-band selection and to permit use of a 5.0–5.5-Mc. v.f.o.



Normally the two 6146s and the output tuning capacitor (center) are covered by a perforated shield. The section along the right-hand side contains the speech amplifier and 1.95-Mc. side-band generator, and the second mixer section is at the center between the 6146s and the panel. The v.f.o. is at the left corner next to the panel.

gang-tuned, and the output stage uses a pi-network coupling circuit with only one control, the tuning control. If you're wondering what happened to the familiar loading control of the pi-network circuit, it is a fixed capacitor of suitable value that is switched in on each frequency range. It is designed to give proper loading of the amplifier when a 50-ohm load is used. Once you get over the shock of a transmitter with no loading control, you can see that the idea makes good sense. Many an operator sets up a linear amplifier (like this is) by "guess and by gosh," with no real confidence that he has it right. But with modern techniques in s.w.r. bridges, he can always get a 50-ohm load or at least tell that he has or hasn't a 50-ohm load. By presetting the load control in the HT-32 transmitter, the designers make it possible for any operator to tune up the rig in a hurry and with assurance, provided, of course, that a Micromatch, Monimatch[1] or other s.w.r. indicator is used. An r.f. output meter across the line is included in the HT-32, and this serves as a resonance indicator for the driver and amplifier tuning controls, as well as an output meter for monitoring the voice level.

The voice-operated control (VOX) picks off audio ahead of the audio level control, amplifies it and rectifies it. The resultant d.c. turns on a relay tube that closes a 3-pole d.t. relay. Anti-trip operation is obtained by connecting to the receiver audio, amplifying it through two stages and rectifying it. The resultant voltage is applied as a bias to the VOX diode. Potentiometers inside the unit are used to set the relative levels through the VOX and anti-trip channels and to set the hold-in time for VOX operation.

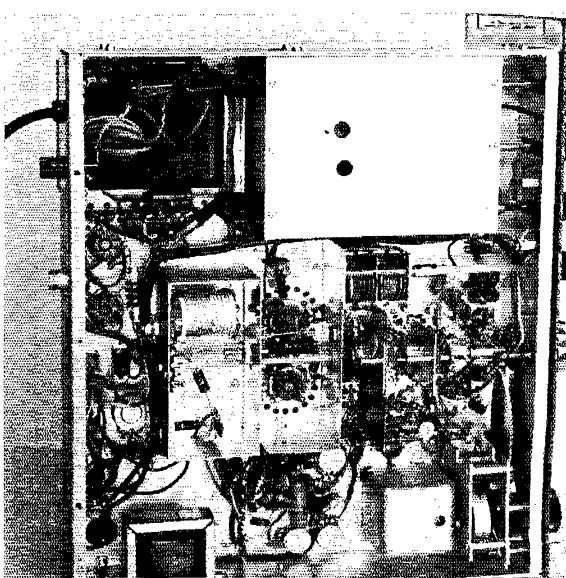
At a control outlet at the rear of the transmitter external connections can be made to the VOX relay for controlling an antenna relay, and for short-circuiting receiver audio. A voltage of −100 is available from the HT-32 for biasing a linear amplifier; taken from one terminal it is constant, and taken from another terminal it drops to zero during transmit periods. In the former case it can be used as operating bias for a Class AB_1 amplifier; the latter connection would be used to cut off an amplifier during receive periods. The −100 volts is taken through a 1-megohm resistor, so it can't be used as a "stiff" bias source.

Some remaining details of the circuit can best be explained while describing the panel controls. As already mentioned, the tuning controls are the v.f.o., the driver grid and plate (ganged), and the output amplifier plate. There is the audio level control (in the audio amplifier), and an r.f. level control (gain control on the 9-Mc. amplifier) that is used to set carrier level on a.m. and c.w. and to set the operating limits on side band. A calibrate level control sets the transmitter output level to a convenient value when "zeroing in" on a frequency. A six-position operation switch turns the primary power off and on and gives a choice of stand-by, manual operation, calibrate and VOX. The manual operation (MOX) position turns on the transmitter, and the calibrate position turns on the transmitter without closing the VOX relay and gives output at a level set by the calibrate level control.

The function switch selects upper or lower side band, a.m., or c.w. In the a.m. and c.w. positions the side-band filters are bypassed and the balanced modulator is upset (unbalanced) to let some carrier through. For c.w. operation the third mixer and the driver are grid-block keyed, giving a chirp- and backwave-free signal that will delight a code man's ear.

In this view a cover has been removed from the output stage inductor (center left). The two-gang capacitor tunes the driver grid and plate circuits.

A heavy flywheel on the v.f.o. tuning knob (lower right) gives a smooth feel to the control. The knob has an interpolation scale on it, and an adjustable dial drag/lock is provided for this drive.



[1] McCoy, "Monimatch, Mark II," *QST*, Feb., 1957.

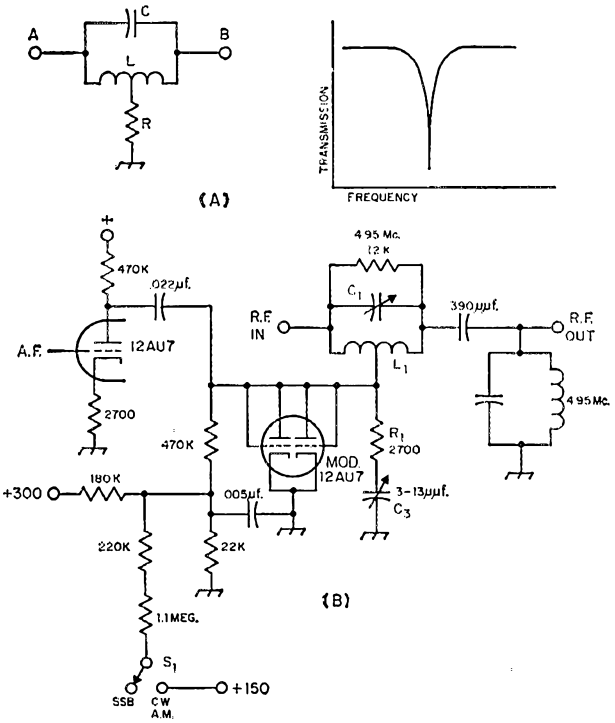


Fig. 2 — The bridged-T circuit is shown at A, together with the transmission properties between points A and B. When the value of R is equal to $\frac{1}{4}$ the resonant impedance of LC, the notch is a maximum, at the frequency determined by LC. Increasing or decreasing the resistance of R reduces the depth of the rejection notch. When used as a balanced modulator, LC is tuned to the (suppressed) carrier frequency and R is varied at the modulation frequency.

The practical circuit used in the HT-32 is shown at B. The modulator tube (diode-connected 12AU7) is made conductive by a small positive voltage on its plate. Part of the 180K dropping resistor is a thermistor that stabilizes the voltage on the diode. The diode resistance in parallel with the effective resistance of R_1 and C_3 is the R of Fig. 2A. The null is obtained by proper adjustment of C_1 and C_3. When audio is applied to the diode the effective resistance is changed at the audio rate and the balance of the bridged-T is upset at this rate. The 12,000-ohm resistor across L_1C_1 loads the circuit so that the impedance doesn't change too rapidly with adjustments of C_1. On c.w. and a.m. the balance is upset by switching in a different voltage to the diode.

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The microphone and key jacks are mounted on the panel, although the key leads can be taken off at the control outlet at the rear, if you're one who prefers to keep the key leads away from the front of the transmitter. A third jack, labeled "Monitor" (for reasons that escape us), provides headphone receiver output that will be cut off during transmit periods.

A Few Circuit Details

The crystal filters at 4.95 Mc. will be of interest to the side-band gang that has struggled with crystal lattices in the 450-kc. region. The advertisements for the HT-32 have been showing a very simple circuit involving two crystals and an inductor. We learned from the manufacturer that the circuit is actually that simple, but it doesn't tell the whole story. Unfortunately for those of us who would like to slap a few surplus crystals into a circuit, diddle a coil and come up with a beautiful side-band filter, the crystals themselves have to be carefully controlled in manufacture. These filters give an assymmetrical characteristic that cuts off sharply on one side and tails off more gradually on the other. Two of them are cascaded in the HT-32, as indicated in Fig. 1, and the side-band rejection is 50 db. or more.

The balanced modulator is something that a ham can build for himself, and it represents a technique we haven't seen before. The normal bridged-T circuit is shown in Fig. 2A. When the resistance at R is equal to $\frac{1}{4}$ the resonant impedance of LC, the circuit will have very high rejection at the resonant frequency. Changing the value of R in either direction upsets this rejection, so the HT-32 balanced modulator substitutes a diode for R and uses the bridged-T circuit as a balanced modulator.

One of the tricks in the HT-32 that many hams might apply to their own rigs is the method for obtaining temperature compensation in the v.f.o. The series-tuned Colpitts (Clapp) circuit is used and, as is necessary in any good oscillator, everything is built like the proverbial battleship. Finding that the temperature coefficients of compensating capacitors are not held as close as the designer wanted, two capacitors of different temperature coefficients are used with a variable

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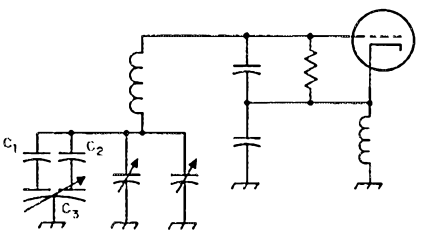


Fig. 3 — The v.f.o. in the HT-32 can be set to the best condition of temperature compensation through the use of a differential capacitor (C_3). C_1 and C_2 are 12-$\mu\mu$f. compensating capacitors of N1500 and NP0 coefficients. Changing the rotor position of C_3 permits effective adjustment of the coefficient from an NP0 characteristic to N1500.

differential capacitor, as shown in Fig. 3. The oscillator is tested by recording the frequency change with temperature. The direction of the drift then indicates which way the differential capacitor must be moved to minimize the deviation.

The signal levels throughout the transmitter up to the output of the third mixer are kept at very low levels, in the interests of low distortion products. For example, in the balanced modulator the input r.f. level is around a volt. This attention to low signal levels with its resultant low distortion is a point many hams should remember in the construction of their own side-band rigs.

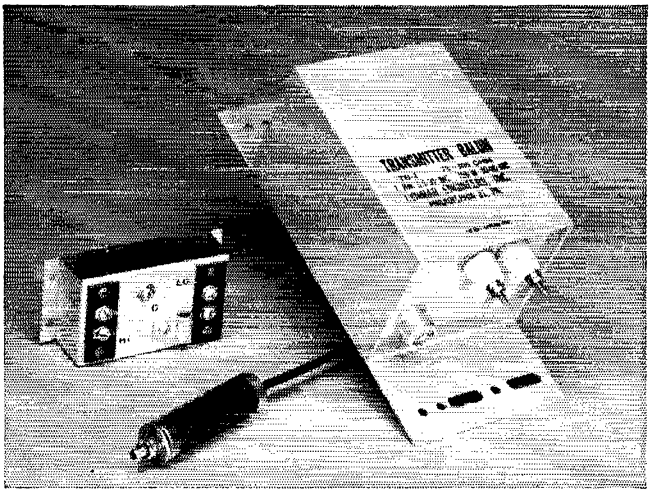
The output meter has a wide range, obtained through the use of shaped pole faces. A diode is included in the meter for damping.

Full attention has been paid to TVI reduction in the HT-32; considerable shielding is used throughout and all control leads leaving the set are filtered. — *B. G.*

New Apparatus

Transmitting and Receiving Baluns

THE device in the largest case in the accompanying photograph represents something new in the way of components offered for amateur use. It is a wide-band — 1.5 to 30 Mc. — balun capable of handling a kilowatt of r.f. at any frequency in the range, when used in conjunction with properly-matched lines. Over the 3.5- to 30-Mc. range it is rated at an "insertion" s.w.r. of better than 1.2 to 1. This rating rises to 1.4 to 1 at 1.5 Mc. Requiring no tuning or adjustment, it is available in three models: Type TB-2, for matching 75-ohm coax to 300-ohm balanced line; Type TB-3, for matching 50-ohm coax to 200-ohm balanced line; and Type TB-4, for matching 75-ohm coax to 75-ohm balanced line.



The other two units in the photograph are receiving-type baluns. The larger, designated RB-1, matches 75 ohms unbalanced to 300 ohms balanced, and should be the answer to an often-expressed need for an untuned balun for coupling a coax feeder to the balanced input terminals of a receiver. It covers the range 1.5 Mc. to 150 Mc. Later versions of this balun have a slightly different case from that shown, for better mounting on the rear apron of a receiver. The small cylindrical unit is a 75-ohm unbalanced to 300-ohm balanced line for the 50- to 1000-Mc. range.

All three baluns are manufactured by Lynmar Engineers, 1432 N. Carlisle St., Philadelphia 21, Pa. — *G. G.*

Strays

W5HJM reports that the Corpus Christi Chamber of Commerce has entered into a program of supplying attractive photographic QSL cards to members of the Corpus Christi Amateur Radio Club, at no cost. The sample sent along by W5HJM was very slick.

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WØUJK has made a big hit with the superintendent of schools in his town. He (WØUJK) comes through loud and clear on the superintendent's record player.

KL7GV thinks that a ham must have helped to make up Coast and Geodetic Survey chart No. 8075. Right in close proximity are Morse Cove and Ham Island.

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Recently W4BHD worked both W8TEA and W3BUN. A real party!

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The MARS Technical Net announcement on page 138 of April *QST* continues on a weekly basis.

● Technical Correspondence

LONG-PATH PROPAGATION

82 Prospect St.
Huntington, Long Island, N. Y.

Technical Editor, *QST*:

Many of the DX-minded fraternity are well aware of the fact that F_2-layer h.f. communication frequently takes place via the long great-circle path around the earth, rather than the short path as is ordinarily assumed. On the other hand, many others are completely unaware that this phenomenon occurs nearly every day in the h.f. region, and frequently in one or more of the amateur DX bands. Equipped with a rotary beam of reasonable front-to-back ratio, a good receiver, and an awareness of propagation conditions over the globe at any particular time, any amateur can watch for and frequently observe this phenomenon for himself.

At certain frequencies and times, propagation via the long great-circle path to some distant points on the globe may be the *only* practical path for low-power signals. The signal strengths observed over paths up to 18,000 miles in length with transmitter powers in the 100-watt region are surprising. Received signal intensities equivalent to a rating of S7 or S8 are often observed.

My own observations have been that long great-circle path propagation is most likely to be observed under the following conditions:

1) The long path is on the dark side of the earth, with the short path completely illuminated by sunlight.

2) The average maximum usable frequency over the long path is above (but not too far above) the operating frequency. Signals will tend to be strongest when at least one of the control points 2000 km. along the path from the ends is close to the m.u.f. These conditions are usually met when it is an hour or two past dawn at the eastern end of the path, with the western end experiencing afternoon or early evening. The long path is favored under such circumstances because of absorption, which tends to be high on the short path most of the distance. The long path, being largely in darkness, has minimum absorption. The fact that long-path routes are largely over sea water is no doubt a factor in the low observed attenuation despite the large number of hops (9 to 12).

The 14-Mc. amateur band seems to offer the most opportunity for consistent observation of long-path signals for the greatest part of the 11-year sunspot cycle. However, during sunspot minimum periods, long paths on 7 Mc. between the U. S. east coast and eastern Australia have been observed. During the current high sunspot activity, long paths on 21 Mc. are showing up more frequently and it may be possible to observe them on 28 Mc. between points in the northern and southern hemispheres.

Examples of these long paths are not hard to find. In the current sunspot cycle, Australian stations have been regularly heard and worked via the long path from eastern U. S. A. on 14 Mc. since the summer and autumn of 1955 at about 2000 to 2300 GMT — the path often remaining open for three hours or more with excellent signal strengths. Signals over even longer paths from New Zealand and Johnston Island or Hawaii to East Coast U. S. A. have also been noted at about 2000 GMT. In the opposite direction, 14-Mc. signals from South Africa, East Africa, Madagascar, the Middle East and the Indian Ocean areas have regularly appeared in the eastern U. S. A. with surprisingly strong signals at about 1300 GMT. Conditions for paths between the northern and southern hemispheres seem to be optimum during the spring and fall equinoctial periods.

During the summer of 1956, signals from India, Ceylon, Singapore and Hong Kong regularly appeared on the East Coast U. S. A. via the long paths on 14 Mc. at about 1300 GMT. There was a rapid reversal of conditions just after the autumnal equinox in September, however, and within about one week the favored path to these points had changed to the short great circle over the north polar regions. This change appears to be due to the change in illumination of the earth's surface by sunlight, with a corresponding decrease in absorption over the short path and a simultaneous increase over the long path. During magnetic disturbances there have been cases where 14-Mc. signals from Ceylon, for example, appeared to favor the long great-circle path, whereas only a day or two before they had been coming by the usual short path.

The foregoing observations may serve to point out some of the rather surprising effects that can be experienced with long-path propagation. It is certain that many similar cases have been noted by amateurs all over the world, but there seems to be very little information on the subject in the published literature. It is hoped that these notes will stimulate further interest and observation of long-path propagation by amateurs. Such activity could contribute significantly toward our knowledge of F2-layer propagation over extremely long distances during the current International Geophysical Year.

— *J. Gregg Stephenson, W2OBX*

D.S.B. vs. S.S.B.

209 Palmer Drive
Fayetteville, New York

Technical Editor, *QST*:

I have read with interest your review of my recent IRE article, "Synchronous Communications," in the "Technical Topics" section of the March, 1957, issue of *QST*. Although I found myself in general agreement with you on most of the points raised, I would like to discuss in this letter some areas of disagreement which I think are of some importance and concern to the ham fraternity.

My main objection is your conclusion that s.s.b. is the "ultimate" system for ham use. I noticed that considerable comparison was made between d.s.b. and a.m. but very little was done in comparing d.s.b. and s.s.b. Before we can relegate d.s.b. to the "interim" category we certainly must compare it to the "ultimate" system. I should like to compare d.s.b. and s.s.b. briefly and show that there are some definite advantages to d.s.b. for ham use which cannot be dismissed lightly.

First of all, let us discuss the relative merits of d.s.b. and s.s.b. on a "talking power" basis. Since both are suppressed-carrier systems all of the radiated power is useful side-band intelligence power in both cases. Thus we must determine what the average r.f. power output will be in d.s.b. and s.s.b. for the same peak-power limitation. Now, if a sine wave of audio is considered, s.s.b. will be found to have a 3-db. average power advantage over d.s.b. If a 100-cycle square wave of audio is considered and a 3000-cycle response is assumed in the audio system it will be found that d.s.b. has a 6.5-db. power advantage over s.s.b. These figures are mentioned to show that *the wave shape of the audio becomes quite important when comparing the "talking power" of d.s.b. relative to s.s.b.* Now, we don't talk sine waves and we don't talk square waves. Tests made recently by various laboratories indicate that d.s.b. and s.s.b. are on a *par with one another* as far as *normal* speech transmission is concerned. This is not quite the whole story, however, since in d.s.b. we may use speech clipping and filtering to increase our talking power just as we have been doing for so many years with a.m. Speech clipping and filtering cannot be used with s.s.b. since the elimination of one side band has the effect of "unclipping" the wave, and this results in r.f. peaks which prevent any significant increase in average side-band power output. The amount of gain which can be obtained by clipping in d.s.b. is far from small and 10 db. probably represents a reasonable value. (The ARRL *Handbook* indicates that a 6- to 12-db. increase in power can be obtained in clipping.) Now there are speech processing techniques which can be used in s.s.b., but the ones I've seen to date are quite complicated and their performance appears to fall short of what can be done in d.s.b. with simple clipping and filtering. Thus, unless shown differently, it appears to me that d.s.b. has about a 10-db. power advantage over s.s.b. This hardly represents the performance of an "interim system."

The spectrum saving of s.s.b. over d.s.b. for ham applications is of doubtful merit to my way of thinking. This is a tough point to argue without going into considerable detail, but the results of some study on this subject briefly stated are as follows: When comparing all s.s.b. operation *vs.* all d.s.b. operation, the average QRM level will be the same in

both cases. The higher probability of being interfered with for all d.s.b. operation is made up for by the opportunity the listener has to dodge this interference by selecting upper, lower, or both side bands at the receiver. Of course, most s.s.b. stations can also switch side bands to dodge QRM, but this requires some coordination between operators which is usually hard to get under heavy QRM as many hams have already found out. It's a much different situation to just listen and change side bands at the receiver without the necessity of informing the other station. While on the subject of reception, I might add that a "side-band switching" type of s.s.b. adapter works quite nicely with d.s.b. even though you are usually 3 db. below ultimate d.s.b. performance. An article on a d.s.b./s.s.b. adapter is almost ready for release, but it has not yet been decided as to where it will appear.

Another advantage of d.s.b. over s.s.b. is, of course, the simplicity of the d.s.b. transmitter. This will permit many hams to convert their present a.m. or c.w. equipment to d.s.b. and hence salvage much of their present investment. D.s.b. also offers the economy-minded ham who is starting to build the most performance *per transmitter dollar* invested as compared to either a.m. or s.s.b.

In closing, I would like to state that in spite of the above comparisons I am not "against" s.s.b. I do feel that d.s.b. has a lot more to offer but we will never prove this by technical arguments. This question will be resolved by the hams themselves on the basis of operating experience. The results should be interesting to watch.

— *John P. Costas, W2CRR*

[*Editor's Note* — The "Technical Topic" in March *QST* was confined to a comparison between suppressed-carrier double side band and the conventional amplitude modulation from which it is derived, as stated at the outset of the article, except for a brief mention of comparative band width. In connection with the latter, the opinion was expressed that d.s.b. was an "intermediate" system. The word "interim," which implies a temporary or transitional stage, conveys quite a different idea than was intended.]

♦

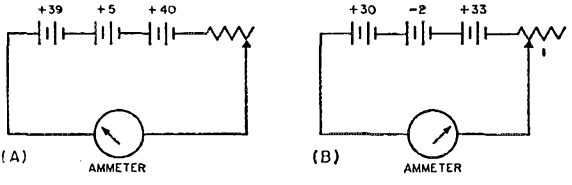
Most of you know Murray Powell, W1QIS, as the senior operator at W1AW, he having been on the job for nearly nine years. Recently he acquired an extra bit of fame when he played a game of chess with Al Horowitz and beat him. As you chess fans know, Mr. Horowitz is three-time U. S. champ and editor of the *Chess Review Magazine*. Of the twenty-five games played (simultaneously) on this particular day, only W1QIS won over Mr. Horowitz. Here we see Murray rehashing the game, which started with a King's Pawn opening by Horowitz, and a French Defense by Powell. Horowitz resigned on the 25th move.

♦

Most of the Quizzes are, of course, merely products of fertile imaginations, but here is one that actually happened. Albert Martin, W1HEG/HL, was making a routine check of some batteries in various states of exhaustion. Connected in series with a very insignificant load, the terminal voltages were measured as at A in the sketch at the right. When the load was increased, the voltages changed to the values shown in B. Notice that the voltage across the middle battery changed polarity! Problem: How do you explain the change in polarity?

—•••—

The answer to last month's is two transformers (or one with two identical



secondaries). The secondaries are connected in phase, so that you actually have two half-wave rectifiers in parallel, working on the same half of the cycle. If you said the box contained two power supplies you were technically correct (but loaded with dough!) However, since no voltages were specified, you were also correct if you used a resistance and capacitance network to operate the two rectifiers in parallel.

A "Juicy" 2-Meter Antenna

Adaptation of the Beer-Can Vertical for 144 Mc.

BY BOB JONES,* W9DWD

MANY hams working on 144 Mc. have, at one time or another, wished for an inexpensive vertical antenna that would have something on the ground plane or vertical dipole. The antenna described is both inexpensive and easy to build. What's more, it works well, having resulted in a considerable improvement in our 2-meter working range, compared to other vertical systems formerly used.

There is little original in the design, it being an adaptation of two antennas that have appeared in *QST*, the stacked coaxial array described by W1DBM, [1] and the beer-can vertical of W2JTJ, [2] combining the performance of one with the economy of the other. It is a three-skirt coaxial antenna, consisting of a center pipe, a vertical radiator at the top, and three quarter-wave skirts mounted a quarter-wave length apart along the center pipe. The top of each skirt is grounded to the pipe, and the bottom insulated from it.

Construction

A detailed drawing of the top section is shown in Fig. 1. An insulator for supporting the whip radiator is mounted atop the first skirt. The transmission line is fed up through the inner pipe, with its outer conductor connected to the skirt and supporting pipe, and the inner conductor to the whip.

A 10-foot length of thin-wall electrical conduit makes an excellent inner pipe. It is long enough to allow for three skirts and still leave some room at the bottom for mounting. Be sure you get the kind of conduit that can be soldered to. The writer was temporarily stumped for material for the skirts. Remembering a beer-can vertical we had built for lower frequencies, I tried using these cans, but no combination of them worked out to be a quarter wave length for 144 Mc., and it is not easy to cut them and do a neat job. After some experimenting it was found that five small fruit-juice cans soldered end to end came out just the right length. They are smaller and lighter than beer cans, and just as easily come by.

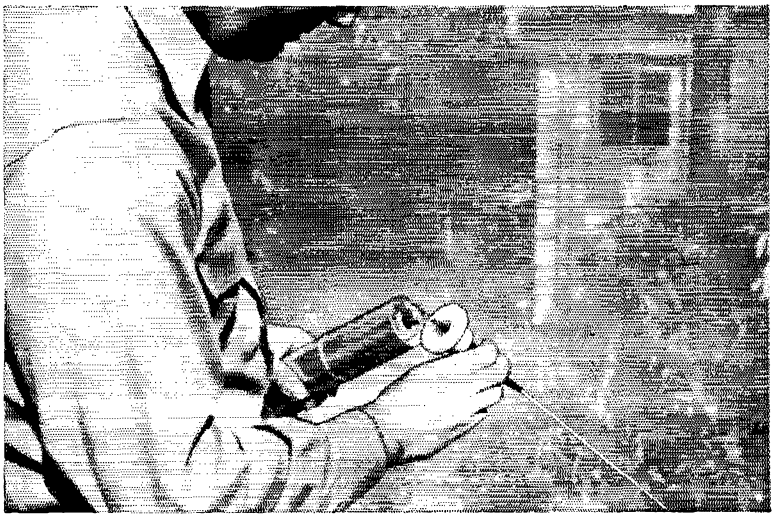
Both ends are removed from four cans and one end from the fifth. Soldering these cans end to end produces a long tube with one end open. It is best to sandpaper the lip of each can before attempting to solder as this will remove any varnish on the cans and bare the metal. In soldering, don't send a boy to do a man's job. Beg, borrow or steal at least a 300-watt iron to do the soldering. All three skirts are made alike.

The top skirt is mounted first, by cutting a hole in the closed end slightly smaller than the outside diameter of the conduit. The skirt is then forced over the end of the pipe just far enough to allow for soldering the conduit to the end of the can. To complete the top skirt, an insulator is needed for the bottom. I used a disk-shaped piece of polystyrene with an inner hole the size of the conduit, and its outside diameter such that it would slip within the open end of the skirt. The insulator may be kept in place by bending the lip of the can around it or

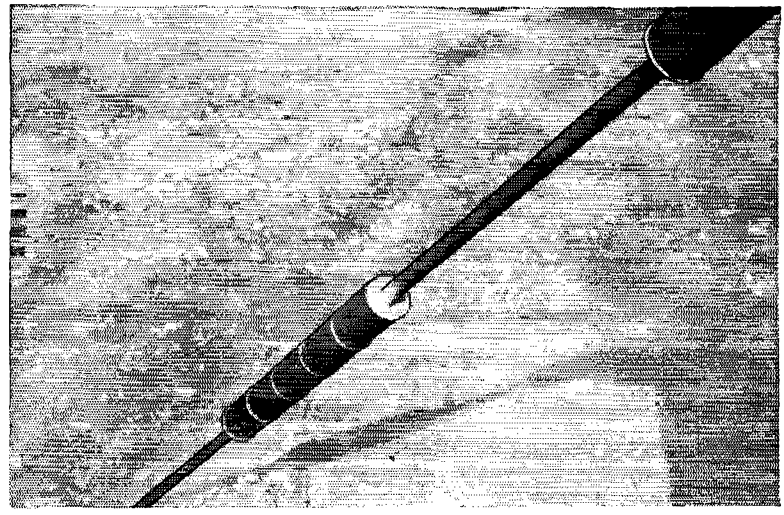
* 425 S. 7th Ave., La Grange, Illinois.

[1] Rand, "Civil Defense Control-Station Antenna," *QST*, Nov., 1951. Also in recent editions of the *ARRL Antenna Book*.

[2] Czerwinski, "Budget 7-Mc. Vertical," *QST*, Nov., 1955.



The top section, with the insulator and whip removed.



Looking into the bottom of one of the coaxial skirts. Vertical support is thin-wall electrical conduit.

by melting the poly slightly with an iron so that it makes a tight fit.

Next scale off a quarter wave length from the open end of the first skirt and make a mark on the conduit. At this point the second skirt will be soldered to the conduit. This skirt is prepared, mounted and insulated in the same way as the first. The bottom or third skirt is assembled and mounted just like the second and it, too, is spaced a quarter wave below the one above.

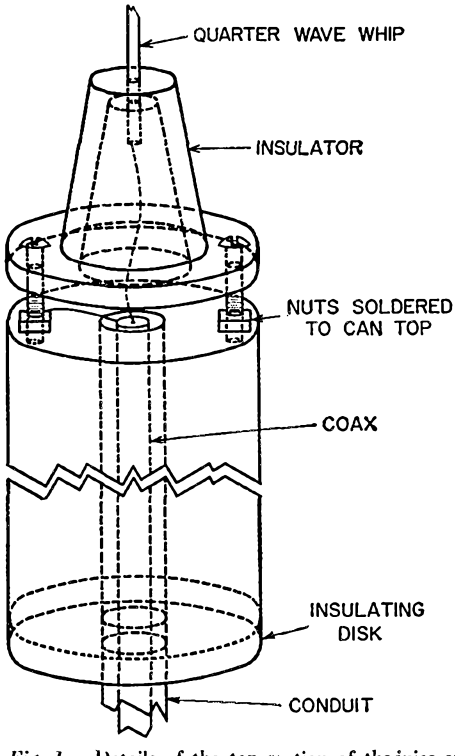


Fig. 1 — Details of the top section of the juice-can coaxial vertical antenna.

Several types of insulators can be found that will be suitable for supporting the whip. Our insulator was mounted by first soldering brass nuts to the end of the can directly below the holes in the insulator. Holes should be punched in the can where the nuts will be, to allow the screws, when tightened down, to pass beyond the nuts.

One of the nuts provided a good place to mount the ground lug of the transmission line. The inner conductor is secured by a nut inside the top of the insulator. The insulator was weatherproofed by spraying it with Krylon. This will keep rain and moisture from getting into the transmission line. In the author's case, the antenna was painted with aluminum paint to give a good appearance and to help prevent rusting of cans and conduit.

The vertical whip was made from a piece of ⅛-inch brass rod. The rod was threaded on one end far enough to bolt in place of the screw and nuts that came with the insulator. Other material could be used in making a whip, such as stiff wire or small diameter tubing.

The antenna will match a 50-ohm line very nicely. Results with mine have been far better than anticipated, with many stations worked commenting on the signal increase. But best of all, building it was a lot of fun. I met all my original specifications: low cost, ease of construction and superior performance, with almost no expense.

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Four weeks' notice is required to effect change of address. When notifying, please give old as well as new address. Advise promptly so that you will receive every issue of *QST* without interruption.

An S.W.R. Indicator for Transmission Lines

Convenient Unit with Built-In Generator

BY JAMES N. WHITAKER,* W6KRZ

• The convenience of an s.w.r. indicator with a built-in signal generator was pointed out by W1ZG in *QST* for December, 1955. The unit described here represents another way of accomplishing a similar result.

MOST TRANSMITTERS do not include a means of reducing power to the level required for use with a standing-wave bridge of the inexpensive type, and such means are sometimes difficult to install. The unit shown in the photograph includes a signal generator so that antenna adjustments can be made independently of the transmitter. The r.f. generator may use any type of circuit preferred by the builder, but it should have good frequency stability and be capable of delivering at least one watt of power. The shielding should be adequate to prevent stray pickup when the instrument is used in the immediate field of an antenna.

One satisfactory source of r.f. power for bridge measurements is shown schematically in Fig. 1. It consists of a simple crystal oscillator with a frequency multiplier for the higher-frequency range. Crystals are very inexpensive and provide ample stability for this purpose. The frequency selected should fall in the approximate center of the band in which the antenna is to be operated.

The oscillator provides ample power for operating the bridge without the use of an amplifier stage and can be controlled directly by crystals operating in the 3.5-, 7- or 14-Mc. amateur bands. A single doubler stage provides output in the 28-Mc. band. All band changing is accomplished by a four-pole, four-position band switch arranged to render the frequency multiplier inoperative when not required. The r.f. output power is adjusted by means of a potentiometer in the screen-grid supply circuit of the oscillator tube. Plate-and-screen power for the oscillator and multiplier tubes is obtained from selenium rectifiers in a voltage-doubling circuit. Notice that no portion of the power supply is connected to the chassis. This avoids the shock hazard and the danger of shorting the power line with grounded systems.

The oscillator plate tuning capacitor is suffi-

*323 Fifteenth St., Santa Monica, Calif.

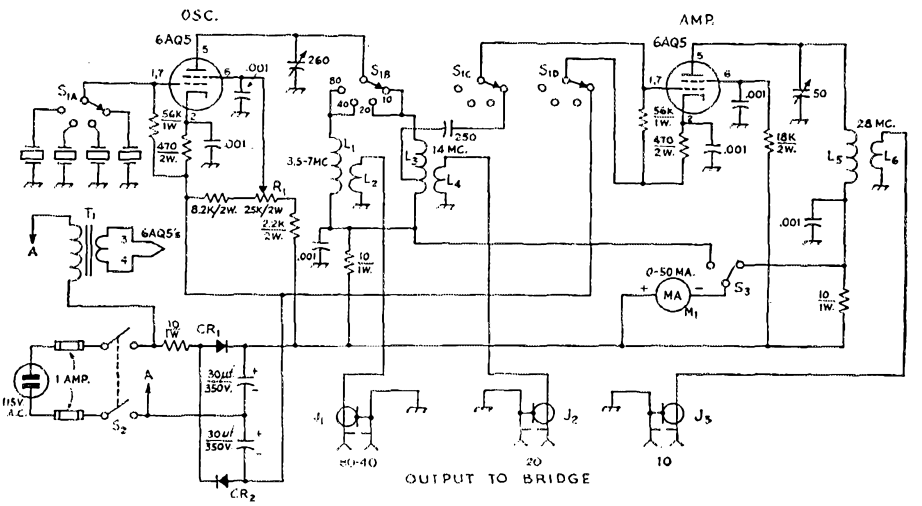


Fig. 1 — Circuit of the signal generator for the s.w.r. bridge.

All capacitances less than 0.001 µf. are in µµf. All 0.001-µf. bypasses are disk ceramic. The 250-µµf. coupling capacitor is mica. Capacitors marked with polarity are electrolytic.

CR_1, CR_2 — 100-ma. 130-volt selenium rectifier.
J_1, J_2, J_3, J_4 — Coaxial receptacle, UG-568/U or similar.
L_1 — 25 turns No. 22, ¾-inch diam., 1¼ inches long.
L_2 — 5 turns No. 24, close-wound ⅛ inch from bottom of L_1.
L_3 — 17 turns No. 22, ½-inch diam., ¾ inch long, tapped 5 turns from bottom end.
L_4 — 4 turns No. 24, close-wound, 3/16 inch from bottom of L_3.
L_5 — 12 turns No. 18, ½-inch diam., ¾ inch long.
L_6 — 3 turns No. 24, close-wound, spaced ⅛ inch from bottom of L_5.
M_1 — 0–50 d.c. milliammeter.
R_1 — Output-control potentiometer.
S_1 — 4-pole 4-position ceramic-insulated rotary.
S_2 — D.p.s.t. toggle.
S_3 — S.p.d.t. toggle.
T_1 — Filament transformer: 6.3 volts, 1 amp. required.

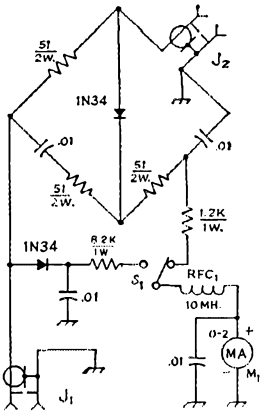


Fig. 2 — Circuit of the s.w.r. bridge. All resistors are composition. Capacitors are ceramic and values are in μf.
J_1, J_2 — Coaxial receptacle, SO-239.
M_1 — 0-2 d.c. milliammeter.
S_1 — S.p.d.t. toggle.

ciently large to permit the coverage of both the 3.5- and 7-Mc. bands with one plate inductor. A second inductor is used for 14- and 28-Mc. operation. The output is link coupled from the oscillator plate coils for 3.5, 7 and 14 Mc., and from the doubler plate tank coil for 28 Mc. Separate output connectors are provided for each frequency range.

The bridge circuit (Fig. 2), which is more or less conventional, is provided with its own coaxial input and output connectors, permitting the use of an external r.f. generator, if desired.

The instrument shown was built into an aluminum case which originally *held a surplus* BC-187A radio transmitter. Any case of appropriate size and shielding ability will be equally satisfactory. If desired, the bridge and indicator system may be housed separately from the r.f. generator. Another convenient modification might involve a redesign into a completely self-contained portable instrument powered by dry-cell batteries. For such an instrument, the use of Type 3Q4 or Type 3V4 tubes is suggested.

With an instrument such as this available, many of the problems experienced in the use of coaxial transmission lines may be solved, and often simple antenna-matching systems may be used to replace the more complicated systems.

The theory of the s.w.r. bridge and its application have been covered in previous *QST* articles[1,2] and in the last several editions of the ARRL *Handbook*.

In normal use little attention is given to the actual meter reading. Adjustments are made to the antenna feed system, working toward a zero meter reading. The instrument should be located as close to the antenna as is convenient, although the readings at the end of a long transmission line will follow in general the readings made at the antenna. Also, if the input level is always adjusted to the same value before each test, it will be easier to determine whether or not the last adjustment made to the antenna has resulted in an improved match.

[1] Caywood, "An Improved Antenna Bridge," *QST*, August, 1955.
[2] Grammer, "Universal S.W.R. Measurements with a Coaxial Bridge," *QST*, December, 1950.

A completed s.w.r. instrument including signal generator. Near the top of the panel are the generator band switch, meter switch and plate milliammeter. Multiplier and oscillator tuning controls and the bridge milliammeter occupy the central portion of the panel. Along the bottom are the power switch, power-output control, generator output receptacles, bridge input and output receptacles, and the bridge milliammeter switch.

QSL Cards

BY L. A. MORROW,* W1VG

"ANY mail for me?" Daily, from coast to coast, the cry goes up. Is it from fair maidens pining for words of devotion from stalwart admirers? From grizzled tycoons with secret mergers pending? No. It's the plaintive, hopeful question of 100,000 active hams who are looking for the most important mail in the world — to them: QSL cards.

This scene, so familiar in U. S. homes, is repeated all over the world. To the OQ near the Equator, to the SM above the Arctic Circle, yes, even to the ZK2 on a dot in the vast Pacific, "mail" means QSLs.

It's a fact that ever since amateurs began to communicate with each other they have wanted written confirmations of the contacts. In the beginning a principal reason was probably that fading, interference from other spark stations and static kept communication from being reliable, and it was encouraging to receive a letter or even a post card telling how loud and clear signals had been before QSS (as fading was then called) or QRM got in its dirty work.

But it's old stuff now, some of us think. Sending a card, for example, to confirm a rag chew between a WØ in Iowa and a W3 in Pennsylvania — why, that went out with two-tube bloopers. Well, maybe it's old stuff for the old timers, but exchanging cards with each other is still a kick for most of us. Maybe we aren't the 35-w.p.m. traffic handlers, the red-hot contest operators, the DX hounds. But we are the ones who are on the air night after night. We're the majority in ham radio. Come to think of it, we practically *are* ham radio.

So let's keep this pleasant, and in many cases helpful custom. And let's not look down our Advanced Class noses at the newcomers when they say at 10 w.p.m., "Pse QSL OM I need ur card." We were all newcomers once.

• To be of greatest value to the other fellow and to be valid for all awards, a QSL must give eight pieces of information. In this story W1VG outlines what the information is and suggests ways of furnishing it.

Why a QSL?

Although reports on signals heard but not worked are often desired by the v.h.f. gang, the real function of a QSL is to confirm a QSO. The card must state definitely that it confirms a two-way contact. It should plainly show the other station's call, the signal report, the frequency band used, the date and time of the contact and whether it was on c.w., a.m. phone, s.s.b., teletype or what. (If nothing designates the use of c.w. or phone, and unless the report is of the Q — R — or RS — type in an authorized band, confirmation is for a c.w. contact.) The name and address of the station owner as well as the station call letters should be on the card.

Oh, sure, everyone knows that. But, unfortunately, everyone does not remember it. Many a handsome QSL has been rejected for WAS, DXCC or some other award because the designer was so art conscious that he let the signal-report line look like a report on heard signals instead of a confirmation of signals worked.

Some foreign awards require that a certain minimum signal report be shown on the cards submitted and others necessitate designation of the frequency band and date.

So let's look again for the eight things on our cards: *Our call, name, complete address; other station's call; fact that card confirms a QSO; mode of transmission; frequency band used; signal report; date; time.*

Where should the essential data appear? It's a matter of personal preference. The put-it-on-the-back gang says the card can be made neater and more attractive that way, while the show-everything boys contend that no one wants to take a card out of an album or off the wall to look at the back, and attractiveness need not be sacrificed when the signal report and all the rest of it are where they can be seen at a glance.

* Advertising Manager, *QST*.

This article is essentially a reprint of one that appeared in *QST* for October, 1950.

«

400-mile QSOs were not too common forty years ago. This one rated a letter instead of the 1¢ postal card (forerunner of the QSL) that was sometimes used. The word "radio" was replacing "wireless" and radio amateurs were forming clubs in various parts of the country.

PLEASE ADDRESS ALL CLUB COMMUNICATIONS TO THE SECRETARY

ATLANTA RADIO CLUB,

R. A. DEVORE, PRESIDENT
18-2ND AVE. OAKHURST
MAX A. HERZOG, SECRETARY
16 FAITH AVE.

ATLANTA, GA.,
Feb.21,1917.

Mr.L.A.Morrow,
1431 E.High St.,
8AOF de 4BY. Springfield, Ohio.

Dear Sir:-
It certainly gave me much pleasure to find that my signals are readable at your station. I have only very recently installed a transformer set,although I have been an amateur for two years.

My set consists of a 650 watt transformer, a rotary of the disk type,an oscillation transformer with four turns on the secondary and two on the primary,and an oil immersed condenser. The aerial is 150 feet long,four wire,seventy and fifty feet high.

On the same night that we worked together I was able to work 9ABU,9EO,9AIM,4AC,and 4E1.A few nights ago I worked with 8AGR,in Port Huron,Mich.

Your signals were very strong,and it was only on account of the exceptional interference that I had trouble on reading you. I hope that we will work together in the near future under more favorable circumstances. Please write and let me know about my signals and spark tone. With best wishes,

Sincerely, "4BY"

M. A. Herzog.

But we must be sure to have the essential information — including our calls — on the back if it is not on the front; otherwise the card is just a picture post card, not a complete QSL.

The Postal Regulations' maximum dimensions of a card which takes 2¢ for domestic mailing are 5⅜ inches by 3⅛ inches. (Minimum: 4 inches by 2¾ inches.) A Government postal is 5½ inches by 3¼ inches but the standard size for QSLs is 5½ inches by 3½ inches, and most of us make our cards conform to those dimensions. Since use of a folded card raises a postage problem, it's a good idea to check with the post office before ordering that kind.

It is generally easier to take care of a card of standard size and even though a large QSL may be impressive when first received it is liable to become a nuisance and end its career folded, filed and forgotten.

What Kind of Card?

No doubt we would all like to have QSLs that are individualistic, but the fact that there are some 210,000 licensed amateurs in the world makes it tough for any one of us to be original.

Still, advantage can be taken of a well-known characteristic of a state (wheat fields of the Dakotas, cowhands of Wyoming), or country (coffee plantations of Brazil, bull fights of Spain), and the big-city ham can include on his card a photo or drawing of an easily identified feature of his city (Golden Gate Bridge, Big Ben). Locating the city and country on a well-designed map is another idea that can be used in several different ways.

There was a time when QSLs were cluttered up with all sorts of information ranging from dates of past contest victories to a list of all the crystal frequencies employed. It is still customary to include important awards like DXCC and perhaps a brief description of the station — a v.h.f. station, especially — but the trend is definitely toward clean, neat cards with a minimum of copy.

We can pay a lot or a little for our cards. Printing colors from a combination line and half-tone plate made from an artist's hand lettering on a professional photographer's picture is the most costly. Photographer's, artist's and photoengraver's bills may total as much as $50 and the cards printed in three or four colors may run as high as 5¢ each. On the other hand a QSL printer's stock card on which he overprints a call, name and address may be bought for as little as $2.85 per hundred cards, postpaid. A few distributors and manufacturers furnish cards, especially to beginners, at even lower rates.

Addresses of several QSL printers may be found in the Ham-Ad column of any issue of *QST*. For an elaborate card printed from a plate it is probably best to talk to a local photoengraver in order to get the project started.

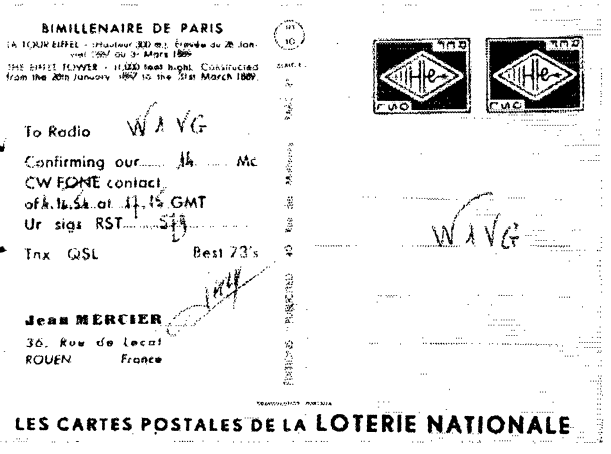
But cards do not have to be printed. It is possible to mimeograph, use a rubber stamp, imprint from a homemade linoleum cut, draw and letter each card by hand, or use photography.

Frankly, though, mimeographed cards are pretty sad and QSLs made from a rubber stamp are often not much better.

A linoleum cut can be made by drawing the card design in reverse on a piece of linoleum, gouging out the background of the design, and mounting so that the cut can be used like a rubber stamp. It may as well be admitted, however, that the resulting card is not apt to take many prizes for looks.

Any of us who are fortunate enough to have artistic talent can turn out QSLs that are real gems, and each one can be different, too. But making cards by hand soon gets to be a grim business. The project generally ends by having the cards printed in black and white from a plate incorporating the best ideas from several QSLs. Then the only handwork remaining is coloring each card — and that can be omitted.

The ham who is an amateur photographer can let his imagination run wild, and emerge from the



We don't need the call to tell us what city this beautifully colored card is from. The eight points are covered on the back.

darkroom with almost anything. It might be a card showing just his call but it could be one with a view of his station, his antenna, his house and his family — including Ida, the maiden aunt with the china choppers.

The shutterbugs say it's neither hard nor expensive to make QSLs. Hamid Durmisevich, W6DQZ, outlined the job on his card something like this:

First, he took a good picture of his station. The negative measured 2⅜ inches by 1⅞ inches. Next, he laid out and lettered in India ink the card design, leaving a space for the station picture. The layout was made on white stock measuring approximately 14 inches by 9 inches so that possible raggedness in lettering would be less noticeable when the reduction to QSL card size was made.

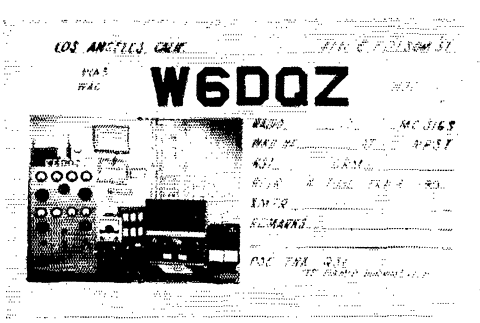
A 5½- by 3½-inch picture was then taken of the card and the place saved for the station picture was cut out of the negative. The last step was to fasten carefully with opaque tape the 2⅜- by 1⅞-inch picture negative into the cutout.

The 5½- by 3½-inch QSLs are contact-printed from this patched negative on regular sensitized post cards which have a semi-matte surface so they will take ink well.

This method is good when the station picture is a convenient size for the card. It has the desirable feature of permitting new station negatives to be patched into the old card layout negative when new pictures of the rig are taken. However, the patching-in must be done with extreme care or the station picture will not be square with the rest of the card.

When the station picture is too large to fit the QSL card a different procedure may be followed. Paste flat, with no wrinkles, a good print of the station picture on a proportionately large layout card, and, after adding the India ink lettering to the card, photograph this assembly. The new negative should be 5½ inches by 3½ inches so that contact prints on the sensitized post cards can be made from it.

In *QST* for October, 1939, several novel methods of obtaining negatives for contact print QSLs were described, and a procedure for making silhouette cards was outlined in the November, 1938, issue.



A photographic QSL. The text tells how W6DQZ made it.

An excellent example of a Contest QSL. It's an uncluttered cartoon printed in three colors with data on the other side.

A QSL drawn by a good cartoonist can be effective when the picture tells a story and when the card is rather plain. Too many details usually result in humorless confusion.

Sending special QSLs after contests is a good custom although not very common, unfortunately. We want to be sure that this type of card confirms a contact, however, or it will be nothing but a souvenir.

When designing a colored QSL it's wise to bear in mind that the card may appear in a picture of another ham's station, so why not choose colors that won't fade out when photographed? Red on white and black on white are good. Dark green, purple, blue and brown will come through. Pastel shades are apt to disappear.

Flash! How To Get a QSL for Every Card Sent Out

That would be front page news, all right, but let's not fool ourselves. No one ever doped out a way to get an answer to every QSL and no one ever will. Most fellows will send a card for every card received, others will send a card to everybody but us (at least it seems that way), but a few just won't send cards at all.

Yes, a few just won't send cards at all — but only a few, and the fact that nearly every one of the 210,000 hams all over the world will buy, fill out and mail QSLs is one of the bright spots in amateur radio.

The QSL problem is a real one for many stations and the rarer the country, the greater the problem. It's so acute for some of the foreign amateurs that they almost hate to go on the air. And we may as well face it: The reason is largely because of the U. S. hams. All Ks and Ws can never work a particular DX station. There are too many of us. But we keep on trying and each time he comes on a few of us succeed. Well, that's okay except that each one of us begs for a card with the result that the DX fellow is forced to spend about half his ham radio time doing clerical work — or get a reputation as a you-know-what because he won't QSL 100 per cent.

The solution? Probably there isn't any. But there is one thing we can do: We can make it as painless for him as possible. Let's not ask him to send his card direct; it's expensive and even if we

mail him International Reply Coupons he has to take more of his precious operating time to go through the stack he is getting ready for the QSL bureau, find the one for us, put it in an envelope and mail it.

Let's hold back on the sob letters until we are sure the card is not coming. The chances are that he's immune, anyway. He knows as well as we do that he is our first ZD7 and if he'd wring the tears out of all the letters he receives he'd have to operate maritime-mobile.

As for working him again just to tell him his card has not come — while the line-up curses fervidly — it's like Dorothy Dix's best advice to young girls: Don't do it.

The QSL bureau systems will function if we give them the opportunity. Most countries have bureaus and they all operate along the same lines. The ARRL QSL Bureau has been working successfully since 1933, and the twenty-three QSL managers in the United States, the U. S. Possessions and Canada are pretty sharp at running it. Imagine handling 3000 to 10,000 cards each month at no charge, as many do. Some fun!

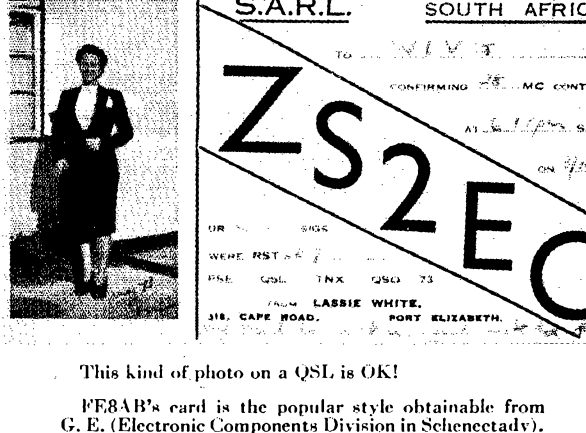
The bureau system saves both time and postage expense for foreign hams. Instead of mailing each card singly, the foreign operator sends his cards in bundles to the ARRL QSL managers, either direct or by way of his own bureau. Each of us keeps in the hands of the QSL manager for his call area a No. 10 stationer's size self-addressed and stamped envelope ($4\frac{1}{4}'' \times 9\frac{1}{2}''$) with our call plainly printed in ink in the upper left-hand corner. The QSL manager sorts the incoming cards and puts them in the proper envelopes, mailing the envelopes when they fill up. (We don't want to forget to send him another as soon as we receive one.) An up-to-date list of ARRL QSL managers is published in *QST* at least every other month.

How long should we wait, how long does it take for a W to get a DX card via the QSL Bureau system? The answer depends primarily upon the foreigner's habits. Does he QSL every U. S. station worked, sending the cards in packages each month to the proper W QSL bureau? (If he does he's our boy!)

And what about us? Do we at all times keep an envelope in the hands of the QSL manager?

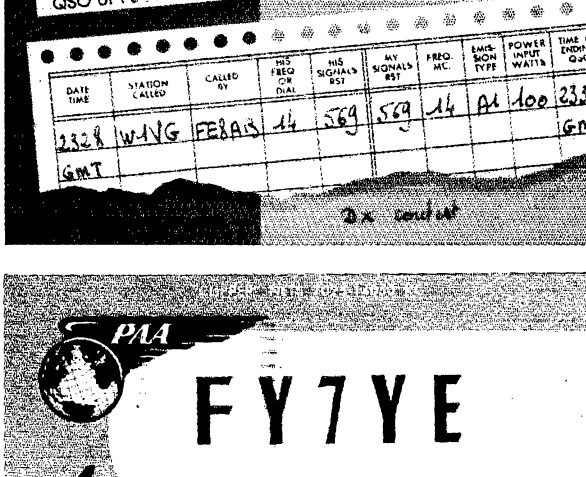
If he does and we do, then the shortest time between our QSO and his sending the card will be about a week, the time required for the package to reach our W QSL bureau will be about three weeks, and even if the QSL manager — who is generally up to here in cards — is able to open the package and put our card in our envelope immediately, the envelope may stay there another two weeks until it has enough cards in it to make it worth mailing. One week plus three weeks plus two weeks makes six weeks.

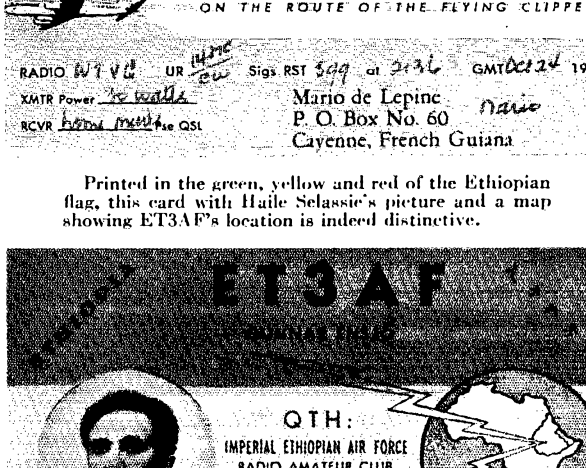
But suppose the other fellow sends QSLs only in answer to cards received, shipping through his own bureau three or four times a year. In about one week, if air mail is used, our card reaches him. In twelve more weeks his card in reply may go to his QSL bureau to wait twelve more weeks for an



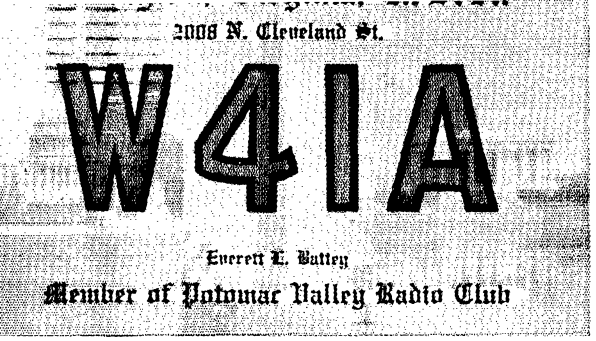
This kind of photo on a QSL is OK!

FE8AB's card is the popular style obtainable from G. E. (Electronic Components Division in Schenectady). The design used by FY7YE is also well known and furnished by PAA. (Latin American Div., Box 217, International Airport, Miami 48, Florida.) Has anyone made GEDXCC or PAADXCC?





Printed in the green, yellow and red of the Ethiopian flag, this card with Haile Selassie's picture and a map showing ET3AF's location is indeed distinctive.



When members of a radio club use QSLs of the same design, it makes us remember both the club and the call. Haven't we all heard something like this: "W4IA? Oh, sure, belongs to the Potomac Valley Radio Club."

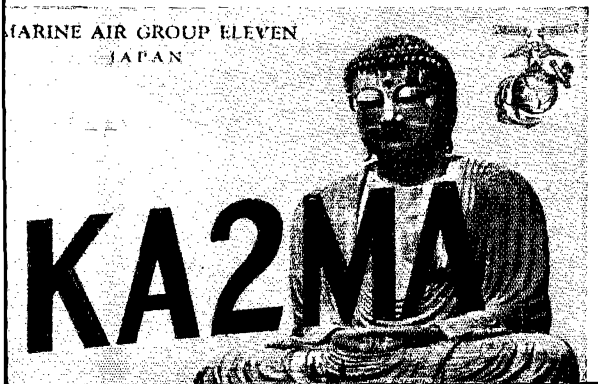
accumulation. Transit time to the U. S. will be about three weeks and if the foreign bureau sends the package to ARRL Headquarters another two weeks may elapse before the cards can be sorted in West Hartford, mailed and received by the QSL manager. In about two more weeks we receive the card. This adds up to thirty-two long weeks — eight months. Actually, the time consumed may be as much as a year.

Most cases will lie somewhere between these extremes. However, we can see that the time required to receive a foreign card via the ARRL QSL Bureau system may be anything from six weeks to a year, so there's no use getting antsy. We can mail another of our QSLs, of course, but when we are waiting for that last card to make DXCC, it's not the ability to write a tear jerker nor a scheme for sending a $400 receiver to the fellow that we need; it's patience.

Occasionally a DX station sets up a special method of QSLing through another ham who handles the cards, but the two principal ways for us to send cards to foreign amateurs are direct and through his QSL bureau.

If he's in a rare country and if we know his address, having gotten it over the air or from the *Call Book* or "How's DX?," we'll probably be at the post office, panting, a few minutes after he signs off. But if we don't know his address and have no information on a special method, we ought to send the card to his own QSL bureau whether he said to or not. The only time we should send a card to ARRL Headquarters is when the station is under cover and when we're sure the QSL information has not been given in "How's DX?" in *QST* during the latest few months.

Uniquely representative of the country, with red call letters, green statue and blue background, this unusually handsome card carries the eight points on the reverse side.



But if he's in a country having lots of active hams we are apt to wait until we have an accumulation of QSLs for that country before we mail to his QSL bureau.

And when should the card be sent to the QSL manager in our own call area? The answer to that one is easy: Never. Our QSL managers have all they can do to take care of incoming foreign QSLs, and that is the only kind they can handle.

A revised list of the foreign QSL bureaus with addresses is printed in IARU News of the June and December issues of *QST* each year and brought up to date in other months as information is received at ARRL Headquarters.

Getting cards from Ws is not so serious a problem — at least for other Ws. If the only hams we ever worked in Utah or Vermont won't answer our QSLs, we can dig around and work others.

The greatest task seems to be the one faced by the beginner who wants to get 48 cards from 48 states. A WAS Certificate looks a long way off to a new ham running fifty watts to a 6146. "Pse QSL OM I need ur card." Let's send it to him. Let's send it to him right away, without waiting for his. Surely we can spend a minute and a 2¢ stamp. Maybe the card will give him a lift just when he's beginning to believe that all hams are so-and-so's and that he'd be happier flying model planes.

There's only one way for Ws — and VEs — to send cards to each other, and that's direct. Neither the QSL manager nor ARRL Headquarters can handle the QSLs. Addresses can nearly always be found in the current edition of the *Radio Amateur Call Book Magazine*.

What To Do with the Cards

And now let's consider that happy day of rest after the cards we wanted so badly have actually been received and sent to ARRL. The shiny certificate has been framed and hung with gentle hands where all visitors, including the Thursday Night Canasta, Conversation and Culture Club, can see it. The QSLs will soon be back from West Hartford and others are coming in, too, both via the QSL manager and direct.

What shall we do with the cards? Shall we display them on the wall or in an album, or shall we find a safe resting place and put them tenderly to bed?

Opinions vary. Some of the old timers are apt to smile a little at QSL wallpaper but probably most hams put up each card as soon as the postman lets go of it, whether it's from the Indian Ocean or Indianapolis. The cards are usually thumb-tacked to the wall, although the schemes shown in the February, 1938, issue of *QST* for using wire, string or Scotch tape work well.

A plan followed by many DX men is to put some of the choice QSLs on the wall, perhaps grouping them around a world map or WAC Certificate, or to fix up a DXCC album with each page devoted to the best card from a given country.

We don't want to forget the fellow who always

(*Continued on page 162*)

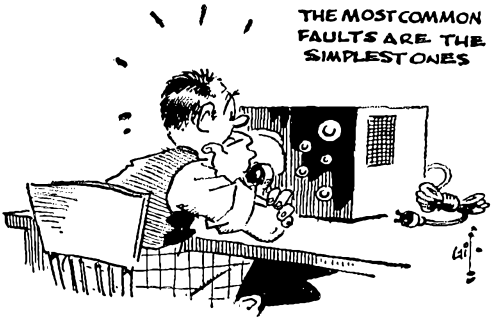
The Careless Consumer

Or, "Instruction Manuals Are Only for Beginners"

Not long ago a new ham bought an NC-57, plugged a microphone into the "phones" jack, snapped the send-receive switch to "send," and called CQ. He kept this up for two weeks, and finally wrote the service department of the National Company to find out why he wasn't getting out.

While most certainly an extreme case, this sort of thing happens more often than you'd suspect. It's not at all funny to manufacturers who constantly have field service problems to solve — most of which could have been avoided if the customer had only read the service manual. We recently made inquiries of a number of *QST* advertisers as to their particular problems, and their responses have formed the basis of this article. Although some of the incidents will certainly give you a good laugh, this is not intended as a "humor" story — we hope that it will help both the ham equipment owner and the manufacturer by cutting down on equipment "failures," as well as resulting correspondence and bad feeling, in those cases caused by carelessness on the part of the consumer. There is no attempt to embarrass any individual who may recognize a paraphrase of his own problem here; the purpose is to help others avoid similar problems. And lest anyone think that failure to observe instructions in the operating manual is a problem exclusive to ham radio, be assured that it is a major headache of all manufacturers building consumer goods, especially in the field of home appliances.

Believe it or not, the most common faults are the simplest ones, such as failure to plug a unit into an a.c. socket, or trying to receive signals with the mode switch thrown to "phono." Don Merten, K2AAA, of Eldico, well recalls a three-



page complaint from an amateur who had purchased and constructed one of the company's grid-dip meters. "He was extremely indignant," Don says, "because after doing everything the instruction manual said and building the unit exactly as per manual, he got no indication on the meter. His letter went into great detail as to how the unit he constructed was exactly like the instruction manual but alas — no dip. He threatened to write ARRL, his local Better Business Bureau and the Inspector of Mails for our advertising and selling a kit that did not work, and he gave us exactly 24 hours to give him satisfaction. Then after his signature there was written in ink a P. S., 'Please disregard the above, I forgot to plug the unit into the a.c. socket, it is working fine now. Thank you.'"

It happens all the time. Ray de Pasquale, W2DCO, of Technical Materiel Corporation, tells us about "the fellow who was shown the set at the dealer's (who demonstrated the phono switch and forgot to switch it back), took his set 15 miles on a bus to his home, plugged it in and said, it lights up fine but doesn't work, and then took it 15 miles back to the distributor who threw the phono switch back to its proper position (plus 15 miles back home)." The instruction book, Ray says, carries the warning: make sure all switches are thrown to the proper mode of operation.

But even the distributor is not exempt from the apparently-general feeling that instruction books are only for the uninitiated. Web Soules, W8HCW, of Electro-Voice, recalls such a case: "A few months ago, one of our distributors returned an RME 4300 receiver because he said it would not work on single side band. He explained that he had the selector switch set for SSBAGC but it would not work and he became disgusted and returned the receiver. I called this party on the telephone and explained to him if he had read the instruction book, it was quite clear in the instructions that on the SSBAGC position a side-band adaptor was required."

Which reminds us to hang our own heads in shame. To prevent embarassment, we shall not give the call of the amateur station involved,

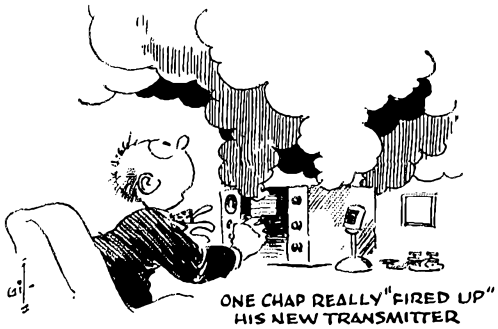
except to say it is the headquarters station of the American Radio Relay League. A new 75A-4 had just arrived, and the operators spent nearly an hour trying to get the thing to work. When the situation reached the point where uncomplimentary adjectives were about to be coupled to the Collins Radio Company, it was discovered that the mechanical filter selector-switch was in the wrong one of only three possible positions! The instruction manual was, of course, tossed on another table, unopened, when the set was unpacked; instruction manuals, we erroneously thought, are only for novices.

Dick Mahler, W1DQH, of Harvey-Wells, has his share of headaches. "One was," he says, "when a civil defense group set up one of our TBS-50s and plugged the main antenna into the two meter antenna socket. Incidentally, it worked very well, but was greatly improved when we found their mistake. We have had other cases where people have attached the antenna to the ground post, and then complained bitterly about the set not working. We have also had a case where the key and the mike were interchanged. However, I think the most remarkable case was when a transmitter was returned to us as being faulty and we found that even though the instruction book pointed out very clearly that some of the tubes had been removed from their sockets, wrapped in tissue paper, and were inside the set, this chap never read the book — he plugged the power supply in and fired it up. As a result, all of the tissue paper was set on fire, and to compound the felony, the set was returned to us without his even opening it to see what had gone wrong in the interior."

Tom Consalvi, W3EOZ, tells us that some purchasers of the Barker & Williamson 5100 get in trouble by failing to read the instruction manual, particularly as concerns use of the multiple-circuit meter. They'll leave the meter switch on "screen" and then spin the final tank capacitor watching for the dip in plate current. Before they realize the error they've made, the tubes may well object to so much off-resonance treatment and head for the happy hunting ground. And he says that similar misunderstandings can exist, if instructions in the book are not followed, on checking grid excitation; the operator switches the meter to the proper circuit, true, but forgets that in this position the scale should be divided by 10, so B&W gets another complaint about excitation running wild.

Jess Wheaton, K9EXY and customer service manager for E. F. Johnson, swears the following actually happened. A new ham bought a Viking kit, assembled it, found it wouldn't work at all. He shipped the transmitter back to the dealer, where inspection showed it to be a particularly neat job of wiring — even better than the pictures in the instruction manual. Small, shiny globs of solder were neatly affixed to wire ends at each terminal and socket lug. It was a puzzle until a closer look revealed the trouble: believe it or not, the constructor had failed to strip the ends of the wires and had "soldered" the wire ends, plastic insulation and all, neatly to the terminals!

Hallicrafters has its share of consumer problems, according to Tony Dambrauskas, W9GXH, over and above the simpler and common instances such as plugging an a.c. set into a d.c. line (and ruining the power supply) despite warnings to the contrary. Many of them are largely the human angle, rather than the technical one. A receiver owner who complained about weak signals indicated in a letter that the difficulty might be the large amount of steel in the building where he used it; the return address showed it was a federal prison! An SX-71 was received in the service lab for repair in rather surprising condition; an accompanying letter explained that the owner's wife had become quite annoyed with the high noise level and applied an axe to the set to silence it. Short-wave listeners have inquired why, when they tune to the "London" or "Paris" markings on the general coverage dial, they don't immediately receive such stations. And Tony tells us of one which, it must be admitted, is not covered in the instruction books: "The owner of a recently-purchased Hallicrafters receiver wrote in expressing concern about the warranty coverage on the set. He pointed out that he was unable to register it immediately, since he was leaving on his honeymoon and asked that we please extend warranty coverage by the time corresponding to his honeymoon." (It was extended!)



Neglecting to arrange for shorting of the antenna coils of a receiver when transmitting, thoroughly covered in instruction manuals, is the principal complaint at the National Company among hams who won't read the books; they end up, of course, with burned-out antenna coils, and in some instances actual fire and resultant receiver damage. Mel Hayden and Bob Murray, W1FSN, sometimes find, however, that the shoe is on the other foot — occasionally a new receiver owner will dissect the instruction manual unmercifully, picking up each obvious error and making a big to-do about how smart they were to discover a mistake. (Bob thinks such people should be sentenced to writing instruction manuals for the rest of their lives!)

Assembly from kits presents special problems, as in this example from Wes Schum, W9DYV,

of Central Electronics: "Our kit-building instructions clearly state that an octal accessory socket is to be mounted on the rear of the 20A exciter and that the special nine-prong socket be mounted in a specified location for the plug-in PS-1 phaseshift network. Our customer proceeded to do just the opposite and when he found he could not plug in the PS-1, proceeded to write us a letter complaining about our gross stupidity in designing this equipment. In fact, due to our stupidity he had to change the special nine prong plug on the PS-1 so he could plug it into the octal socket in his unit."

The Heath Company finds that, in general, the kit builder realizes that instructions must be followed to make a successful, completed unit out of a boxful of parts, and therefore his attention is drawn to the need for following instructions carefully at the very beginning; with an item that is already built, the customer is probably more inclined to feel that he already understands the unit and does not need instructions. Heath's Ernie Mullings, W8VPN, expands on this theme: "Unusual as it may seem, the complete novice in electronics seems to have less difficulty than the individual with somewhat more experience. The novice realizes his own limitations and follows each step-by-step instruction to the letter to be sure that the job is done properly, and to guarantee that he will end up with a kit that works satisfactorily. The individual with some experience, however, will be more inclined to take short cuts based on his own limited experience, feeling that the step-by-step instructions are taking the long way around. Such short cuts almost always lead to trouble. This is especially true in some critical circuits where the placement of individual leads or components is important to circuit functions. These physical locations are outlined in the instructions but are sometimes ignored so that the circuit does not function properly.

"However, a kit builder is very likely to follow the instructions rather carefully as he is building an instrument, but then tends to ignore the instructions when he gets to the point of operating it. Operating instructions are very often skipped because the item has been completed, and the user then feels he has complete command of the situation and needs no instructions for operation. In the case of an amateur transmitter, this difficulty can arise when the kit builder ignores specific instructions about the type of antenna the rig is designed to load into. Even with a pi-network output circuit the impedance range of a rig may be limited to approximately 50 to 1000 ohms. Frequently a customer will try to load such a transmitter into an end-fed long-wire, which may have an impedance of several thousand ohms. The mismatch wastes valuable communications energy and, in some instances, can damage components in the output circuit of the transmitter by placing excessive voltages across them. A kit builder might follow every step-by-step instruction in building his transmitter, and then ignore the recommendations for proper operation to the extent that the transmitter is damaged by improper handling."

But there are some amusing incidents in Heath's case histories, too. One fellow wrote to say, "I ordered this instrument from you and it came all in pieces. However, I put it together anyway, and now it don't work."

Insulated tubing is often referred to by its common name of "spaghetti" in Heathkit instructional manuals. In one instance a transmitter was returned for service and, although not the source of trouble, it was found that *real* spaghetti had been used on a number of leads in the circuit instead of the insulated tubing which had been included in the kit! — *J. H.*

Strays

The 1957 edition of the short-wave broadcast listeners' Bible, *The World Radio Handbook for Listeners*, is now available from Gilfer Associates, Box 239, Grand Central Station, New York 17, for $2.20, including postage. A companion booklet, *How to Listen to the World*, can be obtained from the same source for 60 cents.

—•••—

W9EXD recently acquired a new dog and for obvious reasons had no choice but to name it VQ6. — *W9OIQ*

What are the odds on working two successive calls signs in succession? On two successive QSOs, but several hours apart, W6DX worked JA1ACA and then JA1ACB.

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The engineering staff of WSBA, 910 kc., conducts a special broadcast on Sunday mornings between 12:35 A.M. and 3:00 A.M., EST. The show consists of code practice, DX notes, tips on ham gear for sale, news of ham club meetings, and plenty of good music.

Amateurs in the Kentucky Area Floods

Adding Another Notch to our Public Service Record

BY GEORGE HART,* W1NJM

WHAT'S NEW about a flood? We've had them before, plenty of times, and amateurs have always stepped forward to bridge the gaps in communication, to come out of their round-tabling and rag-chewing and pleasure mobiling long enough to do what has to be done, then go back to their daily enjoyment of amateur radio. So why not just list the stations who took part, give them gold stars, and let it go at that?

Individual credit is one thing; organization or fraternity credit something entirely different. The former can be satisfied by a simple listing, but the latter must know not only who did the work, but what amateur organizations participated, what they did, where and how they did it.

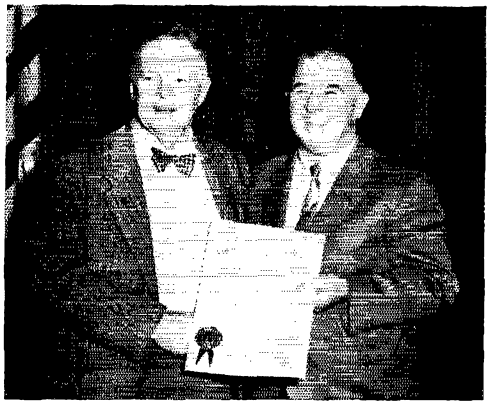
It all started in the western portions of Virginia and West Virginia the week of January 21, when rain began to fall steadily but gently. As day succeeded day the intensity of the rain increased. Water rolled down the mountain sides, gathering in the valleys; streams built up, flowed into larger streams to make torrents which emptied into the large tributaries and rivers; and soon a wall of water was fighting its way toward the Mississippi, carrying all before it. Hundreds of amateurs assisted in Kentucky, Virginia, West Virginia, Tennessee and Ohio, in the most extensive emergency operation so far this year.

Kentucky

Most of the communications in Kentucky were effected through the Kentucky Phone Net (KPN) on 3960 kc. and the Kentucky Net (KYN) on 3600 kc. Because interference was intolerable on the former frequency, one of the first things done was to get FCC to declare it an emergency frequency. This was accomplished at the official request of Governor Chandler of Kentucky through the Federal Civil Defense Administration to FCC, the latter clearing the segment 3955 to 3965 kc. on a voluntary basis at 0810 EST January 30. W4JDU and W3NNX aided in relaying traffic for this emergency clearance.

The emergency work really began in Kentucky at 1820 CST on January 29, when W4TFK in Frankfort received a call from the governor's office requesting him to try to establish contact with Hazard, one of the hardest-hit towns. Contact was immediately established with W4SBI, and emergency work thenceforth began in earnest. W4CDA, who did a lot of monitoring as well as operating, has prepared a day-to-day diary of operation of the two Kentucky nets that is singularly revealing of the type of work that was done by these nets. Space not permitting its reproduction here, suffice it to say that the two nets were in almost continuous operation for six days, and that they were gathering places for all stations operating in the emergency over medium and long distances.

Much of the early traffic concerned the situation in Hazard, which was completely isolated until W4NBY/m appeared on the scene and K4ECJ and W4JDU were able to get established permanently at that point. Later, W8VVL, station of the Queen City Emergency Net, moved to Hazard. W4NBY also did some outstanding work from his home station in relaying much official emergency traffic; W4TZT, W4SMU and W4SBI were also active over long hours, the latter despite chronic illness; contact with Governor Chandler's office in Frankfort was maintained through W4TFK of that



John Gerard, W4TFK (left), receives a Kentucky Colonel's commission from Gov. A. B. Chandler for his work during the flood. W4TFK maintained communication between the governor's office and the flood-isolated areas. W4ZDA, W4ZDB and W4JDU also received Kentucky Colonel commissions from the governor.

city; stations were active from Pikeville (W4JPV and W8EGD), Whitesburg (W4NBY/m), Prestonsburg (W8HRU/4, K4GAG, W4SUD/4 with W4VJV assisting) and Beattyville (W4NCQ and W4JSH). Traffic handled included requests for medical supplies, food, clothing, industrial supplies, engineering equipment, river reports, road conditions and welfare information. Agencies served included U. S. Weather Bureau, Red Cross, Power Companies, State Police, civil defense, FCC, L & N Railroad, hospitals, FCDA.

So much for the general picture. We have individual reports from W4JSH, W4SBI and W4BBD, which give more details of the specific phases of their operation in isolated towns. Here is a boiled-down paraphrase of each:

W4SUD: After talking with W4VJV, we decided to move a station to the disaster area.

* National Emergency Coordinator, ARRL.

Deciding to move a station into the disaster area, W4SUD (foreground) and W4VJV set out for Williamson, wound up setting up this installation at Prestonsburg, one of the harder-hit Kentucky cities. The call used was W4SUD/4. Operation was on the Kentucky Net frequency of 3600 kc.

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W4QCD suggested Williamson, to relieve W4SBI, so we left Owensboro on Friday, Feb. 1, completely self-equipped with food, bedding, an emergency generator, a 150-watt rig and a supply of gasoline. At Ashland, W4ZDB suggested we attend a meeting at his home with several other amateurs bound for the flood area, conducted by a c.d. director, W4BEW, and we were assigned to Prestonsburg. Arrived at Prestonsburg 0300 Feb. 2. Station was set up by 1000 at Red Cross headquarters. On arrival, we found W8HRU/4 already set up, so he covered KPN and I covered KYN and MARS. W4VJV relieved K4GAG at W8HRU/4. Much traffic was thereupon handled until early Feb. 3, when telephone and telegraph service was restored. K4GAG came back on the air to handle any remaining traffic and we closed station.

W4SBI: The small part I played in this should not be mentioned. I was only on the air for a 32-hour period before getting relief from W8ELJ, who operated over 100 hours. This was the worst disaster ever to hit Eastern Kentucky.

W4BBD/4: I was working in Pikeville when the flood hit there. Spent the first night stranded in my car, but the next night I managed to get to W4JPV's QTH and served as a relief operator for 8 hours. Next night I went by boat to W4JKY's place and relieved him for 7 hours; he was working his rig with six inches of water on the floor. My own rig and house in Paintsville were flooded out.

W4JSH: W4NCQ and I left from the Signal Depot at Lexington on January 31, with his transmitter and receiver and 2.5-kw. generator, en route to Beattyville. We reported to the c.d. director at his headquarters in a school building. So much confusion there that we set up at the c.d. director's home, with a direct telephone line from there to the headquarters. Got on the air the afternoon of January 31, after stringing an antenna in a downpour of rain, and stayed on until February 2. We handled traffic for the Red Cross, state police and the National Guard.

Tennessee

About 25 miles southwest of Knoxville, the little town of Sevierville was temporarily isolated. W4TYU installed a 6-meter transceiver in his car and drove to Sevierville on January 31, accompanied by a Red Cross worker, reporting at the WSEV transmitter site, which was being used as a control center. Telephone lines were open to Atlanta, so Red Cross reported information on the flood. This information was passed to Knoxville, with W4ECF relaying to W4ZBQ and W4ZZ. W4TZJ was standing by at Knoxville c.d. headquarters but was unable to make contact. Upon return to Knoxville, W4TYU was interviewed on tape for radio station WATE. The broadcast was made at midnight.

In Chattanooga, the AREC was alerted at 2030, January 31, and activated at 2230. K4CLT and W4UNS with mobile units handled field calls while K4HBT, K4HDF, W4IIB and W4JVM acted as base control and relay stations. Telephone liaison was maintained with the Red Cross until W4JVM/4 could be set up at Red Cross headquarters. The net handled field calls for evacuation and survey reports on the rising

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The staff of MARS station K4WBG made a big contribution to emergency traffic handling on KPN. Operating the rig is W3PFW. Standing at left is W4MMR. At right is Capt. J. W. Lock, MARS Director.

water. The net was placed on stand-by basis at 0700 Feb. 1, some 21 hours later. Other amateurs participating: *K4s* CBE CNZ CPE CWS, *KN4s* ITT JAZ.

Virginia

Although Bristol itself was not in danger, the AREC of Bristol, Va.-Tenn., served in other areas which *were* flooded. On January 29, the Bristol life-saving crew went to Wise, Va., to give assistance, and K4EYE took along a complete amateur station. That afternoon and night K4EYE operated with both commercial and emergency power handling Red Cross, police and welfare traffic. W4WRH, at the Bristol Red Cross chapter, was also in action. *W4s* SSV VTU and TYJ spent many hours handling traffic at the Bristol end. Others who gave assistance were *W4s* JGS VUE YPX KQB IYI, K4HEV and K4EBW. By January 31, K4EYE and the Bristol life-saving crew had set up operations in Haysi, Va., and most regular communication in the area was out. Amateurs in other flood-beleaguered areas were also getting active. On Feb. 1, with K4EYE still going at it from Haysi, the Virginia Phone Net offered its facilities for the duration of the emergency, and from that time on VFN was in practically continuous session until the emergency ended at 1900 Feb. 3. W4IYI, Bristol EC, lists the following additional participants in his area: *W4s* HKU JZG LNF MCZ PAH TKO TLK TRC ZJA, *K4s* AAE AET BFO BTM, W8NYH.

Actually, the Virginia Phone Net was in operation during the entire emergency, starting on January 29 when they were asked to assist in keeping the Kentucky Phone Net frequency clear of interference, and VFN handled the request for FCC clearance of the 3960 kc. frequency. Some outstanding stations on VFN during the operation were *W4s* BWU CQW FJS OGX NV YVG, *K4s* DOR HZD AND HZE.

Miscellaneous

KYN was so loaded with official traffic that in the early part of the emergency it was not possible to handle personal inquiries, and such were not permitted on the net. This traffic was all taken to KYN by W4CDA and other KYN members and held there until the situation permitted its handling.

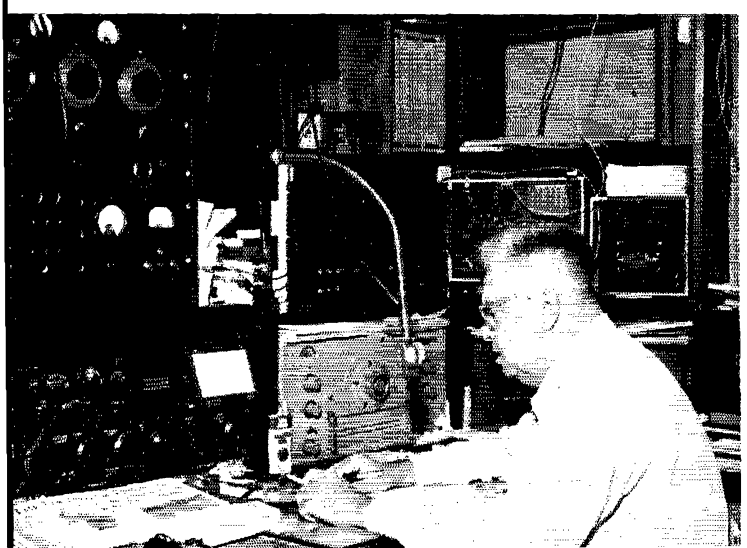
W4RHZ reports a bit of roundabout traffic handling for the Red Cross that was nevertheless effective. Driving through Covington, Ky., he heard K5CCJ calling, "CQ Kentucky" and on answering was informed that K5CCJ (a YL) was in contact with the Red Cross in Marquette, Mich., and had traffic for Kentucky. W4RHZ then drove to the Red Cross headquarters in Covington, invited an official out to the car, and the required information was exchanged. "Just like a private phone line," says W4RHZ.

Not all traffic moved with lightning speed. W8VVL in Cincy gave W4CDA a message for Hazard; two days later, after W8VVL/4 had moved to Hazard and set up shop there, he received the same message and delivered it. So who says you can't originate, receive and deliver the same message?

* * *

This ends the account of another emergency. As always, the reports received are not the whole story. For example, no reports from West Virginia at this writing, although we're sure there was some activity there. In any event, amateurs rose to the challenge as usual, and we have another notch in our public service record.

To complete the roster, the following additional calls should be added to those above as amateurs who were also involved in emergency operations: *W4s* AUZ BAX BAZ BBJ BBU BCV ELF EBI FM GAB GEZ HBA HEA HOJ HSI HTB IV IYT JCN JPP JVJ KKW KQU KRX KRY LRL MVU MWR MWX NVI OBG OGP OOS PHQ PJC PJU PL RHO RYL RPF SDR TQC TQD TRC TYP TZJ UHA UIO UVH UVS VAN VKC WCW WUR YFV YTT ZBQ ZDA ZZ, *K4s* ADX AIS AKD AXO BEA BEH BFW BGQ BVB CFD CLU CNJ CSH DIL DLI DTI FEO FX HBF GBK HOE KXF KHE LWL DRX KZB MMR NAZ WBG WCW, *W3s* ARY CVE ECP PFW/4, PZW, W1HFJ/4, W5GOH/4, *W8s* BYL CCD CLX EKF EDG EVE FUM GFH HQC HQH HQK HXB HZA IFX ORD QID SVL TAV TIS UPB UWY VJF VNL VTP YCP, *K8s* AFX CBD, *W9s* JDS TT TQC WWT ZYK, *K9s* BBO GQB, WØKJZ.



W4RPF (left) was a vital link to Louisville during the Kentucky flood. Operation was on the Kentucky Phone Net frequency of 3960 kc., and on MARS.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Whew!

After the customary frisking at the door whereby Jeeves & Co. were relieved of three incendiary Rettysnitches, we entered the hall just in time to join in the traditional DXHPDS toast to the ghost of Edward Lear. It was May again, *spring* again, and the 1957 convention of our exalted DX Hoggery & Poetry Depreciation Society was at hand!

Survivors of the first fiery round of Old Haywire croaked huskily for refills as our deadly merriment began. And Colin R. Hedzoff, orating atop the grimy GI can containing the desecrated ashes of 1956's DX Hog of the Year, coutributed the kick-off ditty:

Poor Bugtwiddle's mental defects
Are bared by his CQs DX.
The rhythm? Delightful!
His timing? Most frightful —
He'll *flip* if one ever connects.

Unless Buggie considers 14-Mc. garden-variety Europeans to be DX, that is. Next to the stage sprang Lem McCallem II, heartily hailing a propitious propagational hotfoot:

An insular ham named MacBleat
Would T-E-S-T by the hour; then repeat.
Mac's signals, one day,
Came back the long way
And *seared off three-fourths of his feet.*

('Tis said that MacBleat passed his ham exam on all fours.) Our third offering was delivered from the floor by acrophobic N. Leslie Halloran, this gem dedicated to amateurs afflicted with chronic geographic radiational irrationality:

"Directional CQs are bunk!"
Claimed raffish Windjammer McClunk.
Then Windy, poor ham,
Yelled for help in a jam;
His CQ NEW YORK raised Podunk.

Isaiah Gann, next foolhardy volunteer, perched precariously on the podium to remind young squirts that The Amateur Is Balanced:

One bright Novice lad still in school
Got hot shooting rare-DX pool.
But — homework not done —
His teachers said, "Son,
Cool off as class dunce on yon stool."

Ill-fated Izzy collapsed under a barrage of bubble gum, comic books and hot 6L6s while retreating through a side door. The uprising was put down long enough for Horace Lee Bellowing to thump on a theme dear to no one:

"You're 5-9-plus-plus!" roars O'Sock.
"You're plus-plus-plus-*plus!*" shouts O'Crock.
At kilowatt strength
These lids yak at length
From opposite ends of the block!

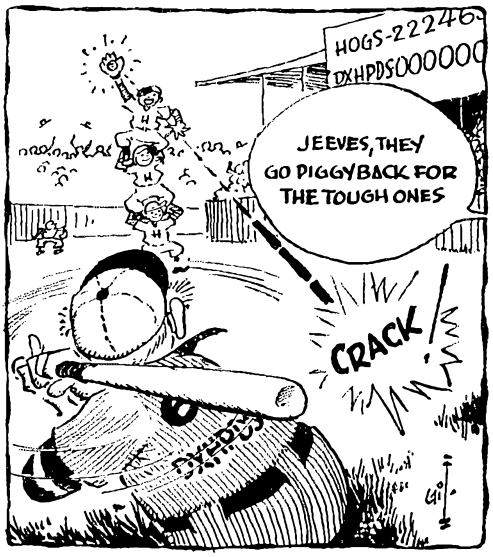
Pandemonium reigned anew. At the rear of the hall a pitched battle broke out between DXHPDS stalwarts and invading DX hogs armed with lethal 813 pack sets bearing poison-tipped whips. Neither side gave quarter in the raging conflict while the rafters rumbled ominously above. Amid the crackle of corona, the whine of ricocheting Wouff Hongs, the wails of tormented souls smothering under pile-ups, and the acrid smoke of blazing QSL files, Jeeves & Co. fled to safety through a shattered wall.

The hogs lost 9 to 8 in extra innings.

What:

After limping bruised and exhausted back to the shack we warmed up the 1-V-2 and ran into a few 14-Mc. free-for-alls that made our harrowing DXHPDS campaign quite cozy camaraderie by comparison. What price DX! May usually is the last really hot DX month before the gradual onset of the well-known summer doldrums. Gather ye new ones while ye may! . . .

10 phone is particularly vulnerable to increased absorptions and diving m.u.f.s, so we'll permit it one more fling in our "How's" Bandwagon lead-off spot. Callphabetically among the 28-Mc. mob, first *W1EKU:* **CN8s** FN IZ, KA9ND, KG1CG, LA7Y, OQ5BK, TF2WBG, UC2KAB, VP5DS of Turks, VP8AQ in the Falklands, VQ3AC (28, 360) 19 GMT, VR2BC (300) 1, ZD1FG, ZE2JR, 9S4BW (200) 17, VKs, ZSs, ZLs, heard DU6IV, noted frequent attacks of aurora. *W1YNP:* 5A5TH. *W3GBC:* FG7XE, FQ8AK, KG1FA, OK1MB, SVØWJ, TF2WBJ, UB5WF, VQ5FS, ZC4IP, UC2; missed on HE9LAA, MP4KAC, Rhodes DX scholar SVØWE, ZD3BFC; reached 114 on A3. *W4GCB:* FG7XB, TG9MB, VP4TS. *W4TFB:* hit jackpot for CRs 4AS 7DQ, EAs 8CF 9EE, FF8AP, FQ8HG, KB6s BC BD, KG6s AGO AGS, KM6AX, KW6CA, KX6BQ, So. Shetlander LU3ZS, LZ1KEP, M1D, MP4BBL, OY7ML, SPs 2SJ 6XA, UB5KAB, VP1s BOY SD, VQs 3ES 5GC, WØBLV/KG6, YOs 3VA 8MS, ZC4VP, ZDs 2DCP 6BX 6RM, 3V8AB, 4X4s BD BX FK IX, 9S4AX, FS7 HI VR2 ZD3 ZD1, Kuwait, St. Maarten. *W4UF:* HZ1BS (400) of Saudi Arabia's royal ham family. *W4WPF:* PJ2AP, VP1HA, ZL1PA. *K4HNA:* CN2AI, HE9 OK, Kuwait and Bahrein MP4s. *W6IIM:* DU7SV, JZØPC, KA5MC. *K6OPI:* HH3TJ, JA1ANG, KAs 2FQ 2KS 2MA 5ZS 7JF 7LB, K5HNY/KG6, KB6BA, DU VR2 ZLs, agrees that "Ten meters is a lot of fun!" *W8NOH:* CN2BL (414) 14, OE5CK (670) 11, PJ2CA (264) 16, SVØWJ (700) 11, ZS3S (234) 16, VP1



* 4822 West Berteau Avenue, Chicago 41, Ill.

W8TOZ: UA1BE, UQ2AN. *W9YYF:* oodles of Euros. *WØQGI:* VP2VG of the Leewards with W2CAA, KV4BB operating. *WØTGG:* 66/48 on CEs 2CX 3CZ, CN8s FV HM, EL1C, GD3IBQ, KG1FA, LUØDAB/MM, PJ2AX, TG9JW, VP6WR, VQ2AW, YU1AD, YV5FK, ZE1JE, ZL1UP, ZP5IB, CR4 KG6 OE, all with a Viking I plus homespun 3-el. spinner. *KØBMF:* YN4CB (400) 1.

10 c.w., really idyllic for day-shift QRP specialists, is favored at *W1DYV:* LZ1KAB, UB5UB, UC2KAB, 4X4FR, SV1 FS7, back in the thick of it after a 5-year QRT. *W1YNP:* LZ1KDP. *K2LHB:* HE9LAA. *W4GCB:* OY7ML, ZC4IP, FS7 SV1 UC2. *W4LDD:* FA8RJ 16, HA5AM 15, OA4BP 21, OQ5CP 14, PJ2ME 14, TI2EA 19, ZE5JA 20, ZP9AY 13, 9S4CM (130) 19, hopes for beam at new QTH after latest visit from OM Stork is paid off. *W4YHD:* JA8AQ, KW6s CA CM (75) 0, K6ABM/KG6, UA0LA (99) 0, VQ4KPB. *K4HNA:* CR6AI, ET2RH, FA9IO, HA5BW, VP2LU of the Windwards, YO3GY, ZB1BF, 4X4BX, LZ SV1 UC2 ZC4, both St. Martins, had new beam go up, blow down, and go up again. *K4IUD:* JA1VX, KL7BP, OX3LD, KG1LH, ET2 OA VQ4 9S4, Sint Maarten, uses DX-35 and Windom wire. *K6OPI:* CR9AH, DUs 61V 7SV, FK8AL, HI8BE, KG1KK, KR6BF, first Yank 28-Mc. QSO for LU2ZS, OE3SE, VK9s DB XK, YU3EU, KW6 UA0. *W7DJU:* JA3AF, XE1VO, elusive XW8AB. *W8CSK:* XF1A, KH6s, many Euros. *W8NOH:* first U. S. contact for DM3KFH (150) 18, LZ1KPZ (70) 16, OE1LM, UB5SB (70) 14, VS6AL (18) 15. *W9NDN:* scads of Europeans, CE3AG (63) 16, FA8RJ (69) 13, HH2DX (108) 21, KZ5CS, KT1DM (25) 13, PJ2AV 16, W9KLD/KL7, IT1 JA KW6 VK9 VP2 XF ZP ZS. *W9YYF:* OK1EB, SP2AP, UA3BN, YU. *WØQGI:* SV1AB, VP8AQ for No. 181. *KØBMF:* OT KP4KD. *1IER:* all U. S. call areas but No. 7.

20 c.w., the DX game's Madison Square Garden, bore up well under a full house during the past few weeks. Down the program, we find at *W1DBA:* DM2AEK (55) 3, EA6AW (15) 0, FA8TT (30) 21, Trieste IIs BCB (20) 20 and BMU (40) 21, KG1KC (25) 20, OQ5CB (35) 20-21, Moscow's RAEM (40) 3, UA3KAH (20) 18, UR2AK (10) 19-20, VQ4AV (50) 21, VR3B (60) 3, YO3GY (85) 22, ZB1HKO (60) 20-21, passed the 100-mark. *W1YNP:* DU7SV, FE8AE, FG7s XB XD, FM7s WP WR, HI8FR, KC6UZ, KR6SS, KW6CA, Alander OH2AA/Ø, ON4CK/LX, UA1s KAG KAQ, UAØCD, UB5s KAI KAW UA, UC2KAB, UP2KBC, UQ2BA, UR2AO, VS6DN, VK9XK, FS7, reached 133. *W2DGW:* ET2US (30) 23, FP8AP, FY7YE (43) 11, HH3DL, IS1MM (12) 22, KT1DM (14) 23, LU2ZS (75) 0, UAØKFA (55) 10, VP2LU (43) 23, EA6. *W2GVZ:* now 218/207 with SVØWD/Crete (71) 3, long-path VR2BZ (64) 20, Ghana's ZD4BQ (40) 23. *W2HMJ:* DU3DO (62) 13, ET2RH (46) 20, FR7ZC (47) 13, KR6s AQ (10) 12, NI (76) 12-13, KW6CM (70) 5. UAØFR (21) 12, UC2AA (83) 1, UN1AB (24) 21, VQ2RG (50) 1, VSs 1HC (23) 13-14, 9AG (45) 20-21, 4S7GE (60) 12-13, FS7, heard CR1ØAA (62) 13 now T9 and ZD8JP (18) 18.

The BV1US gang works overtime to keep Formosa available on 10, 15 and 20 meters, phone and c.w. Here K2MZM (ex-HC1LW) mans one of the station's dual locations at Taipei. Gear includes BC-610, Viking I, AF-67, homespun p.p-250THs transmitters; SP-600, 51-J, PMR-6, Army R-388 receivers; and 10-over-15-over-20 three-element rotary beams. (*Photo via Wm. Rice*).

W2QHH: SVØWQ of Rhodes. *K2GFQ:* one ZD7AH (75) 5. *K2LHB:* KG1FA, VE8PB, VP7NM, YN1LB, 5A2TY, 9S4AZ, Trieste, 807s and ground-plane. *K2PGP:* EA6 487. *K2PIC:* FK8AL, KC4USV, KR6SP, SU1IM, UA9DN, UAØs KQB OE, UD6DD, UP2AC, VQ6LQ, VU2s EJ RM, YA1AM, one YJ1RF, another ZA1AB, ZC4IP, KS4 FP8 UP2 UR2 DU VR3, Rhodes, now at the 161st rung. *K2QAG:* CE9AI (90) 10, KX6BQ 12, VPs 5DS 8AQ, VR3F (160) 11. *K2UOY:* YV5AE (30) 20. *W3UNX:* KX6AF, 9S4DL, VQ6, sundry Russians. *W3WJD:* CE3DZ (25) 1, EA6AM (65) 21, JA8AQ (60) 12. LZ2KBR 6, a TA1FA (50) 23-0, UAs 3BR 4PL, UB5KBV (73) 0, YOs 2KAB 3LM 8KAN, 3V8AO (25) 22, 4X4s CJ DR FA FR HK, IT1 UR2 VS6 5A, all on 75 watts. *W8YIK:* Alands, UQ2, heard LX1JW (10) getting a going-over in the hog market. *W4CYY:* FK8AO, Antarctica's UA1KAE, UJ8KAA, UL7KBA, VK9AS of Cocos, VS2EI, ZS9P. *W4EJP:* KG1, ZLs VKs. *W4LDD:* numerous Oceanians, XF1A (XE1A). *W4NBV:* EA9AP, FB8CC (82) 22, SV1SP (94) 7, UL7FA (58) 13, VQ8AB (83) 12, VS1HB, VU2s HF KL, ZL5AA (49) 12 of Antarctica, CE9 UQ2. *W4UWA:* PY7XM on a 5-watt 6AG7 and nondescript radiator. *W4YHD:* cleaned up on AP2RH, FL8AB (47) 17, FQ8AF, KR6SC, UA9s CM DT DX OB VA YE YP KDL KEC KMA KSA mostly 1-5, UAØs KAA (50) 11, KED (69) 3, KCA (80) 10, KJA (40) 19, UC2s AX (66) 4, KFK (30) 7, UD6AI (30) 6, UF6s KAC (61) 8, PB (71) 6, UI8s AE (72) 3, KAA (47) 5, UL7KBK (58) 4, UQ2AB (81) 19, UR2AR (37) 7, VK9DB, VS1DU (42) 11, VU2s AJ (45) 3, JG (67) 2, ZC4GT (51) 20, 5A4TC (63) 2, SU1 VQ6 VR3 VS9 YA 4S7, enjoys working Us in their own lingo via dictionary reference. *K4DRO:* KV4AA (85) 21-0, VP5CP, FS7. *K4HNA:* CR7LU, UB5KBR, VP5BL of Turks, ZE3JO, UA1 VP7. *K4IUD:* HH2Y. *K4KVJ:* CN8s FB JW, SP6WF, YU2TH, 4S7WP, QROd from 75 to 400 watts. *W5GIF:* JAs 2AT 4AA, 5A2, 35 countries on DX-35. *W6KG:* CR6CZ (80) 6, EAØAD (99) 1, FK8AH (52) 7, GC2FZC (70) 9-10, OA5AAT (95) 4, OE8SH, SP8AG (20) 8. UB5UW (55) 16. *W6NTR:* UO5KBR for 249/241, heard T6 drifty VU5AB (25) 15-16. *W6RLP:* UAØKFC (45) 4, ZC5AL (38) 15, getting warm with 106/76. *W6ZEN:* now 198 worked, FG7XE, FY7YF, UO5AA, Leewards VP2. *K6CEF:* despite his "California QRP" (0.4 kw.) got CE9AK (96) 1 of Chile's chilly southern outposts, CT2BO (10) 1, FA8NL, LU5ZC (27) 0, LZ1KNB (40) 16, OD5LX 4, OQ5GU 2, PJ2AJ 0, UAØKFG (19) 1, UB5KBB 15, VP8s BK (9) 2, BS (57) 0-1, VQ4AQ 14, VSs 1HA 15, 2FN 18, YO3KAA 15, ZC5GL (72) 18, ZS3Q 0. AP2 CR9 EA9 ET2 FK8 FS7 VP2 VQ2 ZD4 ZP 3V8 4S7, now a fast 131/63. *K6KYH:* CX2CO, CE3RE, JA3BB, XE2HN, CR9 VP7 VS1. *K6QHC:* CR6AL. *W7WMY:* DM2s ADJ XLO, HA5KAG (75) 6-7, two LU "Z" fellers, SPs 7HX 8CK 4-5, UAs 1OT 3AH, XZ2AO (35) 6-7, UB5 4X4, then beam froze toward VE8. *W8NGO:* N. Z. Antarctica, heard the spurious ZD9AF wasting too many DXers' time. *W8NOH:* UA1OE of Archangel (48) 23, UI8. *W8WOJ:* KG4AI, DU FS7 FY7, Leewards. *W9UBI:* OX3LD, UA1KFA, XE1B, KV4 YA 4S7. *KØBMF:* VP9CY. *VE1PQ:* EA8BF, FQ8, IS1FIC (15) 12, JAs 3AB 8AA, KR6AQ (30) 11, VK9DB (90) 10, 5A2TP (70) 3, 4S7MG (35) 3, VQ6 VU2 UD6 YO YA, nabbed 55 countries in one ARRL Test week end, now stands at 191/155. *1IER:* every Yank call area, VE7s, VE8OW, YV1AD, UAØRK, Leewards. *KA3BE:* fifty countries in his first 30 days of activity, DM2AJD, FA9VN, LZ1s KEP KSZ, UAs 3KGC 6KOB, UB5LC, UL7AB, UN1AA, one UA2AW/MM, KG1 OX3, all around 14,080 kc.

20 phone will be resuming A3 eminence as 10- and 15-meter openings dwindle. Here and there, *W1PNR:* heard FB8ZZ (145) 13. *W1YNP:* grabbed VP2KD of the Leewards. *K2PIC:* EA9AR, FP8AP, itinerant PJ2MC, VP2VG (gosh, *lots* of Leeward Isles activity lately!), nifty BV1US, all but the FP8 via s.s.b. *K4HNA:* SVØFR. *W6IIM:* HS1A, VR3F, several ZSs. *K6KYH:* HR1s EZ 3, FM 4-5. KX6AF (205) 7, Macquarie's VKØCJ 7, YN4CB 6. *W6YY:* ran across HS1MQ 16, OH2AA/Ø, one ZA1KUN (135) 5-6, IGY outposter ZL5AA 9-12. *W7SVM:* KW6CE. *W8NOH:* EA8AI (135) 20, TG7CB (190) 22. *W9YSX:* nice going on M1B (115) 2. OD5AC (120) 21, SVØWE (195) 1 of Rhodes, TA3US (168) 3, VR6AC (143) 4, ZC4IP (177) 5, 3V8AS (163) 7 . . . . . MRAC, NNRC, SCDXC, WGDXC and WVDXC suggest you try for these 14-Mc. radiophones: CE9s AH AO (152), CRs 4AA (174) 4, 4AD (112) 2, 4AG, 5AC 5SP (120) 6-7, 6AR 6AU 6BB 6CX 6CW 7AF 7CS 9AH, CT2AC (157) 2, DU1ROY, EA8s AI CF, EA9s AR AZ BK BM, ELs 2L 5A, ETs 2US (169) 23, 3RL (195), F9s RY and YP 22-23 in Corsica, FB8BC (142) 4, FF8s AP (144) 6, BI, FM7WP (190) 11, FO8AD (333) 7, FW8AA (340), HC8GI, HZ1s AB (146) 4, TA (135) 16, JAs 1MP 8AA, KAs galore, KC4s USA USB, KC6SP (250) 15, KG4AA, KG6s AAY AGO, KM6AX, KR6s AM MD SS, LUs 2ZP 8ZP, LZ1KAN (76) 6, MP4KDS (127) 5, OD5s AB AT AV BU BZ CD LJ, OQs 5BK 5BZ ØDZ, OX3CP (130) 4, SP9KAJ (124) 19, SU1AS (150) 6, SVØWK, TF2WBJ (190) 3, UAs 1AB 1BE 4FE 6AB 6KAC 6KDP, UA9s CB CC KCA, UB5s UW WF, UC2KAB, UQ2AN, UR2AG, VK9s AJ BW LW, VP1RL,

♦

UA1AB is one of the many hams in the Leningrad area now piecing together colorful collections of North American QSLs. George chases his ARRL WAS credentials on 10, 15 and 20 meters, phone and c.w. (*Photo via W1ICP and W1FH*).

♦

VQs 2JN 2SB 4DP 4EO 5EK 5FS 8AL, VRs 2AD 4AS (207), VSs 4JT 6AZ 6BE 6DA, VU2s BK ES (150) 12-17, XW8AC (183) 16, YO3GM, YSs 1MS 3PL, ZBs 1AJX (270), 2U, ZDs 4BF 6DT (142) 15, ZE3s JG JL, ZK1BS (182) 6-7, ZM6AT, ZSs 2MI (150) 20 of Marion Isle, 3F (190), 9G (190), 4S7YL (180), 4X4s AD AH BO DK DR FF HK, 5A1TP. Many of these are not overly anxious to become involved with the W/K DX posse, so call with fingers crossed . . . . . W9WHM nipped AP2Z (170) 3, FB8 FG7 and VR6.

15 phone now, if you please. And 21-Mc. results can be pleasing, indeed. Here's *W1PNR:* FQ8HG (214), both St. Martins for 124/110, "Conditions fair to good." *W1YNP:* HP3FL, VQ5GC, VP2LU, ZS3BC, KM6 KS4 KX6. *K2PIC:* CP1CJ, KX6BU (s.s.b.), MP4KAC, VQ3AC, ZS9G. *W4GCB:* FY7YE. *W4TFB:* almost ran out of QSLs on CRs 4AS 6AM, CT2AC, EAs 8BB 9AZ, EL5A, FF8AP/m, an FQ8, OD5AV, OQ5RU, TF2WBG, UB5KIA, VP3YG, VQs 2AW 2NS 4GK, ZB2I, ZEs 2KR 3JF 3JG 6JJ 6JU, ZL1VW, ZS9, 3V8FA, 4X4HK, 4S7GE, packaging his A3 BERTA and WBE wherewithal for shipment to RSGB, now free-style 169/159, phone-only 139/119. *W4USQ:* up to 95 on EL2F 19, HH4MV, HP1AL PJ2AK 1, VQ5EK 6. *K4DRO:* almost enough KP4s to qualify for WPR and the Ramey AFB diploma. *K4EIE:* CN8JG, CT1MB, EA8BV, HK5CH, VPs 4LB 5KJ, XE2FL on Globe Scout and 3-el. Gotham. *K4HNA:* KC4USA, VPs 2VG 7BN 8CH, VQ5FS, ZP5JP, 4X4DK, CR4 CT2 EL ZE ZS9. *K4IUD:* VP2LP. *W6IIM:* YV5AP, XE2R, YL ZP5JE. *K6OPI:* KG6AGS, VP9I, the Leewards. *W6ZZ:* KA2FQ, seven KH6s, five KL7s, KX6ZB, OA5H, four VKs, VR2BC, ZLs 1AO 1MA 2AAW 2AX 2MC 3RW 4BK 4IG, ZP ZS9, Windwards and Leewards, noted sluggishness in the California–Europe path, grabbed YLCC-150, needs five more YL states. *K8BLU:* has half-DXCC in five weeks of General effort. *W9WHM:* CR4AP (200), HS1MQ (262) 15-16, juicy PX1YR (252) 21, ZD1FG (190), Leewards, was 4X5RE's first U. S. phone contact.

15 c.w. fed its flock on ample assortment, demonstrating a commendable *sang-froid* in the face of intermittent auroral attacks. First, *W1YNP:* EA6AF, F9YP/FC, HHs 2DB 3DL, KM6AX, LZ1KNB, OQ5GU, UA1KAI, UB5UR, UG2KAB, UP2KBC, VP2GC, VQs 3FN 4CC, VS1DU, VU2RM, XF1A, ZC4IP, that ZP6CR (see "Where" text), ZSs. *K2PIC:* GC2FZC, VS6CT, ZD3A. *W2PZI:* up to 158 via CR9AH, EA9AC, the Alands, VK9AJ of Cocos-Keeling, XW8AB. *W2QHH:* OH2AA/9. *K2LHB:* HH2DX, PJ2ME. *K2MFY:* EL2F, GD3FXN, HP1EH, UA1BE (52) 22, ZB1AY, ZE3JL 19, ZD4CF (111) 23, HH LZ1 ZSs, Sint Maarten. *K2RUR:* FA8IH, HH2OP, KG1KK, 9S4CM, PJ2. *W4GCB:* CR9, Sint Maarten. *W4IV:* UB5WF, ZPs 5AY 9AY, 9S4AX, HH GD ZC4, the Alands. *W4NBV:* Balearics and FS7. *W4USQ:* ET2RH, VPs 2VG (40) 18, 9CY, ZE5JA, VQ4. *W4YHD: fine* haul in BV1US (200) 3, CR7LU (39) 20, DU7SV (103) 2, JAs 1ACA 1ACB 1AFF 1ANG 2JW 3AB 3BB 3TT 6PA, KR6SC, UAs 1DG 1DH 3BF 3FU 3TA 4FC 4FE 9CL (89) 13, VQ3FN (78) 21, VS6s CO (66) 1, DN (72) 1, CR9 VU2. *K4DRO:* CP1CJ, FA8RJ, OA4BP, OD5AV, TF3KG, VP2LH, ZB2V, 4X4IB, St. Martin, now 77/54. *K4EJG:* LU3ZS, 4S7GE on 25 watts and ground-plane. *K4GSU/8:* CX2FD (78) 2, ET2RS (78) 20, FQ8AG (40) 22, HA5BW (70) 16, UAs 3AF 3KAH 6KTB 9KYB (40) 15, UB5s CI (50) 17, EF (73) 17, UC2CB (50) 16, UJ8AF (78) 15, ZB2I (41) 16, ZC4VP (105) 19, ZD6BX, 4X5RE on the Sinai, EA6 EA9 GD PJ2 VQ4 VS6 9S4, heard paradoxical 3W8AA (80) 16, finds college cramps a DXer's style considerably. *K4HNA:* CT3AB, PJ2AV, VQ4KPB, YO3RD, ZL2GS, Alands, St. Martin. *K4IUD:* Juan Lobo y Lobo in his rare-DX disguise (XF1 prefix). *W6RLP:* VP7NM (15) 20, FS7 PJ2 VP2 ZP. *W6ZZ:* CE3AG, FK8AL, many Gs, JAs 1QI 1VX 3AF 3BN, KA7DM, KR6BF, KW6CA, PJ2 UC2 VP2 Leewards-style, VK9XK, ZC4, ZLs 1MQ 1MT 3RN, ZP, 9S4AL, has 166 countries, 130 on 15; 108 phone countries, 97 on 15. *K6OPI:* JAs 3AD 7AD, KAs 2NY 5ZS 7DM, UA3BW, XEIs H PJ, CR9 FK8 KR6 OH0 PJ2 VP2 VK9 VS6. *K6QHC:* CEs 2DH 3AG, KR6SC, OE8KI, many OHs, VP9CY, UA3HI, UB5KIA, UA0KFG, JA PJ2 TF VS6. *W7DJU:* FP8AP, JA2DL, OA4Q, DU, now 64/46. *K0ALL:* one of those revised Chilean mainlanders, CE8BT, EA8BF, YU3FK, HH ZS. *KL7CAW:* CN8JX (90) 22, KW6CM, OE1HV, YU6QL, 4X4DR, DU JA LA ZLs, finds South America awfully tough from Fairbanks. *KH6CBP:* W8CSK. *I1ER:* all W/K areas but Seven and Ten, plus several VEs.

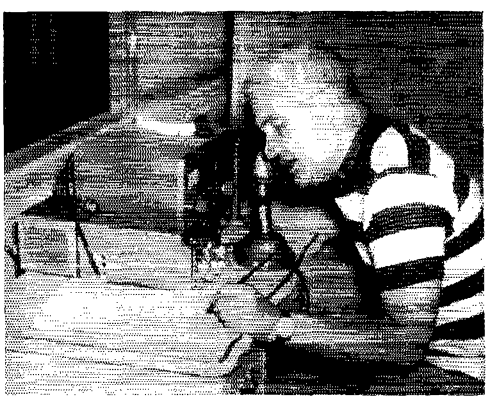
> *The Union Belge des Amateurs Emetteurs* has informed the League that the Section of Radio Astronomy of the Royal Observatory in Uccle, Belgium, is anxious to secure cooperation of radio amateurs in an IGY project. Reports are wanted concerning direction of signals heard, strength, zones of silence, fade-outs, meteor noise, unilateral propagation and the like on, presumably, the DX bands. Work will be done on specific days (three or four a month) and during periods of a week every three months. Since continuous monitoring is desired during these periods, a club or other group should work together with members relieving one another. For full information and log sheets, write to the Observatory or to Joseph Mussche, ON4BK, 84 rue du Merlo, Uccle, Belgium.

40 c.w. noise levels creep upward in our hemisphere but the VK, ZL and ZS gang welcome quieter months on 7 Mc. DX still is found on 40 by *W1YNP:* OQ5GU, UB5SJ. *W2DGW:* CT2BO (7) 0, HH2JB (9) 12, LZs 1KRU (5) 2, 1KSI (8) 0, 2KSB (15) 1, PJ2AN, UA6KOE (4) 0, UB5KIA (9) 0, XE1FV (30) 11. *W2JBL:* EA8BF (45), FP8AP (25), HH3DL (22), OK1AEH, YO6XU (1), protests rag-chewing around the low edge when the skip is out, still runs a potent 55-watter. *K2LHB:* IT1AGA. *K2UEG:* ubiquitous XF1A. *K2PGP:* DM2ABO, OK1KTI, VP2AH, CT2. *K2PIC:* all-bander PJ2ME. *W3WJD:* SP6BW 0, XE1KD (8) 0, ZB1BF (20) 6-7, 4X4CJ (15) 5-6, 5A5TZ (12) 7, LZ ZS, all on 75 watts. *W4EJP:* VP3VN. *K4HIG:* PJ2. *W4YHD:* dug deep for CR7LU (11) 4, ET2RH, FK8AL, IS1LOI (18) 4, JAs 1BU 1VX 3BB 3ZT all around 12, UA6UI (13) 2, UB5UW (17) 6, ZC4IP, 4X4BX. *W6KG:* ZS2LS. *K6EAY:* JAs 1CE 1EF 1AEA 1AGU 2FG 2TS, UA0LA (4), VE8OW, XE1PAD (24), ZS, all 14-17. *K6QHC:* JAs 2OF 3RG 3ZP 4HM 5BI 0HF, UA0FR. *W7DJU:* KA2NA . . . . . Forty's Novice contingent scored scattered DX points. Hither and yon, at *WN1LCX:* WP4AHH (160) on a 6L6 at 15 watts. *WN3LAX:* WP4AIT (178) 10. *KN4HPR* (now K4HPR): VP7BO (182). *KN5GHP* (now K5GHP): WH6CEA (178) 11 on 18 watts. *KN5HWE:* WH6BOE via an 11-watt 6V6 rig. *WN7CNL:* KH6BJU, WH6s BXW BYS.

40 phone DXers are rare by "How's" count but W3PHL, with 500 watts, a BC-312 and a 2-element Mosley twirler, finds more than enough 7-Mc. A3 prefixes to keep him busy. CO2EW, CT1PK, DL4HAB, EAs 3JE 4CX, EI5I, Fs 8PI 9BO, FP8AP, Gs 3COJ 3HIL 3HJJ

5MP, GD3UB, HB9RG, HH2RM, HK4FD, HR1UA, HP3FL, IIs BDV ZCT, JA3EF, KH6s BXH CPB EK IJ MG, KZ5CS, LA8J, OA5H, OK1MB, ON4OC, SVØWT, TIs 2VA 8SF, VKs 2ADT 3ATN 4DK 4TN, VPs 1DH 2DJ 2LU 2VG 3HAG 4MM 6RG 7BN 9L, XE1s IIC SB, YV5DE, ZK1BS, ZLs 1MQ 3ID 4DC, ZSs 5JY and 9G were worked by Fred during and amongst 1957 ARRL DX Test week ends . . . . . K6DV comments on the outstanding signals of JA1s BDR (85) and CE (98 s.s.b.), adding: "There now is talk in Japan of having 7000-7050 kc. for c.w. only, 7050-7150 kc. for c.w. and phone."

80 c.w., riven by QRN and the commercials of Latin America, manages one last DX fillip before crawling into the summer woodwork. Or are we too pessimistic? Anyway, we note at *W1BU:* VK3ZC, *W1YNP:* F3MS, *W2DGW:* EAs 1BC 8BF, FP8AP, I1AMO, KZ5EM (2) 1, OX3RA (18) 5, PJ2AN, PY3GM (32) 1, VPs 2LU 7NM (18) 1, ZB1BF (7) 5, Asian candidate ZC4IP, heard CR6AI, learns from VE1ZZ that 4S7NG shortly will be trying for W/K/VE/VOs on 80, reports DJ2HC working UR2AN, one HV1AB, *W4OMW:* DJ2BC, EA6AF, HB9NL, HH2DX, KH6MG, OK3YY, PY7AN, YU2ACD, ZS2HI, EA8 VP2 VP7 plus ZC4 for all continents on 3.5 Mc. *K4ELG:* FP8 VP7, KP4s ADS DH YD, several Gs, *K6IJT:* KH6CBP (15) 9, KL7AIZ (12) 6, *W8YEJ:* DJ1BZ, DL7AH, OZ7BG, neat Asian catch 4X4CJ, FP8 HB VP7 YU ZC4, remarks "QRN is taking over early this year." *W9YYF:* KZ5 . . . . . Our only Novice note for 80 this trip is WN7CNL's capture of WH6CBX.



W2SKE signed HI8SKE over a busy week end during this year's ARRL DX Test, rolling up some 300 QSOs on 10 through 75 phone. HI8TC assisted in Bill's D. R. licensing and W2SKE highly recommends the prefix for coaxing kilowatt results from QRP.

15 Novice news makes a worthy caboose for this month's "How's megacycloruma. Golly, just as fast as one batch of Novice DXers become Generals along comes a new generation to grab the baton! Down the line, from *KN2UPD:* CNs 2AQ 8FJ, OEs 1HJ 2WC, OH2IZ, OKs in number, LA8s AC ZC, SP2AP, WL7BWY, YU6QL, ZS2LT, now quarter-DXCC. *KN4KHG:* XF1A. *KN4JFE:* a healthy 68/33 with CE3RE, EA6AF, KG1FR, LZ1VK, PJ2ME, SV1AB, UAØOE, gay UA2AW/MM, UB5EF, VP2KF, VQ4CC, ZB2I, one ZD7ET, ZE6JX, is adding a 2-el. rotary for the tough ones. *KN6TBP/5:* HH2DX, JA3BN, KL7BEV, KP4ACF, KZ5LB, WH6BTX, CE ZE. *WN7CNL:* a 10-hour "WAC" with OK1XQ, FA8CR, CE3AK, KN5GLH, JA1ACA and KH6BER, also clipped CE3QK, CX2AM, DU7SV, DM2ACA, JAs 1AAW 1ACB 1ADN 1AFF 2JW 3AA 3JM 4AF 4JU 5AF 5AG 5AI 6AK 6PK, KAs 2KS 2MP 5ZS, OH3TQ, LA3A, WH6s CAG CCL, WL7BYW, UB5KBV, VS6CO, 4S7GE, gobs of VKs and ZLs, has worked 45 Hawaiians, 20 Alaskans, sports a 41/30 DX record, uses Adventurer, 40-ft.-high 3-el. rotary, HQ-140X with Heathkit *Q*-Multiplier, Mon Key autobug. *WN7EBX:* DLs JAs, KX6BU, SM UB5. *WN7GRX:* WH6CCL (98 to go for DXCC!), *KN8BIT:* DK2KBA, LA7Y, ON4VU, WH6HXZ, WL7BUS, WP4ADK, supersexumptious WB6BE whose QSL reads "The Only WB6 in the World!" *KN9DWK:* OH2TM, FP8 WL7 ZD7-mostdoubtful. *WL7BWY:* ZL4MK, CE JA KH6 . . . . . So much for QSOs; now let's take up the equally important matter of QSLs. . . .

Where:

Lively response to our March disquisition on rare-DX QSL matters indicates that the situation is viewed with universal concern. W1s EPW OHB, W2s HBV IJU, K2OIL, W3s HTF VN, W4LDD, W6s GPB OXS, W7RGL, W8s SDD SWZ, K8AOL, W9YRO, VE3DQB, KL7PI and the So. Calif. DX Club *Bulletin* (W6OUN) contribute especially lucid observations and suggestions. In an early *QST* we'll revisit the subject with a resumé of various viewpoints and possible alleviatory measures . . . . . G3IDC, now catching his breath after operational stops in such areas as Aden and Oman, tells W2PZI he has QSLd all stations worked. If your deserved G3IDC/? confirmation hasn't arrived, reapply . . . . . From 4S7MR to K2GFQ: "I am closed down and returning to the U.K. So far I have QSLd only those stations requesting cards but please QSP that I will send everyone a card as soon as I get settled in England. CU from G-land!" . . . . . Ex-HH2OT (W4NL) is back in Haiti again, hoping to be active there on DX bands for the next three years. Herb QSLs via bureaus and receives his cards through W4HYW . . . . . Ex-VK9YY-VK2AYY, fresh from New Guinea adventures, invites QSL correspondence via the route to follow, or through K4MFB, 1821 S.W. 11th St., Ft. Lauderdale, Fla. . . . . From HR1EZ (W7EZY): "My QSLs are current and I have been sending out almost 100 per month. If anyone has not received his card I suggest he check with his bureau. If for some reason one is not received I will send another upon receipt of request giving QSO data and IRC. Approximately 90 per cent of my contacts state that I am 'first HR.' " . . . . . "My father, W6FKH, and myself, W6HM, are handling QSLs for HS1A. W7PHO helps Ken regulate the QSOs when the band is crowded." HS1A formerly signed K4EVP and W6JOT . . . . . VP8AQ of South Orkneys assures K2QXG he'll QSL 100 per cent via bureaus . . . . . W2QHH still hunts op Mac of SVØWN, noting that SVØWN operator Bird now signs SVØWD, also on Crete. Unicall-multioperator rare ones certainly can confuse the QSL issue . . . . . W1JYH, first New England QSO for ZL5AA, is told: "A USCG icebreaker will take our log sheets to N. Z. and all cards for QSOs up to about the tenth of March should be delivered later this year." . . . . . K2GMO has word from ex-SU1CN regretting the long delay in clearing his Egyptian QSL backlog. Patience . . . . . W6OXS still receives mail concerning his 1955 W6OXS/VP2 operation in the B. V. I. although Bob long since has QSLd all contacts direct or via the bureau trail . . . . . Information brought to W1WPO's attention may link the bogus ZD9AF with venerable phony ZP6CR. The story goes that said ZP6 is unable to obtain a legal ticket because authorities aren't sure what country he's in. Which makes it unanimous . . . . . Via W8NOH: Ed and Van of LU3ZS are reported back in Buenos Aires and will reply to all valid QSLs received . . . . . The postal data to follow are offered by W1s EKU JYH RDV UED WPO WPR YNP, W2s GVZ HMJ KGN PTD PZI, K2s MFY QXG, W4s ANC UF YHD, K4ARK, KN4JFE, W6s KG NTR, K6OPI, W7s DJU PHO, W8s BZX GLK KML NOH, W9s CFT HIX, WØs QGI RAP, VE7QF, ISWL, JDXRC, NCDXC, NNRC, SCDXC, WGDXC and WYDXC. They are necessarily neither accurate nor "official." But they may expedite somebody's DXCC-clinching QSLs. Should *you* run across pertinent DX addresses previously unpublished here or in the *Call Book*, do play the philanthrope. So:

CN8IQ, Nav. Com. Fac., Box 60, Navy 214, FPO, New York, N. Y.
ex-**DL4SD** (to W9LYA)
EA9AD, J. C. Rios, Box 423, San Carlos de Fernando Poo, Spanish Guinea
EI4BD, Fergus Walsh, 14 Mt. Merrion Ave., Blackrock, Dublin, Eire
ET2RH, M/Sgt. R. Hall, MESSD (9434), APO 843, New York, N. Y.
FF8BW, A. Legalle, PTT, Oadadougou, Haute-Volta, F. W. A.
FG7XE, G. de Vipart, 29 Rue Henri IV 29, Pointe-à-Pitre, Guadeloupe, F. W. I.
FK8AO, G. Birepinte, Box 104, Noumea, New Caledonia

USSR Contest

A contest in which Russia works the world starts May 4 at 2100 GMT and finishes at 0900 GMT on May 5. Bands used will be 3.5 through 28 Mc., c.w. only.

Give six figure number with first three digits the RST report and the next three the serial number of the QSO. A band multiplier will be used on countries.

Diplomas will be awarded to country winners. Send your logs to Box 88 Moscow.

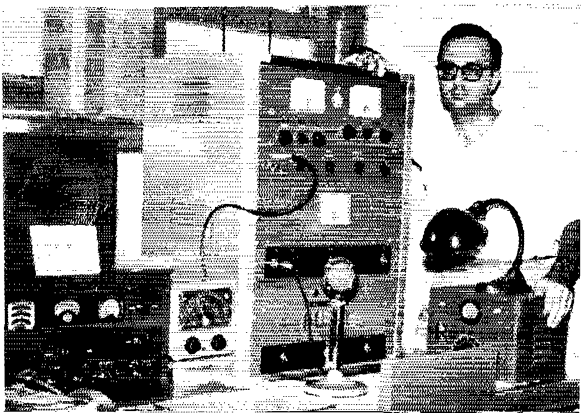
FL8AC, Sgt. Morin, BAISM, Djibouti, French Somaliland
FL8AD, Sgt. Thevenaz, BAISM, Djibouti, French Somaliland
FQ8HG, Box 891, Brazzaville, French Equatorial Africa
FY7YE, M. de Lepine, Boite Postale 60, Cayenne, Fr. Guiana
G3KKC/VP8, A. R. Rumbelow, c/o Sec. FIDS, Port Stanley, Falkland Islands
HH2JP, P. O. Box 586, Port-au-Prince, Haiti
HH2RM (via W2LEJ)
HH5JC, J. Canciulli, B. P. 50, Cap-Haitien, Haiti
HI8BE, Burke Edwards, c/o U. S. Embassy, Ciudad Trujillo, D. R.
HR1EZ, E. L. Eggers, Civilian Aviation Mission, U. S. Embassy, Tegucigalpa, Honduras
HS1A (via W6HM)
HS1MQ, L. M. Moreno Quintana, jr., Argentine Legation, 47 Jawaraj Rd., Bangkok, Thailand
HZ1BS, Prince Abdullah, Riyadh, Saudi Arabia
JA1BU, Hideo Ono, 551 Kaneko, Oi-Machi, Ashigarakami-Gun, Kanagawa-Ken, Japan
K6ABM/KG6, c/o CAA, Agana, Guam
KL7CAW, Lt. J. A. Alexander, Box 3, 433rd FIS, APO 731, Seattle, Wash.
KS6AE, M. Marin, P. O. Box B-157, Pago Pago, American Samoa
M1D, Giovanni Reffi, Republic of San Marino
ex-**MP4QAL** (to EI4BD)
ON4IE/2 (to G2DHV)
OQ5CB, P. O. Box 456, Luluabourg, Belgian Congo
PK5CR, Box 9, Bandjermasin, Borneo
PY8RW, S. de A. Neto, Monsenhor Gil 2171, Teresina, Piaui, Brazil
PY9BR, C. P. Gomes, Port Quebracho, Municipio de Port Murtinho, Matto Grosso, Brazil
SP2AP, Box 13, Znin, Poland
SP9KAD, K. R. K. U1, Zwierzyniecka 26, Krakow, Poland
SV0WD/Crete, QSL to Box 158, Sanford, Fla.
UC2AA, Box 41, Minsk, W. R. S. S. R.
UC2KAB, M. Kaplan, Radio Club, Gomel, Byelorussian S. S. R.
VE0ND (to VE1KW)
ex-**VK9YY** (to VK2AIR)
VK0s AB, PK, c/o Wm. Storer, VK2EG, Lot 11, Prince Charles St., Frenchs Forest, Sydney, N. S. W., Australia
VP2VG (via KV4BB)
VP5CP (via VP5AK)
VP5DS, QSL to D. Stichler, 753 Magnolia Ave., Eau Gallie, Fla.
VP6ZX, P. O. Box 260, St. Michael, Barbados, B. W. I.
VP8AQ, G. Davis, Port Stanley, Falklands, via Montevideo, Uruguay
VQ5GP (via VQ5AU)
VQ9VX (to W6VX)
VR3F, Box 3768, Honolulu, Hawaii, T. H.
VS2FL, Ong Ewe Aw, P. O. Box 14, Kota Bharu, Kerantan, Malaya
VU2BK, R. Z. Kabraji, Staff College, Wellington, S. India
XF1A (to XE1A)
ZA1KUN, P. O. Box 55, Tirana, Albania
ZC4CH, R. E. C. Collins, Police Hq., Nicosia, Cyprus
ex-**ZC4FB**, G. L. Bateman, G3LCG, 131 Parklands Dr., Loughborough, Leics., England
ZC5AL, c/o Post Office, Jesselton, British North Borneo
ZD4CF, Dr. H. de Glanville, Box 1632, Accra, Ghana
ZE5JU, P. J. Liebenberg, c/o Electricity Supply Comm., P. O. Umniati, So. Rhodesia
ZL5AA (via NZART)
5A4TC, Box 372, APO 231, Tripoli, Libya

Whence:

Europe — Sharpen your yodels and alpenstocks, gang — Helvetia-XXII DX Contest time again! USKA (Switzerland) once more invites world-wide participation in its annual H-22 frolic scheduled for 1500 GMT May 18th to 1700 May 19th. Non-Swiss amateurs will set out to work as many HB brethren in as many of Switzerland's 22 cantons (states) as possible; use c.w. or phone or both. The exchange is the usual RST001, RST002, etc., the "T" skipped on voice, and Swiss stations will attach canton indicators to their calls as follows: AG, Argovie; AP, Appenzell; BE, Berne; BS, Basle; FR, Fribourg; GE, Geneva; GL, Glaris; GR, Grisons; LU, Lucerne; NE, Neuchâtel; NW, Unterwald; SG, St. Gall; SH, Schaffhouse; SO, Soleure; SZ, Schwyz; TG, Thurgovie; TI, Tessin; UR, Uri; VD, Vaud; VS, Valais; ZG, Zoug; and ZH, Zurich. For a shot at H-22 Test certifications offered to the two highest scorers in each DXCC country, ship a copy of your log and final score — 3 points per band-QSO all multiplied by the number of cantons worked (22 maximum) — to USKA Comm. Mgr. HB9QO, Lauriedstrasse 6, Zug, Switzerland, postmarked no later than June 6, 1957. "Entries will only be accepted if submitted on separate sheets for each band, using only one side of the paper, and with the declaration: 'I certify that my station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the decisions of the council of the USKA will be final in all cases of dispute.' (Signature)" And when filing your results with HB9QO you might request full scoop on USKA's H-22 diploma, colorful tapestry awarded to those who succeed in confirming QSOs with all Swiss cantons . . . . . *Reminder:* On May 4th-5th VERON (Netherlands) concludes this year's PACC DX Test with a phone fling and EDR (Denmark) throws its yearly OZ-CCA DX Contest (see p. 63, last month's *QST*) . . . . . Along the Continental WAS front W2RWE and W7DJU learn that M1B (14,170-14,190 kc., 0100 GMT daily) seeks nine more states, five in our seventh call area; I1ZJG (same approximate QRG and QTR) needs Idaho and Utah; and SM7MS (14,040 or 21,040 kc., 0500-0630 or 1500-1600 GMT) pursues Vt., Wyo. and Utah. The Beehive State certainly is *the* clinker on most WAS score cards! W7EHF writes to say that he makes Utah available around 14,025 kc., 0000-0100 GMT, while W7DJU points out W7TTM as another Utah candidate on 20 and 15 meters . . . . . DL4HC worked all states on 28 Mc. inside of three months. Doc also accumulated a 134/89 DX tally in Wiesbaden from October '54 to February of this year when he returned to Arizona as K6PNL/7. ZB1CA was DL4HC's first QSO three years ago. W7EYR his finale . . . . . From K2BZT: "ON4DB tells me he built a 'Wonder-Bar' antenna per K6OFM's article in November '56 *QST*. It worked so well that when he raised a a Six in K6OFM's town he had him phone K6OFM to get him on the air for QSO, becoming that author's first European toward WAC!" . . . . . GD3FXN informs W4IV he'll be a Sunday 1500-GMT fixture on 28.3-Mc. phone henceforth . . . . . SP6BZ advises W6ZEN of HA5AM's tentative visit to Albania this month, ZA radiational intentions unspecified . . . . . G8ON resorted to 10 watts on 160 meters to catch his 200th country, the Isle of Man. "But they *never* QSL — to Gs, anyway!"

Asia — Thailand now is uncommonly lively DXwise with the advent of HS1MQ and HS1A. The latter keeps busy near 14,190, 21,200 and 28,400 kc., favoring the period 1500-1700 GMT. Ken expects to try c.w. from time to time and is rigging a quad for 10 meters. HS1MQ prefers phone work around the same hours; W6s YY ZWK and JHB were Lucio's first Yank QSOs . . . . . W1LVQ notes the formalization of two international call-prefix blocks: 9KA-9KZ for Kuwait, S8N-STZ for Sudan . . . . . CR9AH tells W7PHO of Peiking's C3MH, microphonically active around 1200 GMT. The prefix formerly signified Formosa, you know . . . . . W9KOK calls your attention to the book *Wind Between the Worlds* or (British version) *Captured in Tibet*, authored by Bob Ford, ex-AC4RF. Mitch adds, "Bob is back in London now after a holiday in Austria, recuperating yet from his long ordeal in Red China prisons. The Austrian mountains made him rather homesick for Tibet and the Himalayas. He may possibly become rare DX once more in the not too distant future." . . . . . W6QUN figures that the mentally-aberrated borrower of ZK2AB's call also is responsible for some of the VU4 and VU5 nonsense regularly heard on the West Coast these days. The true ZK2AB reckons that three or more culprits have appropriated his call since 1954 . . . . . Now in troubled Aden, ex-ST2NG worked W2HMJ as his first Yankee from VS9AG when he broke into an ET2RH-W2HMJ chat for preliminary QRK . . . . . W6YY has AP2RH's Pakistan departure date as July 18th . . . . . Ex-ZC4FB came away from Cyprus with a 110/95 DX record and is especially anxious to hear QSLwise from CE2CY, CO2CT, CX1CZ and HR1AT. ARRL's coveted DXCC diploma hangs in the balance and K1ARK is assisting.

Africa — Sudan's ham family diminishes. Following ST2NG's switch to VS9, ST2DB relocates in Accra this



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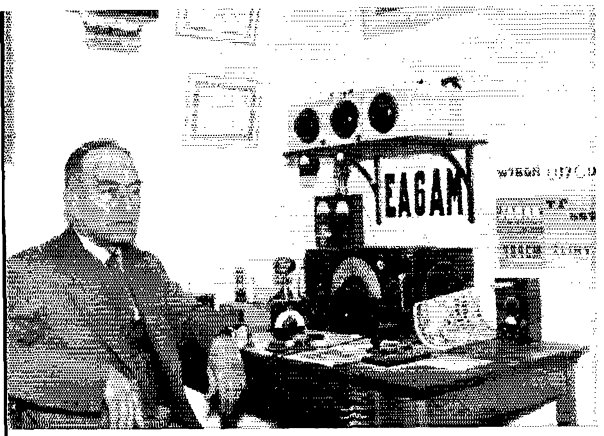
HS1MQ, installed and operated by LU8BF in Bangkok, supplies choice contacts on 14 and 21 Mc. with a Globe King, AR-88 and folded dipoles. Lucio is Argentina's *charge d'affaires* in Thailand and expects to keep HS1MQ workable through 1957.

May 1957



Radiating from pleasurable Palma de Mallorca, EA6AM is among DXdom's 20-meter Old Reliables. Antonio's commendable QSL policy has pushed many a grateful W/K DXer's countries total one notch higher. (*Photo via W1ICP*)

month. W9QGI learns from ex-ST2NG that remaining ST2s AR DD and TC are inactive, ST2AC active infrequently. That spurious ST2RD has been heard thereabouts signing other fictitious calls . . . . . Don't look now, but we missed Seychelles again. Wandering W6VX fired up VQ9VX on 21-Mc. c.w. for a few hours on February 26th, working lucky VQs 4AQ 4ERR and 5EK. "The only other stuff heard was ZS6BJ calling a VK, two FB commercial stations, and a carrier tuning up on 21,018 kc. VQ4AQ confirmed the dawning fact that conditions were terrible! My QTH, as well as the lack of red tape in getting going, was pure dream stuff. No power in the lines to give noise (220 v.d.c. at night only). . . . The band was like a tomb until a signal was heard from VQ4ERR." W6DZZ, who kindly relayed these lines, painfully acknowledges, "Was standing by here during the hours Ken was in VQ9 but 21 Mc. went dead about a half hour before he came on. Did hear V86, JA, PY and VQ4 stations calling VQ9VX before the QSB set in — so close and yet so far!" W6VX adds, "While anchored off Tristan ZD9AC came out to the ship and said he has received many cards for nonexistent ZD9AF." Dave concludes his Cunard Lines pleasure cruise this month and will be back in good old L. A. . . . . Via W6NTR: ZD3A hopes to produce Gambia QSOs for another year and expects reassignment then to another rare spot. Ted prefers 20 c.w. around 0800 GMT . . . . . Reporting somebody's unauthorized use of his call, VQ8AB notifies W6QGI of his removal to Kenya . . . . . By fast direct QSL ZD2DCP credits W4TFB as his first U. S. 28-Mc. QSO . . . . . W9YSX says that FA9IB is sweating out Utah and Wisconsin (yes, Wisconsin!) to complete WAS requirements. Rafa's 20-meter phone often is audible around 0500 GMT . . . . . From W6YY's well-tempered mill: VQ8AB is sure that a permanent 150-watt Comoros ham installation will be functional before "too long." . . . FB8CC (ex-FB8XX) says prospects of near-future Kerguelens activity are dim . . . . . According to WGDXC, VQ6s AB AC and AD (ex-VE7UE) are newly licensed.

Oceania — In this year's ARRL DX Test KH6IJ got a thrill collecting multipliers 'way up on 50 Mc. According to the record South American DX contesters made some use of Six during the first postwar ARRL International Competition a full decade ago. Ham history (courtesy the solar cycle) repeating itself! . . . . . Since activation on February 3rd at Scott Base, McMurdo Sound, ZL5AA has been a most popular item on 20 meters. VKs 3NM 3ZC and JA3BB were the station's initial contacts, and VK3ZC finds that ZL2US does much of the switch-throwing at ZL5AA between 0900 and 1200 GMT . . . . . An 80-meter contact with W1BU highlighted VK3ZC's results in the '57 ARRL Test. John seeks word of the present whereabouts of the VO2AT he worked during March and April of 1958 . . . . . "KW6CM, Florence, is an XYL who can operate 25 or 30 w.p.m. with no trouble at all. She QSLs at once." This YL-DXCC tip from W6KG (ex-DL4ZC) . . . . . VK4YP has completed over 1300 QSOs on regular schedule with G6YQ, and that's a *long* haul.

Hereabouts — Ham vacationers, your ears: "We gladly announce the possibility for licensed foreign amateurs to operate during a period of 14 days per year from the territory of the Netherlands Antilles which comprises the islands of Aruba, Curacao, Bonaire, Sint Maarten, Sint Eustatia and Saba," reads a letter to W1UED from PJ2CL of VERONA. It's a through-consul arrangement; check with PJ2CL for further details. Those areas are respectively prefixed PJ2A, -C, -B, -M, -E and -S; VERONA states that Saba and Sint Eustatia still await their first local ham QRM . . . . . OVARA members W4s EPA KVX OMW and W8EZF prefer the Caymans for their DXpeditionary exercises. VP5BH and club cohorts helped these DXers prepare a venture which coincided with the concluding session of the 23rd ARRL International DX Competition . . . . . SWL Bill Rice is informed that FB8YY of Terre Adelie will rejoin Antarctica's hamdom concurrent with accelerated French IGY activities. QSL delay will be sidestepped by radioing the 'YY log to Madagascar and thence to REF . . . . . W9HIX is a gal with DXCC ambitions, now past the half-DXCC mark with 130 watts and a 2-element beam on 15. Martha's dad is KN9GNK . . . . . In another YL note W9QGI specifies ZP5JP as a possibility for your distaff DXCC . . . . . W7DJU nailed JARL (Japan) AJD Award No. 452 to his Bellingham wall . . . . . W6OX8 (ex-HH9A) retired his c.w. kilowatt in favor of a sporting 25-watter. "Making lots of contacts and really enjoying QRP!" . . . . . K4LPW (ex-W3DGM) nipped his 120th country since shifting to Tennessee last year . . . . . W7HNS, columnist for the daily Portland *Oregon Journal*, had one of his finest DX nights a few weeks ago, later discovering that he worked five continents with an ice-coated wire flat on the ground . . . . . Alaskan squibs thanks to KL7CAW: KL7BVE rotated back to Indiana after shipping out 1500 QSLs; KL7BVW returned to Texas; KL7BFJ, chief op at KL7WAH, operated 10 and 75 while mobiling down the Alcan Highway last month; and KL7CAW will operate from a polar ice island with an ART-13 and BC-348 during Project Ice Skate, an IGY-affiliated undertaking begun last month (also reported by K6IUW and W6ZZ). Alex is amazed at the improvement in DX come-back percentage caused by shelving his W8GZF/KL7 label in favor of KL7CAW . . . . . VE7QF describes VE9MA 7- and 14-Mc. phone activity aboard civilian-staffed Canadian Naval Auxiliary Tanker *Dundurn*. Navy mobile-mariners VE9s NC and ND will be QRT for the present but VE9NE does brisk trade on 20 c.w. VE7QF reports one ZS5MN/MM working the West Coast around 3510 kc. and claiming to be aboard *Laurentian Forest* . . . . . Seekers after all California counties are invited to contact K6EDE for rare Lassen credit. Don hits 20 c.w. regularly with a beam'd 500 watts . . . . . ARRL W4/K4 QSL Manager W4HYW finished his separate-band-finals project and hopes his heavy Bureau duties will permit him time to complete sowing his antenna farm . . . . . HRs 1EZ and 2WC continue as favorites of the s.s.b. crowd. HR1EZ has hooked well over 100 countries and awaits sufficient pasteboards to apply for DXCC. And Nevada will clinch Earl's WAS . . . . . Help! Respectively, Ws 1BTU 2KGN 2QHH and 8CSK request QTH clews anent HL1AB (1948), SV9WU, ex-TG9JK and current DL4VH . . . . . In W2NIY's considered opinion too great a percentage of all sloppy DX operating is perpetrated by old-timers who should know better. Neophytes can hardly be chastized for aping the inane antics of certain 200-country men, 'tis true . . . . . In QSO with KC4USA, W3VKD was delighted to recognize the fellow at the key as old NN7NIC, an on-the-air pal he hadn't worked since 1932. *Small* world . . . . . For the younger blood we should point out that the W1CH who punched out *QST*'s DX column circa ten years ago, thereby supplying us with our present monthly terminating lines of reminiscence, now spiritedly punches the ionosphere on 20 c.w. as W7AH . . . . . It's also only fair to define the initials representing club credits for contributions in the preceding pages: International Short Wave League, Japan DX Radio Club, Milwaukee Radio Amateurs' Club, *Newark News* Radio Club, Northern California DX Club, Southern California DX Club, West Gulf DX Club and Willamette Valley DX Club.

Ten Years Ago in "How's DX?" — Your conductor calls attention to the comprehensive catalog of 13th ARRL DX Contest claimed scores appearing elsewhere in this May 1947 *QST* . . . . . Said Test served to entrench 20 meters as *the* DX band among postwar long-distance devotees. Via 14-Mc. c.w. the gang cornered C1DK, CT2XA, EK1s AA AB, EP1AZ, Dakar's FG3FP, G5KW/ZC1, HAs 1KK 4RS, HE1CE, I6USA, I7AA/I6, Js 2ACS 2AHI 3AAD 4AAK 9AAB 9CRP, LX1XX, OY3IGO, PKs 2AA 6EE 6HA, T1NS, UA9s CA CB, UA0s KAA UA, UD6BM, UO5VW, VSs 4BJ 7ES, W2OUB/C9, W6VIB/C7, W6VKV/I6, W8URU/C7, XABT of Trieste, XU1MCF, YR5V, ZC1AN, ZDs 1KR and 6IJ. Phone feeling ran high over J9s AAN LG, KA1s AK SS, KP6AA, PK1AW, XU6GRL and Basutolander ZS4P . . . . . Ten meters, mode unspecified, contributes CR8AX, HA4R, Js 2COM 2GHQ 3AMA 9AAQ, KP6AK, LX1AO, LZ1XX, NY4CM, PKs 4KS 6AX 6VR, SU1DM, W7IMY/C7, YIs 2WM 7G and ZC6FP . . . . . Forty comes up with FP8A, J2FOX, KA1ZU, UA0KTU, W2CDJ/J2, W6BWS/KG6 and ZK1AH . . . . . Tragedy! A bulky batch of VP2AT "QSLs" arrived the Hq. Bureau bearing data insufficient for DXCC accrediting; only the station's call appears . . . . . W6GRL (XU6GRL), for outstanding communications services rendered, is decorated by the Chinese National Government in Nanking.

CONDUCTED BY EDWARD P. TILTON,* W1HDQ

MAY — here we go again! The special attractions of a sunspot cycle peak kept things reasonably hot on the v.h.f. bands through the winter and early spring, but that doesn't stop the denizens of the world above 50 Mc. from looking forward to May. Man's joy in beholding evidence of advancing spring is shared by v.h.f. men, but for more reasons. V.h.f. DX, too, blooms in the spring.

Already the daily working range is getting longer. (Spring is a wonderful time to put up a new beam — it's bound to work out better than the one you used during the winter months!) Spring inversions are opening the 144-Mc. and higher bands for distances far beyond the winter's best, and the first rumblings of the sporadic-*E* season are being heard on 50 Mc.

We've got big times coming up, that's certain; but we have something else on the horizon, and we'd do well to think a bit of how we're going to cope with it. It's not been much of a problem in the past, but with the number of new stations now showing up on 6 and 2, these bands are going to experience some real QRM this spring, when conditions are good, unless we modify our operating habits.

We have the territory available; let's use it this year. We can't all be in the first 200 kc. of the band. There is nothing intrinsically important about working the low edge of a v.h.f. band; it's just that poor tuning habits of many operators make it pay off. You can do anything on 51 Mc. that can be done on 50.1, except possibly during a marginal F_2 opening. We used to work plenty of sporadic-*E* on the old 56-Mc. band; why knock each other out at the low edge of 50? Auroral propagation, which should show up frequently during the summer, is no respecter of frequency. Tropospheric progation actually gets better, as you go higher, though the difference within any one band is not measurable.

On 6 some of the gang have a valid excuse for staying close to the low end. These are the fellows in the Channel 2 areas. Let's give them a break by not overcrowding them when band conditions are good. Let's also remember that many operators would like to work the band edge on c.w. They can't do it effectively if they have to compete with dozens of stations using voice. Perhaps you don't agree with the fellows who want legislation to set aside an exclusive c.w. assignment at the edge of the 50- and 144-Mc. bands. Then the best way to prevent it is to make such a move unnecessary — by staying out of the first 100 kc. when you're on phone. Maybe you're not even willing to do that, but the least anyone can do is to clear the low edge of local rag chewing on voice.

On 144 Mc. there is no justification whatever for low-edge pile ups. Frequency has no signifi-

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

WØZJB.....48	W4UCH.....45	W8RFW.....45
WØBJV.....48	W4QN.....44	W8LPD.....14
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W1CGY.....46	W5ODNS.....45	WØTKX.....47
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W1RFU.....44	W5JLY.....44	WØJOL.....46
W1FOS.....14	W5JME.....42	WØUSQ.....45
W1KHL.....42	W5VV.....43	WØFKY.....45
W1ELP.....41	W5FAL.....41	WØCNM.....44
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W1SPX.....36	W5BXA.....41	WØURQ.....44
W1UHE.....35	W5HLD.....40	WØJHS.....43
W1LGE.....33	W5FXN.....40	WØ1PI.....43
W1WAS.....31	W5EXZ.....38	WØPKD.....41
W1FTF.....29	W5FRK.....36	WØZTW.....41
	W5HFF.....33	WØQVZ.....37
W2MEU.....47	W5NSJ.....32	WØZTW.....36
W2AMJ.....46	W5ZVF.....31	WØVIK.....36
W2BYM.....46		KØBPM.....35
W2RLV.....45	W6WNN.....48	WØWNU.....34
W2FHJ.....45	W8UXN.....48	WØYZZ.....30
W2RGV.....14	W6ANN.....45	
K2JNS.....42	W6NDP.....45	VE3AET.....45
K2AXQ.....42	K6GTG.....44	VE3AIB.....35
W2SHV.....41	W6GCG.....43	VE1EF.....35
W2GYV.....40	K6HYY.....43	VE3BBX.....33
K2HPN.....39	W6ABN.....43	VE1QY.....32
W2ORA.....39	W6IWS.....41	VE2AOM.....31
W2QVH.....38	W6CAN.....40	VE3DER.....31
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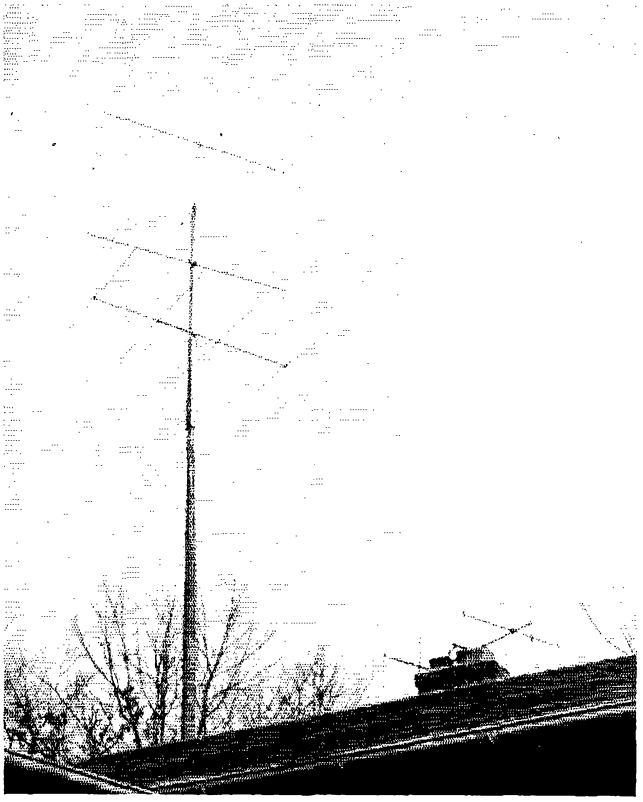
W3MQU.....41	W7DYD.....47	PZ1AE.....15
W3MXW.....41	W7ACD.....45	JA1AUH.....5
W3OTC.....40	W7JRG.....44	
W3FPH.....40	W7BOC.....42	
W3RUE.....41	W7JPA.....42	
W3LFC.....37	W7FIV.....41	Calls in **bold face** are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.
W3TDF.....35	W7CAM.....40	
W3AMO.....35	W7UFB.....32	
W3UQJ.....30		
	W8CMS.....47	
W4EQM.....47	W8OJN.....46	
W4FRH.....46	W8SQU.....46	
W4LNG.....45	W8NQD.....45	
W4CPZ.....45	W8UZ.....45	



Antennas at W2TBD, Medford, N. J., include a 12-over-12 for 144 Mc. and a 4-element for 50. The 2-meter array is hinged at the center for flop-over operation. Spacing between bays is 1½ wavelengths. The vertical array on the chimney is for the RTTY net.

ance, propagationwise, on the 2-meter band. Tuning at least part of the time from points other than the low edge, on the part of a major segment of the band's users, could soon solve the low-edge QRM problem.

A second major factor in v.h.f. QRM is the universal use of plentiful and inexpensive surplus crystals. Tune the 6-meter band in any area where activity is general, and you find heterodynes at 50.1, 50.25 and 50.4 Mc. There is often nothing doing on any other frequency! Then, when the band opens, a few hardy souls decide to move up in frequency. What happens? Out come the 8425, 8450, 8475 and 8500-kc. rocks, and the battle of the heterodynes moves to 50.55, 50.7, 50.85 and 51 Mc. There are many other surplus frequencies in between these, and they are only slightly less crowded at times. On the 2-meter band, 144.13, 144.45 and 145.35, among others, are just about as bad.

The solution is not to use more surplus crystals. Any rock you see advertised at bargain prices is an invitation to QRM. Lay in a stock — but move them around a bit in frequency. There are several ways. W4RMU described an easy-to-make variable-frequency holder in February, 1956, *QST*. A few swipes on Bon Ami spread on a piece of glass will move the crystal out of heterodyning range. Etching is easy, though the acid requires special handling. A good v.f.o. will help, but be sure that it is *good enough*. Few are!

A final suggestion for the spring season that has nothing to do with QRM: remember that DX isn't everything. Permanent growth of v.h.f. activity must inevitably be tied to local communication. Who can say how many budding enthusiasts have been lost because they found it hard to make contacts when they first tried 6 or 2? We certainly don't mean to discourage searching for new states or the striving for unusual DX, but we can all afford to spend some of our time looking for the fellows who are not "rare" and who may not have overpowering signals. There'll be a lot of newcomers on the v.h.f. bands this year; let's see to it that they get at least their fair share of contacts.

Here and There on the V.H.F. Bands

How long does it take to make 50-Mc. WAS? Depends on whether you take advantage of every form of propagation, and work the band for all it's worth. In the Middle West you have a fair chance of working the whole 48 in a single summer, with activity on 6 the way it is these days, but from either coast it may be a bit harder. For a West Coast 6-meter man, K6EDX, Fresno, California, has the record. Bob started his 6-meter campaign May 12, 1955, and he worked No. 48, W4HJQ, Glendale, Ky., Feb. 24, 1957 — 20½ months later. Bob may be the first Technician to make 50-Mc. WAS, though we have no record of the class of ticket held by WØSMJ and WØOGW when they made the grade last summer. All the other members of the club are old 6-meter hands whose states record dates far back before the Technician era.

W4HJQ deserves some special credit, for he also worked W6TMI, Oxnard, Calif., on Feb. 24th, putting Orin into the charmed circle. W6TMI's cards were received first, so

he has special 50-Mc. WAS Award No. 20, and K6EDX has No. 21. Wide-awake operating was a big factor in both awards, as the medium of propagation was *F*2-layer back-scatter, from South America. You don't pass up many chances and make WAS on 50 Mc. from the West Coast, even in these days of increased activity!

Speaking of back-scatter, Feb. 24th was one of the best days yet seen for 50-Mc. DX by that means. Here are some reports, taken from the IGY Project files: W4RMU, Ocean-way, Fla. — W4s CDC JDW TDW NWB, W5s VY ZTE, W6s AJF PUZ NLZ LUZ, 1355 to 1617 EST. W5MJD, Amarillo, Texas — W6s AJF KEV PUZ TMI EDX, W5s YKW ZTE VCX LFQ YJS, WØZJB, 1210 to 1400 CST. W6AJF, Sonoma, Cal. — W4NWB, W5s VY YJS, W6s NLZ PUZ, W7s FGG ERA, W9HLY, WØCNM. Heard W4HJQ. There were South Carolina, Florida, Texas, Oklahoma, California, Arizona, Oregon, Indiana, Colorado and Kentucky — between 0740 and 1250 PST. W6AJF also appears on the "heard" lists of just about every other station in the back-scatter zone that day. Few South American contacts were made; the band was open to the south, all right, but to some area where there was no 6-meter activity. With no direct path across the country there were no strong signals to interfere with the weaker back-scatter, so the boys who were alert to the possibilities inherent in back-scatter had a field day.

Aurora was going big over most of the country in late February, and through March, up to the time we write. Again from the IGY reports, we find aurora DX worked on 50 and 144 Mc. on Feb. 20, 23, 24, Mar. 1, 2, 3, 5, 7, 9, 10, 15, 22, 24, 25, 29 and 31. Some sessions, notably Feb. 23-24, March 1-2 and 9-10, seemed to last almost around the clock, and the areas affected included a major portion of the United States. Only Florida, Louisiana, Arizona, New Mexico, California and Nevada are missing from the reports of two-way work.

How far south and west does aurora effect extend? On March 2, W4IKK, Rome, Ga., worked W5RCI, Marks, Miss., on 50 Mc., at 0340 EST. W4HHK, Collierville, Tenn., was on his way home from work in Memphis, Tenn., when he noticed the visible aurora in the northern sky, just after midnight. He got on the air as soon as possible and heard plenty doing on both 6 and 2, so he called W5RCI on the telephone to get Rex out of bed to join the fun. The aurora was also visible in Marks, Miss., a fairly rare occurrence.

Geomagnetic latitude is not the same as the geographical variety. Lines drawn through areas of equal aurora occurrence swing northward as they go west.[1] W4IKK and W5RCI are on almost the same geomagnetic latitude, but their common line passes well north of the Bay area as it crosses the Pacific Coast. San Francisco has almost the same geographical latitude as Washington, D. C. — but it sees far fewer auroras. This does not mean that W6s, and southern W5s and 7s are completely out of the aurora picture, however. Auroras are seen occasionally in all parts of the United States, and though we have no record of aurora DX worked by Southern California or Arizona stations, we feel sure that it will be done, one day. Close liaison with stations farther to the north, in a better position to observe aurora conditions, would be one way to turn the trick.

W4MDA also saw the Mar. 2 aurora, when he was returning to his home near Chapel Hill, N. C. He got on 144 Mc. and worked W2DWJ, W9KLR and W8PT. This aurora was reported over a wider area than perhaps any other in v.h.f. history, thanks to the IGY project, no doubt. W7JRG, Billings, Mont., reported 144-Mc. reception of a W7, believed to be W7LHL in Seattle, at 2328 MST, March 1. This was within a few minutes of the time when W4HHK first noted the visible aurora near Memphis. (Note that the before-midnight western reports for Mar. 1 and the after-midnight eastern ones for the 2nd are all the same aurora.) What makes this report of special interest is that up to now 144-Mc. aurora work has been all but nonexistent anywhere west of the Wøs.

The Pacific Northwest saw plenty of auroral communication on 50 Mc. at this same time. W7DYD, Bothell, Wash., worked WØOGW, Lake Elmo, Minn. He heard other W7s and South Dakota and Colorado stations around 2300 to 2315 PST. W7INX, Portland, worked several W7s, VE7AFB, WØOGW, and heard about the same areas as reported by W7DYD. W7QDJ, Clearfield, Utah, reports reception of numerous W7s *and W6NLZ* on 50 Mc. He worked W7JRG, W7CJN, KØGKR, WØCNM and WØFKY. This session netted several new states for the two Grand Junction, Colo., stalwarts, WØCNM and WØFKY, and it was only their second experience with aurora. The first was Feb. 23rd.

KØGKR, Lakewood, Colo., worked W4IKK, unheard-of DX during aurora, and his observation is confirmed by W4IKK, to the effect that a tremendous area was coming in during this after-midnight workout. KØKGR worked with his beam NNE, and he was at it until 0145 MST. W7COL, Rigby, Idaho, receiving only, reports a similar list of Northwest stations heard. W7UFB, Casper, Wyo., was in on the fun, working WØCNM and KØGKR, W7JRG and W7CJN. Bob also heard W4IKK, and W7QDJ.

Several Eastern observers say that the band was still open when they quit on this one. Some early birds found signals coming through when they checked around 0600, and

[1] Moore, "Aurora and Magnetic Storms," *QST*, June, 1951, p. 16.

2-METER STANDINGS

	States	U. S. Areas	Miles
W1REZ	24	7	1175
W1FZJ	21	6	1120
W1RFU	20	7	1150
W1HDQ	20	6	1020
W1KCS	19	6	1080
W1AJR	17	5	810
W1IZY	17	6	750
W1UIZ	17	5	680
W1AZK	17	6	850
W1BCN	16	5	650
W1KHL	16	5	540
W1AFO	15	5	810
W1MMN	14	6	800
W2ORI	27	8	1040
W2NLY	27	8	1050
W2AZL	23	8	1050
W2BLV	23	7	1020
W2DWJ	21	6	720
W2OPQ	20	6	970
W2AMJ	20	6	960
K2CEH	20	7	910
W2PAU	20	6	880
W2UTH	19	7	880
W2AZP	19	7	650
K2IXJ	19	6	925
W2CBB	19	6	740
W2KIR	19	6	—
K2IEJ	18	6	745
W2AOC	18	6	660
W2LHI	18	7	620
W2RXG	17	6	675
W2SHT	16	6	650
W2PCQ	16	5	650
W3BGT	28	8	740
W3RUE	28	5	850
W3CKP	23	6	800
W3FPR	21	8	—
W3TDF	21	6	—
W3KCA	21	7	—
W3LZD	20	7	—
W3KWL	19	7	740
W3NKM	19	8	660
W3IBH	19	7	650
W3YHI	19	6	800
W3BNC	18	7	750
W3LNA	16	7	720
W4HHK	29	9	1280
W4HJQ	26	7	750
W4AO	23	7	950
W4DWU	22	6	675
W4JCJ	22	6	660
W4UMF	21	6	720
W4MKJ	20	8	725
W4JFV	18	7	830
W4QLK	18	6	720
W4VLA	17	7	825
W4WNH	17	7	750
W4TLV	16	7	1000
W4CLY	15	5	720
W4ZBU	14	5	800
W4WCB	14	5	—
W4TCR	14	5	720
W4IKZ	13	6	720
W4SOP	13	5	680
W4LTU	13	6	1080
W4CPZ	12	5	650
W4UDQ	11	5	850
W4MDA	11	5	680
W4GIS	9	2	335
W5RCI	21	7	925
W5HEH	15	7	830
W5AJG	15	6	1280
W5AHN	12	5	780
W5QNL	10	5	1400
W5CVW	10	5	1180
W5SWV	10	3	600
W5MWW	9	4	570
W5ML	9	3	700
W5NDE	8	3	520
W5PZ	8	3	500
W5FEK	8	2	580
W5VY	7	3	1200
W6NLZ	6	3	1000
W6WBQ	5	3	1380
W6DNG	5	3	600
W6AJF	5	2	640
W6RRZ	4	2	360
W6PJA	3	3	1390
W6ZI	3	2	1400
W6AJF	3	2	640
W6BAZ	3	2	400
W6MMU	3	2	388
W6ORS	3	2	365
W6LSB	2	2	360
W7VMP	6	4	1280
W7LEE	6	3	1020
W7LHL	4	2	1050
W7JU	4	2	353
W7JIP	3	2	850
W7YZU	3	2	240
W7JUO	2	2	140
W8WXV	28	8	1200
W8RMH	28	8	800
W8SRW	27	7	850
W8SFG	26	7	850
W8LPD	25	8	750
W8DX	25	8	720
W8LOF	24	8	700
W8ILC	23	8	770
W8SVI	22	8	725
W8JWV	22	8	710
W8PT	22	7	810
W8BAX	21	8	685
W8WRN	20	8	670
W8EP	18	7	800
W8ZCV	17	7	970
W8RWW	17	7	630
W8LCY	17	7	610
W9KLR	30	8	950
W9FVJ	26	8	850
W9ZHL	25	8	760
W9EQC	25	8	820
W9GAB	24	7	1100
W9EHX	24	7	725
W9BPV	23	7	1000
W9WOK	22	8	860
W9UCH	22	8	750
W9UED	22	7	960
W9AAG	21	7	850
W9KPS	21	7	690
W9MUD	19	7	640
W9REM	19	6	—
W9LF	19	6	—
W9ALU	18	7	800
W9UGA	18	6	720
W9MBI	16	7	660
W9JYI	15	7	560
W9LEE	15	6	780
W9DSP	15	6	760
W9DDG	16	6	700
WØEMS	27	8	1175
WØIHD	26	7	870
WØGUD	25	7	1065
WØUOP	18	6	—
WØONQ	17	6	1000
WØINI	17	5	830
WØUSQ	14	6	750
WØOAC	14	5	725
WØTJF	13	4	—
WØSMJ	12	5	775
WØZJB	11	4	650
VE3DIR	26	8	915
VE3AIB	25	8	910
VE3BQN	17	7	790
VE3DER	16	7	820
VE3BPB	13	6	715
VE2AOK	12	5	550
VE3AQG	11	7	800
VE1QY	11	4	900
VE7FJ	2	1	365

there was some evidence of aurora through most of the morning. This business of daytime aurora, a distinct rarity most of the time, seems fairly common around the peak of a solar cycle. Your conductor found things stirring again at 1550 Mar. 2, and the March 9–10 session was another almost continuous performance. Signals would disappear for a few minutes at a time, but they were reported intermittently through the night of Mar. 9, and as late as 0930 the following morning by W1SUZ. Traces of aurora were observed by the writer on 50 Mc. as early as 1340 on the 10th, and by mid-afternoon activity was going strong on both 50 and 144 Mc.

DX via the F_2-layer was disappointing to most Ws in March. After the African and South American 50-Mc. work reported last month, the 6-meter band went into a decline. Whether this was the result of the passing of a solar peak, or merely a temporary sag, is the subject of some conjecture. The International Geophysical Year was planned to coincide with the expected solar peak, but we wouldn't put it past Old Sol to get well over his outbreak of the pox before the IGY gets fully under way. If the experts can't be sure, who are we to hazard a guess? We'll make our "prediction" in about three years.

The 6-meter band was quiet for most Ws, but there was still plenty being worked in other areas of the world where the m.u.f. runs somewhat higher. The record DX circuit of more than 11,000 miles, first worked last year in March, was open frequently during late February and into March again this year. First results of 1957 on the JA-LU haul came on Feb. 23, when JA1ATF and JA3JJ worked LU9MA. The band was open from 0848 to 1104 JCT. JA2IF worked LU3EX between 1115 and 1145 JCT on the 26th. Two new country-to-country contacts were at least possible on the 27th, when KP4ABN reported reception of JA2IF and KH6SP (PP?) between 2215 and 2245 EST. KH6CCZ worked LU9MA at 1230 HST Mar. 3, and on March 4 there were scores of contacts between LUs and JAs on 50 Mc. LU7AT reports working JA2GR on Mar. 9, and KH6NS and PP on the 12th, at 2305 to 2316 Argentine time. The band stays open late down there, as it would have to to permit contacts halfway around the world. KH6NS reports South Americans worked on Feb. 24, and March 3, 5, 12 and 17.

V.h.f. club news: W4ZCZ, Opa Locka, Fla., announces the formation of the Gold Coast 6 Club, open to 6-meter operators of the Miami area. If things have been quiet elsewhere, Carroll has been doing OK. So far in 1957 he has worked all states east of the Mississippi except Vermont and New Hampshire, plus California, Oregon, Texas, Oklahoma, Louisiana and Missouri. On Feb. 20 he worked OA4C, CE1AH and XE1A, and has had several contacts with Argentina. W4DWY sends news of the National Capital V.H.F. Society, open to v.h.f. men of the Washington area. A smoothly-functioning TVI committee is at work, handling all complaints that result from work on 50 Mc. and higher frequencies, with results that have been building good will on both sides of the TVI fence. Out in Seattle, the Evergreen 50 and Up Society invites all persons interested in v.h.f. to visit their club house at 94th and Roosevelt Way. Meetings are the first and third Fridays of each month. Out-of-town hams welcome; phone Gladstone 5978 for directions, says club secretary W7YJE. And another 6-meter net: K5BWN invites everyone within reliable working range of New Orleans to check into the Early Bird 6-Meter Net at 0730 CST. Bob is NCS, with K5EQK as assistant. Frequency is 50.55 Mc.

K6DPQ, Berkeley, writes of doings on 50 Mc. in the Bay area. Don says that when he came on 6 in August, 1955, there were no more than a dozen active stations locally, but his station total is now well over 200. To provide a regular opportunity for getting better acquainted, the gang from Oakland to San Jose now meet for luncheon once each month. This is a family affair, for those who like to make it so, and the location is varied from month to month. Picnics are planned for the summer months. Visiting 6-meter enthusiasts may contact W6OJT or K6DOQ for information on the date and location of the next affair.

Interest in s.s.b. is growing as the result of the appearance of the Bay area's first 6-meter s.s.b. station, W6JKN. RTTY use is also spreading. K6DPQ rigged up his Model 26, and copied K6KFF, W6MXQ and K6BYR almost immediately. Several more fellows have RTTY converters in the works, and there is talk of setting up cross-country circuits on 6.

K6RNQ, Oakland, writes that he and K6EDX, and W6s AJF, BAZ and AFC are conducting crossband tests on 50 Mc. with VK2AOU, transmitting on c.w. at 1405 and 1435 PST, 5 minutes each period, and each half hour thereafter until 1700. VK2AOU operates on 28.3 Mc. and is on at 1415 and 1445, and each half hour thereafter. Bob also mentioned that KH6IJ looks for Ws on 50 Mc. between 11 and 1300 PST.

Does anyone know of RTTY services operating just below the 50-Mc. band edge in the South Pacific? K6RNQ reports reception of signals with a beam heading about right for Tahiti. The two Bobs, K6RNQ and K6EDX, offer to help equip anyone in the Pacific Islands who will get on 50 Mc. and really work the band. They have written many letters to various Pacific Islands hams, but so far have found no interest except on Guam. Is there a ham in the Pacific Islands who is interested in something besides phone-patch QSOs with the U. S.? Write K6EDX or K6RNQ.

Latest moonbounce results: W2NLY has heard his own echoes repeatedly on 144 Mc. As many as 30 returns from 120 pulses have been recorded, with the peak signal level reaching about 8 db. above the noise. Jim has eight 24-foot Yagis on 144 Mc. He still feels that his system needs further improvement before he can hope to do two-way work successfully.

W7CRA, formerly W6QKI, says that he has word that W6QFI, Saugus, Calif., has heard his own 144-Mc. echoes, using a large stacked rhombic. Syd is reported to be keeping skeds with KH6NS and KH6UK.

That big array at W2NLY is doing nicely on meteor burst work, as well as in lunar tests. Jim has identified WØIAY, Pawnee, Neb., WØRSP, Marvin, S. D., W5DFU, Tulsa, Okla., and he is hot on the trail of others. Positive identification of these under non-shower conditions gives some indication of what can be expected from W2NLY this spring and summer.

In February *QST*, page 136, we mentioned the doings of the U.H.F. Club of Jamaica, including the construction of microwave oscillators by W2QPQ and W2OKX. Trouble was, the printer left off the last zero on the frequency. These fellows are on 2300 Mc. Interest in this project has spread to the point where more gear is now in the works. Items planned include a 100-watt rig by K2GNR and a 2300-Mc. transceiver by K2IDD.

OES Notes

W1HDQ, Canton, Conn. — Aurora openings come so frequently these days that there is often time to look for interesting QSOs, rather than any particular DX. During March 2, your conductor spent much of the afternoon searching out weak signals, and stations operating above the low-end pile-up, regardless of call area. Results on 50 Mc.: worked Berwick, Maine, 8 watts, Elizabeth, Pa., 10 watts, and Syracuse, N. Y., 40 watts (and up a way in the band). All were having no luck making contacts, though their signals were easily read at W1HDQ. Later the same approach netted a string of nice QSOs on 144 Mc., mostly with fellows who were also convinced that "low power won't work on aurora." DX isn't everything; let's make contacts! Heard WØIFS, Minneapolis, Minn., Feb. 23 — by far the greatest distance a 144-Mc. signal has been heard via aurora at this station.

K2DDK, Flushing, N. Y. — Identified 42 different stations on 144 Mc. during Feb. 24 aurora. Most peaked with beam 40 degrees west of north, the only exceptions being VE3s. Working on local gang to enlist cooperation in clearing first 100 kc. of 2-meter band of voice signals.

K2ITP, Riverton, N. J. — Experimenting with 20-watt d.s.b. suppressed-carrier rig on 50 Mc. Has been copied well by W2MEU, some 75 miles distant. There are now about 100 stations on 6 in the Philadelphia area, with some 20 more mobile. QRM in the low part of the band is becoming severe, and support for 100 kc. of exclusive c.w. at the low edge is growing.

W3KLA, Baltimore, Md. — Interest in aurora work could be extended considerably if operators would work relatively nearby stations, instead of spending all their time looking for DX or new and rare states. Many on both 2 and 6 could work out during aurora, from locations that may be poor for other types of v.h.f. DX. W1 to W3 is an example of the sort of thing that could be done much more often than it is, on both 50 and 144 Mc.

W3UQJ, York, Pa. — Now running 370 watts to ½ 304TL on 50 Mc. Aim NE nightly at 2300, calling CQ on

(Continued on page 160)

Armed Forces Day—1957

ALL U. S. amateur radio operators are invited by the Army, Navy and Air Force to help celebrate Armed Forces Day on Saturday, 18 May 1957. Cosponsors of the activities are the Director of Naval Communications, and MARS representing the Army and the Air Force.

As in past years, the amateur radio activities will be conducted in three categories.

Category I will consist of a c.w. receiving contest. The Secretary of Defense will attest on a Certificate of Merit to the code-copying proficiency of any listener who submits a perfect copy.

Category II consists of a test of radioteletypewriter receiving. Special letters of acknowledgement will be sent by the Department of Defense to each amateur who participates.

Category III is the highlight of Armed Forces Day amateur radio activities, consisting of military-to-amateur contacts, for all U. S. amateur radio licensees. Headquarters stations of the Army, Navy and Air Force in Washington, D. C., will QSO amateur stations and will acknowledge these contacts with new vari-colored QSL cards. The time for contacts has been extended this year to allow a greater number of stations to QSO the headquarters of each service.

The c.w. receiving competition will feature a message from the Secretary of Defense. Anyone is eligible to participate. A certificate of merit will be issued to each participant who makes perfect copy. Transmissions will be at 25 w.p.m. on the following schedules:

Time (*18 May 1957*)	*Call Sign*	*Frequencies* (*kc.*)
190300Z (2200 EST)	WAR/AIR (Army & Air Force Radio, Wash., D.C.)	3347, 14405, 20994
190300Z (2200 EST)	NSS (Navy Radio, Washington, D.C.)	3319, 4010, 7375, 14480
190300Z (1900 PST)	A6USA (Army Radio, San Francisco, Calif.)	6997.5
	NPG (Navy Radio, San Francisco, Calif.)	3319,14927.5, 7595
	AF6AIR (Hamilton AFB, Calif.)	7832.5
(1100 GMT) (2000 INDIA)	NDT (Navy Radio Yokosuka)	2287.5, 4545, 9427.5, 13471.5, 16445, 23010

Each transmission will commence with a five minute CQ call. It is not necessary to copy more than one station, and no extra credit will be given for so doing.

Transcriptions should be submitted "as received". No attempt should be made to correct possible transmission errors. Copy should be mailed to Armed Forces Day Contest, Room BE1000, The Pentagon, Washington 25, D. C. Time, frequency, and call of the station copied shall be indicated as well as the name, call and address of the amateur concerned.

A radioteletypewriter receiving competition will feature a special joint message from the Chief Signal Officer, U.S. Army; Director, Naval Communications; and the Director of Communications, U.S. Air Force. A letter of acknowledgement will be sent to each amateur participant who submits a copy made from the radioteletypewriter transmission of this message. Transmission will be at 60 w.p.m. on the following schedule:

Time (*18 May 1957*)	*Call Sign*	*Frequency* (*kc.*)
190330Z (2230 EST)	WAR (Washington, D.C.)	3347
	NDC (Norfolk, Va.)	7375
	AIR (Washington, D.C.)	7915
190330Z (2130 CST)	NDS (Great Lakes, Ill.)	7375
	NDF (New Orleans, La.)	7375
	A5USA (Fort Sam Houston, Texas)	5302.5
190330Z (2030 MST)	NDW2 (Salt Lake City, Utah)	7375
190330Z (1930 PST)	NDW (Treasure Island, Calif.)	7375
	AF6AIR (Hamilton AFB, Calif.)	7832.5
	A6USA (San Francisco, Calif.)	6997.5

Each transmission will commence with a period of ten minutes of test and station identification to permit amateurs to adjust their equipment. At the end of the test period, the message will be transmitted. It is not necessary to copy more than one station, and no extra credit will be given for so doing. The messages should be submitted "as received". No attempt should be made to correct possible transmission errors. Copy should be mailed to Armed Forces Day Contest, Room BE1000, The Pentagon, Washington 25, D.C. Time, frequency, and call of the station copied should be indicated as well as the name, call and address of the amateur concerned.

Military stations WAR, NSS and AIR, will be on the air from 181800Z to 190500Z on 18 May 1957 to contact and test with amateur radio stations. Amateur contacts will be discontinued from 190245Z to 190400Z for the c.w. and RTTY broadcast competitions. Otherwise, military stations will operate on spot frequencies outside the amateur bands as follows:

Station	*Military Frequency* (*kc.*)	*Appropriate Amateur Band* (*Mc.*)
WAR (Army Radio Washington)	4025 (a.m.)	3.8 to 4.
	6997.5 (c.w.)	7. to 7.2
	20994 (s.s.b.-a.m.)	21.25 to 21.45
NSS (Navy Radio Washington)	4010 (c.w.)	3.5 to 3.8
	6970* (RTTY)	7. to 7.2
	7375 (c.w.)	7. to 7.2
	14385 (s.s.b.-a.m.)	14.2 to 14.3
	14480 (c.w.)	14. to 14.2
	20050 (c.w.)	21. to 21.25
	20075 (s.s.b.-a.m.)	21.25 to 21.45
AIR (Air Force Radio Washington)	3347 (c.w.)	3.5 to 3.8
	7635 (a.m.)	7.2 to 7.3
	14405 (s.s.b.-a.m.)	14.2 to 14.3
	143.46 Mc. (a.m.)	144. to 148.

*NSS will first tune the 7 Mc. amateur RTTY band and then will tune 80 and 20 meter RTTY frequencies.

Military stations will listen for calls from amateurs within the appropriate amateur bands. Contacts will consist of a brief exchange of location and signal report. This is a test of military-to-amateur communications and no traffic handling or message exchange will be permitted. A QSL card will be sent to each amateur station worked.

YL News and Views

CONDUCTED BY ELEANOR WILSON,* W1QON

Another YL SCM

Dorothy E. Wilson, W6REF, of Oxnard, California, (see Feb., '56 column) has been elected Section Communications Manager of the Santa Barbara section. Dorothy joins W1OAK and W1VXC (see Jan. '57 column) as the third YL currently to serve in the office of SCM.

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YLRL Certificate Custodians

Custodians for the various certificates offered by the Young Ladies Radio League follow. Confirmations or inquiries should be sent to the custodian.

YL Century Certificate — Katherine Johnson, W4SGD, Box 666, Fuquay Springs, North Carolina

YL Worked All States — Grace Ryden, W9GME, 2054 North Lincoln Ave., Chicago 14, Illinois

YL Worked All Continents — Barbara Houston, W3OQF 109 Seneca Drive, S.E., Washington, D. C.

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Keeping up With the Girls

Miscellany:

W8RIR, Chairman of the YLRL Nominating Committee, announces the appointment of W5ZPD and W9RUJ to the committee and urges all members to send in their nominations promptly. . . . Present at a small dinner party in Washington, D. C., in honor of Mae, W3CUL, first YL recipient of the Edison Radio Amateur Award, were *W3s* AKB, CDQ, K4LMB, W4TVT, W3TSC and OM W3BKE, W4ETR and OM W3DAZ, and W3CUL and OM W3VR. . . . W9GME reports that since she became YL/WAS custodian last November, she has issued only three certificates: #17-19, to OM W9KA, W4VCB/3, and W6WRT respectively. . . . W2KEB, Georgie, was tops in the BPL in the January listing, for September traffic. . . . WN3LEK became a U. S. citizen and a licensed amateur about the same time. Gisela's first QSO was with her OM W3JAK at KG1FA, Greenland, on 21 Mc. c.w. . . .

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

That's well-known ex-KH6TI in new surroundings as K5CCJ. Dell Johnson has traded the flora of Hawaii for the cactus of New Mexico. Dell's faithfulness to ten meters hasn't diminished though — she can be heard daily from her Las Cruces QTH. Currently she's NCS of the Mesilla Valley Emergency Net. Dell's OM is K5CCI. (*Photo by W5UHI*)

W9HIX, Martha, and KN8DFE, Carol, are majoring in radio and television at Lindenwood College, Missouri. . . . *KNØs* EPE, GZT, and YHG have been attending the Denver Radio Club's study classes faithfully. . . . K4CXJ, Lois, and her OM are being transferred to Japan in June. . . . Two YLs planning to visit Europe this summer are W3CDQ, Liz, and W1DQF, Alice (with her OM W1BB). . . . KN2UKQ, Kay Gaynor, 46 No. Jefferson St., Orange, N. J., would like to study for a General Class ticket with a YL in her own or surrounding town. . . . K4MNM, Lucille (ex W7YDF), checks into the Alabama MARS net from her temporary trailer home at Huntsville, Ala. . . . W7REK, Verona, formerly of Boise, Idaho, is awaiting a W6 call in Los Angeles. . . . W6UHA's latest DX conquests include HS1A, XW8AC, CR5SP, and YL UM8KAA. . . . K6RIIZ and K6RLU, Marilyn and Jackie, are a mother and daughter team who can be heard on two meters daily. . . . K6OQD, Jean, is the new NCS of the California two-meter American Legion net. . . . YLRL tenth-district chairman KØBFS lists some of the more active YLs in the district by state, in case you need a few fillers for YL/WAS: Missouri: *WØs* LHP, MRJ, SZH; Kansas: *KØs* ACC, BFH; N. Dakota: KØBEA; So. Dakota: KØBMS, WØZWL; Colorado: KØBCQ, *WØs* ERR, JGU, TYB; Minnesota: KØBFS, *WØs* ETY, IRD, IRJ, JMI, KJZ, NZT, QVQ, and TQQ.

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Helen Hagen, KØBFS, of Mound, Minnesota, is currently serving as YLRL chairman for the tenth district. Emergency Coordinator for her town, Helen is a regular member of the 10th Air Force MARS and the MSN. Using s.s.b., c.w. and phone on several bands, she has WAS, WAC/YL, and has worked 86 countries. Her OM is KNØIGP, and one of her three children is KØBFV.

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To quote OM W4HXB — "For KN8DQI, Arline Davidson of Charles Town, West Virginia, amateur radio will be a new light, for she is blind." Members of the Shenandoah Valley ARC are building a new transmitter for Arline, which she'll be able to tune by audio. (*Photo by W4HXB*)

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YL Net Directory

A revised list of all of the nets registered with the YLRL follows. It is expected that most of the nets will continue their schedules right thru the summer. Inquiries should be directed to YLRL Vice President Mildred Wright, W3YTM/5, P. O. Box 1088, Pasadena, Texas.

Hereafter, it will be our practice to publish semi-annually, in the fall and spring, the complete list of YLRL nets as registered with the YLRL Vice President, and, at the same time, publish all such other nets (non-YLRL) of which we have received notice. If your net is not affiliated with the YLRL, and you would like it to appear in our semi-annual listings, please drop us a card with the name of your net, n.c.s., day, time, and frequency of meeting. If your net does not appear on the list, the chances will be that it was not registered with us — net information will appear only upon request. Please keep all information up-to-date.

PHONE

Freq.	*Day*	*Time*	*NCS*
7225	Monday	0900 EST	W4BIL-Floridora
3970	Monday	1000 CST	WØUDU-WØs BFW and PIK alts.
3900	Monday	1500 PST	W7HHH-W7NJS alt.
28,800	Monday	2000 EST	W1RLQ-W1CEW alt.
3900	Tuesday	0830 EST	W4HLF-Blue Ridge
3838	Tuesday	0900 EST	WØKJZ-Pi Net
29,000	Tuesday	1300 EST	K6EXQ-W7s YFQ, WLX, W5EGD, KØAUJ alts.-Hairpin
3900	Wednesday	0830 EST	W1TRE-Yankee Lassies
3820	Wednesday	0900 PST	W7QYN-Nylon
3915	Wednesday	0900 PST	W6PJF-W6GQZ alt. Ironing Board
3900	Wednesday	0930 EST	W8ATB
14,275	Wednesday	1300 CST	W8SPU-K9DOT alt. Single-Side Bandettes
3880	Thursday	0800 CST	K5BNQ-Texas Round-Up
7215	Thursday	0830 EST	K2IWO-Friendly Forty
7235	Thursday	1000 CST	W5EGD-Texas Round-Up
14,240	Thursday	1100 PST	W9RUJ-Tangle
21,390	Friday	1430 EST	KZ5VR-W9RUJ, W5RYX, W7WLX alts.-Cross Country

C.W.

Freq.	*Day*	*Time*	*NCS*
3610	Wednesday	2100 EST	W1YPH-East Coast YL
3750	Thursday	1400 CST	W9MYC-LARK

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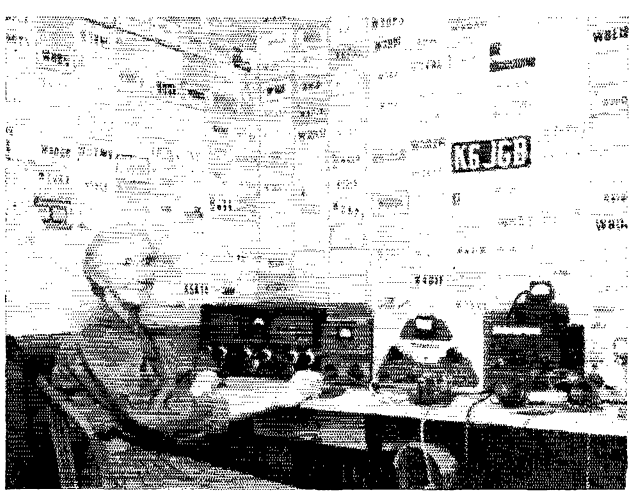
Now eighty-one years young, KN6VCC was a railroad telegraph operator some years ago. Mrs. Nettie Grady and her son K6JGB are on the air from Hemet, California.



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23rd ARRL Sweepstakes Results

Part I — C.W.

ONE THING about the SS: the rules are simple as mud and you can learn the ropes in thirty minutes on the air. You swap NR4 W6XXX 579 SF NOV11-type preambles as often as possible. For the two points per contact (before any multipliers) the five "message" elements must be rogered for in both directions. Which means you have to *communicate*. Now every amateur worth his salt loves communicating and so you never run out of customers, even when you stick at it for the 40-hour maximum. And coming in 15th or 25th can be as much fun as leading the section, provided one lands new states or doubles his code speed or makes the "clean sweep" — and there are 101 other ways to get your feet wet in the SS and have a whale of a time.

Inasmuch as every recent SS has been bigger than the one before, followers of contests will scarcely swoon at the news that the 23rd smashed all past records with 1960 entries (1435 c.w., 525 phone) present and accounted for. The facing tabulation identifies the 73 brasspounders who came, saw and conquered in their respective ARRL sections in 1956. If you were a winner, FB and congratulations! If not, maybe you'll want to study the meat in this report and enhance your chances of becoming one in November, 1957. For one thing, take note of the wide play that ten and 15 meters are getting as the solar-peak days approach.

Scorewise, the prevailing winds were from the South, it would seem, as just three entrants registered scores of 200K-plus and all were Fours. They have thousands of SS manhours behind them and you will recognize their calls: W4KVX, W4KFC, K4LPW (better known as ex-W3DGM). Their scores were 227,213, 219,000 and 204,660. You will also recognize these others who netted above 150,000 points: W6BJU (W6CUF keying) 198,000, W3EIS 185,670, W8FGX (W8EZF opr.) 182,568, W9YFV 180,720, W9OCB (multi-operator) 178,588, W9APY 176,138, W8LQA 174,600, W7KEV 173,649, W1BFT 172,885, W4YHD 165,710, W3VOS 162,360, W9RQM 161,350, W6YMD 157,096, W3JNQ 156,023, W3EIV 155,845, K6JQJ 153,658, W3MSR 153,270, W3AEL 152,575, K6CEF 151,840. Canada's champs proved to be VE3DSU 110,513, VE3VX 85,593, VE3EAM 85,090, VE3ES 74,725, VE2ADD 64,417.

VE8JW assumes the fighting stance with which he salted away 64,253 points, no cinch from aurora-ridden Whitehorse, Yukon. Earl, ex-VE4ALE-VE7ALE-VE7MW, anticipates more steam come next SS thanks to 14-Mc. horizontal and 7-Mc. vertical beams just completed.

If you found Nevada, the odds are ten to one that this is the fellow who made it possible. Las Vegas' W7KEV held sway in his call area and always-rare section with a withering 173,619 points, the U. S. A.'s 11th best code total. Ed's formidable forward gain derives from this antenna farm: a 40-meter zepp.

The following call-area comparisons reflect the peak of competitive effort geographically:

W1BFT	172,885	KP4DH	100,328
W2CQB	134,575	KZ5BC	19,796
W3EIS	185,670	VE1CU	220
W4KVX	227,213	VE2ADD	64,417
K5CAW	138,006	VE3DSU	110,513
W6BJU	198,000	W3MCG/VE4	11,019
W7KEV	173,649	VE5DZ	39,329
W8FGX	182,678	VE6MA	51,975
W9YFV	180,720	VE7JO	47,250
WØCDP	129,666	VE8JW	64,253
KH6MG	92,140	VO6N	19,550
KL7MF	17,325		

The rarity of Vermont, Mississippi, and certain Canadian multipliers notwithstanding, these 27 amateurs contacted all 73 sections: *W1s* EOB HX JYH VG, W2IVS, K2KCE, *W3s* GRF MFJ PZW VAN, *W4s* BEY CVI IHN KFC KVX LYV YHD, *W6s* BIP BVM HOC PYH TT YMD, K6CEF, *W7s* KEV, TKB, WØCDP. It should be recorded for posterity that, by dint of placing diligent section-searching above all else, W4IHN swung the "clean sweep" in a measly 108 QSOs, W1HX did it in 130, and W7TKB in 212.

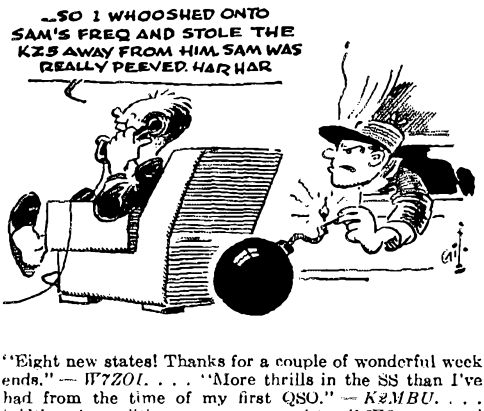
We should call attention to 17 bright-eyed newcomers who earned special Novice awards in their first crack at SSing: *WN1s* 1UU 1WQ, *KN2s* RCC RHQ SRA UPD, WN3FNH, KN4IEX, KN5EZV, *KN6s* PKJ QYG, *KN8s* AHO CPM, *KN9s* BZJ DWK, *KNØs* DSC EGJ.

C. W. WINNERS, 23RD A.R.R.L. SWEEPSTAKES

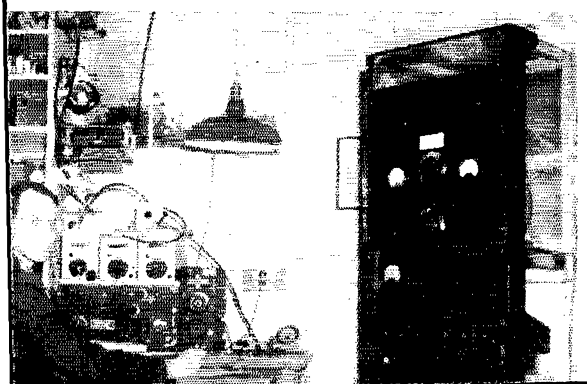
Section	*Call*	*Score*	*Transmitting Equipment*	*Receiving Equipment*	*Bands Used*
E. Penna.	W3JNQ	156,023	Lysco 600-813	HRO60	80, 40, 20, 15
Md.-Del.-D. C.	W3EIS	185,670	Command Sets-813	BC342, Q5er, c.c. conv. (10, 15)	80, 40, 20, 15, 10
S. N. J.	W2HDW	110,773	DX100	HQ140X	80, 40, 20
W. N. Y.	W2SSC	124,783	Ranger	75A3	80, 40, 20, 15, 10
W. Penna.	W3VIW	128,240	Sig. Shifter-813s	HQ129X, R9er, Q multiplier	80, 40, 20
Illinois	W9YFV	180,720	5100B	75A4	80, 40, 20, 15
Indiana	W9APY	176,138	VFO-807-4-125A	NC300	80, 40, 20, 15
Wisconsin	W9RQM	161,350	VFO-807-813	HRO50T	80, 40, 20, 15, 10
No. Dakota	KØCNC	32,745	Heath VFO, 6146	NC88, HQ100	80, 40, 20, 15, 10
So. Dakota	WØTLD	46,384	Ranger	NC183	80, 40, 20, 15, 10
Minnesota	WØRLI	127,925	Viking VFO-6AG7-6BQ6-811As	NC173, Q multiplier	80, 40, 20, 15
Arkansas	W5BYJ	48,400	Bud VFO-6AG7-1625	HQ129X	80, 40, 20, 10
Louisiana	W5YDC	127,090	HT20	NC183	40, 20, 10
Mississippi	W5FPI	49,500	TBS50C	S76	80, 40, 20, 15, 10
Tennessee	K4LPW	204,660	VFO-Viking I	HRO50T1	80, 40, 20, 15, 10
Kentucky	W4KVX	227,213	Meissner VFO-813	75A3	80, 40, 20, 15, 10
Michigan	W8OCK	125,650	VFO-Viking I	75A3, DB23	80, 40, 20, 15, 10
Ohio	W8FGX	182,678	310B-4-125A	HRO60 (mechanical filter)	80, 40, 20, 15
E. N. Y.	K2PIC	113,750	5100B	75A4, DB23	80, 40, 20, 15
N. Y. C.-L. I.	W2IVS	129,758	Ranger	NC300	80, 40, 20, 15, 10
N. N. J.	W2CQB	134,575	VFO-807-812s	NC300	80, 40, 20
Iowa	WØFZO	127,736	Cyclemaster-813	HQ129X	80, 40, 20, 15, 10
Kansas	WØIUR	113,693	VX101-813	HQ129X	80, 40, 20, 15, 10
Missouri	KØHEM	107,726	Ranger	NC300	160, 80, 40, 20, 15, 10
Nebraska	WØBUR	94,013	Viking I; 12AT7-2E26 (6 meters)	HQ129X, c.c. conv. (6)	80, 40, 20, 15, 6
Connecticut	W1TYQ	138,510	Viking II	75A4	80, 40, 20, 15
Maine	W1BCD	51,345	DX100	SX25	80, 40, 20, 10
E. Mass.	W1DDF/1	113,750	32V1	75A3	80, 10, 20, 15
W. Mass.	W1JYH	135,123	VFO-4-250A	Homebuilt	80, 40, 20, 15
N. H.	W1BFT	172,885	32V3	75A4, DB23	80, 40, 20, 15, 10, 6
R. I.	W1CJH	80,063	Viking II	75A1	80, 40, 20, 15, 10
Vermont	W1QMM	47,530	6AG7s-6L6-813	Homebuilt (triple conv.)	80, 20, 15
Alaska	KL7MF	17,325	AF67	SX25	20, 15
Idaho	W7WMO	53,520	DX35	NC45	40, 20, 15
Montana	W7VGZ	54,653	VF1-AT1-813	BC348P	80, 40, 20
Oregon	W7TML	101,010	VF1-AT1-813s	SX71	80, 40, 20, 15
Washington	W7GWD	114,210	VFO-2E26-814	Super Pro	40, 20, 15
Hawaii	KH6MG	92,140	Ranger	75A2	40, 20, 15, 10
Nevada	W7KEV	173,649	VFO-807-4-65A	HQ129X	40, 20, 15
Santa Clara V.	W6UTV	134,750	VFO-4X150B	HRO60	80, 40, 20
East Bay	*W6PYH*	*129,666*	32V3	75A4	*80, 40, 20, 15, 10*
San Francisco	W6BIP	107,164	VT127As p.a.	SX28A, Q5er	80, 40, 20, 15, 10
Sacramento V.	K6ORT	93,100	6AG7s-6V6-1625s	BC348, Q5er	80, 40, 20
San Joaquin V.	W6EFV	87,774	32V2	75A3	20, 15
No. Carolina	W4LYV	111,599	32V3	75A1	80, 40, 20, 15
So. Carolina	W4HGW	86,933	Viking I	HQ129X	40, 20, 15
Virginia	W4KFC	219,000	VFO-807-4E27	75A4	80, 40, 20, 15
W. Virginia	W8KWI	81,680	HT18-813	SX100	80, 40, 20
Colorado	WØCDP	129,666	DX100	SX71	80, 40, 20, 15
Utah	W7BAJ	67,538	DX100	SX100	40, 20, 15, 10
Wyoming	W7HYW	64,470	VFO-813-810s	75A3	20, 15
Alabama	W4WOG	58,823	5100	BC348N	80, 40, 20
E. Florida	W4SHW	83,573	Ranger	SX100	80, 40, 20, 15, 10
W. Florida	W4WKQ	103,125	Lysco 600-813	HQ140X	80, 40, 20
Georgia	K4BAI	100,969	6L6-807s-100THs	SP400X	80, 40, 20, 15
West Indies	KP4DH	100,238	6AH6-6C4-5763s-Viking II (modified)	HROM	40, 20, 15
Canal Zone	KZ5BC	19,796	813 p.a.	NC100, HF10-20	20
Los Angeles	W6BJU	198,000	Sonar XEC-4E27	75A2, DB23	80, 40, 20, 15
Arizona	W7CJZ	119,680	6BH6s-6AG5-5763s-807s-813s	Homebuilt (dual conv.)	40, 20, 15, 10
San Diego	W6ZVQ	107,100	PTO-6AG7s-2E26-814	BC348, SX28	40, 20
Santa Barbara	W6ERB	100,554	Viking II	75A4	40, 20, 15
No. Texas	W5BLU	114,665	DX100	HRO5	80, 40, 20, 15, 10
Oklahoma	W5EQT	103,360	811s p.a.	HQ150	40, 20
So. Texas	W5BTS	108,205	6AC7-5763-6146	Homebuilt (50 kc. i.f.)	40, 20
New Mexico	K5CAW	138,006	5100	75A4	40, 20, 15, 10
Maritime	VO6N	19,550	VFO-807-813	HQ129X	20, 15
Quebec	VE2ADD	64,417	VFO-6N7-6AG7-6146-813	NC125	80, 40, 20
Ontario	VE3DsU	110,513	DX100	HRO7	80, 40, 20, 10
Manitoba	W3MCG/VE4	11,019	32V2	51J4	40, 20, 15
Saskatchewan	VE5DZ	39,329	6AG7-6L6-807-803	HRO	40, 20
Alberta	VE6MA	51,975	6V6-6L6-807	SX23	40, 20, 10
B. C.	VE7JO	47,250	6AC7-6AG7-6L6-807s	AR6, Q5er	40, 20
Yukon	VE8JW	64,253	802-807	75A2	40, 20

Contest Quotes

"Despite necessary school work, made 200 more contacts in my first SS as a General. Expect to represent No. Dak. often in the future and hope ARRL always keeps up this great contest." — *K0CNC*. . . . "Used four watts input to a 50L6 oscillator and four 40-meter crystals. This peanut whistle won't win a certificate but it's fun to see what can be done with it." — *W4SAS/5*. . . . "Bet W4SAS/5 was the lowest-powered station in the SS. He gave me NR 70, not bad for four watts." — *VE3DUS*. . . . "Pickings got rather lean on 20 c.w. towards the end. Was seeking a 14-Mc. WAS but where were Vt. and Miss.?" — *W5JPC*. . . . "Bands in order of importance were 20, 40, 10, 80 and 15, but ten meters proved by far the hottest in QSOs per hour." — *W6YMD*. . . . "The 1956 SS, c.w. style, was terrific. Operating techniques seemed better than ever and conditions superb." — *W6SRT*. . . . "A miserable score but enjoyed listening to the OM (W1SAD) rack up a much better one." — *W1COL*. . . . "First time in 27 years of hamming that I was successful in working all 73 sections in the SS, although there appeared to be very little activity in VE5, VE6, VE1, and heard only one station in KL7, KP4, VE4, So. Dak., W. Va., Miss. and No. Dak." — *W7TKB*. . . . "Open letter to 800 of the 926 stations worked: 'R5 does *not* mean QSZ.' There's absolutely no reason for a guy to send everything twice or three times after receiving RST 579 or better." — *W1JYH*. . . . "Raised my skyhook the second week end and got out worse." — *K6CNE*. . . . "W7TKB gave me my 48th state." — *W1AMY*. . . . "Made ten times my '55 score." — *K4DWF*. . . . "First SS and I'll settle for 64 sections and 47 states in every future one." — *W8IBX*. . . . "47 states and couldn't find Vermont." — *W3BQA*. . . . "Thought I would try for all sections this year but ran into the law of diminishing returns." — *W8DWP*. . . . "Enjoyed testing antennas and flexibility of rig. Suggest that you tabulate the lazy man's SS — the most sections with the least contacts." — *W9REC*. . . . "Don't know when I have enjoyed an SS more. Let's always have this excellent contest." — *K4HAA*. . . . "Great fun but my parents are fed up with hearing odd noises all night, my brother is fed up with being awakened by said noises, and my neighbors are fed up with hearing dididit-dididit on Channel 4." — *W3CCQ/5*. . . . "Although repeat QSOs cut my score by 3500 points, learned much during my first all-out effort. Doesn't everyone?" — *W5FTP*. . . . "A real thrill to work VE7AKI, my first DX." — *KN9CIC*. . . . "What a time! A lot of tries and not many contacts, but the Q multiplier was a great help in the QRM. Don't see why more hams don't enter; they just don't know what they are missing." — *K0BMQ*. . . . "A real pleasure to almost double the amount of stations worked, although I wore out three ball-point pens in the process." — *VE2ADD*. . . . "Best contest in ham radio." — *WN1IEF*. . . . "No wonder I'm tired! Just checked the log and find that I changed bands 101 times during the contest, each operation involving two plug-in coils, numerous switches and knob twisting. Guess I must have been the guy everybody heard tuning up right smack on the frequency. . . . 15 meters paid off with two sections (VE4 and KL7) worked on no other band." — *W4KFC*. . . . "Enjoyed every minute and was amazed at how well the 8-foot whip performed." — *W1ZVG/7*. . . . "A great contest and the prevailing sportsmanship was outstanding. Thanks especially to K4HAA for taking time to explain the rules. Got four new states." — *K2PSE*. . . . "First chance to give my one-knob band-switching rig a real workout." — *W3RYX*. . . . "Used a new rig completed an hour before the SS started. An intermittent in the v.f.o. developed but managed to find the trouble and keep going. Somehow missed three easy sections: No. Dak., Maine and VE4." — *W9RQM*. . . . "Can't hope to top whatever millions W4KFC sends you but doubled last year's Novice score in one-fourth the time. The new VR-tube added to the oscillator really paid off when someone turned on a hot-plate next door. My lucky QSO No. 13 was Nevada; that makes 13 Nevadans toward a goal of 25 hopefully sought." — *K4CQA/4*. . . . "93 QSOs as a WN8 in '55 and 279 this year with same rig plus v.f.o." — *W8BVF*. . . . "How about the guy that must explain the SS to his wife? May I suggest that the League formulate a letter in nontechnical language aimed toward nonham wives? This letter, available in October, might begin, 'Dear Madame: Your husband is about to embark on a great adventure in skill, action, travel, and proficiency, right from your own home. Please bear with him.' Maybe then the XYL would be able to understand my fascination for the SS." — *W4SHW*. . . .



"Eight new states! Thanks for a couple of wonderful week ends." — *W7ZOI*. . . . "More thrills in the SS than I've had from the time of my first QSO." — *K2MBU*. . . . "Although conditions were very good to all WØ on several bands, I failed to hear a single No. Dak. station. VE1 was tough too." — *W9RKP*. . . . "Noticed the usual clean, snappy operating but there were also a number of signals of questionable quality consisting of rough notes, chirps and clicks. Trust these do not indicate a trend toward sloppiness or carelessness. Perhaps we should all make an effort to give *honest* reports so that the op on the other end will be made aware of how his signals sound and take steps to cure the difficulty." — *W4CVI*. . . . "Thanks for a great contest but the letdown afterwards is awful. A year is a long time to wait for the next one." — *WØTDR*. . . . "As a new member of the 'frat,' I learned more in a few hours than I could have in weeks of casual operating. My sincere thanks for a swell exercise in amateur communications and sportsmanship." — *KN2RQU*. . . . "Vt. has always been a millstone around my neck in any contest and this one was no exception. Are all Vt. hams on 420-Mc. n.f.m.? . . . First time ever worked VE1 through VE8 and heard all parts of Canada including Yukon, N.W.T. and Labrador. Three cheers for Canada, especially *VEs* 6MA 2YA 7AGN 7ANQ 7AKI 5DZ 1EX 8JW 3EU 3DSU 4YZ and 3VX. VE6MA and VE8JW send perfect c.w. and had particularly outstanding signals." — *W4WQT*. . . . "A world of fun and finally nailed Wyoming." — *KN2SDE*. . . . "Finished off my WAS and had two wonderful week ends." — *K5ARH*. . . . "Hope everyone had half as good a time as I did." — *W9VAY*. . . . "First Stateside SS and was surprised at results with an all-band dipole using homemade loading traps. Previous operation was from KL7AOL where I used a 680-foot long wire directed on the



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In hotly-contested Md.-Del.-D. C., the chap to beat is W3EIS, holder of five of its last seven awards. This time Don, a Potomac Valley Radio Club prime mover, shoehorned 185,670 points and 1032 QSOs into 40 hours for the nation's fifth-ranking tally and top W3. Between Novembers, Don sets a sterling example in Field Day's Class B with another pretty fair op, W4KFC.

Prowling for new countries is favored but W9YFV is also a Sweepstaker of the first water. Ed was seventh among all brasspounders, leading Nine, and Illinois topper with the 5100B pushing a long wire, 20-meter rotary, or 7-Mc. vertical dipole, latter sporting 32 buried radials. P.p. 4-400As provide additional db. when needed, have helped shore up the W9YFV DXCC standing to 242.

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U. S. A. — *W8IZS*. . . . "Sections were hard to come by. Never heard VE1, VE5, VE7 or VE8 and had to go to 21 Mc. for VE4 and VE6. My ambition was to score over the 100,000-point mark and was able to do it only by getting greater QSO quantity to make up for missing sections." — *W4OMW*. . . . "Plenty of good sigs, excellent conditions and courteous operating. Knocked off the last four for 3.5-Mc. WAS but missed So. Dak. for WAS on 20 in spite of good short skip. Was shooting for 110,000 but illness the first period and a football game the second botched that." — *WØBUR*. . . . "First contest and enjoyed the stick-to-itiveness of fellow hams. Picked up two more states and VE2. Thanks for two perfect, competitive week ends." — *K2SEK*. . . . "FB test but missed Miss. and where was W9IOP?" — *WØRLI*. . . . "Didn't realize that 39 hours could go by so fast." — *W9ESK*. . . . "Lots of valuable experience in my first try at SS. Will have to do more work on my homemade rig which broke down three times." — *W5FCX*. . . . "Afraid I wasted too much time chasing sections, resulting in a low QSOs-per-hour average. Didn't hear No. Dak., Utah, KL7 and VE4." — *W2EMW*. . . . "Experience gained in '55 resulted in a score six times higher. Being limited to 40 meters kept my section total down but that situation will have been corrected by the next SS." — *K2MWM*. . . . "Very enjoyable although the senior class play interfered with time on air." — *W3ZHQ*. . . . "FB SS but has Miss. seceded from the Union?" — *W9WBL*. . . . "The contest taught me the fundamentals of operating and I now have six more states confirmed." — *W3DVM*. . . . "After winning the Miss. award in '55, I missed that section in '56. We need a Q signal to tell a fellow that he has been worked before. Also wish everyone would use ARRL Operating Aid No. 6." — *W9AIY*. . . . "Evidently many were not keeping a duplicate check sheet. My total could have been increased by a large margin if I had accepted all the second and *third* calls received. The amount of second callers was so staggering toward the end that I resorted to calling 'CQ SS NEW STNS.'" — *W2HMJ*. . . . "Finished WAS but score was poor with 25 watts input. How about an extra multiplier, say at 50 or even 30 watts, to give us low-power boys a better chance?" — *K6OVJ*. . . . "The new 150-watt power multiplier is excellent and hope it will stay. Wish more VEIs and KZ5s would take part. How does W4KFC make so many QSOs?" — *W6JVA*. . . . "Yipes! Just found out limit was 150, not 100 watts. Better read the rules next time. . . . The guys at ARRL sure pick week ends with good conditions. Sigs were very strong and it's remarkable what a few watts can do when the bands are just right." — *WØIUB*. . . . "After years of the 100-watt multiplier, many fellows, myself included, have built special rigs for the SS. Why bow to the 'commercial' guys? This is Amateur Radio." — *W9ZRG*. . . . "I demand an additional multiplier for undernourished stations running ten watts or less. Hi!" — *K2EWR*. . . . "Second year that Utah was the last section worked. How about a multiplier of five for those who live one block from a multioperator station?" — *W2HBE*. . . . "Beam rotator failed, power line noise was S8, rig blew condenser, company dropped in, XYL accepted a dinner engagement the second Saturday, and even the electronic key quit. Don't I rate a handicap multiplier of about five?" — *W8DUS*. . . . "A swell time and already looking forward to next year's get-together." — *W3VAN*. . . . "Wow, never heard such activity! Looking forward to the '57 SS." — *W6NHA*. . . . "The contest spurred me to set up my rig on 7 Mc., a new experience. I learned procedure fast and I'll be back next year on three bands with bells." — *K6LZU*. . . . "Raised two new states and KP4DH but W1QMM (Vt.) wouldn't come back. Can hardly wait for the next SS." — *K6LSG*. . . . "Very enjoyable as always. Arrival of stork limited time but next year, oh boy!" — *VE3FT/W2*. . . . "It has been nearly 20 years since I tried the contest. Maybe it's old age but got ten times the bang out of it that I did way back then. Outside of the genuine pleasure of breaking through the roar and the thrill as each new section was contacted, I am now completely convinced that crystal control is not the FB device it was in the thirties. I fought it out with crystals the first period and then, aided by *QST*, the *Handbook* and the junk box, I feverishly threw together a v.f.o. and got it going — *no fooling* — *one minute* before the start of the second week end. Vast improvement was noted . . . All in all it was just grand, wonderful, swell, and the old ham bug has bitten me again in the worst way. Surely do appreciate the ARRL-sponsored contests and the extra-good dope in *QST*. With your help I'll be back with a better rig to double my score next year." — *W7POU*. . . . "My first SS and thoroughly enjoyable but I'm going to devise a better method of eliminating those pesky duplicates. Hope to erect an efficient antenna for each band and boost my power from 35 to the 150-watt limit. I'm gonna take that Tennessee sheepskin. Just wait till next year!" — *K4CWS*. . . . "Bloodshot eyes, angry XYL, hungry OM, *jr. ops thinking Dad off his rocker*, but I promise to do as well or better next year." — *KN9CAZ*. . . . "Really enjoyed hearing all the big guns and upcoming Novices, although an attic antenna was a handicap. Looking forward to next year." — *W1FSJ*. . . . "Worked 45 stations last time as a KN9 and 490 in '56. Just wait 'til next year!" — *K9AKS*. . . . "My second SS and it was a dilly. Bettered previous score by 600%. Glad to see KZ5BC, W7KEV, W6BIP, W4KFC, W4KVX and many other fine ops but missed W9IOP. Having special QSL made and can't wait 'til next year." — *K6SSM/8*. . . . "I'll break 100,000 points or bust next year!" — *W3MWC*. . . . "Biggest thrill was working my first Idaho. Just wait till next year." — *K9ATY*. . . . "First SS in Arizona and sorry didn't make a better showing. Will do better next year." — *W7EAX*. . . . "My brother served as assisting operator and better family relationships resulted. Will have better antennas next year." — *K6IBE*. . . . "School work crossed me up. Hope to get in the full 40 hours next year." — *K5ABV*. . . . "Learned much about operating and message-handling and you can count on a log from me next year." — *K6BCG*. . . . "Four new states and a new country. Hope to be better prepared next year." — *K4EJG*. . . . "Learned a lot and that's the main thing, but wait till next year." — *W6JKJ*. . . . "The SS really improves code ability. *Can't* wait until next year!" — *K4BND*. . . . "To coin a phrase, 'Wait 'til next year.'" — *W1UGW*. . . . "To use an old, dog-eared worn-out expression, 'Wait 'til next year.'" — *WN1MTX*.

All those cheery "Wait till next year" mumblings prophesy another biggest-ever Sweepstakes in November, with oodles of good, healthy QRM, huge QSO and sections-worked totals, and incredible scores from around the field organization. For the nonce, please stand by for the scoop on the radiotelephone and club winners. Just wait till next month. — *P. S.*

East Bay leader W6PYH pays this tribute to his chief operating aid, "a tolerant XYL who kept me constantly nourished." Pete wouldn't be without his t.r. switch for perfect break-in and, at DXCC-222, is another prominent prefix-pursuer who takes an annual fling at SS-ing.

C. W. SCORES

Twenty-Third Sweepstakes Contest

Scores are grouped by Division and Sections. . . . The operator of the station first-listed in each Section is award winner for that Section unless otherwise indicated. . . . Likewise the "power factor" used in computing points in each score is indicated by the letter A or B. . . . A indicates power up to and including 150 watts (multiplier of 1.25, c.w.), B over 150 watts (multiplier of 1). . . . The total operating time to the nearest hour, when given for each station, is the last figure following the score. . . . Example of listings: W3JNQ 156,023—880—71-A-39, or, final score 156,023, number of stations 880, number of sections 71, power factor of 1.25, total operating time 39 hours. . . . An asterisk denotes Novice certificate winners in sections where at least 3 Novice logs were submitted. . . . Multioperator stations are grouped in order of score following single-operator station listings in each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3JNQ . . 156,023- 880-71-A-39
W3CPS . . 141,440- 855-68-A-40
W3GHM . . 125,493- 712-71-A-36
W3BES . . 123,251- 715-69-A-28
W3HHK . . 110,863- 636-70-A-39
W3ALB . . 107,654- 607-71-A-25
W3NOH . . 106,750- 700-61-A-30
W3LEZ . . 105,840- 675-63-A-33
W3ARK . . 105,600- 640-66-A-36
W3LVF . . 98,115- 633-62-A-36
W3EAN . . 97,580- 574-68-A-36
W3MDE . . 96,300- 535-72-A-38
W3I8E . . . 88,943- 603-59-A- –
W3MWC . . 86,960- 547-64-A-39
W3DVC . . . 85,275- 572-60-A-39
W3SOH . . . 84,175- 518-65-A-38
W3WKX . . 82,500- 600-55-A-35
W3KFQ . . . 80,978- 531-61-A-40
W3EQA . . . 80,325- 464-70-A-33
W3WPG . . . 76,555- 502-61-A-40
W3HTR . . . 71,195- 491-58-A-40
W3VDV . . . 69,431- 405-69-A-32
W3MDO . . . 68,796- 546-63-B-40
W3CGS . . . 64,600- 380-68-A-30
W3RRI/3 . . 64,152- 486-66-B-36
W3ADZ . . . 62,125- 350-71-A-35
W3EVW . . . 60,375- 350-69-A-23
W3YLL . . . 56,363- 418-54-A-37
W3BQA . . . 55,945- 334-67-A-29
W3JSA . . . 55,930- 400-56-A-35
W3ADE . . . 53,215- 367-58-A-33
W3IXN . . . 53,213- 387-55-A-34
W3DUQ . . . 53,200- 380-56-A-22
W3DAO . . . 46,050- 308-60-A-39
W3KDF/3 . . 41,340- 312-53-A- –
W3GRS . . . 39,899- 271-59-A-14
W3Z8X . . . 39,000- 328-48-A-18
W3KFK . . . 38,500- 308-50-A-33
W3CLM . . . 36,960- 336-55-B-30
W3DFJ . . . 32,035- 299-43-A-30
W3DBF . . . 30,500- 307-40-A- –
W3ORU . . . 26,983- 252-43-A-12
W3GHD . . . 25,515- 162-63-A- –
W3YTM/3 . . 25,223- 177-57-A-23
W3NHX . . . 24,300- 203-48-A-30
W3AFF . . . 23,834- 315-31-A-33
W3WHK . . . 21,060- 234-36-A-32
W3JPW . . . 19,646- 202-39-A-28
W3YSH . . . 19,440- 146-54-A-20
W3UOE . . . 18,478- 196-38-A-10
W3QLZ . . . 16,380- 182-36-A-10
W3OCU . . . 14,520- 132-44-A- 8
W3DYL . . . 14,085- 158-45-B-12
W3GSD . . . 13,800- 184-30-A-20
WN3FNH* 12,210- 127-44-A-39
W3HUS . . . 11,248- 152-37-B- 6
W3BUR . . . 10,973- 117-38-A-13
W3EYT . . . 10,815- 103-42-A-23
W3VHJ . . . 10,438- 167-25-A-16
W3ZON 8330- 119-28-A-22
W3ANZ 5440- 80-34-B-14
W3ZVY 5330- 82-26-A- 8
W3EMH . . . 4830- 85-23-A-14
W3DVB . . . 4225- 85-19-A-21
W3FXX . . . 3701- 71-21-A- 6
W3YHX . . . 3465- 66-21-A- 8
W3ZXR . . . 2275- 46-20-A-10
W3CHH/3 . . 2250- 60-15-A-10
WN3GYP . . 2093- 47-18-A-21
W3QEZ 1900- 40-19-A-17
W3HO 1828- 43-17-A-19
W3PNL 1553- 35-18-A- 6
W3NF 1470- 28-21-A- 2
W3ZTJ 1350- 37-15-A-10
W3BWI 585- 26- 9-A- 4
W3ZN 572- 22-13-B- 3
WN3GQM . . . 538- 24-10-A-11
W3ZMB 495- 18-11-A- 6
W3FHG 413- 16-11-A- 6
W3QS 403- 23- 7-A- 4
W3CBH 384- 16- 8-A- 6
W3ZJD 260- 15- 8-A- 5
W3FQA 75- 7- 5-A- 6
W3RNF 45- 5- 4-A- 8

W3KT (W3s KT SKQ)
125,901- 700-72-A-38

W3EBG (W3s BES EBG)
99,533- 578-69-A-29

W3WJD (W3s WJD YIK)
77,699- 510-61-A-39

W3FAF (W3s BHP FAF)
18,532- 288-41-B-31

W3VXP (2 oprs.)
1600- 41-41-A- 9

Md.-Del.-D. C.

W3EIS . . . 185,670-1032-72-A-40
W3VOS . . . 162,360- 902-72-A-39
W3EIV . . . 155,845- 878-71-A-40
W3MSR . . . 153,270- 853-72-A-40
W3AEL . . . 152,575- 898-68-A-39
W3TMZ . . . 145,550- 820-71-A-33
W3GRF . . . 141,438- 777-73-A-40
W3KLA . . . 140,498- 860-66-A-40
W3JTK . . . 138,345- 802-69-A-32
W3VAN . . . 133,006- 911-73-B-36
W3PZW . . . 132,495- 727-73-A-40
W3MFJ . . . 120,359- 662-73-A-40
W3KDP . . . 119,160- 664-72-A-40
W3IYE . . . 115,740- 643-72-A-34
W3GAU . . . 112,525- 650-70-A-25
W3DVO . . . 108,113- 699-62-A-37
W3UE 78,720- 492-64-A-40
W3PZA 75,040- 471-64-A-30
W3HVM . . . 72,795- 424-69-A-35
W3WV 67,320- 374-72-A-27
W3HXN . . . 61,000- 488-50-A-40
W3DRD . . . 57,575- 329-70-A-26
W3RYX . . . 56,350- 405-56-A- –
W3ZQ 41,477- 352-59-B-21
W3WG 39,730- 274-58-A-19
W3VKI . . . 39,000- 300-52-A-24
W3HDV . . . 38,857- 330-61-B-30
W3HXA . . . 36,438- 292-50-A-24
W3FDJ . . . 33,750- 338-40-A-32
W3ZSR 25,840- 152-68-A- 5
W3HH 25,080- 209-48-A-14
W3WU . . . . 24,795- 174-57-A- –
W3WLQ . . . 21,730- 164-53-A-36
W3ZGN . . . 20,171- 247-33-A-30
W3DVM . . . 19,500- 200-39-A-16
W3TN 16,931- 158-43-A-15
W3ARR . . . 15,960- 170-38-A-26
W3IBX . . . 15,215- 179-34-A-20
W3TXY . . . 13,428- 131-41-A-24
W3CLI/3 . . 12,150- 108-45-A-17
W3DBV . . . 11,688- 138-34-A-32
W3TXL 9581- 110-35-A- 8
W3IKN 9184- 119-31-A- 8
W3BKE 7590- 115-33-B- 8
W3HB 5689- 63-37-A-14
W3UDO 5145 100-21-A-10
W3VCD 4200- 70-24-A- 8
W3ZMT 2132- 41-26-B-11
W3DNW 1913- 51-15-A- 3
W3CMX 1706- 53-13-A- 8
W3YV 1580- 40-16-A- 9
W3ZAQ 1440- 36-16-A- 5
W3CDQ . . . . 1296- 31-17-A= –
WN3FYL . . . 473- 28- 9-A- 6
W3BFW 270- 12- 9-A- 5
W3FQE 140- 8- 7-A- 4
W3EPX . . . . 23- 3- 3-A- –
W3LII/3 . . . . 23- 3- 3-A- 1

W3FY8 (W3FYS, W6HOH)
149,310- 830-72-A-37

W3CVE (W3CVE, K6DGB)
25,155- 281-45-B-23

Southern New Jersey

W2HDW . 110,773- 755-59-A-40
K2CPR . . 104,939- 627-67-A-37
W2SHM . 100,958- 641-63-A-39
K2ERC . . . 99,990- 607-66-A-40
W2ILN . . . 61,991- 407-61-A-29
W2HBE . . . 61,681- 349-71-A-39
K2QMT . . . 58,000- 400-58-A-38
W2TPJ/2 . . 55,069- 401-55-A-26
W2ENB . . . 54,000- 360-60-A-28
W2QDY . . . 53,750- 430-50-A-36
K2CWJ . . . 51,000- 401-51-A-27
K2KZO . . . 47,588- 405-47-A-32
K2KFJ 40,300- 310-52-A-40
K2SWZ . . . 33,935- 309-44-A-30
W2DAJ . . . 29,868- 262-57-B-23
W2QKJ . . . 27,652- 224-62-B-35
K2HJY . . . 21,986- 268-33-A-25
K2MIO . . . 21,480- 179-48-A-23
W2LY 12,813- 125-41-A-24
W2PNA . . . 11,520- 144-32-A-14
W2APD . . . 10,369- 123-35-A-15
K2BG 9900- 110-36-A- 8
K2PFT 9540- 161-24-A-21
K2EWR . . . 5618- 107-21-A- 4
W2TBD 5365- 74-29-A-13
W2IDMU . . . 5005- 77-26-A-14
K2PPV 3320- 83-16-A-15
K2IIW 3250- 65-20-A-10
K2OEA 2695- 39-28-A- 6
K2AIM 1663- 35-19-A-10
W2VX 870- 29-12-A- 5
W2PAU (W2PAU, W3LTC)
112,283- 683-66-A-40

Western New York

W2SSC . . . 124,783- 703-71-A-29
K2KCE . . . 114,154- 628-73-A-40
W2PGU . . . 91,586- 585-63-A-33
K2HVN/2 . . 81,550- 466-70-A-35
W2FEB . . . 75,970- 536-71-B-40
K2LWR . . . 73,710- 546-54-A-40
W2EMW . . . 72,104- 418-69-A-34
W2FXA . . . 69,190- 407-68-A-31
W2GSJ/2 . . 66,895- 394-68-A-40
W2VJO . . . 66,120- 464-57-A-35
W2TFL . . . 56,313- 425-53-A-32
K2JAE 54,720- 572-48-B-38
W2WOE . . . 53,331- 403-53-A-33
W2TOP . . . 52,215- 362-59-A-38
K2EVP 48,668- 309-63-A-33
W2RUJ 44,713- 256-70-A-27
K2MWK . . . 41,918- 311-54-A-23
K2LMX . . . 40,495- 312-52-A-31
K2UIR 35,103- 308-38-A-40
W2NZA . . . 33,800- 294-46-A-25
K2KID 33,696- 234-72-B-21
K2GWN . . . 32,175- 286-45-A-30
K2JAD 31,710- 303-42-A-36
W2KKT . . . 25,645- 273-46-A-29
W2EUP . . . 22,523- 273-33-A-17
K2MWM . . 19,950- 214-38-A-22
K2IWQ . . . 19,350- 198-40-A-28
K2GVN . . . 17,400- 145-48-A-16
K2GIG 16,188- 175-37-A-20
W2CJQ 15,960- 152-42-A-15
K2MLH . . . 15,295- 161-38-A-22
K2BWK . . . 14,588- 197-30-A-24
W2FPW . . . 12,623- 153-33-A-15

VE3FT/W2
12,420- 138-45-B-17

K2OFY . . . 11,688- 140-34-A-11
K2JFK . . . 10,355- 109-38-A-15
W2DRN 8515- 131-26-A-11
K2PFC 8280- 92-45-B- 7
K2GHD 7470- 83-36-A-11
K2PJS 5130- 108-31-A-25
W2ZRC 4830- 69-28-A- 3
W2RHQ . . . . 4270- 61-28-A- –
W2OVP 1885- 58-13-A- 6
W2MTA 840- 24-14-A- 6
KN2RHQ* . . 825- 30-12-A-21
W2QBB 555- 19-15-B- 3
KN2RQU . . . 338- 15-10-A-12
KN2RYP . . . 248- 11- 9-A- 5
KN2SKB . . . 248- 11- 9-A- 3
K2MTW 225- 10- 9-A- 5
K2ONN 140- 8- 7-A- 3
KN2RLP 120- 8- 6-A- 2
KN2UFA 88- 7- 5-A- 3

W2EWT/2 (11 oprs.)
15,164- 224-34-A-24

Western Pennsylvania

W3VIW . . 128,240- 812-64-A-36
W3GJY . . 104,913- 690-70-A-40
W3PWN . . 99,775- 614-65-A-40
W3ZKB . . . 76,250- 500-61-A-35
W3NRE . . . 75,625- 550-55-A-34
W3YDK . . . 67,650- 414-66-A-32
W3BOA . . . 61,520- 385-64-A- –
W3UGV . . . 50,490- 306-66-A-25
W3ZAO . . . 48,300- 350-69-B-28
W3EPM . . . 37,056- 305-49-A-19
W3BZR . . . 34,615- 310-46-A-35
W3YOZ . . . 31,483- 257-49-A-32
W3ZHQ . . . 30,013- 245-49-A-16
W3RBH . . . 24,940- 232-43-A-22
W3AVY . . . 21,930- 215-41-B-27
W3KQD . . . 19,238- 171-45-A-21
W3TFI 15,660- 175-36-A-14

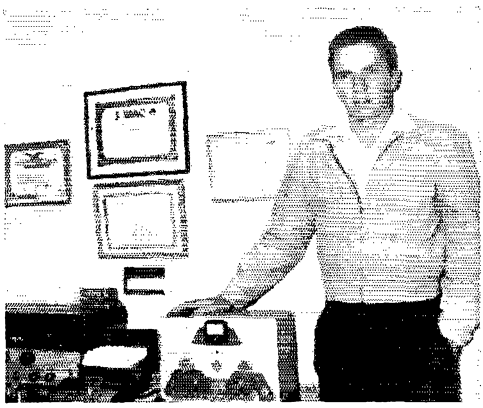
W3ZDA...13,950- 126-45-A-13
W3EFW...13,035- 160-33-A-25
W3FMP....5810- 83-28-A-26
W3ZUG....3465- 50-28-A- 8
WN3FJY...2584- 46-25-A- 9
W3LXE....140- 8- 7-A- 1
W3YA (18 oprs.)
55,803- 494-57-B-39

CENTRAL DIVISION

Illinois

W9YFV..180,720-1004-72-A-40
W9ZAB..134,811- 761-71-A-38
W9AMU..128,610- 715-72-A-40
W9WBL..126,613- 724-70-A-40
W9NII...126,140- 742-68-A-40
W9ZQC...124,069- 767-65-A-40
W9PZT...115,403- 669-69-A-40
W9WFS...92,250- 514-72-A-26
W9LNQ...91,679- 521-71-A-40
K9AKS...78,000- 490-64-A-31
W9YYG...74,425- 448-65-A-40
W9MAK...67,600- 423-64-A-37
K9EWB...64,320- 388-67-A-40
W9AGM...18,750- 300-65-A-21
W9DUA*..46,690- 32-58-A-20
K9ARN...41,938- 306-55-A-24
W9RCJ...40,641- 260-61-A-20
W9CMO..30,873- 233-53-A-26
W9QGG...28,756- 270-43-A-19

K9BMH....2205- 49-18-A- 4
KN9DTB...2205- 46-21-A- 9
W9SES....1800- 40-18-A-19
W9FDY....1783- 32-23-A- 6
W9LQC....1596- 36-18-A- 5
K9EGH....1538- 41-15-A- 7
W9TQR....1083- 23-19-A- 6
W9VOK....885- 30-15-B- –
K9AXT....715- 22-13-A- 2
K9DOY....645- 22-12-A-11
W9YPJ....600- 25-10-A-11
K9AQV....480- 20-12-B- 4
K9BLY....281- 15- 9-A- 2
KN9CIC...163- 10-10-A-10
K9CDI....50- 5- 4-A- 4
K9DFT....13- 5- 1-A- 1
W9UBW....3- 1- 1-A- 1
W9OCB (W9ss DWD JSO OCB)
178,588-1034-70-A-40
W9ECY (W9ss ECY IRH)
70,718- 451-63-A-40
W9YH (5 oprs.)
60,121- 516-59-B-39
KN9CAZ (KN9ss CAZ DTH)
33,480- 262-54-A-40
KN9DJQ (KN9DJQ, KNØELC)
2998- 57-22-A-31
W9NGV (W9NGV, K9BCK)
510- 17-15-B- 3



In Southern Texas, 16-year-old KN5EZV cranked out 34,583 points, the highest score ever amassed by a Novice. Beginning in the hobby like a house-afire, Bob has already earned WAC, WAS and RCC and will bear close watching in future contests.

W9YRH...28,688- 225-51-A-18
W9UBI....25,988- 190-55-A-15
W9ZEN...25,048- 233-43-A-26
K9BGV...24,860- 238-44-A-30
W9QAN...22,069- 161-55-A-17
W9IET....21,450- 160-55-A- 8
W9LGI....20,800- 211-40-A-20
W9QQX...20,621- 178-47-A-13
W9WIO...19,596- 189-71-A-18
W9REC...19,500- 130-60-A-20
W9NIU...18,180- 152-48-A- –
W9BIN...16,920- 144-47-A-16
K9BTD...16,125- 155-43-A-23
W9EBY...15,803- 152-42-A-23
W9YYF...15,06R- 147-41-A-11
W9OJI....14,720- 128-46-A-13
W9DWQ...14,639- 119-49-A- 9
W9ZRG...14,342- 101-71-B-13
W9JAT....13,500- 137-40-A-14
K9BIU....12,600- 115-45-A-18
K9ATV....10,325- 150-28-A-29
W9YYV....10,165- 107-38-A- –
W9YDQ....9095- 107-34-A-12
K9BTN....8925- 120-30-A-20
W9RGB....8539- 107-33-A-13
W9EET....8360- 89-38-A-16
W9KXD....8333- 101-33-A-11
W9VOX....8000- 100-32-A-18
W9CR.....7030- 74-38-A-20
W9UJB....6818- 102-27-A-29
W9TTJ....6300- 64-40-A-10
K9BBD....6152- 67-37-A-11
KN9BZJ*..6006- 83-31-A-22
KN9CHZ...4640- 61-32-A-21
W9EXL....4523- 67-27-A- 5
W9JCX....4140- 90-23-B- 7
K9CFQ....4043- 77-21-A- 6
W9ZDV*...3983- 59-27-A- 8
W9YAL....3875- 58-31-A- 4
W9NGG....3813- 55-17-A- 7
K9BPT....3611- 55-27-A- –
W9EDH....3575- 55-26-A- 5
W9EGJ....2925- 65-18-A- 9
W9GCH....2250- 60-15-A- 5
W9EU.....2218- 46-24-B- –

Indiana

W9APY..176,138-1010-70-A-40
W9AZM..114,155- 673-68-A-40
W9ESK...81,413- 506-65-A-39
W9YSX...79,885- 622-65-B-33
K9CUY...72,773- 476-62-A-40
W9YFD...64,339- 411-63-A-38
W9VAY...57,855- 412-57-A-38
K9BBO...51,675- 390-53-A- –
W9DGA...38,028- 288-53-A-13
W9DMU...37,145- 323-46-A-31
W9CNG...31,465- 203-62-A-18
W9WQQ...22,898- 213-43-A- –
K9AUE...19,000- 200-38-A-22
W9STG...18,624- 160-47-A-23
W9VDB...12,578- 117-43-A-12
KN9DWK*.5720- 79-32-A-31
W9YXX....4875- 65-30-A- 4
KN9DOR....585- 21-12-A-12
KN9CRS....63- 5- 5-A- 3
W9CLY (7 oprs.)
101,238- 629-65-A-40
W9YB (8 oprs.)
74,168- 483-62-A-39
W9ZTD (W9ZTD, K9ADJ)
52,813 332-65-A-27

Wisconsin

W9RQM..161,350- 923-70-A-39
W9KZZ...143,150- 825-70-A-36
W9UDR..117,061- 665-71-A-35
W9GWK..106,925- 711-70-A-38
W9VOD...106,000- 624-70-A-25
W9DIK...100,640- 599-68-A-33
W9DVG....97,845- 594-66-A-38
W9RKP....85,200- 480-71-A-36
W9KXR...79,165- 446-71-A-39
K9CAN....72,312- 524-69-B-30
W9UFV....62,238- 384-65-A-31
W9CXY...61,610- 404-61-A-40
W9ZQA/9..52,595- 314-67-A-23
W9YZG....47,713- 356-55-A-25
W9VOS/9..46,170- 343-54-A-26
W9CHD....38,070- 282-54-A-21
W9QGR...35,388- 267-53-A-18

W9FZC...25,438- 185-55-A-15
W9SZR/9..24,133- 197-49-A-13
W9FPA...20,524- 211-39-A-30
W9FDX...20,280- 156-52-A- –
W9DGB....18,143- 123-59-A- –
W9AQD...17,483- 130-54-A- –
W9DPN...16,900- 130-52-A-22
W9WAN...14,910- 144-42-A- 9
K9AEQ...13,690- 148-37-A-20
W9HCA...9120- 115-32-A- 9
W9WUQ...6750- 101-27-A-26
W9IUQ/9...4000- 80-20-A-35
W9HCX....2625- 50-21-A-10
K9BCB....1575- 32-20-A- 8
K9AQT....1485- 35-17-A- –
W9BCC....1200- 32-15-A- 4
W9CFL....633- 23-11-A- 2
KN9CBE...304- 15- 9-A- 5
K9CPF....175- 10- 7-A- 5
KN9EIT...140- 11- 7-A- 8
W9LUC....63- 5- 5-A- –
W9JBF....3- 1- 1-A- –
KN9DGE (K9CAH, KN9DGE)
1556- 43-15-A-23

DAKOTA DIVISION

North Dakota

KØCNC...32,745- 222-59-A-12
KØADI...13,904- 117-49-A-23

South Dakota

WØTLD...46,384- 295-63-A-24
KNØHHM..5899- 74-33-A-21
WØJLI....1125- 25-18-A- 3
KØAMQ....1069- 24-19-A-29
WØRRN....225- 10- 9-A- 1

Minnesota

WØRLI...127,925- 754-68-A-40
WØWDW..97,600- 615-64-A-35
KØBIT...63,000- 500-63-B-40
KØDHH...28,069- 251-45-A- –
KØAUS....3188- 52-25-A- –
WØDQL....2560- 32-32-A- 7
KNØEEN...1388- 38-15-A- –
KØCAZ....1063- 32-17-A-10
WØFJJ....715- 26-11-A-13
KNØECY (KØCAZ, KNØECY)
23- 3- 3-A- 1

DELTA DIVISION

Arkansas

W5BYJ...48,400- 306-64-A-35
W5WUR...44,685- 331-54-A-36
K5DET...42,315- 278-62-A-37
W5KGJ...39,585- 273-58-A-29
W5MY....17,802- 207-43-B- 8
W4SAS/5..6680- 84-32-A-22
KN5GRT....120- 10- 6-A- 7
KN5EJQ.....55- 6- 4-A- 7

Louisiana

W5YDC..127,090- 717-71-A-33
K5DGI...114,800- 718-64-A-38
W5JAW...87,506- 542-65-A-40
W5BUK...57,800- 341-68-A-32
W5GAI....40,184- 265-61-A-16
K5ARH...39,473- 277-57-A-34
K5GWZ...35,819- 263-55-A-36
W5NDV...28,815- 228-51-A-27
K5AGI....24,240- 203-48-A-17
W5JFR....10,973- 118-38-A-11
W5EKF....9225- 124-30-A-23

K5BWZ....3480- 60-24-A- 8
KN5EJL.....165- 16-12-A- 8
W5TVW.....225- 10- 9-A- 2

Mississippi

W5FPI....49,500- 300-66-A-27
KN5HFM...1995- 39-21-A-33

Tennessee

K4LPW..204,660-1138-72-A-40
W4NBV..110,880- 678-66-A-40
W4WQT..100,975- 578-70-A-40
W4YMG...96,931- 600-65-A-39
W4CVM...96,030- 536-72-A-39
K4CWS...81,908- 489-67-A-38
K4BOM...73,005- 471-62-A-39
W4OGG...42,625- 310-55-A-19
K4AMC...23,569- 213-45-A-14
KN4JWZ..18,375- 161-49-A-34
K4ECZ....15,006- 123-49-A-11
K4CBE/4..14,625- 132-45-A-12
K4APN....10,710- 103-42-A-11
K4CBY.....5148- 74-29-A-19
K4CFA.....4766- 66-31-A-10
K4ACG.....3190- 44-29-A- 3
W4NPS.....2200- 44-25-B- 8
W4CXY.....863- 23-15-A- 6
W4KH/4 (W4ss KH WHN)
41,600- 321-65-B-24

GREAT LAKES DIVISION

Kentucky

W4KVX..227,213-1246-73-A-40
W4OMW..104,960- 656-64-A-40
K4GEZ...101,421- 606-67-A-37
W4HOJ...88,608- 529-67-A-39
W4CVT...87,235- 480-73-A-30
W4SUD...80,719- 514-63-A-29
K4DTI....77,550- 470-66-A-24
W4JBQ....64,125- 450-57-A-24
W4OXX....44,700- 298-60-A-25
K4DVR....23,940- 205-48-A-28
K4CHF.....6663- 104-26-A- –
KN4JGM...5895- 67-36-A-19
KN4JHA....743- 27-11-A-11

Michigan

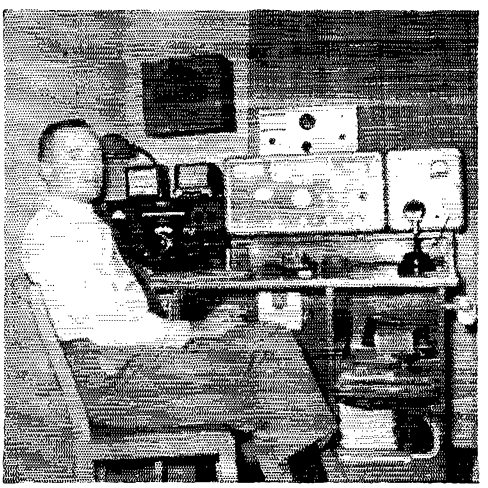
W8OCK*..125,650- 721-70-A-40
W8IRO....95,900- 685-70-B-36
W8TJQ....75,905- 448-68-A-38
W8SRK....71,115- 433-66-A-31
W8IZ8....71,040- 446-64-A-40
W8PWQ...69,300- 466-60-A-40
W8GTI....63,938- 465-55-A-40
W8DM....59,015- 407-58-A-31
W8UMX...55,125- 351-63-A-36
W8HQS...55,046- 352-63-A-32
W8DUS...55,025- 359-62-A-22
W8GB....49,118- 333-59-A-23
W8PVI....46,238- 344-54-A-31
W8VPC....18,225- 322-60-A-21
W8TKW...15,750- 305-60-A-37
W8QZR....40,878- 307-54-A-27
W8ZNH...35,500- 384-50-A-25
W8RVZ....33,488- 236-57-A-17
W8ONA....32,800- 205-64-A-34
W8GEB....29,278- 241-49-A-34
W8IXM....28,999- 205-57-A-33
W8SCW...26,500- 200-53-A-10
W8TRN....22,028- 267-33-A-27
W8HMM...20,738- 200-42-A-18
W8HAN...17,575- 185-38-A-24

WØCDP riddled his Colorado opposition what with rotaries, a ground plane, a Vee beam and a DX100. Harrison has previously accumulated plaudits for his work in the SS, DX Contest and the ARRL Membership Party.

W8NGO...17,420- 134-52-A-10
W8FX....13,950- 155-36-A-16
W8GP....12,400- 160-31-A-14
W8QBG....9900- 88-45-A-11
W8EGI....7040- 88-32-A- 9
W8WZE/8...5808- 101-23-A-23
W8TCY....3651- 64-23-A-16
W8MSK....3500- 70-20-A- 9
K8BEA....3105- 46-27-A-10
W8KTR....2616- 46-23-A-14
W8QZS....2080- 54-16-A- -
KN8CPM*..1829- 43-19-A-12
W8IVK....900- 30-12-A- 5
W8NSS....900- 30-12-A- 3
KN8CJX....538- 23-10-9- 9
W8JEF....518- 24- 9-A- 3
KN8CPR....140- 17-11-A-10
W8FZG....333- 19- 7-A-10
W8RTX/8....30- 4- 3-A- 1
W8EDI (W8S BXY EDD)
41,760- 275-64-A-40
W8YY (W8S NOE NDI RTX, K8BKT)
10,197- 168-33-B-19

Ohio

W8FGX§..182,678-1064-69-A-36
W8LQA...174,600- 975-72-A-40
W8OYI...139,898- 811-69-A-38
W8VTF...132,175- 778-68-A-40
W8IFX...119,170- 701-68-A-36
W8VPT...110,425- 634-70-A-35
W8EPT/8108,630- 612-71-A- -
W8BOJ....81,506- 473-69-A-18
W8QDH....80,876- 515-63-A-33
W8SDJ....72,825- 487-60-A-36
K8SSM/8..69,673- 454-62-A-40



Leading the fifth call area and New Mexico was K5CAW. On the contest scene since 1936, Joe is ex-W9BNB, W3MTQ, W2EHU, W4SEB and KL7AWB, goes for the "Tattoo," a semi-automatic break-in system described in *QST* for last August.

W8SWZ...68,776- 393-70-A-25
W8AXX...66,000- 400-66-A-22
W8SMK...55,413- 404-55-A-27
W9VBV/8..53,400- 357-60-A-27
K8COT...52,930- 318-67-A-40
W8IBX...52,720- 339-64-A-28
W8SGQ...50,320- 318-64-A-29
W8KCK...49,925- 293-68-A-37
W8DWP...48,750- 300-65-A-31
W8VQI...48,606- 355-55-A-31
W8LOF...43,010- 253-68-A-25
W8EDC...42,593- 318-54-A-24
W8QXW...41,785- 345-61-B-26
W8BVF...41,700- 279-60-A-25
W8NMR...38,088- 277-55-A-19
W8NMK...37,950- 346-44-A-39
W8PYX...32,006- 287-45-A-27
W8BDO...31,684- 250-45-A-29
W8AL....31,165- 272-46-A-35
W8GQ....29,540- 211-56-A-27
W8CTP...29,313- 238-50-A-27
W8NPF...29,138- 259-45-A-17
W8EXI...28,875- 210-55-A-24
W8EV....28,400- 160-71-A- -
W8UMA...28,320- 241-59-B-26
W8ELB...27,875- 223-50-A-38
W8RO....26,250- 210-50-A-22
W8TND...25,771- 195-53-A-21
W8NOX...24,955- 217-46-A-17
W8TTN...24,863- 196-51-A-21
W8VZE...23,460- 184-51-A-22
W8UPH...23,063- 226-41-A-31
W8STR...20,329- 209-39-A-21
W8IDM...19,950- 200-40-A-24
W8FDN...19,900- 204-40-A-19
W8CSK...18,638- 216-35-A-35
W8ZLH...15,660- 174-36-A-12
W8CGF...14,648- 189-31-A-27
W8QZA...14,460- 123-48-A-10
W8ZJM...12,925- 110-47-A- 5
W8TZO...12,900- 120-43-A- 7
W8SJU...12,710- 125-41-A-27
W8DAE...12,400- 160-31-A- 9
W8HBJ...11,868- 138-43-A-10
W8VDA...11,280- 141-32-A-28
W8MXO...9170- 131-35-B-11
W8KMF...8284- 71-47-A- -
W8MAE...7080- 76-42-A- 8
W8UPB...7673- 100-31-A- 8
W8RSW...7400- 80-37-A- 6
W8EAR...6844- 110-25-A-11
W8YGR...6510- 62-42-A- 8
W8PMJ...6300- 91-28-A-11
KN8AHO*..5950- 70-34-A-30
W8OYV...4200- 80-21-A-20
W8YGQ...4200- 70-24-A- 6
W8C8A...3960- 60-33-B-10
W8GMK...3875- 50-31-A- 5
KN8AQS...3760- 49-32-A-28
K8DDF...3565- 62-23-A- 5
W8LQG...3220- 56-23-A-10
K8AZQ....3124- 81-17-A- -
W8SWB...2888- 55-21-A- 9
W8QLJ....2589- 55-19-A- 4
KN8AAG...1975- 42-20-A-21
W8THD....1926- 32-23-A- 8
W8KHG....1687- 37-19-A-12
W8VPV....1050- 30-14-A- 3
KN8BDZ....850- 20-17-A- 5

K2RKR....9990- 112-37-A-17
K2HQJ....9075- 121-30-A-16
K2GIR....8236- 142-29-B-15
K2RDM....8120- 118-28-A-20
K2LMQ....7350- 105-28-A-12
K2OSY....6120- 102-24-A- 8
K2GTZ....2560- 64-20-B- 6
KN2UPD*..2494- 50-21-A-21
KN2SFY....2310- 44-21-A-17
W2FLI....1600- 41-16-A-10
W2IP.....1375- 25-22-A-13
KN2UTV....619- 23-11-A- 9
K2IWV.....338- 14-10-A- 3
K2PRB.....40- 5- 4-A- 3

N. Y. C.-L. I.

W2IVS...129,758- 711-73-A-38
W2KTF...124,513- 714-70-A-40
W2PRN...119,970- 667-72-A-32
W2TUK...117,386- 681-69-A-40
W2HQL...113,840- 633-72-A-33
W2HMJ...109,944- 764-72-B-40
W2MUM...108,413- 620-70-A-37
K2CF....105,963- 606-70-A-39
K2FC....98,940- 582-68-A-36
W2PZE....90,055- 582-62-A-35
W2CWD...85,928- 605-57-A-40
K2GHS....82,240- 514-64-A-36
W2VL....63,050- 388-65-A-29
W2GXC...60,032- 470-64-B-27
W2JBQ....57,391- 469-49-A-26
K2CMV....56,238- 409-55-A-33
W2WFL....55,645- 359-62-A-23
W2NCG....52,178- 387-54-A-38
K2GBH....50,516- 357-57-A-35
W2MDM...50,508- 414-61-B-28
W2YSL....44,370- 353-51-A-31
K2OPJ....40,005- 382-44-A-27
W2LPA....36,750- 300-49-A-36
W2ZYX....35,100- 250-56-A-21
W2UXY....32,640- 256-51-A-12
W2OWO....30,409 232-53-A-27
W2AOD....38,320- 236-48-A-26
K2RAR....24,521- 255-39-A-31
W2UUS....24,050- 260-37-A-20
K2KYK....23,925- 218-44-A-22
W2GP.....22,478- 243-37-A-20
K2BTT....22,100- 173-52-A-23
W2PHF....20,895- 199-42-A-35
W2AEE§...18,480- 133-56-A- -
K2GTC....18,145- 191-38-A-27
W2TNI....18,000- 200-36-A-21
W2OBU....17,625- 235-30-A-15
K2PRP....15,551- 163-39-A-25
W2TEZ....15,500- 200-31-A-23
W2AIZ....15,340- 236-26-A-24
W2UAL....14,945- 214-28-A-20
K2HVM....13,965- 134-42-A-18
K2SEK....11,733- 187-26-A-34
W2MZB....10,675- 122-35-A- -
K2ONP....9636- 151-33-B-16
K2PGP....8827- 107-33-A-13
K2JTW....8706- 101-33-A-14
W2DQN....7844- 126-24-A-13
K2PZH....7650- 90-34-A-15
K2JQO....7525- 86-35-A-13
K2BH.....7400- 80-37-A- 7
W2UNS....7260- 88-33-A- -
W2WUQ....7215- 111-26-A-17
K2LWK....7155- 107-27-A-12
K2TAP....6971- 87-33-A-31
K2PSE....6848- 127-22-A-27
KN2RCC*..6688- 107-25-A-17
W2IAS....5040- 63-32-A- 9
W2OQI....3445- 53-26-A- -
K2LQM....3098- 60-21-A- -
W2DID....2800- 61-20-A- 8
KN2RCM...2730- 53-21-A-23
K2OUD....2636- 57-19-A-15
KN2STF....2310- 47-22-A-17
KN2SNM...2213- 62-15-A-18
W2ENW....1932- 46-21-B- 3
W2IHE....1886- 41-23-B- 6
K2UQX....1520- 41-16-A-15
K2OEG....1360- 34-16-A- 6
W2IWC....1238- 33-15-A- 1
K2PTP.....991- 31-13-A- 9
K2QBW.....740- 19-16-A-10
K2KXZ.....690- 23-12-A- 2
K2ABW.....608- 19-16-B- 2
K2KND.....325- 13-10-A- 7
W2CLG7....175- 10- 7-A- -
W2APM.....63- 5- 5-A- 1
W2GTV.....50- 5- 4-A- 1
K2DEV.....49- 7- 3-A- 2
K2TCD.....35- 4- 4-A- 1

Northern New Jersey

W2CQB...134,575- 770-70-A-40
W2OIB...122,850- 702-70-A-40
W2GND...108,205- 641-68-A-40
K2BHQ...101,589- 607-67-A-38
W2LQP....79,695- 506-63-A-30
K2KDW....74,865- 486-62-A-28
W2FZY....74,195- 419-71-A-39
K2GLQ....67,883- 431-63-A-27
K2CSC....67,481- 459-59-A-37
W2TWC...67,320- 408-66-A-24
W2LRO...63,288- 415-61-A-35
W2WSN...62,310- 372-67-A-40
K2MFF...60,538- 420-58-A-40
K2JLQ....59,210- 383-62-A-33
K2BJA....56,925- 380-60-A-31
W2MPP....55,581- 421-53-A-36
W2WOS....50,003- 339-59-A-25
W2DRV....56,691- 316-63-A-20
K2JMX....49,275- 365-54-A-34

W2ERG...49,088- 385-51-A-33
W2ONA...46,800- 312-60-A-32
W2GBY...45,250- 362-50-A-26
W2OZU...38,049- 250-61-A-27
W2L8X...36,366- 319-57-B-17
K2RPI....35,280- 289-49-A-31
W2IPJ....34,063- 273-50-A-26
K2KFP....33,250- 239-56-A-21
K2JFJ....31,784- 271-47-A-39
K2IBO....30,674- 232-53-A-20
K2GAL/2..30,609- 262-47-A-26
W2JIB....30,135- 287-42-A-22
K2RAD....27,563- 221-50-A-29
K2KIB....25,542- 237-54-B-38
W2HUG...25,144- 224-45-A-17
W2CWK...24,019- 154-63-A-12
W2OAE...23,895- 177-54-A-24
W2ZEP...23,690- 206-46-A-16
W2BRC...23,430- 284-33-A-20
W2EHN...23,250- 235-40-A-27
W2NEP...23,250- 187-50-A-16
K2PLF....22,040- 233-38-A-25
K2KFF....19,305- 176-44-A-14
W2GUM....18,700- 220-34-A-15
W2HTX....17,990- 129-56-A-18
W2ZXL....15,720- 132-48-A-19
W2EQS....13,335- 127-42-A-10
W2WRG...13,313- 214-25-A-18
W2CFW....11,238- 155-29-A-15
K2MMK...10,605- 155-28-A- 9
K2LSX....9810- 109-36-A-17
W2ABL....6800- 85-32-A- 5
K2QNI....6655- 123-22-A-14
K2DN.....5820- 97-24-A-11
W2BWW....5425- 70-31-A-16
K2UUU....5000- 102-20-A- 6
W2RXL....4950- 100-20-A- 9
W2BU.....4560- 96-19-A- 7
W2UNQ/2...3570- 51-28-A- 9
K2PHP....3445- 53-26-A- 9
K2UUT....3438- 83-22-A-15
W2ZVW....2780- 41-28-A- 2
K2GTZ....2560- 64-20-B- 6
KN2SRA*..2125- 47-20-A-17
KN2SDE...2040- 37-24-A-18
W2COG....1000- 25-16-A-15
K2SKK.....805- 23-14-A- 2
W2KKR.....683- 20-14-A- 2
KN2ULB....570- 20-12-A-19
K2SOW.....555- 19-15-A- -
KN2TEO....475- 19-10-A-12
K2TOU.....413- 15-11-A- 2
K2OOA.....390- 20- 8-A- 9
W2IYN.....371- 10- 9-A-18
K2MMM.....320- 17- 8-A- 4
W2EWZ.....105- 7- 6-A- 1

MIDWEST DIVISION

Iowa

WØFZO..127,736- 742-69-A-39
WØNCS...125,408- 728-69-A-39
WØCXN..117,075- 669-73-A-37
KØEXT...116,263- 655-71-A-38
WØGXQ...86,955- 528-66-A-36
WØRAP...78,910- 610-65-B-37
KØDZX...63,364- 511-62-B-38
WØDSP...53,680- 352-61-A-38
WØUJC...52,762- 426-62-B-29
WØATA/Ø..49,339- 338-59-A-31
KØAAH...12,540- 155-33-A-20
WØTNX....9375- 150-25-A-19
KØAKO....6760- 85-32-A-22
WØBGB....5600- 70-32-A-12
WØTLX....5528 72-33-A-16
KØAKN....3025- 56-22-A- 8
KØBLJ....2970- 54-22-A- 8
KØCYF....1778- 40-18-A-11
WØUJF/Ø....190- 29-17-A-12
KNØDSC*..1103- 27-18-A-18
KNØDJV....674- 28-11-A-11
KNØGEY....315- 15- 9-A- 8
WØCOD.....175- 10- 7-A- 5
KNØHFW.....10- 3- 2-A- 3
KNØGTF.....5- 1- 1-A- 1
WØUJD (WØs UJD UJF)
51,850- 340-61-A-40
WØWDK (WØs WDK YSE, KØCZQ)
51,315- 314 66-A-39
KØBSK (KØBSK, KNØGTF)
32,419- 238-57-A-39
KØCLS (WØSMS, KØs CLS CUI)
32,137- 249-53-A-29
KØDON (2 oprs.)
27,428- 207-53-A-18
WØQQH (WØs QQH USP)
24,681- 180-55-A-30
KØDPH (KØDPH, KNØHFR)
23,055- 174-53-A-31
WØYSE (WØYSE, KØCZQ)
17,480- 153-46-A- -

Kansas

WØIUB..113,693- 737-62-A-31
WØGAX...81,260- 479-68-A- -
WØDEP...74,625- 500-60-A-34
KØBSL....67,280- 423-64-A-37
WØYFT....53,006- 389-55-A-32
WØBYV....48,510- 385-63-B-28
KØBXF....23,063- 205-45-A-23
WØWMH...11,135- 131-34-A-13
KØHVR....6724- 84-33-A-10
KØCFT.....160- 8- 8-A- -
WØQQQ (WØLCQ, KØBIX, KNØHNC)
9998- 131-32-A-20

Missouri

K0HEM . 107,726- 627-69-A-40
W0EZU . . 99,964- 665-61-A-40
W0TDR . . 93,194- 574-65-A-39
W0PUV . . 74,506- 459-65-A-40
W0WYJ . . 70,560- 506-56-A-37
W0QWS . . 60,600- 410-60-A-39
W0FIN . . . 57,173- 425-54-A-38
W0GVI . . . 56,240- 352-64-A-28
W0ETV . . . 52,388- 321-66-A-32
W0MHS . . 36,113- 269-54-A-22
W0YPB . . . 30,144- 232-53-A-20
W0YCA . . . 28,500- 230-50-A-32
W0GUV . . . 28,060- 230-61-B-30
K0AQO . . . 22,110- 201-44-A-26
KN0GJD . . . 5890- 76-31-A-25
KN0DKQ . . . 3080- 51-28-A-25
W0KIK 1960- 49-16-A-13
W0UAW . . . 1215- 27-18-A- 5
W0ZLN* 3- 1- 1-A- 1
W0EEE (7 oprs.)
66,670- 568-59-B-39

Nebraska

W0BUR . . 94,013- 547-69-A-27
W0RNH . . 85,140- 523-66-A-40
W0WLO . . 84,175- 521-65-A-40
W0DW . . . 76,640- 483-64-A-40
W0YRY . . 51,404- 349-59-A-34
W0ZIN 9625- 112-35-A-10
W0VSR 8910- 108-33-A-17
K0DSJ 2300- 41-23-A- 7
K0BQY 2104- 52-17-A-13
K0EMH/0 (20 oprs.)
15,120- 184-42-B-35

NEW ENGLAND DIVISION

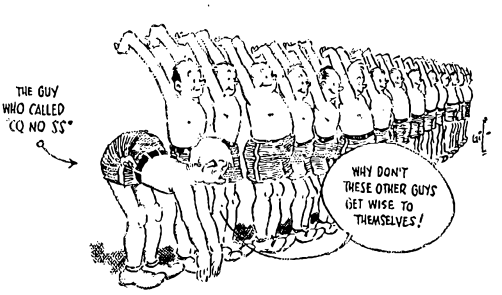
Connecticut

W1TYQ . . 138,510- 771-72-A-38
W1B1H . . 123,113- 706-70-A-38
W1FEA . . 109,895- 714-62-A-40
W1ODW . 108,719- 613-71-A-38
W1MHF . . 85,905- 514-69-A-36
W1ZDP* . . 85,085- 501-68-A-28
W1SVS . . . 75,225- 512-59-A-35
W1VG* . . . 62,689- 344-73-A-25
W1GVK . . 59,850- 400-60-A-33
W1AW*, 10 59,000- 500-59-B-19
W1ACR . . 38,700- 332-48-A-29
W1DDJ . . . 35,535- 309-46-A-28
W1OPY . . . 34,230- 326-42-A-28
W1AMY . . 23,156- 238-39-A-18

W1CWX . 102,506- 578-71-A-39
W1DLF . . 101,405- 597-68-A-40
W1BOD . . 101,338- 607-67-A-40
W1AQE . . . 89,613- 535-67-A-39
W1JEL . . . 86,933- 524-67-A-39
W1BAD . . . 71,685- 486-59-A-28
W1EPE . . . 65,344- 511-64-B-34
W1MQV . . . 58,793- 351-67-A-32
W1ONP . . . 46,620- 333-56-A-32
W1EIQ . . . 44,038- 271-65-A-29
W1PEG . . . 37,819- 328-59-B-40
W1NS 34,169- 254-55-A-26
W1MEG . . . 28,119- 205-55-A- –
W1SMO . . . 25,600- 323-32-A-26
W1AGN . . . 25,313- 203-50-A-24
W1FJJ 21,998- 210-42-A-29
W1TVZ . . . 19,731- 226-35-A-14
W1HX 18,907- 130-73-B-35
W1BPA . . . 16,958- 134-51-A-15
W1JYZ 15,844- 163-39-A-22
W1IJP . . . . 15,610- 223-28-A- –
W1PLJ 15,480- 129-48-A-25
W1PWK . . . 14,509- 110-53-A-11
W1BPW . . 13,956- 160-35-A-22
W1UPS . . . 13,808- 134-42-A-19
W1VJE . . . 13,392- 141-48-B-29
W1NPT . . . 10,950- 146-30-A-19
W1IRH . . . 10,931- 134-33-A-21
WN1IUU* . 10,114- 150-31-A-40
W1KIN 6970- 82-34-A-12
W1DPB 6938- 111-25-A-27
W1ZXB 6814- 119-22-A-23
WN1NQT . . 3098- 61-21-A-31
W1ZFS 3025- 55-22-A- 6
W1QVK 2000- 40-20-A-10
WN1KYM . . 1725- 36-20-A-29
WN1IEF . . . 1318- 33-17-A-12
WN1MIX . . . 1020- 24-17-A-11
W1IIP 956- 26-15-A-11
W1TEC 863- 23-15-A- 3
W1VOE 770- 30-11-A-11
W1LNX 293- 13- 9-A-12
W1UJQ 135- 9- 6-A- 8
W1LQQ 23- 3- 3-A- 1
WN1KSI . . . . . S- 3- 1-A- 8
W1COL 3- 1- 1-A- 1

Western Massachusetts

W1JYH . . 135,123- 926-73-B-39
W1EOB . . 126,801- 869-73-B-35
W1WEF . . 102,633- 673-61-A-30
W1AZW . . . 33,203- 234-57-A-27
W1FSJ 11,115- 126-36-A-15
W1BKG 9353- 87-43-A- 8



W1QIS* . . . 21,550- 216-40-A-13
W1VKZ . . . 20,213- 231-35-A-37
W1NLM . . . 18,724- 151-62-B- –
W1ILV 18,348- 210-44-B-16
W1EFW . . . 16,538- 135-49-A-17
W1JGS 16,313- 226-29-A-37
W1OOL 11,186- 119-47-B-18
W1TCW 9875- 158-25-A-20
W1RON 6105- 111-22-A-12
W1JBK 5468- 81-27-A- 7
W1EBW 4433- 100-18-A-15
W1BGP . . . . 3800- 76-20-A- –
WN1IWQ* . 2280- 41-24-A-13
W1BDI* 2210- 34-26-A- 4
W1NJM* . . . . 1980- 50-16-A- –
W1ASO 1845- 41-18-A- 4
W1KAM . . . . 1763- 47-15-A- –
W1GBZ 1573- 37-17-A- 6
W1YYM* 990- 22-18-A- 2
W1RFJ . . . . . 860- 43- 8-A- –
KN1AQC 150- 10- 7-A- 5
W1INB 100- 8- 5-A- 2
WN1NQX 69- 8- 5-A- 9
WN1MDB 30- 4- 3-A- 2
W1IKE* . . . . . 10- 2- 2-A- –

Maine

W1BCD . . 51,345- 326-63-A-31
WN1LCX . . . 3394- 23- 9-A-11
W1HAG 113- 9- 6-A- 4

Eastern Massachusetts

W1DDF/1
113,750- 651-70-A-40
W1TW . . . 106,663- 610-70-A-35
W1JSM . . 104,794- 608-69-A-40

W1ASU 4635- 52-36-A- 7
W1YKH 2460- 62-20-B- 5
W1BDV 300- 15- 8-A- 1
W1GNN (W1s GNI GNN)
29,963- 249-51-A-39
W1ZPJ (W1s BDV GHG, WN1s GTZ IFH) . . . 10- 2- 2-A- 1

New Hampshire

W1BFT . . 172,885- 975-71-A-40
W1CRW . . . 57,684- 437-66-B-19
W1TRM . . . 23,153- 189-49-A-26
W1HKA 7286- 102-29-A-31
W1IQD 1280- 32-16-A- 3
WN1MTX 3- 1- 1-A- 1

Rhode Island

W1CJH . . . 80,063- 525-61-A-38
W1VBR . . . 55,350- 412-54-A-36
W1RFQ . . . 27,251- 254-43-A-29
W1BIS 24,750- 180-55-A-14
W1CMH . . . 22,500- 250-36-A-16
W1SXX . . . 18,375- 150-49-A-22
W1LWA . . . 11,770- 107-44-A-11
W1FII 10,888- 170-26-A-22
W1UTA 8330- 119-28-A-13
W1AWE . . . . 2156- 41-21-A- –
W1DED 1120- 25-19-A- 8
W1ZXA 689- 27-13-B- 6
WN1JWZ (WN1s JWZ KGR)
915- 31-12-A-39

Vermont

W1QMM . . 47,530- 340-70-B-27
W1UGW . . . 35,123- 223-63-A-17
W1OAK . . . . 2562- 61-21 B- 4

Smiling KP4DH copiously distributed West Indies to one and all, taking honors in that section with 100,238 points. When last heard, Frank was batting out about 50 QSOs per hour in the 1957 ARRL International DX Competition.

NORTHWESTERN DIVISION

Alaska

KL7MF . . . 17,325- 165-42-A-14

Idaho

W7WMO . . 53,520- 339-64-A-34
W7ASA 46,526- 330-57-A-28
W7FBD . . . 15,810- 156-51-B- 6
W7IY 8190- 86-39-A-36
W7ZRC 7556- 100-31-A-17

Montana

W7VGZ . . . 54,653- 352-63-A-38
W7TKB . . . 38,690- 212-73-A-29
W7BMI 1056- 34-13-A- 6

Oregon

W7TML . 101,010- 725-70-B-39
W7AOZ . . 86,681- 523-67-A-39
W7AIJ 42,981- 285-60-A-30
W7LT 37,844- 287-66-B-39
W7ZUD . . . 10,920- 156-28-A-28
WN7CMR . . 3445- 64-26-A-21
W7AXK 1000- 41-10-A-11
W7JAZ 390- 22-10-A- 8
W7SYF 383- 17- 9-A- 4
W7WQM/7 (W7s JHA WQM)
89,080- 528-68-A-39
W7ADU (W7s ADU DIS)
56,183- 348-66-A-30

Washington

W7GWD . 114,210- 638-72-A-37
W7PQE . . 109,944- 771-72-B-40
W7AJS . . . 108,290- 629-68-A-29
W7LEV 89,355- 521-69-A-35
W7YAQ . . . 65,960- 394-68-A-36
W7WMY . . 60,468- 383-67-A-32
W7AAT . . . 54,560- 343-62-A-28
W7VRO . . . 42,981- 273-65-A-18
W7ZOI 37,950- 253-60-A-38
W7JJL 26,500- 200-53-A-39
W7FZB . . . 21,330- 159-54-A-18
WN7CNL . 20,625- 167-50-A-36
W7VKZ . . . 11,468- 140-33-A-30
W7ETO . . . 11,300- 113-40-A-18
W7HVM . . . 10,814- 107-41-A-19
W7ZUF 10,238- 91-45-A-16
W7MEA 6300- 72-35-A-15
W7FVI 2000- 50-16-A- 5
W3UYN/7 . . 1155- 42-11-A-11
W7BVM 131- 8- 7-A- 2
WN7BUO 3- 1- 1-A- 1
W7YGN (W7s YGN YMW)
65,178- 443-62-A-39
W7QLH (W7s CSK QLH)
12,398- 132-38-A-32

PACIFIC DIVISION

Hawaii

KH6MG . . 92,140- 542-68-A-34
KH6IJ 89,136- 619-72-B-38

Nevada

W7KEV . . 173,649- 956-73-A-40
W7VIU 11,704- 134-44-B-11
W7YNO/7 . . 9240- 107-44-B-11
WN7CRT . . . . 488- 20-10-A- –

Santa Clara Valley

W6UTV . . 134,750- 770-70-A-36
W6HOC . . 124,556- 685-73-A-39
K6DYX . . . 59,295- 444-67-B-38
W6JKJ 52,341- 315-67-A-30
K6LSG . . . 31,650- 211-60-A-26
K6QCT . . . 25,125- 205-50-A-37
W6PBV . . . 24,711- 187-53-A-18
W6CLZ . . . 21,670- 197-44-A-26
W6MMG . . . 2115- 47-18-A- 5
W6EGX 150- 10- 6-A- 1

East Bay

W6PYH . . 129,666- 713-73-A-40
W6TT 118,808- 651-73-A-34
K6GS 106,380- 591-72-A-38
W6TMX . . . 97,891- 552-71-A-38
K6AUC . . . 69,530- 425-68-A-30
W6IPH . . . 42,880- 335-64-B-27
W6NBX . . . . 1855- 53-14-A- –
K6ITZ (K6ITZ, KN6SYR)
23- 4- 3-A- 1

San Francisco

W6BIP . . . 107,164- 734-73-B-40
W6EYY . . . 91,560- 662-70-B-31
K6OPI 55,738- 347-65-A-30
W6YC 42,545- 318-67-A-30
K6AYB . . . 16,575- 129-52-A- –
K6QHI . . . . 9735- 179-22-A- –
W6WLV 1733- 33-21-A- 9

Sacramento Valley

K6ORT . . . 93,100- 532-70-A-33
W6OKK . . . 67,830- 400-68-A-33
K6CNE . . . 56,480- 357-64-A-37
W6NHA . . . 55,208- 412-67-B-23
K6ILB 10,165- 108-38-A-20
W6QIV 7175- 82-35-A-21
KN6SXA . . . 2546- 67-21-A-30
KN6TBP . . . 2370- 41-24-A-21
W4AWM/6 . 1720- 44-16-A- 8

San Joaquin Valley

W6EFV . . . 87,774- 495-71-A-31
W6MYP . . . 79,450- 454-70-A-30
W6BVM . . . 78,787- 542-73-B-26
K6OVJ 51,300- 345-60-A-39
W6HYK . . . 47,120- 300-64-A-27
W6HYH . . . 15,297- 160-63-B-14
W6QXF . . . 25,125- 150-67-A-30
K6HTM 9900- 140-36-A-20
K6JPT 8926- 102-37-A-26
K6OOV 2835- 65-18-A- 9
K6JSY 2430- 43-24-A-11
K6HFA 1080- 27-20-B- 3
KN6PKJ* . . . 400- 20- 8-A-10
KN6TLX 340- 17- 8-A- 5
K6LZU 315- 15- 9-A- 3

K6MBM.....68- 9- 3-A- 3
K6CLK.....40- 4- 4-A- 1
KN6RLX.....35- 4- 4-A- 4
KN6UTK.....23- 3- 3-A- 1

ROANOKE DIVISION

North Carolina

W4LYV...111,599- 621-73-A-40
W5DWT/4 77,726- 497-63-A-25
W4BTZ...54,900- 360-61-A-40
K4LFX...21,336- 255-42-A-27
W4BDU...13,000- 130-40-A-10
W4RFB...11,305- 122-38-A-24
KN4IEX*...4894- 87-27-A-19
KN4KBA...3438- 55-25-A-20
K4IHN.....523- 20-11-A- –
KN4JAK.....440- 17-11-A- 4
K4BHN.....383- 17- 9-A- 2
KN4JZE.....248- 13- 9-A- 5

South Carolina

W4HGW..86,933- 524-67-A-36
W4ZRH...70,500- 470-60-A-37
W4BWZ...63,365- 441-58-A-40
K4DFR...45,598- 403-46-A-35
K4IUD...20,625- 193-44-A-40
K4EYV...16,215- 139-47-A 20
W4VDG.....370- 19- 8-A- 3

Virginia

W4KFC..219,000-1205-73-A-40
W4YHD..165,710- 910-73-A-39
W4PNK...136,413- 784-70-A-38
W4BZE...127,075- 749-68-A-38
W4IA....114,480- 637-72-A-31
W4TKR...107,453- 644-67-A-39
W4JUQ...102,296- 658-63-A-39
W4CXA...99,720- 554-72-A-35
W4GF....88,751- 564 63-A-34
W4TFX...87,280- 546-64-A-31
W4ZM....83,583- 499-67-A-39
W4QMX...58,499- 483-61-A-37
K4HAA...54,780- 500-44-A-36
W4YZC...54,738- 355-61-A-11
W4JUJ...53,040- 332-64-A-23
W4WBC...49,300- 340-58-A-33
W4YEA...45,120- 376-60-B-30
W4VRT...44,395- 342-52-A-10
K4IKF....40,500- 325-50-A-21
W4SNH...37,560- 313-48-A-16
W4FRO...34,688- 278-50-A-19
K4JKK...33,278- 234-58-A-32
W4PVA...30,993- 253-49-A-34
W4JHK...29,820- 250-48-A-11
W4NH....29,288- 213-55-A-14
W4FJ....23,688- 213-54-A-22
W4JAT....37,150- 181-60-A-13
K4CQA/4..25,174- 206-49-A-20
K4BND...22,400- 224-40-A-33
W4PLS...22,375- 182-50-A-21
K4EZL....19,013- 195-39-A- –
W4IHN....15,695- 108-73-B-30
K4GWO...14,644- 178-33-A-29
W4JUY....12,303- 133-37-A- –
KN4JFE...12,045- 165-33-A-40
W4BLR...11,780- 152-31-A-12
W4NAD...10,450 110-38-A- 7
W4HJK.....9529- 116-33-A-11
K4GLX.....7950- 109-30-A-24
W4ZCL.....7552- 118-32-B- 7
W4FPX.....6606- 76-35-A-13
W4BIJ.....6405- 61-42-A- 6
K4DSD/4...5033- 92-22-A-12
W4PHL.....2900- 50-29-B- 4
K4HVO.....2650- 54-20-A-11
W4UPV.....2255- 41-22-A- 9
W4YE.....1573- 37-17-A- 1
K4BJU.....1560- 40-16-A- –
K4AL.....1440- 32-18-A- 5
W4HRP.....1354- 29-19-A- 9
W4FZG.....1295- 37-14-A- 3
K4EJG.....1091- 24-19-A-12
KN4KES....860- 26-16-A- 8
K4FZY.....510- 18-12-A- 5
K4CAD.....468- 17-11-A- 1
W4ZIE.....413- 15-11-A- 2
W4IMP.....98- 7- 7-B- –
K4JKL.....90- 9- 4-A- 3
W4WSF.....23- 3- 3-A- 1
K4JVE.....10- 2- 2-A- 1
W4ZCL.....8- 2- 2-B- –
W4KXV (WIUGW, W4KXV) 109,200- 624-70-A-35
K4DKA/4 (K4s DKA JKL) 7020- 104-27-A-11

West Virginia

W8KWI...81,680- 518-64-A-25
W8TDG...46,839- 354-53-A-26
W8SNP...22,052- 302-37-B-16
W8UYR...20,304- 213-48-B-20
W8SWX....7210- 103-28-A-14
KN8CMW...5731- 70-35-A-32
W8MLX....1254- 32-17-A-11
KN8CCO....123- 8- 7-A- 4

ROCKY MOUNTAIN DIVISION

Colorado

WØCDP..129,666- 713-73-A-36
WØSGG...64,181- 410-63-A-28
WØWME..48,000- 324-60-A-35
WØIA....45,225- 304-60-A-34
WØIC....34,461- 274-63-B-19
KØEDK...27,000- 200-54-A-20
KØEDH...21,060- 176-48-A-21
KØBWI....9263- 95-39-A-18
KØGEU....8750- 100-35-A-25
WØUNM/Ø.4830- 69-28-A-17
WØMYB....1870- 34-22-A- 7
KØEDG....1725- 30-23-A- –
KNØEGJ*...1415- 37-17-A-15
KNØDZJ....1175- 52-10-A-20
WØUIB.....15- 3- 2-A- 3
KNØEQS.....5- 2- 1-A- 2
KØDCC.....3- 1- 1-A- 1
KNØEJG.....3- 1- 1-A- 1

Utah

W7BAJ...67,538- 385-70-A-35
W7POU...25,181- 202-51-A-39
W7TTM...24,295- 229-43-A-26
W7BUY (W7BUY, WØAZT) 8815- 86-41-A-15

Wyoming

W7HYW...64,470- 461-70-B-29
W7HRM...21,471- 211-51-B-10
W7UFB....14,063- 114-50-A-13
W7PSO....12,488- 113-45-A- 7
W7BHH....3843- 53-29-A-10

SOUTHEASTERN DIVISION

Alabama

W4WOG...58,823- 342-69-A-26
W5LOT/4..55,361- 355-63-A-32
W4GUV....47,200- 297-64-A-25
W4USM....21,788- 210-52-B-12
W2GVH/4 13,300- 175-38-B-21
W4EJZ....11,973- 155-39-A-12
K4AIW....8215- 107-31-A-20
K4CXC.....7640- 96-32-A- 6
W4ZGE.....4691- 70-27-A- 4
K4IVF.....3705- 59-26-A-15
KN4KID....3526- 50-31-A-20
W4CIU.....300- 15- 8-A- 3

Eastern Florida

W4SHW...83,573- 510-66-A-32
K4IXG...33,525- 515-65-A-39
K4EVU...78,199- 501-63-A-40
K4IXC...68,778- 451-61-A-34
W4RWA...67,408- 462-59-A-40
K4DAS...66,439- 484-56-A-39
W4VPD....65,625- 375-70-A- –
W4WHK...61,200- 384-64-A-27
W4DXL/4.41,895- 338-63-B-36
K4KDN...40,165- 277-58-A-17
K4IKQ....21,038- 168-51-A-32
K4DRO....20,210- 174-47-A-16
W4VTJ....13,200- 132-40-A- –

Western Florida

W4WKQ..103,125- 627-66-A-37

Georgia

K4BAI...100,969- 753-67-B-38
W4ZKU...71,355- 506-71-B-35
K4DWF...68,424- 411-67-A-31
WØWFP/4.67,320- 510-66-B-29
W4BEY...66,065- 365-73-A-37
W4FWU...64,739- 387-67-A-37
W4BXV...60,776- 427-57-A-28
K4GGN...48,000- 302-64-A-38
K4HAV...41,663- 304-55-A-29
K4GBL...37,760- 257-59-A-22
K4ANZ...35,554- 250-57-A-31
W4LDD...28,420- 197-58-A-26
W4EGP...27,731- 250-45-A-28
W4YK....26,455- 204-65-B-15
K4HMS...14,580- 112-54-A- –
K4IOV.....1900- 40-19-A- 8
K4HOU.....1650- 33-20-A- 5
K4CXE.....1463- 33-18-A-10
KN4HIG....1401- 42-19-A-16

West Indies

KP4DH...100,238- 616-66-A-35
KP4ZW...32,966- 224-59-A-19

Canal Zone

KZ5BC...19,796- 202-49-B- –

SOUTHWESTERN DIVISION

Los Angeles

W6BJU[12]..198,000-1107-72-A-38
W6YMD..157,096-1079-73-B-34
K6JQJ....153,658- 878-70-A-38
K6CEF....151,840- 832-73-A-37
W6SBB...146,881- 829-71-A-39
K6OIZ....74,100- 456-65-A-34
W6SRT....56,063- 325-69-A-32
K6JBV....48,525- 333-60-A-30
W6KWF...43,350- 389-60-A-28
K6CXF....39,340- 281-56-A-29
W6ACL...34,368- 234-59-A-25
K6GUZ....30,590- 219-56-A-14
W6WKE...30,360- 277-55-B-19
W6CRV....20,213- 165-49-A-19
W6MJP....18,488- 145-51-A-12
K6DQE....18,240- 152-48-A-21
K6IGZ....17,273- 141-49-A-16
K6UYK....16,800- 140-48-A-12
W6AMY....15,480- 131-48-A-31
W6LVQ....14,375- 115-50-A-31
K6PQV....12,240- 136-36-A-15
K6DLY.....9595- 102-38-A-21
W1CUL/6...9204- 101-37-A-31
W6KUC.....8740- 116-38-B-12
K6KZY.....7830- 131-24-A-27
K6BAG/6[13]..7688- 62-62-B- 8
K6LKG.....7425- 92-33-A-12
K6EEZ.....5950- 85-28-A-12
W6UUC.....4650- 60-31-A- 8
W6FUO.....4130- 60-28-A-20
K6JAM.....4125- 57-30-A-18
K6DDO.....3713- 55-27-A- 3
KN6QYG*...3508- 65-23-A-25
K6SHJ.....2400- 50-20-A-20
W6GTR.....1853- 40-19-A-11
KN6PSJ....1628- 54-14-A- –
K6MQN.....1625- 35-20-A- –
KN6QBZ....975- 27-15-A-13
K6KMD.....900- 23-16-A- 3
K6QIP.....675- 27-10-A- –
W6ZOL/6....510- 17-12-A- 3
K6KME.....360- 17- 9-A- 2
KN6SLM....113- 15- 3-A-24
W6DXZ.....40- 4- 4-A- –
K6PLW.....23- 3- 3-A- 1
K6IBE (K6s CYX IBE) 80,730- 468-69-A-40
K6LBE (K6s LBE MSG) 20,913- 243-35-A-40

Arizona

W7CJZ...119,680- 707-68-A-40
W7EAX...32,592- 294-56-B-16
W7ATV...20,844- 199-54-B-14
W7PUV...10,800- 112-40-A-16

San Diego

W6ZVQ...107,100- 612-70-A-38
W6JVA...103,216- 584-71-A-39
K6LIV....37,950- 256-60-A-29
K6EQL....26,860- 158-68-A-15
K6EJK.....4070- 74-22-A-12
K6LXI.....2125- 43-20-A- 3
K6IWU.....1983- 32-26-A- 7
K6BCG (K6s BCG OLS, KN6ULV) 19,080- 162-48-A-35

Santa Barbara

W6ERB...100,554- 567-71-A-40
W6YK....92,520- 516-72-A-39
K6INI....56,438- 323-70-A-36
K6QNR/6.25,760- 226-46-A-37
W6DTY....17,325- 158-44-A-17
K6CST....15,096- 148-51-B-19

WEST GULF DIVISION

Northern Texas

W5BLU...114,665- 680-68-A-40
K5HLG...113,419- 658-69-A-40
W5DXW..104,563- 600-70-A-37
W5COY....84,105- 543-63-A-25
W5FTD....62,175- 416-60-A-34
W5OC.....60,165- 382-63-A-28
W5QF.....46,719- 289-65-A-24
W5DLM....41,253- 291-57-A-23
W5DYK....27,540- 204-54-A- 8
W5FCX....25,145- 194-47-A-26
W5OBY....23,136- 243-48-B-27
W5EOZ....21,862- 166-53-A-17
W5FIY....17,625- 153-47-A-40
W5AWT....4495- 73-31-B- 4
W5LBC.....920- 23-16-A- 3
KN5HWY...304- 16- 9-A-11
K5BFP.....11- 3- 3-A- 1
KN5IBR.....3- 1- 1-A- 1
W5GNE (W5s GNE ZKJ) 89,050- 550-65-A-40

Oklahoma

W5EQT...103,360- 672-64-A-39
W5NQF...76,455- 481-64-A-36
W5CYQ...70,880- 450-64-A-34
W5CKT...24,750- 225-55-B-14
W5LPL....10,916- 107-41-A-21
W5FEC....8701- 102-39-A- 8
K5CBA....3375- 54-25-A- –

Southern Texas

W5BTS...108,205- 650-67-A-40
W5ABV...78,790- 464-68-A-27
W5JPC....64,020- 388-66-A-33
K5WAC[14]..54,648- 416-66-B-28
KN5EZV*..34,583- 262-53-A-34
K5BSZ....18,600- 156-48-A-12
W5CTZ.....2760- 46-24-A- 9
KN5GFF....2670- 55-24-A-31
KN5EAU[15]....10- 2- 2-A- 1

New Mexico

K5CAW...138,006- 794-71-A-38
W5GCI...104,400- 582-72-A-37
W5FTP....88,468- 662-68-B-39
W5KWP...62,144- 408-61-A-40
W5ECP....14,300- 133-44-A-16
W3CCQ/5...7306- 87-35-A-19

CANADIAN DIVISION

Maritime

VO6N.....19,550- 170-46-A-22
VE1CU.....220- 11- 8-A- 1

Quebec

VE2ADD..64,417- 412-63-A-39
VE2BX....43,106- 303-57-A-29
VE2YU....41,025- 275-60-A-21
VE2CP....30,378- 210-58-A-20
VE2AVC...25,530- 222-46-A-23
VE2PZ....17,220- 163-41-A-15
VE2ANQ...3190- 59-22-A-15
VE2AOQ....1425- 30-19-A- 6
VE2AJD.....764- 26-13-A-13
VE2ATT.....200- 11- 8-A- –

Ontario

VE3DSU..110,513- 632-70-A-40
VE3VX[16]..85,593- 512-67-A-39
VE3EAM..85,090- 510-67-A-36
VE3ES....74,725- 494-61-A-39
VE3EU....54,356- 335-65-A-36
VE3DUB...51,258- 357-58-A-39
VE3BXF...48,538- 353-55-A-32
VE3AUU...44,318- 315-57-A-22
VE3ACB...34,190- 263-52-A-26
VE3DH....20,213- 194-42-A-21
VE3BMB..19,650- 131-60-A-25
VE3IR....18,300- 150-61-B-14
VE3RN....17,763- 145-49-A-29
VE3YY....15,222- 177-43-B-16
VE3BLY...13,640- 177-31-A-18
VE3IZ.....7750- 100-31-A- 9
K2INZ/VE3..6885- 82-34-A- 9
VE3DYJ....6510- 85-31-A-23
VE3BAJ.....180- 12- 6-A- 3

Manitoba

W3MCG/VE4 11,019- 108-41-A- 8
VE4YZ.....4640- 73-32-B- 7
VE4WI.....1575- 34-20-A- 7

Saskatchewan

VE5DZ....39,329- 300-67-B-33

Alberta

VE6MA...51,975- 330-63-A-35
VE6SX....12,675- 131-39-A-22
VE6TY....12,470- 118-43-A-11

British Columbia

VE7JO....47,250- 300-63-A-24
VE7AGN..27,084- 233-47-A-31
VE7AC....24,780- 210-59-A-16
VE7JL....14,981- 120-51-A-34
VE7RZ.....200- 11- 8-A- 1

Yukon

VE8JW....64,253- 484-67-B-28
VE8OJ.....4633- 55-34-A- 9
VE8OW.....3706- 56-34-B-25
VE8CN (VE8s AB CN) 30,409- 230-53-A-12

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[1] W3OQJ, opr. [2] W9ZMJ, opr. [3] W9EXP, opr. [4] W8DJN, opr. [5] W8EZF, opr. [6] K2DVT, opr. [7] W2GNP, opr. [8] WØCMU, opr. [9] Hq. Staff, not eligible for award. [10] W1WPR, opr. [11] W1WMH, opr. [12] W6CUF, opr. [13] W6NJU, opr. [14] W6HQN, opr. [15] K5ABV, opr. [16] VE3BHS, opr.

ARRL thanks the following amateurs for submitting their logs for checking purposes: *W1s* SEO UE, W2CVW, W3HTK, *W4s* AUM GGD KOQ NSM, W6MUR, *W7s* CCC FCD HBO RGZ, *W8s* BMX PQQ, *W9s* OML RMQ, *KØs* CML DNU/7, VE2ATL, VE6VO.

Happenings of the Month

WORLD CONFERENCE PROGRESS

U. S. preparation for the 1959 International Telecommunications Union administrative radio conference continues, with meetings in Washington nearly every week under the sponsorship of the Department of State. The basic committee organization is:

I — Executive Committee
II — Organizational Regulations
III — Allocation of Frequencies
IV — Technical Questions
V — Operational Regulations

The actual work is accomplished primarily by subcommittees, each dealing with a special aspect of the general subject; in some instances, special working groups are formed to tackle more specific problems (e.g., Subcommittee C of Committee II deals with several subjects including "Article 42 — Amateur Stations" — and, incidentally, is chairmanned by George Turner, W3AP, of FCC). League representatives have membership on each of the main committees, and are participating regularly in the meetings of these and the smaller groups.

The most significant development to date has been the submission by the Federal Communications Commission of a proposal that there be *no changes* in the Service allocations of the Atlantic City frequency table — from 10 kc. clear up through 10,500 Mc. From our standpoint, the Commission is saying it proposes that all amateur bands be maintained in their present widths. It is too early to know whether the proposal will be countered by other government, military or industry requirements, but it is nevertheless a heartening point of view from the agency most concerned with overall spectrum problems.

DOCKET 11866 FILING

As indicated in this department of March *QST*, the Federal Communications Commission is examining the status of frequency allocations in that portion of the spectrum above 890 Mc. Although amateur bands in that region are not specifically affected, the League promptly filed notice of its intent to appear in the event amateur questions did arise. More recently, responsive to a general notice issued by FCC requesting an outline of the substance of evidence which interested parties might be called upon to provide at forthcoming hearings, the Executive Committee directed the filing of an additional statement of the amateur position, which we reproduce below for the information of members:

Statement of Proposed Evidence for Docket No. 11866 of the American Radio Relay League, Inc.

Since the very beginning of planned allocation of the radio-frequency spectrum above 1500 kilocycles it has been the policy of the U. S. regulatory authority to assign to the radio amateur small bands of frequencies in more-or-less harmonic relationship. The theory underlying this practice has been that each octave of the spectrum offers possibilities of exploring propagation modes unlike those associated with the harmonically-related frequencies and, similarly, that the techniques of generating and utilizing them differ markedly from one octave to the next. The wisdom of this allocation policy has been demonstrated many times over. The amateur is traditionally an experimenter and explorer; his enthusiasm for exploiting new methods finds its source in his keen personal interest in the art, unrestricted by the necessities that frequently proscribe commercially-activated development programs.

The contributions of the amateur to the art of radio communication and the public welfare are well known and have been made a matter of record in various proceedings before the Commission. As an example, nearly all of the presently-known modes of propagation of radio waves in the h.f. and v.h.f. spectrum were uncovered through the communication activities of amateurs operating on the frequencies assigned to them in these regions. The operators of amateur stations have provided the numbers, geographical distribution, and enthusiasm necessary for cooperative research, both with private and government agencies. Such a project is being undertaken in connection with the International Geophysical Year.

As concerns the part of the frequency spectrum under consideration in the present proceedings, the existing assignments for the Amateur Service represent a sampling that makes adequate provision for the amateur to follow his bent for discovering the unusual. The amateur bands below 10,500 megacycles are, of course, allocated internationally to the Amateur Service under the Atlantic City Regulations. Although they are not in strict harmonic relationship, each progressively higher frequency represents a marked change in the equipment techniques required, and the bands are sufficiently separated so that the probability of discovering new propagation modes associated with particular parts of the spectrum is enhanced. In nearly all of these bands amateurs have communicated over distances well beyond line of sight, and as solutions are found to equipment problems it is to be expected, in the light of history, that contributions on these frequencies will parallel those already made in the spectrum below 890 megacycles.

Since in the present proceedings the Amateur Service is not among those specifically mentioned, the League does not request an opportunity to present oral testimony except in the unanticipated event that a change in the allocations for amateur use should become the subject of consideration. If the Commission desires, the League will present testimony in amplification of the points discussed above.

A. L. BUDLONG
March 28, 1957 *General Manager*

FEEDBACK

In W1TRF's article on "The Mobile Single-Bander," (*QST*, Jan., 1957, p. 19) the meter switch was erroneously specified as Centralab type PA-1002. This should be a type PA-1003 (nonshorting). Also, midget-type contact assembly Guardian type 200-M2 will fit more easily under the chassis than the standard-type assembly.

OUR COVER

Our cover this month calls attention to W1HDQ's article on some s.s.b. ideas for v.h.f. men. Here's another opportunity for amateurs to pioneer in new techniques of communication.

COMING A.R.R.L. CONVENTIONS

June 1–2 — Oklahoma State, Tahlequah, Okla.

June 7–8–9 — Dakota Division, St. Paul, Minn.

June 15–16 — Rocky Mountain Division, Estes Park, Colorado

July 27–28 — West Gulf Division, San Antonio, Texas

August 16–17–18 — Southwestern Division, Long Beach, California

August 30–31–Sept. 1 — ARRL National Convention, Chicago, Illinois

August 31–Sept. 1–2 — Maritime Provinces, Charlottetown, Prince Edward Island

September 21–22 — Midwest Division, Kansas City, Kansas

October 18–19 — Ontario Province, Toronto, Ontario

A.R.R.L. OKLAHOMA STATE CONVENTION

Tahlequah, Oklahoma — June 1–2, 1957

On June 1 and 2 on the campus of Northeastern State College at Tahlequah, the Tulsa Amateur Radio Club, Inc. will sponsor the first ARRL Oklahoma State Convention in more than ten years. With the cooperation of the college, a package registration has been worked out providing three meals and lodging and all convention activities for $6.50 per person. There will be technical talks, round-tables, a mobile hunt, a ladies' program, an auction, and entertainment. Preregistration refundable deposit is $2.00 per person. Write to Phil Garver, W5ZBI, Box 3322, Tulsa, Okla., by May 29.

A.R.R.L. DAKOTA DIVISION CONVENTION

St. Paul, Minnesota — June 7–8–9, 1957

It's St. Paul this year for the first Dakota Division Convention to be held in that city since 1937. The dates are June 7 through the 9th, and the Hotel St. Paul is the place. An excellent banquet is planned for Saturday evening while the days will be devoted to technical matters, DX, s.s.b., and net meetings and luncheons. Special events are planned for the XYLs and YLs. Civil Defense and Emergency Corps meetings will be held in addition to mobile activities. A Wouff-Hong initiation will brighten the darkness of Saturday night. FCC examinations are planned and a representative of ARRL Hq. will be present. Reservations at $6.50 each may be made by writing to Norm Johnson, WØTHY, 998 McLean Avenue, St. Paul, before May 15. Following that date, and at the door, the price will be $7.50.

HAMFEST CALENDAR

Illinois — Starved Rock Radio Club Hamfest, June 9, southwest of Ottawa, Illinois, on State Route 71. Follow Route 23 to south end of Illinois River bridge, turn west on Route 71. Follow big yellow Hamfest signs. Plenty of parking area. Adequate facilities for all. Free swap section run on the same basis as previous ones. Advance registrations $1.00 if postmarked before June 1, otherwise $1.50. Mail your advance registrations to Starved Rock Radio Club, W9MKS, RFD 2, Box 22-A, Utica, Illinois. Hamfest site is near Ottawa but within short driving distance of Starved Rock State Park and recreation areas. Blackhawk Beach nearby. Come to La Salle County 4-H Home and Picnic area June 9.

Strays

W9DYZ advises that the annual meeting of the Ham-Reps will be held in the Lincoln Room of the Congress Hotel on May 21. Dinner at 7:30 P.M., speaker to follow.

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The *Vereniging Voor Experimenteel Radio Onderzoek In Nederland*, IARU society for The Netherlands, is conducting a contest among its members during the period 1 March 1957 to 28 February 1958 based on working all states. The society requests the cooperation of U. S. amateurs by answering QSLs from PAs as promptly as possible during the contest period.

—•••—

Southwestern Division Director W6EKM reports that everyone working a Long Beach ham will receive a special QSL plugging the Miss Universe pageant and the Southwestern Division Convention.

May, 1932

. . . Forgive us for getting personal, but it was the compact receiver described by George Grammer in the May, 1932, issue of *QST* which started the present Managing Editor in ham radio twenty-five years ago.

. . . OA4U told how he came to investigate the directive properties of his antenna, because of excellent success with a 7.5 watt rig, and described the necessary equipment.

. . . J. L. McLaughlin described a linear electronic voltmeter, while the Experimenters' Section was full of a number of interesting circuits and ideas.

. . . Considerable space was devoted twenty-five years ago to activities on five meters. The Bloomfield Radio Club of N. J. reported on its Five-Meter Field Day, and the high point of the report was the advice that two of the stations had established two-way communication over a distance of 41 miles.

. . . W2ALS described a portable 56-Mc. transmitter and receiver using (wow!) '01As in the output stage!

. . . To round out the 56-Mc. picture, there is a report on the use of that frequency in air-to-ground communications. Distances of up to 60 miles were worked.

. . . Noting some prices in the ads. UX201As were 45¢, while a type 866 went for $2.95. *Call Books* were 82¢. The Collins Radio Company advertised complete transmitters at prices ranging from $74 to $286.

. . . And say, here's an interesting ham ad. A Milton Chaffee of Connecticut offered to trade a xylophone for a push-pull transmitter. That erstwhile musician is now W1EFW and director of the League's New England Division.

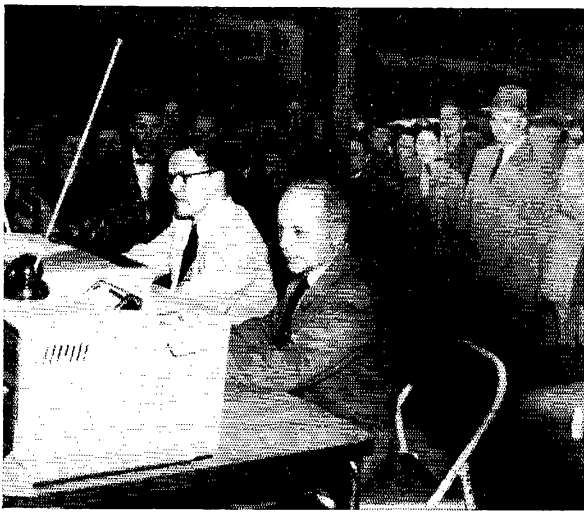
Strays

DURING the first week of March the Omaha Radio Club availed itself of an opportunity to demonstrate ham radio to a large segment of the population of the city. The purpose of the demonstration was to educate the public not only concerning the public service aspects of ham radio and the just plain fun that also exists, but in addition to point out some of the facts concerning TVI.

The club set up a station in a department store window facing on the busiest intersection in the city. On hand to start things going were the Governor of Nebraska and Miss Universe. The Governor talked to hams throughout the country and passed out commissions in the Nebraskan Navy, while Miss Universe stood around looking beautiful and admiring the curly hair of one of the amateur operators. After these opening ceremonies, the club got down to business and kept the station on the air for eight hours a day, for three days. Two operators were always on duty, one working other ham stations and the second one explaining ham radio to the crowd assembled outside the store window.

The station caused no TVI to a TV receiver right along side the transmitter, but the hams had plenty of difficulty with interference from elevators and traffic.

The club members had fun, and it is estimated that some 53,000 people saw the station in action.



KØGHK and WØGFQ in an Omaha store window

♦

Each year the Milwaukee Radio Amateurs' Club makes awards to the "ham of the year," with suitable trophies. For 1956 the award went to a father and son combination, W9GIL and KN9CAN (now K9CAN). W9GIL is a member of the DXCC and twice past-president of the MRAC. Licensed since 1928, he is an assistant ARRL director in the Central Division. Son K9CAN was first licensed when he was 13 years old and has already worked some 96 countries, and is an active participant in the annual Field Day. He has just entered high school. The MRAC decides its awards on a point system based on active participation in a number of amateur activities. Other clubs might be interested in getting details by writing to W9ONY.

Silent Keys

IT IS WITH DEEP REGRET that we record the passing of these amateurs:

W1EGD, George R. Urquhart, Boston, Mass.
W1HVI, Alexander Buchok, Meriden, Conn.
W1IR, Thomas F. Conneen, Portland, Me.
W1MG, Kenneth C. Cushing, South Portland, Me.
W2CTP, David Meer, New York, N. Y.
K2PEN, James L. Keir, Clay, N. Y.
W2ZN, Jesse W. Holland, New York, N. Y.
W3AVL, Allen B. Hanger, Hollywood, Md.
W3IBU, Edward P. Ellison, Philadelphia, Pa.
W3NXR, Silvio Galzerano, Indiana, Pa.
W4GSS, James I. Stancil, Centreville, Ala.
W4TXC, Glen C. Cook, Louisville, Ky.
W4WOO, Frank R. Thielan, jr., Montgomery, Ala.
W6AWZ, Max A. Frauenthal, El Centro, Calif.
W7OOW, Louis C. Liddard, Lewiston, Idaho
W7SXD, Kingsley A. Dutton, Boulder City, Nev.
ex-W8AIC, Lee R. Kness, Mannington, W. Va.
W8EHQ, James D. Goodman, Elyria, Ohio
W9DHM, Vernon S. Gouker, Elkhart, Ind.
W9GUA, Howard L. Yates, Chicago, Ill.
W9GYG, Anthony Coppotelli, Glenwood, Ill.
W9OF, Leroy F. Watkins, Avon, Ill.
WØDOM, Robert G. Haines, Mountain View, Mo.
WØGAF, Marvin L. Nielsen, Sibley, Iowa
WØHWD, Carl G. Simenson, Kindred, N. Dak.
WØICN, Walter L. Williams, Winona, Minn.
WØIQQ, Lee R. Aro, St. Louis Park, Minn.
WØVEU, Joseph J. Maher, jr., Muncie, Kansas
CR5AA, Armando Frederico Mariano, Lisbon, Portugal
VE7AAF, William E. Drummond, Victoria, B. C., Canada

Correspondence From Members-

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

BRAVO!

Camp Lejeune, N. C.

Editor, *QST*:

I wish to compliment Frank H. Tooker on his "Trial Under Fire" (*QST*, March, p. 71). How about some more of his articles?

— *Earl King, KN4LAA*

VICTIMS OF HABIT

469 South Third St.
San Jose, California

Editor, *QST*:

The Novice develops a bad habit of thinking all amateur operators have three-letter calls. I have concentrated on my spacing while transmitting to new General operators, so I feel certain that my fist is not at fault. I sign K6DV, long space, again K6DV followed by long space, three times, and what do I receive? K6DVK. . . .

— *Bob McCormack, K6DV*

AUTOMATIC CONELRAD

630 Sansome St.
San Francisco, Calif.

Editor, *QST*:

I have an automatic conelrad that was in operation long before the regulations required such a device. It's my wife. She watches a portable TV in her room every night. It doesn't matter whether I'm operating my rig, am at the work bench in the basement or reading the paper in the bathroom; comes the slightest flicker on her TV receiver and she yells, "turn that darned thing off."

— *J. R. Henthorn, K6DXV*

NOVICE DX

8 Massachusetts Ave.
Worcester, Mass.

Editor, *QST*:

It seems to me, after operating on the air for over seven months as a Novice, that the 15-meter band presents a real problem. I feel that the complaints of the General-Class licensees concerning the Novice interference with the phone DX are very much justified. The Novice-Class license was established to initiate newcomers into the hobby of amateur radio, and to aid them in obtaining a more permanent footing in that hobby. Is the working of DX essential to the accomplishment of this purpose? No, I certainly don't think so. . . .

— *Charles A. Allen, WN1LQV*

INCENTIVE

5316 Plainfield Ave.
Baltimore 6, Maryland

Editor, *QST*:

I think it is a good policy for ARRL to petition for extra privileges as an incentive to amateurs. But why, pray tell, do you keep attempting to give the holders of Advance Class licenses a free ride? If they want the same privileges as those that hold the Extra Class ticket, let them earn it the same way the present holders of General Class tickets will have to earn it.

I'm all for the incentive program, but only if it's an incentive for all hands; not just the poor unfortunates who got into ham radio when it was no longer possible to memorize a few questions and come up with a higher class of license.

— *S. D. Brokhausen, W3IEL*

NST

RFD 2
Nampa, Idaho

Editor, *QST*:

All my sympathy goes to K5DNG (p. 62, March). I remember how perplexed I was when I heard a station sending NST (test). . . .

— *Lyle Estabrook, WN7CQX*

418 E. Baldwin Ave.
Paulding, Ohio

Editor, *QST*:

After reading the letter from R. B. Calhamer, K5DNG, I am reminded that I am constantly amazed to find that so many of them announce, "nag is Jim" — or Bill, or Joe. Also hear so many of them say NST when turning up their rigs — and it is not all "Novice Accent."

— *A. W. Wolfe*

2340 Kensington Road
Lansing 10, Michigan

Editor, *QST*:

My hat is off to R. B. Calhamer, K5DNG, who, in a rather subtle way, replying to "YOUR NOVICE ACCENT" (Nov. 1956), hands some of our c.w. ops. a swift kick right where it is needed most. . . .

— *C. G. Calkins, W8IISG/MEX*

640 Riverside Drive
New York 31, N. Y.

Editor, *QST*:

After reading Mr. Calhamer's letter in March *QST*, in which he referred to operators sending NEET and TV after word groups, I have come to the conclusion that he had better go back to the Novices. Obviously NEET is simply the $\overline{BT}$, or break sign, which is used to separate thoughts instead of a period. If Mr. Calhamer doesn't know a $\overline{BT}$ after more than a few months on the air, he had better turn in his ticket, because operators like that just cause more QRM on the bands. Just after I went on the air, I heard many boys sending GE, or GA, right after they made a contact. Not knowing what this stood for, I simply looked it up in *Operating an Amateur Radio Station*, and found out it meant "Good Evening". The ARRL does a tremendous job in getting newcomers to learn operating techniques, and I am amazed to find someone who couldn't recognize a $\overline{BT}$ after being a ham for several months.

— *Richard Light, K2UOY*

HARMONIC ANTENNAS

Hy-Gain Television Products
249 North 48th Street
Lincoln, Nebraska

Editor, *QST*:

Considerable concern has been shown in a previous letter to the editor regarding the harmonic radiation of multiband antenna systems (*QST*, Feb., p. 49). As a manufacturer of multiband antenna systems using parallel resonant trap circuits, the matter of harmonic radiation has also been of great concern to us.

In first considering the problem and reducing it to careful analysis, we came to the following conclusion. Harmonics are generally coupled to an antenna system capacitively. This assumes, of course, a harmonic attenuator or antenna tuner is being used, as it should be with almost any antenna. In a multiband system incorporating parallel resonant trap circuits, the feed line is low impedance to the second harmonic as well as to the fundamental. Therefore, harmonic energy getting into the antenna system through stray ca-

(Continued on page 152)

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

Call Signs as Handles. Once in a while a newcomer will ask about the common practice of using the station call-letters as the "handle" of the operator. While call letters do apply specifically to FCC station authorizations, the personality of the operator and his station in amateur radio are closely identified. The practice of using the call signal or the call letters alone or in conjunction with an operator's first name or nickname comes from its convenience in providing a short but positive identification. The exchange of first names *alone* is often very inadequate in amateur radio — and was never practiced on a large scale before World War II. There are scores of Eds and Joes in the call book! New amateurs with a very limited acquaintance in operators may know just *one* Joe, Dick or Tom. But that is *not* true of those with many QSOs. When we say George, W1DF or George, W1NJM or just NJM we cannot be misunderstood. Furthermore, the use of one's call is highly fraternal and traditional. *Using our calls* in signing our letters as well as in reports, and operator sines for responsibility in receipting for traffic, especially in multi-op stations, is always the mark of an understanding and experienced amateur. Assigned calls quickly become *identities*; they acquire personality; however, we should be careful always to use them so they hold respect.

Club Program Objectives. February *Hamgab*, published by the Hamfesters Radio Club (Ill.) likewise calls for getting Field Day groups organized early and for ideas and competition in all these activities. The new club president W9PSB, sparks a club program worthy of emulation by other big clubs: (1) To get more than 166 dues-paying members, (2) to conduct code and theory classes through the Vocational High School, (3) to promote portable gear for a 50.5-Mc. program — nine prizes, (4) to place *more* field day groups afield (W9IRH is chairman for outside activities), (5) to give certificates to the leading club members in the Ill. QSO Party and SS, and (6) to devise a balanced-subject schedule for variously interested club members and fill it out by obtaining competent speakers. Program, TVI and Publicity committees are in the capable hands of W9QXO, W9OFQ and K9CDV.

A recent ARRL Affiliated Club Bulletin describes in detail how one club put on an equitable WAS Contest for its up-and-coming membership, and stressed the services clubs conduct for the prospective amateur and the licensed ones newly on the air. We're happy at any time to send data on affiliation to any non-affiliated groups interested in the benefits of such bulletins or the ARRL training aids which may be received after completing an affiliation with the League.

Watch Harmonic Radiations. "The way the harmonics are flying . . . a lot of pink tickets will be issued before any OO can get the offender's QTH and mail him a card." — *K9CKP*. "There are quite a few newly licensed KN6 and KN7 stations on 7.4 Mc., with chirpy sigs too." — *KH6ARL*. "With seasonal activity increasing there seems an increasing number of harmonic signals. Ten meters keeps getting hotter and hotter. There is no difficulty in logging ten or more out-of-band harmonics per hour just on the strong ones!" — *W2LS*.

Thus do Official Observers report on current conditions. Their assisting work continues. Here are some pertinent questions amateurs should ask. Have you checked with the ham across town who has a general coverage receiver to *make sure* you are not radiating a harmonic? Do you have a simple absorption wave meter or grid dip meter to check your output frequency? Use an antenna coupler? Can harmonics reach or be radiated from your antenna? Novice-carelessness in *not* getting the correct dip, in incorrectly making rigs double or triple or leaving the wrong crystal in a transmitter when changing bands, these things inevitably result in FCC trouble.

For Improving Traffic Work. A candid quote from a reliable trafficker (name on request) who passes along some suggestions for originators and message handlers:

". . . any message going to a big city *must* have a full and accurate address. . . . I am no hot-shot operator and make my share of mistakes, but am working hard to improve my operating technique. I think I have the problem of monitoring my own sending solved with a few more gadgets. I do *not* want to emulate the boys who send 6 dots for H and 7 or 8 for a 5 to give the false impression they are fast. If they would back off and be accurate by sending heavier slower dots their actual speed of operation would go up sharply . . . (our net) seems to have a lower percentage of offenders than any other nets I report in to. I don't find phone the best place to handle my traffic. The names of nonexistent streets often come from a phone operator putting down what he *thought* he heard, when he didn't hear so well. Any real communicator, whether on phone or c.w., asks for fills and repeats, receipting only when sure of correctness and word count. As I write I have 73 of 100 deliveries-plus-originations for my third BPL and should make it without trouble."

Ready for Field Day? The annual testing of emergency rigs, the outstanding club and individual activity of the year, is scheduled just next month. The dates of June 22-23 will be here before we know it. Full detailed rules for ARRL's

Field Day will appear in June *QST*. All affiliated clubs have this information already. You can look up the similar rules in June '56 *QST* or the report of results in Dec. '56 *QST* for more data.

On *Field Day Planning* see page 78 of March 1957 *QST* for some ideas. Reason for this notice in May *QST* is that the FD log forms, available gratis on request, will be ready after May 15th. They will help you in your logging, and help us in recording results of the FD if you will ask, by radiogram or letter for field day forms, so we have time to get them to you in advance of the activity; we can't guarantee a thing on late requests though we always try to do our best . . . the mailman is unpredictable these days. Field Day is primarily a workout for *portable stations afield*, but even fixed home stations can keep a record and help the test, and our form is convenient for those reports too. Don't overlook including a short workout, or more, for your mobile rig either, come field day time. Last year the number of mobile reports was up 26%. A try out ahead of summer vacationing use will test the range as well as general serviceability. Don't forget, requests for FD report forms are invited in the latter half of May. BCNU FD! —*F.E.H.*

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

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 May 15th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7080, 14,100, 21,010, 50,900 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted on May 2nd 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. References 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 buzzer or audio oscillator and attempt to send along with W1AW.

Date	Subject of Practice Text from March *QST*
May 1st:	*ARRL Ninth National Convention*, p. 10
May 7th:	*Tropospheric Scatter Techniques . . .*, p. 11
May 9th:	*Parallel Dipoles of 300-Ohm Ribbon*, p. 14
May 13th:	*A Dual Keyer for Differential Keying*, p. 28
May 21st:	*A 3-Band 90-Watt Transmitter*, p. 35
May 24th:	*Operation Deep Freeze*, p. 48
May 27th:	*Keeping Your Station Log*, p. 50
May 31st:	*How's DX?*, p. 63

W1AW SUMMER SCHEDULE

(Effective April 28, 1957)

(All times given are Eastern Daylight Saving Time)

Operating-Visiting Hours:

Monday through Friday: 1300–0100 (following day).

Saturday: 1900–0230 (Sunday). Sunday: 1500–2230.

Exception: W1AW will be closed from 0100 May 30th to 1300 May 31st in observance of Memorial Day.

A map showing how to get from main highways (or from HQ. office) to W1AW will be sent to amateurs advising their intention to visit the station.

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

Frequencies (kc.):

C.w.: 1885, 3555, 7080, 14,100, 21,010, 50,900, 145,600.

Phone: 1885, 3945, 7255, 14,280, 21,330, 50,900, 145,600.

Times:

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

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

General Operation: Use the chart below for determining times and frequencies for W1AW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies. Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. On May 15 and June 20, instead of the regular code practice, W1AW will transmit a certificate qualifying run.

W1AW GENERAL-CONTACT SCHEDULE

(In Effect April 28, 1957)

W1AW welcomes calls from *any* amateur station. Starting April 28th, W1AW will listen for calls in accordance with the following time-frequency chart.

Time (EDST)	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0000–0100 [1]	.....	.....	3555 [3]	.....	3945	7080 [3]	.....
1300–1400 [2]	.....	21 28 Mc.	21 28 Mc.	21 28 Mc.	21 28 Mc.	21 28 Mc.	.....
1500–1600	.....	7080	14,100	7255	14,100	7080	.....
1600–1700	.....	14,280	7080	14,100	14,280	14,100	.....
1800–1900	.....	14,280	14,280	14,280	14,100	7255	.....
1900–1930	.....	7255	.....	21,010	.....	14,280	.....
1930–2000	.....	14,100	.....	3555	.....	14,280	.....
2000–2030 [1]	14,280	3555 [3]	14,100	14,100	7080 [3]	14,100	.....
2030–2100	14,280	3555	14,100	14,100	7080	.....	.....
2100–2130 [1]	145.6 Mc.	21,330	145.6 Mc.	50.9 Mc.	21,330	.....	.....
2230–2300	.....	.....	1885	.....	1885	.....	.....
2300–2330	.....	.....	3555	.....	3945	.....	.....
2330–2400 [1]	.....	3945	7255	3945	7255	3945	.....

[1] Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 2000, on phone at 2100 and 2330.

[2] Operation will be on 21,010, 21,330, 28,060 or 29,000 kc., depending on band and other conditions.

[3] W1AW will listen for Novice Class licensees on the Novice portion of this band before looking for other contacts.

There are times, during the stress of an emergency situation, when we amateurs are called upon to be something besides what we are, such as a policeman, fireman, newspaper reporter, broadcast announcer or commentator, or even a civil defense director. Some amateurs delight in stepping out of their shoes as communicators, when asked to do so, and perform other tasks normally delegated to others trained for them. Sometimes they get away with it. More often, however, they are embarrassed, confused, reluctant, or attempt it and make a botch of it, to our everlasting discredit and that of the organization we are serving.

We amateurs are communicators, and we ought not forget it. In emergencies or at other times, the content of the communications we handle is none of our business, provided only that it is legal. All we do is set up the facilities, provide the operators, maintain the equipment, and do whatever else we are required to do to get the traffic from point of origination to point of destination. This sounds easy, but there are some other factors to be considered, not the least of which is to see that messages are in acceptable form (preferably written, if practicable), and *properly authenticated* by the person sending the message. An operator in an emergency situation, for example, should not pass along a message yelled at him by a total stranger to the effect that "tell headquarters we need blankets down here right away." Who needs them? Where? Who says so? What's his authority? Or, even worse, something like this: "Tell the civil defense director that the dam is cracking and might break at any moment." Without authentication, you can just imagine what kind of havoc such a report might create! And it has happened.

In many emergencies, amateurs have been called upon to be other things than communicators, but it seems to us that we have enough to do in our own field. Let's leave newspaper reporting and broadcasting to those who are qualified and authorized to do it. We'll provide communication for them, but we should eschew other functions insofar as we can. It doesn't do us any good and could do us a great deal of harm.

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Last October, during the Simulated Emergency Test, a fire broke out in Carrollton, *Ill.*, just after *EC* W9IFA had completed his SET drill, and the boys went right from an imaginary exercise into the real thing. The fire started in a furniture store and quickly spread. W9ZMF was first on the scene, and was later joined by W9IFA and W9CFK with their two-meter mobiles. One mobile unit was dispatched to a nearby water supply (city water supply was exhausted) and the other remained at the scene of the fire, thus maintaining communications between fire fighting units until the fire was brought under control.

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On the afternoon of January 5 an unusual power failure crippled the Carlsbad, N. M., area, affecting five counties. Mobiles K5DAA and K5CEV, who were running some tests with K5CXN at Lincoln National Park, reported promptly to police headquarters, where the former was retained as base station and the latter was put to work locating e.d. personnel.

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The AREC group of Rush City, Minn., was able to render an emergency service on January 20 when a car broke through the ice on Rush Lake and a six-year-old boy was drowned. EC WØGXU called the Rush City and Chicago Emergency Net into action at 1830 and notified KØDEH to establish a liaison with the Minnesota Phone Net. WØGXU then proceeded to the scene, accompanied by KNØEBC and KØBLZ. Communication was established and maintained from the scene, where dragging operations were being conducted, to the sheriff's office in Rush City, until 2005. Seven messages were handled, all oral.

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Amateurs in New Brunswick were active on 3735 kc. from January 22 through the following week end in connection with the search of an area near Havelock, 25 miles northeast of Moncton, for a downed airplane said to contain several New Brunswick provincial officials. The civil defense group under the direction of VE1EV established communication with Moncton (VE1ACX), Fredericton (*VE1s* ABT PF VU LX and OQ), Sussex (VE1HM) and Halifax, N. S. (*VE1ADH*). This net operated daily, with the bulk of the traffic between Havelock and Moncton, until 0200 Jan. 27, when the search scene was shifted to Port Eglin, some 70 miles to the southeast. VE1EV/1 was dismantled in 10-below-zero weather, loaded into a car, and was back in operation from Port Eglin by 0800 the same morning. Operation continued until the evening of January 29, with some 205 messages being handled. Relief operators at VE1EV/1 were VE1JM and VE1XP; at VE1ACX, VE1FT acted as relief operator. Other amateurs involved in the communications work were *VE1s* CO and EL. Other amateurs assisted in keeping the frequency clear and novice WN operators were very cooperative.

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A gas explosion in Reno, Nevada, which destroyed a considerable portion of the city's main business section, brought action from the Reno AREC organization. Although normal communications facilities were not impaired, an overload on telephone circuits enabled a number of amateurs to assist in handling health and welfare messages and other inquiries. Reno EC W7PC reports that 91 such messages were handled and 48 inquiries of other natures answered. He also states that much experience was gained as a guide to operation in future emergencies. Those amateurs listed as having participated in the activity include *W7s* PC ZHW VJC AZF ZVN, K7FDB and K2DIH/7.

— • • • —

During a severe fire in downtown Russellville, Ark., on Feb. 16, W5WSM set up a network of amateurs in fifteen cities to handle emergency traffic. According to a dispatch in the Russellville *Daily Courier-Democrat*, the amateur network was one of very few means of communication with the outside after long distance telephone lines went out as a result of the fire. W5WSM contacted K5HDO in Tulsa, who phone-patched him to the AP Bureau in that city, thus making the complete story of the fire available to the outside world. The network was active from 2130 Feb. 16 until 0200 Feb. 17 and handled several dispatches and personal messages. Other stations listed as having taken part are *W5s* TLC DRZ LXH LHY ESB TNW ZBI JJR ERX BRJ GVV SGM AFA EJK NKI TTW WEE, *K5s* ISZ EGS HIV AUX, and KØBPJ.

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On hand to lend assistance during a multi-million dollar blaze in Cleveland on Feb. 25 were *W8s* LHX IY LPZ QYT AEU and K8ABA. The spectacular blaze, which started at 2200, was fought all night, with Cuyahoga mobile and fixed units active in communications activities until 0200, when their services were no longer required. — *K8CBE, Asst. EC Cuyahoga County, Ohio.*

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Orange County, N. Y., EC W2PCQ called a surprise emergency drill of his AREC unit on January 26th. Without any warning whatsoever, 20 stations reported in ready to go. Nearly all were using portable or mobile rigs on 2 and 6 meters. In addition, six low-frequency rigs were ready to go on c.w., a.m. or s.s.b. W2PCQ says that a Hudson River 2 Meter Net is being formed to cover from New York to Albany with hookups from Lake George to Philadelphia.

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On November 29th the state of California had a simulated earthquake drill called "Operation Shakedown," which hit the City of Santa Barbara with an intensity great enough to "really put things out." All roads were closed due to slides in the mountains and bridges collapsing. The AREC through a two-meter link between city and county e.d. was able to handle traffic and use mobiles for delivery of

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

The Pequannock Township (N. J.) Civil Defense Group has an active bunch of amateurs organized as a part of the Morris County RACES Plan. Shown in front of Township offices with gear are (standing, l. to r.) K2CSR, W2NUL, K2JXV, W2SOE, K2GRO; (front row, l. to r.) W2EDM, W2OPU, K2GQC, K2IWN, W2PCI (RO).

messages and collecting of information. Santa Barbara EC K6EAQ did a fine job of planning and execution. County Chief Radio Officer K6BF also worked with efficiency, sending and receiving messages concerned with the need for food, medical supplies, status of Santa Barbara and nearby towns. Twenty-five operators were active in Santa Barbara alone, with a total of 105 in the Santa Barbara ARRL section. About 50 of these were members of the AREC. It is felt that this drill has pointed out some faults that can be corrected, but has also proved that the Santa Barbara AREC is ready and able to act under emergency conditions. — *K6CVR, SEC Santa Barbara Section.*

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We start off the year 1957 with a bang, as concerns SEC reports. No less than twenty-three Section Emergency Coordinators reported January activities on ARRL Form 8. This is not only a record high for January (18 reports received last January) but we think the 6731 AREC members represented is a new high in that department. Sections reporting: Ala., Ga., W. N. Y., Conn., N. M., Minn., Colo., San Joaquin Valley, Iowa, E. Fla., Santa Clara Valley, Los A., Santa Barbara, Ont., Wash., N. C., Ore., Tenn., E. Pa., NYC-LI, Wis., Md.-Del.-D. C., Maritime. Okay, now only fifty sections to go!

RACES News

The Westmoreland County (Pa.) RACES organization, under RO W3UVD, puts out a neat little monthly paper called "Ham-O-Gram," edited by the RO himself, containing monthly progress reports and news of organizational interest. In the January, 1957, issue, for example, the first paragraph states the slogan: "To create a better understanding between the radio amateur and Civil Defense and by working and being together we will have an expert functioning group." A chatty little paper such as this can go far toward creation of good fellowship within a RACES group, and W3UVD does a good job.

—•••—

The first drill of the Bernalillo County, N. M., RACES group was held on December 14th and consisted of participation in a practice evacuation of the military facility at Sandia Base in cooperation with military authorities and the Atomic Energy Commission. The RACES group tested its ability to move its mobiles through evacuation traffic on the base and reach designated evacuation areas. This was accomplished in 30 minutes. Mobiles then proceeded to their homes and simulated the loading of communications equipment which would be needed in the case of an actual evacuation. Within 80 minutes after the initial alert, all mobiles were at their assigned stations and the RACES net was established. All evacuation areas are at least 30 miles from target areas. The Bernalillo County (Albuquerque area) RACES consists of 15 mobiles and 6 portables, with additional authorizations pending. Tactical calls were used throughout the test. — *W5UWA, EC/RO Bernalillo Co., N. M.*

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The combined RACES/AREC organizations of Concord and Bedford, Mass., held a very successful drill on January 7, under radio officers W1WNP and W1NDI respectively. A violent snowstorm the previous night caused the Sector I-D radio officer to call off the drill, but W1WNP and W1NDI did not consider this a good reason for the cancellation and went ahead with the drill anyway. W1AQE controlled the ten meter net from Bedford with 11 stations participating. W1WNP was at central control station in Concord and eventually took over for the West Concord auxiliary station on 29,120 kc. A 2-meter RACES net linked the Concord c.d. center with West Concord, the emergency hospital and three 2-meter mobiles who performed yeoman service under terrible road conditions. The central station operated on auxiliary power for a time. Thirteen stations participated from Concord. Civil defense and other officials observed and participated in the drill, which was considered highly successful by Concord RO W1WNP despite disclosure of certain easily-correctable weaknesses.

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W5MZP informs us that the Arkansas RACES plan was approved by FCC on January 18, 1957, and 98 amateurs have expressed interest in joining the Arkansas RACES nets. FCC Forms 482 were mailed to all district RACES officers and RACES decals have been ordered for all members. This is good news from Arkansas, formerly among the more backward states as far as civil defense was concerned.

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Speaking of RACES decals, we understand that the first order for 5,000 of these was quickly used up. FCDA has just informed us that a new order of 10,000 is ready for distribution — so those of you who missed out on them the first time, just be patient. A new supply is on its way.

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We would like to compliment the Spokane Radio Amateur Club (Wash.) on their bulletin, a copy of which we have recently received. Civil Defense and RACES are emphasized in it, and although we can glean that the State of Washington is veering away from the use of amateurs for civil defense communications, such is not the case in the City of Spokane, which is depending heavily on its amateurs.

TRAFFIC TOPICS

Not so long ago, in a traffic net, we were called upon to pass on the legality of a series of book messages which had as their purpose the raising of funds. It was obvious that the net members would have liked to have had us state that such messages were illegal and they must not handle them, but we could not do so. In this case, the station originating the messages was not soliciting funds for himself, was not receiving any kind of compensation for his operation, and was therefore entirely in the clear.

The only thing that makes any message illegal is payment in money or in any other form, direct or indirect, to the operator for the use of his amateur station. This

applies only to U. S. amateurs; in other countries in which amateurs are allowed to handle third party traffic, there are usually further restrictions concerning commercial-type traffic. Thus, our government has been quite lenient, in this and most other aspects of our amateur operation.

The question then arises whether we should take full advantage of this leniency by handling business-type communication by amateur radio (i.e., somebody else's business, not your own), by conducting fund-raising campaigns (for somebody else) at will, by domestic phone-patching, etc. ad infinitum — or should we try to set up some self-imposed rules by means of which we can agree among ourselves not to do these things because (1) they are apt to result in creation of restrictive FCC rules if carried to the extreme and (2) amateur traffic handlers very strenuously object to handling traffic to save people money or to make money for someone. Our service is "free," sure enough, but its purpose is not to save anyone money. We handle traffic simply for the joy of it, or for the prospect of using the skill acquired in emergency work, or for the training we get out of becoming proficient operators, or for the benefit of isolated persons or groups who do not have access to commercial communications.

Assuming that the majority of traffic amateurs will agree (and we think they will) that certain types of traffic are inimical to the amateur traffic service, where do we draw the line? Which types shall be taboo? Shall we taboo "fair" traffic? Military-type traffic? Traffic over 48 hours old? Traffic with incomplete preambles, traffic originated in certain foreign countries, traffic with long texts, traffic with incomplete addresses, traffic of a "commercial" nature, traffic that says something like "having a fine time, wish you were here"? How far shall we go?

Opinions will be varied so much that we'll never get anywhere by canvassing opinions, never be able to set any specifications as to what kind to handle and what kind not to handle. Anyway, when you get right down to it, what the messages says isn't any of our business as communicators. What kind of traffic appears on our nets is, in the end, up to those who originate traffic. If you don't like it as an individual, you don't have to accept it.

So we can only wind up this discussion by making a double-barreled appeal: first, to originators: for heaven's sake, use your heads and refrain from cluttering up the traffic nets with messages you know the boys won't want to handle, just as you wouldn't if you were in their place. We all like to think we're doing something worth while and not being made suckers of. To the relayers: handle the traffic that comes your way to the best of your ability; if you don't like it, tell the originating station, don't write us to say "there oughta be a law." We have no practical solution to the matter.

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Another topnotch YL traffic handler left out of the list of prominent YL traffic "men" in February *QST* was Georgie, W2KEB. (How *could* we have done such a thing!) W2KEB has been near the top of the BPL for many months running and is secretary of the Transcontinental Phone Net as well as being one of their primary traffic outlets. She and OM George, W2KFV, each run up sizable traffic totals every month.

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Miscellaneous reports: The North Texas-Oklahoma Net reported 28 sessions, 1022 station check-ins and a traffic count of 252. Dragnet had 417 check-ins and handled 715 messages. TCPN reports: 1st call area, 1559; 2nd call area, 1239; 4th, 9th and 0th call areas, 410; total, 3208. Eastern States Net handled 795 messages with 64 stations in 21 sessions. Early Bird Transcontinental Net handled 705 messages in 28 sessions for an average of 25.1 messages and 21 members per session. Interstate Single Sideband Net: 258 messages, 28 sessions, average participation, 39 stations.

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Virginia Fone Net (VFN) has an interesting idea that might be useful to some of you netters. Instead of calling the roll by individual members, the roll is called by areas, the state being divided into 14 such. Traffic is also reported in accordance with areas. Net Manager K4AET says that 40 to 50 stations can be checked in, with their traffic, in ten to fifteen minutes using this method.

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National Traffic System. At the risk of appearing to be repetitious, we want again to emphasize that NTS nets are dependent on a time schedule for proper operation and should be *kept on time*. This means not only that the NCS should call the net promptly at the appointed time, but also that net members should be on deck at that time so that the net's business can get under way at once without any delays caused by someone's lateness. This is a continuing fault of NTS nets that needs correction. In section nets, liaison stations should be excused so that they can make their liaison with regional nets on time. In regional nets, the liaison stations should similarly not be held up beyond the time the area net is due to meet. TCC liaison stations in area nets should clear the area nets from which they are receiving traffic in sufficient time to meet their counterpart TCC stations. All this means that NTS nets should make a special effort to clear their "thru" traffic *first*, in order that liaison stations may be released as soon as possible. Even if they do not clear in time, the liaison station should be released anyway, if this is necessary to enable him to meet his liaison schedule on time.

What of the remaining "thru" traffic? Well, it either has to be held or take alternate routes. Normally, it is possible to clear all "thru" traffic within the regular time, provided all stations QNI on time. If they do not do so, they have only themselves to blame.

The time schedule is what makes NTS a system rather than a loose scattering of nets. Reporting stations for whom there is no business should be excused fifteen minutes after the session starts; if traffic arrives for them after this time, that's the tough luck of the station who brings it in late. Tardiness on NTS nets may sometimes be unavoidable, but it is never excusable, and we should not allow it to slow down the systematic flow of traffic that NTS is designed to

A.R.R.L. ACTIVITIES CALENDAR

May 2nd: CP Qualifying Run — W6OWP
May 15th: CP Qualifying Run — W1AW
June 5th: CP Qualifying Run — W6OWP
June 8th-9th: V.H.F. QSO Party
June 20th: CP Qualifying Run — W1AW
June 22nd-23rd: ARRL Field Day
July 3rd: CP Qualifying Run — W6OWP
July 19th: CP Qualifying Run — W1AW
July 20th-21st: CD QSO Party (c.w.)
July 27th-28th: CD QSO Party (phone)
Aug. 7th: CP Qualifying Run — W6OWP
Aug. 19th: CP Qualifying Run — W1AW
Sept. 5th: CP Qualifying Run — W6OWP
Sept. 17th: CP Qualifying Run — W1AW
Sept. 18th: Frequency Measuring Test
Sept. 21st-22nd: V.H.F. QSO Party

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Apr. 27th-28th: PACC Contest (c.w.), VERON (p. 63, April, How's DX).

May 3rd-13th: West Virginia QSO Party, Mountaineer Amateur Radio Assn. (p. 164, this issue, Station Activities).

May 4th-5th: PACC Contest (phone), VERON (p. 63, April, How's DX).

May 4th-5th: OZ Cross Country Contest, EDR (p. 63, April, How's DX).

May 11th-12th: 4th Annual Rocky Mountain Division QSO Party, Denver Radio Club (p. 164, this issue, Station Activities).

May 12th: 1957 Virginia QSO Party, W4KX (p. 164, this issue, Station Activities).

May 18th: Armed Forces Day, Dept. of Defense (p. 69, this issue).

May 18th-19th: 1957 Helvetia-22 Contest, USKA (p. 63, this issue, How's DX).

During a communications conference last December, at which civil defense delegates from seven states of FCDA's Region 3 attended, the above picture was taken of Region 3's radio facilities at Thomasville, Ga. Left to right are Cdr. T. R. Gray, Sixth Naval District, Charleston; Maj. G. D. Furlong, MARS Director, 3rd Army; Curtis Steed, W4POI, FCDA Regional Communications Officer; and Arthur Melvin, W4UHY, Fla. State C.D. Communications Officer.

effect. If you must be late, be content to take your chances that your traffic cannot be cleared, or that you may have to wait your turn to clear what you bring. *In* most NTS nets, it's a case of first come, first served; and that's the way it should be.

February reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation*
1RN	39	500	0.78	12.9	78.0%
2RN	47	356	0.83	7.6	93.6%
3RN	40	301	1.10	7.5	79.2%
RN5	39	591	0.94	15.2	....
RN6	47	315	0.57	6.7	43.2%
RN7	47	230	0.31	4.9	33.1%
8RN	46	430	....	9.3	89.9%
9RN	56	1048	1.00	18.7	89.7%
TEN	84	1587	....	18.9	74.0%
ECN	19	107	0.46	5.7	91.2%[1]
EAN	23	817	1.08	39.0	97.8%
CAN	28	1184	0.99	42.4	98.8%
PAN	23	705	0.68	31.7	100.0%
Sections[2]	760	6327		8.3	
TCC Eastern	54[3]	353			
TCC Central	....	1506			
TCC Pacific	103[3]	808			
Summary	1298	17156	3RN	11.1	PAN
Record	1298	17156	1.26	19.1	100.0%
Late Reports:					
RN7 (Jan.)	47	223	0.38	4.7	33.1%

[1] Regional net representation based on one session per night. Others are based on two or more sessions.

[2] Section nets reporting: QMN (2 Mich. nets); WSN (Wash.); WVN (W. Va.); KYN (Ky.); AENB, AENP and AENT (Ala.); MPN, MSN, MJN (Minn.); Tenn. C.W.; ILN (Ill.); S. Dak. 75 Fone & S. Dak. 40 Fone; TLCN (Iowa) and Iowa 75 Fone; CN & CPN (Conn.); GSN (Ga.); OSN, PQN (comb. Ont.-Que.); QKS, QKS SS, QKN (Kans.); NJN (N. J.); SCN (Calif.); Colo. Emergency.

[3] TCC schedules kept, not counted as net sessions.

Ho hum. Same old story, each month the records fall, and this February we break all previous records for February in number of sessions and total traffic reported. Naturally, we can't keep this up forever, but there is still plenty of leeway left. NTS activity builds up every year over previous years.

W1BVR reports that 1RN discontinued its late session on March 1st, reason: lack of attendance. In 2RN, the New York State Net in February missed its first session since August, 1955; attendance at the 1845 session is poor compared to the 1945 session, but both are doing well. W3UE says that 3RN sounds almost like a MDD net supplement; he would like more attendance from the Penna. sections. W4BVE has resigned as 4RN manager and W4LAP has agreed to take on the job. On recommendation of the Pacific Area Staff, W7GMC has been appointed RN7 Manager; W7WAH deserves great credit for an excellent interim job. K9ENQ and W9JOZ have received hard-earned 9RN certificates. ECN had its best month ever in February; the comparatively high representation percentage comes from more participation from Maritime stations. W9DO deplores the fact that they missed 100% in representation in February because one of the regional nets was not represented one Sunday. W7APF is being replaced by K6DYX as PAN Manager.

Transcontinental Corps. Things going along about as usual. There are still some vacancies in the Eastern Area, but W3WG is doing a good job of seeing that the traffic gets handled. Central and Pacific Areas are solid (except Pacific Area has a couple of unassigned spots on Sunday). The roster: Eastern Area (W3WG Dir.) — W1AW W1BDI W1EMG W1NJM W2ZRC W3COK W3WG W4ZDB W8QLJ W9CXY W9DO; Central Area (WØSCA Dir.) — W9CXY W9DO W9JUJ WØBDR WØKJZ WØLGG WØSCA; Pacific Area (WØKQD Dir.) — K6DYX K6GZ K6LVL W6ADB W6BPT W6EOT W6GJP W6GQY W6HC W6PLG W6REF W6RFW W6VZT W6YHM W7APF W7DXV W7FRU W7GMC WØKQD. These fellows and gals deserve a big hand for the job they are doing, often under pretty trying circumstances.

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Do you belong to too many nets? It has been my experience that a majority of stations who "QNO" without getting "QNX" do so because they have to meet another net schedule. But it is embarrassing, to say the least (and happens all too often!), for an NCS to give a station "QNK" only to find that the outlet is a "dead duck" when he is wanted. Seems to me that each of us who prides himself on being a net member should evaluate our time allotments to see whether or not we have "bitten off more than we can chew."

I learned the hard way. I entered net operation some years ago with more enthusiasm than good judgment. It wasn't long before I found myself committed to more nets than I had time for, so I had to sit back and take stock of the situation. The problem was to fit the time into the available NTS net schedules. Once the time schedule was worked out in accordance with my availability, I was able to give full attention to certain nets and resist other tempting net affiliations.

We recognize the casuals for what they are: those stations who cannot or prefer not to become regular net members but who do have, from time to time, legitimate traffic to unload. Such stations are welcome, of course, but most certainly there is no justification to adding them to the roster of "regular" net members.

Why don't *you* take stock of your net affiliations? Are you taking too big a bite? Figure your available time and match it against available net sessions, then get in there and really pitch. Give your chosen nets *all* your available

time; don't be just a "casual" QNI. We need you — *that* way. — *Howard S. Pyle, W7OE.*

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Traffic operators in Northern California organized the Northern California Traffic Association at a traffic breakfast a while back, for the purpose of furthering amateur traffic work and liaison in the Northern California area and discussing traffic problems in general. W6ZRJ was elected president, W6PHT secretary for the first three months. Among agenda items discussed were the meeting times of section nets, liaison between phone and c.w. nets, liaison between NTS and non-NTS nets, and a traffic guide showing coverage of all traffic nets. Meetings are held every three months, and it is hoped that the Association can be expanded to cover the southern part of the state as well. Here's a step toward bringing traffic men into close personal contact with each other for face-to-face discussion of mutual problems. Anybody else doing it?

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for February traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	175	1633	1332	197	3337
W2KEB	69	1118	892	118	2197
W9JOZ	9	831	835	5	1680
WØPZO	2	845	824	7	1678
W4FPC	8	25	1614	25	1672
WØBDR	52	848	754	4	1658
W3Z8X	141	697	609	25	1472
W4PL	10	731	629	62	1432
WØLCX	40	638	617	21	1316
W8UPH	34	507	386	107	1034
W7BA	19	495	472	22	1008
W3WIQ	26	408	531	23	988
W7PGY	36	472	399	73	980
W1LDE	8	488	441	16	953
W9CXY	10	445	437	8	900
WØSCA	8	430	417	0	855
W9NZZ	285	286	1	277	849
W3PZW	13	410	367	43	833
W8GBF	11	404	397	1	813
WØCPI	6	382	359	23	770
K9BBO	34	368	363	2	767
WØLGG	28	372	345	17	762
W9DO	16	349	304	61	730
W9FFC	34	2	689	0	725
W8VTP	6	355	329	26	716
W8ELW	26	328	295	30	679
W6EOT	9	329	310	22	670
W2KFV	1	297	258	102	658
W4IA	91	316	242	5	654
W6GYH	427	99	106	16	648
WØGAR	8	313	317	4	642
W7VAZ	29	307	279	21	636
W9TT	32	296	232	73	633
W5DRZ	32	284	264	19	599
W9YYG	56	272	203	67	598
K4AIS	21	280	249	26	576
K4KDN	17	274	256	7	554
K2IYP	10	282	229	46	547
WØKQD	48	262	231	5	546
WØZWL	7	295	27	215	544
W9EHZ	39	245	192	60	536
W2MLW	13	257	217	44	531
W4UHA	14	297	215	2	528
W4ZDB	42	239	219	20	520
W4RLG	25	249	225	18	517
Late Reports:					
W7TLC (Jan.)	43	247	225	22	537
More-Than-One-Operator Stations					
W6IAB	49	1016	1490	474	3029
K5WAB	34	622	600	22	1278
K7FEA	332	355	316	9	1012
W4DFU	25	265	260	5	555
Late Reports:					
KH6AJF (Jan.)	141	314	218	157	830
K7FAE (Jan.)	147	160	260	17	614

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

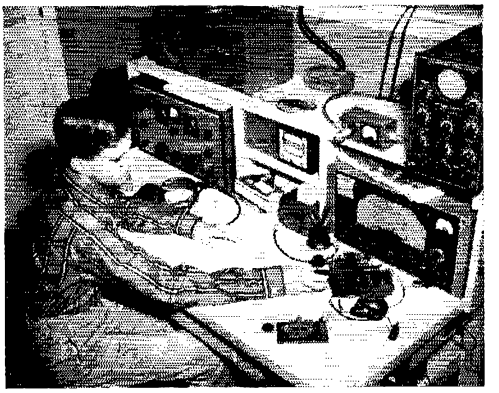
K2WAO	377	W1BPW	123	W8ILP	110
W9JYO	206	K2EQP	120	W1BTV	107
W7TLC	204	W4PIM	118	W8DAE	104
W3AFF	175	K6MON	118	W6CMN	102
W6GQY	162	K4EOG	117	W8AL	102
KØRCQ	161	W8GFE	115	Late Reports:	
WØKJZ	129	W9EJW	113	K2WAO (Jan.)	229

More-Than-One-Operator Stations

W4VOZ/4	229	K3WBJ	155	Late Reports:	
W3YDX	166	KH6AJF	177	W5LPL (Jan.)	216
W1AW	165	K7FBN	110	K7FBN (Jan.)	129

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W1DYE, W8HNP.

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.



Tennessee C. W. Net's youngest member is J. W. Smith, K4GCO, eleven years old. Smitty obtained his novice ticket in September, 1955, and got rid of the "N" a year later. He checked into TN the first time on January 2, 1957 (starting out the New Year right) and since then has been a regular Chattanooga representative on TN. His dad is W4EIN, TN NCS on Thursdays.

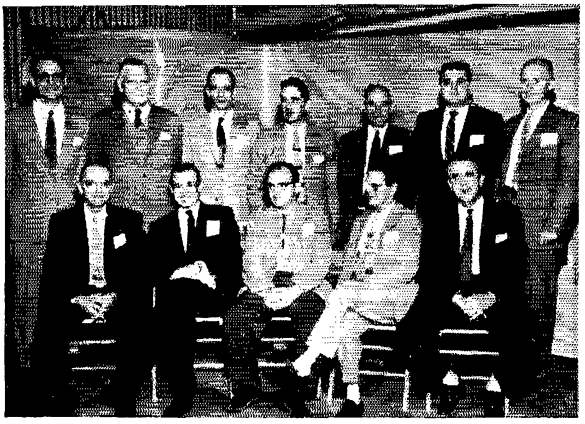
SUPPLEMENT TO NET DIRECTORY

The following list of nets will supplement and correct the listings on page 79, Nov. *QST*; page 74, Jan. *QST*; and page 83, Mar. *QST*. This brings the record up to date as of March 20, 1957. Since these nets were registered subsequent to publication of the cross-indexed Net Directory, use this information to make corrections and additions thereto. An asterisk (*) indicates correction from one of the abovementioned prior listings. This is the last *QST* net supplement before fall reregistration. Don't forget to register your net as soon after August 1 as practicable.

Important note: ARRL lists of nets are for *information only*. They do not carry any official significance. Nets are registered as closely as possible in accordance with information given by the registrant.

Name of Net	*Freq.*	*Time*	*Days*
All American Net	21,330	2000 GMT	Mon.-Fri.
Blackstone Valley Radio Net (R. I.)	29,000	1900 EST	Mon.
Brazoria County (Tex.) Emer. Net (BCEN)	3825	1330 CST	Sun.
College Net (CCN)	3895	1515 EST	Fri.
East Coast Radiotelegtype Net (RTNET)*	3620	1900 EST	Wed.
Erie County Emergency Net*	3915	1230 EST	Sun.
Florida Mid-Day Traffic Net	7225	1200 EST	Mon.-Sat.
Florida Slowspeed Net	3675	1830 EST	Mon.-Fri.
Forty NNJ Net (FNJ)	7105	2215 EST	Mon.-Sat.
Hair Net	3875	0800 EST	Sun.
Harford County (Md.) Amateur Radio Club (RACES) Net	29,590	1900 EST	Wed.
Horse Trader Net (Me.)	3940	1600 EST	Sun.
Interplanetary Space Patrol Net	3950	2100 CST	Mon.
Iowa-Des Moines Net (IDM)*	7130	1330 CST	Sun.
Kentucky Net (KYN)*	3600	1700 CST 1900 CST	Daily
Kentucky Phone Net (KPN)*	3960	1930 CST 1300 CST	Mon.-Fri. Sat., Sun.
Lake Erie Emergency Net	29,150	2000 EST	Sun.
Midwest VHF Club Net	51,750	2000 CST	Tue.
NC District 13 (Emergency Net)	3900	0900 EST	Sun.
The Noontimers (N. Y.)	3905	1230 EST	Daily
North Texas Novice Net (NTNN)*	7176	1900 CST	Sun., Hol.

(*Continued on next page*)



♦

This group of traffic men of the Oklahoma CW Net (OLZ) posed for the above photo at the Tulsa Hamfest last November. Standing in the back row are (l. to r.) W5JXM (RM), W5CF (then West Gulf Div. Director, ARRL), K5HZF, W5PA, W5SWJ, W5BBI, K5CBA. Seated (l. to r.) are W5MFX (PAM), K5AOV, K5AUX, W5PCQ, W5GIO (SCM).

♦

O.A.R.S. Net (Oregonian Amateur Radio Society, Portland)*	29,200	1930 PST	Daily
Phil.-Mont Mobile Net (Pa.)	29,493	0700 EST	Daily
Roanoke-Chowan Emergency Net (N. C.)	3845	2000 EST	1st Thu.
Sea Gull Net (Me.)	3940	1700 EST	Mon.-Sat.
SKETO Net (Calif.)	3865	2000 PST	Wed.
Slide Rule Net (Pa.)	3955	0700 EST	Mon.-Fri.
South Dakota 40 Meter Phone Net	7225	1215 CST	Mon.-Sat.
Traffic Hounds Morning Watch*	7080	0700 EST	Daily

DXCC NOTES

Announcement is hereby made of the following change in the ARRL Countries List. Starting March 5, 1957, contacts with Ghana, formerly the Gold Coast, will be credited as a separate country. Gold Coast contacts made prior to March 5, 1957, will continue to count for that country. DO NOT submit confirmations for Ghana credit before July 1, 1957.

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We should like to call attention of new applicants for the DXCC Award of the availability of Operating Aid No. 7, the ARRL Countries List. The use of this aid by new applicants will not only be a convenient way for the applicant to comply with Rule 4 but will also be of help to us.

DX CENTURY CLUB AWARDS

HONOR ROLL

W6AM.....271
W1FH.....271
W8HGW.....269
W6ENV.....268
W6MX.....265
W3GHD.....264
W8NBK.....264
W6SYG.....264
PY2CK.....264
W6DZZ.....263
W9NDA.....262
W8K1A.....261
W3JTC.....261
W6CUQ.....261
W6TT.....261
W3BES.....261
W2AGW.....261
W5ASG.....261
ZL2GX.....260
W6SN.....260
W7AMX.....260

Radiotelephone

PY2CK.....259
VQ4ERR.....252
W1FH.....249
ZS6BW.....244
W8HGW.....244
W8GZ.....242
CN8MM.....241
W9RBI.....237
W3JNN.....236
W6AM.....235
W1NWO.....234

From February 15, to March 15, 1957 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

W8BOJ.....177
W1FFO.....170
SM5XP.....124
OH1QE.....120
4X4FQ.....117
ZB1BF.....113
ZE3JJ.....113
EA5CF.....112
W3NKM.....110
W4IEH.....110
LA7Z.....110
PY1RW.....109
EA2CR.....107
W4WOG.....106
W9MPX.....105
W9SFR.....107
VE3ANH.....105
W6HSY.....104
G3HHV.....104
W1TKC.....103
W8TUO.....103
DL1EV.....103
HB9NO.....103
OK3IA.....103
W9WHF.....102
G3HFJ.....102
PA0VO.....102
K2QQQ.....101
VE3ANH.....101
W2TQR.....101
W0GIB.....101
W3HDZ.....100
K5AHZ.....100
W6WLI.....100
W9POB.....100
W0FXI.....100
DL4MW.....100
F7ER.....100
SP5AR.....100

Radiotelephone

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Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Clarence Snyder, W3PYF—SEC: NNT. RM: YAZ. PAM: TEJ. EPA Nets: 3610 and 3850 kc. With all the excitement of winning the Edison Award, CUL made quite a hit in her appearance on the Arthur Godfrey morning show. CMN reports he has been in the *Boys Life* Listening Contest. CCH now is active on ESN from Reading, with a 150-watt rig to a pair of 807s. ZSX has a new friend interested in amateur radio who is sporting the call FCI. FCI, 15 years old, already is active in traffic-handling. The jr. operator, Mel, here at PYF has passed his Novice Class test and is awaiting his call. NF, who operates only four nights a month in the traffic nets, had a total of 124 for the month. JAK is keeping regular skeds with his XYL on 15-meter c.w. JAK, one of Philco Teckreps, is in Greenland and the XYL is WN3LEK. MDO reports that there are 7 new Novices in Monroe County through the efforts of the radio club there. AXA is DXing after 25 yrs. of traffic-handling. WQL is active in the Bucks Co. C.D. Net on 2 meters. TEJ has a new address in Lancaster RD. New officers of the Abington Township ARA are RFI, pres.; OQG, vice-pres.; PDJ, secy.; and RCE, treas. PDJ is active again in the EPA C.W. Net and 3ItN. The Hazelton ARC has a club paper edited by ZLP and printed by GFE. The Harrisburg Radio Amateurs Club has begun a series of 50-Mc. transmitter hunts. A tribute to ADE is one of the principal stories in the Harrisburg Radio Club *Newsletter* for February. HWN and OVU now are on s.s.b. VZJ is busy with the DX hunt. CGQ is building a new shack. SXT has a new 10-meter beam. MAG reports that activity is high between IVL, IMV and MAG on 433 Mc. The Delaware Lehigh Amateur Radio Club is now filing incorporation papers. New officers of the Keystone V.H.F. Club of York are OCI, pres.; SST and FYG, vice-pres.; DEX, secy.; ZKU, asst. secy.; EDO, treas.; and ZNN, trustee. New officers of the So. Phila Amateur Radio Klub are NJS, pres.; QLZ vice-pres.; and WN3IVD, secy. DFJ won the February transmitter hunt run by the Philmont Club of Philadelphia. ZBE is heading the TVI committee for the Lehigh Valley Amateur Radio Club. HQP now has a DX-35 on all bands. JRM is mobile on 6 and 2 meters. TEJ is joining DHJ in reading the ARRL Official Bulletins preceding the PFN nightly. OLO is busy checking out new c.d. equipment in the Pen Argyl Area. SMA has a new 10-meter vertical. YAZ reports activity is running high on the c.w. net. Traffic: W3CUL 3337, ZSX 1472, YDX 324, AFF 319, BBM 311, TEJ 185, NF 124, PDJ 101, BNR 73, YAZ 70, BFF 60, OGD 56, QLZ 46, ZRQ 40, AXA 33, CCH 24, FCI 18, BUR 17, HOF 16, NQB 16, CNO 10, AMC 7, ADE 5, PVY 5, PYF 5, WQL 5, EAN 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, John W. Gore, W3PRL—The Annapolis Radio Club will now hold its meetings at the Eastport Democratic Club on the 2nd and 4th Mon. of each month. BKE has a new GPR-90 receiver. ZSR advises he may be operating as ZSR/KR6 during June and July. RFW, the Hagerstown High School station, has installed a DZZ-type beam and contacts have been made regularly with PAØXX in Holland, at which time exchange students attending the Hagerstown schools have been able to talk with their parents. ARA has started a code class. ARA elections results: NHR, pres.; WN3JPU, vice-pres.; ZGN, secy-treas.; EDA, act. mgr. and FBR, NCN. VAM gave a talk and demonstration of the Washington County Schools "Closed Circuit TV" equipment. VRK, who was president of the ARA for the year 1956, joined the Silent Keys in January. The whole area was saddened by the news that on Mar. 8 AVL joined the Silent Keys as a result of a heart attack. Bruce was a lt. commander in the Navy and his burial was in Arlington National Cemetery. CAY is in the hospital for an operation and will have a convalescent period of several weeks but his friends have provided a receiver to be installed in his room at the hospital. MSR now has a fifteen-element Telrex for 2 meters and a three-element WRL beam for 10, 15 and 20 meters staked on a 70-ft. tower, also a Gonset VFO and linear amplifier for 2 meters and a 32V-3 and B&W linear amplifier for 825 watts c.w. with a 75A-3 receiver. WN3JJI, under the guidance of UAC and PMQ finally has gotten on the air and has worked 24 stations on 40 meters with a DX-35 into a 40-meter folded dipole and an S-40A receiver. The Washington Chapter of QCWA and the AAOOS held a dinner and a meeting at Olney Inn on Feb. 16. Rear Admiral Henry Chester Bruton, 4HI, was the guest speaker. WV won a 4-125A and a transistor radio in the contest as to the oldest active ham present at the meeting, having been identified with amateur radio since 1905. CDQ had a busy month during February attending the Edison Award Dinner for CUL and the QWCA Dinner and participating in the YL/OM Contest, also the DX C.W. Contest. The WRC discussed TVI troubles and their elimination, and antenna coupling devices, on Feb. 15. DL3DW also spoke at this meeting on Ham Radio and Amateur Clubs in West Germany. At the Feb. 1 meeting of the WRC a discussion was held on buffers, doublers, amplifiers and general transmitter data and information. The ACRC at its Feb. 25 meeting presented a film and discussion on Capacitance by CXG. EZA is equipped with a Motorola Conelrad monitor. Traffic: (Feb.) W3PZW 833, UE 456, K3WBJ 445, W3ZGN 125, PQ 90, TN 84, ZSR 76, UCR 60, RV 55, K4DKG/3 53, W3ECP 41, COK 38, PRL 35, PKC 32, ENU 30, EOV 30, OYX 10, JZY 9, FAP 8, BKE 2, BUD 1. (Jan.) W3OYX 15.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: YRW. PAM: ZI. Appointments of the month: K2JKA and K2PTJ as OPSs. A very fine report has been received from K2PQS, Southern Counties Amateur Radio Assn., whose new president is K2BKG. Meetings are held at the Atlantic City Naval Res. Training Center. K2HBY has received his General Class license. It is with regret that we report the passing of K2IYO, who was involved in a fatal electrical accident. K2WAO, Fort Dix, continues as top traffic-handler in the section. K2HPV is doing fine with a new antenna. Section Net certificates have been issued to K2DGQ and K2LZB. ZI and VDE are doing a fine job managing the New Jersey 75-Meter Phone Net. REB, SJRA National Convention chairman, is making plans for a large group to make the trip to Chicago. SZP is adding many new countries to his list on 10 meters. SJRA's *Harmonics* continues to grow in size and interest. SVV, Mercer County EC and Radio Officer, and his able assistants, are increasing their county coverage by adding a 6-meter net to their present setup. Hamilton Twp. and Princeton Boro are now holding regular c.d. drills. K2JGU hopes to be on 2 meters soon. K2DSL, Trenton, finds little time for operating because of school work. Burlington County Radio Club members continue their weekly RACES/AREC drills under the direction of UA, County EC and Radio Officer, MUE. Riverside, received the 35-w.p.m. certificate. Traffic: (Feb.) K2WAO 409, W2HDW 270, YRW 241, RG 178, K2JGU 110, W2ZI 74, K2EWR 54, W2BZJ 48, K2PTJ 36, KN2THX 31, K2DSL 8, HPV 2. (Jan.) K2WAO 243.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: UTH/FRL. RMs: RUF and ZRC. PAMs: TEP and NAI. NYS C.W. meets on 3615 kc. at 1800. ESS on 3590 kc. at 1800, NYS Phone on 3925 kc. at 1800, TAR on 3570 kc. at 1700, 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. K2IJT, MWS and PJU are all on 10 meters with "Wonder Bars." The Watertown RC has started code training classes. K2MLT has a new WRL Champion 300 and a Johnson 6N2. HNH has taken over as editor of the excellent *Rags Review*. The RARA will hold its annual hamfest on Sat. May 4. EMW now has 205 confirmed and has built a 6-meter converter; he also is starting a 6-meter transmitter. K2HUK has a

(Continued on page 94)

two-element beam on 15 meters; he also is building a bandswitching 4E27A rig for a.m., s.s.b. and d.s.b. UTH is using a new WRL 3-bander beam. RUF is getting back in the groove handling traffic again. SJV confines most of his activities to MARS lately. Congrats to HIL, the new president of RAGS and K2LGA and W2QAR, 1st and 2nd vice-presidents. K2DG is building a 90-watt c.w. rig. K2JAE has built a 15-meter preselector. QQ is erecting a telephone pole for a new 20-meter beam. K2YCU, the Vets Hospital station in Buffalo, with ICZ at the mike, is holding regular skeds with KC4USA. ILVQ and the Bell Telephone Lab Show were presented at a joint meeting of KBT, RAWNY and ARATS. ZOL and K2HUK have been appointed Asst. State Coordinators for AF MARS. They are setting up Air-Force-sponsored code and theory classes for teen-agers. K2ISO has a class going in Arcade. K2s MVN, DBN, QJA, PTH, BFA and W2WNO are all sporting new 10-meter beams. DBN worked 20 countries with his DX-100 in one afternoon and evening. CRR gave his DSB pitch to RARA with over 100 hams in attendance. WZR has completed a 2-meter converter using 417As. UFI and THC set up a pair of Gonset Communicators at the recent dog-sled races at Lake Oneida for timing purposes. KN2YGC edits the *Squaw Island Smoke Signal*, and does an FB job for the SIARC in Canandaigua. POM worked KC4USA using an 80-meter Zepp and 50 watts s.s.b. on 15 meters. Please mail your activity reports to the SCM by the 3rd of each month. Traffic.: (Feb.) K2IYP 547, KIR 138, W2ZRC 85, COB 71, EMW 70, K2DG 60, DSR 57, GWN 46, PJU 25, GQU 21, W2RQF 20, OE 18, K2QIW 16, KTK 14, MWS 12, W2DEX 10, SSS 8. (Jan.) K2QIG 25, W2RQF 24, K2KTK 15.

WESTERN PENNSYLVANIA—SCM, R. M. Heck, W3NCD—SEC: GEG. RMs: UHN, NUG, NRE and GEG. PAM: AER. As this is my last report I wish to thank all who assisted me during the past four years and hope that you will give full cooperation to the new SCM, John F. Wojtkiewicz, W3GJY, 434 Glenwood Drive, Ambridge. The SCARC still is active on 6 and 2 meters and above. ZPZ is about to erect a new beam for 20 meters. OKU has 20 countries on s.s.b. NKM is phone-patching s.s.b. SVJ has been selected to join the Army. AAN is going mobile on 6 meters. MPO was nominated for the Edison Award. KWH is collecting BSN certificates. The BARC still is awaiting approval of its c.d. plans, and plans to expand the club station's (YDW) operating room at the Community Center. SUL has been on 80- and 40-meter c.w. and phone with 18 milliwatts. MNJ worked RVS with a transistorized rig. OGN is teaching the radio club. LEL and RMX are building receivers. TCP completed the A.F. Generator and now is building a 'scope. UJP reminds us of the Breeze Shooters Hamfest scheduled for May 12 at the Lodge in North Park. The hamfest committee is composed of SIR, EUL, RSB, SHT, WFR, PC, EOR, PII, SJK, TTR, FSF, LKZ, OTS, WHA, OJW, VEK and IMB. KLP made a new VFO. ZUZ made a 115-mile QSO on 220 Mc. SHT was on 6 meters recently. UJP participated in the Novice Roundup. The AKARA held a QSO Contest from Feb. 15 to Mar. 15. The club civil defense coordinator, WSW, received a quantity of 29.3- and 29.5-Mc. crystals from the c.d. director for club c.d. use. The SHBP&M elected QOQ, pres.; VKS, vice-pres.; BDB, secy.; ZQV, treas.; BWU, NKM and IDL, board members. The SHBP&M Hamfest will be held Aug. 4 at the usual location in Spreading Oaks and Totem Pole Lodge in South Park. The Wilkinsburgh civil and c.d. officials gave a demonstration of 50-Mc. emergency communications; ERJ/3 set up a Gonset Communicator in the Borough Building and worked two-way with EBH, HFE, BWU, GXL, ZJA, JIZ and CPI. The Pittsburgh 6-Meter Net meets Mon. at 7:00 P.M. on 50.4 Mc. KDL has a new beam on 10 meters; VOA, with a new modulator, is on 10 and 15 meters. ZQV had his Gonset overhauled. QWW has a new modulator. WFR is finishing up his 60-ft. tower. VKS has a new 10-meter beam. NKM has a new KWS-1. BWU is active on 6 meters. ZQC is getting good results with a new Wonder Bar antenna. BEX is thinking about a 100-ft. tower. LZK reports from Kane. NQ is rebuilding for higher power. JGV has TVI trouble. BRJ is sunning in Florida. RZN is heard on 40 meters. MIA moved to Indiana. LZK is getting interested in 20-meter DX. UHN, the WPA Net manager, thanks all who are working on the net. KUN, NRE and LXQ are especially hard workers. UEM is county Radio Officer; UEN, alternate; WJF, county key station, with KWG alternate of the WCARA c.d. organization. Headquarters are in the Red Cross Building. Equipment is a DX-100, a DX-35, a TDS-50, an SX-71, an S-102 an S-106 and a 7.5-kw. auxiliary generator. WN3FTM made 13,000 points in the Novice Roundup. WN3IAN has 10 countries via 15 meters. ZKB has WAC, WAS and DXCC 101/85. RAE notes: KLD announced plans for the April c.d. drill. QPP has been appointed RAE publicity man. ZWK has a new beam on 40 meters. A new ham is WN3KPM, who is working on 2-meter gear. FVH has a new HQ-150. MED is on 160 meters. 8IJG is on 1¼ meters with 350 watts, and DJA is looking at the 1¼ meter frequency. AAC has joined the 10-meter gang. WJA has agreed to take over the TVI committee on the resignation of LKJ. 8LJF and 3NMP gave a discussion and demonstration of ham radio to the Zonta Club of Erie. The demonstration was by contacts with MS, NRL, ZWK, OIE, NNZ and LKJ. WBA loaned some of the necessary gear. YOZ, who operates 10 meters mostly, got WAS and scored 60,750 in the Jan. C.D. Party. Traffic: W3WIQ 988, BZR 239, KUN 125, YUL 120, CDE 68, UHN 66, KNQ 38, LSS 17.

CENTRAL DIVISION

ILLINOIS—SCM, George T. Schreiber, W9YIX—Section Nets: ILN, 3515 kc. Mon. through Fri., 7 P.M. IEN, 3940 kc. RMs: STZ and MAK. EC. HOA, Cook County EC: HPG. Repeating, please do NOT send AREC membership forms to the SCM, but drop a card and we will advise address of your local Emergency Coordinator. Then he can issue your card and have a record of your membership. Have you seen the Land of Lincoln Award certificate issued by the Sangamon Valley Radio Club for working five or more club members after Feb. 15? It is a beaut. DUA has complete RTTY equipment running half a kw. to a KWS-1. MCD and GDW acquired Valiants. IWF is wiring his own between shifts at the FBI station. TUC and EUQ are s.s.b.ing with Pacemakers; the latter follows with a linear on 20 meters. AZI and LIL are vying for DX. With the "loss" of Channel 2 in Springfield PNO, PRN and YPS are giving serious consideration to higher power 50-Mc. rigs. KQL reports little time on the nets but hopes to get a midstate RTTY net going soon. The Sangamon Club's code class graduated 8 Novices. UZ now signs 4CF. Congrats to OBN and his associates for their splendid club bulletin, *Central Illinois Radio Club News*, which they have affectionately named the *Big Yak*. A new General Class call heard is K9DHZ. MAK and YYG are mainstays in 9RN and DO also has a big finger in the pie. K9AMC has a new 600L linear. YFO keeps a weekly sked with K4DDN (formerly MRQ). SKR can't forsake the DX on 15 meters. YMZ sports a new 10-meter three-element beam. KMZ is going to radio school in Chicago and signing portable nine. YH, with chief operator ØBZK, has a BC-610 perking on all bands and hopes to hit ILN again soon. The North Central Phone Net handled 228 messages in February. No report was received from IEN or ILN. ICF built a new radio shop with his own two hands. New officers of the SWANT Radio Club are OBY, K9s ESQ and CCO, YUN and KN9DZF. The club demonstrated its emergency gear to the Crystal Lake Chamber of Commerce recently. Meetings are held the last Mon. of each month at 40 North Ayer St., Harvard. K9EID received a ten contact certificate from the St. Clair County Amateur Radio Club. The Synton Amateur Radio Club gets out a nice bulletin for members edited by WAX and OZC. A new traffic man in the section is GJR. The Chicago Suburban Radio Association toured the Hallicrafters plant Mar. 8 and observed first-hand how the gear is turned out. The Eight Ball Net meets on 2960 kc. each Wed. at 7:30 P.M. with members of the Montgomery County AREC participating. LNI reports that Streator now has three RTTY stations and more are expected. HPG reports the Chicago c.d. drill to test dispersal worked very well, but that skip was troublesome. FAW spent three weeks in the hospital. General Manager QKE, of the National Convention set for Chicago Labor Day week end, reports the following additional committee chairmen appointed: K9BZI, secretarial; SQE, prizes; LQF, registrations; BWM, license examinations and KCW, contests and awards. See you at the convention. Make your reservations now. Traffic: (Feb.) W9IDO 730, YYG 598, MAK 472, IDA 261, YRH 257, CTZ 104, OCB 84, OYL 65, BUK 59, YIX 53, CEE 44, VHD 43, GJR 34, SXL 27, PCQ 26, VEY 22, STZ 20, EDH 18, BA 12 YFO 8, K9AMD 4. (Jan.) W9FAW 31, K9BFI 9.

INDIANA—SCM, Seth Lew Baker, W9NTA—Asst. SCM: George H. Graue, 9BKJ. SEC: QYQ. RMs: DGA, TOC and TT. PAMs: CMT, KOY, SWD and UXK. New appointments: JWI as OBS for the morning net, VZF as OO. Club elections: New officers of the Bloomington ARC are YYX, pres.; NOK, vice-pres.; NZK, secy.-treas. Kokomo ARC—DKR, pres.; YIT, vice-pres.; JKR, secy.-treas.; HUF, dir. Michiana ARC—BYY, pres.; CSY, vice-pres.; K9AJC, secy.; ZGC, treas.; CBQ, Corr. Secy.; DLE, compt.; ZZA, act. chairman; WTY, dir. The Duneland ARA

(Continued on page 98)

HIGH FREQUENCY FILTERS

LAST August in number 19 of this series we discussed an important new development, the successful result of a three year research program in Hallicrafters' laboratory. This was a crystal filter circuit which would operate efficiently at frequencies as high as 10 megacycles instead of being limited to about 500 kilocycles as was previously the case. The importance of this development to single side band transmission can hardly be over-estimated since it marked the first time high frequency crystal filters had been used successfully in a commercial transmitter.

AS MOST amateurs know, a single side band transmitter is in many ways similar to a super-heterodyne receiver — but in reverse. In a receiver a high frequency signal is introduced at the input stage and through one or more conversions is reduced to a low frequency for maximum amplification and selectivity. In recent years the best receivers have used dual conversion with a comparatively high first i.f. frequency in order to place unwanted images as far as possible from the desired signal.

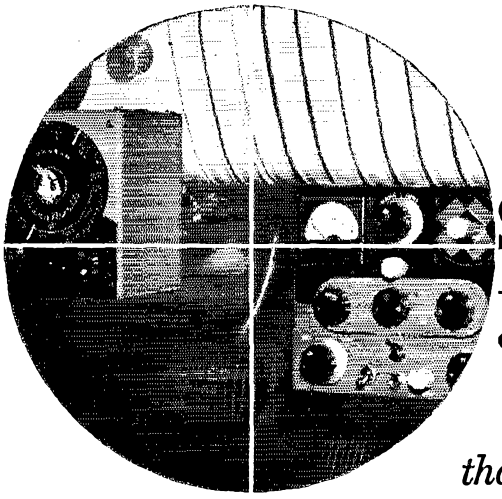
IN A single side band transmitter the process is reversed. The signal is generated at a comparatively low frequency and by heterodyning is transferred to the desired amateur frequency. Until the development of this new Hallicrafters filter it was necessary to generate the original signal below 500 kilocycles and to use several heterodyne stages to reach the higher amateur bands. Extra precautions were necessary to prevent the transmission of unwanted image signals less than 500 kilocycles from the desired signal. Now, these problems are no longer existent.

IN THIS new HT-32 transmitter, the crystal filter operates at approximately 5 megacycles. By generating the original signal at this comparatively high frequency, the number of heterodyning operations needed to reach any amateur band is reduced to a minimum. Also, because of Hallicrafters crystal controlled side band selection, the high frequency cut-off of the filter need not be steep and phase distortion is greatly minimized. This contributes to a marked degree in producing the natural voice quality so noticeable in the HT-32.

WITHIN the limits of one page it is not possible to cover all the advantages which this new high frequency filter offers over the old style low frequency type. We would like to suggest that you visit your distributor and examine the HT-32 in person. In this way you can see and hear the advantages offered by Hallicrafters' 5.0 Mc. quartz crystal filter.

CY READ, W9AA

Bud Hallgren Jr. W. J. Hallgren W9AC for hallicrafters



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on the mobile transmitter that delivers more audio punch

VIKING MOBILE TRANSMITTER

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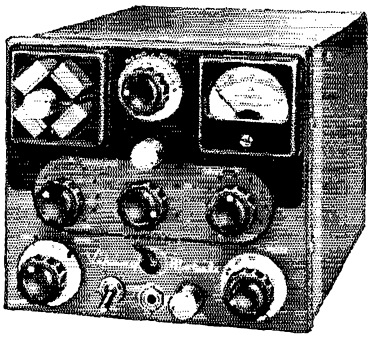
Cat. No. 240-141-2 Wired and tested on special order only.



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This rugged little unit has been designed specifically for mobile use. Solid engineering and construction minimizes frequency shift due to road shock and vibration—small size permits steering post mounting. Temperature compensated and voltage regulated. Calibrated 75 through 10 meters. With tubes.

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Cat. No. 240-152-2 Wired and tested **Amateur Net $49.95**

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Provides high efficiency base loading for mobile whips with instant bandswitch selection 75 through 10 meters. Air-wound coil provides extremely high "Q". Fibre-glass housing protects assembly. Mounts on standard mobile whip.

Cat. No. 250-26.. Wired and tested**...Amateur Net $19.50**

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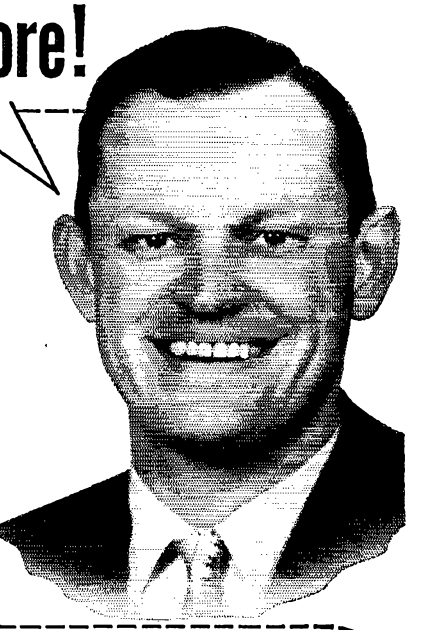


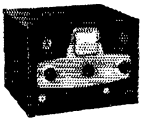
More communication power!

More operating features!

More in engineering and construction!

Yes, dollar-for-dollar and feature-for-feature, you'll find just what you've been looking for in one of these 4 Viking transmitters. Top performance isn't simply a matter of watts. Only carefully integrated equipment design can be counted on to develop effective power that punches your signal home, every time. That's what we call "communication power" . . . and your Viking transmitter delivers it in *full* measure!

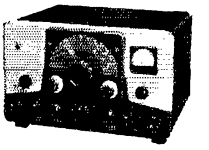
Punch your signal home...with one of these 4 Viking full-power amateur rigs!



"ADVENTURER"

This compact and completely self-contained 50 watt CW transmitter was used to earn the first novice WAC. (Worked All Continents) Effectively TVI suppressed, the "Adventurer" puts 50 watts of power into a rugged 807 transmitting tube. Instant bandswitching 80 through 10 meters... operates by crystal or external VFO control. Wide range pi-network output—no antenna tuner needed. Designed for easy assembly—with tubes, less crystals and key.

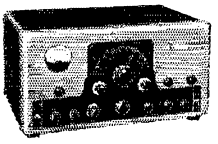
Cat. No. 240-181-1..Kit....Amateur Net $54.95



"RANGER"

This popular 75 watt CW or 65 watt phone transmitter delivers a solid signal! As an RF and audio exciter, the "Ranger" will also drive any of the popular kilowatt level tubes. Self-contained . . . effectively TVI suppressed . . . instant bandswitching 160 through 10 meters. Operates by extremely stable, built-in VFO or crystal control. Easily assembled—with tubes, less crystals, key and microphone.

Cat. No. 240-161-1..Kit....Amateur Net $214.50
Cat. No. 240-161-2..Wired .Amateur Net $293.00



"VALIANT"

Here's power to slice through terrific QRM . . . a transmitter engineered for outstanding flexibility and performance! 275 watts input on CW and SSB*, 200 watts phone. Instant bandswitching 160 through 10 meters—operates by built-in VFO or crystal control. Final amplifier uses three 6146 tubes in parallel. TVI suppressed—timed sequence (break-in) keying —low level audio clipping—built-in low pass audio filter —self-contained power supplies. With tubes, less crystals, key and microphone.

Cat. No. 240-104-1..Kit....Amateur Net $349.50
Cat. No. 240-104- 2 Wired..Amateur Net $439.50

"FIVE HUNDRED"

Over a half-kilowatt of *full* communication power! Rated 600 watts CW . . . 500 watts phone and SSB*—conpact 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—also may be operated by crystal control. Instant bandswitching 80 through 10 meters —TVI suppressed—high gain push-to-talk audio system—low level audio clipping. Pi-network output will match a wide range of antenna impedances. With tubes, less crystals, key and microphone.

Cat. No. 240-500-1..Kit....Amateur Net $699.50
Cat. No. 240-500-2..Wired .Amateur Net $879.50

*P.E.P. input with auxiliary SSB exciter

Certified for matching funds by the FCDA on factory wired and tested models for crystal controlled operation. Requires use of Johnson 250-20 Low Pass Filter and on frequencies above 7 mc., the "Valiant" must be used with a Johnson "Matchbox" Antenna Coupler. (Cat. No. 250-23).

E. F. Johnson Company

2829 SECOND AVE. S.W. WASECA, MINNESOTA

is conducting code classes with EEO in charge. HXR has a DX-100, is back on the air after two years absence and is now WAS. OAI, formerly /VO6 at Goose Bay, has moved to Columbus. IUF, now located in Kokomo, is on with a Viking II and an HRO working mostly 20 and 10 meters. He is WAC and belongs to the Old-Timers Club. NH is a bulldog fancier and has won 22 ribbons with one particular dog. CC has been in California on vacation and BKJ plans to head that way. House Bill 50 reducing the fee for call letter license plates from $5 to $2 effective Jan. 1, 1958, has been passed and signed by the Governor. You can thank MDC, SWD and many other members of the IRCC for pushing this through. CC and EJW have phone patches working. AZK has dropped the "N." SWD reports IFN morning traffic as 229 evening as 272, total 501. TQC gives QIN as 1169 and TT reports RFN as 124. CAEN, as reported by EHZ had 123 and KOY gives Interstate S.S.B. Net traffic as 258. Those making BPL were JOZ, NZZ, K9BBO, W9TT, EHZ, JYO and EJW. This earns a medallion for K9BBO. URQ reports that Princeton has a code class with six students. The Indiana Fone Net (IFN) celebrated its tenth anniversary Feb. 19 and the Calumet Area Emergency Net (CAEN) was five years old Apr. 7. AQQ is on with a KWS1 and a 75A-4. BKJ has a 2-meter mobile. The ATNN continues to grow, which is a tribute to K9AMD, Carole, the NCS. The treasury also is growing with money of many nations, including the Confederate States of America. The frequency is 3910 kc. Tue. evenings after the IFN clears. Traffic: (Feb.) W9JOZ 1680, NZZ 849, K9BBO 767, W9TT 633, EHZ 536, JYO 456, ZYK 300, EQO 322, TQC 269, EJW 161, BKJ 151, SWD 105, AB 84, SVL 84, LDB 67, DGA 66, HRW 61, NTA 52, RTH 40, QYQ 35, BDP 34, UXK 31, CLY 29, K9GQB 26, W9WTY 25, HXR 23, STC 23, BUQ 21, EJC 21, DZC 17, DOK 16, PQZ 15, YYX 15, ZSW 15, CMT 14, PLB 14, QR 14, SVZ 13, CYZ 12, KOY 12, WHL 12, YVS 12, EZW 11, LDG 10, EHY 9, NTR 9, AZF 6, CDW 6, URQ 6, AMW 5, VQP 5, YAA 5, WAU 4, K9BEH 3, ELE 3, KN9GEO 3, W9WUH 1. (Jan.) W9AMW 5.

WISCONSIN—SCM, Reno W. Goetsch, W9RQM—SEC: OVO/EIZ. PAMs: NRP and AJU. RMs: KQB and KJJ. Nets: WIN, 3535 kc., 7:15 P.M. daily; BEN, 3950 kc., 6 P.M. daily; WPN, 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequenty: 29,620 kc. CXY participated in the YL/OM Contest and averages 3-4 hours nightly handling traffic. YOS joined the Navy. ILR is working DX on 10 meters without a beam. FFC was married Feb. 16th. K9AEQ put up a folded dipole on 28 Mc. and worked ZS, XF and G. KJJ is working on a transistor transmitter. SQM's phone patch is working FB. Guest speaker at MRAC's Mar. 14th meeting was ARRL President Dosland, ØTSN. SZR/9 picked up FS7, FP8 and KG6 to bring him up to 87. HTY is pushing the 100 mark for his DXCC. New officers of the Door County Club are GJK, pres.; JM, vice-pres.; and NLH, secy.-treas. JEF, K9BBT, K9BMC and KN9GBV joined the Naval Reserve. JEF took the Extra Class exam. The Waukesha Club meets at the Waukesha Catholic Memorial High aschool. GFL worked ONM, IZG and DIG in the Madison Area on 144 Mc. Although convalescing satisfactorily, REQ is curtailing activities after a recent illness. JCL is rebuilding a station and antennas. SZL is on with a DX-100 and Elmac mobile gear. RXS demonstrated RTTY at MRAC's Mar. 21 meeting. K9GDF uses an HQ-140X, Globe Scout 65-A and a Knight VFO. CCO visited ZL2ANF, ZL2DX and ZL2ANR when his ship docked in New Zealand. He expects to be back about Aug. 9th. IZE/7, mobile in Arizona, is looking for Northern Wisconsin contacts on 29 Mc. UXW is now with WDLB at Marshfield. K9AQT took first place in WVRA's recent WAS Contest. FZC has his new automatic keyer working FB. GPI and IZO are DXing on s.s.b. GIL and K9CAN are pleased with results from their new 3-band beam. Traffic: W9CXY 900, FFC 725, K9AEQ 208, W9KQB 138, KJJ 126, SAA 72, FZC 26, SQM 25, KWJ 15, GFL 12, SZR 12, YOS 10, OVO 8, RQM 7, YZA 3, JEF 1.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Elmer J. Gabel, WØKTZ—The Red River Radio Amateurs of Fargo elected the following officers: NGL, pres.; KZZ, vice-pres.; and CPQ, secy.-treas. OAB is back on the air after a short session in the hospital. ECX spent ten days in Western Montana and DTX is back from the West Coast. The 75-Meter Phone Net held 22 sessions and handled 150 messages. The North Dakota C.W. Net had 10 sessions and handled 11 messages and the EBTAN held 12 sessions and handled 14 messages. Traffic: KØCNC 202, WØYCL 25, BFM 24, KØHLT 24, WØIHM 20, KØADI 15, WØMQA 14, KTZ 6, HVA 4.

SOUTH DAKOTA—SCM, Les Price, WØFLP—Asst. SCM: Gerald F. Lee, ØYKY. SCM assistants: HOH, FKE, APL, GQH, NEO, TI, MZJ and GDE. SECs: YOB and GDE. PAM: ULV. RM: SMV. The South Dakota C.W. Net, SMV as NCS, had 12 sessions, QNI 48, high 6, low 3, average 4; QTC 31, high 5, low 1, average 2.6. The South Dakota WX Net, ZWL as NCS, had 24 sessions, QNI 449, high 26, low 12, average 18.7; QTC 400, high 25, low 11, average 16.6. The 40-Meter Noon Net, EXX as NCS, had 24 sessions, QNI 358, high 27, low 13, average 14.9; QTC 46, high 6, low 0, average 1.9; informals 29, high 4, low 0, average 1.2. The 75-Meter South Dakota Evening Phone Net, UVL and GDE as NCSs, had 28 sessions, QNI 931, high 49, low 23, average 33.21; QTC 64, low 0, high 9, average 2.28; informals 105, high 10, low 0, average 3.78. The PDARC and Yankton are losing another active amateur with the acceptance of a position as station manager at KABR, Aberdeen, by ELV. New officers of the PDARC are SCT, pres.; KYM, vice-pres.; KNØEWJ, secy.-treas.; MMQ, chief op.; GDE, custodian; ZVV, pub. mgr. The Howlin' Wind RC of Watertown meets the 2nd and 4th Thurs. in the members' homes. At the Feb. 14th meeting, held in NIW's home, the following officers were elected: URD, pres.; BJV, vice-pres.; VT, secy.-treas. Traffic: WØZWL 544, KØARF 198, WØNEO 30, NNX 25, EXX 16, SMV 16, FLP 14, KØAZD 13, WØQDU 12, DKJ 11, DIY 9.

MINNESOTA—SCM, Robert M. Nelson, WØKLG—Asst. SCM: Robert W. Schoening, ØTKX. SEC: GTX. RMs: DQL and RLQ. PAMs: JIE and LUX. The best way I know to start my first report is to express sincere appreciation to MXC for his hints and help in getting me started with my new duties. Chuck says he is going to settle down and do some real hamming after four years as SCM. According to HKF the Dakota Division Convention plans are really taking shape. Save your nickels, fellows, as this is going to be a big one! CRO is building a kw.-s.s.b. rig which soon will be on the air. BFS, EC Mound Area, reports IRM has been appointed Asst. EC. ALJ, CAZ and CRB also are active AREC members in the Mound Area. KJZ gave an interesting talk on traffic-handling and procedure at the Minneapolis Radio Club which was very well received. DNM has been appointed ORS. K9GGT, of Rock Island, Ill., formerly ØVXO, is now stationed at Minneapolis for the summer. UBD has been working 2 meters exclusively. BUD has been appointed OBS on 75 meters. BFS has completed the WAC/YL and DUF Awards. Congrats, Helen! GKI is now EC for Faribault County. WQF is working 10-meter mobile only. QZ has a new KWS-1. BFV and GQX have General Class licenses now. MSN (net) meets daily at 1830 CST on 3595 kc. MSN February totals are 28 sessions held, 193 total traffic, 6.9 average per session, 8.6 average QNI. Totals for MPN (noon): 24 sessions, 91 total traffic, 3.8 average per session, 28.0 average QNI. Much credit is due to KJZ and IRJ for keeping MJN (the Minnesota slow-speed c.w. net) going. MJN meets Mon. through Fri. at 1630 CST, with the NCS on 3700 kc, tuning for KNØS. Former MJN member KØEKR now has his General Class license and has joined the gang on 3595 kc. Traffic: (Feb.) WØKJZ 373, UNG 158, KLG 147, KØDNM 112, WØRVO 88, ALW 72, DQL 71, KØBUD 46, WØWMA 39, RLQ 37, IRJ 36, UMX 33, VBD 31, EMZ 25, LUX 22, QVR 22, TCK 22, QDZ 19, ZEL 16, KØADI 15, CVD 14, DIA 13, WØCWB 11, KFN 11, TBX 11, OET 10, KNØHNN 10, KØAEE 8, CAZ 8, KNØIEA 6, WØLIG 6, KXW 5, NTV 5, BUO 4, KNØECZ 4, WØMXC 4, KNØAAK 1, IDW 1. (Jan.) WØDQL 257, VBD 31.

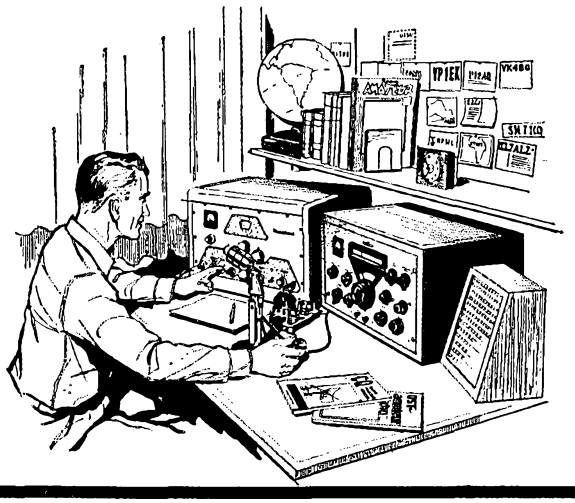
DELTA DIVISION

ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—Many of the amateurs from this section sure had a nice day at the RACES Hamfest at Camp Robinson Mar. 4. We feel sorry for the boys who had to miss it. The number of amateurs who signed up for RACES membership sure looks encouraging. WSM is interested in getting a daily section net started and is anxious to hear from any of the Arkansas boys who are of the same frame of mind. We invite news of your radio club for this column. EMN is the kindly gentleman who furnished the venison for the lunch at the RACES Hamfest. Thanks, Hail, it sure was fine. DAG has a new linear final on the air running about 400 watts. GUE has upped his power with a 300-watt final. KRO sure is happy with his new single sideband gear. We wonder what happened to all the amateurs during the month? We received very few station reports. We would be very happy to have all stations report their activities and traffic for this column. New ECs for the month: K5BQV, K5ANF and K5BUQ. Traffic: W5KRO 59, WSM 28, DAG 25, ZZY 6, HEE 3.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—ESW, who is in the Navy on the West Coast, wrote to ask about Louisiana license plates. BMD, who has an

(Continued on page 108)

HEATHKITS®



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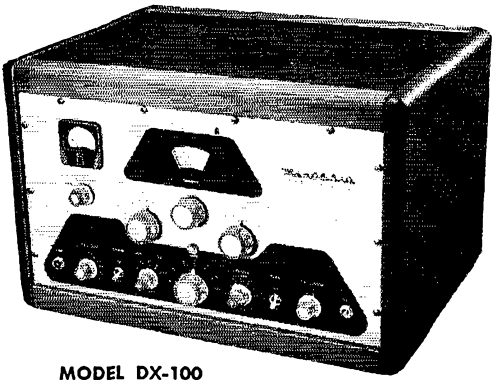
DX-100

TRANSMITTER KIT

PHONE AND CW

- *Phone or CW—160 through 10 meters.*
- *100 watts RF on phone—120 watts CW —parallel 6146 final.*
- *Built-in VFO—pi network output circuit.*
- *Easy to build—TVI suppressed*



MODEL DX-100

$189.50

$18.95 dwn., $15.92 mo.

Shpg. Wt. 107 Lbs.

Shipped motor freight unless otherwise specified. $50.00 deposit required on c.o.d. orders.

The Heathkit DX-100 phone-CW transmitter offers features far beyond those normally received at this price level. It has a built-in VFO, built-in modulator, and built-in power supplies. It is TVI suppressed, and uses pi network interstage coupling and output coupling. Matches antenna impedances from approximately 50 to 600 ohms. Provides a clean strong signal on either phone or CW, with RF output in excess of 100 watts on phone, and 120 watts on CW. Completely bandswitching from 160 through 10 meters. A pair of 1625 tubes are used in push-pull for the modulator, and the final consists of a pair of 6146 tubes in parallel. VFO dial and meter face are illuminated. High-quality components throughout! The DX-100 is very easy to build, even for a beginner, and is a proven, trouble-free rig that will insure many hours of enjoyment in your ham shack.

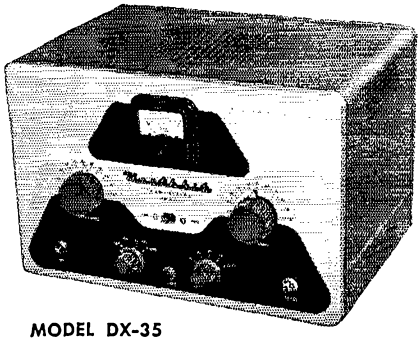
HEATH COMPANY BENTON HARBOR 9, MICHIGAN

A Subsidiary of Daystrom, Inc.

HEATHKIT DX-35
TRANSMITTER KIT

PHONE AND CW

This transmitter features a 6146 final amplifier to provide 65 watt plate power input on CW, with controlled-carrier modulation peaks up to 50 watts on phone. Modulater and power supplies are built in, and the rig covers 80, 40, 20, 15, 11 and 10 meters with a single band-change switch. Pi network output coupling provides for matching various antenna impedances. Employs 12BY7 oscillator, 12BY7 buffer and 6146 final. Speech amplifier is a 12AX7, and a 12AU7 is employed as modulater. Panel control provides switch selection of three different crystals, reached through access door at rear. Panel meter indicates final grid current or final plate current. A perfect low-power transmitter both for the novice or the more experienced amateur. A remarkable power package for the price. The price includes tubes, and all other parts necessary for construction. Comprehensive instruction manual insures successful assembly.



MODEL DX-35

$56.95

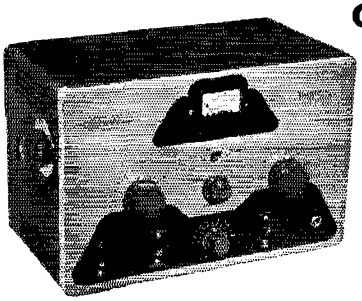
Shpg. Wt. 24 Lbs.

$5.70 dwn., $4.78 mo.

- *Phone or CW—80 through 10 meters.*
- *65 watts CW—50 watts peak on phone—6146 final amplifier.*
- *Pi network output to match various antenna impedances.*
- *Tremendous dollar value—easy to build.*

BRAND NEW

HEATHKIT DX-20
CW TRANSMITTER KIT



MODEL DX-20

$35.95

$3.60 dwn., $3.02 mo.

Shpg. Wt. 18 Lbs.

- *Designed exclusively for CW work.*
- *50 watts plate power input—80 through 10 meters.*
- *Pi network output circuit to match various antenna impedances.*
- *Attractive and functional styling—easy to build.*

Here is a straight-CW transmitter that is one of the most efficient rigs available today. It is ideal for the novice, and even for the advanced-class CW operator. This 50 watt transmitter employs a 6DQ6A final amplifier, a 6CL6 oscillator, a 5U4GB rectifier and features one-knob bandswitching to cover 80, 40, 20, 15, 11 and 10 meters. It is designed for crystal excitation, but may be excited by an external VFO. A pi network output circuit is employed to match antenna impedances between 50 and 1000 ohms. Employs top-quality parts throughout, including "potted" transformers, etc. If you appreciate a good signal on the CW bands, this is the transmitter for you!

HEATH COMPANY BENTON HARBOR 9, MICHIGAN

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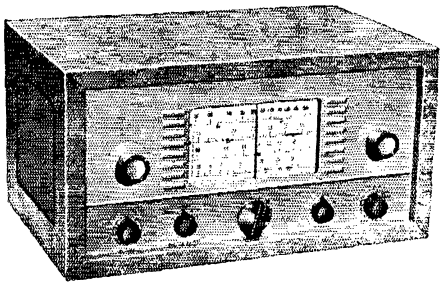
HEATHKIT

COMMUNICATIONS-TYPE, ALL BAND

RECEIVER KIT



This receiver covers 550 kc to 30 mc in four bands, and is ideal for the short wave listener or beginning amateur. 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—headphone jack—and AGC. Has built-in BFO for CW reception. Shpg. Wt. 12 Lbs.

MODEL AR-3

$29.95

incl. excise tax (less cabinet)

$3.00 dwn., $2.52 mo.

CABINET: Fabric covered cabinet with aluminum panel as shown. Part 91-15A. Shipping Wt. 5 Lbs. $.50 dwn., $.42 mo. $4.95

Ⓐ HEATHKIT VFO KIT MODEL VF-1

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 VDC at 15 to 20 ma, and 6.3 VAC at 0.45A. Incorporates regulator tube for stability and illuminated frequency dial. Shpg. wt. 7 lbs. $1.95 dwn., $1.64 mo. **$19.50**

Ⓑ HEATHKIT GRID DIP METER KIT MODEL GD-1B

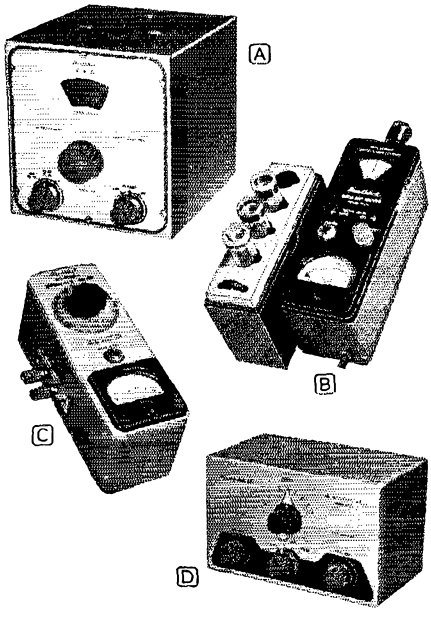
Continuous coverage from 2 mc to 250 mc with prewound coils. 500 ua panel meter for indication. Use to locate parasitics, for neutralizing, determining resonant frequencies, etc. Will double as absorption-type wavemeter. Shpg. wt. 4 lbs. $2.00 dwn., $1.68 mo. **$19.95**

Ⓒ HEATHKIT ANTENNA IMPEDANCE METER KIT MODEL AM-1

The AM-1 covers 0 to 600 ohms for RF tests. Functions up to 150 mc. Used in conjunction with a signal source, will determine antenna resistance and resonance, match transmission lines for minimum SWR, determine input impedance, etc. Shpg. wt. 2 lbs. $1.45 dwn., $1.22 mo. **$14.50**

Ⓓ HEATHKIT "Q" MULTIPLIER KIT MODEL QF-1

Functions with any receiver having IF frequency between 450 and 460 kc that is not AC DC type. Operates from receiver power supply, requiring only 6.3 volts AC 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. Provides extra selectivity for separating signals, or will reject one signal to eliminate heterodyne. Effective Q of approximately 4000. Shpg. wt. 3 lbs. $1.00 dwn., $.84 mo. **$9.95**



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It's simple—just identify the kit you desire by its model number and send your order to the address listed below. Or, if you would rather budget your purchase, send for details of the Heath Time Payment Plan for orders totaling $90.00 or more.

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New

HAMMARLUND HQ-110

- DOUBLE CONVERSION!
- 6, 10, 15, 20, 40, 80 AND 160 METER BANDS!
- SEPARATE SSB LINEAR DETECTOR!
- Q-MULTIPLIER!
- DUAL DIALS!
- CRYSTAL CALIBRATOR!
- CRYSTAL CONTROL!
- SEPARATE STABILIZED BFO!
- DIAL SCALE RESET!

Hammarlund's done it again.
Here's a real sweetheart for the amateur...

The **HQ-110** incorporates all the features you need at a price that's hard to believe. Only through **Hammarlund's** exclusive production techniques could so much receiver be offered at so low a price.

It's **VY FB OM**—so get all the details right now—you'll be amazed at what Hammarlund's done this time...

VY FB-
YOU BET! WRITE
FOR COMPLETE
BULLETIN...

$229.00*

* Optional Telechron automatic clock-timer $10.00 extra.

ANOTHER
"BEST BUY"
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UNSCRAMBLE

SSB/CW or AM/MCW

with your

PRESENT RECEIVER

HAMMARLUND

HC-10 converter

FEATURES

Works with any receiver having IF in range of 450 KCS to 500 KCS. Simple plug-in adapters fit most receivers.

Completely self-contained. Input from receiver, output to speaker and controlled AC socket for receiver.

Tuned IF amplifier with seven selectivity positions, approaching mechanical filter skirt selectivity.

Razor sharp slot filter adjustable ± 5 KCS over passband. Better than 40 db attenuation of unwanted signal. Up to 60 db attenuation available.

Vernier type passband tuning control ± 3 KCS for ease of SSB reception.

Complete control of all functions on front panel. Small in size but POTENT!

Remove your IF tube, insert the adapter, plug the tube back into the adapter — and you're all set for the finest **SSB/CW** and **AM/MCW** reception you've ever heard.

That's all there is to connecting the new **Hammarlund HC-10** Converter to your present receiver because it's a complete unit in itself with its own audio system and power supply — in fact everything but the front end and the speaker.

The **HC-10** is a pleasure to operate; at a flick of a switch select either upper or lower, or both sidebands — and at the same time adjust the passband for a setting of either .5, 1, 2 or 3 KCS. In addition, an adjustable notch filter permits easy elimination of co-channel interference.

Add an **HC-10** Converter, and really get the most from your present receiver.

This is only a brief...get the complete story...you'll be amazed...WRITE FOR LITERATURE...

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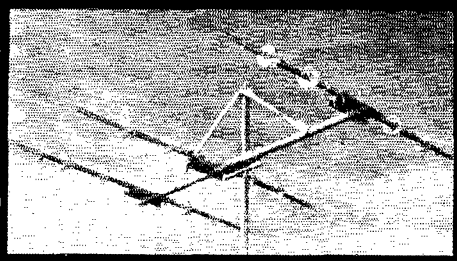
Established 1910

The Hy-Gain Triple Spanners

Featuring one beam, one feedline and three bands (10, 15 & 20M), the Triple Spanners are better performing than three stacked arrays, because of elimination of interaction and detuning effect. Extremely low SWR. May be erected in extremely short time with no adjustment necessary. These are the only factory pretuned and pre-adjusted Tri-Banders which will assemble to our specifications 100% of the time. Special features include carefully designed aluminum "carpet beater" ends to reduce vibration fatigue, heavy Boom/Mast Clamp, and rugged construction throughout as proven in weather conditions the country over.



ROTATABLE DI-POLE
Three-Band performance at lowest cost! $39.95

2-ELEMENT SPACE SAVER
Maximum gain for minimum space and cost! $69.50

3-ELEMENT STANDARD
Performance standard in amateur radio! $99.75

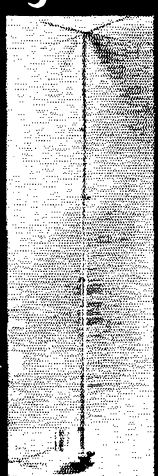
5-ELEMENT CHAMPION
Finest, heavy-duty, 3-band amateur communications array in existence! $349.50

The Insu-Trap; - the only weatherproof, adjustable trap circuit in existance . . . used in all Hy-Gain Triple Spanners, and acting as insulators for selected frequencies, isolating the various element sections at 10, 15 and 20M.

There Are Now More Hy-Gain Triple Spanners in Use Than ALL OTHER TRI-BAND BEAMS COMBINED!

VISIT US IN ROOM 644A . . . the Conrad Hilton Hotel at Chicago's Radio Parts Show in May!

Hy-Gain Economy Toppers



Economy Toppers offer multi-band vertical operation with manual bandswitching at the lowest possible cost, allowing the ham to save money while saving space . . . Proper operation on all bands is maintained by the correct tapping of a base loading coil furnished with each system. Antenna comes complete with vertical aluminum mast sections, loading coil, polystyrene base insulator, coil tapping clip, base mounting plate and universal guy rope or side mount bracket and bracket insulator, all necessary hardware and complete instructions.

40-V (for 40-6M) $18.95

80-V (for 80-6M) $19.95

160-V (for 160-6M) $22.95

New "Capacity Hat" electrically lengthens the vertical and increases radiation efficiency.

Hi-Q Base Loading Coil for maximum efficiency on 80 and 160 meters. Positive connection through pressure tapping clip.

Sensational new Insu-Traps isolate various sections of the Auto-Toppers, maintaining exceptionally low SWR on all bands.

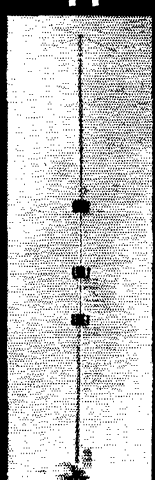
Hy-Gain Auto Toppers

Similar in appearance to Economy Toppers, the Auto-Toppers offer automatic bandswitching 40-10M, and maintain exceptionally low SWR on all bands through use of three sensational weatherproof Insu-Traps, and a base loading coil on 80 and 160 meters. All Toppers are calibrated for phone and CW on all bands. Comes complete with all items listed for Economy Toppers, plus the three Insu-Trap sections.

40-AV (for 40-6M) $27.95

80-AV (for 80-6M) $29.95

160-AV (for 160-6M) $32.95



ALL HY-GAIN EQUIPMENT GUARANTEED FOR ONE FULL YEAR!

The Hy-Gain Tip-Topper CT-1

For the ham who wants the best, here's a remote controlled, continuous tuning vertical antenna system for the frequency range 3.5-30 Mc. Write for the complete story on this space-saving antenna. $99.95

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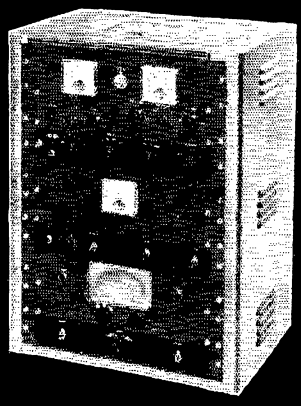


THE FAMOUS Globe King 500B

New, commercial-type compression circuit allows three times the "audio punch". Completely bandswitching, 160-10M. Built-in stable VFO, 540 watts on fone, CW and SSB (P.E.P.), with external exciter. Transmitter relay controlled, and including built-in antenna relay. Pi-Net matches most antennas from 52-600 ohms. Electronic Grid-Block Keying for maximum clarity of signal (time-sequence operation). New audio compression circuit holds modulation at high level without usual clipping distortion. RF section enclosed with complete shielding for TVI-suppression. Separate power supply for modulator, allowing better overall voltage regulation. Many other top features including provisions for crystal operation, push-to-talk, etc. Table-top size: 31x22x14¾ **$699.00**

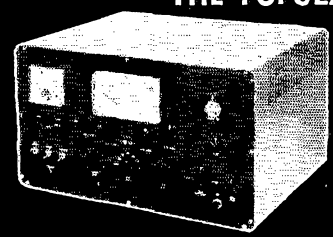
GLOBE KING 500B R.F. SECTION, ONLY **$299.50**

SPEECH AMPLIFIER AND MODULATOR SECTION, ONLY **$249.50**

DUAL POWER SUPPLY AND VFO SECTION, ONLY **$189.50**

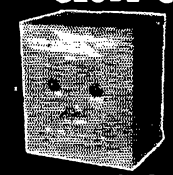
King Modification Kit: FOR INSTALLING NEW COMPRESSION CIRCUIT IN EARLIER MODELS OF THE KING (500, 500A), COMPLETE: **$10.95**

THE POPULAR Globe Champion 300



Completely bandswitching, 160-10 Meters;- 350 watts on CW, 275 watts on fone and 300 watts SSB (P.E.P.), with external exciter. Built-in VFO, push-to-talk, antenna changeover relay, provisions for crystal operation. Improved time-sequence keying. Pi-Net output circuit, 48-700 ohms. Extensively TVI-shielded, filtered and by-passed. High level Class B Modulation with splatter suppression; new audio compression circuit holds modulation at high level without usual clipping distortion. Ready to go on SSB with any external exciter. Two Amperex 9909 Final tubes (1000 V on plates) allow 33⅓% safety factor. **$449.00**

GLOBE CHAMPION 300 KIT, Complete With Instructions **$349.00**



THE Conelrad Alarm

Completely automatic, this Fail-Safe Alarm permits easy compliance with the FCC Regulations. Compact, low-cost, operating automatically from any receiver with AVC, easy to connect (two leads to receiver; receives AC plug from Xmttr.) Includes visual indication of alert, also. May be used with any Xmttr. up to 500 watts. **$29.50**

CONELRAD KIT, With Printed Circuit, Complete Instructions **$22.50**

VISIT US IN ROOM 644A . . .
THE CONRAD HILTON HOTEL
At Chicago's Radio Parts Show in May!

Guaranteed FOR ONE FULL YEAR!

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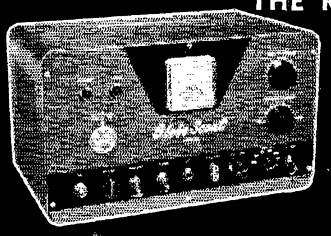
BY POPULAR DEMAND

THE AMATEUR'S CHOICE FOR PRICE & PERFORMANCE

THE RELIABLE Globe Scout 680



Compact, completely bandswitching transmitter for 6-80 Meters; allows operation of 6 M band by technicians and novices (CW), plus later use by advanced ham without becoming obsolete. Completely self-contained with built-in power supply, for 65 watts CW, 55 watts phone. Full modulation of Final. TVI-shielded cabinet. Pi-Net output on 10-80M; link-coupled output on 6 M, matching into low impedance beams. New-type shielded, full range plastic meter for better readability. Adaptable for Mobile Operation.

$99.95

GLOBE SCOUT 680 KIT, Complete with Detailed Instructions $89.95

GLOBE SCOUT 66, as shown, but for range 10-160M, wired only $99.95

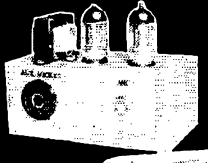
THE FAST-SELLING Globe Chief 90

Handsome 90 watt Xmttr. with meter indication at 75 watts, allowing the Novice all the power he can legally use. Self contained, completely bandswitching, 160-10M. Combination Pi-Net, with provisions for antenna changeover relay, speech modulator input, VFO input and operation. Modified Grid-Block Keying for max. safety. Has complete, well-filtered power supply. Kit form wiring pre-cut and pre-tinned, containing pre-punched chassis, all parts and detailed assembly instructions.

$64.95

GLOBE CHIEF 90 KIT, Complete With Detailed Instructions $49.95

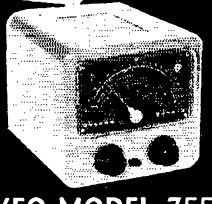
THE Screen Modulator Kit



Designed specifically for use with the above Globe Chief Transmitter, but may be used with similar CW transmitters such as the Heath AT-1, Johnson Adventurer, Knight 50 watt, etc. Permits radio-phone operation at minimum cost. Self contained. All parts, connections to transmitter, 2 dual purpose tubes and detailed assembly manual included.

$13.95

THE VFO Model 755

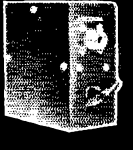


Completely bandswitching with "crystal stability", the Model 755 has built-in power supply. Calibrated on 160, 80, 40, 20, 15, 11 and 10 Meters, with output on 160 and 40 Meters. Calibrate switch for zero beating signal frequency or tuning to desired frequency without turning on transmitter. Temperature compensated. 5:1 tuning ratio. Provisions for automatic operation with Xmttr. and oscillator cathode keying.

$59.95

VFO MODEL 755 KIT, Complete With Detailed Instructions $49.95

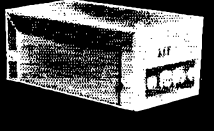
THE SWR Bridge



Designed for 52 ohms; furnished for 72 ohms when specified. High power type, handling up to 600 watts fone, 1000 watts CW, when line has low SWR. Accurate well past 30 megacycles. Usable with Xmttrs. as low as 30 watts.

$16.95

THE Economy Code Oscillator



Kit with transistor and printed circuit. Pleasant audio tone. Screw terminal input for key; output jacks receive standard fone tips. Complete with batteries and detailed instructions.

$3.95

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Broadway at 34th Street Council Bluffs, Iowa

837 final on s.s.b., reports that BMD, IYT and FYZ participated in relaying pledges to Shreveport in the March of Dimes Telethon. VAR drives an 813 final with a Ranger operating 40 and 75 meters. NDV is active on NTS, TXN and MARS handling traffic. K5CHC reports the 6-meter band opening to WØ and W9 early in January. K5BWN is on 6 meters. KN5EQK is awaiting his Tech. Class ticket. MXQ developed trouble in his new transmitter. KRX reports activity on RN5 and CAN and a five-month traffic report. The Jefferson ARC station, K5ISI, went on the air Jan. 26 with a BC-669. ØJHY/5, who operates mobile around New Orleans, has been attending USNR School there. CWC is now Air Force MARS. The Baton Rouge ARC recently elected IOF, pres.; LUX, vice-pres.; IOU, secy.; DPM, treas.; OVV, GIX and WG, board members. The Jefferson ARC started its second year with EPC, pres.; EKL, vice-pres.; K5GGR, secy.; K5HEK, treas.; K5AGJ, MXQ and JGW, board members. The Caravan Club reports that over $10,000 in pledges were reported via amateur radio. The station, FHS/5, was set up in the Crystal Ballroom of the Washington-You-Ree Hotel operating from 9 P.M. to 4 P.M. K5BES, SEC and State Radio Officer for Louisiana c.d., reports message centers have been set up in six c.d. areas and others are progressing. Join in this program by signing up with AREC and cooperating with your local c.d. officials. GAD is on s.s.b. with a 20-B. K5HEK received his new DX-100. AVO moved back to New Orleans. KN5IZD is on the air with a Globe Chief and an SX-99. K5DDH will move into a new ham shack soon. K5CHC has been working on a converted Globe Scout 65-A. He now has 60 watts on 6 meters. Traffic: (Feb.) W5NDV 160, MXQ 142, K5AGJ 128, W5EA 23, CWC 4, FMO 4, BMD 2, VAR 2. (Jan.) W5NDV 220.

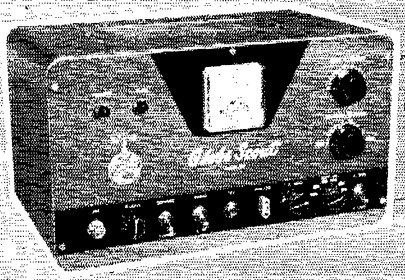
TENNESSEE—SCM, Harry C. Simpson, W4SCF—SEC: RRV. PAM: PQP. RM: IV. Memphis ARC officers have set June 30th as the date for the Memphis Hamfest. The club was treated to an outstanding lecture by VT on, "What Thirty Years Has Done to the Amateur, and Vice Versa!" DCH, who has learned that the best solution for TVI is to keep his ticket a secret, explains his new 50-ft. mast to his neighbors—"—going to help track the earth satellite." TDZ is sporting a new 6N2. K4CWS reports that the Chattanooga High School Club station has been licensed as K4MNZ and in the first fifteen days 39 states and six countries were worked! PL, with another fine total, congratulates 3CUL, which reminds us that two of the five Edison Award winners were traffic people! K4DIZ, after lots of transmitter trouble, got back on the air and sustained a painful injury in a fall. NJE's radio and TV shop is manned 100 per cent by hams, including XYL VJX and K4s INF, ING, IOU and MFY. He reports that ROF, an M.D., has 6-meter emergency gear installed in his hospital. The Bristol ARC, through SCM liaison UKJ, wonders to whom they should report —the club meets in Tennessee, the shack is in Virginia, and the members are located in *both* states! We are very pleased to "claim" this active unit. K4EYE, with a new Valiant, hooked KC4USA and CO2USA. IGW raised his antenna from 12 to 75 feet. The new call of 3DGM/4 is K4LPW. UWA complains that present classwork at Tenn Tech. doesn't leave much time for hamming. WQT, now a two-receiver station, reports visits from BMI, ZZ, GEN, CVM, K4GKE, K4JPP, W5GJI, K5GJZ and K5DCB. K4AJC is a new General Class licensee in Clarksville. UIO, after several years of developing ETPN, has put the net in the capable hands of PAH. Traffic: W4PL 1432, K4DIZ 98, W4VJ 59, SCF 57, EWC 48, UVL 47, IV 34, K4GFL 25, W4PFP 23, K4BMC 18, W4IGW 17, UVS 16, K4MNZ 13, W4PAH 13, UIO 13, WQT 13, NJE 9, LPW 6, SZI 3, UWA 2, CWS 1, HHK 1, HSX 1, HUT 1, JNI 1, PAH 1, PVD 1, UKJ 1, YRM 1.

GREAT LAKES DIVISION

KENTUCKY—SCM, Albert M. Barnes, W4KKW—SEC: JSH. PAMs: VJV and SUD. RM: QCD. Governor Chandler, of Kentucky, has expressed his personal gratitude and the deep appreciation of the people of Kentucky by conferring Kentucky colonels commissions upon ZDB, ZDA, JDU, MWR, JSH, NBY, BEW, SBI and NCQ for their outstanding work during the recent devastating floods. The new State Radio Officer is BEJ and the c.d. drill held Feb. 25 was an outstanding success with the able help of HOJ, KPN and KYN assisting. PAM VJV reports 14 stations have earned their KPN Section Net certificates with good activity for six consecutive months. They are K4JCA, DLG, DLI, W4HSI, KJP, KQU, NGZ, NIZ, SUD, SZB, TQD, UVJ, VJV and YZE. The Owensboro Amateur Radio Society (OARS) is conducting Novice classes under the guidance of YYI. OMW reports his youngest daughter, ten years old, now is KN4MWC. That makes

(Continued on page 110)

NOW! RESTYLED! COMPLETELY NEW!



THE Globe Scout 680

COMPLETELY BANDSWITCHING XMTTR.

FOR 6 THRU 80 METERS

KIT FORM: Cash Price: $89.95 — Only $7.29 per mo. Pay $9.00 Down

WIRED: Cash Price: $99.95 — Only $8.10 per mo. Pay $10.00 Down

Also available as shown above except for frequency range;
Globe Scout 66 for 10-160M, wired only, $10.00 down, $8.10 per mo.

★ Built-In Power Supply ★ Pi-Network Output (except 6 meters)

★ High Level Modulation ★ Full Modulation of Final

★ TVI-Screened Cabinet ★ 65 Watts on CW; 55 Watts on Fone ★ Adaptable for Mobile Operation

Only 10% Down

Easy Terms on These Top-Notch Receivers!

the RME 4350

Only $12.83 per mo.

CASH PRICE: $229.00

Crystal controlled dual-conversion. High selectivity and rejectivity. Easy pinpoint-precision tuning with two-speed tuning control. High degree of mechanical and thermal stability; very low frequency shift or drift. Sensitivity; - between 1 & 2 mv through tuning range. Betwen 3.5 & 6 DB low noise factor. 1750 KC - 30 MC. 7 multipurpose tubes.

the Hammarlund HQ-100

Only $13.69 per mo.

CASH PRICE: $169.00

Continuous tuning from 540 KCS to 30 MCS. Electrical bandspread tuning with direct dial calibration. Dial markings on 80, 40 & 20M bands every 10 KCS, every KCS on 15M band, and every 50 KCS on 10M band. Q-Multiplier. 10 tube superhet circuit. Automatic noise limiter. Voltage-regulated and temperature-compensated high-frequency oscillator for extra stability.

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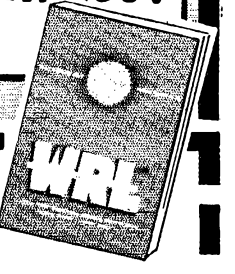

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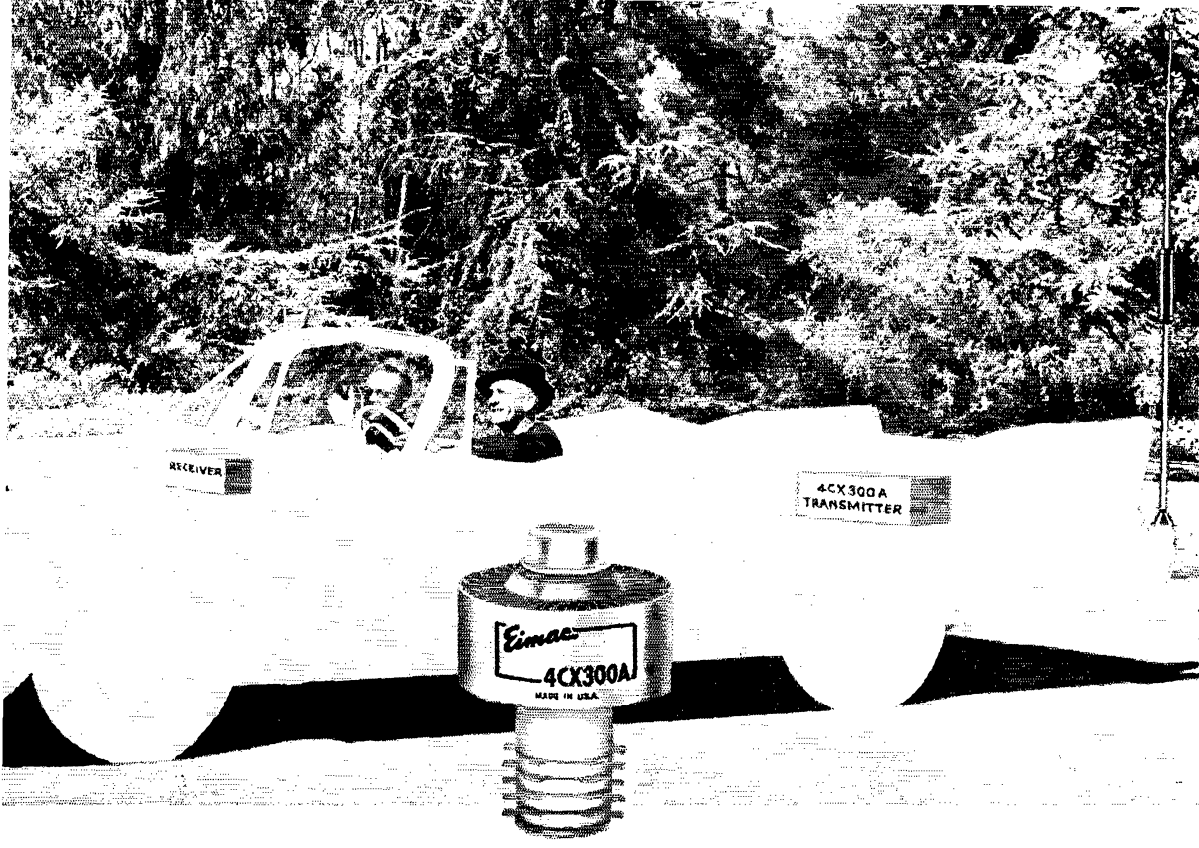
three calls in his family with wife Marv UTO and son Bobby (18) UNH, MGT is a very active OO. CDA is getting housemaid's knee cleaning up the shack. K4DTI has 105 countries now. After the flood was over, ZDA had the three children down with scarlet fever. K4JGN, W4KQU and JDU are new OPSs. K4AIS and W4ZDB made BPL. BAZ is directing c.d. work around Louisville. CIA put up a new antenna. KKG worked a rare one, OH2AA/Ø. JUI is building a sinch 'scope and s.s.b. The Kentuckian Radio Club has an excellent c.d. setup. The Mammoth Cave Radio Club is 100 per cent active in c.d. drills. K4BCR is a new AREC member. 5GOH/4 has gone to Fort Bragg. K4DVR put up a new two-element 15-meter beam. KZF worked PZ1AE on 6-meter phone. RM QCD reports excellent activity on KYN with 50 sessions held and a traffic total of 590. ODK, AUZ, NDY and MGT had an s.s.b. dinner. K4GEZ, Blue Grass Amateur Radio Club president, is a very active OO. K4JTE is a new AREC member. K4CIA received CP-30 and WAS certificates. Traffic: K4AIS 576, W4ZDB 520, SUD 263, W5GOH/4 261, W4QCD 241, KKW 163, SBI 160, HSI 137, JSH 125, ZDA 102, K4JGN 100, W4BAZ 97, RPF 86, CDA 78, HOJ 68, KQU 62, MWR 57, KKG 37, JCN 36, K4DTI 35, W4YYI 33, K4HBF 25, W4MWX 23, NGN 22, TQC 18, BBD/4 16, SZB 12, K4DVR 6, HOE 5, W4JUI 2.

MICHIGAN—SCM, Thomas G. Mitchell, W8RAE—Asst. SCM (c.w.) Joe Beljan, 8SCW; Asst. SCM (phone) Bob Cooper, 8AQA. SEC: GJH. ELW has ILP for company this month on the BPL list. Lamp says that this is his second such award and that they are hard to come by. New ORS certificates adorn the shack walls of AUD, NTC and OCU this month. Congratulations to all. New officers of the Niles Amateur Radio Club are MBZ, pres.; AYF, secy.; and NLO, treas. IWF has returned from two years of military service and is now active on the air. FX has been trying various Conelrad devices with good success and reports that the simple ones are the best. HSG/MEX has been under his doctor's care again and we all wish him a speedy and complete recovery. His amendment to the matter mentioned in this report last month has been introduced in the legislature and is being processed with favorable action. QQO is moving to his new QTH and is taking over the job of EC for Berrien County as soon as time will permit. FGB has a new wide-spaced three-element rotary beam working for him on 10 meters. I have just been advised of my election to another term as your SCM. Your confidence is appreciated and I will continue to carry out the duties in the same manner as during the past two years. I should like to take this opportunity to publicly express my appreciation for the help from Asst. SCMs AQA and SCW and our SEC, GJH. Without the help from them and others, the duties of the SCM could not be as smoothly carried out. It is an honor to represent the fine group such as we have in the Michigan section. Let's all work together for betterment in the next two years. Traffic: (Feb.) W8ELW 679, ILP 297, K8NAW 159, W8YAN 125, SCW 121, FX 119, NOH 116, ZLK 114, DAP 90, FWQ 82, DSE 81, AUD 71, NUL 67, WXO 40, QIX 39, RTN 39, TIN 34, OCC 28, RAE 24, RVZ 22, OGY 17, EGI 4, HKT 4, HSG 2, FGB 1. (Jan.) W8QQO 96, IWF 11, KN8DKV 9.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCMs: J. C. Erickson, 8DAE and E. F. Bonnet, 8OVG. SEC: UPB. RMs: DAE and FYO. PAMs: HPP and HUX. DNU moved to Detroit. EKK is in Cleveland Clinic undergoing surgical treatment. MNM is back on the air after being off for ten years. The Dayton ARA's 1957 officers are QDI, pres.; HAF, vice-pres.; OVG, secy.; DHJ, treas.; and TPL, editor. The Springfield ARC reports that IIP spoke on Conelrad and multi-band antennas. Also ZP5HX told them about operating a ham station in Paraguay. The Ohio Valley ARA's 1957 officers are 4JBQ, pres.; ELB, vice-pres.; 4KVX, secy.; and CGY treas. TSF is, as far as he knows, the only W8 with the Air Force contingent of operation Deep Freeze and sends his 73 to the Ohio gang from ZL-Land. WE works a lot on 2 meters. HXB handled 12 Red Cross messages from the Kentucky flood area. K2RNE/KL7 wants phone patches in Northern Ohio and Pennsylvania from 7 to 9 P.M. EST nightly on 21,372 kc. K8BBI has a new Ranger. EIB is running 800 watts. K8ABQ has his General Class license. EEQ received his Doctor of Theology degree. 1957 officers of the Greater Cincinnati ARA are MYC, pres.; PLB, 1st vice-pres.; WJV, 2nd vice-pres.; IVE, corr. secy.; 4DAF, re. secy.; and NCV, treas. The Columbus ARA operates a Novice crystal bank. We regret to report that EDW has joined Silent Keys. Those who made BPL in February are DAE, GFE, UPH and AL. The Fulton County ARC's 1957 officers are K8BJL, pres.; OFN, vice-pres.; UPR, secy.-treas.; and ZHQ, act. mgr. GTE has a new DX-100 and NC-300. IY has a new QTH. HUX finally received the Gonset G77 she won last fall. She also has a 75A-4. K8CUT received his General Class license.

(Continued on page 112)



For all-band custom mobile operation
THE EIMAC CERAMIC 4CX300A

For the discriminating amateur who insists on high power mobile operation with a minimum of space, Eimac's new 4CX300A is the answer. Of ceramic and metal construction, this radial beam power tetrode is another of the Eimac tubes "that can take it". Smaller than a tennis ball, a single 4CX300A will take 500 watts input in SSB, or 300 watts in Class C AM service from 160 through two meters. Its ruggedized construction insures longevity and consistent output under the most trying conditions. The Eimac 4CX300A will deliver its rated output whether it rides in smooth comfort in a high priced car, or is bounced around in an old time jalopy.

Its small dimensions give the amateur an opportunity to build high-power mobile equipment in small space. Its low driving power requirements in all classes of service (zero watts SSB, 2.1 watts AM) minimizes the size of exciter equipment.

Eimac, with its reputation for building "ceramic tubes that can take it", has the mobile operator's answer to the "right" tube in the powerful 4CX300A.

For further information on the 4CX300A, contact Eimac's Amateur Service Bureau, or visit your Eimac distributor.

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Eimac First for mobile de luxe

Eimac

4CX300A TYPICAL OPERATION

Class C Plate Modulated

Plate volts	500	1000	1500
Plate current, ma	200	200	200
Grid current, ma	22	19	17
Driving power, watts	2.7	2.3	2.1
Plate power input, watts	100	200	300
Plate power output, watts	75	160	250

SSB Class AB[1]

Plate volts	1000	1500	2000
Peak RF grid voltage	50	50	50
Driving power, watts	0	0	0
Zero plate current, ma	100	100	100
Max-signal plate dissipation, watts	125	150	175
Max-signal plate power output watts	125	225	325

URD is rebuilding the transmitter. K4GYO is new chairman of the Case Tech. ARC. VBV/8 received an ORS appointment from YIX. UPH is Toledo's ham of the month and Bob is one of the king-pins on BN. HUX and HWX received their YL-WAC. BN is in the hospital and we want him to get well fast. The stork brought a baby girl to HYE. K8HJL spent a few days in the hospital. VAQ has a new DX-35. FVI is a 2nd lt. in the ROTC. A little bird told us that OFG and VJO are going to marry. LHX, IY, LPZ, QYT, AEU and K8ABA, of the Cleveland AREC, were ready to help establish communication if needed in a multi-million-dollar fire in Cleveland on Feb. 25. WSH and WTY are a father-and-son combination and have rebuilt their 160-meter rig. K8DJF has a new 6N2 and a Valiant. K8AKU has a 6N2 and a 6-meter beam. K8BRN has a new NC-300. New appointments are GKB, STR and K8DDG as OOs and K8DDG as ORS. BUM has a new 8JK on 20 meters. Traffic: (Feb.) W8UPH 1034, VTP 716, SZU 293, DAE 253, QLJ 197, GFE 187, HXB 172, AL 168, SVL 133, VDA 94, K8AEC 88, W8SYD 71, CTZ 57, BEW 44, LZE 40, W9VBV/8 36, W8LLY 20, UHW 20, HZJ 16, HPP 15, ARO 12, WE 10, TCS 9, EEQ 8, LER 7, RZ 7, EQN 6, LMB 6, YCP 6, HUX 4, MGC 4, JPD 3, MXO 3, GAC 2, GBH 2, GXR 2, ILE 2, RO 2. (Jan.) W8SGX 21, K8BYP 4.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: KGC. RM: BXP. PAMs: GDD, IJG and NOC. Section nets: NYS on 3615 kc. at 1900, NYSPTEN on 3925 kc. at 1800, SRPN on 3980 kc. at 1130, IPN on 3970 kc. at 1530. MHT on 3716 kc. Sat. at 1300. New officers of the Crystal Radio Club are MDO, pres.; K2MJN, vice-pres.; GYU, secy.; and IRA, treas. K2BCU reports on plans for a theory class in Ulster County. K2LVN is heading up a club display for the Lions Club Exposition with the Ulster Co. Mike and Key. Receiver sensitivity was discussed by ZHI, of GE's Research Lab, at the February SARA meeting. New appointment: VNJ as ORS. Endorsements: TYC and K2EDH as ORSs. Those from Eastern New York attending the Edison Award Dinner Feb. 28th included DC, JZK and ZBY. The IBM Club is sorry to lose MHE, who moved to California on Mar. 3. K2PRB is now v.f.o. to enhance his operating pleasure. K2KTX pepped up his 2-meter signals with a large beam. WQL has a home-made driven rotary inductor on his vertical. Sporting new receivers are K2ICF with an SX-42 and K2RUU with an S-27. A Greenland GI was located in two hours recently by LXP and phone-patched to his family concerning his father's death. Garrett keeps daily skeds with these Northern outposts assisted by a staff of operators. The Harmonic Hill Radio League featured printed circuits at its February meeting. The ENY Medical Net reports 22 stations total during its sessions three times a week on 2 meters. KGC, with a new Palco mobile rig and a 2-kw. gas generator, is ready for any emergency. LWI, a recent OES, has worked 15 states and 2 provinces on 144 Mc. Field Day soon will be here and we hope you are in the final stages of your plans. Traffic: (Feb.) W2BXP 386, EFU 161, PHX 114, K2HPQ 102, EDH 66, W2ATA 35, K2LKI 34, GCH 21, HJX 20, W2VNJ 6, GTC 5, K2HNW 2. (Jan.) K2HQJ 11, PRB 1.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: ADO. PAM: OBW. RM: WFL. Section nets: NLI, 3630 kc. nightly at 1930 EDST and Sat. at 1915 EDST. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EDST. NYC-LI AREC, 3908 kc. Sun. at 1400 EDST. The NYC-LIPN celebrated its first anniversary with an FB dinner which climaxed a fine first year as our section's phone traffic net. The NYC-LI AREC Net is progressing nicely and invitations are open to all who are interested. Congratulations go to KEB, our consistently top BPL-winner, who received a General Electric commendation certificate for her work with the civil defense. K2PHF received his 35-w.p.m. CP certificate. The DX Contest helped to raise the country total to 67 at K2DEM. Rich also received a YLCC-150 endorsement. The fellows at AEE submitted their sixtieth consecutive traffic report! BO travelled to Washington, D.C., to attend the Edison Award Dinner. Your SCM is now mobile on all bands with a G-66B and an AF-67. K2RJO added a Viking II for all-band work. After many years on the air, LGK worked a DL4 on 10 meters for his first country on any band. ORM now has an XYL to dust off his rig. VDT has a new Johnson KW. While on annual USNR training duty at Brooklyn, HQL, operating K2NR, assisted in a mercy call from South America. IVS completed his 4-125A final. AOD is looking for 420-Mc. contacts. In one month of operation from his new QTH, BQM's country total has risen to 152 on phone with ten new countries added. ELK added

(Continued on page 114)

GONSET

BEAMS

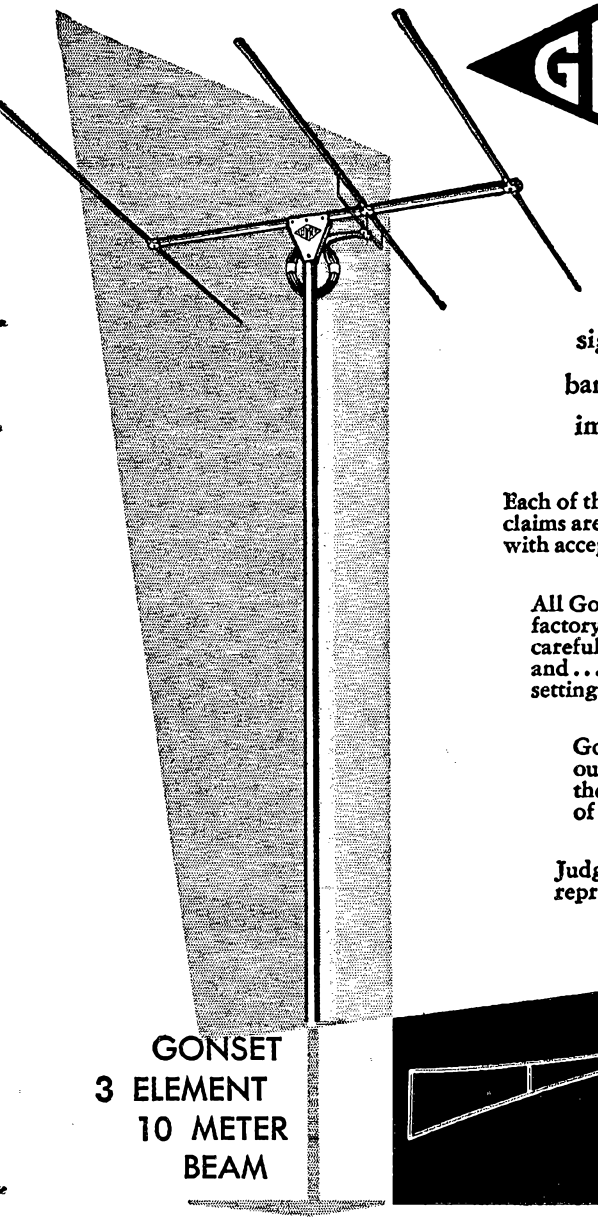
responsible for so many of the "big" signals on 20-15-10-6 and 2 meter amateur bands... justify your choice from many important standpoints.

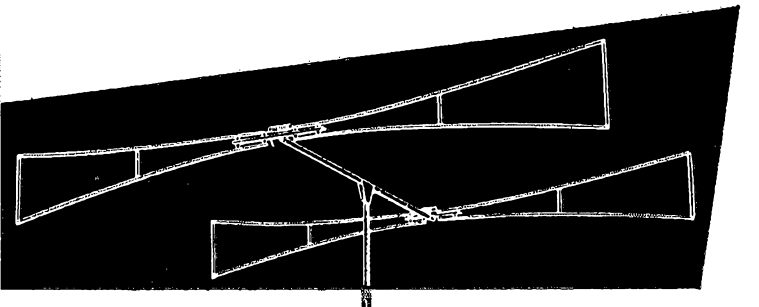
Each of these beams really *performs*. Performance claims are conservative, *believable*, fully in line with accepted theory.

All Gonset beams are, within practical limits, factory tuned and matched. Packaging is impressive, carefully thought out to bring you the beam intact and... with "Bantam" series... with coil settings unaffected by the rigors of shipping.

Gonset products have long been considered outstanding in their attention to detail, in their mechanical excellence. This series of beams for 20-15-10-6-2 is no exception.

Judged by any yardstick, each Gonset beam represents an unusual dollar-for-dollar value.





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Accurately pre-tuned and matched...

Gain over 8 db at optimum frequency compared to matched resonant dipole.

F-B-R at low vertical angles more than 20 db at peak frequency.

Uses 52 ohm coax. "T" match with half-wave balun, (furnished) maintains symmetry and good impedance match over band.

Light-weight, only 18 pounds, handled readily by any husky T-V rotator. Boom is 1½"d, galvanized steel, 10' long. Elements are aluminum alloy, ¾"d.

Part No. 1587.....Net 34.50

Complete with 40" galvanized stub mast and balun.

Other Gonset Beams...

BANTAMS: Models for 20 and 15 meters. Total length only 16½ feet, tip-to-tip. Turning radius 9½ feet. Bow-tie elements for broad banding. Copper tubing, air-wound coils for lowest loss, performance closely approaching full-length 2-element beams *in all kinds of weather!*

6 METER, 4 ELEMENT YAGI.....

2 METER, 12 ELEMENT "Twin six"

2 METER, 13 ELEMENT "Big Bertha"

GONSET ..... Burbank, Calif.

DIVISION OF L. A. YOUNG SPRING & WIRE CORPORATION

a Q-multiplier to his HQ-129X and is now shooting for OO Class I or II with a BC-221 frequency meter. JGV worked a VE6 with his 10-watt mobile on 28 Mc. KGN received his Old Timer's Club certificate and participated in the DX Contest, snagging 52 countries on 14 Mc. only. K2AAN made WAS. The Babylon RC invites everyone to its meetings on the 1st and 3rd Mon. at 2000 at the Hale Rd. Fire Dept., N. Babylon. K2JVB, newly-appointed EC for Manhattan, is assisted by K2s GHS and IAD and requests those interested in AREC in the city to contact him. K2PSV worked 4X4-Land to complete his WAC on 10-meter phone. K2PSP has a Valiant and a 75A-4 on 20-meter phone. K2YEQ, ex-2ALT, has returned to ham radio with an NC-300 and a pair of 813s. KN2YGW, the XYL of QDM, recently received her ticket. Ex-3KCI/2, now signing K2YOR, has an NC-300 and a Valiant and celebrated the arrival of his new call with WAC on 80 meters during the DX Test. A new v.f.o. at K2UOY helped to raise his country total to 17. QPQ is testing a 2C40, 2400-Mc. cavity. The Garden City HSRC has an AR-3 receiver. Our Hudson Division Director, OBU, has moved to Commack. VVZ, mobile on 10 meters, is interesting the five YLs in his car pool in amateur radio. New officers of the Staten Island ARA are ELM, pres.; GGJ, treas.; NWK, rec. secy.; and K2EFB, corr. secy. New officers of the Eastern Suffolk RC are K2OQC, pres.; K2EC, vice-pres.; K2UEK, secy.; KDN, treas.; and LXK and K2s EGY and TNA, directors. RA is using a new 3-element Mosley beam on 14 Mc. K2SEK expects to join the NLI Net with his S-85 and 30-watter. New officers of the Mid-Island RC are WFL, pres.; KTF, vice-pres.; JBQ, secy.; SMQ, treas.; CLG, sgt.-at-arms; and ELT and OWP, trustees. K2JLE can now be heard from W3-Land. New calls in the Levittown ARC are KN2s YJA and YJC. KOY is heard on 20-meter phone. K2IOT is getting good results with his new trap antenna. KN2VTX added a 15-meter beam and a preselector to his SX-99. Traffic: (Feb.) W2KEB 2197, KFV 658, WFL 369, K2PHF 190, DEM 169, AMP 114, GHS 85, BII 64, LUM 54, W2AEE 49, BO 45, TUK 37, K2GLP 29, PSE 28, RJO 28, OPJ 24, KQG 22, W2LGK 22, DID 20, K2CRK 19, ECY 16, JZR 16, W2HAC 13, PF 13, K2OBO 11, W2IAG 10, K2AAW 8, W2GP 8, OBW 7, EC 6, HQL 5, K2DQD 3, W2IVS 2, K2KXZ 2. (Jan.) W2BO 92, K2OPJ 53, W2HAC 23, K2CQP 4, W2OME 3, K2UOY 3. (Dec.) K2OPJ 72.

NORTHERN NEW JERSEY—SCM, Lloyd H. Manamon, W2VQR—SEC: IIN, PAM: BDE, RMs: BRC, CGG and NKD. K2GIF is a new OPS and has a 225-watt rig on the air. ZVW is busy building a 144-Mc. converter and a new FD rig. The Nutley Amateur Radio Club arranged a joint meeting with the Belleville, Bloomfield and Irvington Clubs on Feb. 18 at the auditorium of Federal Tel. Comm. Labs. in Nutley. TJD gave a very interesting demonstration and lecture entitled, "Single Sideband Sounds." The second issue of the GSARA publication, *The Scope*, shows quite an improvement in that the first articles by department editors appear in this issue. NBP has a new jr. operator. K2CTJ is building a new super receiver. Reports are that GUM again is drawing 6-inch arcs off the new final. FZY and CQB suggest checking license renewal dates. K2GTX is erecting a new 70-ft. tower with a four-element 20-meter beam. PWX suggests that more of us get on 144 Mc. during the off season and see what's "behind the green door." VCZ is a new OO. K2PSX, now General Class, is all set to go on 20 meters with a Globe Scout and an HQ-129X. The Raritan Valley Radio Club, QW, is on the air with three rigs. Present active members in the club are K2EFA, CHI, JOM and PSX. K2AUR has resigned as secy.-treas. of the Night Owl Net. He was replaced by GVV. Your SCM was a recent speaker at the Tri-County Radio Club, Plainfield. K2GIQ is a regular in ESN. KN2YFE is a new member of the gang. Bob has a DX-35 and an HQ-100 on the air. He also is interested in getting into a Novice Net. Contact him at 489 E. 22nd St., Paterson 4. GVU has been hospitalized, but is now out of sick bay. K2SZO is on 10 meters with a Ranger and an SX-100. K2DHE has a new Ranger and 6N2 layout. K2TWK now is General Class. New stations in NJN are K2CWJ, CSC and CGC. K2CGC is the Cape May Coast Guard base amateur station and is manned by K2GUN, from Spotswood. NJN activity report for Feb.: Evening net—sessions 28, attendance 447, traffic 328. Morning net—sessions 24, attendance 74, traffic 39. Net. mgr. BRC states that because of lack of activity the morning sessions of NJN were discontinued Mar. 1st. February marked the first full 7-days-per-week operation of NJN. K2EQP and MLW made BPL this month. The Sunday night sessions of NJN need bolstering. How about looking over 3695 kc. on Sun. nights and joining in? BLL and NIY were visited by 5OJ, an old shipmate from Annapolis. Our new PAM, VDE, is doing a bang-

(Continued on page 118)

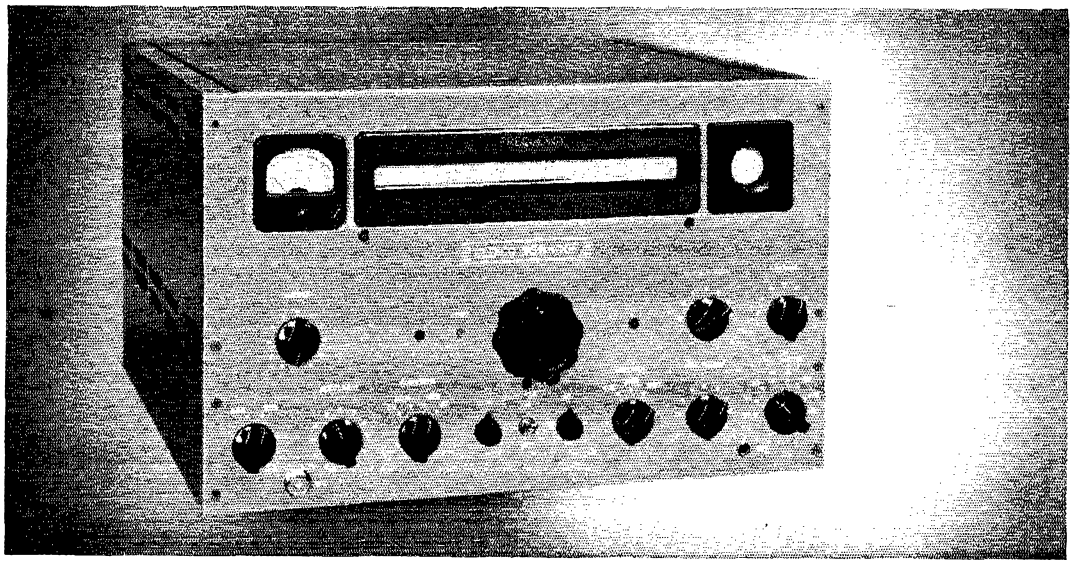
For Peak Performance

one name stands out

ELDICO *New* SSB-100F

featuring
CRYSTAL LATTICE FILTER

100 WATT P.E.P. OUTPUT*
EXCITER/TRANSMITTER



There's no compromise with power and performance when you choose ELDICO'S New 100 Watt Exciter-Transmitter. You'll enjoy every minute of operation with this luxury-class equipment. And best of all ELDICO'S popular price puts this superior equipment within reach of every ham's pocketbook.

Compare the features of the SSB-100F with any equipment and you'll know why ELDICO'S "Years Ahead" equipment is your best buy!

CHECK WITH YOUR DEALER FOR HIS "LOW DOWN PAYMENT—EASY TERMS" PLAN ON ALL ELDICO EQUIPMENT.

- **BAND COVERAGE:** 80, 40, 20, 15, 11-10 Meter Bands.
- **TYPE OF EMISSION:** CW - AM LSB - HSB
- **POWER RATINGS:** DC average input SSB-100 watts; AM input (two tone test) - 60 watts. Peak envelope power input SSB-144 watts. Peak envelope power output SSB-100 watts.

***144 P.E.P. INPUT**

HARMONICS AND SPURIOUS RESPONSES: Spurious mixer products — 40 db or more down. Third order distortion products — 35 db or more down. TV interference suppression — 40 db or more second harmonic, 60 db or more higher harmonics.

UNWANTED SIDEBAND AND CARRIER SUPPRESSION: 50 db or more down, THROUGH LOW FREQUENCY CRYSTAL — LATTICE FILTER.

FREQUENCY STABILITY: Control Oscillator — (800 to 1300 kc) — ± 100 cycles after two minute warm up period. Output frequency — within 300 cycles after five minute warm up period. Dial accuracy — ± 2 kc after calibration.

- **CABINET:** Receiver type table model with hinged cover.
- **FINISH:** Flat gray.
- **SIZE:** 17¼" long by 10¾" high by 15" deep.
- **WEIGHT:** 58 lbs.
- **SHIPPING WEIGHT:** 65 lbs.

DELIVERY AT YOUR LOCAL DISTRIBUTOR IN MAY

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72 East Second Street, Mineola, L. I., N. Y. **Ploneer 6-5212**

"I am now using the Gotham V80 vertical antenna with only 55 watts, and I am getting fantastic reports from all over the world". VP1SD

ALL-BAND VERTICAL ANTENNAS

GOTHAM'S sensational new vertical antennas give unsurpassed multi-band performance. Each antenna is complete, can be assembled in less than two minutes, and requires no special tools or electronic equipment. In the V160, resonance in the 160, 80, 75, and 40 meter bands is secured through use of the proper portion of the loading coil. Yet, when the coil is eliminated or bypassed, the V160 will operate on 20, 15, 10 and 6 meters! The same idea applies to our V80 and V40 multi-band verticals. No guy wires needed; rugged, occupies little space, proven and tested.

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Simple, efficient design and superior materials give perfect all-band operation, and effective low-angle, omni-directional radiation. Gotham verticals are rugged, broad-banded, with low initial cost and no maintenance. Guaranteed Gotham quality at low Gotham prices. Perfect for the Novice with five watts or the expert with a kilowatt.

QUALITY MATERIAL

Brand new mill stock aluminum alloy tubing with Aluminite finish for protection against corrosion. Loading coils made by Barker & Williamson.

ALL-BAND OPERATION

Switch bands with ease. Operate anywhere from 6 to 160 meters. Work the DX on whatever band is open.

EASY ASSEMBLY

Less than two minutes is all you need to put your vertical together. No special tools or electronic equipment required. Full instructions given.

SIMPLE INSTALLATION

Goes almost anywhere. On the ground, on the roof, or outside your window. No trick fittings or castings needed.

AMAZING PERFORMANCE

Hundreds of reports of exceptional DX operation on both low and high power. You will work wonders with a Gotham vertical.

NO GUY WIRES

Our design eliminates unsightly guy wires. You save time, trouble, space and money by avoiding guy wires.

PROVEN DESIGN

Over a thousand Gotham verticals are on the air — working the world and proving the superiority of Gotham design.

AND THE PRICE IS RIGHT!

"I worked LU3ZS on Half Moon Island in Antarctica on Dec. 26 at 21150 Kc. I was using my Gotham V80 vertical antenna and only 35 watts." KN5GLI

Airmail Order Today — We Ship Tomorrow

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1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

V40 vertical for 40, 20, 15, 10, 6 meters.....$14.95 ☐
V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters.....$16.95 ☐
V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters.....$18.95 ☐

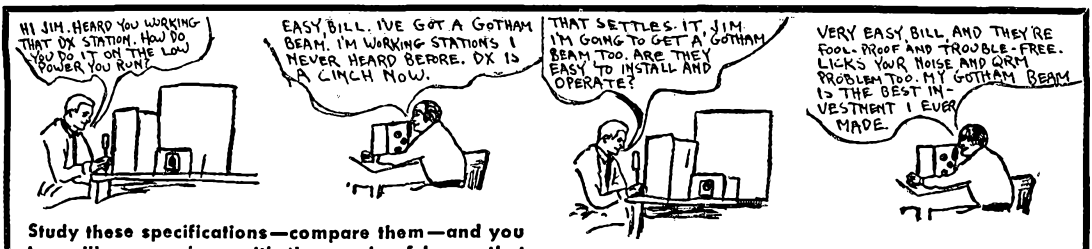
Name.....

Address.....

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

How to order
Send check or money order directly to *Gotham* or visit your local distributor. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

GOTHAM 1805 PURDY AVENUE MIAMI BEACH 39, FLA.



Study these specifications—compare them—and you too will agree, along with thousands of hams, that GOTHAM beams are best!

TYPE OF BEAM. All Gotham beams are of the full half-wave plumber's delight type; i.e., all metal and grounded at the center. No wood, tuning stubs, baluns, coils, or any other devices are used.

MORE DX CONTACTS

GAIN. Gotham beams give the maximum gain obtainable. Our 2-element beams give a power gain of four (equivalent to 6 db.); our 3-element beams give a power gain of seven (8.1 db.); and our 4-element beams give a power gain of nine (9.6 db.)

THE DESIGN IS PROVEN

FRONT-TO-BACK RATIO. We guarantee a minimum F/B Ratio of 19 db. for any of our 2-element beams; 29 db. for any of our 3-element beams; 35 db. for 4-element beams.

THOUSANDS IN DAILY USE

MATCHING. Matching of the transmission line to the beam is extremely simple and quick. Everything is furnished and the matching is automatic. No electronic equipment or measuring devices are required.

ALCOA QUALITY ALUMINUM

ASSEMBLY AND INSTALLATION. No special tools are required for assembly and installation. Entire job can be done by one man in less than an hour. Full instructions are included with each beam.

CONSISTENT PERFORMANCE

MAST. Any Gotham beam can be mounted on a simple pipe mast. Diameter of the pipe should be between ¾" and 1⅝".

QUICK INSURED DELIVERY

STANDING WAVE RATIO. A very low SWR of approximately 1.5 to 1 will result from following the instruction sheet, depending on the height above ground and the surrounding area. If an SWR indicator is available, Gotham beams can be quickly and easily adjusted to 1.1.

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.

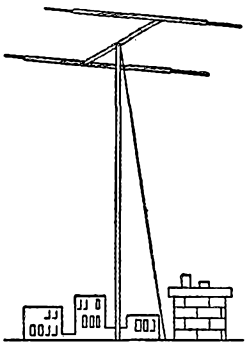
AND THE PRICE IS RIGHT!

HOW TO ORDER FROM GOTHAM

Send check or money order to GOTHAM – we ship immediately by Railway Express, charges collect.

HOW TO ORDER FROM A DISTRIBUTOR

ANY electronic distributor can order a Gotham antenna for you. Here are some of the leading distributors who sell Gotham beams: Atronic Corp., Alltronics, Amateur Radio Supply, Lew Bonn Co., Burghardt Radio, Capitol, Curle, Crabtree's, Dixie, Duffy, Evans, Electronic Distributors, Emco Electronics, Electronic Supply, Miami, Emrich, W. H. Edwards, Fargo, Ft. Wayne Electronics, Graham Electronics, Henry of Missouri and Calif., Harris, Johannesen, Kinkade, Mytronic, Melrose Sales, Nidisco, Offenbach & Reimus, Purchase, Rome Electronics, Radio Electric Service, Radio Equipment Co., Radio Parts Co., Radio Supply Co., E. A. Ross, Sacramento Amateur Radio, Specialty Distributing, Swan Distributing, Srepco Inc., Selectronic Supplies, Thurow Distributors, Tel-rad, Thrifty TV Supply, Universal, World Radio.



This Full Size Gotham Cost Only $21.95 And Brought In 87 Foreign Countries, All Continents And 30 Zones On 35 Watts!

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Enclosed find check or money-order for:

2 METER BEAMS		
☐ Deluxe 6-Element	$9.95	☐ 12-El $16.95
6 METER BEAMS		
☐ Std. 3-El Gamma match	12.95	☐ T match 14.95
☐ Deluxe 3-El Gamma match	21.95	☐ T match 24.95
☐ Std. 4-El Gamma match	16.95	☐ T match 19.95
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☐ Std. 2-El Gamma match	11.95	☐ T match 14.95
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☐ Std. 3-El Gamma match	34.95	☐ T match 37.95
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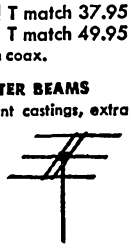
(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

NEW! RUGGEDIZED HI-GAIN 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.



☐ Beam #R6 (6 Meters, 4-El).....$38.95
☐ Beam #R10 (10 Meters, 4-El)..... 40.95
☐ Beam #R15 (15 Meters, 3-El)..... 49.95

Name.....

Address.....

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

up job on NJFN. Special net certificates will be awarded to out-of-State stations who are regular members of NJFN. VDE attended the NYC-LI Net dinner with ZI and had a fine time. The DX seeds have been sown by the BTG/YLS combine. Look out, you DXCC members, here they come. K2IPR has a new rig on 75 meters. K2ICE is back from a Florida vacation. Traffic: W2MLW 531, K2EQP 195, W2BRC 149, VDE 144, K2BHQ 112, MFF 73, W2RXL 51, K2MMM 28, W2VMX 28, K2BWQ 18, W2CVW 16, K2GIQ 16, W2OXL 14, K2SKK 14, GIF 12, W2ZVW 10, K2EMJ 9, W2KFR 9, CFB 4, NIY 2, K2RGS 2, SZO 2, OYJ 1.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—New officers of the Central High Radio Club of Sioux City are YSE, pres.; WDK, vice-pres.; KØCZQ, secy.; UJF, treas.; and KØBSK, chief op. Officers of the Fairfield High School Club are UEG, pres.; IWF, vice-pres.; KØBRE, secy.-treas.; and EAK, act. mgr. Cedar Valley Radio Club officers are YBE, pres.; DKJ, vice-pres.; WKW, secy.; CPR, treas.; LBK, NSN, NQM, KRD and KØABO, board of directors. A teen-age Novice organization has been formed in C.R. called the Cedar Rapids Brass Pounders Society. KNØHWF is chairman and HGB is secy. Starting with 8 members, Bob says that good-looking YLs between 13 and 16 are especially welcome to join. New appointments: EEJ and DZC as ECs with FMZ as ORS. FDL renewed his EC appointment. AEH, CHI and JOL worked ZE2JE on 50 Mc. CHI also worked VQ2PL. KNØIWA is a new Novice in Burlington. INO, ING and ILV are new Novices in Woodward. KJN vacationed in Florida. Hard-working PZO took top honors for traffic points this month. MG reports a total of 177 AREC members for February. An increase from 21 for last October, which shows the good job Rosy and the ECs are doing. Traffic: (Feb.) WØPZO 1678, BDR 1658, LCX 1316, SCA 855, LGG 762, CZ 330, BJP 296, GXQ 159, BLH 129, KØAAH 103, WØKVJ 89, UTD 74, LJW 65, YAL 54, QVA 46, WHE 42, KØDZX 36, WØNAY 30, FDM 27, QFZ 26, KØBEC 17, WØEHH 17, YI 17, UTX 15, ZPM 15, FMZ 14, VWF 14, KØBRE 13, CLS 13, GBD 13, WAD 13, AIC 11, WØNGS 11, CGL 9, KØDBW 9, WØWLT 8, ZPM 8, ZZF 8, UIZ 6, JPJ 5, HNE 4, SEF 3, RQW 2. (Jan.) WØNAY 69, YAL 10, KØAIC 5.

KANSAS—SCM, Earl N. Johnston, WØICV—SEC: PAH, PAM: FNS, RM: QGG. New officers of the Kaw-Blue Amateur Radio Club are CVB pres.; PAH, vice-pres.; and TOL, secy.-treas.; New officers of the Scott County Amateur Radio Club are MI, pres.; YLO, vice-pres.; KØDZF, secy.; EUP treas.; and ZUX, act. mgr. The Hi-Plains Amateur Radio Club is holding its 8th Annual Hamfest Sun., May 19th, at Plains, Kans. Christy's Picnic (sponsored by the KVRC of Topeka) will be held at Osage City May 26th. At Salina Sun., June 9, the CKRC will hold its Annual Hamfest at the usual place. JAS is general chairman. Don't forget to circle the date Sept. 20th-21st for the Midwest Division Convention at the Town House in KCK. This month we hear from the Smoky Valley Radio Club, which holds weekly drills on 1890 kc. BDK is NCS and has held drills for the past five years. The SVRC also is an ARRL affiliated club. CJI, of Arkansas City, reports lots of activity on its new RACES station and its c.d. and tornado setup. Operation is on 6 meters and CJI, KØEGQ, KØCRL, KØHIU and KØGKD are building 6-meter mobiles. The c.d. group plans on a practice drill using taxicabs, police, CAP and RACES in a simulated emergency in the near future. The Kaw-Blue Radio Club of Manhattan has the use of a fancy trailer this year for Field Day. The Wheat Belt Club is holding its Field Day at Sappa State Park near Oberlin. Traffic: WØOHJ 408, FNS 228, TOL 222, NIY 152, QGG 152, SAF 101, KØBXF 90, WØBLI 84, IFR 78, ABJ 50, FDJ 35, UOL 33, KNØHSF 31, WØICV 20, KNØHVG 20, WØONF 19, DEL 11, WWR 11, TSR 10, IHN 8, TNA 8, LIX 7, LOW 3, FHU 2, LQX 2.

MISSOURI—SCM, James W. Hoover, WØGEP—HUI, Springfield EC, called a surprise emergency drill at 1500 on Feb. 10. During roll call at 1600, twenty-two stations reported within 15 minutes. The Heart of America Radio Club publication, *NEWS*, reported the calls of 29 regularly-active stations on 6 meters in the Kansas City Area. DE has recovered sufficiently from an eye operation to be back at work. The Missouri School of Mines Radio Club has elected KØIQQ as secretary and KØCHZ as trustee. KØEAW has a new HT-19. KØBDT has a kilowatt s.s.b. rig on 20 meters. New officers of the Northeast Missouri Amateur Radio Club, Moberly, are KØACK, pres.; KØBDT, vice-pres.; KOI, secy.-treas. Meetings are held the first Thurs. of each month. JHY has completed the Navy Administration and Instructor Schools in New Orleans. KØCHZ is on 20, 15 and 10 meters while attending school in Rolla. Officers

(Continued on page 122)

A frank statement about the future in Field Engineering

At first glance, Field Engineering may not seem to possess the potential and stature often associated with other engineering activities.

At *Hughes*, however, nothing could be further from the truth.

Men who undertake the responsible task of evaluating Hughes-produced military equipment in the field are in the enviable position of becoming thoroughly familiar with the complete design and operation of the advanced electronics systems involved.

Essentially, Field Engineering embraces all phases of support required to assure maximum field performance of Hughes armament control systems and guided missiles. E. E. and Physics graduates selected for this highly important and respected phase of our engineering activities work with the armed forces and airframe manufacturers at operational bases and plants in continental United States and overseas.

The knowledge, background and experience so gained assure unusual opportunities for more specialized development in other divisions of the Research and Development Laboratories at Hughes. In fact, few openings in engineering today offer the rewards and opportunities which are available to the Technical Liaison Engineers, Field Engineers, Technical Training School Engineers, Technical Manuals Engineers, and Field Modifications Engineers who comprise the Field Service and Support Division.

Engineers and physicists selected for this highly respected phase of our activities at Hughes enjoy a number of distinct advantages. These include generous moving and travel allowances between present location and Culver City, California. For three months before field assignments you will be training at full salary. During the entire time away on assignments from Culver City, you'll receive a generous per diem allowance, in addition to your moving and travel expenses. Also, there are company-paid group and health insurance, retirement plan, sick leave and paid vacations... and reimbursement for after-hours courses at UCLA, USC, and other local universities.

E.E. or Physics graduates who feel they are qualified to join the Field Engineering staff at Hughes are invited to write for additional information about this exciting and rewarding opportunity to establish a challenging career in electronics. Write to:

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HT-32 AMATEUR BAND TRANSMITTER

$67.50 down
20 monthly payments of $33.36
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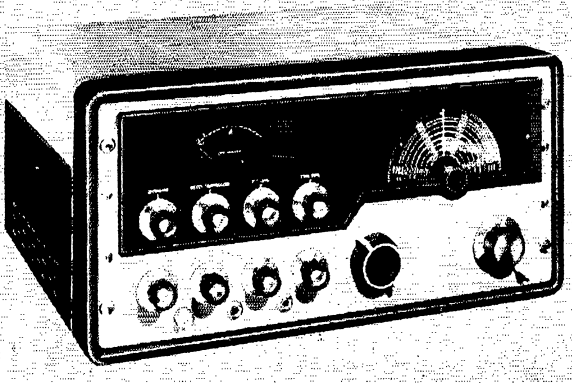

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of the Rolla Amateur Radio Assn. are NXT, pres.; RTR, vice-pres.; KØDEY, secy.; THK, treas.; FPK, trustee. VTF has a new 40-meter mobile installation. WYJ received a 35-w.p.m. Code Proficiency certificate. OMM is hospitalized, but it is reported that she is making good progress and expects to be back on the air soon. New officers of the MO-REB Amateur Radio Club are KØCXY, pres.; WYJ, vice-pres.; ex-9CA, secy.; LCC, treas. Traffic: (Feb.) WØCPI 770, GAR 642, BVL 179, VPQ 139, IJS 120, GBJ 96, OUD 95, CKQ 74, UXT 73, KIK 64, RTW 60, WYJ 45, MHS 44, IIR 32, WAP 31, YVM 31, LQC 19, EBE 16, EEE 14, HUI 14, KØDEX 12, WØECE 9, EPI 7, BUL 4, KØCHZ 1, WØGEP 1, ZHR 1. (Jan.) WØIJS 132, IIR 28, ECE 20, ZHR 12.

NEBRASKA—SCM, Floyd B. Campbell, WØCBH—SEC: JDJ. PAM: MAO. RM: MAO. Doris, SPK, is the new manager of the Nebraska 75-Meter Morning Phone Net. The net reports QNIs 281, average 11.2, QTCs 46, average 1.8, duration 443 minutes, average 15.8 minutes. KØBFS (AAFBSF) would like to arrange a sked with a YL in Nebraska. She can work all bands phone, c.w. or s.s.b. Report from Western Nebraska Net: 24 sessions held. QNIs 317, average 13.2, QTCs 22. KNØHUF is using a vertical antenna. FQB is a member of the Ham-butchers Net (7185 kc.). Art is on 7- and 29-Mc. phone. FQB is installing a WRL trap antenna for all bands, and with the station located in the fire station ham activities depends on the business at hand. KØAKR is running a code class with 8 students. BTG now has both phase modulation or a.m. in his 6-meter rig. A new call at Scottsbluff is KNØIIV using a Globe Scout and an RME-45. KØDZG and KØGJR have dropped the "N." NSS reports QNIs 127, average 4.5, QTCs 26, average 1, duration in minutes 1195, average 43. Roll call is 15 members. 75-Meter Emergency Phone Net: QNIs 661, average 23.6, QTCs 81, average 2.9, duration 689 minutes, average 24.6. Roll call is 51 members. KØDGW received his Army MARS ticket. MAO received his 2500 Traffickers Club certificate. Traffic: WØMAO 152, KØDGW 145, WØZJF 116, SPK 51, ZOU 40, PQP 35, KDW 31, BOQ 30, KØCDG 28, WØZWG 27, NIK 20, ERM 18, KNØHUF 18, WØPDJ 16, KNØIWS 14, WØLJO 14, KØBRS 11, BRQ 10. WØDQN 10, BTG 8, ORW 8, NHT 7, UJK 7, FBY 5, HOP 5, KØDFO 4, WØKLB 4, KØELQ 3, FBD 3, WØAQQ 2, BSB 2, EGQ 2, IAY 2, NGZ 2, VGH 2, KØAKR 1, CYN 1, WØZWF 1. (Jan.) WØZWG 31, ZWF 3, KØAKR 2.

NEW ENGLAND DIVISION

CONNECTICUT—Acting SCM, Victor L. Crawford, WITYQ—SEC: EOR. RM: KYQ. PAM: YBH. Traffic Nets: MCN, Mon.-Fri. 0645 on 3640 kc.; CPN, Mon.-Sat. 1800, Sun. 1000 on 3880 kc.; CN, Mon.-Sat. 1845 and 2200 on 3640 kc. CTN, Sun. 0900 on 3640 kc. New officers of the Milford Amateur Radio Club are KUN, pres.; CRG, vice-pres.; UWU, secy.; JBK, treas.; LLM, comm. officer. The members are building 6-meter rigs as a club project. The early birds on MCN met 19 times during February, handling 123 messages. Mainstays were BVB, RFJ and IBE, reporting 18 times, while JLZ made it 17 times. YBH reports CPN met 28 times, handling 231 pieces of traffic for an average of 8.3. QNI honors go to DHP and TVU, 28; HID, 27; VQH and YBH, 26; VIY, 25. KYQ reports a good month for CN with the early session meeting 24 times, handling 339 messages with an average QNI of 10.2 stations per session. The late session also met 24 times and handled 98 messages with a QNI average of 6.6. High QNI goes to GVK, 43; EVH, 38; RGB, 28. Congratulations to AW, who made BPL again this month. WKW made WAC and WAS. WHL is running code and theory classes Wed. evenings at the Hamden Amateur Radio Club. HCZ has an 829B on 6 meters. BDI is tasting some DX with the new 14-Mc. beam. EJH has a new QTH in Bridgeport. Congratulations to FYF and DHP on receiving Inter-State Phone Net certificates. WN1MDB, whose big brother is DHP, made RCC and YLRL. KUO has a new DX-100. WHO is on s.s.b. with a B&W KW and a 3DZZ beam. WN1ULZ dropped the "N" before going to Libya with the Air Force. BYX is setting up TV on 430 Mc. ULY spoke on Amateur Radio at the Rockville Exchange Club. OES reports were received from FVV and SUZ. RAN, ex-DL4II, is back and eager for some contest work. OO reports were received from AMY, BVB and DHP. ETF is getting ready for TV on 442 Mc. Why don't you get together with BYX. New appointments: ECH as ORS, CUT as OES, EKJ as EC. Renewals: ADW and RAN as ORSs. ADW, HDQ and RRE as ECs, LIG as OPS. AMY is making CN and ESN nets a habit. Connecticut has a net to suit your mode of operation (phone or c.w.) at a time to fit in with your daily schedule. New officers of the CQ Radio Club of Torrington are KXB, pres.; TMO, vice-pres.; YOG, secy.; FHP, treas.; JJL, HQM and KN1AQE, trustees. Meetings are held in the new

(Continued on page 184)

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Hallicrafters new HT-32 is a complete table top, high efficiency amateur band transmitter providing S.S.B. AM or CW output on 80, 40, 20, 15, 11 and 10 meter bands. This unit incorporates two new exclusive features in S.S.B. generation techniques.

First is a high frequency crystal filter which cuts unwanted sideband 50 db. or more. Second is a newly developed bridged-tee modulator which is extremely stable. These and other features make the HT-32 the best transmitter buy on the market today!

FEATURES:

- 144 watts plate input (P.E.P. two-tone).
- Six band output (80, 40, 20, 15, 11-10 meters)
- All modes of transmission—S.S.B., AM, CW
- Unwanted sideband down 50 db. or more
- Distortion products down 30 db. or more
- Carrier suppression down 50 db. or more
- Both sidebands transmitted on AM.
- Exclusive Hallicrafters patented sideband selection.
- Rugged heavy duty deluxe construction.
- 52 ohm pi network output for harmonic suppression.
- Logarithmic meter for accuracy tuning and carrier level adjustment
- Ideal CW keying and break-in operation
- Full voice control system built in

TUBES AND FUNCTIONS:

- 2-6146 Power output amplifier
- 6CB6 Variable frequency oscillator
- 12BY7 R.F. driver
- 6AH6 1st Mixer
- 6AH6 2nd Mixer
- 6AH6 3rd Mixer
- 6AB4 Crystal oscillator
- 12AX7 Voice control
- 12AT7 Voice control
- 6AL5 Voice control
- 12AX7 Audio Amplifier
- 12AU7 Audio amp and carrier oscillator
- 12AU7 Diode Modulator
- 12AT7 Sideband selecting oscillator
- 6AH6 4.95 Mc. Amplifier
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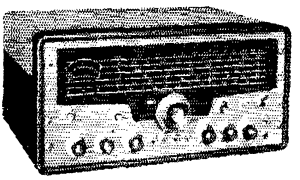

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Hallicrafters new SX-101 is the complete answer to ham reception . . . incorporating every essential feature needed for today and wanted for the future.

Look over the feature "extras." Hallicrafter's quarter-century of leadership and experience now makes it possible to put them all in one model.

First, it is built like a battleship. Big . . . rugged, the SX-101 utilizes the heaviest chassis in the industry. Second, and equally important . . . it's an amazing marvel of stability. In fact, the SX-101 is so stable, it is designed to out-perform any other model in the market today.

FEATURES:

- Complete coverage of seven ham bands — 160, 80, 40, 20, 15, 11—10 meters
- Band-in-use individually illuminated
- Dual scale S-meter
- S-meter zero point independent of sensitivity control
- S-meter functions with A.V.C. off
- Special 10 Mc. position for W.W.V.
- Coverage of most important M.A.R.S. frequencies
- Local oscillator output available for use in heterodyne V.F.O.
- Tee-notch filter
- Full gear drive from tuning knob to gang condensers — absolute reliability
- 50:1 tuning knob ratio
- Built-in precision 100 kc evacuated marker crystal
- Five steps of selectivity from 500 cycles to 5000 cycles
- Sensitivity — one microvolt or less on all bands
- Antenna trimmer
- Relay rack panel
- 14 tubes plus voltage regulator and rectifier

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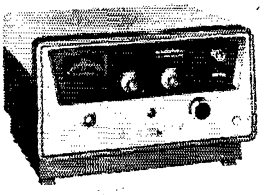

HT-33 LINEAR KILOWATT AMPLIFIER

Hallicrafters new ultra-compact HT-33 is the only kilowatt amplifier to employ *extra-safe, extra long life* ceramic power tubes. They're rugged, assure a consistently higher performance, as well as provide extra safety under overload conditions.

See the HT-33, look at its clean table-top lines, compactness, then put it to work. You'll know immediately why this new linear kilowatt amplifier is in a class of its own.

SPECIFICATIONS*

Power Input.....1000 watts S.S.B. and C.W. 700 watts A.M.
Power Output S.S.B....625 watts P.E.P.
Power Output C.W....575 Watts
Power Output A.M....285 carrier with D.S.B.
Drive Power S.S.B.....8 watts P.E.P.
Drive Power C.W.....6.5 watts
Drive Power A.M.....6.0 watts

*These are production performance data not just taken from tube manuals, but actual measured values.

FEATURES:

- Six Ham Bands—80, 40, 20, 15, 11-10 meters
- Pi-network output system for high harmonic suppression
- All control leads filtered
- Full metering of all important circuits
- Built-in power supply
- 52 Ohm coaxial output
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CIRCUIT DETAILS:

This power amplifier employs two ceramic 4CX300A power tetrodes operating Class AB1. These new rugged, low inductance tubes assure high efficiency and excellent stability. The grid circuit is designed for 52 Ohms input and is condenser tuned. Band switching is by one knob which simultaneously selects the proper grid coil and plate tank inductance. **$775.00**

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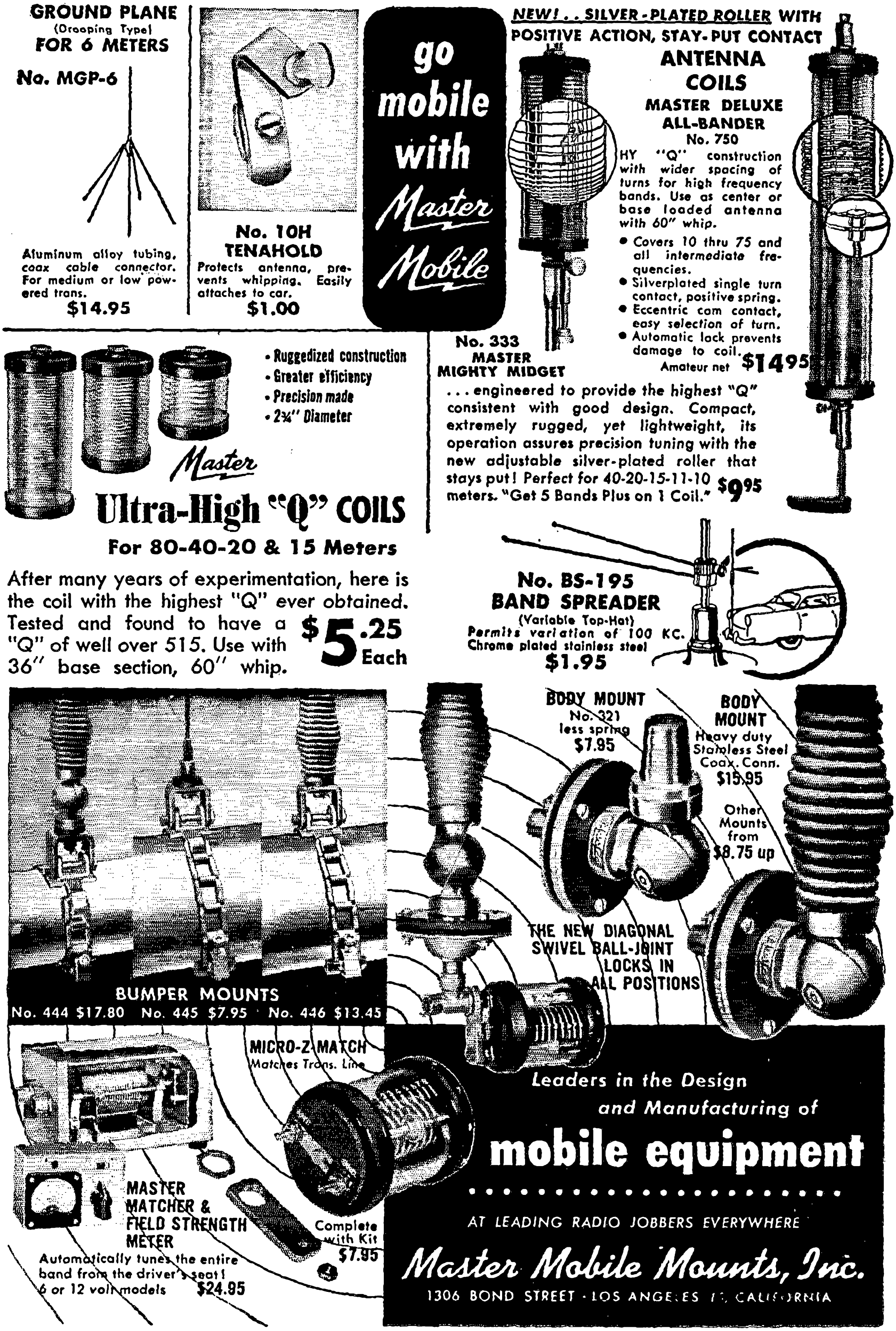
club rooms leased to the club rent-free by the City of Torrington in recognition of service performed during the 1955 flood and recent snow and ice storms. Traffic: W1AW 444, FYF 352, EFW 322, TYQ 265, YBH 264, KYQ 256, CUH 252, RGB 209, HID 184, GVK 159, BDI 121, AMY 109, DHP 108, RFJ 83, BVB 82, LV 69, ULY 50, AVS 37, IUC 24, GEA 23, EKJ 17, VIY 16, FHP 7, YOG 7, WN1MDB 5, W1HYF 3, EJH 1.

MAINE—SCM, Allan D. Duntley, W1BPI/VYA—Asst. SCM: Oliver R. Hamlin, 1WRZ. SEC: TVB. PAM: FNT. RM: EFR. OOs: WRZ, CBU and TVB. The Barn Yard Net meets Mon. through Sat. at 0800-0930 on 3960 kc.; the Sea Gull Net meets Mon. through Sat. at 1700-1800 on 3940 kc.; the Pine Tree Net meets Mon. through Sat. at 1900 on 3596 kc.; the Horse Traders Net meets Sun. at 1600-1700 on 3940 kc. More and more mobiles are heard on the band—it must be the warmer weather. NVF, the XYL of FCS, has had her ticket for a long time but we neglected to mention it before. VXU is keeping daily skeds with P.O.C. There are getting to be a lot of K1 calls on the band. Congrats to them all. IZS has lost the "N" and is giving VYA competition in Casco. Go on c.w., Bart, I won't bother you there. Let's see you all at the gala hamfest in Augusta on June 16, 1957. Calumet Club is the spot. Augusta Radio Club the sponsor. HKZ is back on the air with a TBS-50. MFU is operating 2 meters from Holden Mountain. Listen for Bob. CBU also is working 2 meters. QCC moved to Nova Scotia and is doing well on the high frequencies. K6MPJ/1 is running the legal limit on s.s.b. EPN is keeping Presque Isle well represented on the nets. ZEN is looking for net controls on the Barn Yard Net. Traffic: W1LKP 352, CEV 92, FNT 76, BCD 31, UDD 23, EPN 17, BDP 13, CBU 10, BX 9, HGI 8, FZK 7, RJE 7, OTQ 6, FLV 5, K2KVP 5, W1BZF 4, FNU 4, HZZ 4, KFY 2.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointments: WN1KCR as OES; QQL Radio Officer Sector 1-F, SHV Lynn, PSG Gloucester as ECs; DLF as OO. Appointments endorsed: NF, RQZ, AVY and TVZ as OOs; IBE Rockport, IPZ Shirley, ADM Canton, MME Hull, MRQ/CHA Groveland, MMQ Milton, HRY Wellesley, TVZ, Hopkinton as ECs; AQE, AOG, TY, NBS and MRQ/CHA as ORSs; AOG as OES. AVY, MME and ZQM as OBSs; MME and RP as OPSs; AQE and EPE as RMs; EPE as PAM. We are sorry to have to report the death of MUM of New Bedford. AKC is going on 220 Mc. NXK is on 10 meters. DTB is on the air again. KXW is new in Braintree. EYK is on the air some. Heard on 2 meters: K4DUN/1 Saugus, K2CCI/1, KNs AIM and AIC and MV, NQQ, ZVI and LUT. On 6 meters: K1ALB and AWZ and W1s AHH, CZO, EAH, EAJ, FEY, FGS, FRR, GGI, HHV, HJY, HTU, IRV, RCJ, RFN, AOG, ZKT and GRT. AJI is recovering from a serious operation. HOL is back on at a new QTH in Newton. FOS is mobile. K2OTO/m/FNQ has a halo for the car. 4YHO/1m works at Harvard. 2BAV/1. Melrose, is back on after 10 years, GRT has a 6N2, THO has another car and will be mobile. TXZ, 1PA, TQP, ALP, QQL and ZYX were at a meeting of Area 1 Radio Comm. KTG is much better after an illness. NF, one of our active OOs, suggests the following: "Give and request HONEST reports." The GBARS held a meeting and SAD spoke on TVI preventive measures. HLF and MAC joined LQQ's AREC group. FAA now is in ET2-Land. LQQ has WN4 and needs 2 counties for WANE. NLU has a new three-element beam for 10 meters. NVB has gone s.s.b. KN1ACM is PSG's XYL. They are on 2 meters. BL, ALP, SE, EX and KO attended the Winter Dinner of the QCWA at Providence. BPW made BPL and still is working DX. On 160 meters: DHE, JJS, DBE and TUD. FJJ has a DX-35 and a v.f.o. HQ-100 and applied for ORS appointment. TZ was on jury duty for a month. AKN will have a rig on 10 meters in the car. DPO is on 10 and 15 meters. ETH lost a transformer in his DX-35 but is on with a v.f.o. MCJ has a Heath AR-3 and a DX-35 with a QF-1 and has a rig for 2 meters. A special meeting was held in Boston by the Boston Metropolitan Chapter, Red Cross Disaster Communications System. IPA is vice-chairman and would like to hear from any amateur in this vicinity who would like to join them. ALP attended the meeting. SPL, SNR and Mr. Lansman gave a demonstration at the GBARS of Tapetone Converters for 6 and 2 meters. KN1ADA is on 15-meter c.w. The T-9 Club met at RCA's QTH. TVZ is Radio Officer for Hopkinton. The Braintree Radio Club held its regular meeting. AKY was auctioneer at the South Shore Club. AVY, HWX, RHZ, AZU, KHV, FVD, ALP and WK have built the Monimatch in Oct. and Feb. *QST*. AVY and HWX have a Wonder Bar 10-meter antenna. HWX is in the Navy. MHN cleaned up his rig with new tubes and parts. RHZ has a Valiant and a 75A-4 Collins receiver. HBW and his XYL are doing a nice job on 10-meter phone

(Continued on page 126)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For 80-40-20 & 15 Meters
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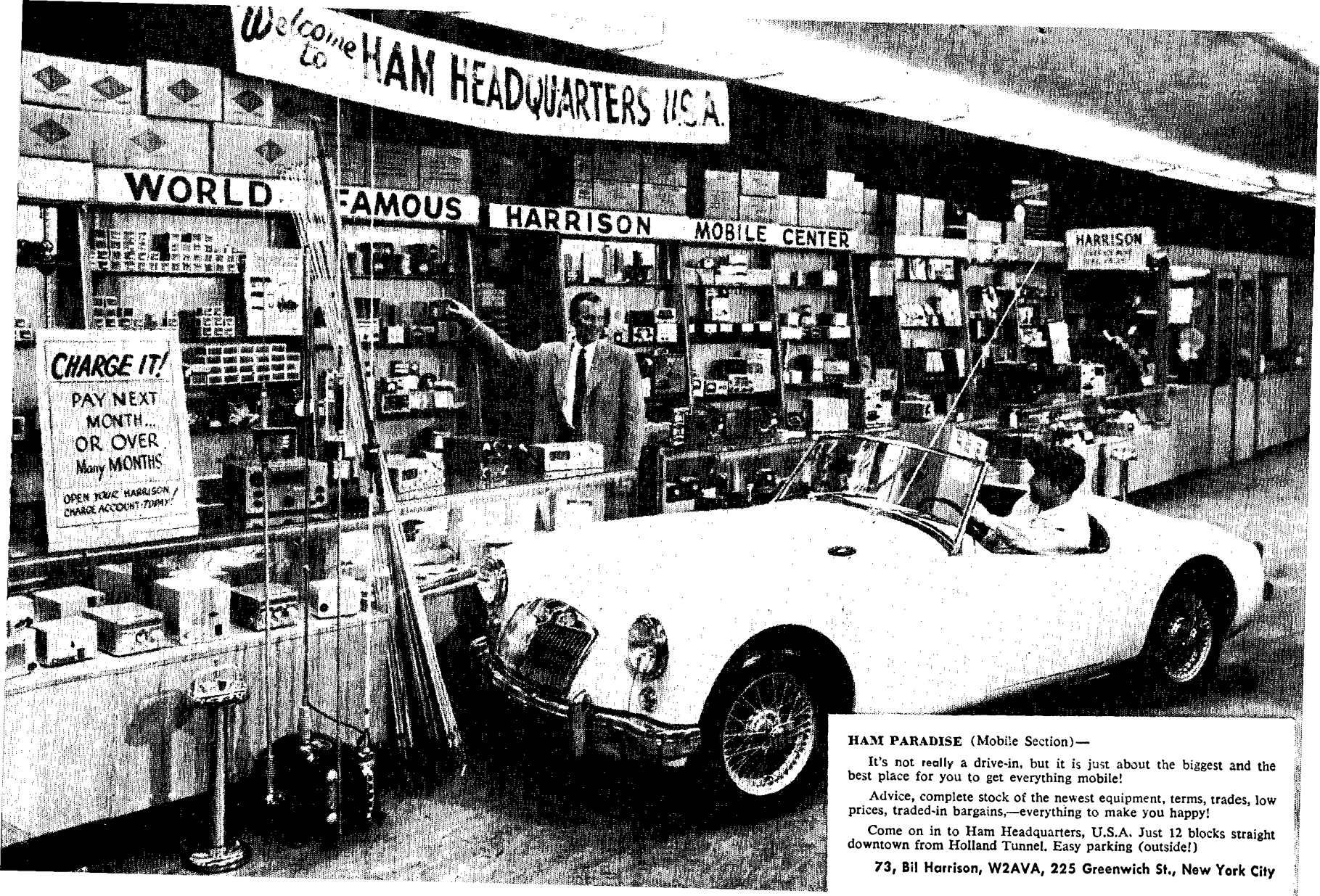
with a DX-100. Technicians at the c.d. plant are LAZ, CTZ, DIR, ZFS, CNT, CZW, UQH and UID. MB, our EC for Scituate, renewed his appointment. Sorry to have to announce the death of EGD. The Quannapowitt Radio Assn. had Mr. Hallenstein as a speaker at its last meeting. The North Shore Radio Assn. had an auction. The Eastern Mass. Federation of Radio Clubs has 9 clubs signed up. Write to JLN if your club is interested in joining. HFJ is back on the air. SMO is active up on Mt. Wachusett and met IAO. PIW has a crystal Conelrad alarm. QMU is building a 6-meter rig. SXD is making a pair of 6146s for 2 and 6 meters. LMU visited LYV, UG, LVN and CMT. CMT has an 829 on 2 meters. NEM changed jobs. AGR has retired. TJW is working in Waltham for Raytheon. I hear MEV is back in this section. ALP spoke at the South Shore Club on the ARRL and GOU talked about DXCC and showed his collection of QSL cards. The Framingham Club had a film on "Automation." FRR and QVK have a Novice class going. Winthrop c.d. drills are being held with good attendance and a 6-meter Gonset. YYI and VIN are active in c.d. work in Carlisle. New officers of the Hingham Amateur Radio Club are ONV, pres.; VM, vice-pres.; GRX, secy.-treas.; IGH and ZXG on the planning board. New officers of the Harvard Wireless Club. AF, are KØBIB, pres.; 3FCS, secy.-treas.; 1ARU, station mgr.; IVGX, chief operator. Traffic: W1EMG 380, BPW 320, EPE 302, GNX 110, EAE 105, AVY 88, TY 38, BY 32, AOG 23, FJJ 22, WU 20, LDK 13, SMO 12, TZ 9, AKN 3, DPO 2, AUQ 1, ETH 1.

WESTERN MASSACHUSETTS—SCM, Osborne R. McKeraghan, W1HRV—The WMCW Net meets on 3560 kc. Mon. through Sat. at 1900 EST. The West Mass. Phone Net held its first session Mar. 6th at 1800 EST on 3870 kc. Ten stations reported in with very good coverage of the section. The Hampden County Assn. enjoyed a fine talk on IGY by Mason Southworth at the March meeting. The HCRA boys are laying plans for an all-out effort on Field Day. The Berkshire County Assn. has had some fine speakers at its recent meetings, all local talent, too. FZY, IN Athol, has been appointed ORS. JJO has been appointed OES and OO. LDE made BPL again. EOB worked OH2AA for No. 174 and is holding down Wed. net control on EAN. K1AZS, a newly-licensed blind ham in Northampton, is operating a DX-100, an HQ-129X and a ground plane antenna. DWA is back on WMN again after a long layoff. AGM still is working his favorite band, 11 meters. WPW is back on 80-meter c.w. after a sojourn in v.h.f. regions. The Horsetraders Net, every Tues. at 1930 on 50.1 Mc., has been meeting for over 20 years. RFU is currently net control. JJO has an HRO-60. STR has acquired a Telrex beam. ALL has a new Ranger on the air. GYM has been a net control on the Eastern States Net. VSR is ready to go at his new QTH with a tower and three-element beam. CBR, DQX, FDK, HPA, IW, JDB, UEY, UIS and UUJ, all of the Berkshire County Club, paid a visit to the Albany Amateur Radio Club recently and had an enjoyable evening with the W2 boys. The Greater Worcester Phone Net frequency has been changed to 29,200 kc. to avoid conflict with the Worcester C.D. Net, which has been reactivated by VHN. The G.W. Phone Net also plans 6-meter operation. KN1AWT is a new Novice in Chicopee Falls. JKD has a new Valiant. WN1AGL has a DX-100. NPL has a new beam rotator and has been active giving Novice exams. Traffic: W1LDE 953, DLS 296, BVR 157, UEQ 156, FZY 104, DWA 47, EOB 45, TAY 37, DGL 34, DVW 34, MNG 21, AJX 14, DZV 14, RWR 13, AGM 5, HRV 4, JYH 4.

NEW HAMPSHIRE—SCM, John A. Knapp, W1AIJ—SEC: BXU. RMs: CRW and COC. PAM: CDX. The GSPN now meets at 1900 on 3842 kc. Mon. through Fri. and at 0900 Sun. NHEN meeting time is Sun. at 1300 on 3850 kc. NHN is on 3685 kc. Mon. through Sat. at 1900. KKT demonstrated an amateur radio set-up for a Boy Scout Troop in Milton. CDX reports that Amateur Radio Club 73, an informal group in Portsmouth and environs, at the request of the Civic Theater Management, set up an amateur radio station in the lobby Feb. 22 and 23 for the purpose of handling messages to the general public. A good stack of messages was cleared. Operators were POK, WHI, GJM, YDX, CDX, GHV and UEB. WN1MEL reports a new net, not restricted to Novices, named the Fifteen Hundred Club, which meets Sun. at 1500 on 3725 kc. Our PAM's jr. operator, Bruce, is now KN1BAW. Welcome to the Franconia Radio Club, K1AHE, pres. Certificates for OPS go to DYE and GJM, who also is a new ORS. Welcome to the following new hams: KNs ABM, ABY, ACX, ADG, AFH, AFY, AGO, AGU, AJD and AKG and K1s AEG, AEJ and AHV. The Concord Brasspounders, at its Feb. meeting, enjoyed a talk and demonstration on model airplane radio control by SSK and Ed Hunt. Traffic. (Feb.) W1GJM 110, SAL 64, CDX 25, ENM 23, EVN 15. (Jan.) W1BYS 8.

(Continued on page 128)



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RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ. PAM: YNE. RMs: BBN and BTV. Section Nets (all Mon. thru Fri.): RIN on 3540 kc. at 1900; RINN on 3743 kc. at 1830; and RIIN on 29,260 kc. at 1930. New appointments: VSZ, IHW, POP, BTV and VZP as ECs and K1ABR as OBS. Endorsements: YAO as ORS and TBY as EC. ECs are requested to submit their reports to PAZ by the third of each month. The BCRA sponsors code and theory classes each Tue. evening with NCD, ISE and DHG as instructors. Results of the recent ARASNE, Inc. election: WAC, pres.; WN1LFW, vice-pres.; GHT, secy.; LQG, treas.; and EJ, trustee. The PRA will hold its 36th Annual Dinner Dance at Rhodes-on-the-Pawtuxet on May 18. GBO, who recently marked 25 years with this call, now is using a Globe Champion on several bands. On Mar. 5th members of the BCRA visited the studios and transmitter of WPRO. ZXA is going RTTY. LU is rebuilding his rig for all bands and will be back on the air by spring. Welcome to new General Class licensee K1AZR. It is good to note an increase of participation in the monthly LO parties by Rhode Island LOs. Traffic: W1BTV 138, YKQ 78, VXC 58, BBN 48, CMH 37, TGD 18, HLY 10, KDS 8, YRC 7, ZXA 5, CCN 4.

VERMONT—SCM, Mrs. Ann L. Chandler, W1OAK—SEC: SIO. RM: BNV. PAM: SEO. Nets: VTN, Mon.-Sat. at 6:30 P.M. on 3520 kc. VTPN, Sun. mornings at 9 on 3860 kc. GMN, Mon.-Sat. at 12 Noon on 3860 kc. JLZ is liaison between VTN and GMN each evening, which speeds up distribution of traffic on the noon net. AVP has been doing a fine job reporting ARRL Official Bulletins to phone nets as OBS. New appointments: BNV and GAE as ORS, VVP as OPS. UFZ's OBS appointment has been endorsed. The BARC held a swap night at TLI's and CML's on Feb. 23. The Rutland Radio Club has an encouraging crop of young license holders and aspirants. The Middlebury Mike and Key Club showed colored slides through the courtesy of Owen Perry, who was with Task Force 43 as chief electronic electrician. 9BWU/1 and 4HYI, both of EAFB, are leaving for new stations in Duluth, Minn. YFL is with the Army in Hawaii. MH went South for a trip. SDG has a new Gonset on 6 meters. EXZ enjoyed the DX Contest using a 50-watt mobile rig working 10 countries on 10 meters. During the first week end of the c.w. DX Test UGW worked such new ones as KR6, KX6, OQ5, CR6, FS7 and ZS3. BXT has a new SX-100 receiver. ZJL has a new Tecraft CC5-144 kit working swell and using IMK's Heathkit AT-1 on 3.5 Mc. and 10-meter phone. IMK purchased ZJL's CC3-144. UWS will be on phone again using his TBS-50-D. PWB is the second to go s.s.b. in St. Johnsbury on 75 meters using a Central Electronics 10B SSB exciter driving a pair of 813s and a 500-watt final. JBN, stationed at USNR Training Station in Burlington, operates K1NAG. NLO, from WJOY, and QNM, from WDEV, relayed the basketball tournament games from Barre via their respective BC stations. SPK is on 2 meters with six watts, also mobile on 148.1 in CAP. MMVs latest are CR4AS, FP8AP, CR5SP, VR3G and PJ2MC. We are sorry to report the passing of RLS of Newport. Traffic: (Feb.) W1JLZ 101, ZYZ 87, OAK 62, AVP 50, KRV 41, BXT 40, BNV 31, ZNM 20, ELJ 18, ZEW 17, KJG 14, VVP 6, ZJL 3. (Jan.) W1VMC 3, TXY 1, UGW 1.

NORTHWESTERN DIVISION

ALASKA—SCM, Dave A. Fulton, KL7AGU—UM received the first WAZ award in the territory after nine years of hard work. W9KLD/KL7 is now on from the Arctic Coast with a kw. to a 4-1000A and a 51J4 receiver and three-element beams on 20 and 10 meters. W9ACC, W7QYV and W1KPH are also at the same QTH. KLD/KL7 was up to 41 states and 30 countries in the first two-and-one-half weeks of operation. Any of you DX hounds for a trip to the Arctic Coast this summer? Another bad accident south of Anchorage found BJD/mobile on the spot to handle communications with PJ on the Anchorage end. Now that summer is upon us we find the mobile activity on the upswing. S.s.b. stations in the Anchorage Area are on the upswing. CP gave up his 20A for a new Pacemaker pushing a kw. Yours truly went on with s.s.b. about the first of the year with about 400 watts. AZI and MS hope to join the sidewinders soon. Traffic: W9KLD/KL7 6.

IDAHO—SCM, Rev. Francis A. Peterson, W7RKI—The Idaho C.D. Net will tell when to apply for new ham license plates. The Nampa Club has voted for ARRL affiliation; the Lewiston group is planning the same. Write the SCM for information for your club. The Nampa bunch sponsored the first mobile breakfast with 27 mobiles there. The Pocatello Club is starting a class especially for hams' wives. They also have new jackets for meetings and c.d. drills. *Ham Hill News* printed an FB 2-meter f.m. circuit. WN7HWR is a new

(Continued on page 130)

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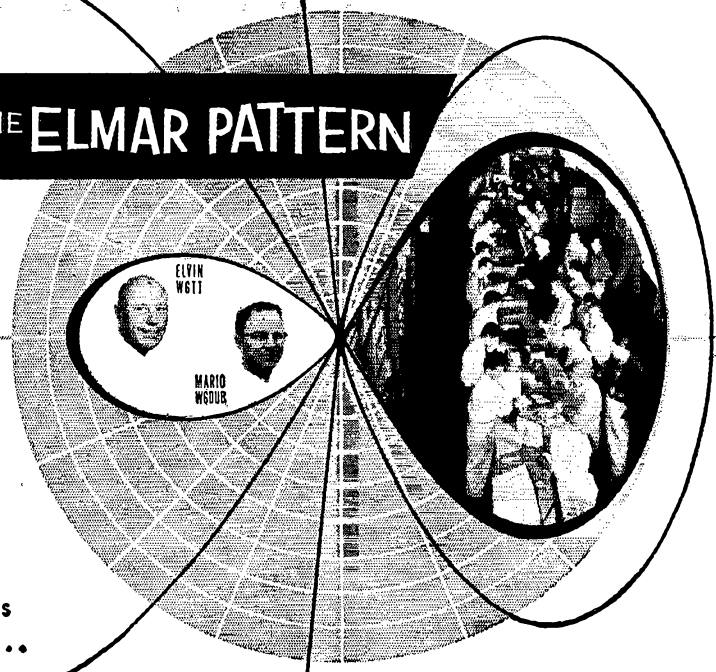

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Power supply/modulator is arranged as a separate unit to permit mounting in trunk or other available space.

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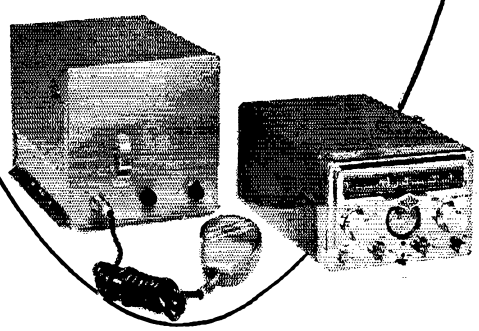

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Novice at Kellogg. GMC finally finished the mobile. FBD, in Burley, has 176 DX countries. BGP keeps his sanity with ham radio on snow-covered Mt. Kinport. LEJ ordered a Valiant. WBK glued his rig back together. DWE reports lots of new Wonder Bars. RSP still is stuck in the mud. LQU and PCP are proud new parents. YBA worked Iowa on 40 meters with one transistor. RKI has a transistor transmitter and a receiver for 80- and 40-meter phone and c.w. Traffic: W7GMC 231, VQC 42, WHZ 6.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WXI—SEC: KUH. The Electric City Radio Club is conducting classes for about fifty prospective amateurs. HEM is chief instructor. The ECRC holds hidden transmitter hunts on the first Sun. of each month. BOZ confused the group by using a handie-talkie and roller skates as the hidden mobile. New calls: HBT in Laurel and N7HHK at Joliet. New Conditional Class license: DWM. N7DOV moved from Livingston to Butte. IXD is on 80 and 40 meters with RTTY. SMY built a multiband mobile for his brother, FUY. CTM has a home-made 7-watter in his gas station. SFK is getting "Woods' Navy" out of dry-dock and is installing radio gear. Other new gear: HBT has a Hart 75, QGJ a DX-35, WUJ a DX-100, HAH a Viking Valiant, OOG a Viking Valiant and ED a KWS-1. Recent appointments: RSK and SEW as Emergency Coordinators. Traffic: (Feb.) W7SFK 48, BPG 20, NPV 13, YCQ 9, OOY 5, YPN 5, TPE 4, BKB 3, DWJ 2, EEO 2, EUQ 2, FTD 2, MQI 2. (Jan.) W7MQI 12.

OREGON—SCM, Edward F. Conyngham, W7ESJ—LT has had his working hours changed so that Thurs. and Fri. now are free. This makes a change in his operating schedule. JCJ is compiling a new Oregon call book. OMO has just returned from the hospital but still can't go up or down stairs, so has moved the rig to the ground floor. HDN is due to make a trip to the hospital and will be off for a short period. VIL has a new 2-meter station going, working around town and into Ashland. His next project is an emergency c.w. generator rig. YUY renewed his ORS certificate. YG, the Iota Tau Kappa Fraternity, renewed its OBS certificate. The chief operator is EYX, an old-time Navy operator with whom this SCM has worked from 1934 to 1943, Bremerton to Balboa, Panama. PQJ has been doing a lot of frequency measuring for some MARS boys not so well equipped for the task. ADX got out his BC-221, also FPD, SMR and ESJ. TMI, BJI, UZU, LT, SMR, NGW, WAA and others were out and after the CP runs. TLC is getting in his licks at the traffic business and the OBS job. He built a new antenna-matching unit and improved his ground system. WHE has modified the GP7, going on 160, 80, and 40 meters. His best DX on 160 meters was 5SOT. Traffic: (Feb.) W7TLC 487, ENU 115, HDN 70, LT 57, OMO 51, BVH 32, HJU 15, OLU 15, VIL 14, YUY 12, JCJ 2. (Jan.) W7TLC 537, ENU 81.

WASHINGTON—SCM, V. S. Gish, W7FIX—At its Tenth Annual Banquet the Valley Amateur Radio Club (Puyallup) elected the following officers for 1957: MPH, pres.; OIV, vice-pres.; QJC, secy.; OEB, treas.; WN7FQD, sgt. at arms; JJK, trustee. A history of the club was given by UZE and color movies were shown of 1956 highlights. PUA and CMQ returned from a trip to Fort Ord. OIV and MCU visited LHL, where they heard tapes on meteor bursts and tropospheric propagation. The Bremerton Hamfest is scheduled for May 4. PGY still is QRL with a new shack. WAH reports he was relieved as acting manager of RN7 on Mar. 1 by GMC. AIB now is affiliated with the local AREC and has liaison arranged with WQD for exchange of traffic between WARTS and WSN. USO reports the Clarks County Amateur Radio Club purchased and installed a Viking Ranger and an RME-4300 with all-band antenna at Red Cross Headquarters. AMC is back on 10 meters after four years on other bands. BXH is going up for 2nd-class phone and telegraph license and then 1st-class telegraph. EHH reports ALN is polling members on a six- instead of a seven-day net, as at present. ZFY had fun in the C.W. DX Contest but his quad blew down in the middle of the first c.w. portion. CWN is finding a lot of the old-timers on MARS nets and is looking for a GOOD receiver CHEAP. YFJ has finished the DX-100 and is trying it out on the air. AVM reports the Grays Harbor Amateur Radio Club is quite active. HDT reports from Clarkston that PSL is building a kw. final, PKR is getting to be a "rock hound" and UJA is going high power and has a BC-221. KHL was off the air while undergoing surgery at Marine Hospital. K6BDF/7 is QRL night school. SWA and family are back in Puyallup after working for Hughes Aviation at Laguna Beach, Calif. MCU is working on 3-centimeter gear for the June V.H.F. Contest. VARC is going out to break all records in the coming Field Day. Your SCM had a letter from G2BYA, who is coming to Seattle to work

(Continued on page 132)

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5-band coverage from 150 KC to 23 MC, and operation on 115V AC-DC or batteries briefly sums up this new, versatile 4-way receiver. Use it as a 3-way portable, SWL, Ham, or Marine receiver . . . indoors or out. It has electrical bandspread with logging scale, fixed tuned CW oscillator, two built-in antennas (ferrite loop for DF and BC bands, whip for SW), phone jack, 5" PM speaker, and special marine band from 150 kc to 400 kc. Housed in sturdy, two-tone metal cabinet, chrome trimmed, and with carrying handle. 12-5/16" W, 9-11/16" H, 10" D. Wt., 16 lbs., less batteries.

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Dollar for dollar the most remarkable communications receiver ever produced. Sensitivity and selectivity place it in the really "hot" class. Continuously tunable from 540KC to 30MC. Electrical bandspread tuning with unequalled direct dial calibration. Q-multiplier permits continuously variable selectivity for all operating conditions. Sensitivity: 1.75 microvolts produce 10 to 1 signal-to-noise ratio. Voltage regulated and temperature compensated. Auto-Response automatically adjusts audio response to fit receiving conditions. 10-tube circuit with automatic noise limiter. Seven tuned circuits in two stages of IF. BFO variable from zero to ±4kc. With "S" meter. 16¼" L, 9-7/16" H, 9⅛" D. Wt., 30 lbs.

HQ-100—Receiver .....Net **169.00**
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6x9" Matching Speaker..Net **14.95**

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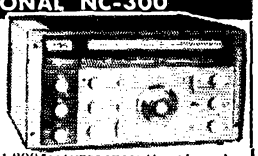
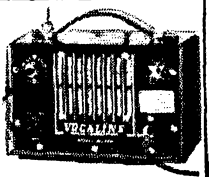


National NC-300 features exceptional sensitivity (3–6 db noise figure on all amateur bands). Has 10 dial scales for coverage of 160 to 1¼ meters; 3 position IF selector provides super selectivity, gives optimum band width for CW, phone, phone net or VHF; separate linear detector for single sideband; giant, easy to read "S" meter. Muting provision for CW break-in operation, and a host of other outstanding features that make the NC-300 the "dream receiver" of every ham.

NATIONAL NC-300 — Complete. **399.95**

VOCALINE RADIO TRANSCEIVER Model JRC-400



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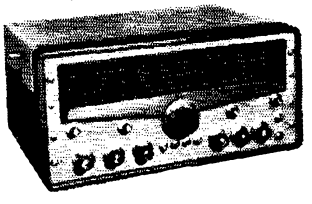

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for Boeing. Traffic: (Feb.) K7FEA 1012, W7BA 1008, PGY 980, VAZ 636, FRU 481, K7WAT 388, FBN 227, W7WAH 151, JC 71, ER 56, FZB 42, AIB 41, APS 40, USO 36, AMC 31, BXH 29, JEY 23, EHH 21, LVB 20, WQD 18, RXH 14, WLK 8, EVW 5, ZFY 3. (Jan.) K7FAE 614, FBN 198, W7WLK 12.

PACIFIC DIVISION

HAWAII—SCM, Samuel H. Lewbel, KH6AED—AIW, who was the Assistant Director for Hawaii, left for a two-year job in Chile. Bruce promised to get on the air as soon as he finds a ham shack. After that he will look for a place to live. The Honolulu Amateur Radio Club runs a code practice transmission Tue., Wed., and Fri. evenings on 3970 kc. starting at 2000 HST. CEX, OS and AED are currently making the transmissions. IJ is now on 2 meters with his new 6N2 rig and worked Honolulu with it using a TV Yagi antenna. No reports were received from the neighboring island clubs this month. Traffic: (Feb.) KH6AJF 299. (Jan.) KH6AJF 830.

NEVADA—SCM, Albert R. Chin, W7JLV—SEC: JU. We regret to report Silent Keys for two Nevada hams —PST, of Gardnerville, and SXD, of Boulder City. OYQ and MRN are available for Las Vegas traffic. OYQ operates mornings and early afternoons on 7225 to 7250 kc. using a Globe King. MRN wants a twice-weekly sked with Reno on any band with a 32V-2 and a 75A-4. While operating c.w. during the CD Party YNO and VIU were interrupted by fire. They lost their heat but finished OK and there was no damage to the radio gear, with VIU working DX such as 4S7GE on 15-meter phone. K2GUR/7 is at Dyer with a DX-35 and an SX-71. During Reno's explosion ZWZ and YKQ, at Las Vegas, handled traffic to Reno. The Reno gang handled over 139 messages. The Southern Nevada gang furnished communications for the Junior Economy Run of 96 cars. Those participating were RBV, VIP, VIQ, ZLQ, JU, PWE and TKV. Traffic: W7JU 47, K7FDB 40, W7ZVN 20, AZF 17, PC/HPP 9, VJC 4, K2KIH/7 2, W7ZHW 1.

SANTA CLARA VALLEY—SCM, G. Donald Eberlein, W6YHM—Asst. SCM, Roy E. Pinkham, 6BPT. SEC: NVO. RM: ZRJ. PAMs: OFJ and WGO. New appointees are ZWE as EC for Mt. View, JCG as ORS, RLB as OES. Endorsements: NVO as SEC, VCZ and K6FQ as ECs, K6HGV as OBS and OES. ZTX, the first owner of a three-band beam in the Salinas Area, reports good results by working lots of DX. IYY reports losing his 20-15-meter beam and is temporarily off these bands. QNK has moved to San Clemente. LSC is home from the hospital and reported improving. New calls in the MBRC Area are KN6SWK and KN6VQV. K6WBO, of Paradise Valley, became a Silent Key recently. JCG reports doing fine work with the 7-Mc. mobile phone rig. K6FQ is QRL building a new home to replace one eliminated by the new freeway. YHM is using an 8JK beam on 14 Mc. and reports FB signal reports from Africa. K6GZ is working on a frequency standard with digital counter for frequency measurements. ZLO reports his brother is studying for his ham license. PLG is working on the MARS amateur traffic net. Clem advises that this net has good coverage in those hard-to-clear states here in the West. EVC, ex-4Y1P, is returning to the East Coast. K6BBD now is using a 5-watt mobile rig on 3.8-Mc. phone. RPV is operating from a new QTH west of Redwood City. LPS is building an all-band transmitter. NW is slowly getting the new shack finished. A new call in San Jose is K6YKG, ex-7NYJ. VZT lost his 20-meter beam in a wind just when he had finished a 1-kw. final. Traffic: (Feb.) K6DYX 298, CGA 249, W6BPT 243, YHM 221, K6GZ 210, W6PLG 165, OFJ 152, VZT 147, YBV 67, ZRJ 66, AIT 50, K6QCI 46, W6ZLO 30, FON 15, OII 15, K6DHO 10, W6HC 4, K6BBD 3. (Jan.) W6OFJ 309.

EAST BAY—SCM, Roger L. Wixson, W6FDJ—Asst. SCMs: Harry T. Cameron, 6RVC, and Oliver Nelson, jr., 6MXQ. SEC: CAN. PAM: LL. RMs: EFD, JOH and IPW. CAN expects to move to Arizona soon and will turn over the job of SEC to K6BYQ, of Napa. Around the clubs in the East Bay: The Acacia Club, which is made up of radio amateurs who also have a common interest in Masonic work, had a business meeting which was held at Trails End. The East Bay Club enjoyed a technical talk given by the Eimac Company on Ceramic Tubes. The Oakland Club held its mid-winter auction. The Mt. Diablo Club held its meeting on Feb. 15 at the Contra Costa Junior College. The highlights of the evening were talks on c.w. and phone. The Richmond Club had John Reinartz from Eimac Company, who gave a most interesting talk on Standing Waves vs Power Loss in Antenna Systems. The SARO held its meeting at the Bow and Bell in

(Continued on page 134)

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the Jack London Sq. The guest speaker was John Reinartz. Other points of interest were the club's efforts in helping to dispose of the gear belonging to FAQ, who passed away recently. BS recently underwent a serious brain operation but is recovering as well as can be expected. The SARO gang is fixing him up with a transmitter and receiver which can be used at his bedside while recuperating at Bolinas. John David Tait was born in Shedd, Ore., Nov. 13, 1897. He first became interested in amateur radio around 1910. Jack's first ticket, 7JD, was issued in 1914. In 1916 he moved to 6-Land where he took on the call of 6JU. He then went back to 7-Land with the calls of 7JW and 7XBD. Jack attended Salem High in Salem, Ore., and later attended Oregon State in Corvallis, Ore., graduating in the Class of 1921. Jack started out with a ford spark coil, later built up his own transformer from stovepipe iron and wound the coil with wire obtained from an old motor starter holding magnets. During a trip to Los Angeles Jack heard his first amateur phone station, namely the Seford Brothers in Hollywood, 6EA and 6EB. Jack went into the battery business in Oregon and later opened up a radio service shop and worked at this from 1921 till 1924. Back in California he bought a radio shop from Sanford Harrick. Jack made the rounds in the radio business, doing service work for the original Pacific Wholesale, Manager for Radio Central, then owned by Ralph Sykes and Bill Whiting, AQO. He attended U.C. for four months taking courses in radar and later went into the 9th Sig. Corps as a procurement engineer. During the war Jack maintained and repaired p.a. systems on transports. At present he owns the Walnut Creek Radio Service. OJW finally has gotten his DX-100 going and is working all bands, c.w. and phone. He is using an 80-meter off-center-fed doublet for all bands. HGL, also in Dixon, is completing a DX-100. Ex-HBM has his DX-100 ready to go as soon as he gets his ticket back from the FCC. Traffic: K6GK 258, W6VPC 62, CBF 4.

SAN FRANCISCO—SCM, Walter A. Buckley, W6GGC—The HAMS was host to the Central California Radio Council at a monthly meeting with a big turnout. AHH was the hidden transmitter station for the 29ers 10-meter hunt for February. The Humboldt Radio Club reports that a new member in the club is KN6YBT. MWF was called into Army Service and is now in Germany as radioman. The Marin Amateur Radio Club invites friends to join in on club nets: the ANRC Net at 1000 each Sun. on 3885 kc. and the Golden Gate Net on 28.7 Mc. each Tue. at 8:30 P.M. New officers were installed in the MARC at the February meeting. The ANRC Net check-ins have been meeting for breakfast at the Bilgewater for coffee(?) after regular check-ins. QMO and her OM, PHS, have a new antenna up for 40 and 80 meters. The Bay Area Mobileers attended a group breakfast with the RAMs (Sacramento Area mobileers) in Vallejo by special invitation. The San Francisco Radio Club held its first meeting at the new location Feb. 27. The new hall is Forest Lodge, located at 266 Laguna Honda Blvd. All the members who attended this meeting agreed that the Lodge was a perfect place for the club as the location is easily reached. Congratulations and thanks to PHS for finding a new hall for the SFRC. AGX was in Children's Hospital for a couple of weeks. The ARRL Pacific Division Convention arrangements still are undecided. The Marin Club hoped to be able to handle them but decided to plan on one some other year instead. Visitors to Doc Havens (DEK) at San Mateo General Hospital says Al looks better each time they drop in to see him. He seems to have taken over a large part of the routine work of the ward. K6ANP worked PJ2ME and an EA9 with his new Mosley 10-20 beam. C.D. Net members on 6 meters are learning to handle traffic in the correct manner so they will be ready for all emergencies. Check-ins are held each Tue. at 8 P.M. The regular monthly luncheon meeting was held in San Mateo in February and although it rained very hard 78 of the 6-meter group showed up. The Young Ladies Radio Club of San Francisco has "adopted" G8LY and plans on sending her club data each month along with "friendship card greetings." Some of the local ladies "forget" to hear their phones these days as they are listening in on Arthur Godfrey from afar and report reading him 5.9 plus in San Francisco. Traffic: W6GQY 435, QMO 194, GGC 28, JWF 20, GHI 18.

SACRAMENTO VALLEY—SCM, LeVaughn Shipley, K6CFF—SEC: JEQ. My sincere thanks for the honor bestowed upon me during the recent election. Your confidence is most gratifying. I'm still checking the files and setting up records. Also, I'm in the process of contacting officers of all the clubs in the section as well as all official appointees. We have a big section and it will take a while to cover all of it. In the meantime, if any individual, group or club has

(Continued on page 136)

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any problem with which I can be of assistance, please advise me immediately. It seems the fellows around Sacramento have gone "club happy." The Sacramento Signal Depot Club has been revived, Aeroject Corporation has sponsored a club for its employees, then there is the new North Hills Club in the Fair Oaks Area. There are rumors of revival of the old Mather Field Club. Let's support the clubs; there are enough of us to do it. (Let's hope they all affiliate with the League. They have everything to gain and absolutely nothing to lose.) Besides, we need their unified support in the national scope of things. Next month I'll have a report from the fellows up north and some information on traffic and our nets.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Fresno Amateur Radio Club's Annual Hamfest is to be held May 11-12 at the Memorial Auditorium in Fresno. There are plans made for all and it promises to be the best ever. K6KYW is on 40-meter mobile. WYT is heard on 75 meters with a new Ranger and also is on 10-meter mobile. OUX has a DX-100. PXP has a Johnson KW and a Tri-Band beam. JUK has a 10-15-20-meter beam. JPS finally shucked off his TVI. ASV and EFS are heard on 75-meter s.s.b. with good signals. K6KFW has a new Pacemaker, pushing a pair of 8005s. ONK has a pair of 250THs and will be on 15 and 20 meters with a kw. ENQ is now in his new QTH in Yosemite, with Ma Bell. ADB had an automobile go right through his radio repair shop and is reported still to be assorting resistors and condensers. KN6RPL has a new Hallicrafters S-102. GIW is working out FB with his one-watt mobile on 2 meters. K6IXA did some swapping and ended up with a grid-dip meter. HAB is on 420 Mc. K6IKT is in the Air Force stationed in England. K6EIA is heard on 75-meter phone. Don't forget that TV is the Fresno City civil defense station and is handling check-ins every Mon. at 8 o'clock on 3995 kc. See you at the Hamfest. Traffic: W6ADB 178, EBL 8.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: ZG. PAM: DRC. Your SCM, SEC, Radio Officer W. H. Jacobs, Gen Griffin, state civil defense director, and James W. Denning, communications officer of the state c.d., held a meeting in Greensboro, N. C., to go over the plans for a State RACES program. A plan prepared by the Radio Officer was approved. It was agreed at this meeting that RACES was for ALL amateurs who wanted to participate in the program. The amateurs in any county, city or town may file a RACES plan, or they should contact their Emergency Coordinator and become affiliated with his RACES plan. We want it definitely understood that ALL amateurs living in North Carolina are eligible to be in RACES. Contact the state civil defense headquarters for a sample plan. To be sure you file your plan in correct order, contact W. H. Jacobs, CVQ, Roy C. Corderman, ZG, or B. Riley Fowler, RRH, SCM, whoever is nearest you. All of us will be delighted to assist you in any way. The approved plan is very simple and is just a matter of filling in names of county, city or town. An explanation accompanies the RACES plan. The Tar Heel Net has rewritten its rules and elected the following net directors: EYZ and HUL, three-year men; RRH and YPZ, two-year men; BAW and QC, one-year men; TJA, secy.-treas. YPZ was elected net manager by the new board of directors.

SOUTH CAROLINA—SCM, Bryson L. McGraw, W4HMG—ZRH, State C.D. Radio Officer, reports a fine meeting held in Charleston and sponsored by the Charleston Radio Club was attended by more than 45 amateurs. Speakers were ZRH, Mr. E. C. Black, deputy director, and Mr. Stark Totman, director of operations for district No. 3. Plans were outlined on a state c.d. net on 3997-kc. phone and 3507-kc. c.w. GQE reports hearing 4LTU, Orlando, nightly on 144.061 Mc. at 10 P.M. EST, with S9 sigs. GQE is one of the State's best in rolling-your-own rig builders with pro skill. Congrats, FFH, on your fine assistance to mobiles within your area. TYS is handling traffic like a well-oiled machine with his s.s.b. rig. FM complained of bad c.w. notes during the DX Contest AKC, our RM, soon will disclose plans for phone stations to check into the C.W. Net for traffic only. The C.W. Net is on 3795 and also will monitor 3910 kc. This will provide liaison between our two fine nets. SOF, our SEC, advises of good progress with the AREC and reports a fine EC job being done by CAL, of Aiken. Congrats to PED and the North Augusta-Belvedere Club on the fine articles and photos that appeared in the *North Augusta Star* on the recent hidden transmitter hunt. K4AYG and his new 15-meter 75-ft. high beam is doing FB with DX including ZD9. K4EJR's latest DX is FS7RT.

(Continued on page 138)

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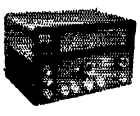

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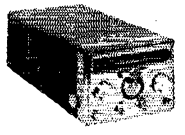

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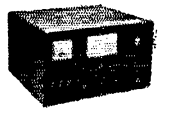
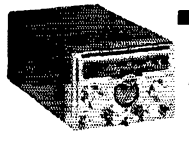


WRL GLOBE CHAMPION 300 RECEIVER
Amateur net: $399.00



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The *Rock Hill Bulletin* is completing its first year and needs your continued support. Congrats to GQV, AKC and others responsible. The Shaw-Sumter Club Emergency Net has 14 members on 29.626 Mc. Thurs. at 2000 EST. Congrats to K4GMW, the NCS. Traffic: W4AKC 240, K4JFN 104, EJR 17, GLT 15, W4CHD 13, COA 10, K4DFW 6, W4FM 4.

VIRGINIA—SCM, John Carl Morgan, W4KX—SEC: PAK. See details regarding the Va. QSO Party to be held Sun May 12. See details on page 164. It may interest you to know that, according to individual station reports, Virginia stations handled 16,835 messages in 1956. Undoubtedly many more were not reported. Three generations of YLs are represented by 8-year-old KN4LXL, her mother K4GKO and grandmother KN4GUD, all of Poquoson. These Virginia hams were present at the Edison Award Dinner: IA, KFC, NJF, OP, ZM and K4LMB, with IH as speaker. We are sorry to lose K4DYX who is California bound. Welcome to ITRX, now K4LPR in Norfolk. KFC and ZM presented "The Story of DX" as a program for the Rappahannock Valley ARC. The Fairfax HS Club is on the air using K4EZL/4 while awaiting its own club call. The Richmond Club reports much interest in the Va-JF Award and suggests it be widely publicized by individual Virginia hams. It is open to all hams anywhere. Simply submit proof of QSOs with 25 or more Virginia stations since Jan. 1, 1957 to the Richmond ARC, P. O. Box 1985, Richmond. JUJ has a 150 YL sticker on YLCC. K4IKF has 5 continents from Mobile. The Bristol ARC has a temporary shack and has applied for a club license. Club secretary UKJ admits confusion as to which SCM gets reports, since the club is in Va./Tenn.!! K4MBL is new at Yorktown. CVO reports good luck mobiling to South Carolina. K4ELG says 80-meter DX is good with just 40 watts. K4DKA and K4GWO also have been getting their feet wet in DXing. BIJ, one of our hardest working OOs, says s.s.b. with the new Pacemaker is competing for his time. YE says his youngest, K4CAX, passed the General Class exam. YZC, his eldest, has discovered YLs and the rig is now stone cold. Traffic: (Feb.) W4IA 654, QDY 370, K4DKA 194, AET 143, EZL 99, W4KX 76, FLX 50, K4GWO 45, DBC 43, W4BZE 40, K4JLO 29, W4THM 23, K4IKF 21, W4AAD 20, K4ELG 17, DVX 12, W4LW 11, CVO 9, K4BFW 7, W4JUJ 7, K4BUI 5, BYS 4, DPX 4, W4SPE 4, IF 2. (Jan.) K4AET 50, EZL 45, W4ZM 42, AAD 20, VMC 4.

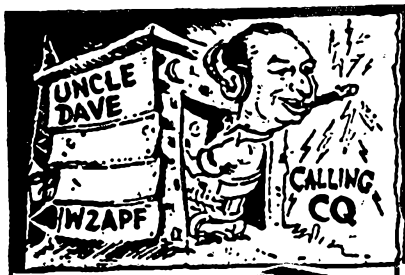
WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—SEC: GEP. PAM: FGL. RMs: DFC, GBF, HZA and PBO. PBO is a new Route Manager. He has been doing a terrific traffic job. Congratulations to GBF for making BPL for February with a traffic total of 813. NYH was on the air 59 hours during the flood emergency. Quite a few other stations operated long hours. The Stonewall Jackson Club will have a picnic again this summer. JM is becoming interested again. SSA is very active and is doing a good job on the West Virginia Phone Net. The Wheeling Club has the call K8BYB. BWK also is very active now. CSG is working lots of DX. He has SET as a neighbor. AVW is working 20-meter c.w. and phone DX with a new beam. DDB gets out very well with the new vertical. BNL gave a very interesting discussion on RTT at the last Kanawha Radio Club meeting. This club meets the 1st Fri. of each month at the South Charleston Naval Reserve Armory. Visitors are certainly welcome. DIE is building a kw. pi-network final for all bands. PBO and PZT had water in their homes and shacks during the flood. ESH is building a new VFO for 6 meters. Traffic: W8GBF 813, PBO 405, HZA 112, BWK 110, NYH 97, PZT 87, SNP 51, KXD 28, DEY 25, UYR 24, AXU 23, CSG 6, PQQ 4, MLX 1.

Note! See QSO party details p. 164

ROCKY MOUNTAIN DIVISION

COLORADO—Acting SCM, William R. Haskin, KØCEN—SEC: NIT. RM: KQD. PAM: IUF. You know there must be more than ten or twelve active amateur radio stations in the fair State of Colorado, but sometimes I wonder as the greatest number of station activity cards that I have received has been twelve in one month. *Bark*, the publication of the Boulder Amateur Radio Club is a fine business paper. It compares favorably to *Midwest Clirs* and *PANN*. The guys sure are doing a fine job in Boulder with dances, transmitter hunts, auctions, etc., planned for the summer. In case you old-timers from Dixon, Ill., wonder what has happened to 9AWA, he is now KØIIII at Estes Park. Welcome, OT of 31 years as an amateur. TUT reports receipt of YO3RF, SP3BY, UB5CR, UA3DF and XE4A to make a total of 55 countries. In looking over the traffic reports and seeing the big total, we sometimes wonder how many of the messages have been handled per ARRL rules in the booklet

(Continued on page 140)



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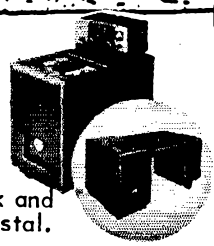

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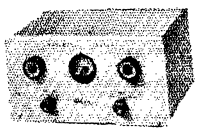

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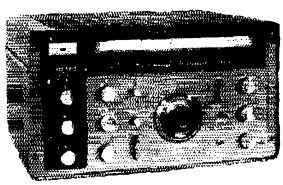

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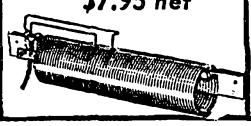

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Operating an Amateur Radio Station, pages 10-12. Anyone who wants to handle traffic right, drop me a card and I'll send a copy. PANN and HNN are doing a fine job insisting that every message be in proper ARRL form. Check your totals to see if your reports meet the requirements. KQD made BPL. Traffic: WØKQD 546, KØBCQ 317, WØIA 316, TVR 191, NVU 120, KØDCC 93, WØJHI 93, TVI 85, NIT 28, SGG 15, KØDSI 8.

UTAH—SCM, James L. Dixon, W7LQE—GPN has a new 35-ft. tower, a four-element 6-meter beam, and a 2-meter 1-½ wave horizontally polarized corner reflector. SAZ now is on 10 meters with an 7C5 rig loaned by LRP. CTI is building a differential keyed exciter and is teaching code and theory with new classes starting every eight weeks. Call Salt Lake IN 7-6987 for details. The Ogden City-Weber County c.d. reports 31 full and 9 supporting members in AREC. WCEN frequencies are 29,510 kc., 50.4 Mc. and 145.35 Mc. at 8 P.M. on Mon. and Wed. QAG is setting up a v.h.f. relay between Ogden and Provo and ham TV is ready to test to Ogden, both facilities from the TV station site on Mt. Vision. QDJ lost his 6-meter 4-by-4 in a 65-mile gale and is replacing it with a 6-meter four-element beam. RPY is a newcomer on 6 meters with an ARC-5 and a vertical. GBM is trying for 15-meter WAS with a Viking II and a vertical half-wave Zepp. Traffic: W7OCX 6.

WYOMING—SCM, James A. Masterson, W7PSO—The Pony Express Net meets Sun. at 0830 on 3920 kc. with PSO and MWS alternating as NCSs. The YO C.W. Net meets on Mon., Wed. and Fri. at 1830 on 3610 kc. with BHH, DXV and NMW alternating as NCSs. MNW has been appointed SEC. EC certificates have been endorsed for AEC, VTB, YSF and HX. The Sheridan Radio Amateur League's officers for 1957 are JMM, pres.; LRU, vice-pres.; QPP, secy.-treas. The club has been issued the call GUX and is conducting code and theory classes under the direction of QPP. LIP has returned from California. LKQ, BFL and YSF are all building linear finals. BHH made WAS, all on 80 meters except New Hampshire, which was on 20. PSO is now on RTTY. The YO Net needs more check-ins. Come on, fellows, this is a chance to blow the dust off that key. Traffic: W7DXV 102, BHH 42, YSF 41, NMW 14, PSO 6, UZR 5, DTD 4, MWS 4, ORM 4, AEC 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Joe A. Shannon, W4MI—February was indeed a good month for the traffic hounds! Thirty-three stations reported a total of 3073 traffic points with three BPLs! AENB set a February traffic record, while the four section nets (AENB, AENO, AENP, AENT) reported a total of 108 sessions for the month! The DX hounds also report good hunting and WOG has DXCC confirmed. DS is keeping a weekly sked with a G. Make your plans now for the May hamfests—Birmingham the first Sunday and Mobile the last Sunday. Several ECs have plans set for Field Day. Let's have a BIG one this year! We would like to see more ECs participating in monthly UO Parties. It's good fun and enjoyable. Try it. YRO has two 35-ft. sticks set for a new antenna. K4BTO is home-brewed mobile on 75 meters and DDC boasts a new Q multiplier. Ex-OR is now 9OK in Indiana. DGH has the 200-watt rock-crusher de-bugged and back in business. ZSH has a new 75A-4 and KAC a Johnson KW. The Mobile Club collected $3,000 in the Cerebral Palsy Drive, using 19 mobiles while QEE/4 as NCS handled close to 900 messages! What's new and who's new department: K4DWC, Birmingham, MUG Parrish, KN4MQO Midfield (XYL of K4BFL), KQE Hamilton, KQI Haleyville. Traffic: (Feb.) W4UHA 528, RLG 517, K4AOZ 304, ANB 222, W4CNU/4 221, HON 184, K4EOG 181, W4KIX 151, K4BRS 141, W4WOG 127, YRO 76, K4BFL 74, BWR 51, DDC 46, BTO 30, W4ZSQ 30, MI 26, GZM 23, CIU 22, CRY 14, RTQ 14, K4AJG 13, W4GUV 11, WHW 10, YFN 10, DGH 9, TKL 9, ZSH 8, DS 7, SXS 3, IUL 2, K4APF 1. (Jan.) W4EJZ 32, K4EEH 20, W4BAI 12, K4AAQ 2, W4ZUP 1.

EASTERN FLORIDA—Acting SCM, Andrew C. Clark, W4IYT—Asst. SCM: John F. Porter, 4KGJ. RM: LAP. PAMs: KQ and TAS. KGJ has been elected as your SCM for the next two years and will take over this column next month. My thanks to you all for your cooperation the past five months. We are sorry to report the passing of KCK, of Orlando. The Broward Amateur RC held a very successful auction with over 110 amateurs present. Don't forget the Silver Springs Hamfest June 2. New officers of the Palm Beach RC are SJK, pres.; K4AWB, vice-pres.; DWK, ex-1CQS, secy.; TH, treas.; and YOT, act. mgr. The club meets the 1st and 3rd Fri. in the club house at Howard Park, Orlando: EC NKD reports 30 amateurs participated in the c.d. evacuation drill. TOD and his

(Continued on page 142)

Model 200 mounted on tower and rotator with 80 and 40 meter radials.

The new C & G Seven-band antenna System is ideal for those with limited space who want optimum coverage on 80 through 6 meters. All Systems are pre-tuned and color-coded to simplify installation. Assembly is simple and fast. A standard heavy-duty TV rotor operates the beam.

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ELECTRICAL SPECIFICATIONS AND CHARACTERISTICS CHART

	6 Meters	10 Meters	11 Meters	15 Meters	20 Meters	40 Meters	80 Meters
Model 100 Amateur Net...$ 99.95							
FORWARD GAIN	4.7db	7.6db	6.7db	5.9db	0 db	(c) 1.5db	(c) 1.5db
FRONT TO BACK RATIO	12.6db	26db	21db	17db	(a)	(a)	(b)
STANDING WAVE RATIO	1.2-2.1	1.1-1.8	1.1-1.5	1.1-1.6	1.1-1.3	1.1-2.1	1.1-2.1
NUMBER OF ELEMENTS	2	3	3	2	1	1	(b)
HORIZONTAL BEAM ANGLE	22 deg.	30 deg.	34 deg.	37 deg.	(a)	(a)	(b)
Model 200 Amateur Net...$ 149.95							
FORWARD GAIN	4.7db	7.6db	6.7db	5.9db	5.6db	(c) 1.5db	(c) 1.5db
FRONT TO BACK RATIO	12.6db	26db	21db	17db	14db	(a)	(b)
STANDING WAVE RATIO	1.2-2.1	1.1-1.8	1.1-1.5	1.1-1.6	1.1-1.6	1.1-2.1	1.1-2.1
NUMBER OF ELEMENTS	2	3	3	2	2	1	(b)
HORIZONTAL BEAM ANGLE	22 deg.	30 deg.	34 deg.	37 deg.	39 deg.	(a)	(b)
Model 300 Amateur Net...$ 199.95							
FORWARD GAIN	5.2db	8.8db	7.9db	7.8db	7.6db	(c) 2.6db	(c) 1.5db
FRONT TO BACK RATIO	12.6db	29db	26db	23db	21db	9db	(b)
STANDING WAVE RATIO	1.2-2.1	1.1-1.8	1.1-1.7	1.1-1.6	1.1-1.6	1.1-2.1	1.1-2.1
NUMBER OF ELEMENTS	3	4	4	3	3	2	(b)
HORIZONTAL BEAM ANGLE	22 deg.	22 deg.	26 deg.	30 deg.	32 deg.	39 deg.	(b)

Footnotes; (a) Standard figure 8 dipole pattern rotary
(b) Vertical cone radiator with top loading
(c) With radial guy wires

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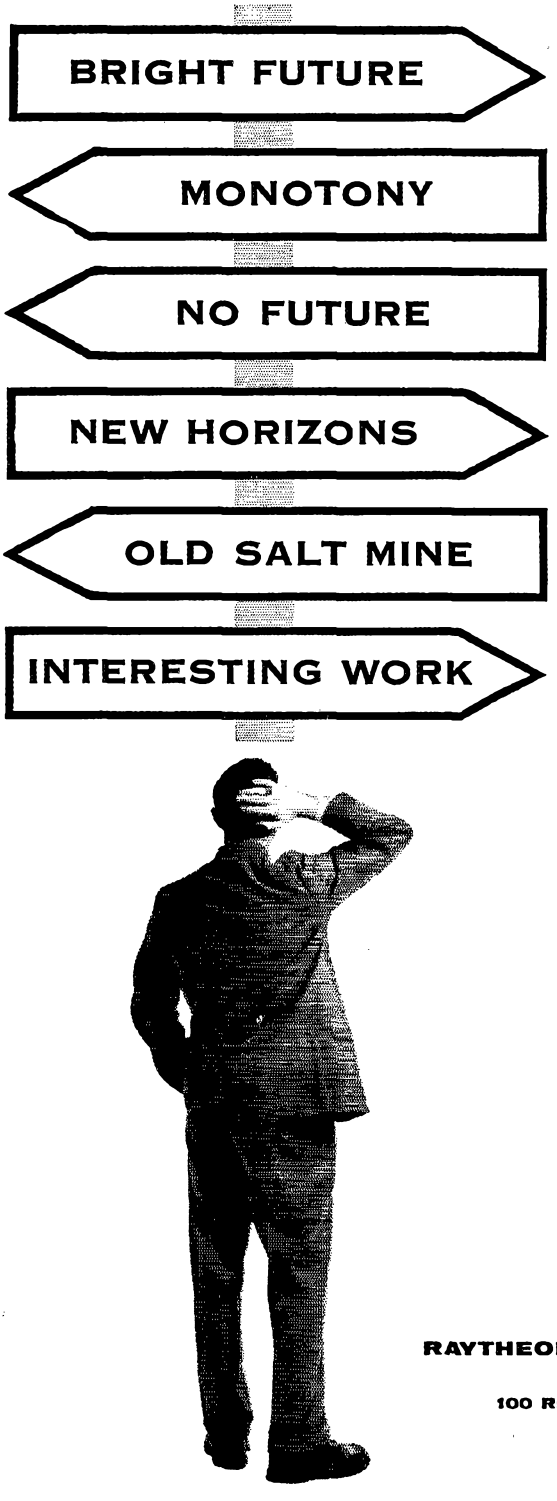
RACES group used 29.52 and Gonset 2-meter stations for the drill. DWI had a two-column write-up with pictures in the paper. K4BCP moved from Miami to Orlando. LTU worked Wisconsin, Rhode Island, New York, New Jersey, Illinois, VE3 and CO2VY on 2 meters with 400 watts and a 48-element beam. The Lake Amateur Radio Assn. puts out a nice club paper called *Ham Salad*. The club installed a 6 meter vertical J atop the Clermont Citrus Tower over 200 ft. high. VDY is RACES Radio Officer and SXJ is EC for Lake Co. 9FRP/4 is now K4MTP. Sarasota: WDX is waiting for his gold-plated KW with 8 813s p.p.p. Check page 154 of Feb. *Popular Science* for Bill's new invention. Winter Haven: The WHARA, VOZ/4, operated 2 home-built stations at the citrus County Fair, handling traffic from visitors to the Garry Moore TV show, reports K4ELB. Tampa: The TRC set up DUG at the famous Tampa Fair and sent out thousands of messages from viewers. LAP did an excellent job in coordinating c.w. skeds again this year. Jacksonville: COW was home from KL7-Land to visit his XYL, GXZ. Wes works 20-meter phone and c.w., also 29 Mc. CLW threw an old-timers hamfest for ASR with HGO, WS, QR and many other OTs on deck. Dade County: K4GHA has a new Globe King 500B and three-element 20-meter beam. Miami Springs RC won a special award for its Optimist Hobby Show display. The MSRC is now affiliated with ARRL. KGJ is the new RACES RO and K4AG is the new c.d. CO. K4DRO's DX stands 73/53. EHW QNIs 11 different nets. K4ENN has a new portable/mobile/fixed emergency station. MVR/SDI set up a 2-meter station at the WTVJ Crusade for Children Telethon. Dozens of mobiles and fixed stations assisted in picking up over $5000.00 in donations. The U. of Miami RC's new officers are OVZ, pres.; 8JTB/4, vice-pres.; R. Cordova, treas.; and S. Fitzgerald, treas. KDN is net mgr. of FSN on 3675 kc. at 1830. The Daytona Beach ARA will hold its hamfest May 19th at City Island Recreation Hall, according to SDR. TAS is net mgr. of the new Florida Midday Traffic Net, which meets Mon.-Sat. on 7225 kc. from Noon to 1 P.M. Lakeland: New club officers are K4LTX, pres.; YKP, vice-pres.; HNC, secy.; and KN4EIJ, treas. Is anyone interested in an RTTY net? We know of the following interested in RTTY: IYP, BNI, JSS, BQW and K4ANJ. Are there anymore? Drop IYT a card, he will try to coordinate efforts in establishing skeds. Traffic: (Feb.) W4FPC 1672, DFU 555, K4KDN 554, W4IWM 453, DVR 302, EHW 233, VOZ/4 231, K4BNE 223, W4WEO 187, IYT 170, WS 160, LAP 156, TAS 126, ZIR 124, K4ABV 85, W4PZT 76, LMT 63, K4AEE 61, W4HGO 43, DUE 40, K4AHW 37, GOX 27, ELB 25, MTP 21, W4QCP 20, TRN 18, ZXK 18, BWR 14, BJI 10, EF 9, YOT 3. (Jan.) W4IWM 252, WEO 59, BWR 12.

WESTERN FLORIDA—SCM, Edward J. Collins, W4MS/RE—SEC: HIZ. EC: MFY. RMs: AXP Escambia, BVE Okaloosa. GMS is handling traffic for the boys in Antarctica. DAO/DEF is all installed in the new shack and enjoying ragchews. K4AH has an FB-looking mobile installation. K4DDD and W4YES keep the air hot with DX-100s. CCY is all set up at the new QTH. UCY keeps the 10-meter nets perking. AXP spends week ends visiting old buddies. AXF is going after WAC. ZFL and HBK installed a rotator in GMS's tower. K4EGD does an excellent job of being the hidden transmitter. PQW is digging up speakers for the Pensacola Amateur Radio Club meetings. GRO operates more mobile than fixed. HIZ is QRL setting up emergency nets, etc. RDC has about the best-sounding 10-meter mobile setup in the area. IJK and the gang stage hidden transmitter hunts every Sunday afternoon. K4LQC has an excellent quad up for his DX-35. K4KIF is on 6 meters and looking for DX. K4IYQ is developing a super converter for 6 meters. K4AGM now has three countries and 25 states on 6 meters. SHE is after WAS. PTK has been ill but is resting up. FHQ is back at work after a siege with the doctors. DHP has returned to the air mith a Ranger. FQR is putting out an excellent signal on 6 meters with a four-element beam. UUF is up on 6 meters after being exclusively 144 Mc. ODO is looking at a B&W 5100. JPD is sweating out delivery on the SX-101 and building phone patches. PAA still is hunting DX. VR stays on 40 meters. K4ECP ran the battery down leaving the filaments on all night. ACB visited the area and reports interest in 6 meters over Tallahassee way. We are aware of considerable activity over Panama City way but haven't had a report from them this month. BVE is setting up nets in his area. LRC has a 20A s.s.b. exciter ready to go. K4EHI is ready for that General Class.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: K4AUM. PAMs: LXE and ACH. RM: PIM. GCEN meets on 3995 kc. at 1830 EST on Tue. and

(Continued on page 144)

MAKING THE BIG DECISION?



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Thurs. and at 0800 EST on Sun.; ATLCW on 7150 kc. at 2100 EST Sun.; GSN Mon. through Fri. at 1900 EST on 3595 kc. with PIM as NC. The 75-Meter Mobile Phone Net meets each Sun. at 1330 EST on 3995 kc. with UUH as NC. The Atlanta Ten-Meter Phone Net meets each Sun. at 2200 EST on 29.6 Mc. with VHW as NC. The Atlanta Radio Club will hold its hamfest Sun., June 2 at the American Legion Post 216 in Atlanta. The Georgia Cracker Radio Club will hold its regular picnic this year in Dublin, Ga., on July 28 at the Little Ocmulgee State Park. Congratulations to PIM on the continuous growth of the GSN. K4CZQ reports the Kennehoochee Radio Club has traded for a DX-100. PDP has a 2-element Telrex Mini beam now in operation on 20 meters. A new ham in Thomasville is KN4MVL. The annual meeting of the South Georgia Rag Chewers Club will be held in Thomasville on May 5. K4HOU has added a Q-Multiplier. LNG is trying to get a group of hams to build a 144-Mc. moon reflection station. MQN, the Atlanta Radio Club emergency truck, will be operating on 3995 kc. and 28.8 Mc. on June 1 and June 2 to give directions to hams coming into Atlanta. ZML won the 10-meter hidden transmitter hunt Mar. 3rd and HBO won the 75-meter hidden transmitter for the Atlanta Radio Club. Prizes were given. This will continue periodically throughout the summer. W4ZUE won honorable mention in the latest Westinghouse talent search of the American Science Club in constructing a Beta-Ray Spectrometer. Check your Emergency Corps cards for renewal to your EC. Traffic: W4PIM 331, K4CZQ 99, LVE 99, W4DDY 72, PBK 65, K4CSL 54, W4ZD 38, BXV 33, ETD 33, K4BAI 16, W4PDP 16, ZDP 12, HYW 11, K4GCF 10, HOU 9, W4RTY 8, MVZ 5, CFJ 4.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: HZ ABA and DJ are new owners of used HRO receivers. DJ is working on a Class B 811 modulator. AZ has a new 75A-4 receiver and is using cathode modulation on 75-meter phone. EK often switches to c.w. while working phone to get more stations to use c.w. AAO was transferred State-side by the USN. AIW, ex-K4JEB, uses a Viking Ranger with 10-meter vertical on 75 meters from the Naval radio station at Martin Peña. Members of the Air Force ROTC have organized the University of P.R. Radio Club using a concrete building on the campus that was previously used for the Bureau of Standards propagation measuring equipment. There are six 60-foot poles available for antennas. Equipment consists of a Globe Champion, an HQ-129X, an SX-25, v.h.f. recievers, radar transmitters and a large airport traffic control transmitter using 810s in the final. Contact KP4AAM for details. KD renewed ORS appointment and made 697 contacts in the ARRL DX Contest the week end of Feb. 23-24 using six bands. He also added a new country, OH2AA/Ø Aaland Island, for DXCC-221. KD uses a 67-ft. Zepp antenna, a Viking II and a Matchbox, and now is assembling a "Wonder Bar" beam. AHV and AIN, of USWB, are installing a 10-meter beam. WP4AIS is on 21 Mc. looking for DX. WP4AIA is on 3.7 and 7 Mc. ADK built an electronic key. The antenna-raising party at the QTH of RM brought out DJ, EK, HZ, SZ, ARN and LK. ACF dropped in for a visit, too. ORS ZW is transferring to Winter Garden, Fla., about May 15th. WT reports to the Antilles Weather Net at 7 A.M. and 5:30 P.M. daily on 3815 kc. and the P.R. Amateur Emergency Net on 3925 kc. at 8 P.M. and has a receiver on 3925 kc. from 7 A.M. to 10:30 P. M., for traffic. AED is building beams for 10 and 15 meters. AAB, ABN, ABP, ACH, ACK and CA use H.W. TBS-50s on 50 Mc. ABN continues working LUs every morning using a W6SIA three-element beam with omega match. AAB and ABP are now building similar beams. ABP uses a Hallicrafters 50-Mc. receiver. AAB uses a VHF-152 ahead of an HRO-50.

CANAL ZONE—SCM, P. A. White, KZ5WA—The Canal Zone section was first in getting the GPR message in to Washington when 5VR gave it to W4ZZA on 21 Mc. Jan. 21 at 5 P.M. EST. RM, KA and VR received a letter from Elaine Forgie on the Yacht *Yankee* mailed in February from Pitcairn Island. KA is the *Yankee's* only contact since leaving Panama—the 21-Mc. Novice band. RU has a new Harvey Wells T-90 operating mobile. AD has a new Globe Scout going at Gatun. New hams heard in the Canal Zone in February are UC, GM, BX (ex-K5BOX from Corpus Christi), WT, PY, FG, DU, MF and EL (organization station at Albrook AFB). FL and AU left in March for short Stateside business trips. DG, GD and DP have returned from vacation trips. 5DK helped out in notifying relatives and friends of 47 members of the Diablo Camera Club here when their plane became fogbound in Quito on Washington's Birthday week end. Traffic: KZ5JS 90, DK 72, VR 61, AD 21, RM 14, RV 9.

(Continued on page 148)

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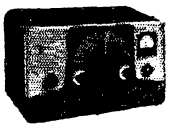
$4.46 per month for 12 months.
Complete price **$54.95**



VIKING "RANGER"—This popular 75 watt CW or 65 watt phone transmitter delivers a solid signal! As an RF and audio exciter will also drive popular kilowatt level tubes. Self-contained . . . effectively TVI suppressed. Instant bandswitching 160 through 10 meters. Operates by extremely stable, built-in VFO or crystal control. Easily assembled—with tubes.

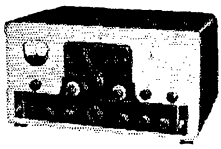
ONLY $21.45 DOWN (Kit)

$11.69 per month for 18 months.
Complete price **$214.50**
Wired and tested . . . Only **$29.30** down—**$15.96** per month for 18 months.
Complete price **$293.00**

—an open letter:

Take pride in your equipment—don't be misled by fantastic, unfounded claims and a cheap price tag. Invest in quality—you will not only have far better results and more satisfaction, but it will cost you less in the long run. Remember, we offer you only top grade lines backed by the double-barreled guarantee of quality manufacturers and Burghardt Radio Supply. Why accept inferior substitutes when you can have fine equipment like the JOHNSON transmitters shown below! Easy terms, prompt and personal service and a long record of customer satisfaction are yours when you buy from Burghardt's.

73,
Stan Burghardt
WØBJV



VIKING "VALIANT"—*275 watts input* on CW and SSB, (P.E.P. input with auxiliary SSB exciter) 200 watts phone! Instant bandswitching 160 through 10 meters—operates by built-in VFO or crystal control. TVI suppressed . . . break-in keying . . . low level audio clipping . . . built-in low pass audio filter . . . self-contained power supplies. With tubes.

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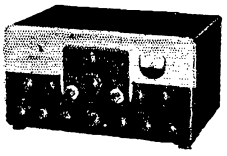
$19.04 per month for 18 months.
Complete price **$349.50**
Wired and tested . . . Only **$43.95** down
$23.95 per month for 18 months.
Complete price **$439.50**



VIKING "PACEMAKER"—*90 watts* P.E.P. input SSB and CW . . . 35 watts AM. Excellent stability—built-in temperature compensated VFO. Bandswitching 80, 40, 20, 15 and 10 meters—automatic voice controlled operation. Pi-network matches antenna loads from 50 to 600 ohms—more than enough power to drive a kilowatt amplifier. With tubes and crystals.

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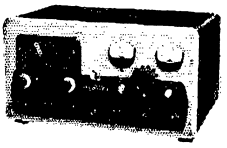
$22.27 per month for 24 months.
Complete price **$495.00**



VIKING "FIVE HUNDRED"—*500 watts* phone and SSB (P.E.P. input with auxiliary SSB exciter) . . . 600 watts CW! All exciter stages ganged to VFO tuning. Compact RF unit designed for desk top operation—power supply/modulator unit may be placed in any convenient location. Instant bandswitching 80 through 10 meters . . . TVI suppressed . . . high gain push-to-talk audio system. With tubes.

ONLY $69.95 DOWN (Kit)

$29.37 per month for 24 months.
Complete price **$699.50**
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SOUTHWESTERN DIVISION

LOS ANGELES—SCM, William J. Schuch, W6CMN—Asst. SCM: Albert F. Hill, jr., 6JQB. SEC: LIP. RMs: BHG and GJP. PAMs: K6BWD and PIB. Thanks to all for the very fine support through the last two years. See page 6 *QST* for your new SCM's address. GYH is QRL five nets. DDE is very QRL work but still is holding down on TTL. K6MON joins the BPL ranks for the third month in a row. CK has a new kw. BHG got a BPL medallion. HJY is busy with three nets. K6OZJ is doing well on 51 Mc. K6LVL is a new OBS. The West Valley Club is planning for Field Day. K6UKO finally got on the air. K6COP is recovering from a sick spell. GJP helped CMN wire the new shack. ORS will host the traffic meeting in April. K6EA is getting ready for Field Day. LIP is very very QRL in c.d. and AREC work. INH is back in business on nets after moving. VSH pushed his beam up to 99 feet. K6LMW is having fun on 220 Mc. K6UYK is planning new antennas. K6BWD is doing phone patch for the Far East. K6HXX is in the Air Force now. K6EIU is in the Coast Guard. MUR is busy with travel on business. The West Valley Club members worked in force on the March of Dimes. FB going, gang. The San Fernando Valley Club is planning a hamfest for June. Help your new SCM write the news; no news, no space used. 73 and thanks. Traffic: W6GYH 648, DDE 400, K6MON 311, W6CMN 223, LHG 190, HJY 161, K6OZJ 128, LVL 66, HOV 64, COP 50, W6GJP 40, K6GUZ 39, EA 30, W6ORS 30, LIP 26, INH 22, K6EXO 18, W6YSK 18, USY 17, VSH 17, CK 12, BUK 11, K6LMW 10, UYK 9, BWD 7.

SAN DIEGO—SCM, Don Stansifer, W6LRU—Effective May 1st KBT is the EC for the City of San Diego. He has been EC for the Central District, and is very active in c.d. and Red Cross communications. KUG is on 144 Mc. with a Communicator. HU, ORS in Orange County, also is very active with MARS. EOT is now Route Manager for this section. He has made BPL for three months straight, earning an ARRL BPL medallion for his outstanding traffic work. A nice QSL arrived from ex-UWL, who now operates from KA5ZS. Danny Weil, of *Yasme* fame, gave a talk sponsored by the San Diego Council of Amateur Radio Organizations at the NEL auditorium. New members of the Clairmont Club include K6STG, VTO, KN6VOS, W6BKW and PLX. New members of the Coronado Club include K6QKE, QKF and ØAUO/6. IZS worked ZL1AAX and JA1QM on 75-meter phone. New officers of the Silvergate Club are: KN6TLP, pres.; K6EFF, vice-pres.; and K6IIR, secy-treas. BYE is a proud grandfather. GGX is the proud mother of a boy. OME becomes the seventh San Diego station to work 200 or more countries, and KSM becomes the fourth to confirm 200 or more. The next San Diego Council meeting will be on May 2nd at Red Cross Headquarters. All clubs are invited to send two delegates. GBG was back in town awaiting Navy assignment and gave a good talk with pictures to the Coronado Club about his tour of duty in the Philippines. AMO and PLK are chasing DX up Santa Ana way. KN6VHH is now on the air with a DX-35. K6BPI again is active and has recovered from recent operations. 3MSK, ex-member of the San Diego DX Club, was a visitor at the February meeting. K6EC again is active in a new QTH on Pt. Loma. RCD, a 10- and 20-meter phone DXer ten years ago, is again active, mobile on 10-meter phone. The 10-meter AREC group again furnished communications for the Glider Meet. Traffic: W6UAB 3029, EOT 670, K6BPI 96, W6HU 4.

SANTA BARBARA—SCM, William B. Farwell, W6QIW—This will be my last report as SCM of the Santa Barbara Section. Your new SCM is Betty Wilson, W6REF, of Oxnard. Congratulations, Betty. Thanks, fellow hams, for your cooperation the past two years. I have enjoyed working with you. K6QNR worked some FB DX on 40 meters when he worked ZK2AD recently. New officers of the Ventura Club are QKO, pres.; K6LUT, vice-pres.; Maria Wallace, secy.; KN6VKI, treas.; IGH, publicity. KN6VVY made his first 144-Mc. contact with FYW and is stirring up some 2-meter interest in Atascadero. The Peanut Whistle Net now meets on 3860 kc. at 8:30 A.M. Don't forget the Tri-County Net is going strong at noon on 3820 kc. Take your pick or join both of these nets. There is a lot of talk of forming a section net on 75-meter phone in the evening. If interested, write to your new SCM and let's get it started.

ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: YWF. PAMs: LUJ, of the Grand Canyon Net, which meets on 7210 kc. Sun. A.M.; ASI, of the Arizona Emergency, which meets on 3865 kc. at 7:30 P.M. Mon. through Fri. The c.w. nets meet on 3690 kc. at 8 P.M. Mon. through Fri. and on 7115 kc. Mon.

(Continued on page 148)

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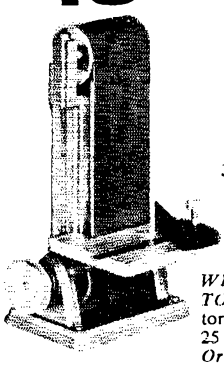

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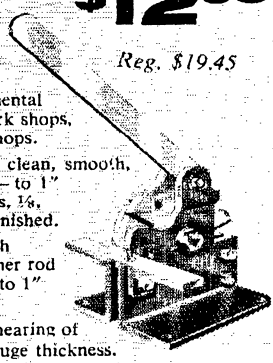

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PUNCH PRESS — Punches clean, smooth, holes in metals to 16 gauge — to 1" from edge of stock. 5 punches, 1/8, 5/32, 3/16, 7/32 and ¼" furnished.

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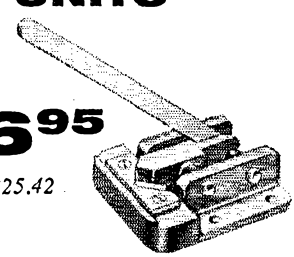

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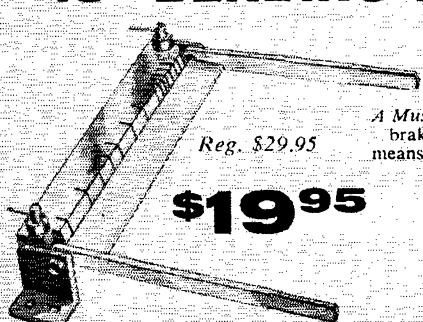

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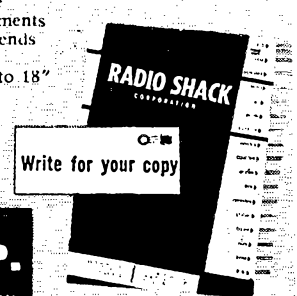

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through Fri. at 4 P.M. Twice the Arizona Amateur Radio Club has supplied communications for the Stock Car Races at the Arizona State Fair Grounds. The members did such a good job and made the race so much better and safer that the U. S. Auto Club is going to try to use the same system in other cities. A potluck supper was held in Spook Hall in Jerome with K6TTC, ex-7NUL, as guest of honor. Remember Montezuma Well June 1 and 2. Pre-registration must be in by May 15. Traffic: W7NFL 39, OIF 12.

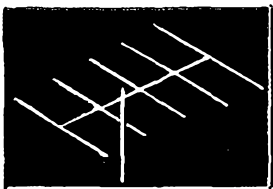
WEST GULF DIVISION

NORTHERN TEXAS—SCM, Ray A. Thacker, W5TFP—SEC: BNG. PAM: IWQ. RM: KPB. Because of his increasing duties and committee assignments in the State Legislature PYI has been forced to submit his resignation as SEC of this section. What else can be said at a time like this but, many thanks for a job well done! BNG, of Ft. Worth, has consented to accept the appointment as SEC, effective immediately. Our new SEC has been the most outstanding EC in this section and has worked untiringly at his task with very outstanding results for his efforts in Tarrant County. I know that we all will be proud of the job that BNG will do in this appointment. If you or your local group really want to do something worthwhile toward AREC work in your area I urge you to contact BNG for his help and suggestions. Also because of business reasons YKT is forced to resign as PAM and Net Manager of the NT-O. This loss, I fear, will be felt by all traffic men. Many thanks to you, YKT, for your efforts and for a real hard job done well! Because of our small allocation of space in this column, I will be forced to carry over until next month the news and information received from many of you. Thanks and please, keep the information flowing to this address. Ordinarily I lack quite a bit of data to do a decent job with this column, but it was imperative that we bring to your attention the above information. See you next month. Traffic: K5WAB 1278, W5KPB 195, UBW 193, FCX 88, K5EMR 79, BKH 54, W5ASA 38, YKT 37, BKH 36, TFP 14, OCV 5, AWT 3.

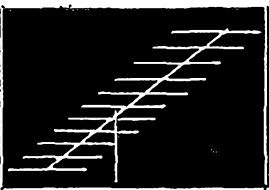
OKLAHOMA—SCM, Ewing Canaday, W5GIQ—Asst. SCM: James R. Booker, 5ADC. SEC: LXH. PAMs: MFX and KY. RM: JXM. It will be noted that a new PAM has been appointed. Bob is responsible for 40-meter activities, specifically the new Sooner Nooner Net which is doing a bang-up job of handling traffic into and out of the state on 7250 kc. New OPSs handling traffic on this and other nets are DRZ and EJK. K5HZF is a new ORS. K5HDO helped with emergency traffic work with W5WSM when a major fire destroyed long-distance lines out of Russelville, Ark. ØIXO has changed his call to K5JEA. K5JCX has graduated from Novice to General Class. KN5IZY and KN5JFY are a new father-and-son team at Lawton. KN5JBX is a new Novice at Ft. Sill, all as a result of classes at the Lawton-Ft. Sill Club. The Bartlesville Club has a class of newcomers on the way with K5HZF and K5AUX as instructors. K5CAY has a bi-weekly schedule with DL4ULM to phone-patch a local XYL to her OM. EHC worked JA1EF on 40-meter phone, his first Asiatic contact in 35 years on the air. ZXD has a new tri-band beam and K5BVA is working lots of c.w. DX with a new Viking II. ZPO has mounted his beam on a 45-ft. tower to go after DX with his new Valiant. 75-meter phone was a bit confused recently when W5BBA and K5BBA got together for a QSO. Traffic: (Feb.) WDRZ 599, K5CAY 298, W5ESB 275, GIQ 152, K5HZF 116, W5JXM 92, KY 50, CCK 48, MRK 48, ADC 39, K5CVU 38, W5GOL 36, FEC 32, MFX 26, K5AUX 24, W5LPL 24, EJK 22, K5DJA 21, W5MGK 21, K5DVE 20, W5PNG 19, K5CBA 14, W5MQI 13, RST 13, KCG 12, EHC 9, IER 9, VAX 6, K5DLH/5 5, W5VBG 2, WEI 1. (Jan.) W5LPL 432.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF. The new officers of the Corpus Christi Amateur Radio Club are CRO, pres.; PPC, vice-pres.; K5EWK, secy.; GMT, treas.; LOW, act. mgr.; HQR, pub. mgr. ALV is building a new single 813 rig, with a Peterson Special exciter. DTJ received the first Texas YL Roundup certificate issued to an OM. He also has a new combination frequency meter and VFO, using a BC-221. KN5JEH is a new Novice in West Columbia. DTJ is the OO in San Antonio. GJX is ORS. AQK is OES. CRO is OBS on 40 meters. The many friends of IFU are glad to hear him on 75 meters. BRZ is going FB on 10 meters with a new Wonder Bar antenna. MDS is on with a new DX-100. FNT is mobile with a new Elmac. WPC is vacationing in California. We don't suppose the new grandchild had anything to do with his going out there. K5COZ and CPA are on 6 meters. MMK was mobiling around in South Texas recently. MX is the chairman of the City-County Civil Defense Council for Corpus Christi

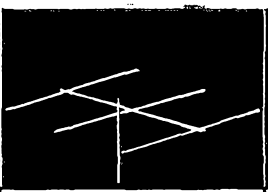
(Continued on page 150)



MODEL No. A50-5
6 meter 5 Element Beam
Price $19.50



MODEL No. A144-11
2 meter 11 Element Beam
Price $11.50



MODEL No. A28-3
10 meter 3 Element Beam
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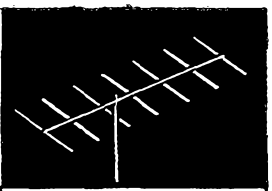
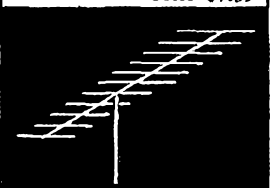
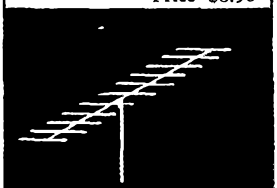


MODEL No. A144-7
2 meter 7 Element Beam
Price $7.35



MODEL No. A220-11
1¼ meter 11 Element Beam
Price $8.50



MODEL No. A430-11
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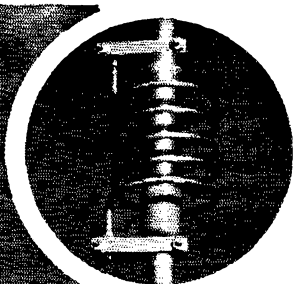
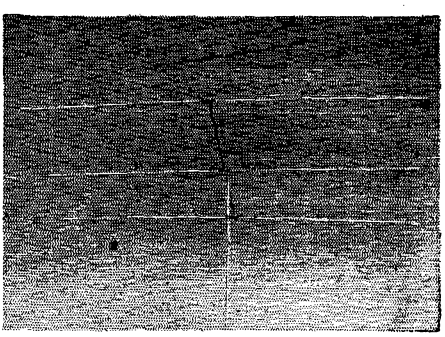


MODEL No. A21-3 15 METER BEAM $29.50



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and Nueces County. We certainly would appreciate some news from around South Texas. Traffic: W5DTJ 86 K5GEM 34.

NEW MEXICO—SCM, Einar H. Morterud, W5FPB —SEC: DAA. PAM: DVA. RM: RKS. The NMEPN meets on 3838 kc. Tue. and Thurs. at 1800 MST, Sun. at 0730: the NM Breakfast Club meets on 3838 kc. daily except Sun. at 0700. BHF has a complete Gonset mobile rig. RFF has been chasing DX on 20 meters. CIN has a new WRL-300. BIH has a new shack. WNU had receiver trouble. MSG measured all six frequencies in the February F.M.T. SUY has ten students in his code and theory class. KWP is active on 6 meters. ØMINP/5, our newest OES, is experimenting on 1250 Mc. NTN is moving to Cortez, Colo. SB burned the mortgage on the transmitter. FED is active on 75 and 40 meters. SGC and NSV are working on an antenna to receive Albuquerque TV. BNJ is on 20-meter c.w. K5INQ is ex-7UPQ. QNT is putting up a new 40-meter antenna. CIN and his XYL prepared the San Juan Co. RACES plan. FHM and his XYL visited in Farmington. IGC is the new EC for Otero Co. Danny Weil, of *Yasme* fame, spent a few days in Albuquerque; he was interviewed on KGGM-TV and spoke at a meeting held at the U. of N. M. Traffic: (Feb) W5TBP 34, CIN 16, DMG 13, NQG 11, UAR 11, ZU 10, FPB 5, BIH 4, RKS 4, KN5IPK 2, WNU 1. (Jan.) W5NQG 31. (Dec.) KN5IPK 2.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCM: Aaron Solomon, 1OC, SEC: 1FH. Have you completed your vacation plans? Don't forget the convention to be held at Charlottetown over the Labor Day week end. For details and reservations, contact the Keith Rogers Memorial Radio Club, P.O. Box 321, Charlottetown. PZ has built an electronic keyer and Monimatch and has received his Old-Timers Club certificate. The Sydney Club now has 30 members and meets bi-monthly. The club call is VE1AEP. PF is the winner of the VE1 Contest with 5616 points. Runners up were VN (5408) and GA (5292). OH has moved from P.E.I. to Bedford, N. S. Field Day preparations are in full swing and the Maritimers should be well represented this year. Father Boudreau now has his call, 1HY, and is using a Viking Valiant and National 300. 3DBD, ex-1SP, is back in Halifax. 3QV and 3CAA also have moved to the Port City. Hams aboard the HMCS *Algonquin* operated under the call VEØNB. AEB challenges any Maritimer to equal the results he is getting with his flea power 1-watt rig. Traffic: (Feb.) VE1FQ 209, UT 38, ADH 21, WK 16, OM 15, ME 14, DB 10, OC 9, PZ 9, VU 2. (Jan.) VE1AEB 2.

ONTARIO—SCM, Richard W. Roberts, VE3NG—SEC: 3KM. PAM: WT. BIV returned from the deep seas for a well-earned vacation. DSX is editor of the Norquebont paper. DBH is c.w. instructor for the North Bay Club. DUU worked a G on 75-meter phone. DMV is vacationing in South America. My congrats to the VE3s who did so well in the recent W/VE Contest. Our report previously mentioned BSD as the vice-president of the Quinte Club. It should have read ASD. AQC is now in Belleville. AMT and RW are bandhopping with their DX-100s. BIV has acquired a Valiant. NO, DPO, AJR and DCX are liaison to other nets for the Ontario Phone Net. Our PAM, WT, is recovering from an operation. Appointees are reminded that certificates must be reendorsed each year to be valid. The following clubs were active on behalf of the AREC at the Sportsman Show in Toronto: Metro, Skywide, Nortown and West Sides. Four transmitters were active in a well-attended booth. Traffic was accepted in very large amounts. BJV is busy with traffic and as OBS on 7 Mc. The SEC, KM, visited the Windsor Club. The Scarboro Ridge Club now meets in the Scarboro Civil Defense Bldg. Congratulations to the Oakville Radio Club on the entry of 12 new members to the AREC. KM is s.s.b. on 10 meters. YR and JU are s.s.b. on 20 meters. Reports have it that the 2-meter boys are going great guns in Toronto, Hamilton, Oakville and Belleville. Others seldom report to the SEC or SCM so we can't tell what they are doing. AML is to be thanked for the FB job of handling traffic for the boys of the Royal Canadian Navy on the Aircraft Carrier *Magnificent* while en route to the Middle East and return on 14 Mc. Traffic: VE3BUR 264, NG 95, NO 92, TX 71, BJV 66, GI 63, AML 55, AUU 55, DEX 54, AJR 34, EAM 32, EAU 28, CJM 24, DPO 18, KM 16, IU 11, APL 4, VZ 4, AVS 3, RW 3.

QUEBEC—SCM, Gordon A. Lynn, VE2GL—ATL reports handling considerable traffic and that he has now acquired a 25-w.p.m. Code Proficiency certificate. ALD also is handling some traffic with 150 watts. ANR has a DX-100 and a VRL receiver. AGN has a

(Continued on page 152)

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new long-wire antenna. YU now is active on 15 meters and made a score of 1865 in the BERU Contest, and took part in the February Frequency Measuring Test. Welcome to VE3CP, now located in Montreal, who hopes to try and run 700 watts from his apartment! The South Shore Amateur Radio Club puts out a very nice bulletin under the masthead *Skywave*. ADT has 19 set on 75 meters. NJ is back on 10 meters with 60 watts n.f.m. KC skeds VE8OX. WF has his 2-meter station primed up and ready to go and is looking for contacts there. TE has a DX-100. AUA, AOL, AJD and UB are active on 75-meter phone. Traffic: (Feb.) VE2DR 100, ATL 76, EC 38, ANR 27, ALD 18, AGN 14, ATQ 12, GL 9. (Jan.) VE2ATL 91.

ALBERTA—SCM, Sydney T. Jones, VE6MJ—UB has been appointed activities manager for the Calgary Club. WL is a new OPS in Calgary. CI and CE have joined the Edmonton gang on 144 Mc. DZ has rebuilt his home station 144-Mc. rig and is responsible for most of the activity in Edmonton on this band. CE and WL will be leaving shortly for a communication course at Arnprior. JP is rebuilding his speech amplifier and modulator. SX is planning higher power with a pair of 811s. KX is DXCC. Nice going, Warren. GE, NX and MJ were active in the DX Contest. EJ (formerly 7HD) is now located at Edson. HM reports working VE9NE (HMCS *Bonaventure*) on 14 Mc. NX was heard working some choice DX during the second half of the contest. May I remind all those holding appointments of the necessity of reporting each month to your SCM. This month only three reports were received and it is very hard to find enough news to fill our space. Traffic: VE6HM 154, YE 19, TT 13, MJ 5, OD 4.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—If there is any information about the license plates you will hear it on the BCAREC Net on 3755 kc. The Vancouver Amateur Radio Club sponsored a "Backyard Field Day" Feb. 24th. I could not take part as I was working that week end but did not hear any results of the "BYFD." It's getting around to mobile time, and with the length of the list of the mobiles in British Columbia, and especially in Vancouver, it is about time Vancouver had a mobile club on a concrete basis instead of the lackadaisical one that was operating before. Victoria has an active and concrete mobile club that serves some usefulness. Not long ago the members took part in the March of Dimes and did a good job. The Nanaimo Club is adding three more amateurs to the band through its training efforts. ALY, who seems to be in an enviable location, has now become an acting net control station on the BCAREC Net. Thanks for your good work, Norm. Other activity seems to be at a low ebb with the bands being very spotty. There should be some increased activity on spot frequencies on 2 meters soon in Vancouver as a lot of 2-meter surplus gear has been picked up by a number of hams. Another reminder, when operating on the net PLEASE do not break as if you were switch-happy but wait until you are asked for a relay or can relay without fouling up all the other transmissions.

CORRESPONDENCE

(Continued from page 84)

pacitances is actually less than a normal 20-meter antenna whose feed-line impedance is high at the second harmonic. This conclusion points up the fact that a parallel resonant trap loaded multiband antenna system may be a less serious harmonic radiator than the conventional single band antenna system.

To verify our analysis, we then conducted a series of tests at our antenna laboratory here in Lincoln, Nebraska. Field strength tests substantiated our original thinking that trap-loaded multiband antennas are actually not radiating any more harmonics than a single-band antenna.

In conclusion, I would like to point out than an antenna must be designed to couple radio frequency energy into space as efficiently as possible. Harmonic attenuation is a job for a harmonic attenuator or an antenna tuner. The place to reduce harmonics is in the transmitter itself or through the use of harmonic attenuator circuits. Harmonics should be reduced before they are fed to *any* antenna system.

— *Andrew A. Andro*

Strays

W1MOM isn't! — *K4CQA*

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Beams and Towers

(Continued from page 25)

has been modified to meet changing conditions or new service requirements, and the last two are the same as the old ones so that less confusion would result at the time of change.

Alloying Element(s)	First Digit
High purity	1000
Copper	2000
Manganese	3000
Silicon	4000
Magnesium	5000
Silicon and Magnesium	6000
Zinc	7000
Unassigned	8000

Now we can take our old designations and renumber them. 24S is now 2024. The "S" stood for "wrought" as opposed to casting alloy, but this is no longer used. 2024 then tells us this is a copper alloy, and if we were familiar with the old designation, the "24" tells us the old number. B18S is now 2218. The second "2" tells us this s the second modification; the original alloy was known as 18S. New alloys which will come into commercial prominence will be assigned numbers by the Association and all producers have agreed to abide by them. Until these new alloys are released, the Association will issue experimental numbers.

Let's go down the line with the old and the new.

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3S — 3003	17S — 2017	61S — 6061
4S — 3004	A17S — 2117	63S — 6063
50S — 5050	43S — 4043	75S — 7075
52S — 5052		C50S — 5350

Now that we can tell one alloy from another, how can we tell what condition it is in? We can add other numbers to tell if it is cold-worked only, and how much; if it is heat-treated; aged; heat-treated and aged; heat-treated, aged and cold-worked, and so on.

A few changes have been made in this system, also. H½ used to mean cold-worked to about half the strength that the alloy could develop if cold-worked completely. Now we say H14, like this:

Condition	Was	Now
Annealed	—0	—0
¼ Hard	H¼	H12
½ Hard	H½	H14
¾ Hard	H¾	H16
Full Hard	Full	H18

If it is a magnesium-type alloy we may add a thermal treatment to prevent subsequent softening. So we increase the first digit and say H32, H34, etc. If partially annealed to lower properties from higher ones achieved from cold work, say H22, H24, etc.

Heat-treatable alloys can be additionally treated to yield: T4 — heat-treated only, T6 — heat-treated and aged, TX ("X" equals some other digit or digits) — various other combinations of thermal and cold-working treatments.

(Continued on page 156)

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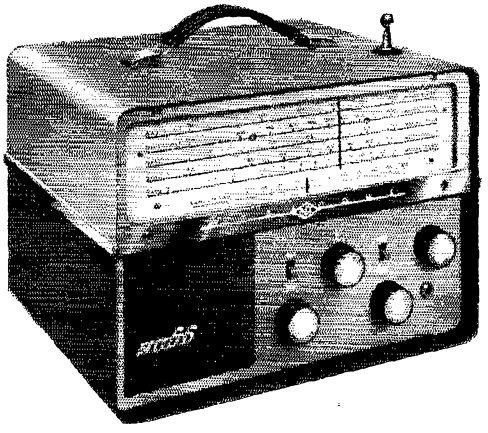

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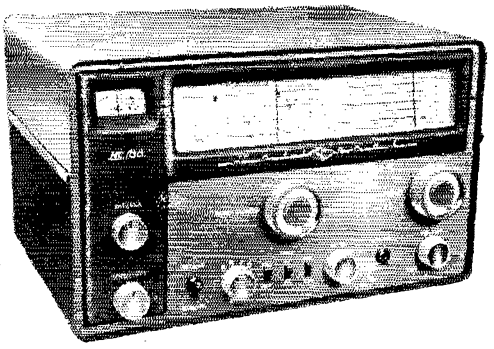

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Now we can specify alloy and treatment by combining forms. 6063-T6, 6063-0 and 6063-H12 all have different strengths. The list is almost endless. Why did I not list 2024-T6, if it is the strongest alloy designation, instead of 6061-T6 and 6063-T6? Well, the last two alloys must be aged to develop the maximum properties. But 2024 ages all by itself at room temperature in a couple of days and ends up as *T6* even though only T4. But since only the T4 treatment was actually used, that is what we use for a designation.

What did 24ST originally mean? Nothing at all. You left off the identifying description. You don't ask a waitress for "eggs" without telling her what type of "heat treatment" you want, and neither does a metallurgist. So, in future always be sure to ask for and get the complete alloy designation and then you won't go wrong.

You might someday see something like this: Alc 2024-T4 or some other designation preceded by an "Alc" The "Alc" stands for aluminum clad. Some alloys aren't so hot from the corrosion standpoint in certain applications, so we coat them with corrosion-resistance alloys and end up with a sort of "galvanized" aluminum. Of course, our coating is simply a special aluminum alloy and not zinc! The strength is somewhat reduced because the total cross-sectional area is no longer one alloy. But the reduction is small because the coating is thin.

This "Alc" can be on one side or both, so you'll have to ask about that; the designation doesn't say.

Appendix

Table I was derived from these equations for a cantilever beam:

$$s = \frac{Mc}{I} \qquad M = \frac{wL^2}{2} \qquad P = 0.004\ V^2$$

s = yield strength divided by safety factor, 2 or 3.
c = outside radius in inches.
I = $\pi r^3 t$ (r = mean radius and t = wall thickness in inches).
w = weight (lbs. per linear inch).
L = length in inches.
P = force exerted by wind (lbs. per sq. ft.).
V = wind velocity in m.p.h.

Table II was derived from this equation for a cantilever beam:

$$\text{Sag (inches)} = \frac{wL^4}{8EI}, \text{ where}$$

E = 10,300,000 for aluminum; 29,000,000 for steel; weight per ft. of aluminum × 2.9 = weight per ft. of steel.

Table III was based on the formula for a cantilever beam with a concentrated load at one end. (This is fudging a bit, on the safe side.) The most common tubing sizes are given in various publications. Many sizes have several wall thicknesses listed. In this case the mean value listed has been used.

(Continued on page 158)

0.375" O.D.	0.305" I.D.	0.035" wall	0.044 lb./ft.
0.500	0.402	0.049	0.0817
0.750	0.634	0.058	0.148
1.000	0.870	0.065	0.225
1.500	1.250	0.125	0.635
2.000	1.624	0.188	1.260
3.000	2.500	0.250	2.540

Who's Afraid of a Receiver?

(*Continued from page 28*)

that simple, and the next thing to try is to find out if the hum comes from ahead of the audio volume control. If the hum increases with the setting of this control, the hum is coming from somewhere ahead of the control, and this can mean that either the lead from the detector or the detector itself is the culprit. Shielded leads to and from the volume control may be the answer to the problem; at least they're worth a try. If the hum comes in from beyond the volume control, as indicated by no change in hum level with the volume setting, using smaller coupling capacitors between stages will reduce the low-frequency response and, consequently, the hum level.

If you're a c.w. man and find that you hear no T9 signals on 21 and 28 Mc., but you do on the lower bands, you have frequency modulation of the high-frequency oscillator. This is tough to cure sometimes, but just changing the oscillator tube may help. If the oscillator circuit is one with the cathode tapped "up" on a coil, adding a small low-resistance r.f. choke to the ungrounded heater lead may reduce the hum. Don't overlook the possibility of the rough note coming from a humming transformer that vibrates the chassis and modulates the oscillator frequency; the cure here is to tighten the screws that hold the transformer together.

Conclusion

A dozen articles might not cover all of the facets of receiver design, test and maintenance, and we claim nothing more than a start for this one. But it will have served its purpose well if a few sufferers of receiverphobia have been started on the road to recovery through the assurance that they have nothing to fear from the receiver itself; the only enemy is one's own ignorance and languor.

Heathkit AT-1 on 50 Mc.

(*Continued from page 22*)

Results

The rig does not work at high efficiency, as might be expected, but the output appears to be comparable to that obtainable on 28 Mc. with the original hookup. This is plenty to work out on 50 Mc. when conditions are good. In two afternoons last summer W9MJJ worked five states along the East Coast, with S9 reports on phone. His antenna was a standard *Handbook*

(*Continued on page 160*)

4-element beam, only 18 feet or so above ground. Quite a few locals are using their AT-1 rigs on 6 in this fashion, and they are having fine results, considering the low power.

Admittedly, there are many ways of putting the AT-1 on 6, but the method outlined seems to be about the simplest, and at the same time about the most effective approach we've seen. One word of caution: There is little or no TVI-prevention incorporated in the lineup as shown. This may not be a problem if your neighbors are not too close, but if you live in a congested area it would be well to do some careful checking on the TVI possibilities before operating too extensively. Methods of treating 6-meter TVI have been covered many times in *QST* and the *Handbook*.

World Above 50 Mc.

(*Continued from page 68*)

c.w. on 50.01. Would appreciate reports. Also invite scatter skeds.

W4AZC, Birmingham, Ala. — Would like early-morning skeds on 50 Mc. with stations in adjacent states. Can be on from 0600 to 0800. Have Sunday 0800 sked with K4DJO, Memphis, Tenn., more than 200 miles. Several good contacts, and signals nearly always heard.

W4HHK, Collierville, Tenn. — Working W5RCI, Marks, and K5AEH, Greenwood, Miss., regularly on 432 Mc. Crystal-controlled converter was low on injection, so a 6AJ4 grounded-grid amplifier stage (at 382 Mc.) was added following the 6AK5 that tripled to this frequency. This made it easy to develop more than enough injection for the 6J6 mixer. R.f. amplifier is 416B; i.f. output from mixer is 50 Mc. Injection for both mixers is supplied from the same crystal oscillator. W4HHK, W4TLV, W5RCI and K5AEH are in market for 432-Mc. skeds.

W4YRM, Nashville, Tenn. — Heard VQ2PL and ZE2JE on 50 Mc. Feb. 18. Middle Tennessee 6-meter net meets Mondays at 1930 CST, on 50.6 Mc.

W5KWP, Santa Fe, N. Mex. — Hear the 50-Mc. scatter tests of K6GTG, Arlington, Cal., about half the mornings checked. Reception is usually about S1, with S4 peaks, a combination of forward scatter and meteor bursts. Signals of W5BAZ and W5KWP reported heard by FA8IH in Algeria. Any more info on this one?

W7PUA, Eatonville, Wash. — Put up 72-element 432-Mc. array which works out very well. Consists of 6 sets of 6 half waves in phase, with reflectors. Configuration is 6 high and 6 wide, with horizontal 3/2-wave phasing lines between bays and a 2-wave vertical line fed at the center. Most operation in Puget Sound area is on 433.35 Mc., using 8025-kc. crystals.

W9KLD/KL7, Anchorage, Alaska — Marked inversion (air temperature at ground level −55 degrees, aloft −20 degrees) showed marked improvement in signals from 100 miles away on 150 to 172 Mc. Apparently, favorable conditions for v.h.f. propagation can prevail, even during periods of very cold weather.

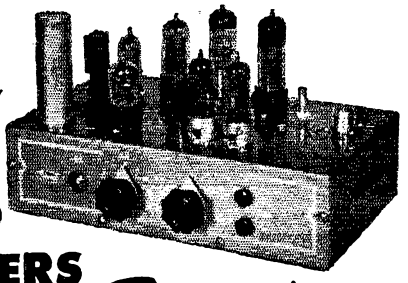
WØMNP/5, Location unknown — Experimenting to determine upper limit of oscillation with conventional receiving tubes. A 6AJ4 with a quarter-wave line was made to work up to 1050 Mc. The lines were then extended for ¾-wave operation and oscillation was obtained up to 1268 Mc. A 6J4, used in the original circuit, refused to oscillate at all.

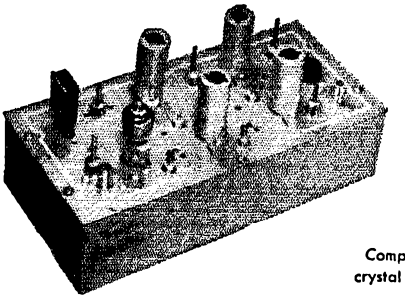
Note to all OES — Please put your location on each OES report.

Strays

W2KDC, president of the Lake Success Radio Club, is a Ham.

1¼, 2 or 6 METERS with Tecraft





AMATEUR NET **$42.50**

Complete with crystal and tubes.

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 @ 4 amps & 250 v DC @ 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 and plugs.....**$59.95**
Matching Power Supply..... **39.95**

Tecraft converters may be had with IF output frequencies to suit the tuning range of your receiver, and provide the ideal system, in terms of **extreme sensitivity, maximum stability, low noise, high gain and selectivity.**

LOW NOISE FIGURE: Approximately 4 db. 1 microvolt of signal will provide better than 20 db. thermal noise quieting.

SENSITIVITY: Approximately 1/10 microvolt input will provide a signal 6 db. over noise level.

GAIN: Better than 30 db.

MODEL: *CC5-50, CC5-144, CC5-220* for
Collins 75A1, 2, 3.....Specify IF 26–30 Mc.
Collins 75A 4.....Specify IF 28–30 Mc.
National NC-300.....Specify IF 30–35 Mc.

MODEL: CC5-50 and CC5-144. For General Coverage receivers. Choose either 6–10, 7–11, 8–12, 10–14, 12–16, 14–18. Any of above in kit form, **$29.75.** CC5-220. For 14–19 Mc. only. Wired only.

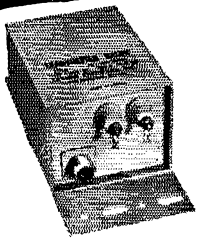
Tecraft

AT YOUR DEALER, OR WRITE

The Equipment Crafters, Inc.

523 WINNIE AVE. RIVER EDGE, NEW JERSEY COLFAX 2-0159

FOR YOUR TRANSMITTER —



ONE BALUN FOR 1.5 to 30 mc

Full Kilowatt Rating When SWR is 2 to 1 or Better

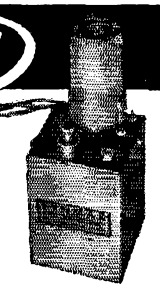
One balun for 1.5 to 30 mc. True broadband operation. No switching or complicated circuitry. Full kilowatt when SWR is 2 to 1 or better. Three types are available.

Type TB-2 Matches between 75 ohms unbalanced, and 300 ohms balanced...Price $16.95
Type TB-3 Matches between 50 ohms unbalanced, and 200 ohms balanced. .Price $17.50
Type TB-4 Matches between 75 ohms unbalanced, and 75 ohms balanced....Price $17.50

These baluns are a natural for feeding dipoles, beams, trap antennas, twinlead, etc., etc. They allow transmitters designed for coaxial cable output, to drive balanced circuits without any strain or pain. Completely weather-proofed, they may be mounted on a pole, suspended by a rope, or mounted in your shack.

Specifications: 3½" wide, 3" deep, 4½" long (less mounting bracket), 8" long (with bracket). Weight 2½ lb.

it's Here!



AN ELECTRONIC T-R SWITCH THAT REALLY WORKS!

FEATHERWEIGHT • MIDGET-SIZE • UPS EFFICIENCY

Don't confuse this great, new electronic Transmitter-Receiver Switch with anything similar you've ever known! Here is a truly effective, efficient and practical replacement for that time-worn coax relay. The Lynmar TRS-1 Switch is designed for any amateur transmitter, home-made or commercial. Wonderfully tiny, it hides away inside most transmitters (1½ x 1½ x 2¼, weighs approx. 4-oz.), does not add any TVI and makes most receivers perform better. Under test, receiver sensitivity increased up to 15db when used with transmitters of 150-watts or less . . . uses negligible power for operation and takes 6.3 volts filament and 150 volts @ 13 mils for plate of type 6AH6 tube, ordinarily supplied by transmitter. This switch is a must for every Ham rig!

PRICE $11.95 (with tube)

LYNMAR ENGINEERS, INC.

1432 N CARLISLE STREET • PHILADELPHIA 21, PA

Consultants and Manufacturers

ELECTRICAL • MECHANICAL ELECTRONIC

QSL Cards

(Continued from page 52)

keeps a few QSLs in the most accessible place of all: his pocket. "Speaking of DX," he says, interrupting a traveling salesman story with a new twist, "I just happened to have these with me." It's easy to stop him, though — just tell him we worked the same guys on 160.

Sometimes a 48-page WAS book is made from a photograph album with room for three cards on each page to take care of a three-band WAS display. The cards can be fastened in with gummed corners or draftsman's Scotch tape, or put in transparent envelopes which are glued to the pages. Perhaps, instead of the album, the 48 cards are tacked on the wall around a map of the United States.

One group declares that it's foolish to display QSLs at all. They maintain that visiting hams would rather talk about their own cards and that non-hams don't know what it's all about, anyway. Their advice is to get a good file drawer, probably a used one from an office supply store, and file the DX cards first by continents, then by countries, then alphabetically by calls within each country. Tab cards to separate continents and countries are easily homemade. Ws and VEs are filed behind the DX cards, or in another drawer if we're lucky enough to need another, by call areas and then by states and provinces within the call areas. With this system, finding a card is both easy and fast and any QSL can be taken out of the file and examined on both sides without blowing the dust off of it or tearing its corners.

Well, that's about it. Getting the dope together for this article has been interesting, but why all the fuss about QSLs? What if my dear pal down the street did get a card from French Togoland. I had a good, solid QSO with FD4BD myself. (At least, I'm almost sure he came back the second time.) I don't care if I never get his . . . say, is that the doorbell? Oh, just the postman. Well, as I was saying, I don't care if — oh, the POSTMAN!

Any mail for me?

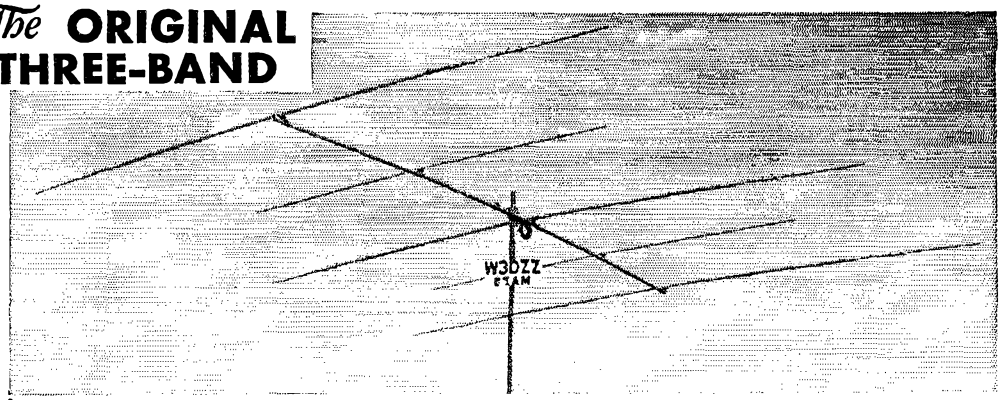
Strays

W4SPA has an open-rack home-built transmitter which is situated in a hen house. A while back one of the chickens laid an egg near the h.v. power supply. The egg eventually broke and ran down into the power supply. When W4SPA turned on the rig, up went the rig and chicken house in smoke. — *W4DF*

—•••—

W9OYZ points out that on the average, man is an 0.25 megohm, 1-watt resistor. At one milliampere, shock is perceptible. At 10 ma. you can't let go. Finally, 100 ma. is generally fatal, and technicians are already in short supply.

The ORIGINAL THREE-BAND



✓ **NO STACKING REQUIRED**—all elements are at the full height yet wind resistance is held to a minimum.
✓ **UNIQUE WINDMILL DESIGN**—permits ready access to all parts of the beam from the tower.
✓ **WIDE-BAND BALANCER**—affords perfect pattern symmetry with coaxial feed line. No adjustment required.
✓ **MAXIMUM GAIN**—*over 8-db. gain on 20 and 15 meters, somewhat higher on 10 meters.*
✓ **HIGH FRONT TO BACK RATIO**—in most installations the front to back ratio exceeds 30 db. on 10 and 20 meters and 25 db. on 15 meters.
✓ **RUGGED DESIGN**—Boom consists of two 12-foot lengths of 2¼" dia. tubing with .065" wall. Three-band elements are made of 1½" tubing with .058" wall. All tubing is of 6061-T6 heat-treated aluminum alloy for maximum weather resistance and strength.

MODEL FT-100 BEAM ANTENNA PARASITIC ARRAY operating on 10, 15 and 20 meters. Complete with chromate dipped hardware and aircraft type stainless steel clamps (to assure against corrosion and rust), assembly instructions and prints..... **$225.00**

MULTIBAND DESIGN FOR WIRE ANTENNAS—The W3DZZ design employs a concentric coil and condenser completely potted in Polyester Resin. Polystyrene insulation of concentric capacitor can withstand highest amateur transmitter voltages.

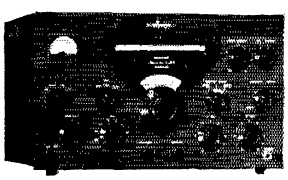
MODEL FT-200 TRAPS for 5-band antenna operation on 10/15/20/40 and 80 meters. (75 ohm feed line). Pair, postpaid.....**$12.50**

See your local distributor or write to:

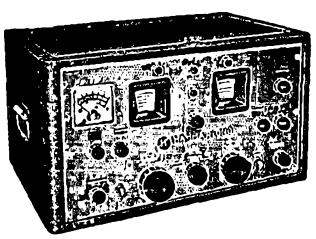
FREDERICK TOOL & ENGINEERING CORPORATION
414 PINE AVENUE, FREDERICK, MARYLAND

AVAILABLE IN STOCK NOW!

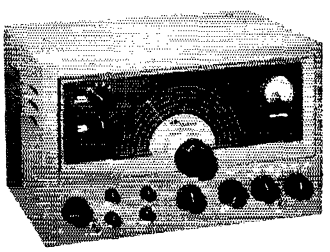
COLLINS



75A-4 . . . . $595.00
KWS-1 . . . . $2,095.00



NEW HAMMARLUND HQ-150 RECEIVER. Net.....$294.00



THE NEW RME NO. 4350 RECEIVER $229.00

Also available in stock: Gonset, Elmac, Hallicrafters, Johnson, National, Morrow and all other amateur lines.

VISIT "THE ATTIC" YOUR WEST COAST HAM HAVEN

universal distributors inc.

4642 W. CENTURY BLVD.
INGLEWOOD 2, CALIF.
ORCHARD 4-5740
OREGON 8-5509

1957 VIRGINIA QSO PARTY

Sunday, May 12

A QSO Party, open to all Virginia amateurs, will be held from 0800 to 2200 EST on May 12. Object is to contact as many different stations in as many Virginia counties as possible. (Independent cities are considered to be within their adjacent county.) All bands and modes may be used but only one QSO per station per band (except for mobiles) is permitted.

Information to be exchanged consists of QSO number, call, RS or RST report, county and operator's name. *Example:* W4KX in his first contact (with W4FJ) might send "NR 1 W4KX 589 SPOTSYLVANIA (County) JNO." W4FJ would then reply with a similar message.

Scoring: Between General Class or higher licensees, score 1 point for each message sent and for each received, or a maximum of 2 points per contact. For each message sent and received where at least one end of the QSO is a Novice (i.e. Novice to Novice, or Novice to higher class licensee), score 5 points, or a maximum of 10 points per contact. Multiply total number of QSO points by the number of different counties worked.

Mobiles operating in more than one county may be worked once in each different county by a fixed station. Similarly, a mobile operating in more than one county may count the same fixed station as another contact from each new county.

All participants are urged to submit copies of their logs, regardless of the amount of operation. Entries should reach SCM W4KX (see address, page 6) by June 1, 1957.

WEST VIRGINIA QSO PARTY

MAY 3-13, 1957

The Mountaineer Amateur Radio Association will sponsor a W. Va. QSO Party from 11:59 P.M. EST Friday, May 3 to 12:01 A.M. EST Monday, May 13. The contest is open to all W. Va. amateurs and to all others who have held calls in W. Va. in the past. Only these contacts may be counted. There are no power or band limitations and the same station may be worked on different bands for credit. C.w.-to-phone QSOs are allowed but cross-band contacts are not permitted. When working W. Va. stations, score 2 points for each QSO when the following is sent and received: date, call, time, city and county. In contacting stations outside W. Va., obtain the above information plus the call sign the operator held while in W. Va. All logs must contain complete information sent and received; incorrect logs will not be counted. The following frequencies are suggested for finding W. Va. stations: 3570 to 3580 and 3890 to 3900 kc. To be eligible for prizes, logs must be postmarked not later than May 27. They should be sent to James A. Ford, W8QR, Secretary MARA, P.O. Box 909, Fairmont, W. Va. Prizes will be announced at a later date over the W. Va. phone and c.w. nets.

FOURTH ANNUAL
ROCKY MOUNTAIN DIVISION QSO PARTY

All amateurs in the Rocky Mountain Division and surrounding states are cordially invited to take part in the Fourth Annual QSO Party to make and renew acquaintances and to publicize the division convention to be held at Elkhorn Lodge, Estes Park, Colorado, June 15 and 16, 1957.

Rules: *Time and dates:* Contest begins 0800 MST May 11; ends 2300 MST May 12. 2. *Where:* All bands, phone, c.w., RTTY. 3. *General call:* C.w. "CQ RMD"; phone "CQ Rocky Mountain Division." 4. *Contacts permitted:* You may work for credit the same station once on each amateur band, i.e. one contact credit will be given for a QSO anywhere in the band 3.5-4.0 Mc., either phone or c.w., and one contact credit for QSO in the band 7-7.3 Mc., etc. No cross-band QSOs will be counted. 5. *Exchange:* Each party to a contact will give his name or "handle," location, and whether or not registered at the convention. 6. *Scoring:* Score 1 point for complete information sent and 1 point for complete information received, a total of 2 points for each complete contact. 7. *Reports:* Logs must show time, date of QSO, call of station worked and information received. Total your score, give your name, address and whether registered at the convention, and mail to your SCM (see address, page 6) postmarked not later than May 18, 1957. 8. *Prizes:* First, free de luxe treatment at convention for one person, registration, meals and room; second, free registration and meals for one person; third, free registration for one. Send your convention registrations to W. M. Reed, 1355 East Amherst Circle, Denver 10, Colo.

REALLY IN STOCK AT *DeMambro*-SX-101

Proven to be everything you want PLUS!!

It's all amateur — and as rugged as they come! Built like a battleship. Bigger. Heavier. A marvel of stability.

- Complete coverage of 7 bands — 160, 80, 40, 20, 15, 11-10 meters.
- Special 10 mc. pos. for WWV, plus coverage of maior MARS frequencies.
- Exclusive Hallicrafters upper/lower side band selection.
- S-meter functions with A.V.C. off.
- Tee-notch filter.
- *Local oscillator output available for use in heterodyne V.F.O.

PLUS: Band in use individually illuminated . . . built-in crystal calibrator . . . antenna trimmer . . . dual conversion . . . full gear drive from tuning knob to gang condensers . . . five steps of selectivity from 500-5000 cycles . . . sensitivity — less than 1 microvolt on all bands . . . direct coupled series noise limiter . . . 50 to 1 tuning knob ratio . . . and many more.

ONLY **$395.00**
AMATEUR NET

LIBERAL TRADE-INS
LOW DOWN PAYMENT—EASY TERMS.
Send for LIST of used Equipment Values!

DeMambro BLANKETS NEW ENGLAND WITH **FIVE BRANCHES:**

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All with TELETYPE CONNECTIONS direct to BOSTON Headquarters to guarantee you fastest delivery of all types of ham equipment and components.

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Write, wire, or phone ERNIE BONO (W1QBP) for immediate service
1095 Commonwealth Ave. · Boston 15, Mass.

BETTER STILL, COME IN — PLENTY OF PARKING SPACE

U. S. Crystals offers the most complete line of guaranteed crystal frequencies for the novice, amateur, technician, and the experimenter.

SPECIAL FT-243 YOUR CHOICE 49¢ ea.

2015	2585	2990	3890	5245	6073 3	6500	7025	7433 3	7708 3	7966 7	8225	8500			
2017	2590	2995	3895	5265	6075	6506 6	7040	7440	7710	7970	8233 3	8506 6			
2020	2595	3000	4035	5327 5	6125	7050	7041 7	7716 7	7973 3	8240	8508 3				
2025	2650	3010	4045	5335	6106 6	6540	7073 3	7450	7720	7975	8241 7	0510			
2035	2655	3015	4080	5385	6125	6550	7075	7458 3	7770	7980	8250	8516 7			
2040	2660	3020	4085	5397 5	6140	6573 3	7100	7466 7	7773 3	7983 3	8258 3	8520			
2055	2665	3025	4110	5435	6142	6575	7106 6	7473 3	7775	7990	8260	8525			
2060	2680	3030	4135	5437 5	6150	6600	7125	7475	7725	7991 7	8266 7	8530			
2065	2685	3035	4165	5485	6173 3	6606 6	7140	7483 3	7730	8000	8270	8533 3			
2090	2690	3040	4175	5500	6175	6625	7150	7491 7	7733 3	8006 6	8273 3	8540			
2105	2695	3045	4190	5545	6185	6640	7200	7500	7740	8016 7	8275	8541 7			
2125	2705	3050	4215	5582 5	6200	6650	7206 6	7506 6	7741 7	8020	8280	8550			
2130	2710	3055	4220	5587 5	6206 6	6673 3	7225	7508 3	7750	8025	8283 3	8558 3			
2135	2715	3060	4255	5645	6225	6675	7240	7510	7758 3	8030	8290	8560			
2140	2720	3065	4280	5660	6235	6700	7250	7516 7	7760	8033 3	8291 7	8566 7			
2195	2750	3070	4295	5675	6240	6706 6	7273 3	7520	7766 7	8040	8300	8570			
2200	2755	3075	4300	5687 5	6250	6725	7275	7525	7780	8041 7	8306 6	8573 3			
2305	2760	3095	4330	5700	6273 3	6740	7300	7530	7783 3	8050	8308 3	0575			
2320	2765	3110	4340	5706 7				7533 3	7790	8058 3	8310	8580			
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2355	2775	3135	4397 5	5730				7541 7	7800	8070	8320	8590			
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2370	2790	3150	4490	5760				7560	7810	8080	8340	8606 6			
2375	2795	3155	4495	5773 3				7566 7	7816 7	8083 3	8350	8608 3			
2390	2815	3160	4535	5775				7570	7820	8090	8358 3	8610			
2415	2825	3165	4540	5780				7573 3	7825	8091 7	8360	8616 7			
2430	2835	3170	4580	5782 5				7575	7830	8100	8366 7	8620			
2435	2840	3175	4610	5800				7580	7833 3	8106 6	8370	8625			
2440	2845	3202	4620	5806 7				7583 3	7840	8108 3	8375	8630			
2442	2850	3205	4635	5820				7590	7841 7	8110	8380	8633 3			
2450	2855	3210	4680	5825				7591 7	7850	8116 7	8383 3	8640			
2455	2860	3220	4695	5840				7600	7858 3	8120	8391 7	8641 7			
2460	2865	3225	4710	5850				7606 6	7860	8125	8391 7	8650			
2485	2870	3230	4735	5852 5				7608 3	7866 7	8130	8400	8658 3			
2470	2875	3235	4780	5868				7610	7870	8133 3	8406 6	8660			
2475	2880	3240	4785	5873 5	6273 5	6750	7306 6	7616 7	7873 3	8140	8408 3	8666 7			
2480	2885	3290	4815	5875	6275	6773 3	7308 3	7620	7875	8141 7	8410	8670			
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2490	2895	3320	4840	5892 5	6306 6	6800	7325	7630	7883 3	8158 3	8420	8675			
2495	2905	3340	4845	5900	6315	6806 6	7333 3	7633 3	7890	8160	8425	8680			
2505	2910	3410	4852 5	5906 7	6325	6815	7340	7640	7891 7	8163 4	8430	8683 3			
2510	2915	3420	4880	5907 5	6335	6825	7341 7	7641 7	7900	8166 7	8433 3	8690			
2513	2920	3455	4900	5925	6340	6840	7350	7650	7906 6	8170	8440	8691 7			
2520	2925	3465	4930	5940	6340	6850	7358 3	7658 3	7908 3	8173 3	8441 7	8700			
2525	2930	3525	4950	5950	6362	6873 3	7366 7	7660	7910	8175	8450	8706 6			
2530	2935	3640	4980	5955	6373 3	6875	7373 3	7666 7	7916 7	8180	8458 3	8708 3			
2535	2940	3655	4995	5973 3	6375	6900	7375	7670	7920	8183 3	8460	8710			
2545	2945	3680	5030	5975	6400	6906 6	7383 3	7675	7925	8190	8466 7	8716 7			
2550	2950	3700	5035	5995	6405	6825	7391 7	7675	7930	8191 7	8470	8720			
2557	2955	3760	5050	6000	6406 6	6940	7400	7680	7933 3	8200	8473 3	8725			
2560	2960	3800	5137 5	6006 6	6425	6950	7406	7683 3	7940	8206 6	8475	8691 7			
2565	2965	3885	5165	6025	6440	6973 3	7406 6	7690	7941 7	8208 3	8480	8733 3			
2570	2975	3940	5180	6040	6450	6975	7408 3	7691 7	7950	8210	8483 3	8740			
2575	2980	3955	5205	6042	6473 3	7000	7416 7	7700	7958 3	8216 7	8490	8741 7			
2580	2985	3980	5235	6050	6475	7006 8	7425	7706 6	7960	8220	8491 7	8750			

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NOVICE BAND FT-243 FUNDAMENTAL OR DC-34 FREQUENCIES **99c**

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80 METERS 3701 through 3748 in steps of 1 KC. FT-243 or DC-34.
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DOUBLING TO 40 METERS 3588 through 3599 in steps of 1 KC. FT-243 or DC-34.
15 METERS 5276 through 5312 in steps of 1 KC. FT-243 or DC-34.

FT-241 SSB. Matched Pairs.....pr. $1.95
FT-241 Single Side Band low frequency Crystals — 370 KC to 540 KC.....ea. 49c
DC 34/35 from 1690 to 4440 KC.....ea. 49c
AN/TRC-1 FT-241 holders from 729 to 1040 KC — 1000 KC excluded.....49c
FT-241 200 KC or 500 KC.....ea. $1.00
FT-243 1000 KC Marker Std.....ea. $2.95
100 KC FT-249 RCA VC-5.....ea. 4.95

SPECIAL GRINDING SERVICE
Available to the Amateur, Novice, Experimenter, Technician and all users of crystal control. FT-243-½" DC-34-35-¾" FT-171 Banana.

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.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters, be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 7¢ rate. 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 signature and address be printed plainly. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, 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, W8RI, 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, RT18/ARC1, R5/ARN7, BC610E, ARN6, BC788C, 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. Zimmermann 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 Eimac, Gonset, Hallicrafters, Hammarlund, Johnson, Lysco Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

URGENTLY need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

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., 15 East 40th St., New York City. Tel. LExington 2-6254.

DX'ERS Notice! Save money? Save Time? Free info. DX QSL Coop, Box 5938, Kansas City 11, Mo.

MULTI-BAND Antenna. 80-40-20-15-10, $19.95. 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, 107 So. Livermore, Livermore, Calif. W6KF, Skipper.

WANTED: 2-way FM equipment. Phillips, 1312 McGee St., Kansas City, Mo.

WANTED: Highest prices paid for ARC-3, ARC-1, BC788, BC610, BC348, ART13, BC312, BC342 and other military or aeronautical surplus. Name your price. We pay freight and c.o.d. James S. Spivey, Inc., 4908 Hampden Lane, Bethesda, Md.

WANTED: Used receivers and transmitters: Will pay cash or trade, 10% down with up to 24 months to pay. In stock: New 75A4's, KWS1's (Collins equipment shipped out of our Cedar Rapids store). Demonstrator Johnson KW amplifier with desk: Johnson 6N2, Valiant, Pacemaker, B&W, National, Hallicrafters, Elmac, Hammarlund, Gonset, Central Electronics; 10-15-20 meter Hi-Gain beams, $99.75; 10 meter, $18.95, also Mosley & Gotham. Write for Bargains in used receivers and transmitters. Ken, WØZCN, or Glen, WØZKD, at Ken-Els Radio Supply Co., 428 Central Ave., Ft. Dodge, Iowa.

VACATIONS. Ham with my equipment, modern housekeeping cabins, American plan. Big McKenzie Lake, Spooner, Wis. Tony Martorano, W9HZC.

QSLS? SWLS? Finest and largest variety samples 25¢. (refunded). Callbooks (latest). $4.50. "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Michigan.

C. Fritz for better QSLS-SWLs! Top quality! Samples 10¢. 1213 Briargate, Joliet, Ill.

QSLS-SWLS. Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSLS. Nice designs. Samples, Besesparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

DELUXE QSLS — Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

QSLS-SWLS. Samples free. Bartinoski, W2CVE Press, Williamstown, N. J.

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. Western states only. Fast delivery. Samples 10¢. Dauphinee, K6JCN, Box 66009, Mar Vista 66, Calif.

QSLS. Samples 10¢. Bob Morris, W2IHM, 230 Rose St., Metuchen, N. J.

QSLS. Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 for 200 and get surprise of your life. 48 hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS — All kinds and prices, samples 10¢ fast service. DX Card Co., Kulik St., Clifton, N. J. GR 3-4779.

QSL Samples. Dime, refundable. Roy Gale, W1BD, Box 154, Waterford, Conn.

QSLS-SWLS. Samples free. Bolles, W5OWC, Box 9007, Austin 17, Texas. (We regret p.o. box error in last ad.)

QSLS. Neat, Attractive. Samples 10¢. Woody's. Box 164, Asher Sta., Little Rock, Ark.

QSL Special. Free sample. Nat Stinnette, W4AYV, P. O. Box 155, Umatilla, Fla.

QSLS, Taprint, Union, Miss.

RUBBER Stamps for QSLS: sample imprints. C. W. Hamm, W9UNV, 542 North 93rd, Milwaukee, Wis.

NEW! QTH cards! Proud of your call? QTH? Large call in color, QTH, Land Line. Business card quality, size. Must for Ham Gatherings. Samples 10¢. Country Print Shop, Route 2, Chesterton, Ind.

RUSPRINT Special: QSLS-SWLS, .01¢ each, samples 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS-SWLS .01¢ each, samples 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS. 100, 2-color, Kromekote, $2.75. Fast service, free samples. Dortch, W4DDF, 6108 Jocelyn Hollow Rd., Nashville, Tenn.

QSLS. Glossy. Samples 10¢. W1OLU Press, 30 Magoun, Medford, Mass.

QSLS. Samples 10¢. H. J. Snyder, 398 Washington, Peru, Ind.

NOVICES! Generals! QSLS, VHF's, SWL's, YL-OM's (samples approximately .09¾¢). Reasonably priced "tacked-up kind", different, comic, sedate, diversified, attractive, prototypal, unparagoned, infrequent, unprecedented, extraordinary, dissimilar, (whew!). Rogers, KØAAB, 737 Lincoln Ave., St. Paul 5, Minnesota.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS-SWLS. 100, $2.85 up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS. Reasonable. 3 weeks delivery. Samples 10 cents (coin). Dick, K6GJM, Box 294, Temple City, Calif.

QSLS, Sharp! 200 one color, glossy, $4.75; Multi-color samples dime. K9DAS QSL Factory, Edward Green & Sons, Box 197, Frankfort, Ind.

QSLS, SWLS. Samples dime. Backus, 703 Cumberland St., Richmond, Va.

QSLS: Cartoons, colors, something different. Samples 15¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

FINEST QSLS! Lowest prices. Samples. WAT, Box 128, Brecksville, Ohio.

QSLS Glossy, two colors, samples 10¢ (refunded). 200 cards $3.75. W1GKH Press, Candleview Ridge, Danbury 18, Conn.

QSLS. Ham's "Super-Speed Specials" are engineered to cover knot holes in drafty shacks. Sharp, fast, reasonable. Samples dime. Robinson, W9AYH, 12811 Sacramento, Blue Island 13, Ill.

NOVICES! Get started: Heath AR-2, AT-1, antenna coupler, cyrstal, and key, $55; code course 0–18 WPM, $12. Top condition F.o.b. Racine, Wisconsin. Poulson, K9CPT, 929 E. Colonial Dr.

CASH for BC-312, BC-342, R5A/ARN7, BC-788, BC-610E, BC-939, BC-614, BC-221 and late type test equipment, receivers, etc. Amber Industrial Corporation, 75 Varick St., New York 13, N. Y. We pay freight charges. Write.

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.

WANTED: ARC-3, ARC-1, ART-13, BC-312, BC-342, BC-610, BC-788, O-17/ART13 LFO and other surplus. Advise what you have and price. Ritter, W4VHG, Box 5878, Bethesda, Md.

SCHEMATIC diagrams ARC-5 80-40 meter rcvrs and xmitters, 25¢ each or trade. S. Consalvo, 4905 Roanne Drive, Washington 21, D. C.

RADIO magazines. Buy, sell or trade. Bob Farmer, Plainview, Texas.

CASH Paid! Sell your surplus electronic tubes. Want unused, clean transmitting, special purpose, receiving, TV types, magnetrons, klystrons, broadcast, etc. Also want military, and commercial lab test and communications gear. We swap, too, for tubes or choice equipment. Send specific details in first letter. For a fair deal write, wire, or telephone: Barry Electronics, 512 Broadway, New York 12, N. Y. Tel. WAlker 5-7000.

FOR Sale: One NC-98 rcvr, $100, plus shipping cost. Arden Henry, Canisteo, N. Y.

FOR Sale: HQ-140X with speaker, not yet a year old, $220; 40 watt modulator, $35; Adventurer, $40. K5CDD, 2400 Long, Beaumont, Texas.

WANTED: Collins 75A4 with filters, $1000 in tubes, power supply units, test equipment, meters, miscellaneous parts for trading. W6OOB, 4254 Niagara Ave., San Diego, Calif.

MEDICAL Hams! Trade Beck-Lee Model E electrocardiograph for a good Collins receiver. T. R. Jacobson, M.D., W0SLG, Hot Springs, S. Dak.

SALE: QSL metal file boxes with State and DX index. Initialed with call letters. $3.00 each. Gerold Kaminski, W8OQK, 2814 Albion St., Toledo, Ohio.

TECHNICAL Manuals TM11-273, 120 pages covering BC-312 receivers and BC-191 transmitters, $2.50. TD-60/APA-10 Panadaptor manuals, $2.75. Both postpaid in U.S.A. Electronicraft, Bronxville, N. Y.

FOR Sale: Harvey-Wells TBS50D Bandmaster Deluxe transmitter, never used, plus schematic, $110. Robert Hildebrand, 501 Washington Ave., Greenville, Ohio.

SELL: SCR-522, xmitter, receiver, and power supply. Converted, in gud condx except receiver needs alignment. Prefer local sale. $50.00. Phil Kantz, WN3JLD, 7336 Woodbine Ave., Phila. 31, Pa.

FOR Sale: 75A1 receiver, no modifications. In excellent condition, $200. Cash. 30 ft. Kuehne tower, 3-el. Telrex 10-meter "Mini-Beam" AR22 rotor complete. 100 ft. RG8U coax, all for $70 cash. L. M. Newberry, 1703 Bunker Hill Dr., Irving, Texas.

SALE Or Swap: Assorted knobs, alignment tools, ARC-5 by-pass condx, assorted paper and oil condnsrs, assorted micas, low freq. plated xtals, many other items. L. A. Gerbert, W8NOH, 38k6 Ivy Dr., N.E., Grand Rapids 5, Mich.

TELREX 20 meter beam for sale, five element, Mod. 506-A, unused, $140. R. E. Winkelman, 54 Boylston St., Cambridge 38, Mass.

WANTED: Late 75A4. Quote lowest price. T. Shepard, W8BNG, 18680 West 13 Mile Road, Birmingham, Mich.

B & W 5100, $335; B&W grid dipper, new condx, $25; HRO-5 w/pwr supp and 4 coils, $150; new GPR-90, $400; Elmac A54H, $80, Thordarson 19P65 transformer 2000/2500 .300 Ma., $25, PE-103 with control plug, $25, Jennings vacuum capacitors 32KV 12μμfd $5; 50μμfd $7, F.o.b. 390 Hill Ave., Elmhurst, Ill. W9AMU.

FOR Sale: Tubes, brand new, RCA 813s, $7.50; 832As, $4; 100TH, $4.50; 250TH, $18; 811s $2; 810s, $8; 203As, $2; new Measurements Corp. Mod. SG-61/U signal generator, $85; Bendix TA-12 transmitter, unmodified, makes swell 100 watt rig, $35; plate transformer 4400 c.t., 400 mils, primary 220 volts, $20; BC-338 80 watt transmitter, covers 75, 80, and 40, unmodified, $18; ARN-8 aircraft receiver, $15; filament transformer Stancor P6139, new, $3; I.M.-5 frequency meter, A.C. supply, calibration book, $75; VHF152, $35; Knight 20 watt high fidelity amplifier, $25; all guaranteed. Can ship C.o.d. Bill Slep, W4FHV, Ellenton, Fla.

DON'T Cry if you're having code trouble. Shortcut methods are pure fantasy. We teach the association method, approved the world over. Novice course, basic code instruction and practice material to 8 WPM, $5.95. Advanced course, practice material 9 to 18 WPM, $4.95. Combined, $9.95 7" dual track magnetic recording tape, 3¾ IPS. Satisfaction guaranteed. Tapedcode, Box 31-E, Langhorne, Pa.

SELL Carter Gen-E-Motor 5.5 VDC input, 600 VDC .175A output, $15; Home-made 10 meter 3 tube dialless converter, $10; send for list of QSTS available, 30c postpaid. W2DTE, Robert Cobaugh, 29-29 213 St., Bayside, L. I., N. Y.

WANTED: 10A. K2CLQ, 826 Preston Rd., Eastmeadow, N. Y.

FOR Sale: Viking Adventurer with B & W balun coils and Knight R.F. Z-bridge. $36. W90HH, 2929 N. Lowell Ave., Chicago 41, Ill.

FOR Sale: Viking Ranger, perfect condx, differential keying, $190 or make an offer. SX-25, gud shape, spkr, $65. Larry Alkoff, K2DXV, Burton House, Box 4343, M.I.T., Cambridge, Mass.

WANTED: Elmac xmitter with pwr supply, mobile antenna, mike, converter, (for 12 volt) in exchange for: VTVM Stark VT-9, tube tester Stark 9-66 (like new). R. Couture, VE2AJM, 294 Notre Dame St., Black Lake, P. Q., Can.

FOR Sale: New, used and surplus test equipment, receiving tubes and components, books and magazines. Free list. Cecil Baumgartner, Box 343, Milton, Pa.

WANTED: Model 10-B sideband exciter. W1AGE, 44 Seaview Ave., Marblehead, Mass.

W1REP has extra Panda Radio Co. G42U Mini-Beam, $75. R. L. Gibbons, 15 Everett St., Canton, Mass.

WANTED: Hams as wholesale salesmen in own area. Tremendous earning potential. Gotham, 1805 Purdy Ave., Miami Beach, Fla.

TOWERS. Self-supporting, all welded tubular steel. The finest available for Ham Beams in reasonable price ranges. Heights to 200 feet. Equipped for toro and 2-in. masting. The following towers tested to withstand 80 MPH winds, unguyed: Catalog #23AT40S, 50 feet, 227 lbs., $89.95; #23AT20S, 50 ft., 209 lbs., $82.50; self-supporting #23AT244, 40 ft., 170 lbs., $59.95. Order the Model of your choice and when it arrives if you do not agree that it is the finest in design, materials and workmanship return within ten days for a full refund. Ladd Electronics, 111 North 41st St., Omaha, Nebr.

500 Watt allband AM-SSB linear unit in BC610 type cabinet. Has high level Class B modulator; $200. Johnson Matchbox, new, $35; new 2 to 4 Kv. at 1 amp. plate transformer, $45; Elmac 4-250A new, never used, $32. All-bander mobile coil $8; 61.6-4-65A rig with pp modulator complete, $70; BC453, $10; 3-el. 10-meter beam, $10; 2 el. 15 meter beam, $10; Philco 12" TV, in gud condx, #40; Crescent tape recorder, new, $55. Other gear cheap. W4BIW, Byron Lindsey, 751 San Antonio Dr., N.E., Atlanta, Ga. Tel. TR 5-4759.

FOR Sale or trade: Complete volumes of QST. Years 1925 to 1929 inclusive; 1931 to 1950 inclusive. Some issues of 1924. Make offer. Also 175 watt home-built transmitter complete TVI suppressed: 811As separate modulators 811As. 35 to 50 watt Masco amplifiers, mikes, speakers. W3AQN, Paul L. Stumpf, 715 S. Pine, York, Pa. Tel. 4-36275.

RADIO Operators! Must have FCF 2nd Class License and type 40 wpm. Starting salary $3.14 month; free air travel; retirement and hospitalization plans. Send complete resume to American Airlines, Inc., 99 Park Ave., 8th Fl., New York City.

SELL: National NC-88 with S-meter, perfect condition, $70. Also Simpson V.O.M. multimeter. Best offer. Gary C. Clifton, KØAMY, Orchard, Nebr.

FOR Sale: My 833A KW, 70-20 phone and c.w.; pi-network final. Photo on request. R. M. Walker, W2ZOL, Mott Rd., Fayetteville, N. Y.

SELL 20A, 458 allband VFO in matching case, QT-1 top condition, $199.95. W6NZ, 84 Vincente Rd., Berkeley 5, Calif.

SELL Knight cw 50-watt transmitter, $40. Bob Stern, KN2VAE, 37 Brook Rd, Valley Stream, L. I., N. Y.

CHICAGO Area only! Sale: 75A3 complete, $400; NC300, new, $250; Elmac w/supp., $100; Eldico SSB100, $400. W9KPD, Fillmore 5-2215. Will not ship. Come and get it. Wm. Frankart, 1259 So. Boeger, Westchester, Ill.

FOR Sale: Heathkit DX-100 in excellent condx. Will consider any offer $180 or over. W8UBA, R. L. Bristol, Almont, Mich.

250 Watt xmitter fone/c.w. 813 final, homebrew, less HV power supply. Highest offer over $75. Dave Thomson, 3213 Osborne Blvd., Racine, Wis.

SELL: New 20 meter Workshop 3-element beam, in original packing case, $100 or best offer. F.o.b. Dover, Mass. Francis Blake, Strawberry Hill, Dover, W1HUP, Tel. Dover 8-0001.

SELL: Tri-Band converted to 6 bands as in May 1955 CQ, fair, $15; Lysco A129 ten meter clamp modulated transmitter, like new, $13; UTC VM3, $10; 6v. Carter dynamotor 420 V. .280 A output, like new, $12; BC459, used, $6; Eico 221K VTVM, $20; Navy ATD (814 final Autotune .5 to 15 Kc) with 28 volt dynamotor unit, good used, $40. F.o.b. Chamblee, Ga. Donald Vaughan, W4MTV, 4511 Briarcliff Rd., Chamblee, Ga.

HIGH Power rotary inductors for kilowatt pi networks. Worth three times price. Get flyer, details. Guaranteed. Paulson Electronics, P. O. Box 14, Towaco, N. J.

3-ELEMENT 10 meter Workshop beam, $25; Gonset 20 meter beam, one year old, $45; one full size 20 meter beam, $75; Harvey-Wells TBS-50 with H-W VFO and pwr supp., $115; 4-125A tube, $10; 250 watt final with 4-125A, bandswitching 10-80, 1440 volt power supply and modulator section enclosed in 36" x 21" x 15" cabinet, $125; Amphenol-Mims heavy duty rotor with selsyns, indicator and cables, complete, $150. W4ZUK, 2817 North Atlantic Blvd., Ft. Lauderdale, Fla.

WANTED: Complete crystal filter unit from National HRO-5 (not HRO-5-AL) or standard pre-war HRO recvr. Send complete description and state your price. No offers made. F. G. Pearson, 130 Valley Rd., Ardmore, Pa.

COLLINS 32V3 transmitter, excellent, used less than 25 hours: $460 cash. W7QFF, 428 So. 4th Ave., Tucson, Ariz.

COMPLETE 12 volt Gonset mobile package with Commander xmitter and VFO in panel with Super Six convertor, Superceiver with remote R.F., audio and c.w. control and Carter dynamotor power supply: $600 plus value with Shure mobile mike and extra set cables. Only $275. W9BEF, 121 N. 7th St., St. Charles, Ill.

W8JS (formerly W1JR) now relocated on Mockingbird Hill II. My gal Lou says "Clean it out or I'll give it away" so here goes my annual Spring Housecleaning! Wide variety including SSB and RTTY gear. Write for list. Richelieu, 3425 Middleton Ave., Cincinnati 20, O.

SELL: National NC-240D recvr with spkr, in exc. condx, original owner, used only as standby, $150; Hallicrafters SX-28A recvr, gud condx, $145; brand new Mallory Vibrapacks, 12 volt inpt, 300 V at 100 Ma. outp., $9. S. J. Semel, W2SHE, 910 W. Second St., Elmira, N. Y.

20A SSB Exciter, brand new, $219. WØZHJ, 2444 D St., Lincoln, Nebr.

SELL 36 ft. aluminum tower, in 2 sections, 8 ft. square base, $49. W3VDF, Colfax 5-2619. Rich Hill Rd., R.D. 1, Cheswick, Penna.

S20A and BC348 VFO (160 to 15) assembled but not aligned. No time to operate. Pictures forwarded if desired. Yours for the largest offer of donation to Bishop Fulton Sheen received by the 30th of the month. Your tax deduction. K4GTB, 118 Scott Drive, Manassas, Va.

FOR Sale: BC610D, Tuning units for 15-20-40-75 modified for good bandspread VFO with outside tuning condenser. Regular 10 meter unit with several crystals. Some other ham band regular units. Full set of final coils. Coax output with coax changeover relay. Extra 250TH and pair of 100TH modulator tubes, new. TVI suppressed for medium strong signal area. FB shape and topgrade BC-610. In use but takes up too much room for me. $500 less $25 if you pick it up. R. Rex Roberts, W7CPV, 837 Park Hill Drive, Billings, Mont.

SELL: Central Electronics 10B, beautiful condx, $90; SCR522 converted 2 meter transmitter, with meter, xtal and panel, $29 final $25, K2HXE, 220 Beecher St., Syracuse, N. Y.

OLD Old Timer's Club, 40 years in ham radio. Join this pioneer group. Write W4PPZ, Cline, for application blank.

SEND for this month's standout listings of Reconditioned Equipment. Also request our new "1957" Amateur Catalog. We feature all leading brands and promise you an attractive deal always regardless of your needs or budget. Check our offer first. We deal quickly, easily and always on a personal basis. Stan Burghardt, W0BJV, Burghardt Radio Supply, Watertown, S. Dak.

VIKING II, VFO, filter, coax relay — $225. New Gonset Triband and noise clipper, $30. Will not ship. Roy Norby, K2CQG, 75 Ganung Dr., Ossining, N. Y.

HALLICRAFTERS S40R with Heath Q Multiplier. Hammarlund HQ140XA, new January 1957. Best offers. C. Gerst, 2674 W. 25th St., Cleveland 13, Ohio.

VIKING Pacemaker in original box and in a like-new condx. First check for $350 F.o.b. Phoenix, Ariz. Frank Shopen, 4916 W. Indianola, Glendale, Ariz.

WANTED: Factory-wired and tested Viking II or Valiant. Also gud used Instructograph. M. H. Booth, W5IKN, 4423 Sol Rockford, Tulsa, Okla.

VIDICON Deflection yoke and focus coil, $30. W8RMH, 1910 Long Point, Pontiac, Mich.

SACRIFICE NC-300 w/spkr, Moseley 3-el. 20M VP beam, Johnson LR filter, Johnson SWR bridge, BC-458 converted for use with 20A. Advance Relay 115V AC coax relay. No reasonable offer refused for any item. Leaving amateur radio until kids are grown. L. F. Murphy, 1986 First St., Atwater, Calif.

ILLUMINATED "S" Meters for Gonset Communicators. Just plugs in to attach. Also new and used Communicators, linear amplifiers, G-66's, Super-Sixes, Elmac A-54H's, AF-67's, PMR-7's, etc; new Gonset G-77 transmitters. Special: 2-meter Communicators, brand new, $199.50. Graham Co., R. T. Graham, W1KTJ, Stoneham, Mass. P.O. Box 23, Tel. ST: 6-1966.

OSCILLOSCOPE for SSB, used DuMont 241 5-in. tube, 4 megacycle amplifier includes spare 5JP1 C.R.T. Will ship. Robert A. Waters, W1PRI, 161 Lexington St., Weston 93, Mass.

HQ-129X or SX-28 for sale. Selling either receiver but not both. Make an offer. W8WSP, 2010 East Broad St., Columbus, Ohio.

FOR Sale: B&W 5100 transmitter, with SSB conversion by B&W (used 3 contacts only), $470. NC183-D w/spkr, last IF cut thru for SSB slicer, $275, new and perfect. C. Judd, W2LZW.

NOVICE Station: $45; Heathkit AT-1 transmitter, Drake low pass filter, balun coils with coaxial cable and fittings, Amphenol 40M dipole antenna and relay, BC457 VFO, key. Pat Kelly, K2PQP, 420 Park Place, Apt. 1D, Ft. Lee, N. J. Tel. WIndsor 7-2771.

RETIRED Ham would like to contact ham who would be interested in *taking trip around the U. S.* in a house-*trailer visiting places of* interest, sharing expenses of trip. H. Rogers, W2MEK, 1424 Burton St., Whitestone 57, L.I., N. Y.

"PIG-In-A-Poke"? Not if you visit Ham Headquarters, USA, and take your choice from the hundreds of "Like New" bargains in the world-famous Harrison Trade-In Center! (SS photographs, pp 147, March QST and p. 133 April *QST*). Greater values, because tremendous turnover means lower overhead! Terms. Trades. BCNU. Bil Harrison, W2AVA, 225 Greenwich St., New York City.

DX-100 Brand new, never used; assembled by technician. Calibrated and air-tested. Must sell immediately: $240. Robert Lederer, 1015 Broad St., Bridgeport, Conn. Tel. EDison 6-1141.

SELL Or swap: Hi-power radio trans. test equipment, 20 meter beam; want 16 mm sound projector. Write to Fred W. Rudolph, Stryker, Ohio.

WANTED: Used laboratory type parts and equipment. Send list of equipment, condition and best price. Will pay cash, or trade for equipment from shack. Clarence Bigelow, 105 North Main, Bluffton, Ohio.

VIKING Ranger, factory-wired and tested. Used very little. First good offer. Mickey Corn, 660 E. 92nd St., Brooklyn, N. Y. DL 2-7694.

FOR Sale: S-40, DX-35 and VFO, all for $150. Also have oscilloscope and 100 watt CW xmitter. Will sell or trade for rcvr or mobile gear. John Duda, W1KIM, Main St., East Douglas, Mass.

WANTED: Hallicrafters S-37 rcvr and S-35 Panadaptor, any condx. Sell: set Millen wavemeters 3.0 to 150, Mc., $8; SP-44 Panadapter, $49; 6 meter Millen VFO, $35, Ampro #750 tape recorder, nearly new, $49; Todoc UHF Monitor and communications receiver VHR-4O1A, W4UCH, Sterling, Va.

MUST Sell: Morrow MB560 xmitter, Morrow MBR5 rcvr, Morrow RVP250 vib. sup., Morrow hook-up cables. Three months old. $400 gets all. Charlie, W5GPO, 1208 Kemp Blvd., Wichita Falls, Texas.

TWO New 4D32 tubes, $10 each; Collins low pass filter, $20; field strength meter, $10. H. Smith, 325 Chilean Ave., Palm Beach, Fla.

WANTED: Factory-wired allband transmitter, beam, accessories. Send description. Cash or trade speed Graphic camera, Springfield rifle, target pistol, antique flintlock. Pilot preamp. All replies answered. Forman, W1LAK, Woodbrook Drive, Springdale, Conn.

BARGAINS: Reconditioned with new guarantee. Shipped on approval. Hallicrafters S38 $29.00; S40A $69.00; SX99 $119.00; SX71 $149.00; SX96 $189.00; SX100 $229.00; Viking Adventurer $89.00; Viking II $199.00; S40B; S85; SX88; SW54; NC98; NC183D; HRO5; NC400; HQ129X; HQ140X; HQ140XA; GPR90; A54; AF67; PMR6; PMR7; HT9; HT19; Collins 75A3; 75A4; 32V3; many other items. Easy terms. Write for list. Henry Radio, Butler, Mo.

SELL: HRO-60, $485; FRA teletype receiving converter, $55; HT-4B model BC-610 transmitter, $295; 32V-2, $375. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. RIchmond 2-0916.

2-METER Mobile station: Eldico xmitter, Gonset converter and silencer; Mallory 300v. supply at 200 Ma., also RME DB22A preselector, Hy-Lite wide spaced 20-meter 3-el. beam. W2LFB, Nutley, N. J. NU 2-7552

CASH & Carry: Globe King 500A $450; WRL vfo $40; B&W low pass filter $8; Harvey-Wells Z-match antenna coupler $60; Johnson signal sentry $12; Rug $10; xtal mike $6; NC300 receiver $300; xtal calibrator for NC300 $12; speaker $10; Heath AM1 impedance bridge $10; 3 element triband beam $45, with prop pitch rotator, xmfr, 100 ft. six conductor cable $20 more, and with 90 ft. RG8/U another $8; a pair of unused selsyns $5. All excellent condition, 20% discount if you buy it all. W3VPU — Wendell Turner, 742 Hickory Ave., Bel Air, Maryland. Phone Bel Air 1075-J

BEING Transferred. Must sell: 813 rig exactly as illustrated in the 1952 ARRL Radio Amateur's Handbook, looks like factory job, installed in 6 ft. Bud cabinet with Variac control plate supply 1V and bias supply, Heathkit VFO plus 100% spare tubes, plate transformer, choke, mod. transformer for 811's and misc. extras: $150 cash and carry. LeRoy Flatt, 14 Virginia, Natick, Mass.

RME69 Communications receiver with double bandspread and matching speaker. Excellent condition. Original owner. Make offer. W2AFE, C. H. Daykin, 19 Oxford, Geneva, N. Y.

SELL: 3400 volt xfrmr matching 20H choke and 866 bridge fil. xfrmr surplus for KW SSB/c.w. power supply, $30; new Raytheon 813, $10; 2 surplus 803s, $4 — 4 866's, $5; 3 837's, $3. All above never used, W9NXU, Leon Little, Linden, Ind.

COLLINS V2, $395. Want: 75A4, SSB transmitter. W2UKV, 12 N. 27, Camden, N. J.

WANTED: 800 to KW amplifier with or without power supply and with or without modulator, commercial or home brew for use with DX100. K9CAZ, Box 291, Bunker Hill, Ill.

300 Watt transmitter; 813 final; plug-in coils; balun coils; $150 complete or trade on good receiver. Leo Gray, W9LRQ, 424 30th St., N.E., Cedar Rapids, Iowa.

SELL 813 final xmitter, TVI-suppressed, also many misc. xmittg. parts. W2XKQ, Meditz, 477 Grandview Ave., Ridgewood, Brooklyn 37, N. Y.

FOR Sale: Collins 310B exciter TVI suppressed, BC645A transceiver new, TR switch; BC459, BC457A, BC457A converted for 10 meters; BC696A; PE55 12V dynamotor new, 813 tubes, new, 6 V Leece-Neville alternator with regulator; Elmac PMR 6A with Q multiplier and Elmac 12V vibrator supply. Make offer. Dr. Paul Haus, 25 Upland Dr., Chappaqua, N. Y.

I have several six volt Carter dynamotors 420 volts 280 mills, like new, $15 each; also one type AC 15-meter coil set for HRO-50, $20. Money order takes any or all of the above. Carl Snyder, W8ARW, Box 103, Greenville, Ohio.

FOR Sale: 20 QST binders, 10 Proceedings of the IRE Binders (small size), in excellent condition, half-price plus postage. Mrs. C. W. Janes, 11 Palisade Blvd., Demarest, N. J.

SELL: Collins 32V2, $450, also Viking II with Johnson matched VFO, $225. Both guaranteed perfect. Price crated and F.O.B. Also sell 110 V. AC coax relay and 12V. dynamotor. Sell separate. Fred Kloepper, W0FON, Lawrence, Kans.

FOR Sale: SX99 receiver, used few hours, absolutely perfect condx, packed in original carton; SX71 receiver, late run, no circuit changes or modifications. Looks and performs like new. QST and CQ magazines, 1937 to 1954. All letters answered. J. Houston, W0OIV, Lancaster, Mo.

SELL: QST 1932–1956, complete, $25, f.o.b. Need bookshelf space. Bob Simmons, 810 E. Orchard, Kirksville, Mo.

SELL: Cash, no trades! Complete ham station: Collins 32V2, 75A3 (converted from 75A2 by owner), and speaker. Miscellaneous accessories include spare 4D32 tube, D-104 microphone with push to talk stand, Vibroplex bug, antenna relay, complete set interconnecting cables, instrux manuals, etc. You pick up, $750. I pack and ship collect $800. Lester Thayer, Jr., 409 Jarvis St., Greenville, N. C. Ex-CP5EQ/CP6.

COLLINS 32V3 transmitter, one owner, $525. Just completely overhauled by Collins, never used since. F.o.b. Johnny Fearon, W4WKP, 4165 Club Drive, N.E., Atlanta, Ga.

WANTED: Used Johnson Matchbox, $30 plus postage. P. Leahy, W9GVV/9, 102½ E. Oak St., W. Lafayette, Ind.

OLD Cone type loudspeakers: Collector wants all makes and models, manufactured before 1927. In reply state make, model, condition, location and price. D. Eymard, 140–35 58th Road, Flushing, L.I., N. Y.

WANTED: Leica, Cannon or Exacta. Will swap for xmitter running 600 w. SSB, 400 c.w., fully metered, 4-125-A final, 10-A exciter, separate c.w. and NBFM exciter, all voltages regulated. Fully TVI suppressed! What's your deal? W2WFV, 255 Eastern Parkway, Brooklyn, N. Y.

FOR Sale: Telrex 3-el. 20 meter beam model 56–12, $79; also Mosley 3-el. 20-meter Shortbeam, Mod. VPA 20–3, $49; both beams less than 1 year old in a like-new condx and can be rotated with T.V. rotator. Also 1957 Plymouth "Fury", 290 H.P. 700 miles with new Morrow equipment. Bargain at $4750. W2FUR, S. Gogel, 1096 Laux Pl., No. Bellmore, L.I., N. Y. SUnset 5-6876.

SELL: DB22A, $35; pair type 5 selsyns, $10; UTC PA303, $16; UTC S58, $4; 4 μfd 3000V, $4; code training set AN/GSCTI, $15; 75 meter SSB xtal lattice exciter, all-band PP 811 final; rack-mounted, $100; PE103A, new, $25; Eldico grid dipper, $10; new RCA 810, $5; power supply 2000V, 350 Ma., rack mount, $50; CW3 5 Mc. receiver and RCA freq. std., $25; many meters, transformers, relays, chokes, condensers, etc. Stamped self-addressed return envelope for list. W2PRN, 225 Blueberry Lane, Hicksville, L. I., N. Y. Fone We 1-3677.

BARGAINS: With New Guarantee: HT-9 $99.00; S-52 Receiver $55.00; SX-28 rack $99.00; Elmac PMR6A $79.00; Morrow 3BR $24.95; Lysco 600 $69.00; Eldico TR75TV $30.00; Meissner EX VFO $25.00; NC-183D rack $259.00; Millen 90800 $14.95; Johnson Adventurer $34.50; Johnson VFO $24.95; Viking II $199.00; Elmac A54 $99.00; RME-84 $65.00; Gonset TriBand $24.50; Sonar SRT-120 $99.00; Globe Trotter $34.50; Scout 40A $59.00; Globe Champ 165 $149.00; Globe King 275 $199.00; Globe King 400B $275.00; and many others. Free trial. Terms financed by Leo, W0GFQ. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

TO 75% discount. Braud name parts, new. Meters, switches, relays, tubes, resistors, condensers, others. For complete listing send 50¢ coin, refundable. Ensall, 1134 Bingham Ave., Warren, Ohio.

SIDEBAND Slicer, Model "A", factory aligned with AP-1. $30 or swap for KW modulation transformer. W. J. Nolan, W9TQL, Box 413, Winfield, Ill.

SACRIFICE SX-71, good, first $120 f.o.b. Heath Q-Multiplier, like new condx, $7.50; National MB-40-SL, unused, $10. W2PIE, Robert Lewin, 28 Fenimore Dr., Harrison, N. Y.

SELL Johnson Pacemaker, uncrated, $450. H. Stillman, 3832 Washington Blvd., Chicago 24, Ill.

SALE *Tubes:* 4X150A's, $12.50; 4X150G's, $15; 829's, $5; 723A/B's, $4.00; 20KV vacuum capacitors. Everything is new, unused surplus. Bell, W8GUE, 5292 West 45th St., Parma 29, Ohio.

SELL: Hallicrafters SX-100 receiver, perfect condx, less than 3 months old, $200. W. W. Hardwick, 532 Almar Ave., Pacific Palisades, Calif.

WANTED: BC-221, BC-348, BC-312, BC-342, BC-610-E, ARN-7, BC-788, ARN-6, APR-4, ARC-1, ARC-3, ART-13. All types surplus or amateur transmitters, receivers, test equipment taken in trade for New Johnson Viking Ranger, Pacemaker, Valiant, Hallicrafters, Hammarlund, National BNW, Gonset, Elmac, Telrex, Fisher Hi-Fi, etc. Write Tom, W1AFN, Alltronics, Box 19, Boston 1, Mass. Tel. Richmond 2-0048. Stores: 60 Spring St., Newport, R. I.; 44 Canal, Boston, Mass.

USED Meters: About 35 good meters such as Weston, Jewell, etc., various ranges and shapes from 2–8 inches in diameter. About 30 other good meters of the low-price variety. Ten additional meters needing cases or glass windows. 3 tachometers, some new motor cases. Everything: $40. W8QKU, 2748 Meade St., Detroit 12, Mich.

SELL: Elmac A54H transmitter, Gonset Triband converter, two Carter Dynamotors, power supply, two antennas, rack, misc., for best offer over $150. Donn Weirick, W2EYL, 64 Fletcher, Mount Vernon, N. Y. Tel. MO 7-0904.

FOR Sale: One 6 meter rig as described in the 1955 Radio Amateur's Handbook, completely TVI suppressed, metered, $90; one SCR-522 2-meter rig, shielded in cabinet, all circuits metered, 'phone or c.w. $35; one 75 w. Eldico c.w. rig, $45; one Hallicrafters SP-44, Panadaptor, $45. Will box and ship, you pay all charges. J. O. Van Sickel, W3AKZ, 143 Virginia Ave., Uniontown, Penna.

COLLINS 75A1 in perfect condition, $260, including speaker. Walter A. Duke, Radio Station WDBL, Springfield, Tenn.

FOR Sale: Heath DX-35, wired, $50; Stancor ST-203 10M. xmitter, $15; SCR-522 2M. xmitter, $10. H. M. Ash, K2KPH, 443 Eastgate Rd., Ridgewood, N. J.

SELL: DX100, NC125 w/spkr and Heath Q mult., Gonset Super Six and Superceiver, Babcock mobile transmitter w/ 6 V. vibrator supp; RME DB23. No reasonable offer refused. D. Tanzer, K2DDY, 4272 Kepler Ave., Bronx 70, N. Y. FA 4-8268.

SELL: 80-10 (500 w. xmitter), ARRL Handbook; Oct. 1952 QST; 4-250A final, pi, pr. 805 mod. Class B, Variac controlled, 6 ft. rack panel, $250; 32V1, $230; HRO-50T, spkr, coils, $230; HT-18, $25; Meissner EX, NBFM, $20; VRS-1, $20. All instr. manuals. Cash. Will not ship. Paul Haczela, 310 Walnut Pl., Syracuse 10, N. Y. 75-3155.

WANTED: Regular sq. cased running time meters for mounting into 2 3/4" round hole. G-E preferable. W4MDQ.

MAKE An offer on back issues of QST May 1949 through 1956, and CQ 1950 through 1953. Missing only a few issues. All in exc. condx. J. L. Gammill, 71 Village Dr., Somers Point, N. J.

SELL: Hy-Lite 20 meter 3-el. beam, excellent condx, $35; 75 meter 12 volt mobile transmitter, control head and power supply, built by McGuire Radio. $30. New condx. R. Maculuso, 41 Birchwood Dr., North Arlington, N. J.

SELLING Collins 30K1 xmitter, $750; 75A3 plus Q multiplier, $350; Harristahl NE6 xmitter, never used, $50. W2BBV.

FOR Sale: New HRO60T, A, B, C, D coils w/spkr, xtal cal.; original factory carton, never opened. Cost $642.45 one month ago. First check for $550 takes it. F.o.b. Miami, Fla. W. E. Ethier, W4HKJ. 990 S.W. 63rd Ave., Miami 44, Fla.

LAMPKIN Frequency meter, Mod. 103-B, Serial 323. Brand new, going out of business. $125. Gerard Moor, W1OGY, 53 Garland Ave., Cranston, R. I.

SELL: HQ140X, in like-new condx. Guarantee satisfaction. $200 F.o.b. Minneapolis, Minn. R. E. Jackson, KØHXP, 1412 East 31st St., Minneapolis 7, Minn.

15 & 20 Meter beam; 2 full sized beams on one boom. Price $50. K2JZT, Sherburne, N. Y.

NC101XA or similar wanted. Sell or swap kilowatt plate transformer, etc. Strubank, 4417 Bedford, Detroit 24, Mich.

RARE Collector's item: 3-element tube built by McCandless for Dr. Lee de Forest in 1908. Positively intact. Open for bids. Write J. E. Sacker, 10234 103rd St., Edmonton, Alberta, Can.

TMCGPR90 receivers and slicers. Gonset, Elmac and Penta tubes. Write for trade. Baker Supply Co., McComb, Ohio.

WANTED: Hammarlund Super-Pro. W2ZZQ, Hal Hauser, Montain Ave., Mt. Bethel, Plainfield, N. J.

BC-929 'scope indicator, $10. Alan Waggoner, 1938 Hetrick, Richland, Washington.

HALLICRAFTERS, Central Electronics ham gear — others. Swartzlander Radio Limited. Fremont, Ohio. Call Jerry, W8EPI or write.

RUBBER Stamps of all kinds. Special, Nickel-plated self-inking pocket stamp, $1.40. Name, QTH and Call. Howard Rapple, WØVRB, 401 N. 2nd St., Humboldt, Iowa.

WANTED: Short wave & communications receivers. New or used. All types electronic tubes. Highest cash prices paid. Write or phone: North Radio Co., 62 Cortlandt St., New York 7, N. Y.

SELL Your way to wealth! Wanted: Surplus military and commercial aircraft electronics: ARN-6, ARN-6, ARN-6, AS-313, AS-313, AS-313, ART-13, ART-13, ART-13, ARN-7, ARC-3, 51R-3, APN-9, BC-348, BC-788, 1-152, MN-53, test equipment and all vacuum tubes. Top prices paid! For fattest checks, sell to Rex! Bob E. Sanett, W6REX, 1524 S. Edris Dr., Los Angeles 35, Calif. Phone REpublic 5-0215.

SWAP Fedders ½ ton air conditioner, used 15 hours, for ham equipment. W3BDS, 24 N. Custer, New Holland, Pa.

SELL: BC610C, all coils, BC939A, antenna tuner; BC614C speech amplifier. All in A-1 condition. $250 F.o.b. Earle Wimberley, Fone 57. Hayti, Mo.

SELL: Heath AT-1 and AC-1 coupler, both in excellent condition, $32. Will ship. Lewis Van Sant, KØDTV, R.F.D. #2, Fort Collins, Colo.

WANTED: Instruction book McMurdo Silver 906 signal generator. VE3ID, 251 Carleton, Ottawa, Canada.

FOR Sale: Very clean 32V2 spare 4D32, grip-to-talk mike stand; D104 coax relay, $350; two Elmac vacuum variables, 60 μμfd, 20,000 volts, $42.50 each. Have mounting plate for split stator complete assembly, $75. W9LXQ, 6440 Dean Road, Indianapolis, Ind.

FL8 Audio filters, 2 for $2.00 prepaid in U. S.; BC348 shock mounts, $1.00; 110V DC to 110V AC, 250 watts, 60 cyc. converter, $10; 300–600 Mc. freq. meter, gud condx, $7.50; VHF152A in gud condx, $50; Gonset 10 meter converter, $18; Gonset 1.6-4 Mc. converter, $15; BC433 compass receiver, $5; BC1031A Panadaptor gud condx with instrux book and extra C.R.T. Wanted: good tape recorder and Gonset G66 revr. M. D. Haines, W5QCB, 1316 S.W. Military Drive, San Antonio 21, Texas.

FOR Sale or exchange for ham equipment. Tracerlab model SC1A-100 radiation counter, in working condx. C. N. Huhtanen, Red Hill Rd., New City, N. Y.

SELL: Lysco 600 and Heath AT-1 transmitters. Eldico AM-40 modulator. Lysco antenna tuner and Mod. 401 modulator. Bob Hartman, Dakota, Ill.

FAMOUS VHF "Lunenburg" antennas, 6 meter 5 element, $14.95; 2 meter 6 element, $6.95; 6 meter horizontally polarized mobile antenna. Wholesale Supply Co., Lunenburg, Mass.

TRADE: New Eico audio generator (fungus sprayed); Sylvania voltage calibrating standard and 6 volt Carter Gen-E-Motor. Want: Globe Scout 65A or B transmitter. K4CDP, 218 Michigan Ave., Daytona Beach, Fla.

2 KW Amertran, $60; 3 KW 110–220/6800 V. ct, $70; Gonset 6–10–15 converter, $35; AVT-112 & 3 band receiver with 6–12–24 volt power supply. W8QJR.

SELL: NC98 with speaker; Heath Q multiplier, in perf. condx, schematics included. $125 F.o.b. Dr. Mortimer Solomon, K2MVW, 41 Westbrook Lane, Roosevelt, N. Y.

NATIONAL NPW-O gear drive until with 6 gang, 225 μμfd per section condenser, insulated sections, in gud condx; special dial FB for VFO, receiver, etc, $4.50; New GF11 xmittr with tubes (see Jan. CQ), $7.95; gud broadcast band Command set, $7.50; Guaranteed 4-125A, $9.00; UTC S45, $7.75; S57, $2.50; S61, $2.75; S28, $1.75. F.o.b. Joe Harms, W1GET, Plaistow, N. H.

SELL: Heavy-duty prop pitch motor, mount for tower, transformer, $25. Details supplied. W8UEP.

SELL At best offer 2/813 tubes, one socket and filament transformer, BW TVL coils and swinging link 10, 20, 40, 80, also 1000 volt 300 Ma. power supply, and two Triplett 321 meters 50 and 100 Ma. All F.o.b. W9NYI, Orville Braaten, Morris, Minn.

SSB-120 μfds at 2500 volts for sale. Aerovox PX18D3 energy storage capacitor, 13" x 13½" x 3", new for $35. Shipping weight 39 lbs. ea. Will accept trades. Erik Roy, Upper House, Lawrenceville Radio Club, Lawrenceville, N. J.

SONAR 120P bandswitching TVI suppressed compact 120 watt push-to-talk phine/c.w. with built-in Sonar power supply, new final AX9903 (5894), with Jones mike and Cinch VFO connectors, gud condx, $100. Julius M. Hoffer, W8UFH/1, 24 Cherry Road, Framingham, Mass.

HT-18 VFO, $39.50; 200W linear, June 1955 QST, $20; WRL antenna Tuner, $5.00; B&L microscope, $15; brand new Regency converter, $60; Magnemite battery tape recorder, $150. My junk box worth $100 for only $15. W8FIL, 11833 Wisconsin, Detroit 4, Mich.

COLLINS 75A-3. Used 2 months before owner gave up ham radio. Has been in storage since then. New condx. In original carton. With matching speaker, $375. Tom Gardiner, W5MVJ, 3790 Gold St., Apt. 7, Los Alamos, N. Mex.

SACRIFICES, all like-new condx: HQ-140X w/spkr, $195; B&W #426 low-pass $12.50; PR 80 m. Novice crystals, $1.50 each; Transitron TRswitch, $7; FB xtal mike, like JT30, $5; Trimm "dependable" earphones w/cushions, $1.50. Bob, K2PBH, 121 Village Rd., Manhasset, L.I., N. Y. Call MA 7-5972.

MULTIBAND Traps 80 thru 10. Weather sealed, 52 or 72 ohm feed, 1 KW. $8 pair, postpaid. Send stamp for literature. S. & W. Electronics, 293 N. Evergreen, Kankakee, Ill.

FOR Sale: All or part of the station of the late W1HH: 600 w. fone/c.w. transmitter, rack-mounted, with ART-13 VFO and exciter head; PP 813's mod. by 811A's. Also modified complete ART-13, SX-28, beam, tower, etc. Drive out to Wellfleet and see this equipment. Mrs. Ralph E. Brooks, P.O. Box 533, Wellfleet, Mass. Tel. 9-2464.

XFORMER, Inp. 115/60v, output 1120V/0.5 Amp. c.t., 6.3 V/3 Amp. 0.3A; 5V/6 amp. 2A, for $7.50. S. S. Brody, 211–10 73rd Ave., Flushing 64, N. Y.

FOR Sale: HT31 amp. $250; Meissner 150B $95; RCA 500w. mod. trans., $16; 75 w., $4; plate transformer 1250 V. DC, 1600 V AC. 1900 V. AC c.t.; Heath signal generator, $12; BC654A, $12; Sonar CFC VFO, $12; BC610 plug-in units, $1; T17 mike, $1. Other items. W20TI.

2 METER Communicator, latest deluxe model, $170; Collins 75A2 receiver, superb performance and like-new appearance, $325. W2ADD.

DELTA-TENNA ground planes, 2 meters, $19.95; 6 meters, $24.95; 10 meters, $29.95. Built-in coaxial connector, gold anodized elements. Matches 52 ohm coax. Meets FCDA standards. Send check plus postage allowance to Western Gear Corporation, 132 West Colorado St., Pasadena 1, Calif., for immediate delivery.

BRAND New Collins mechanical filters, 800 cycle and 3100 cycle, $27.50 each, both for $50. LeRoy Schulz, W9NEG, 812 West Williams St., Danville, Ill.

NEW Western Electric 8 volt filament equivalents of 4-400A, $5; pair $9; unused DM-35D dynamotors, 12 volt input, 625 volts at 225 ma. output, $12; matching 12 volt combination relay (antenna changeover and hi-voltage), $1.50. Include postage with check. S. Tucker, W2HLT, 51–10 Little Neck Pkway, Little Neck 62, L. I., N. Y.

CENTRAL "A" Slicer $49.95, "B" Slicer $74.95; Collins 32V2 $450.00, 32V3 $550.00; Eldico TR-75TV $49.95, VFO-2 $19.95; Elmac A54 $99.95, A54H $110.00, PSR-2 $39.95, PSR-12 $19.95; Gonset Commander $94.95, Communicator-II $179.95, Super-Six $34.95; Hallicrafters SX-62 $225.00, S-76 $139.95, S-40 $69.95; Hammarlund SP-400X $229.95, Johnson VFO $39.95, Viking-1 (TVI-ed) $139.95; Lettine 240 $59.95; Lysco 600 $79.95; Millen 90810-VHF $89.95; Morrow MBR-5 $194.95; National NC-88 $79.95, NC-98 $119.95, NC-125 $129.95, NC-183D $250.00, HRO-3 $99.95, NC-300C2/NC-300C6 and cabinet (new) $89.95; PE-103 $19.95; many other used items available. Write for latest list. Evans Radio, Box 312, Concord, N. H.

WE Will pay you $$$$.¢¢ cash for an AN/ARN-6, or any of its components. Also need AS-313 loops, AN/ARC-3 or any components. Phone us collect Stanley 7-0406 for these items. Similar fabulous prices paid for: APR-9, ARC-1, ARN-7, ART-13 parts, BC-788-C, 1-152-C, LP-21-AM, -LM or MQ-18A or MC-507 from these loops, R-65/APN-9, test sets 1-100, TS-117, -125, -147, -148, -488. What other electronics do you have? Arrow Sales, Inc. Dept. QST, 7460 Varna Ave., North Hollywood, Calif.

WANTED: 800 cycle filter for Collins 75A-4 receiver. Prop-pitch motor (small type). Must be in gud condx. W8OHV, Rt. 1, Prospect, Ohio.

FOR Sale: Heathkit AT-1, has no meter but is in excellent operating condx. External meter can easily be connected. Make an offer. Will consider trade. All inquiries answered. W1FGF, c/o ARRL, 38 LaSalle Rd., W. Hartford, Conn.

1 KW RF kit, pr. 4-250A, fila. xfrmr., Rotocoil vacuum capacitor, extras, $50; pr. 4-250A, 1 Kw. mod. xfrmer, $60; power supply kit 2500/3000V ½A tubes, sockets, fila. xfrmr, complete filter, $48; power supply kit 1250–1500V, 300 Ma., tubes, sockets, UTC transf., complete filter, $30; power supply kit 2700V-2A pr. 872, sockets, fila. xfrmr, $33; 3 4X-150A, pr. sockets, HD blower, $40; 4 400A, air socket, fila. xfrmr, $28; meters, capacitors, misc. Don Gardner, W2GSS, 209 Knapp Rd., Syracuse 4, N. Y.

FOR Sale: Antenna, wide base, approximately 15 ft. tall with 20 ft. additional pipe mast with ball bearings. Completely equipped. Prop pitch motor, Selsyn's and transformer with 8 conductor cable — Johnson indicator. Used 6 months. Prop pitch motor fully enclosed. Suitable for installation on roof. Overall height 25 ft. $150. W1HZN.

FOR Sale: New and surplus test equipment, receiving tubes and components. Send stamp for list. Cecil Baumgartner, Box 343, Milton, Penna.

ANTIQUE Wireless collection for sale. Write for list. W4KL.

SACRIFICE, 5½ ft. grey Par-Metal Deluxe cabinet, 2350V at 450 Ma., ICAS dual section filter PW supply; RCA Kw mod. xfrmr 1:1 ration WH SCRN winding, $115; or trade for Elmac AF-67; Also 304TL with socket and fil. transf., $10; Natl. MB-150, $111; Pr. 810's with sockets $10; loading and tuning conds. for KW pi-net, $9. George B. Lagaly, W5NTL, 912 N. Hester, Stillwater, Okla.

FOR Sale: Factory-wired Ranger xmitter with Bud low-pass filter and Dow-Key coaxial relay, perfect, $195; Brand new Eimac 4-400A and Eimac air socket, never used, $50; new 83" enclosed Bud relay rack. Will trade rack for best comm. rcvr. or hi-fi gear offer. Write to Don Stichler, Rt. #1, Box 112, Eau Gallie, Fla.

HALLICRAFTERS S-71, $125; R-46A, speaker, $12; Harvey-Wells TBS-50C, $50; APS-50, $20; Heathkit VFO, $13. Harry Brown, 242 S. 8th St., Terre Haute, Ind.

WANT RANGER. Will trade Viking II and VFO for cash difference, no shipping. W9PLW.

PERFORATED Aluminum sheet .051, 5/64" OD holes, 1/8" centers, $1.20 sq. ft., cut to size. Send for listing on Beams, Aluminum Tubing, etc. Radcliff's, Fostoria, Ohio.

SELL: NC-183 with spkr, $150; G-E Amplidyne with ½ HP 115V 60 cyc. single phase motor, $25; Thordarson 100 watt Multimatch mod. xfrmr, $10. F.o.b. Sturgeon Bay, Wis. Donaldson, W4VXD/9, Box 596.

SELL: Have tubes, resistors, small parts, magazines and tools. Will consider swaps. Stamp will bring complete list. M. Marshall, 455 Washington Ave., Dumont, N. J.

SX-17 with speaker, $100; Motorola FM-82 9-tube 21-99 Mc. tuner, $45; xmitter power supp., partly assembled, weights 100#, $10; GE 260 6-band portable, $15; Simpson 260 $25; mutual conductance tester, $60; Colt .38 Spl PP. Want enlarger, condenser tester, consider swaps. Al Pratt, 114 W. Lakeview Ave., Milwaukee 17, Wis.

FOR Sale: 1 Kw. 2 Par 4-250 pi net and TVI supp. filter PP811 mod. aud. amp. Has clip and filter on switch, $200. W2DMA is moving to smaller quarters. Contact A. Weasner, Box 418, RD 1, Pennington, N. J.

SELL: SX-71 Hallicrafters, late model, 21 Mc. bandspread, like new. A real buy, $139. George Maringas, W1OHC, Franklin, Mass. Tel. 137-M.

FOR Sale: SX-43 receiver, R-44 speaker. Full band coverage. Std. freq. 10–80 meter FM/AM 44.0–55.0 — 86.0 — 110 Mc. 125 volts AC. Like new. Name your price, write or phone. Felix Rivera, 101–26 45th Ave., Corona 68, L. I., N. Y.

CUBICAL-Quad antenna. Two band 10–15 meter, lightweight, rugged, non-metallic construction. Performance equals 4-element beam. Special $29.95. F.o.b. Cubex Co., 3322 Tonia Ave., Altadena, Calif.

SALE: Johnson Matchbox (new), $30; 100–100 μfd 6000 Wv V. cond., $5; Select-O-Ject, $10; T-125, $5; 3½" RD 0–200 Ma. $2.50; 2½" Sq. 0–250 Ma. $2.50. Wanted: 5/25 Hy 500 Ma. choke, 2500WV filters. WØFLK, Rte 1, Box 75, Grand Rapids, Minn.

FOR Sale: Hallicrafters S-95 receiver 152/173 Mc., FM Police, taxi, etc. Also S-94 50/30 Mc. FM police, wrecker, police, telephone, etc. Excellent condition, $40 each. Carter A1060 c.w. converter, 6 volt D.C. inp. 110 V AC, 60 watts outp. 60 cyc. Almost new, $25. Harvey Gordon, 1120 Cooper St., Lansing, Mich.

FOR Sale: Practically new mobile station, complete: $300 or will sell items separately. AF67 xmitter, $135; PMR7 rcvr, $125; 6–12V PMR7 pwr supp. $26; mobile antenna w/coils for all bands, $20; 12V dynamotor and all necessary relays, $20; push-to-talk E-V mike, $20. W9BYX, Wm. H. Vogel, 205 Evergreen, Elmhurst, Ill.

WANTED: BC-224 and BC-348 receivers. Also: ARC-3, ART-13, BC-788, R5/ARN-7. To get most dough, sell to Harjo! We pay top money and pay it fast! Cash or trade. Harjo Sales, 503 North Victory Blvd., Burbank, Calif.

SELL AT-1 modified, in excellent condition, $30. AC-1, $10. W2LGJ, 211 Park Ave., New Castle, Ind.

SELL: SCR-522, VFH transceiver, unmodified, with companion 115 V. RA-62 power supply plus newly reconditioned Meissner Mod. EX Signal Shifter (VFO) covering 10 thru 80 meters. All for $80 express collect. WØQBS, Sylvernale, 116 East Buffalo St., Duluth, Minn.

304TL tubes, $8.95 each, four for $29.95. Oldenburg, 764 Vann, Evansville, Ind.

BUG Code key, $10; ten station intercom Master, $15; General Electric 3-way portable radio, $15; Bell Model 750 tape-player, $25. All in excellent condition. Postage addtl. V. R. Hein, 418 Gregory, Rockford Ill.

FOR Sale: Collins KW-1. Excellent condition. Will ship prepaid USA. Any reasonable offer accepted. R. A. Mahler, Harvey-Wells Electronics, Inc., Southbridge, Mass.

WANTED: AC coil (15 meter) and manual for HRO Sr (M), recvr; variable coupling antenna tuning unit from ARRL Handbook. Wm. Jackson, 4719 Telegraph Rd., Los Angeles, #22, Calif.

COLLINS 75A1, $275; DX-100 xmitter $195; 10 mtr. convrtr, $8.50; 15 mtr. preselector, $4.50. W6RET, 862 Elm, Chula Vista, Calif.

FOR Sale: Viking I and Heathkit VFO. Both in excellent operating condition. Best offer over $160. WØVRE, Benedict, Nebr.

FOR Sale: 26 teletypewriter with table, in excellent condition, $90. Will consider trade for keyboard perforator. Wanted: TTY keyboard perforator. WØDNW, Rte 1, North Platte, Nebr.

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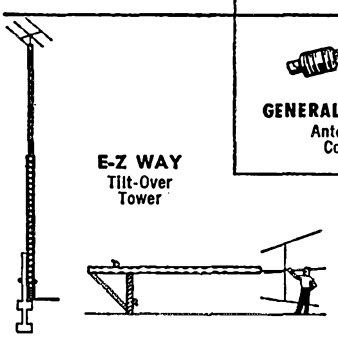

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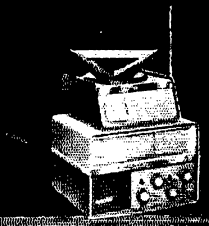

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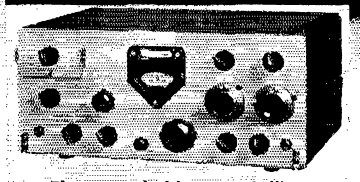

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