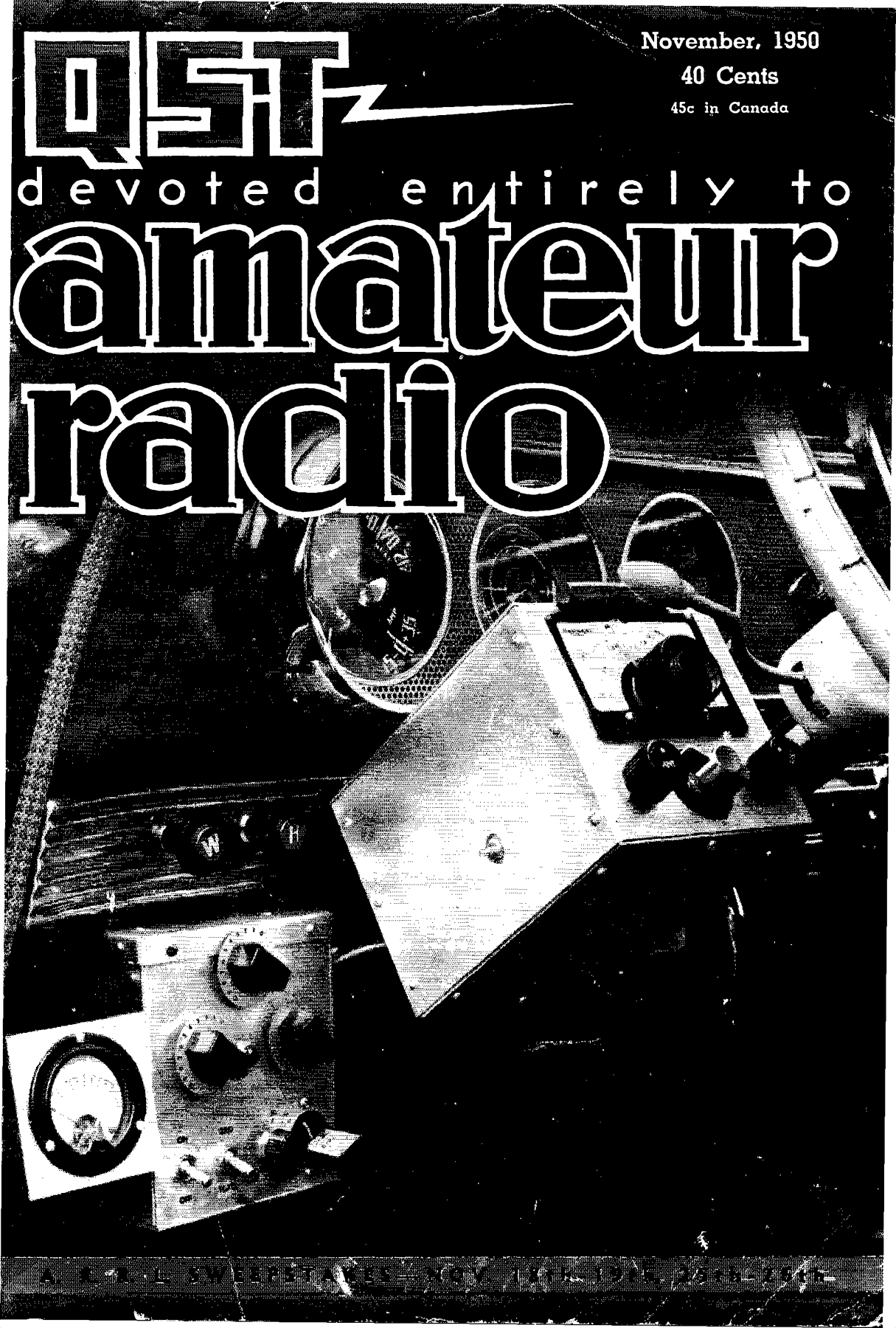
November, 1950
40 Cents
45c in Canada

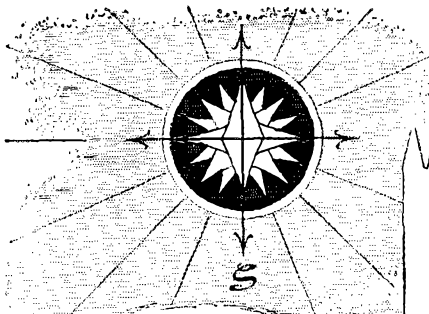
QST

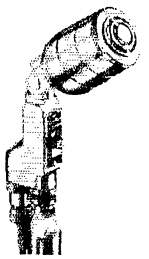
devoted entirely to

amateur radio



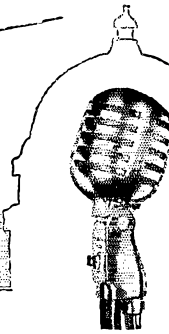
A. R. R. L. SWEEPSTAKES—NOV. 18th–19th, 25th–26th—





The "630" DYNAMIC

Very popular super-dynamic. Ideal frequency response. High output. Acoustalloy diaphragm. Lists at $39.50.

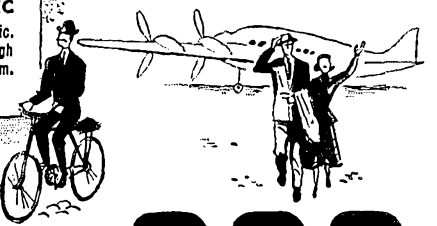


The CARDAX

World's favorite premium crystal mike—the first high level crystal cardioid with dual frequency response. List, $39.50

The MERCURY

Rugged, handsome Crystal or Dynamic. Extra quality features at minimum cost. List prices from $24.50 to $34.50.

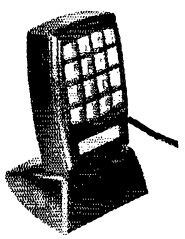


wherever you g QSO

Across the U. S. A....out to far-away places...your chance of a clear QSO is *better* with an E-V mike.

E-V engineered response puts your exact speaking voice on your carrier...assures quick, individual voice recognition. There's a model made for you in the complete E-V line...with all the *extra* quality, *extra* features, *extra* value you want.

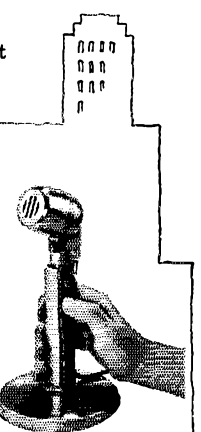
Ask your E-V Distributor, or write for Catalog No. 110.



The CENTURY

Low-cost all-purpose crystal and dynamic models. Rugged, dependable. Satin chromium finish. Lists at $11.00 and up

Microphones • High Fidelity Speakers
Phono Pickups • Self-Tuning TV Boosters



TOUCH-TO-TALK

First to fit any mike with ⅝"-27 stand coupler. Finger-tip relay operation or microphone "On-Off." With or without mike.

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Export: 13 East 40th St., N.Y. 16, U.S.A., Cables: Arlab

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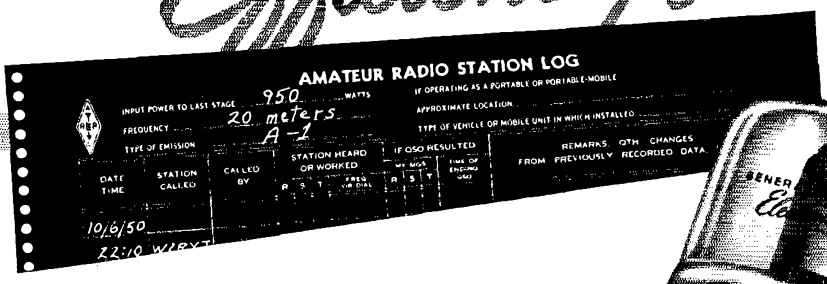
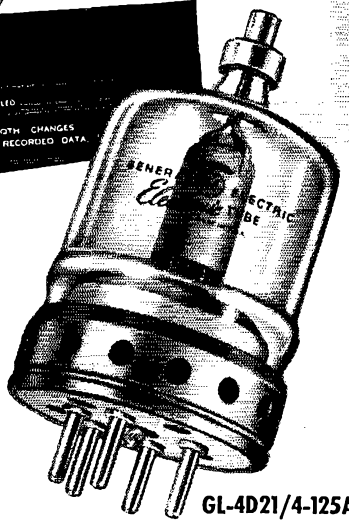
Efficiently!



Generous in their output, you'll find these G-E tetrodes *misers for drive!*



GL-4D21/4-125A

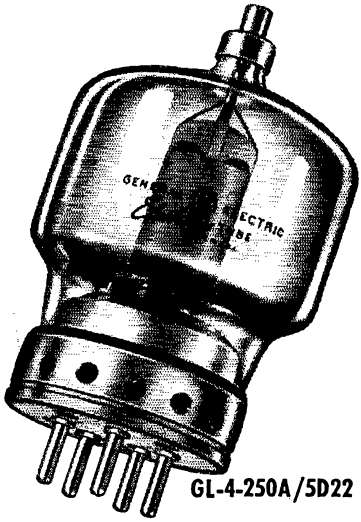
Tired of the blank spaces in your log-book? Here's big-tube help to put your signal right up there with the DX crowd's.

And you won't need extra tubes for intermediate driving stages. Your present 807 or better will handle either G-E tetrode, giving you a kilowatt signal with no increase in your rig's driving power.

CW input of the GL-4-250A/5D22 is well over 1,000 w, making that desired kilowatt signal easy for you to attain. Phone input is 650 w. A pair of GL-4D21/4-125A's will take more than 1,000 w CW, or up to 750 w phone. Lots of power from both types . . . a big, far-ranging signal . . . all with substantially the same circuit you have now! Either G-E tube is a smart choice for hams who want wallop without having to re-design their rigs.

Of course, merely increasing power from 700 or 800 w to a kilowatt, hardly would be worth your effort in QSO's gained. But the extra 10 db you can get by going, say, from 100 w to 1,000 w, not only is apt to give you more QSO's per call, but may let you contact that elusive VK9 you've been chasing the past couple of months.

Backed by General Electric, both tetrodes can be relied on to give full-rating performance. Extensive quality-control tests mean the G-E tube *you* put in your rig will be a top-value, long-lived product. See your G-E tube distributor! He'll be glad to help you with prices and complete information. *Electronics Department, General Electric Company, Schenectady 5, New York.*



GL-4-250A/5D22

ELECTRONIC TUBES OF ALL TYPES FOR THE RADIO AMATEUR

GENERAL ELECTRIC

180-JA7

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323 W. Madison St.

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633 Walnut St.

Cleveland, Ohio
Radio & Electronic Parts Corp., 3235 Prospect Ave.

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811 Estrella

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Lexington, Kentucky
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Long Beach, California
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969 American Ave.

Los Angeles, California
Henry Radio
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Kierulff & Co.
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Topeka, Kansas
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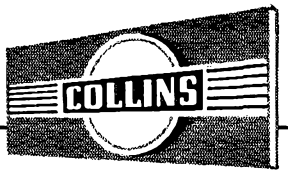

COLLINS RADIO COMPANY, Cedar Rapids, Iowa

11 West 42nd Street, NEW YORK 18 **2700 West Olive Avenue, BURBANK**

QST

NOVEMBER 1950

VOLUME XXXIV • NUMBER 11

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

OFFICES

38 La Salle Road
West Hartford 7, Connecticut

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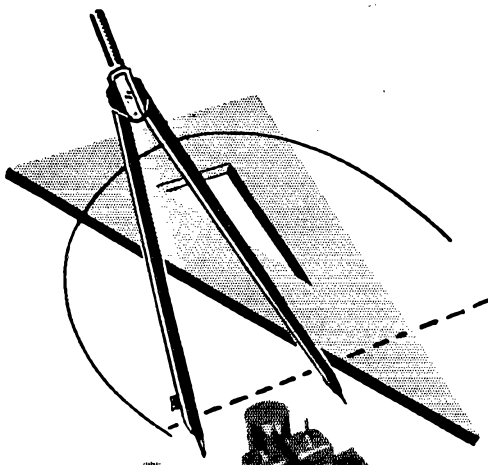

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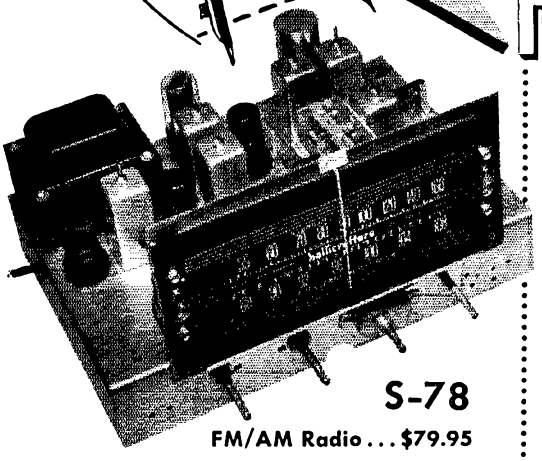

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Reports Invited. *All amateurs, especially League members, are invited to report station activities on the first of each* month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio Club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

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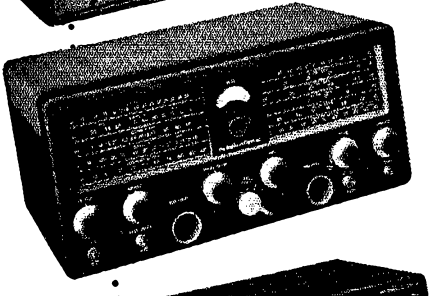
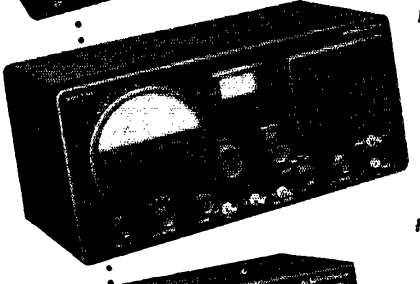


Model SX-71 Value-packed with features specifically asked for by the Hams. Extra sensitivity, selectivity, and stability; double super-heterodyne, plus built-in Narrow Band FM. One r-f, two conversion, and three i-f stages. Range 538 kc to 35 Mc, 46-55 Mc. Extra wide dials for Main and Bandspread Tuning. Sensitivity, Volume, BFO Pitch, Selectivity, and Crystal Phasing controls.; AVC, BFO, Rec./Standby, ANL, Tone, and Phono-Rec. switches. Phonograph input jack. 500, 3.2-ohm output.....**$189.50**



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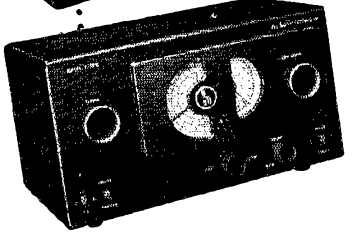

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. 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.

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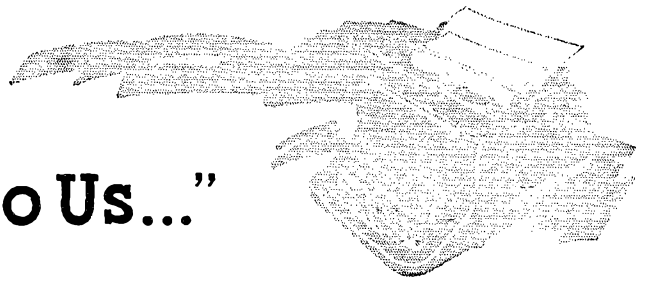


"It Seems to Us..."

THE N.S.R.B. PLAN

Following Presidential approval, the National Security Resources Board has released its long-awaited *United States Civil Defense.*[1] Like its predecessor Hopley Report, the present work is a broad outline of steps which must be taken at each level — federal, state and community — to prepare the nation's civilian population against possible enemy attack.

This is not a detailed blueprint but an over-all concept of the problem. It does not treat specific communications matters any more than it describes, in the medical section, how to bandage a wound. It does suggest the pattern for civil-defense planning and organization of all needed facilities, including communications. From the amateur standpoint, we can expect speeded-up planning in local communities as a result of the distribution of NSRB's report. Although action by Congress is not expected until its winter session, President Truman has indicated that he will set up a temporary Civil Defense Administration at an earlier date.

In this report to the nation, communications facilities have been termed the "nerve system of civil defense." The principal needs for communications were summarized on page 10 of October *QST*. State and local civil-defense organizations now making plans are called upon to: (1) Identify the communications needs that would exist in the event of an emergency, anticipating the volume and kind of traffic and special problems. (2) Inventory all existing communications facilities and make arrangements for their use in accord with the requirements. (3) Provide secondary systems of communication in the event a primary system is made unavailable or inoperative. "All existing communications facilities and services should be used to their fullest extent, but provision must be made for emergency services as alternate means of transmitting messages when regular facilities are destroyed. Such emergency services should include mobile two-way radio equipment, amateur radio services, and any other means that could be developed."

In a separate paragraph (broadcasting is the only other service so singled out) the report says of amateur radio operators:

> Amateur radio operators and networks will be used in civil-defense communications. They are licensed radio operators and their radiotelephone and continuous-wave equipment can be utilized as secondary services thus providing for maximum flexibility. Under an organized plan, amateur radio operators will make an important contribution to civil-defense communications.

Organized plan? Yes, as soon as Washington can come to agreement — not as concerns amateur radio exclusively, but in such things as the over-all responsibility for civil-defense communications, and what security measures must be taken to prevent disclosure of valuable information to an enemy through radio, which the report admits is particularly vulnerable from the security standpoint. Work continues toward formulating a plan, into which amateur radio stands ready to fit. So far we have seen only a faint glimmer of the green light. More specific and administrative recommendations in communications as well as other fields are of course to follow the issuance of the NSRB report, probably to be derived in some measure from the simulated-emergency tests being conducted in various cities, an example of which from the amateur communications standpoint is given by Seattle's ARRL Emergency Coördinator on page 46 of this issue. Meanwhile, communities will undoubtedly get their c.d. wheels rolling faster, now that they have something tangible after which to pattern their efforts. Our cue continues to be liaison with community authorities to lay before them the potentialities of amateur radio communications for civil defense so that adequate provision will exist in the local plan when these other matters are finally settled. And, of course, to continue expanding our Emergency Corps to include every active amateur so that the full facilities of amateur radio will be available.

[1] NSRB Doc. 128, 25¢ from Superintendent of Documents, Government Printing Office, Washington 25, D. C.

We amateurs won't be the primary means of civil-defense communication. Quite properly, primary reliance will be placed on established "commercial" systems, mostly landline telephone. But as the report points out, "Even though our existing communications systems are efficient, in wartime they can be severely damaged in areas under heavy attack. Therefore, every contingency must be provided for, and sound, flexible plans developed so that in any emergency, communications in some form will be available. . . . Secondary communications services should be available to insure communications during any emergency." That describes amateur radio with a capital A.

FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D. C.

September 29, 1950

The Editors, *QST:*

In connection with the hurricane which struck in the vicinity of Pensacola, Florida and Mobile, Alabama, on August 30 and 31, 1950, the Commission is in receipt of a report from its Gulf States Regional Manager indicating, among other things, that not only were the amateur emergency radio nets active in providing efficient emergency communications for the area, using emergency power when the commercial power lines failed, but also that the frequencies in use by those nets were voluntarily cleared by amateurs in all parts of the country.

The Commission is also in receipt of similar reports concerning the operation of amateur emergency nets in Florida during several storms which occurred during the recent hurricane season, including the one which on September 4 and 5, 1950, fortunately, failed to result in serious damage except in the vicinity of Cedar Keys. One report in this connection especially mentions the efficient operation of the amateur net which handled weather reports and warnings in cooperation with the United States Weather Bureau and the Florida Association of Broadcasters.

The Commission wishes to commend, through the medium of your magazine, the excellent spirit of public service displayed by all of the amateurs involved in the above emergency communication operations, not only those who performed yeoman service in the handling of emergency communications but also those who cooperated in making that service possible. It is such demonstrations of a recognition of responsibility and a spirit of public service on the part of the licensed amateurs of the United States which justify the faith of the Commission in the inherent public value of the amateur radio service.

Sincerely yours,

WAYNE COY,
Chairman

November 1925

. . . The intricacies of crystal control — from cutting a rough blank to building a 210 oscillator-transmitter — are discussed by Assistant Technical Editor John M. Clayton.

. . . A push-pull 204-A rig that handles nicely down to 10 meters is described by Ralph M. Heintz, 6GK.

. . . The U. S. Fleet has returned to San Diego, completing a six months' Pacific cruise which demonstrated the superiority of short-wave communication. Lieut. Fred H. Schnell and the amateur body have been commended on the effectiveness of the tests by the Fleet commander-in-chief.

. . . *Hq. staff notes:* Charles A. Service, jr., has resigned as assistant secretary-treasurer to enter business in Florida; A. L. Budlong, heretofore assistant traffic manager, has been named assistant to Secretary-Editor Warner.

. . . An insight to the workings of the National Bureau of Standards West Coast standard frequency station, 6XBM, is provided by Prof. Henry H. Henline of Stanford University.

. . . Amateurs the world over are mourning the loss of the dirigible *Shenandoah.*

. . . Experts 3DW, 8CEO, and c2CG contribute a wealth of ideas to A. L. Budlong's symposium on "Keeping a Log."

. . . The design and circuit placement of key thump filters are discussed by Technical Editor Kruse.

. . . Raytheon has announced the development of a low-current gaseous-type rectifier for use in "B" eliminators.

. . . Four DX-chasers are listed in the station descriptions section this month: They are Jimmy Cotter's c3EN, Ottawa, M. E. Lawson's 5ACL, Dallas, Brandon Wentworth's 6OI, Stanford University, and 8BNH, Akron.

OUR COVER

A close-up view of the business end of W1LOP–mobile. The converter mounted on the steering post is a bandswitching job giving excellent performance on 75, 20, 11 and 10 meters. It is described on page 18 of this issue. The unit at the lower left is a companion 30-watt (2E26 final) bandswitching transmitter with provision for either crystal or VFO operation.

FEED-BACK

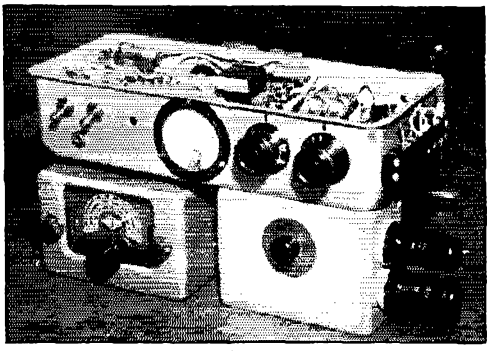
In the circuit diagram of the "Mountaineer" portable station on page 18 of the September issue, C_4, C_5, C_{18}, C_{19}, C_{20} and C_{22} should be 0.005 μfd. instead of 0.0005 μfd.

A Crystal-Filter S.S.B. Exciter

Simplified Design with I.F. Quartz Crystals

BY F. E. EDMUNDS,* W1JEO/9

CIRCUIT complexity and the need for critical adjustments have undoubtedly kept many amateurs from trying their hands at single-sideband 'phone. As an incentive to all who have considered "taking the plunge" but have been deterred for the reasons above, the following s.s.b. exciter is presented as a solution.



The dashboard-mounting s.s.b. exciter of W1JEO/9, complete with receiver converter and VFO. The top dish is the exciter (with cover removed), showing some of the "innards." The meter reads cathode current to a pair of 807s driven by the unit, and the two knobs handle carrier reinsertion and 6AG7 plate tuning.

• If you ever had, or hope to have, an interest in s.s.b. 'phone, this is an article you won't want to pass up. It describes a simple and nearly foolproof design for a s.s.b. exciter unit. As an indication of its practicality, it is interesting to learn that W1JEO/9 designed the unit for mobile use in his car, to be mounted under the dashboard and driving a pair of 807s in the trunk. Operated as a fixed station on 75, with a 20-foot-high horizontal antenna, all districts were worked during the first three nights of operation.

This is not the first amateur s.s.b. exciter to be built using quartz crystals. A few Ws use crystal filters borrowed from commercial sources closed to most amateurs, so descriptions of these rigs have never been run in *QST*. We had on hand a description by Harold Whitehead, G2NX, of his rig, the first British amateur crystal s.s.b. transmitter, but the W1JEO/9 exciter uses components more readily available to Ws and is somewhat simpler. We sincerely believe it will be worth your while to read on and find out how he does it.

The Crystal Filter

The exciter uses a quartz crystal filter[1] operating at 450 kc. (or vicinity). The filter allows a passband of 300 to 3000 cycles; the sideband rejection, as measured with the YRS-1, indicates 35–40 db. over 300 to 3000 cycles. At no time within the reject range is rejection less than 30 db.; at some places it approaches 60 db. Suppression of the carrier is obtained *without* the use of balanced modulators, and the stability of suppression is excellent. Crystals suitable for use in the filter are available on the war surplus market for less than one dollar each. The most useful of these crystals are in the series that runs from 375 to 525 kc. in 1.388-kc. steps; this series is marked at 72 times the crystal frequency in a series of channels from 28.0 to 38.0 Mc. The crystals were manufactured by Western Electric for the Signal Corps, and are of the plated variety, mounted in an FT-241A holder. The holder pins have ½-inch spacing. The crystals may be socket-mounted or soldered directly into the filter at the builder's discretion.

* Lieut., USN; Box 256, College Corner, Ohio.

[1] Patent applied for.

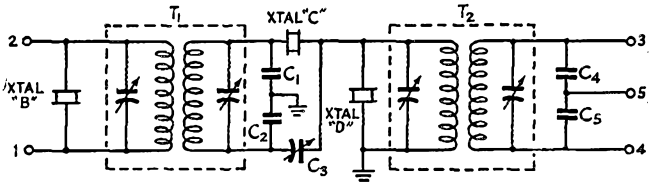


Fig. 1 — The 450-kc. quartz crystal filter used for sideband and carrier rejection.
C_1, C_2, C_4, C_5 — 100-$\mu\mu$fd. mica or ceramic.
C_3 — 3- to 30-$\mu\mu$fd. ceramic trimmer.
T_1 — 455-kc. interstage i.f. transformer (Meissner 16-6659).
T_2 — 455-kc. diode i.f. transformer (Meissner 16-6660). For a carrier frequency of 450 kc., the crystals are:

Crystal	*B*	*C*	*D*
High-freq. reject	452.8 kc.	448.6 kc.	450.0 kc.
Low-freq. reject	447.2 kc.	451.4 kc.	450.0 kc.

Because most amateurs are interested more in constructional details than in filter theory, only such theory as will aid in construction and alignment will be discussed. The filter is of bridge design with complex entry and terminating sections. The complex sections are used to suppress the carrier and modify the response characteristics of the bridge. Fig. 1 shows the filter proper, set for rejection of the upper sideband. The trans-

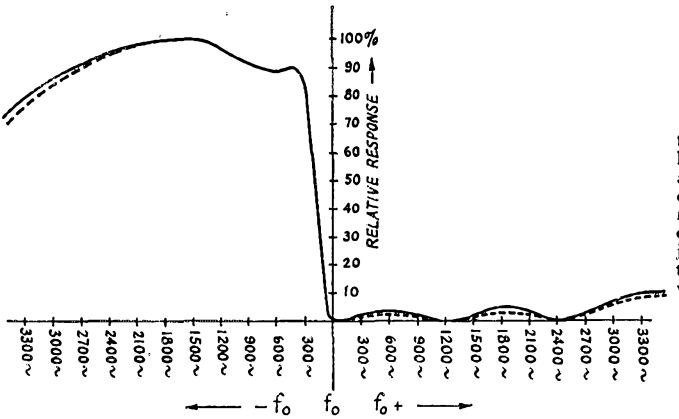


Fig. 2 — Response characteristics of the crystal filter. The solid line indicates the results measured at the output of the filter, and the dashed line was plotted from measurements made at the output of the exciter unit. The better rejection at the output is attributed to leakage to the v.t.v.m. indicator when measuring the filter directly.

former, T_1, is a replacement-type 455-kc. interstage i.f. transformer, mica-tuned, and air-cored. T_2 is also a replacement type, designed to feed into a diode detector.

The original filter was designed to operate at a carrier frequency of 450 kc., although the filter has since been tested at frequencies between 425 and 490 kc. without alteration of the circuit or transformers. Under the condition of design for 450-kc. carrier, crystal "B" is 2.78 kc. *higher* than 450 kc., or 2 channels higher in the crystal series previously described. Crystal "C" is 1.39 kc. *lower* than 450 kc., or 1 channel lower. Crystal "D" is 450 kc. Crystal "A," also at 450 kc., is used in a crystal oscillator to generate the initial carrier. Channel markings on these crystals are as follows:

"A" — 32.4 Mc., Channel 324
"B" — 32.6 Mc., Channel 326
"C" — 32.3 Mc., Channel 323
"D" — 32.4 Mc., Channel 324

Any other group within the range of the i.f. transformers may be utilized; only the channel relationship need be retained.

Response characteristics of the filter are as indicated in Fig. 2. The graph shows the high sideband being rejected; the lower sideband may be rejected in a similar manner with appropriate crystals, as suggested in Fig. 1.

Fig. 3 shows the entire exciter in block diagram. The 6K8 hexode-triode serves as 450-kc. oscillator and audio mixer. Approximately 3 volts of audio is required at the signal grid of the 6K8 for optimum results. The 6K8 delivers a carrier (450 kc.) and sidebands to the input of the filter. The filter rejects one sideband (depending upon the selection of crystals) and delivers single-sideband energy to the 6SN7 mixer. The filter also suppresses the carrier some 60 db. below the peak sideband energy. The 6SN7 mixer combines the single-sideband energy (in the vicinity of 450 kc.) with the output of the VFO (3400 to 3550 kc.) and the sum products are recovered in the output (3850 to 4000 kc.). The balanced mixer is used to remove the VFO component from the output tank. Balance is not critical and no adjustments are required or provided. A VFO signal of about 6 to 8 volts is required. The output of the mixer is fed to the grid of a 6AG7 which runs as a Class A tuned r.f. amplifier. The output of the 6AG7 is sufficient to drive a pair of 807s Class AB_2. Operation on 10 and 20 meters is accomplished at W1JEO by using high-level mixing, but that is another subject best left to some future article. Most VFOs in use cover or may be easily made to cover 3400 to 3550 kc. A single untuned 6SJ7 or 6AC7 Class A amplifier following a BC-221 is used at the home station with completely satisfactory results as a driver for this exciter.

Construction

The original transmitter was built for mobile operation and much hole drilling and experimentation has occurred on the chassis. A suggested physical layout for home use is shown in Fig. 4. This plan will keep stray capacity coupling at a minimum. No shielding other than that provided by the i.f. cans and the output tank can is re-

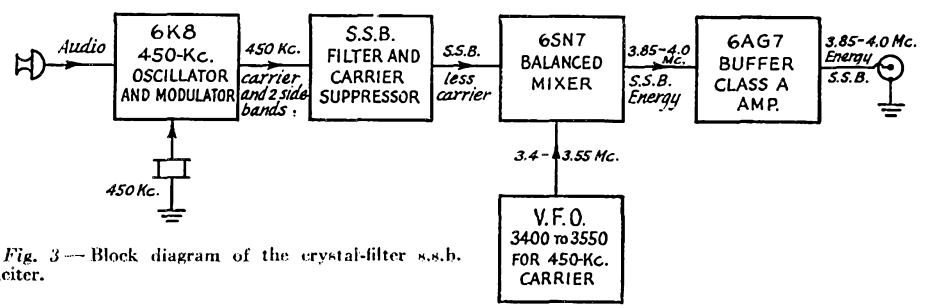


Fig. 3 — Block diagram of the crystal-filter s.s.b. exciter.

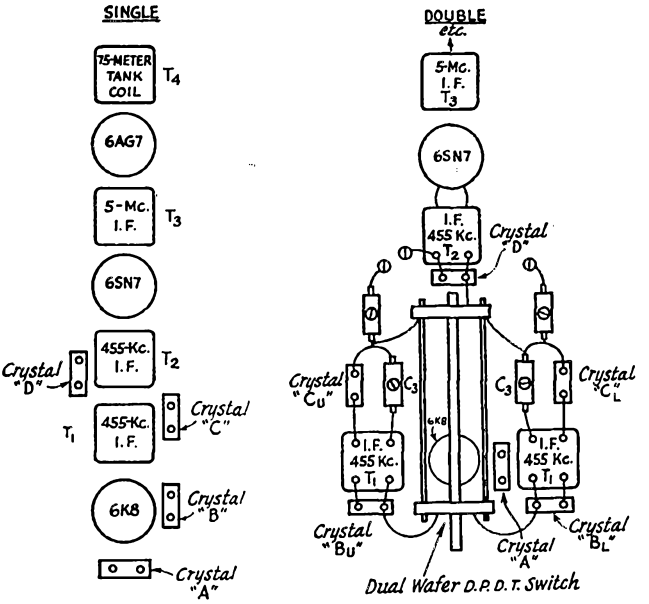


Fig. 4 — Recommended physical layout of the single- and double-channel filters. The double-channel filter is required where instantaneous selection of upper or lower sideband is desired.

quired. It is important that capacity coupling *around* the crystal filter be minimized — in other words, no modulated signal must reach the 6SN7 mixer by any route except through the filter. Before construction is started, a decision must be made as to whether or not choice of sidebands is desired. If choice of sidebands *is* desired, a dual filter using 5 crystals will be required. This filter is shown schematically in Fig. 5. A double-section wafer switch selects the upper or lower sideband. These wafer sections must be separated by approximately 3 inches to minimize stray coupling. In general, if the recommended physical layouts are followed, no undesirable coupling effects will be encountered. It is recommended that the crystals be wrapped with several layers of adhesive tape and then strapped to the chassis with metal brackets; connections may then be made by soldering to the holder pins. The physical layout and schematic diagrams (Fig. 7) with specifications provide sufficient information to allow even an inexperienced amateur to construct an efficient exciter.

Alignment

Alignment of the filter is straightforward, and once aligned it will need little attention.

1) Crystal "A" is first removed from the circuit. This crystal is best provided with a socket mount so it can be removed during alignment.

2) A calibrated signal generator covering the crystal range is connected to the grid of the triode section of the 6K8.

3) A vacuum tube voltmeter is connected from grid to ground of one of the 6SN7 grids.

4) Swing the signal generator through the crystal range until a maximum response is noted at the voltmeter. This will indicate the series-reso-

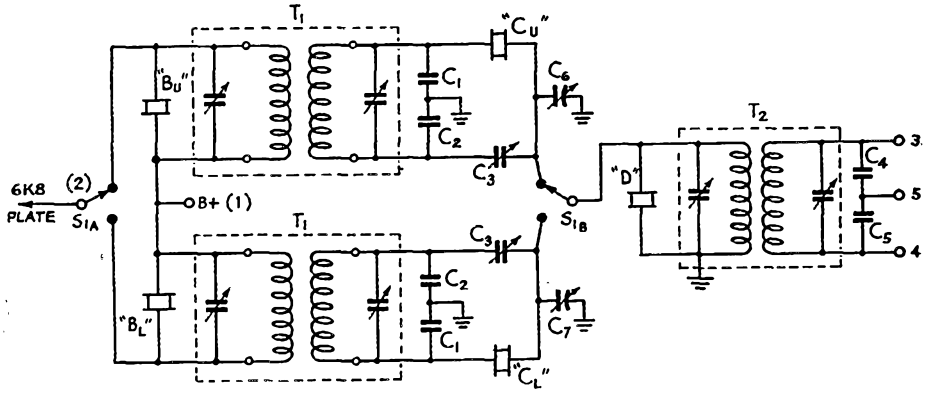


Fig. 5 — The double-channel crystal filter. All components are the same as in Fig. 1, except for the addition of the d.p.d.t. wafer switch, S_1, and the compensating condensers, C_6 and C_7 (3- to 30-$\mu\mu$fd. ceramic). The trimmer on the input side of T_2 is set at minimum and the alignment procedure is followed with C_6 or C_7 wherever the instructions call for adjusting the input condenser.

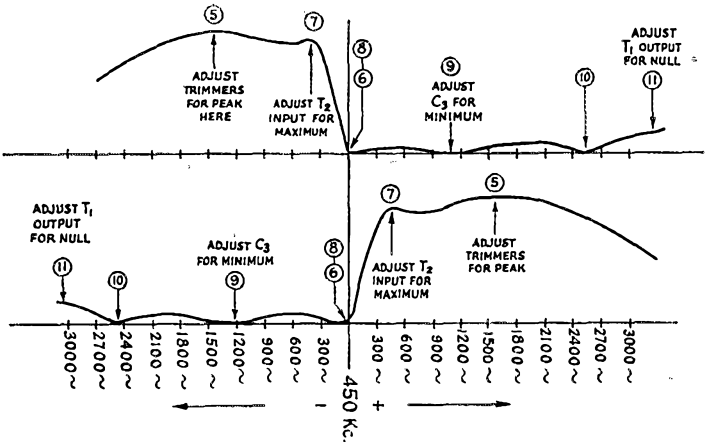


Fig. 6 — An alignment chart of the crystal filter. The numbers in the circles correspond to the steps outlined in the text.

nant frequency of crystal "C" and with the crystals described, based on a 450-kc. carrier, will be approximately 448.6 kc.

5) Align all transformer trimmers for maximum response on this frequency.

6) Next, adjust the signal generator *slowly* in the higher-frequency direction until a *null* is obtained. This will be the series-resonant frequency of crystal "D," 450 kc. with the crystals indicated.

7) Move the signal generator ½ kc. *lower* than this null and adjust the trimmer on the input side of T_2 for maximum response.

8) Return signal generator to null.

9) Move the signal generator approximately 1 to 1.2 kc. *higher* than the null and adjust C_3 for *minimum* response.

10) Move the signal generator *higher* until another null is found; this will be the series-resonant frequency of crystal "B," approximately 452.8 kc. with the crystals shown.

11) Continue approximately ½ kc. higher than this null and adjust the output trimmer on T_1 slightly for a moderate null.

12) Repeat Steps 7 through 11 to compensate for interaction, and alignment is complete.

For alignment of the dual filter the procedure is identical but must be done once for each sideband. However, when adjusting the filter for rejecting the *lower* sideband and where Steps 1-12 mention "higher" you must insert "lower" and vice versa. The alignment chart, Fig. 6, will simplify the alignment procedure on either filter.

The slug-tuned i.f. transformer is peaked at

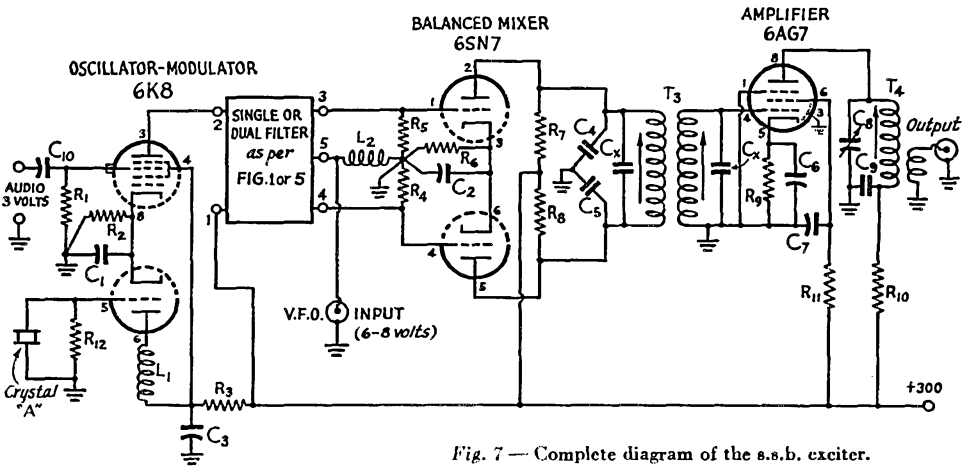
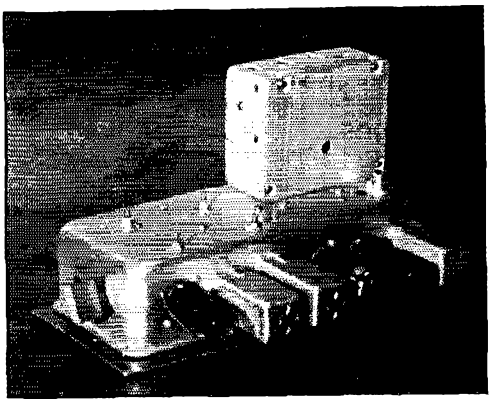


Fig. 7 — Complete diagram of the s.s.b. exciter.

C_1, C_2, C_3, C_6, C_7 — 0.1-μfd. 400-volt paper.
C_4, C_5 — 39-μμfd. ceramic.
C_8 — 100-μμfd. variable air condenser.
C_9 — 0.02-μfd. 600-volt mica.
C_{10} — 0.01-μfd. 400-volt paper.
C_x — Trimmers in T_1.
R_1 — 0.47 megohm.
R_2 — 220 ohms.
R_3, R_{11} — 20,000 ohms, 1 watt.
R_4, R_5 — 0.1 megohm.
R_6, R_7, R_8 — 10,000 ohms.
R_9 — 150 ohms, 1 watt.
R_{10} — 1000 ohms.
R_{12} — 47,000 ohms.
All resistors ½ watt unless specified otherwise.
L_1 — 2.5-mh. r.f. choke.
L_2 — 0.5-mh. r.f. choke.
T_3 — 5-Mc. slug-tuned i.f. transformer.
T_4 — 5-Mc. slug-tuned i.f. transformer. Secondary removed and 8-turn link wound over cold end of primary. All fixed capacitors removed.



Another view of the exciter, with the converter removed. The oscillator crystal is mounted on the left-hand end, the tubes and transformers along the side are 6K8, T_1, T_2, 6SN7, 6AG7 and output tank. The Jones output jack can be seen above the output tank shield can, in front of the VFO unit. Power leads are brought to a terminal strip on the far end.

3930 kc. and then staggered slightly to provide coverage of the entire 'phone band. The 6AG7 plate tank capacitor is adjustable from the front panel and is touched up when shifting frequency, as in the case of any transmitter amplifier stage.

Carrier Insertion

At the present state of the art, it is desirable to be able to reinsert carrier at the transmitter, in order to raise stations not used to tuning in s.s.b. signals. Carrier reinsertion in this exciter requires only one more tube, as shown in Fig. 8. A triode cathode-follower stage couples some of the r.f. from the oscillator to one grid of the

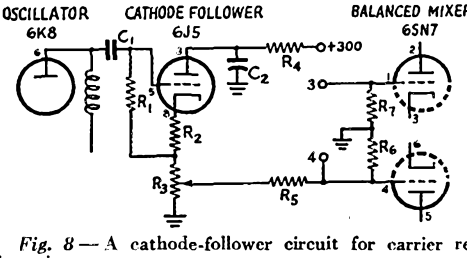


Fig. 8 — A cathode-follower circuit for carrier reinsertion.
C_1 — 47 μμfd.
C_2 — 0.01-μfd. 400-volt paper.
R_1, R_6, R_7 — 0.1 megohm.
R_2, R^4 — 1000 ohms.
R_3 — 20,000-ohm carbon potentiometer.
R_5 — 0.2 megohm.

6SN7 through a potentiometer that permits setting the carrier at any desired level.

Miniature-Tube Equivalents

If it is desirable to use miniature tubes in the exciter, a 6BE6 can be substituted for the 6K8, but it is then suggested that a 12AU7 twin triode be used for the oscillator and the carrier-inserting cathode follower. A 12AU7 can be used in place of the 6SN7 balanced mixer, but there is no suitably-shielded counterpart of the 6AG7.

THE quartz-crystal filter s.s.b. exciter of W1JEO/9 featured in *QST* this month should help a lot of the holdouts to get started on s.s.b. Its simplicity puts it in the same class with the famous **W2UNJ** exciter that has given so many of the gang a start, and the fact that it was designed for portable work means that perhaps a few adventurous ones may go mobile-single-sideband, thereby showing the real efficiency of the system and perhaps getting the jump on the commercials. We've never heard of any land-mobile s.s.b. rigs used by commercial interests, so the door is open for some pioneering. Ed uses the exciter to drive a pair of 807s in Class AB_2, running them to a little over 100 watts input on peaks, and DX on 75 so far is both coasts.

An interesting letter from Geoffrey Bagley, **G3FHL**, tells how the Gs on s.s.b. are **G2NX**, **G3CWC** and **G3FHL**, in that order. His rig uses a crystal filter at 8300 kc. and ends up with 80 watts peak to a pair of 807s on 80 meters. A number of other Gs have s.s.b. rigs under construction, and it shouldn't be long before they have a net going that approaches the 75-meter activity over here. DX on 80 is mainly the s.s.b. OZs, SMs and PAØ that have been reported here.

Alfred Soboleski, **W2QIL**, in Buffalo, put his phasing rig on the air last May, and the first QSO developed into a 5-way. Borrowing ideas from W6BES and others, his rig ends up with an 829B running over 150 watts on peaks. He will be back on the air in November.

The early birds in the game who recall Sid of W2TBZ will be interested to learn that he is now OE13CC in Austria. His s.s.b. rig, ending in an 813, will be on 20 by November, offering another country for the DXers. He wishes to be remembered to the 75-meter s.s.b. gang.

Yoe of **W2EB** has been spreading the gospel, and has had 261 QSOs on s.s.b. since the first of the year. Best DX was JA3RO and a two-way s.s.b. with **VK2CP**. Other DX includes MF2AA, ZS2DY, EL5A, OZ7KY, VK6MK and a lot more. Yoe runs 300 watts to a 4-125A final. He says that 300 watts of a.m. usually allowed him only one or two go-rounds before QRM took him out, but with s.s.b. he can really enjoy a swell QSO.

W3KPP is doing a great job on s.s.b., both from the operating angle and for the roster of *active* 75-meter s.s.b. stations he compiles and circulates to the gang. His latest edition shows a total of 50 Ws and VEs. He has recently upped the power over the 40 watts that sold him.

Recent visitors to the office included **W2URX** and **W2NJR**. Needless to say, the subject of s.s.b. came up once or twice! — *B.G.*

Announcing the 17th ARRL Sweepstakes

Certificates Will Be Awarded to C.W. and 'Phone Winners in Each Section and to Top Scorers in Club Groups

CONTEST PERIODS

Time	*Start* Nov. 18th & 25th	*End* Nov. 20th & 27th
EST	6:00 P.M.	3:01 A.M.
CST	5:00 P.M.	2:01 A.M.
MST	4:00 P.M.	1:01 A.M.
PST	3:00 P.M.	12:01 A.M.

IT'S TIME to get your station in readiness for the 17th Annual ARRL Sweepstakes. This popular contest affords you an opportunity to pit your operating skill against the best men in your ARRL section, or to fill in some of those states that are lacking for WAS. Every licensed amateur in every League section is urged to participate; whether or not you're an ARRL member, you are cordially invited to get into the SS and submit an entry. All scores reported in accordance with the rules will be listed in a *QST* tabulation of final results.

As usual, the contest will run over two consecutive week ends, with a maximum allowable total operating time of 40 hours out of the possible 66 for each entry ('phone or c.w.). The rules are identical to those of last year. You can operate both 'phone and c.w., but separate logs must be filed for each mode.

Entries by multiple-operator stations are encouraged and will be listed, but only single-operator stations will be eligible for the certificates offered to the top 'phone scorer and the top c.w. scorer in each section. Multiple-operator scores can be grouped with single-operator scores in club competition, however, and a handsome gavel is offered to the club with the highest aggregate score. Within a club, single-operator entries can compete for the "club-certificate" awards given to the top c.w. and 'phone scorers.

The Sweepstakes, like Field Day, puts a premium on operating skill rather than on power, since the 1.25 score multiplier applied to stations operating with 100 watts or less during the contest practically insures that most of the operation will be in this power class. The 807s really go to town in the SS!

If you're new to the SS, it won't take you long to catch on. During the contest period, call "CQ SS" or answer such a call, exchange preambles in the form shown elsewhere in this announcement, and keep your log properly. ARRL will gladly send you contest forms upon request, or you can draft your entry in accordance with the sample. Although it is not mandatory under the rules, more and more operators each year are using the 24-hour time system in their SS exchanges. For those unfamiliar with this system, it is based on a 24-hour day starting at midnight. Thus midnight is 0000, 1 A.M. is 0100, 12 noon is 1200, 6:30 P.M. is 1830, and 11:59 P.M. is 2359.

Tune up your gear now, warn the folks that you'll be unavailable the week ends of Nov. 18th and 25th, read the rules to acquaint yourself with the pattern, and then get set for an operating spree that is real fun.

Rules

1) *Eligibility:* The contest is open to all radio amateurs in the sections listed on page 6 of this issue of *QST*.

2) *Time:* All contacts must be made during the contest periods indicated elsewhere in this announcement. Time may be divided between week ends as desired, but a total of 40 hours must not be exceeded for each entry. Time spent in listening counts as operating time.

3) *QSOs:* Contacts must include certain information sent in the form of a standard message preamble, as shown in the example. C.w. stations work only c.w. stations and 'phone stations only other 'phones. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your preamble and/or receipt of a proper preamble.

4) *Scoring:* Each preamble sent and acknowledged counts one point. Each preamble received counts one point. Only two points can be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see p. 6) worked during the contest is the "sections multiplier." It is not necessary for preambles to be sent both ways before a contact may count, but one must be received, or sent and acknowledged, before credit is claimed for either point(s) or multiplier. Apply a "power multiplier" of 1.25 if the input power to the transmitter output stage is 100 watts or less at all times during contest operation.

The final score equals the total "points" multiplied by the "sections multiplier" multiplied by the "power multiplier."

5) *Reporting:* Contest work must be reported as shown in the sample form. Mimeographed contest forms will be sent gratis upon receipt of radiogram or postcard request. Indicate starting and ending times for each period on the air. All Sweepstakes reports become the property of ARRL. No contest reports can be returned.

There are no objections to one's obtaining assistance from logging, "spotting" or relief operators, but their use places the entrant in the multiple-operator class, and it must be so reported.

A single-operator station is one manned by an individual

HOW TO SCORE

Each preamble sent and acknowledged counts one point.

Each preamble received counts one point.

Only two points can be earned by contacting any one station, regardless of the frequency band used.

For final score: Multiply totaled points by the number of *different* ARRL sections worked, that is, the number in which at least one bona fide SS point has been made.

Multiply this by 1.25 if you used 100-watts-or-less transmitter input *at all times* during the contest.

EXPLANATION OF "SS" CONTEST EXCHANGES

Send Like a Standard Msg. Preamble, the	*NR*	*Call*	*CK*	*Place*	*Time*	*Date*
Exchanges	Contest info. numbers, 1, 2, 3, etc., for each station worked	Send your own call	CK (RST report of station wkd.)	Your ARRL section	Send time of transmitting this NR	Send date of QSO
Sample	NR 1	W1AW	589	CONN	1812	NOV 18

amateur who receives no assistance from other persons during the contest periods. He may not have assistance in any manner in keeping the station log and records, or in spotting stations during a contest period. Contest reports must be postmarked no later than December 10, 1950, to be eligible for *QST* listing and awards.

6) *Awards:* Two certificate awards will be given in each section, one for the highest c.w. score and one for the highest 'phone score. Only single-operator stations are eligible for certificate awards. Multiple-operator scores will receive separate *QST* listing in the final results.

A gavel will be awarded to the highest club entry. The aggregate scores of 'phone and c.w. reported by club secretaries and confirmed by the receipt at ARRL of contest logs constitute a club entry. Segregate club entries into 'phone and c.w. totals. Both single- and multiple-operator scores may be counted for club entries. Only the scores of bona fide club members. in a local club territory, may be included in club entries.

The highest single-operator c.w. score and the highest single-operator 'phone score in any club entry will be rewarded with a "club" certificate where at least three single-operator 'phone and/or three single-operator c.w. scores are submitted.

7) *Disqualification:* Failure to comply with the contest rules or FCC regulations shall constitute grounds for disqualification. In such cases, the decisions of the ARRL Contest Committee are final.

Sample of report form that must be used by all contestants.

STATION W. . . . — SUMMARY OF EXCHANGES, SEVENTEENTH A.R.R.L. ALL-SECTION SWEEPSTAKES

Freq. Band (Mc.)	*Time On or Off Air*	*Sent (1 point)* NR	Stn.	CK-RST	Section	*Time*	*Date (Nov.)*	*Received (1 point)* NR	Stn.	CK-RST	Section	*Time*	*Date (Nov.)*	*Number of Each Different New Section as Worked*	*Points*
3.5	On 1810	1	W1AW	589	Conn.	1812	18	7	W8JIN	589	Ohio	1814	18	1	2
"	"	2	"	589	"	1815	"	6	W1BFT	599	N. H.	1817	"	2	2
"	"	3	"	579	"	1820	"	6	W1BJP	579	Vt.	1821	"	3	2
7	"							24	W5KIP	479	Ark.	2005	"	4	1
"	"	4	"	479	"	2115	"	38	W5HJF	579	N. Mex.	1915	"	5	2
"	"	5	"	579	"	2128	"	45	W7KEV	479	Nev.	1820	"	6	2
"	"	6	"	589	"	2133	"	59	W8RSP	589	Ohio	2134	"	..	2
"	Off 2135 Time: 3 hrs. 25 min. On 1845														
14	"	7	"	569	"	1915	19	94	KL7AD	569	Alaska	1418	19	7	2
"	"	8	"	569	"	1925	"	127	W7ZN	569	Idaho	1728	"	8	2
"	"	9	"	469	"	1935	"	114	W7HRM	569	Utah-Wyo.	1730	"	9	2
3.5	"	10	"	579	"	2110	"	130	WØLHS	579	N. D.	2005	"	10	2
"	"	11	"	589	"	2112	"		W5KIP		Ark.				1
"	Off 2115 Time: 2 hrs. 30 min.														

Total Operating Time: 5 hrs. 55 min. 3.5, 7 and 14 Mc. used. 10 Sec., 22 Pts. 85 Watts Input Power

Assisting person(s): name(s) or call(s), etc.:.....

Claimed score: 22 points × 10 sections = 220 × 1.25 (85 watts input) = 275

I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is correct and true to the best of my knowledge.

Signature.....

Address.....

Tube Line-Up.....

Number Different Stations Worked.....

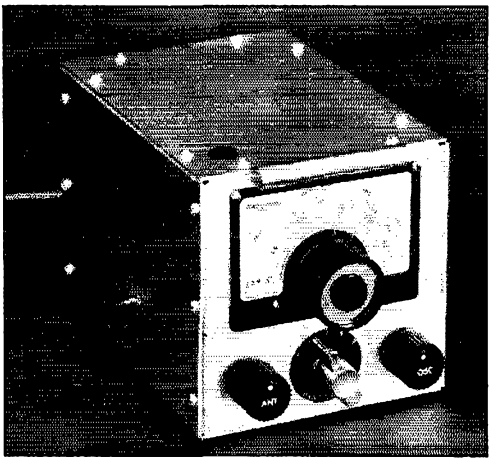
A Bandswitching Mobile Converter

Four Bands in a Compact Unit

BY DONALD MIX,* W1TS, AND JULIUS GALIN,** W1LOP

ANYONE who tries his hand at building mobile gear eventually comes to realize that he must reconcile two conflicting factors — electrical efficiency and physical size. It isn't enough that he has to contend with an unfavorable antenna system that makes power output and receiver efficiency of even greater importance than they are in the home station. Tending to discourage progress toward these objectives are the additional requirements that the gear must fit into limited space and draw a minimum of power from the car storage battery.

On the receiving end, the generally-followed system is one in which a h.f. converter feeds into the car b.c. receiver, the latter doing service as the i.f. and a.f. amplifiers. Besides simplifying the job of construction, such a system provides plenty of gain, since most car receivers are infinitely better jobs than the average chassis in the home b.c. cabinet. Despite this, the task of designing a good companion converter is not a particularly easy one, because it cannot often be built within the desirable limits on dimensions without excluding features that are sometimes considered essential in the larger station receiver. Too often, ultra-midget size is achieved only at the price of permitting performance to fall below satisfactory levels — especially if standard components must be used.



The completed mobile converter ready to install. At the bottom, the r.f. input tuning is on the left and the oscillator trimmer on the right.

The Circuit

While the converter shown in the photographs is somewhat larger than many of the current commercial units on the market, it is still small enough to be mounted on the steering post and is presently in regular use mounted in this position. In comparative tests in the same installation, it considerably outperforms one of the popular commercial all-band models.

The circuit diagram is shown in Fig. 1. Since the vibrator supplies of most car receivers are not designed to handle any appreciable extra power, and since it is desirable to avoid the need for a separate power pack, the number of tubes in the converter should be held to a minimum. However, an r.f. stage is a necessity if serious image interference is to be avoided; it also improves the signal-to-noise ratio as well as providing desirable gain when working into a small antenna. Most mobile operators, in common with those who use even the newer communications receivers, like to have an input-trimmer control on the panel to peak up the antenna tuning for each band — or even at several points within a band. For this reason, it was decided to avoid the complication of a single tuning control. If the input circuit is to be trimmed, it is just as easy to do it with the regular tuning condenser of the r.f. stage. A single setting will hold over a considerable portion of a 'phone band without noticeable loss in sensitivity. It is, of course, desirable to have a second tuned circuit in the output of the amplifier further to improve the gain and image rejection. To avoid adding another tuning control, a self-resonant coil, tuned by a slug to the approximate center of each band, is used.

A 6BA7 is used in the converter circuit. This tube is the miniature equivalent of the 6SB7Y — a particularly effective converter tube. A series-tuned oscillator was tried first for the purpose of obtaining better oscillator frequency stability with changes in supply voltage. However, it was found impossible to obtain satisfactory operation of this circuit over the desired total frequency span without complicating the switching system. The stability of the high-C Colpitts circuit shown proved to be entirely satisfactory for 'phone work. Each of the bands covered is spread out over a good portion of the dial so there is no difficulty tuning in and holding a signal. An air trimmer, C_9, is provided so that the tuning may be adjusted to calibration from the panel. The output coil, L_{14}, is tuned to 1500 kc. and is coupled to the input circuit of the b.c. receiver by L_{15}, a winding of several turns around L_{14}.

The converter covers the 4-, 14-, 27- and 29-Mc. 'phone bands; that is, 3800 to 4000 kc. on 75, and all of the 20-, 11- and 10-meter bands.

* Assistant Technical Editor, *QST*.
** Technical Assistant, *QST*.

A six-circuit switch takes care of bandswitching in all circuits. One coil serves for both 27 and 29 Mc. at the input of the r.f. stage. A separate coil for 27 Mc. is provided in the output circuit because a single coil would not quite cover both 27 and 29 Mc. satisfactorily. In the h.f. oscillator circuit, the same coil is used for both 27 and 29 Mc., but the tuning range is altered by switching in the series capacitance made up of C_{14} and C_{15}. C_{10} is added at 14 Mc., primarily for bandspread purposes, but it also improves the stability on this band.

One section of the bandswitch, S_{1E}, together with the final tap of S_{1A}, serves to connect the antenna to the b.c. receiver when the converter is not in use. Since the extra switch section S_{1F} otherwise would be unused, it was put to work to turn off the filaments of the converter automatically when the switch is in the b.c. position. Power for the converter is taken from an outlet added to the b.c. receiver. A dropping resistor in the b.c. set should be inserted if the "B" voltage to the converter exceeds 180 volts under load.

Construction

The converter is built on a 5 × 7 × 2-inch aluminum chassis. A box, 5⅛ inches high, made of sheet aluminum, is fitted around the chassis. Half-inch lips are bent over along the top and bottom edges of the sides, and along all four edges of the front and rear ends. The lips along the side edges of the front panel extend down only to the chassis. The box is assembled with machine screws and nuts. Four long machine screws through one side of the chassis provide means for attaching a steering-post clamp mounting.

The National MCN dial is placed on the front panel so that it will line up with the shaft of the oscillator tuning condenser which is mounted directly on top of the chassis. It is necessary to

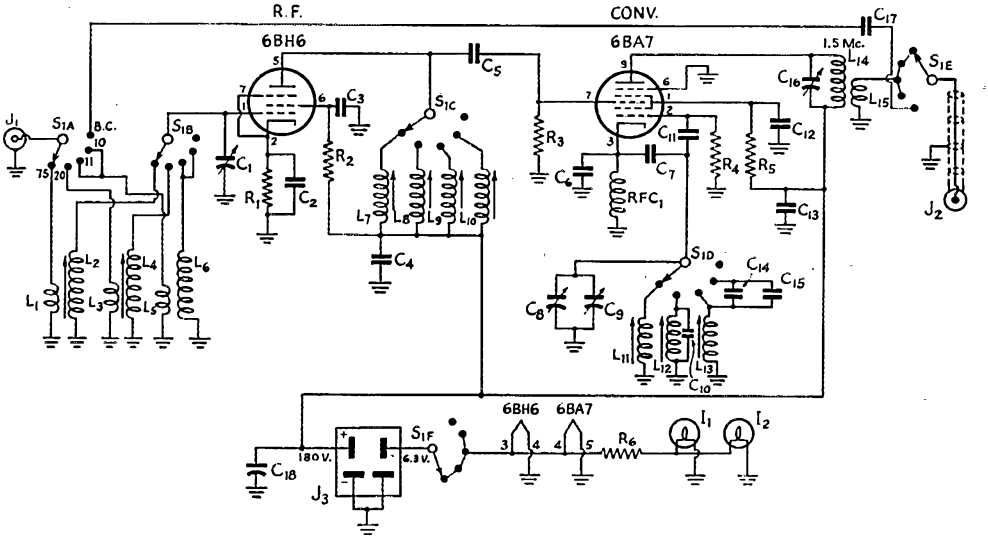
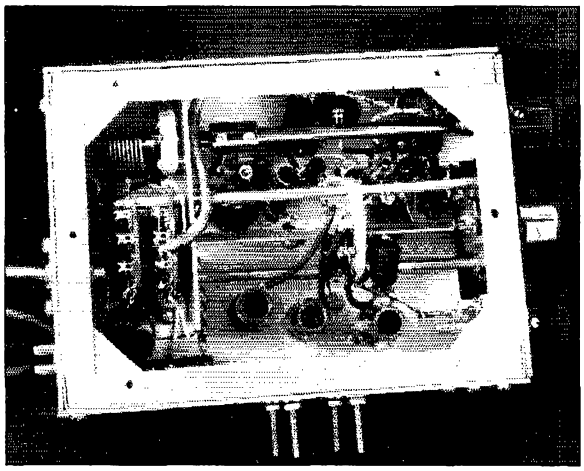


Fig. 1 — Circuit diagram of the mobile converter.

C_1 — 50-μμfd. variable air trimmer (National PSE-50).
C_2, C_3, C_4, C_{12}, C_{13} — 0.01-μfd. disc ceramic.
C_5 — 100-μμfd. mica.
C_6, C_7 — 220-μμfd. silvered mica.
C_8 — Approx. 40-μμfd. variable (Millen 19050 with one rotor and one stator plate removed).
C_9 — Approx. 5-μμfd. variable (National PSE-25 with all but two plates removed).
C_{10} — 100-μμfd. silvered mica.
C_{11} — 47-μμfd. silvered mica.
C_{14} — 470-μμfd. silvered mica.
C_{15} — 330-μμfd. silvered mica.
C_{16} — 30-μμfd. mica trimmer.
C_{17} — 50-μμfd. ceramic.
C_{18} — 0.1-μfd. paper.
R_1 — 100 ohms, ½ watt.
R_2 — 2200 ohms, ½ watt.
R_3 — 15,000 ohms, ½ watt.
R_4 — 22,000 ohms, ½ watt.
R_5 — 15,000 ohms, 1 watt.
R_6 — 10 ohms, 1 watt.
L_1 — 15 turns No. 24 d.s.c. scramble-wound over bottom of L_2.
L_2 — CTC Type LSM-5 Mc., 7 turns removed.
L_3 — 4 turns No. 24 d.s.c. wound over bottom end of L_4.
L_4 — CTC Type LS3-10 Mc.
L_5 — 3 turns No. 24 d.s.c. wound over bottom end of L_6.
L_6 — 11 turns No. 22, ⅝ inch long, on CTC Type LS3 ⅜-inch diam. form, slug removed.
L_7 — CTC Type LSM-1 Mc., 150 turns removed.
L_8 — CTC Type LS3-5 Mc., 50 turns removed.
L_9, L_{10} — CTC Type LS3-10 Mc., 4 turns removed.
L_{11} — 90 turns No. 30 enam., wound on CTC Type LS4 ½-inch diam. form (see text).
L_{12} — 5 turns No. 20, ⅝-inch diam., spaced 16 turns per inch (B & W 3007 Miniductor), slipped over CTC Type LS4 ½-inch diam. form (see text).
L_{13} — 3 turns No. 16, ⅝-inch diam., spaced 8 turns per inch (B & W 3006 Miniductor), slipped over CTC Type LS4 ½-inch diam. form (see text).
L_{14} — CTC Type LS3-1 Mc., 80 turns removed.
L_{15} — 20 turns No. 24 d.s.c. scramble-wound over bottom end of L_{14}.
I_1, I_2 — 6.3-volt 150-ma. dial lamp.
J_1 — Shielded jack (ICA 2378).
J_2 — Pin plug (ICA 2375).
J_3 — Four-contact chassis-mounting plug (Jones S-304-AB).
RFC_1 — 2.5-mh. r.f. choke (National R-50).
S_1 — Bandswitch — see text.



Bottom view of the mobile converter showing the placement of the miniature coils.

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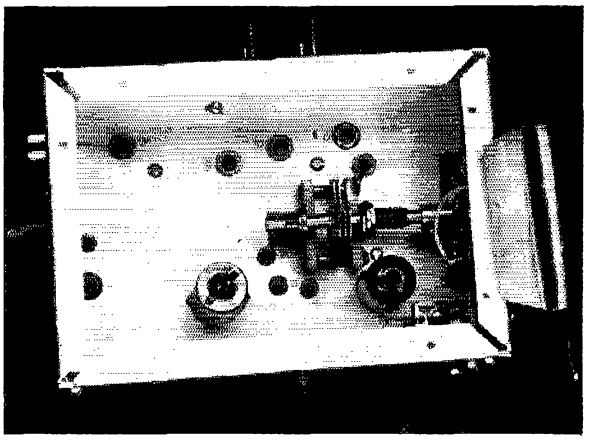
notch out the front edge of the chassis for the dial mechanism.

The bandswitch is placed underneath at the center of the front edge of the chassis, with the controls for input tuning and oscillator trimmer to either side. The switch is made up from Centralab kit parts. All switch wafers are of the two-pole five-position type. One ceramic wafer (Type RR) is used for S_{1C} and S_{1D} in the amplifier-output and oscillator circuits. This section is spaced two inches from the index head (Type P123). The other two wafers are of bakelite (Type K). The innermost of these serves for S_{1E} and S_{1F}, while the end section takes care of S_{1A} and S_{1B}. Two and one half inches back of the ceramic section, the two 6-inch switch-assembly rods pass through an aluminum bracket which provides a rugged brace for the rear end of the switch gang. The first bakelite switch wafer is spaced ¼ inch behind this bracket and the second wafer is ½ inch behind the first. The input tuning condenser, C_1, also is mounted on this aluminum bracket and is controlled by an extension shaft from the panel in front. The oscillator trimmer condenser, C_9, is fastened directly on the front edge of the chassis.

The placement of the two tubes can be seen in the top-view photograph. The converter tube is near the front of the oscillator tuning condenser and the amplifier tube is to the rear, covered with a shield.

CTC (Cambridge Thermionic Corp.) slug-tuned coils and coil forms are used for the various inductances. Details are given under Fig. 1. About a half inch must be cut from the top of each of the LS4 forms so that they will fit under the chassis. The placement of the coils can be judged from the bottom-view photograph. In that view, the oscillator coils are the three large ones near the bottom. From left to right, they are for the 75-, 20- and 10–11-meter bands. The three smaller coils above are in the output circuit of the r.f. amplifier. From left to right, they are for the 20-, 10- and 11-meter bands. The 75-meter coil is the large one above, mounted horizontally from the side of the chassis. The r.f. input coils are to the extreme left, grouped around the end of the switch. From top to bottom, they are for 10–11, 20 and 75 meters. The output coil, L_{14}, is hidden under the lip of the chassis in the extreme upper-right corner. Its tuning condenser, C_{16}, is the mica trimmer in the lower-right corner of the top-view picture. A grommeted hole in the top cover permits adjusting this condenser after the top is in place. This may be found convenient in case it is necessary to shift the i.f. slightly to avoid interference from a strong local b.c. signal at 1500 kc. The inductance of L_7 is trimmed from the side, while the slugs of all other coils are adjusted before the cover is fastened down.

A short length of coax line connects the output winding of L_{15} to the switch. Another external length connects the output of the converter to the input of the b.c. receiver. A pin jack at the rear provides a connection for the antenna input. Power connections are made at the rear through a four-contact connector.



Provision for illuminating the dial at night presented somewhat of a problem, since no small compact lamp fittings could be found. The difficulty was overcome with a simple home-brewed arrangement. One end of a piece of shim brass or copper about 3 inches square is rolled a little more than halfway around a pair of standard 6.3-volt dial lamps placed butt to butt. The ends of the partial cylinder thus formed are covered by soldering in

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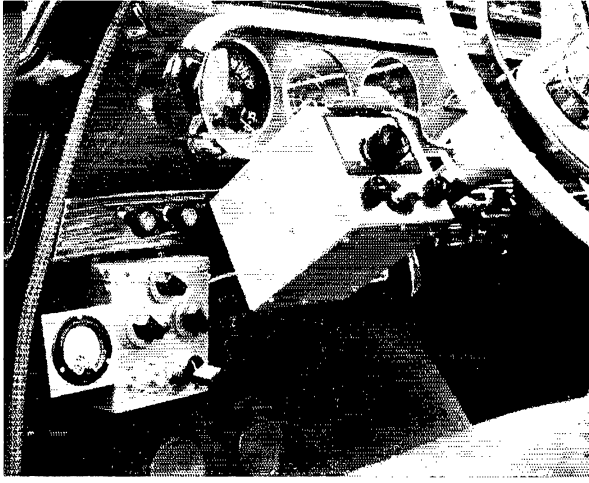
Top view of the converter with the cover removed to adjust the various inductance slugs. The object to the right is the dial-lamp shield.



The mobile converter in operation on the steering post.

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small discs of the same material. The lamps are then spaced about an inch apart and their shells are soldered to the metal enclosure. The two lead tips of the lamps are joined by a short piece of wire which connects to the "hot" side of the filament circuit. The remainder of the sheet is inserted between the top lip of the panel and the cover. By loosening the cover screws, it is possible to adjust the position of the lights for best illumination of the dial scale. The lamps should not need replacement often because the dimmer resistor, R_6, cuts the current down well below normal rating.

Adjustment

The output circuit of the converter tube should be adjusted first. Before proceeding, retrim the input circuit of the b.c. set to the antenna with the bandswitch in the b.c. position. Then switch to any of the four converter positions and tune C_{16} for maximum noise with the b.c. receiver tuning set at 1500 kc. The next step is to tune the h.f. oscillator to the appropriate ranges, starting with the 75-meter band. On all but the 10–11 meter band, the oscillator is tuned to the low-frequency side of the signal frequency. Since the i.f. is 1500 kc., the oscillator should be tuned 1500 kc. lower than the desired signal. For the range of 3800 to 4000 kc., the oscillator should cover the range of 2300 to 2500 kc. To accomplish this, turn the bandswitch to the 75-meter position, set the tuning condenser, C_8, at maximum and adjust the slug in L_{11} until the oscillator signal is heard on the station communications receiver at 2300 kc. (3800 minus 1500). To hear the signal, it may be necessary to run a wire from a point near the oscillator coil to the antenna terminal of the station receiver. Now, with an antenna connected to the input of the converter, swing the input tuning condenser, C_1, through its range, listening for a peak in noise. If none is found, set the slug in L_7 to a different position and try again. As soon as a noise peak is found on C_1, adjust the slug in L_7 for maximum response. The same procedure is followed for the 20-meter band, setting the tuning condenser at maximum, adjusting the slug in L_{12} until the oscillator is heard at 12,500 kc. (14,000 minus 1500), and then peaking up the r.f. stage input and output circuits. In this case, a second response point may be found. This is the image response to signals at 11,000 kc. If two response points are found, peak C_1 and L_8 at the response of higher frequency.

On the 10-meter band, which should be taken care of next, the oscillator is tuned to the high-frequency side of the desired signal. So, with the dial at the maximum-capacitance end, and the switch in the 28-Mc. position, adjust the slug in L_{13} until the oscillator signal is heard on the station receiver at 29,500 kc. (28,000 plus 1500), and then trim up the r.f. stage tuning as before. The image response will come at 31,000 kc., so be sure to peak up the r.f. circuits at the response of *lower* frequency.

Adjusting the slug in L_{13} for 28 Mc. also should place the oscillator in the correct range for the 11-meter band when the switch is in the 11-meter position. C_1 has sufficient range to cover both bands, but the separate r.f. stage output coil, L_9, must be peaked up. If it is found that the 11-meter range comes too far off on the dial, it may be necessary to slide the 10-meter range toward one end of the dial or the other by readjusting the slug in L_{13} slightly. As an alternative, the correction may be made by altering the capacitance of C_{14} or C_{15}.

A.R.R.L. ACTIVITIES CALENDAR

Nov. 4th: CP Qualifying Run — W6OWP
Nov. 16th: CP Qualifying Run — W1AW, WØTQD
Nov. 18th–19th, 25th–26th: Sweepstakes Contest
Dec. 2nd: CP Qualifying Run — W6OWP
Dec. 8th–10th, 15th–17th: 10-Meter WAS Party
Dec. 18th: CP Qualifying Run — W1AW, WØTQD
Jan. 5th: CP Qualifying Run — W6OWP
Jan. 19th: CP Qualifying Run — W1AW, WØTQD
Jan. 13th–14th: V.H.F. Sweepstakes
Jan. 20th–21st: CD QSO Party (c.w.)
Jan 27th–28th: CD QSO Party ('phone)
Feb. 3rd: CP Qualifying Run — W6OWP
Feb. 7th: Frequency Measuring Test
Feb. 9th–11th: DX Competition (c.w.)
Feb. 14th: CP Qualifying Run — W1AW, WØTQD
Feb. 16th–18th: DX Competition ('phone)
Mar. 2nd: CP Qualifying Run — W6OWP
Mar. 9th–11th: DX Competition (c.w.)
Mar. 13th: CP Qualifying Run — W1AW, WØTQD
Mar. 16th–18th: DX Competition ('phone)

Premodulation Clipping and Filtering

Their Effects on the Intelligibility of Speech

BY STEPHEN E. STUNTZ,* W1RXX

Over the past ten years, the radio journals have published extensively on amplitude- and frequency-limiting speech amplifiers. The fundamental purpose of such equipment has been the improvement of transmission efficiency in radiophone transmitters, by permitting only the frequencies essential to speech to modulate the transmitter, and by maintaining the highest *average* proportion of modulation possible without exceeding the transmitter's linear capability. The principal devices recommended have used volume compressors, limiters, clippers, or automatic gain-control networks, and usually incorporate frequency filters which eliminate all but the band occupied by typical speech.

The physics and economics of these amplitude- and frequency-restricting amplifiers have apparently been generally accepted. However, there seems to have been a good deal of unwillingness to employ them, regardless of their technical advantages, on the ground that they so distort the natural voice as to jeopardize intelligibility. This argument does not square with the results of some recent experiments designed to study exactly this problem: how do clipping and filtering affect speech intelligibility? Indicative of this work was an article published about four years ago in *QST*.[1] Several others have appeared in the engineering and scientific literature which are worth the amateur 'phone man's consideration. This paper will undertake a review of these articles, and attempt to demonstrate the usefulness of their results.

First, let us refresh our knowledge of the dynamics of speech. When the human voice is impressed upon a microphone, voltages are set up whose instantaneous peaks normally exceed the root-mean-square value by 12 to 15 db.[2] It is this "peak factor" which requires us to design our amplifiers with a much greater range of linear amplification than we expect to use most of the time, when we wish to transmit voice signals with minimum distortion. Also, in English as we speak it, the average vowel produces a peak voltage which runs about 12 db. higher than that produced by the average consonant.[3,4] This 12-db. figure is the *average* vowel-consonant ratio for all combinations of sounds in our language; the *instantaneous* value may vary from a fraction of the average to several times its magnitude. Now, peculiarly enough, the *intelligibility* of speech depends much more heavily upon the sounding of consonants (b, p, z, s, t, d, f, v, th, k, l, m, n, etc.) than upon vowels (a, e, i, o, u, y, etc.), despite the fact that the ordinary vowel sound has around 16 times the power of the usual consonant.

*Effects of Clipping** on Intelligibility*

From the foregoing, we can immediately see what happens when the peaks are clipped from the speech wave. At one and the same time we reduce (1) the peak factor, and (2) the vowel-to-consonant ratio. Effectively, we have cut down the range of variation in speech-energy amplitude, and in so doing have given proportionally greater emphasis to consonants, upon which intelligibility largely depends, as we have seen. This would lead us to expect that we might improve intelligibility by the use of clipping. There is, on the other hand, the possibility that the distortion of amplitudes resulting from peak clipping might actually reduce intelligibility. This is the gist of the question for which answers have been sought in the psychological laboratory, using some techniques of measurement which have become standard in studying voice communication.

Some years ago the Bell Telephone Laboratories devised tests to measure the effects of telephone circuits on the intelligibility of speech. A talker would read lists of syllables or words made up of all the sounds of the English language, in various combinations. His voice was then transmitted over a telephone circuit to a group of listeners who would write down what they thought the talker had said. By comparing the talker's original list with the listeners' reproductions of it, a percentage could be computed representing the proportion of spoken sounds correctly received by the listeners,[5] as circuit conditions were systematically changed by introducing various degrees of filtering, attenuation, nonlinear amplification and the like.

Early in World War II this method was applied, by a group of psychologists at the Harvard University Psycho-Acoustic Laboratory, to a study of the effects of premodulation clipping

* Research Psychologist, USN Medical Research Laboratory, USN Submarine Base, New London, Conn.

** In this discussion as in general engineering usage, "clipping" means cutting off both positive and negative speech-wave peaks above a given amplitude, then amplifying the resultant up to the magnitude it would have attained without clipping.

[1] Smith, W. W., "Premodulation Speech Clipping and Filtering," *QST*, Feb., 1946, p. 46.

[2] Dunn, H. K., and White, S. D., "Statistical Measurements on Conversational Speech," *Journal of the Acoustical Society of America*, *11*, 3, Jan., 1940, p. 278.

[3] Fletcher, Harvey, *Speech and Hearing*, Van Nostrand, Inc., N. Y., 1929.

[4] Kryter, K. D., Licklider, J. C. R., and Stevens, S. S., "Premodulation Clipping in AM Voice Communication," *Journal of the Acoustical Society of America*, *19*, 1, Jan., 1947, p. 125.

[5] Egan, J. P., "Articulation Testing Methods," Psycho-Acoustic Laboratory, Harvard University, *OSRD Report No. 3802*, Nov. 1, 1944, PB 22848.

upon the intelligibility of speech transmitted over a miniature radiophone circuit, using standard amplitude modulation.[4] The results of this testing showed that in the absence of QRN, when extremely weak *unclipped* signals were only about 30 per cent intelligible, using 24 db. of clipping would raise intelligibility to 75 per cent. These percentages represent intelligibility of words on the special lists; the equivalent in connected meaningful sentences may be higher.[5, 6] Such an advantage in favor of clipping also holds when QRN is very heavy, to almost the same degree.

Listeners in these experiments were asked to report on change of voice quality as clipping increased. Here is their average opinion: at 0 db. clipping, natural voice; 6 db., clipping effects barely noticeable (comparable with standard broadcast quality); 12 db., talker appeared to be enunciating with unusual care; 18 db., voice took on a sharp "sandy" character, quality rated not as good as before; 24 db., voice was coarse and "grainy," rated as poor. Note, however, that despite the very evident changes in voice quality, intelligibility actually improved, particularly when conditions were less than optimal. This effect has been noted before,[1] although perhaps not so explicitly documented.

The question arises, "What about the effects of clipping on intelligibility when conditions are nearly perfect?" The most definitive answer available comes from another series of experiments.[6] With 0 db. clipping, signals were 100 per cent intelligible; as clipping was increased, intelligibility fell off slightly until at 20 db. clipping it had reached 96 per cent. Clipping was gradually advanced, and at *100 db.* (almost all speech peaks flattened to rectangles), intelligibility had fallen to 75 per cent. (This, remember, under ideal conditions of quiet for both talker and listeners, with no fading or interference.) Incidentally, these experiments revealed that with signal/noise conditions which completely obscured unclipped speech (intelligibility at 0 per cent to 10 per cent), the same signal when clipped 100 db. and over was 30 per cent intelligible. In these experiments, nothing was said about changes in quality; it could be expected, however, that with such severe clipping as 100 db. it would be very hard to identify the talker by the distinctive sound of his voice.

Effects of Filtering on Intelligibility

Up to this point, we have discussed speech in terms of its gross amplitudes only, without considering the individual frequencies present in spoken language. For reasons dictated by engineering standards, several recent amplifier designs [7, 8, 9] have included both high- and low-pass filtering. Since this practice is becoming more widespread, let us examine its effect on intelligibility.

This matter has also been investigated in the psychological laboratory, under conditions comparable with those found in the amateur 'phone bands.[10, 11] Using the same testing procedures as in the study of clipping effects, a talker's voice was transmitted over a wire circuit to a group of listeners. The speech was subjected to various degrees of filtering and attenuation, and was then combined with an unfiltered, constant-intensity thermal noise, simulating QRN, and led to the listeners' headphones. At no time was peak clipping permitted to occur; thus the effects of filtering alone could be evaluated. One series of experiments, studying changes of intelligibility at various signal levels and signal/noise ratios when either high or low frequencies were separately filtered out,[10] showed that when everything below 350 cycles was cut off, intelligibility of moderately to very strong signals was slightly improved by comparison with unfiltered signals. However, at the lower signal levels, where QRN presumably was more disturbing, intelligibility suffered some loss as a result of such filtering. Extremely weak signals in noise were 5 per cent intelligible when the 350-cycle high-pass filter was in the circuit, but jumped to 25 per cent when the filter was switched out, although signal strength and noise level remained unchanged. It was further found that when signals were strong and in the clear, everything up to 580 cycles could be cut off with little damage to intelligibility. As to cutting off the highs, when everything above 3950 cycles was eliminated there followed very little reduction of intelligibility regardless of signal strength. However, when the cut-off point was moved down to 2500 cycles, results were quite different. When signals were strong and clear, intelligibility was down to 78 per cent with the filter in, as compared to 90 per cent with no filter. As signals grew weaker, the *proportional* loss of intelligibility due to filtering diminished somewhat, although even at the lowest signal level used in the tests, the 2500-cycle low-pass filter hampered intelligibility appreciably.

We may now ask, "What happens to intelligibility when we filter off both highs and lows at the same time?" The effects of bandpass filtering on speech in a noise background have been separately investigated.[11] As before, unfiltered constant-intensity noise was superimposed upon the filtered speech signal, which was also varied in strength to secure various signal/noise ratios. As might be expected from the discussion of high- and low-pass filtering, greatest intelligibility at all signal strengths resulted when the widest passband was used (130–9200 cycles, intelligibility about 90 per cent). The effects of filtering

[6] Licklider, J. C. R., Bindra, Dalbir, and Pollack, Irwin, "The Intelligibility of Rectangular Speech Waves," *American Journal of Psychology, 61*, 1, Jan., 1948, p. 1.

[7] Rand, P. S., "The 'Little Slugger,'" *QST*, Feb., 1949, p. 11.

[8] Anon., "Logarithmic Compressor," *G. E. Ham News, 5*, 3, May–June, 1950.

[9] Swafford, T. W., "More Effective Speech Amplification," *QST*, July, 1950, p. 50.

[10] Pollack, Irwin, "Effects of High Pass and Low Pass Filtering on the Intelligibility of Speech in Noise," *Journal of the Acoustical Society of America, 20*, 3, May, 1948, p. 259.

[11] Egan, J. P., and Wiener, F. M., "On the Intelligibility of Bands of Speech in Noise," *Journal of the Acoustical Society of America, 18*, 2, Oct., 1946, p. 435.

upon intelligibility were most noticeable, as before, when signals were strong and relative noise level was low. Interestingly enough, at all signal levels, the passbands 340–3900 cycles and 550–3900 cycles produced almost identical effects on intelligibility; *actually, neither one seriously impaired intelligibility when compared with the widest passband.* However, shifting the cut-off points toward each other clearly resulted in poorer intelligibility, as the following table shows. Signal strength and signal/noise ratio are the same for all filter combinations.

Passband Limits	*Intelligibility*
130–9200 cycles	90%
340–3900	80
550–3900	80
550–2500	70
870–3900	65
870–2500	55

There have been several other investigations of filtering and its effect upon speech intelligibility.[3, 12] However, they deal only with signals transmitted under ideally quiet, unfading conditions for both talker and listeners; their results, therefore, are probably not as pertinent to amateur 'phone operation as the work already discussed, hence no detailed mention of them has been made.

Summary

On the basis of the foregoing evidence, we may summarize as follows:

1) Speech clipping definitely improves intelligibility.

2) As signals get weaker, and as signal/noise ratio gets worse, the greater the clipping, the greater the improvement of intelligibility, up to at least 24 db. of clipping.

3) Extremely heavy clipping (100 db. or more) is beneficial under very severe signal/noise conditions, although it will not make poor signals completely understandable.

4) Although the quality of speech changes noticeably over the clipping range from 0 db. to 24 db. (and probably above), even under the best signal conditions intelligibility is not impaired by clipping.

5) In general, high-pass filtering up to 350 cycles will not harm intelligibility, and may actually make a slight improvement when signals are strong and clear.

6) Under optimum signal conditions, frequencies below 580 cycles may be eliminated with little loss of intelligibility.

7) Cutting off frequencies above 3900 cycles by use of a low-pass filter will have hardly any effect on intelligibility.

8) Cutting off frequencies above 2500 cycles will seriously impair intelligibility.

Conclusions

We may conclude, therefore, that the engineering advantages obtained from speech clipping prior to modulation are accompanied by definite improvement of intelligibility at the receiving end of a radio circuit, especially under adverse operating conditions. Further, the change in voice quality noted as a by-product of clipping does not really impair intelligibility of the signal; speech can be distorted very severely by nonlinear transmission and still be perfectly understandable. Filtering to avoid or remove the undesirable side effects of clipping will not impair the intelligibility of speech until the upper cut-off frequency gets down around 2500 cycles. In fact, filtering off the low frequencies (below 350) may actually improve intelligibility under good signal conditions. The limit for cutting off low frequencies is apparently much less critical than for high frequencies: any cut-off point up to almost 600 cycles may serve for the lows with little damage to intelligibility, while for the highs cut-off should be well above 2500. It appears now that the more or less arbitrary low-pass cut-off of 3000 cycles now rather widely employed [7, 8, 9] may be a little too slow for optimum communication. This last observation assumes, of course, that the frequencies above nominal cut-off are abruptly and completely attenuated. It may very well be that intelligibility would not suffer so seriously were the frequencies above, say, 2000 cycles subjected to the relatively gentle treatment of the typical *RC* network, i.e., 3 to 6 db. attenuation per octave.

[12] French, N. R., and Steinberg, J. C., "Factors Governing the Intelligibility of Speech Sounds," *Journal of the Acoustical Society of America, 19*, 1, Jan., 1947, p. 90.

Strays

For those whose curiosity was aroused by October *QST*'s story of the erection of the 36-element 10-meter beam at W9EH, we pass along the latest from Sandwich. The "biggest beam" is now in use, and it is living up to all expectations. It shows approximately 10 db. gain over a stacked 4-over-4 array, so a gain figure of 18 db. seems a conservative estimate. That is plenty of decibels at 28 Mc.!

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W3PT, a 2-meter enthusiast, points out quite correctly that while October *QST* says the three contacts required for renewal of amateur operator licenses must be "by c.w.," A2 (amplitude tone-modulated telegraphy) may be used on those bands where it is permitted in making contacts for proof-of-use.

HAMFEST CALENDAR

NEW YORK — Saturday, November 11th, at 174th Armory, Buffalo — Annual Hamfest of Radio Assn. of Western New York. Tickets $3.00.

NEW YORK — Thursday, November 9th, at Lost Battalion Hall, Elmhurst, Long Island — 14th Annual Hamfest of the Federation of Long Island Radio Clubs. Program starts at 8 P.M. and includes entertainment, contests, and technical talks by prominent hams. Admission will be by ticket only — $2.00 at the door, $1.50 if purchased in advance. Tickets may be obtained from Federation clubs, selected radio stores, or from Secy. Thomas S. Black, W2JSV, 8417 124th St., Richmond Hill 18, L. I., N. Y.

Cut-Off Frequencies and Audio Quality

Band Limits in Relation to Bandwidth

BY J. P. NEIL,* VE3PN

IT IS fairly obvious to those who have experimented with reproducing systems for speech and music that the quality of reproduction depends on the relationship between the upper and lower frequency limits of the band transmitted, as well as on the actual values of those

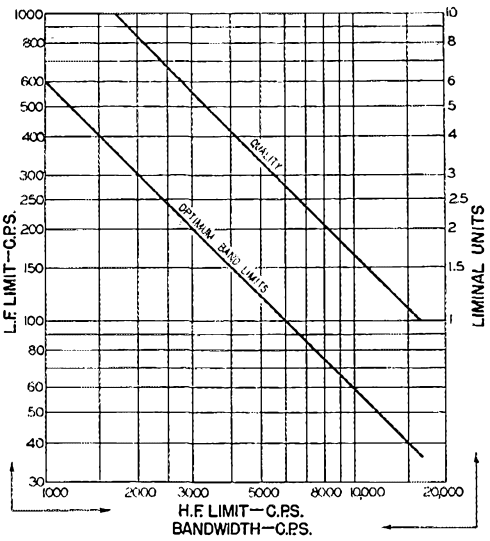


Fig. 1 — The curve marked "Optimum Band Limits" shows the most desirable frequency for cut-off at one end of the band when the cut-off at the other end is chosen. The "Quality" curve can be used to rate a given bandwidth as against another.

limits. This is so whether high-, medium- or low-fidelity systems are being considered. For a given passband (in cycles) speech or music will always sound most pleasing when the low- and high-frequency limits are properly chosen in relation to the bandwidth.

Researchers in the field of acoustics have, as a result of summarizing statistical data, given us a good deal of quantitative information.[1] From a practical standpoint, the data on the optimum frequency limits, for a given bandwidth, are incorporated in the curve marked "Optimum Band Limits" in Fig. 1. This curve expresses the approximate relationship

$$Y = \frac{600{,}000}{X}$$

where X is the upper limit for the band and Y is the desired lower limit for optimum fidelity.[2] For example, if 5000 cycles is chosen as the upper limit, the curve shows that the low-frequency end should cut off at about 120 cycles; if 3000 cycles is chosen as the upper limit, the system should cut off at 200 cycles at the low end.

The practical value of the band-limits curve is that it gives the optimum proportion of low- and high-frequency response for a given bandwidth. If the low-frequency cut-off is much below the indicated optimum limit for a given high-frequency cut-off, both music and speech will sound "boomy." On the other hand, if the low-frequency cut-off is fixed and the optimum high-frequency limit is exceeded to any extent, the reproduction will be shrill or "tinny." For best balance, the frequency limits indicated by the curve should be observed.

Bandwidth vs. Quality

The fact that the proper frequency limits are chosen does not, of course, mean that the fidelity will be the same for all bandwidths. An estimate of the loss of quality can be obtained from the curve marked "Quality," using the right-hand scale of Fig. 1. This scale is in "liminal units," a term adapted for acoustics by Gannett and Kerney, and meaning a just-discernible change in the character of the reproduction. The curve in Fig. 1 is the average of statistical tests made on a group of *critical* listeners; the ordinary listener probably would not detect one liminal unit. (Actually, a liminal unit for speech is equivalent to two liminal units for music — that is, it is harder to detect changes in quality in speech than in music — but for practical purposes the scale can be used as given.) The approximate formula from which the quality curve is drawn is

$$Y = \frac{16{,}900}{X}$$

where Y is the number of liminal units and X is the bandwidth in cycles per second.

The curve is used for comparing two bandwidths. For example, let us assume that the band from 120 to 5000 cycles is capable of reproducing everything we need for speech, and can therefore be used as a standard of speech quality. The bandwidth is 5000 − 120 = 4880 cycles, approxi-

(*Continued on page 88*)

* Apt. 2, 207 Charlotte St., Ottawa, Ont., Canada.

[1] Fletcher, "Hearing, the Determining Factor for High-Fidelity Transmission," *Proc. I.R.E.*, Vol. 30, p. 266, June, 1942; Gannett and Kerney, "The Discernibility of Changes in Program Bandwidth," *B.S.T.J.*, Vol. 23, p. 1, January, 1944; Sivian, "Speech Power and its Measurement," *B.S.T.J.*, Vol. 8, p. 646, October, 1929; Dunn and White, "Statistical Measurements on Conversational Speech," *Jour. Acoust. Soc. Am.*, Vol. 11, p. 278, January, 1940; Steinberg, Montgomery and Gardner, "Results of the World's Fair Hearing Tests," *B.S.T.J.*, Vol. 19, p. 533, October, 1940; Snow, "Audible Frequency Ranges of Music, Speech and Noise," *Jour. Acoust. Soc. Am.*, Vol. 3, p. 155, July, 1931.

[2] The curve expresses the relationship XY, a constant. Various authorities give values for the constant varying between 500,000 and 640,000; 600,000 represents a good average value to a first approximation.

• Technical Topics —

Frequency Response and Intelligibility

THERE are two articles in this issue[1] that ought to be read by everyone interested in 'phone work. In studying the article by W1RXX it should be borne in mind that the work reported there on bandwidth and cut-off frequencies *versus* intelligibility was done with filters having very sharp cut-off characteristics. As the author says at the end of the article, the results may very well be modified by using filters that have a more gradual cut-off. At this stage of the game it might be premature, and perhaps unfortunate, to jump to the conclusion that if a speech amplifier is not *flat* out to 3950 cycles there will be a drastic loss in intelligibility.

The last few editions of the *Handbook* have carried a clipper-filter speech amplifier whose design was based on the premise that a really sharp high-frequency cut-off characteristic was required, in order to prevent the high-frequency harmonics generated by the clipping process from getting to the modulated r.f. amplifier and appearing as spurious sidebands on the transmitted signal. The measured frequency response of the amplifier is shown by the dashed curve in Fig. 1. The cut-off frequency (defined as the point where the response is 6 db. down) is 2600 cycles, and from there on the response drops at a rather rapid rate.

This amplifier was tested under quiet conditions on a number of observers, and the verdict was that (as compared with the filter switched out, when the curve was essentially flat to 15 kc.) there was no serious loss of intelligibility in connected speech.[2] The "quality" was not especially pleasing, which did not concern us very much at the time because intelligibility was the main issue. The unit has subsequently been in use at W1LOP, and experience with it has shown that receiving operators do not like the way it sounds, despite the considerably higher average modulation level with clipping and filtering. The general complaint seems to be that it is "boomy," which is no doubt true. And whether it is strictly logical or not, the ordinary person is not completely happy about adequate intelligibility if it is not accompanied by some element of "naturalness."

In building a new clipper-filter unit for the coming *Handbook* edition a simpler filter arrangement was used, and after some tinkering the characteristic shown by the solid curve in Fig. 1 resulted. The principal considerations in this case were to get something that would sound well — we can't be any more specific than that — and would, at the same time, have sufficient attenuation above 3000 cycles. Although the cut-off frequency — 2900 cycles — is not greatly different than in the other amplifier, the cut-off is more gradual and the attenuation becomes practically

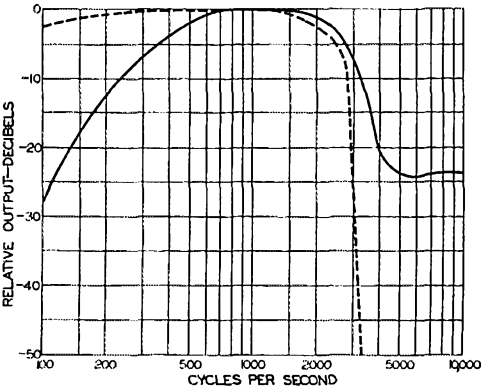


Fig. 1 — Output *vs.* frequency curves of the two speech amplifiers discussed in the text.

constant above 5000 cycles. In fact, the attenuation is not very large, and we had considerable doubt that it would be enough. To check the point, the unit was used to modulate an r.f. amplifier, and a careful check of the transmitted spectrum showed that there were no sidebands of any significant amplitude above 4000 cycles from the carrier, and very little in the region from 3000 to 4000. This was with over 12 db. of clipping. The signal was, in fact, considerably narrower with 12-db. clipping and the filter in circuit than it was on straight modulation with flat amplification. The unit has since been in regular use at W1LOP and the universal reaction now is "That's fine; leave it just the way it is." The fact that the high- and low-frequency cut-off points more nearly approximate the optimum described in the VE3PN article than was the case with the original amplifier no doubt has something to do with it, but we suspect that the sloping characteristic at the high end is equally important.

On the question of clipping there does not appear to be much room for argument; clipping up to 12 db. does not materially affect naturalness and, if anything, improves intelligibility. Since a

(*Continued on page 90*)

[1] Stuntz, S. E., "Premodulation Clipping and Filtering," p. 22; Neil, J. P., "Cut-Off Frequencies and Audio Quality," p. 25.

[2] With the amplifier having the characteristic shown by the dashed curve in Fig. 1 it was practically impossible to distinguish between the consonant sounds "f" and "s," and very difficult to identify, alone, similar-sounding words differing only by those consonants. Nevertheless, with the aid of context the connected-speech intelligibility was high. The intelligibility tests mentioned in Mr. Stuntz's article were made up of discrete words only; had these same words been spoken as parts of complete sentences their individual intelligibility would have been much higher, in spite of distortion due to clipping or filtering.

Military Amateur Radio System

New MARS Headquarters Station Opens

Maj. General S. B. Akin, chief signal officer, U. S. Army, and Maj. General F. L. Ankenbrandt, director of communications, U. S. Air Force, extend a personal invitation to U. S. radio amateurs to visit and inspect the new joint headquarters station of the Military Amateur Radio System.

The joint headquarters station is really two complete stations, housed in a single area, with a common reception room. MARS itself is actually two separate radio systems, one operating under Army direction, the other under Air Force direction. The two systems are joint only for determination of policy.

The new stations are located on the concourse of the Pentagon at Washington, D. C., where they serve a dual rôle. Functionally the stations are the nerve centers of the Army and Air Force amateur radio networks which parallel established military circuits within the U. S. and extend overseas to most of the military installations. Abstractly the stations are a 24-hour-a-day symbol of the esteem in which the military holds the radio amateur. As WAR and AIR the military stations use military frequencies and handle military traffic. But as K4USA and K4AF the stations and personnel are purely amateur and operate in accordance with amateur practices and procedures.

A receptionist and an operator will be on hand, day and night, to welcome all visitors. Any amateur who wants to try the equipment needs only to produce a valid ham ticket, identify himself, and the receptionist will arrange for him to go on the air if equipment is available.

Design and Construction

Because of the location of the stations special engineering problems were encountered. For example, heavy bus traffic directly beneath the stations produced ignition QRM (the site is located in an exceptionally high noise level). Diathermy interference from the Pentagon dispensary is also experienced. To alleviate interference the entire operating rooms were shielded by copper screening.

Antennas are located on the rooftop some 300 feet from the transmitters. Gordon rotary beams are employed for 10- and 20-meter operation; home-constructed doublets are available for 40- and 80-meter work. Balanced transmission lines feed the two rotaries, employing four runs of large size (inch diameter) 52-ohm coaxial cable (two for each beam). Altogether, more than 9000 feet of shielded wire and 2500 feet of conduit were used in construction.

The equipment proper breaks down into three categories: For each station there is a 1000-watt transmitter and associated equipment, a master console, and two QSO booths.

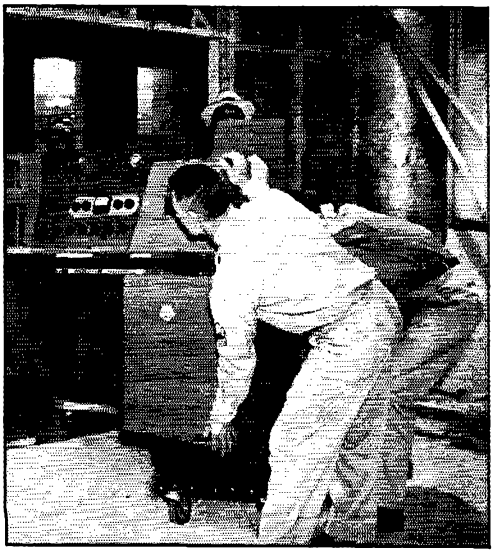
The chief operator controls all station activities. At his fingertips are the switches that control all station operation including volume levels, turning microphones on and off, and frequency control.

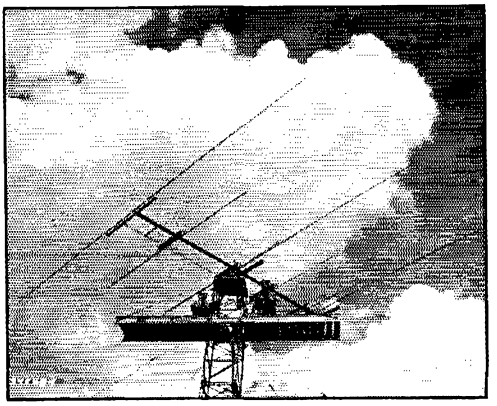
Operations and equipment in the master control room may be viewed by the public through large double-glass picture windows.

Inside the "goldfish bowl," from his position at the master console, the chief operator can look directly into the individual operation booths — also through double glass.

Two equipment racks, one on either side of the transmitter, are flush-mounted into the wall in each of the master control rooms. Rack No. 1 contains an antenna multicoupler (Signal Corps coupling unit), a Magnachord recorder and control panel, a beam control panel, a transmitter

(*Continued on page 90*)





Highlights in the installation of the new joint headquarters station of MARS at the Pentagon. *Left:* Workmen and operators ease the master console into position. Note the copper screening on the walls. *Right:* A field telephone is put into service between station and tower as the 10- and 20-meter rotaries are tested and tuned.

{Continuing the ARRL Series on Amateur Operating}

General Operating

BY JOHN HUNTOON, W1LVQ

DINNER is finished and the clatter of dishes in the kitchen has subsided . . . the youngsters are in bed . . . . the XYL has picked a good book and settled down for the evening.

The old man? Headed for the shack, of course. Tonight is the night for some "general operating" . . . rag chewing . . . just plain hamming.

We warm up the receiver and switch on the transmitter filaments. A crisp light on the operating table discloses log, scratch paper and pencil in readiness. A quick check shows the 100-kc. continuously-running standard and the shack clock right on the button with WWV . . . they always are, but since they're used so often we check each time anyway.

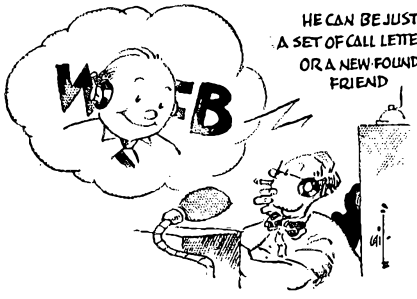
What's doing on 80? We turn the receiver dial, finding out who of the gang are on and what they are working. Say, there's Joe at W4 —, an old crony, but he's busy in a traffic schedule; maybe we can catch him later when he's through. Here's a CQ, with a nice fist — but shucks, it's directional west, so guess we can't help him out. Let's go up in the band a little further. . . .

We're getting the "feel" of the band. Good operating starts with the receiver. We've read somewhere that time-recording clocks placed on transmitters of proficient ham operators show a maximum of 20 per cent and as little as 5 per cent of total time in the shack is spent by them in actual transmitting. The rest? — in listening, to make operating time return the most pleasure. A guy who barges into his shack and starts calling CQ while his receiver warms up is a pseudo-

broadcaster, hardly a ham communicator. So we listen first. And then listen some more. . . .

Zowie! What a signal *that* one is — clicks 20 kc. away. Why don't some of these guys realize the importance of a clean signal? — to comply with the regulations, sure, but to go even beyond that so that copying is a real pleasure. Just as the neatness of a home tells a lot about the housewife, so a ham signal is a reflection of the operator — our calling card to the amateur world. When a new rig is finished it probably will produce a T9 signal right off, but a few extra hours with soldering iron and *Handbook* on a simple keying filter will pay off many times; the other fellow wants to copy clean stuff as much as we do. Ah, ha! — no need to bust in and tell this guy about his clicks; the ham he's working is doing a nice, friendly job of that. . . .

Hey, there's another CQ. Close enough to where the transmitter was last set that there's no need to retune the final, but of course we'll have to call him right on or next to his frequency or we won't have a chance of raising him. Nice signal and fist, a W8 — don't think we've worked him before. So we flip the VFO-only switch and zero in on the channel. Yes, VFO-*only*. It's bad enough to have to put full carrier in a crowded band even



for the few seconds required to tune up, but high on the list of public enemies is the guy who "swishes" his VFO with the rig on the air. The VFO is a great boon to ham radio but improperly handled can be the greatest bane. Monitoring the VFO, we tap out a couple of diddle-de-dah-dits to get the feel of the bug and to make sure it's set for about the same speed as the fellow we're going to call. There, he's signed . . . the big switch goes on, a couple of quick calls and BK . . . yep, there's his snappy break, and we sign.

So now "the door is open" — we're face to face with another amateur. He can be just a set of call letters or a new-found friend. We can mumble, on our turn, that it's nice to see him, remark what nice weather we're having, and then shuffle off to "ring another doorbell" and go through the same routine all over again — if that's what we want. Or we can develop the greeting into a new and warm friendship — the stuff of which true amateur radio is made — and spend a pleasant half-hour or longer chatting about anything under the sun.

It's up to us.

Into the log goes the date, time, frequency and mode, and we wait for our signal report. Meanwhile, we're thinking of the more-or-less "standard" rut into which many amateurs fall in general operation, when on the first transmission they say something like:

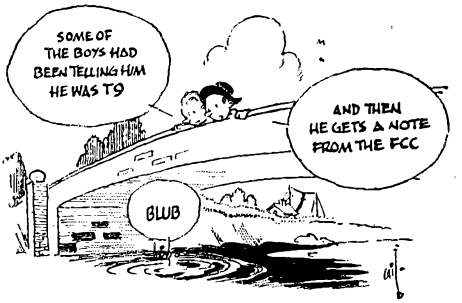
R R OK OM TNX FER CALL UR SIGS RST 579X HR IN EAST HARTFORD CT WX CLR ES WARM WL OM HW? W . . .

And on the next one:

R R OK OM TNX FER RPT OK ON UR WX WL OM GESS QRU HR SO TNX QSO ES HOPE CU AGN VY 73 W . . .

Strictly impersonal and unimaginative. Yet we fell into the same routine when beginning, being self-conscious in our first contacts and so imitating the scope of conversation the other fellow used in the thought that it must be standard amateur practice. And then came that fine day, after our first and very pleasant rag chew, when we realized that on the other end of the circuit was not just a collection of radio equipment but a real, live human being. We'd been in a rut and, as the saying goes, the only difference between a rut and a grave is in the dimensions. Hope this W8 isn't like that.

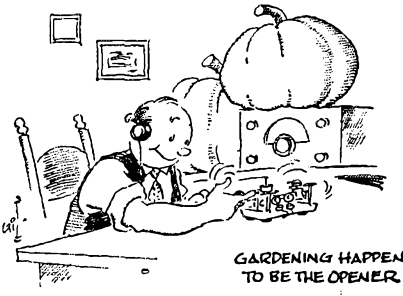
Oops, almost missed the signal report: RST 489, and down it goes in the log; he says there's a bit of interference locally. Mighty good op, that, who realizes every S8 signal is not automatically R5. Many of us have forgotten that the numbers have definition and meaning. R-readability is a gauge *of ability to understand* the signal — roughly, what percentage of material is actually being received as communication. S-Strength, an entirely separate measure, of course relates to *strength* of the signal. It is perfectly possible for a weak signal to be 100 per cent copiable, in which case the report might be Readability 5, Strength 3. Conversely, a hefty signal being messed up by even stronger interference might be reported as Readability 2, Strength 8. The customary 579x can be an accurate report in an uncrowded band with average conditions, but is too often improperly used, strictly out of habit, under other conditions. Fairness in RST reports will ensure that the other fellow will do likewise and your log entry under "my sigs" will mean something, too. T-Tone is a particularly-abused measure; a T7 report won't bust up a beautiful



friendship if the guy at the other end is any kind of ham; he wants to know the quality of his signal if it's below standard rather than being patted on the back with a false T9 so that he goes along blissfully in ignorance. . . .

"HR IN MANSFIELD OHIO . . ." Drove through there a couple of years ago headed west on vacation; must ask him if he's ever had steak sandwiches at that little diner west of the city on Route 30N. His name — Bill, and we mark it in the log for future reference. Ho! — says he's just come in from the garden with a couple of pumpkins for jack-o-lanterns. That means we can swap notes on sweet corn, varieties of winter squash (wonder if he's ever had stuffed Zucchini), and whether or not to stake tomato plants. Boy, this is going to be a swell chew!

And it is. Gardening happens to be the opener, but it might have been one of a thousand other subjects, radio or otherwise. We hams have to have standard operating procedures in calling and signing for *convenience and speed* in communications, but what goes on between the BT signs is up to us. That's where we cease being only radio operators and become individuals.



Contests are different. In an SS, for example, the idea is to make the greatest number of contacts in a given time and therefore each one as short and snappy as possible. That's fair enough for a contest aimed at developing operating pro-

THE R-S-T SYSTEM

READABILITY

1 — Unreadable.
2 — Barely readable, occasional words distinguishable.
3 — Readable with considerable difficulty.
4 — Readable with practically no difficulty.
5 — Perfectly readable.

SIGNAL STRENGTH

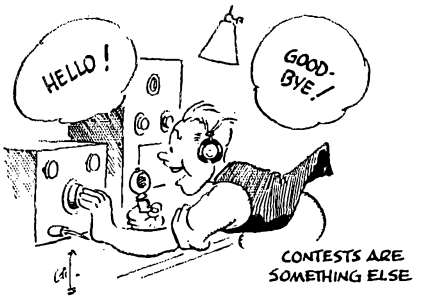
1 — Faint signals, barely perceptible.
2 — Very weak signals.
3 — Weak signals.
4 — Fair signals.
5 — Fairly good signals.
6 — Good signals.
7 — Moderately strong signals.
8 — Strong signals.
9 — Extremely strong signals.

TONE

1 — Extremely rough hissing note.
2 — Very rough a.c. note, no trace of musicality.
3 — Rough low-pitched a.c. note, slightly musical.
4 — Rather rough a.c. note, moderately musical.
5 — Musically-modulated note.
6 — Modulated note, slight trace of whistle.
7 — Near d.c. note, smooth ripple.
8 — Good d.c. note, just a trace of ripple.
9 — Purest d.c. note.

If the signal has the characteristic steadiness of crystal control, add the letter X to the RST report. If there is a chirp, the letter C may be added to so indicate. Similarly for a click, add K. The above reporting system is used on both c.w. and voice, leaving out the "tone" report on voice.

ficiency and skill. But we're talking about general operating . . . rag chewing . . . just plain hamming, where "hello-goodbye" contacts have no place, where we forget our secondary status as a bug-pusher or a mike-holder and become an individual.



That's what ARRL's RCC (Rag Chewer's Club) is for — to promote fraternalism in ham radio and get away from stereotyped contacts. We're mighty proud of that little blue certificate on the shack wall, signed by The Old Sock. A half-hour rag chew reported to Hq. by postcard and confirmed by the other fellow, already an RCC member, was all that it required. It's a pleasant reminder of the many enjoyable contacts of a half-hour or longer that have occurred since, like this one, and we hope that will continue long in the future. . . .

And so we learn a lot about Bill of Mansfield, his garden, his rig, his family, and we in turn tell him about ours. The contact goes so smoothly we can't help noting his expert use of abbreviations to save time, and Q signals when they fit. He's not trying to break any speed records, though, and keeps his sending rate down to what can be handled on the bug with a minimum of errors. When there is a bust, it is corrected with the standard sign • • • • • • • • (eight dits), the proper indication of error. He doesn't use R at the beginning of a transmission unless he really got us solid. His sending is clean, and a pleasure to copy. We're getting a mighty warm feeling for this fellow Bill. Novel, too, though mighty logical, the way he uses periods (• - • - • -)at ends of sentences and the double-break (BT) to set off paragraphs of thought. Of course in rag chewing there's a minimum of punctuation used.

The contact is enjoyable, further, because we're "reading" him and not copying down his transmission verbatim. Took us a while to break away from the solid pencil copy habit, but now we can sit back and take it easy, of course making notes on items that we specifically want to remember for comment when it's our turn. In fact, once or twice we break in with a particularly pertinent comment, of course remembering that while it's not necessary to sign a comment of less than three minutes' duration, in a series of rapid exchanges we must sign at least every ten minutes.

Yipes! — nearly 8:30 and time for the late session of the section 'phone net. Where'd this last hour go? Hate to bust it up but want to check into the net tonight. How about a schedule for Thursday, OM? Fine, we'll be there, same time, same spot. A million tnx, Bill, and CU then. 73.

Up goes the receiver dial. We swing the VFO up, flip the "tune" switch for low power, and adjust the final, then kick in the modulator. All set. And just in time — there's the net control station. We make final frequency adjustment to his channel with the VFO-only switch. Listen to him handle that net call up — his push-to-talk system is a marvel, darned near as useful as break-in on c.w. Got to look up details and fix this old crusher the same way, or maybe even try voice control. Only have two switches now for changeover, but that's one too many in comparison to the punch this fellow gets into — and out of — his hamming. We'd have to go to 11 meters or above 144 Mc., where duplex is permitted, in order to improve on his set-up — that is, short of single sideband.

It's so smooth it seems to "just come natcherly," but he sure knows his voice operating. To start with, there's no confusing background such as a b.c. set running wide open in the next room. Most important, he *says it with words*. Funny, isn't it, how we carry c.w. abbreviations into 'phone use when probably the reason we got on voice was to use words! When this fellow wants a net member to stand by, he says "please stand by," not "please QRX a minute." And none of the "okay on this, okay on that" sort of thing; when he says okay, he means okay on everything, without feeling obligated to recite a check list to prove it.

Our turn, near the end of the list — at his "break" we make a quick check-in. Couple of the other fellows have traffic and while it's in process let's make out a QSL card to Bill so we can mail it first thing in the morning. . . . Turns out there's not much else doing tonight, so the net breaks up a little early. A few of the boys hang around for a round table. We listen a few minutes, noting their efficient sign overs: "W1AAA [next station to transmit] and the gang in the Blank Net, this is W1BBB, over." No waste of time here. And there'll be no questionable language or indulging in rumor-spreading or pseudo-broadcasting for the entertainment of SWLs in *this* crowd; while the appeal of ham radio to these fellows is the personal contact, they still maintain it on a high plane.

We? Headed for 20 'phone. Need Oklahoma for WAS on that band, and maybe it'll still be open. Hope we can find someone in the Sooner State — and hope he'll be in the mood for a rag chew. . . .

On the way down, though, let's stop off on 40 for a minute. Conditions seem pretty good, and the band is full, as usual. What's this carrier? Oh, somebody testing. He's signing . . . a new ham if his call means anything — and there he starts a CQ. Let's get the rig on 40, quickly. Oklahoma will have to wait. We'll never forget

(Continued on page 92)

Happenings of the Month

DIRECTOR ELECTIONS

Percy C. Noble, **W1BVR**, the only nominee, has been declared reëlected as director of the New England Division for the coming 1951–1952 term. Similarly, **Franklin K. Matejka, WØDD,** continues as director of the Rocky Mountain Division for two more years.

Five alternate posts have been filled beginning January 1st, also as a result of no competition: **Charles F. Reberg, W9MVZ,** becomes alternate director, Central Division; Harry Mathews, W9UQT, was nominated but found with insufficient continuity of membership. **Karl W. Weingarten, W7BG,** will be the new alternate for the Northwestern Division; a petition was filed for the incumbent, A. D. Gunston, W7GP, but he withdrew in view of the fact he no longer lives within the division. **Gus Browning, W4BPD,** remains alternate director, Roanoke Division, as the lone nominee. **Ramon S. Walker, WØOWP,** gets the Rocky Mountain Division alternate post and **Walter R. Joos, W6EKM,** the Southwestern Division alternate job beginning the first of the year.

The remaining offices are contested, valid nominating petitions having been filed and balloting now being in progress for the following candidates:

CENTRAL DIVISION
Director: John G. Doyle, W9GPI
Wesley E. Marriner, W9AND
DAKOTA DIVISION (Special Election)
Alternate: Alfred M. Gowan, WØPHR
Paul M. Bossoletti, W8EZY/Ø (WØGZD)
HUDSON DIVISION
Director: Joseph M. Johnston, W2SOX
Gay E. Milius, jr., W2NJF
Alternate: George V. Cooke, jr., W2OBU
Earl R. Thomas, W2MM
NEW ENGLAND DIVISION
Alternate: Frank L. Baker, jr., W1ALP
Clayton C. Gordon, W1HRC
NORTHWESTERN DIVISION
Director: Harold W. Johnston, W7DXF
R. Rex Roberts, W7CPY
ROANOKE DIVISION
Director: William H. Jacobs, W4CVQ
J. Frank Key, W4ZA
SOUTHWESTERN DIVISION
Director: John R. Griggs, W6KW
William J. Schuch, W6CMN
WEST GULF DIVISION
Director: David H. Calk, W5BHO
A. David Middelton, W5CA
William M. Mead, W5APW
Alternate: Charles Fermaglich, W5FJF
Frank E. Fisher, W5AHT/W5AST
D. Morgan Richards, W5HBM

WASHINGTON NOTES

Frank Kratokvil, W3BA, was recently named as assistant chief of FCC's Field Engineering & Monitoring Division. Under the capable direction of George S. Turner, W3AP (and in the old days an ARRL division director), FEMD gives operator examinations, inspects stations, handles interference complaints, and takes care of a host of other matters including keeping a close watch on the activities of all radio stations.

Frank got his first ham ticket, 9PG, in 1923. He joined the Department of Commerce in 1928 as a radio inspector out of the Detroit office and has been keeping an eye on radio operations for the government ever since; he remembers particularly cleaning up the unlicensed b.c. station epidemic while head of the Dallas office in the mid-30s, as well as tangling with illegal Mexican border radio operation. From 1946 until his recent promotion he served as chief of the monitoring branch in Washington.

W3BA

Hamwise? Well, he's had so much experience solving ham BCI that his own station is out in the country — Beltsville, Md.! Reminiscing, he thinks his biggest thrills as a ham have been "those distinctive notes we used to develop when the bands were less crowded," and "in the old days, working Australia with the modulator connected but using hand key saying 'ah' in the mike and sneaking in a few words." "But," Frank sighs, "it's illegal nowadays."

—•••—

With Selective Service and the calling up of reserves, numerous amateurs thereby affected will undoubtedly be away from home for extended periods or perhaps overseas, so that compliance with the proof-of-activity requirements for amateur license renewal will be difficult if not impossible. The situation is aggravated in that a considerable number of amateur licenses will come up for renewal next year. With this in mind the League approached FCC's staff informally to seek a waiver of the requirement in the case of servicemen unable to comply; the initial reaction in Washington has been highly favorable. Watch *QST* for details of any such action taken. . . . At this writing (early October), there's absolutely no news on Docket 9295. . . . The position of amateur radio in Washington as concerns possible effects of the Korean war and its aftermath remains precisely the same: there is no tendency anywhere to talk of closedown or curtailing of any of our activities.

CALL SIGN ALLOCATIONS

Under the Atlantic City regulations the United States has available for its use all call signs

COL. 1 *Class of station*	COL. 2 *Composition of call sign*	COL. 3 *Call sign blocks available*
Coast[1]	3 letters	KAA thru KZZ. WAA thru WZZ.
Aeronautical[2]	3 letters, 1 digit	KAA2 thru KZZ9. WAA2 thru WZZ9.
Fixed,[3] coastal telephone in Alaska[3]	3 letters, 2 digits	KAA20 thru KZZ99. WAA20 thru WZZ99.
Land (other than aeronautical and coast)[3]	3 letters, 3 digits	KAA200 thru KZZ999. WAA200 thru WZZ999.
Mobile telegraph (other than ship and aircraft)	4 letters, 1 digit	KAAA2 thru KZZZ9. WAAA2 thru WZZZ9.
Mobile telephone (other than ship and aircraft)	2 letters, 4 digits	KA2000 thru KZ9999.
Ship telegraph	4 letters	KAAA thru KZZZ. WAAA thru WZZZ.
Ship telephone[3]	2 letters, 4 digits	WA2000 thru WZ9999.
Ship telegraph and telephone	Same as for ship telegraph	
Ship radar[3]	Same as ship telephone	
Ship radar and telegraph	Same as for ship telegraph	
Ship radar and telephone	Same as for ship telephone	
Aircraft telegraph	5 letters	KAAAA thru KYZZZ. WAAAA thru WZZZZ.
Aircraft telephone	Registration Number	
Aircraft telegraph and telephone	Same as for Aircraft telegraph	
Lifeboats, liferafts and other survival craft	Call sign of parent ship or Aircraft plus 2 digits from 20 to 99 inclusive. The parent call sign must in such cases be a 5 letter call, if aircraft, or a 4 letter call, if a ship. See Parts 8 and 9 of the rules.	
Broadcasting[4] (standard)		KAAA thru KZZZ. WAAA thru WZZZ.
Broadcasting (FM)	4 letters	KAAA thru KZZZ. WAAA thru WZZZ.
Broadcasting (FM) (where the last 2 letters are FM)	5 letters[5]	KAA-FM thru KZZ-FM. WAA-FM thru WZZ-FM.
Do	6 letters	KAAA-FM thru KZZZ-FM. WAAA-FM thru WZZZ-FM.
Broadcasting (television)	4 letters	KAAA thru KZZZ. WAAA thru WZZZ.
Broadcasting (television) (where the last 2 letters are TV)	5 letters[5]	KAA-TV thru KZZ-TV. WAA-TV thru WZZ-TV
Do	6 letters	KAAA-TV thru KZZZ-TV WAAA-TV thru WZZZ-TV
Experimental (where the letter "X" follows the digit)	(2 letters, 1 digit, 3 letters)	KA2XAA thru KZ9XZZ. WA2XAA thru WZ9XZZ.
Amateur (letter X may not follow digit)	(1 letter, 1 digit, 2 letters)	K1AA thru KØZZ. W1AA thru WØZZ.
Do	(1 letter, 1 digit, 3 letters)	K1AAA thru KØZZZ. W1AAA thru WØZZZ.
Do	(2 letters, 1 digit, 2 letters)	KA1AA thru KZØZZ. WA1AA thru WZØZZ.
Do	(2 letters, 1 digit, 3 letters)	KA1AAA thru KZØZZZ. WA1AAA thru WZØZZZ.
Standard frequency		WWV.

[1]Except for coastal telephone stations in the Territory of Alaska.

[2]Assignment shall be made according to the call sign district in which the station is located.

[3]See Part 8 of the Commission's rules for assignment of call signs to ships documented by the Customs Bureau of the Treasury Department and provided with distinguishing signals for visual and aural signaling.

[4]Any three letter call sign now authorized for use by a licensee of a standard broadcast station may continue to be available to such licensee for use by the station to which it now is authorized.

[5]Available only to licensees of Standard broadcast stations already assigned a three-letter call sign.

§2.303 Table of geographic assignment of call signs. The following geographic allocation of call signs will be used for all fixed, land, and radionavigation land stations except coast stations (other than coastal telephone stations in Alaska.)

Call sign area	*Call sequence*[1,2]
Colorado, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota	KAA-KBZ WAA-WBZ
Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont	KCA-KDZ WCA-WDZ
New Jersey, New York	KEA-KFZ WEA-WFZ
Delaware, District of Columbia, Maryland, Pennsylvania	KGA-KHZ WGA-WHZ
Alabama, Georgia, Florida, Kentucky, North Carolina, South Carolina, Tennessee, Virginia	KIA-KJZ WIA-WJZ
Arkansas, Louisiana, Mississippi, New Mexico, Oklahoma, Texas	KKA-KLZ WKA-WLZ
California	KMA-KNZ WMA-WNZ
Arizona, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming	KOA-KPZ WOA-WPZ
Michigan, Ohio, West Virginia	KQA-KRZ WQA-WRZ
Illinois, Indiana, Wisconsin	KSA-KTZ WSA-WTZ
Pacific Areas	KUA-KVZ
Alaska	KWA-KZZ
Atlantic,Caribbean areas	WWA-WWZ

[1]Broadcasting station calls do not follow the sequence of this table.
[2]The first two letters of Experimental Station calls will follow the sequence of this table.

beginning with A, K, N and W. In practice A and N are used by the military, K and W by civilian services. With FCC station license authorizations running into boxcar figures, it requires a rather complex scheme to derive that many calls from only two prefixes. If you've done much exploring outside the amateur bands, you've perhaps wondered how the system works. The table reproduced herewith is from Part 2 of FCC's rules.

A considerable bloc of calls is in reserve for amateur use, as can be seen from the table. Note the greater differentiation, resulting from ACy, between former "amateur-type" call signs for experimental services; e.g., old W1XR of the Mount Washington Observatory is now KC2XBQ, KC indicates the geographical area (New England), and the X bloc is used for experimental stations. Why the numeral 2? Because ACy prohibits, except for amateur calls, use of the numerals 1 or Ø adjacent to letters; thus, KC1XBQ might be erroneously written KCLXBQ or KCIXBQ. As can be seen from the table, the prefix now indicates the geographical area; incidentally, the boundaries are identical with those worked out between FCC and ARRL for amateur call areas in 1945.

A.R.R.L. COMMENTS ON DISASTER SERVICE PROPOSALS

Early in September the League filed its comments on the proposed rules for a new Disaster Communications Service operating in 1750-1800 kc. The text follows:

FEDERAL COMMUNICATIONS COMMISSION

IN THE MATTER OF

ESTABLISHMENT OF PART 20 OF THE COMMISSION'S RULES—RULES GOVERNING THE DISASTER COMMUNICATIONS SERVICE } DOCKET NO. 9749

COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE

I.

Pursuant to paragraph 4 of the Notice of Proposed Rule Making in Docket No. 9749, released August 3, 1950, the American Radio Relay League files these comments.

II.

The American Radio Relay League urges the Commission to speed the docket toward final rule making in order that the traditional ability of the amateur radio service to provide disaster communications may be enhanced through liaison with other services engaged in disaster communications. To this end the League requests that the Commission enter its final order after consideration of and action upon the comments filed and to be filed. The League endorses the proposed rules, and particularly the overall concept of the service. The present comments deal with comparatively minor matters which can be acted upon without oral argument.

III.

As concerns proposed rule § 20.8(a), the League requests consideration by the Commission of establishing a fifth telephone (A-3) channel in lieu of seven of the proposed c.w. (A-1) channels. The present proposal for frequency assignments in the band 1750-1800 kc. provides 15 c.w. channels, one Scene-of-Disaster frequency, and four voice channels. It is the opinion of the League that licensees in the Disaster Communications Service, particularly those of other than amateur origin, will choose voice communication, primarily if not exclusively, as a result of their similarly using voice for communications on their own regularly-assigned frequencies. This, it seems to us, will dictate that amateur use also will have to be largely with A-3 emission in order to accomplish the purposes of liaison. Conversely, there will be comparatively little use of c.w. Therefore we perceive an excess of c.w. channels in comparison with expected use. Although realizing it means a reduction in the total number of available channels, the League believes that for the reasons stated above there is no alternative but to suggest that a fifth voice channel be added by deleting seven of the presently-proposed c.w. channels. The eight c.w. frequencies remaining, it is believed, will be sufficient to accommodate the amount of use by that mode of emission. The overall plan will, thereupon, be more realistically geared to the expected usage as we see it.

IV.

As concerns the general technical specifications for equipment, the League believes that proposed § 20.8(d) requires a degree of carrier stability beyond that consistent with the nature of the service to be performed. We are, of course, primarily concerned with its effect on amateur participation in the proposed service. In practice, § 20.8(d) means not only crystal control, but the use of a crystal ground to well within 90 cycles of the channel chosen, with resulting considerable cost. Since amateurs obtain their equipment with personal funds, the extent of amateur participation will be in some measure geared to the expenditure of money required for participation; the cost of the necessary carrier-frequency accuracy can therefore be a considerable factor in the extent of amateur participation. But more than that the League believes such stringency in tolerance is not necessary for the type of service to be performed, and that perfectly satisfactory communication can be conducted with somewhat wider limits. A tolerance of 250 cycles either side of the selected channel seems to the League to be a more realistic figure for the nature of the proposed service, and suggests this figure for the consideration of the Commission. In terms of percentage, we suggest the round figure of .015%.

V.

Without offering specific alternative proposals, the League wishes to note in passing that the provisions of § 20.8(b) seem similarly stringent in that they are obviously picked up *in toto* from present texts of regulations governing allied services operating on a non-emergency basis. The League questions whether or not the requirement of such standards is desirable in a service which will perform its useful functions in time of disaster when conditions may not lend themselves to complying with such standards. More important, here again we must point out that the extent of amateur participation in a second service, and thereby the overall effectiveness of the service, will be affected by the technical requirements to be met since they in some measure govern the amount of personal funds the amateur will have to expend.

VI.

The League's final comment concerns the Supplementary Notice in the Docket, released August 24, 1950, proposing the use of a standard application form. While in accord with the principle, the League is concerned about the complications which may result from the need of an amateur to file such information as geographical location in terms of minutes of latitude and longitude, and such information as specified if he resides within three miles of an aircraft landing area. The League appreciates the necessity, for example, of the Commission's ascertaining that no hazard to operation of aircraft is involved in a proposed *new* station application, but is of the opinion that a presently-licensed station in the amateur service can be deemed to have qualified in these respects, when the application is for the same location, by virtue of the existence of the license which the Commission has already issued. It is our suggestion, therefore, that such information be required only of "new" applicants — that is, applicants who do not already possess a license in some other service from the Commission, or those presently-licensed applicants who propose to construct a complete new station and antenna at a new location for the Disaster Communications Service.

AMERICAN RADIO RELAY LEAGUE

By: PAUL M. SEGAL, *General Counsel*

ARTHUR L. BUDLONG, *Secretary*

September 11, 1950

Simplified Approach to Rotary-Beam Construction

A Neat 10-Meter Wide-Spaced Array

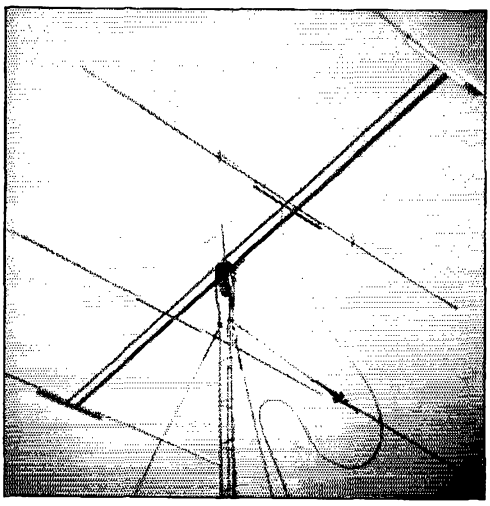
BY EMMETT P. BONNER,* W5RCA/4

MANY fine articles have appeared on rotary-beam construction, to the benefit of amateurs all over the world. However, some of the better beams we would like to build frequently entail extensive welding, burning and cutting of metal, and considerable machine-shop work. We believe the approach to rotary-beam construction presented here, while not entirely original, nevertheless represents about the limit of sound construction with an absolute minimum of operations requiring other than hand tools.

Another feature of this beam is that it can easily be moved. This one was transported from Charleston, S. C., to El Paso, Tex., last year, and back to Washington, D. C., this fall. The mast, a "store-bought" guyed affair, comes down into 10-foot lengths and stows in a moving van as easily as a living-room rug.

The beam as currently operated employs four elements with wide (0.2-wavelength) spacing on ten meters with a "T" match. It could easily be changed over to a four-element 0.1-wavelength spaced array on 20 meters merely by substituting longer elements; it is fully rugged enough for this and has, in fact, been so operated.

* Cmdr., USN; 700 E. Broad St., Falls Church, Va.



The ten-meter beam in place at the top of the tower.

Construction of the Boom

The boom consists essentially of two pieces of aluminum angle stock ($1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{16}$-inch) each 20 feet long. The total weight of the boom (less elements) is just under 25 lbs., so that it is quite practicable for one man to haul it up the mast outside of the guys.

Four element supports, each 3 feet long, are first bolted symmetrically to the two long members of the boom (Fig. 1), which are placed $6\frac{1}{4}$ inches apart, outside surface to outside surface.

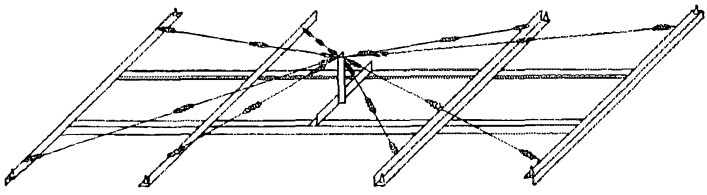


Fig. 1 — Sketch showing the method of constructing the boom and supports for the insulated elements. Rigidity is added by the guy wires which should be broken with insulators.

An additional short crosspiece is bolted across the boom at the center, and a 2-foot length of angle stock is bolted vertically from it. The boom is practically complete now, and all we have used is a hack saw, drill, screwdriver, and wrench.

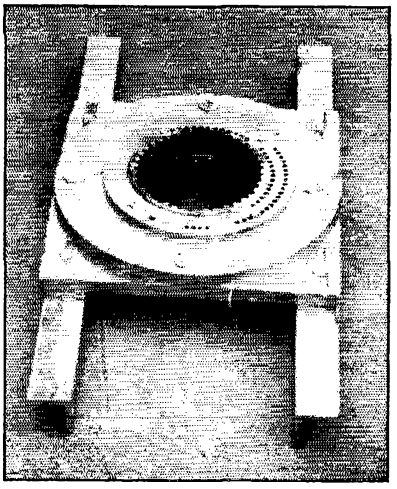
Guy wires, broken with insulators and provided with turnbuckles, are now run from the top of the center vertical member to points near the ends of all four element supports.

Aluminum angle stock is particularly easy stuff on which to mount the stand-off insulators, since it is readily drilled and does not require long bolts to reach through it to the insulators.

"T" Match

This arrangement requires that the matching section be mounted above the driven element. This is easily accomplished by the use of special brackets readily made from $\frac{3}{4} \times \frac{3}{4} \times 1\frac{1}{8}$-inch aluminum angle stock. The method of notching these brackets with a hack saw is obvious from Fig. 2. The cuts need not be precisely made, nor is it necessary to file them smooth, since a tighter fit will probably result from leaving the edges rough. A single bolt and wing nut for each side will clamp the "T" section to the driven element with a death grip, yet it will permit easy adjustment of the clamps for minimum s.w.r. The beam tilts to facilitate this adjustment.

The center portion of the "T" section must, of course, be insulated. We could not find any insulating material of sufficient diameter to tele-



scope snugly into the 1¼-inch tubing being used, so instead we cut a narrow rectangular piece of polystyrene and "sewed" it onto each half of the matching section (Fig. 2) with No. 12 wire. This seems to be preferable to long bolts, since it allows for minor errors in drilling the holes, and is not so prone to crack or split the polystyrene. (Also, we didn't have bolts long enough, and were in a hurry to get the beam up.)

Two small brass machine screws were first inserted through the opposite side of both halves of the "T" section, right at the inner ends, for use as binding posts for the feeders.

Rotating Mechanism

We got an assist from a local shop in brazing three short lengths of pipe and a ring on top of the upper section of our tower as indicated in Fig. 3. This is the only item requiring the use of other than ordinary hand tools.

This arrangement is about as simple as one can imagine. The prop-pitch motor (B-29 type) sits comfortably in the ring of the adapter at the top of the tower, securely held by four bolts, as shown in Fig. 3. Fortunately, there are four bolt holes already drilled in the housing of the prop-pitch motor to permit this. The thrust-bearing plate of the prop-pitch motor has been removed and is not

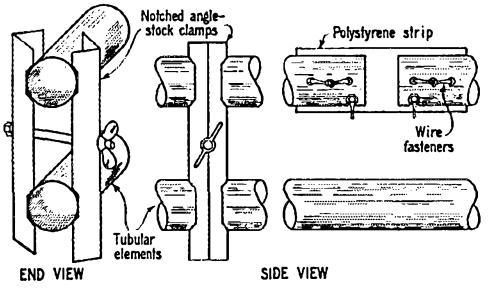
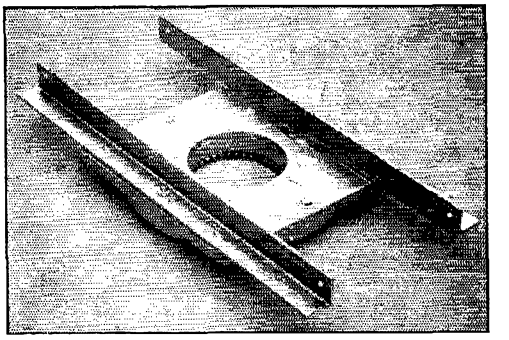


Fig. 2 — Detail sketch showing the manner in which the "T" matching section is clamped to the antenna element. The side view also shows the polystyrene-strip insulator at the center of the "T" section.



Top (*left*) and bottom (*right*) views of the rotating-head assembly. Details are shown in the sketch of Fig. 4.

used. This saves some aloft weight, since the remaining flange on the gear-reduction housing serves as an admirable thrust and bearing surface. A neoprene oil seal still remains in place around the splined gear, and has proven its ability to keep out Virginia snow and ice, South Carolina ocean-salt spray, and West Texas windborne dust and dirt. The short length of splined shaft protruding above the level of the flange may cause a raised eyebrow at this point, but let me hasten to say that this system, using the tilting assembly described below, has successfully supported and rotated a stacked 10-and-20-meter array through severe windstorms.

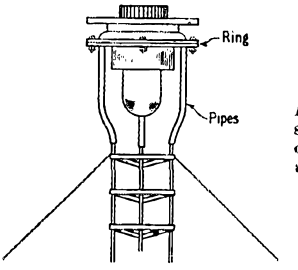
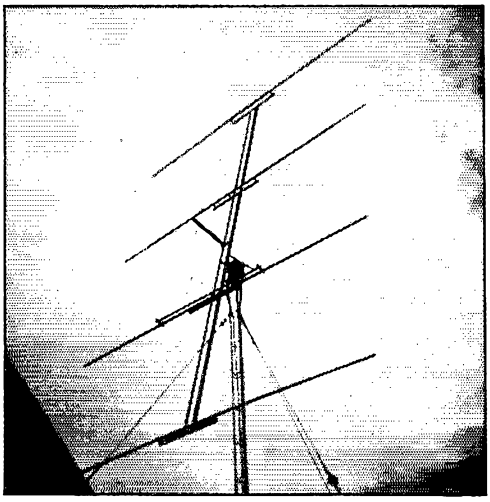


Fig. 3 — Drawing showing the mounting of the prop-pitch motor at the top of the tower.

It is possible to remove the motor proper from the gear housing without taking the beam down, should it be necessary, as in the case where brushes need repairing or by-passing. The motor itself unbolts from the bottom of the gear housing with the latter remaining in the top of the tower.

Tilting Assembly

This assembly is made of plywood (for ease of working) and two lengths of angle iron. Metal plates could be used, but this involves shop work which is not necessary. A disk and rectangle of plywood are sawed out as shown in Fig. 4. They should have a combined thickness equal to, or greater than, the distance that the splined shaft of the prop-pitch motor extends beyond the flange. The purpose of the disk is to provide a means for belt drive to operate a direction-indicating system. The small thin annular splined gear from the electrical stops of the motor goes in the same groove below the flange that it originally



Adjustments can be made easily by tilting either end in toward the tower.

occupied. Its sole function now is to transmit torque from the splined shaft to the rest of the tilting assembly. The two large holes in the plywood pieces should be just large enough to slide down over the splined gear with a snug fit. The entire tilting assembly is bolted together, using washers where the bolts terminate in the plywood. Painted with aluminum paint, this assembly has lasted two years without any deterioration. The iron angles should be spaced to make a comfortable fit outside the boom rails.

All that remains is to sit the boom in the tilting assembly and carefully drill four holes so that the two can be bolted together. To tilt the beam in a given direction, the two bolts at the opposite end are removed. Care must be taken, therefore, that the two holes at each end line up exactly. The completed beam is light enough for one man to haul to the top of the tower, outside of the guy wires, and bolt to the tilting assembly.

As a matter of possible interest, we decided on a 465-ohm open wire line (No. 12 wire spaced 2 inches) feeding into a quarter-wave matching section of 300-ohm kilowatt tubular line. The primary purpose of the matching section is merely to permit rotation of the beam with a minimum

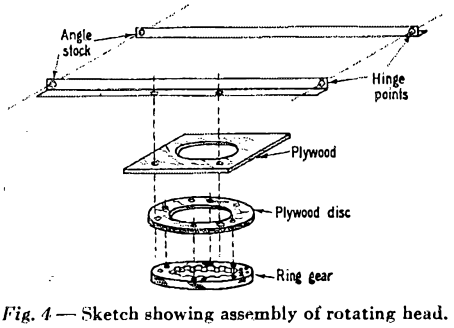


Fig. 4 — Sketch showing assembly of rotating head.

of constructional difficulties, while retaining the low-loss feature of the open-wire line.

The extra trouble of providing wide spacing has been justified in practice by being able to dispense with the tedious process of tuning the individual elements, by the increased gain resulting from wide spacing, and by the ease with which the beam works over the entire band.

A.R.R.L. QSL BUREAU

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

W and VE stations should not send cards for other W and VE stations through the QSL Bureau; they cannot be accepted. Likewise, cards for foreign stations should be sent only through the foreign bureaus. For a list of these overseas QSL bureaus, see page 49, June, 1950, *QST*.

W1, K1 — Frederick W. Reynolds, W1JNX, 112 Commonwealth Ave., Dedham, Mass.

W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.

W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.

W4, K4 — Johnny Dortch, W4DDF, 1611 East Cahal Ave., Nashville, Tenn.

W5, K5 — L. W. May, jr., W5AJG, 9428 Hobart St., Dallas 18, Texas

W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.

W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.

W8, K8 — William B. Davis, W8JNF, 4228 W. 217th St., Cleveland 16, Ohio

W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.

WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.

VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.

VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.

VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.

VE7 — H. R. Hough, VE7HR, 1785 Emerson St., Victoria, B. C.

VE8 — W. R. Williamson, VE8AK, Box 534, Whitehorse, Y. T.

KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.

KZ5 — C.Z.A.R.A., Box 407, Balboa, Canal Zone

KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.

KL7 — Box 73, Douglas, Alaska

United States Naval Reserve

ANY MEMBER of the Naval Reserve or Marine Corps Reserve who is a licensed radio amateur, and any amateur in the Regular Navy or Marine Corps, may be authorized to participate in Naval Reserve radio drills from his personal station. Application should be made to the Commandant (District Reserve Electronics Program Officer) of the naval district in which you reside. A Naval Reserve Radio Station certificate is issued and Navy call sign and frequency assigned. A crystal for the designated frequency is furnished upon request. Not only does appointment as a Naval Reserve Radio Station permit the amateur to receive training in his own home, but his station becomes a part of the overall Naval Reserve Communication System, permitting him to tie in with similar stations for service during emergencies.

Amateurs in the categories mentioned above may be authorized to drill with regular networks composed of radio stations of Naval Reserve training centers, electronics companies, and electronics platoons. However, because of the number of stations involved, separate amateur-Reservist networks normally are operated. At last reports, amateur-Reservist drills were being held as follows (all schedules subject to change):

First Naval District (HQ, 495 Summer St., Boston 10, Mass.): Sunday, 10:00–11:00 A.M. EST; Tuesday, 9:00–10:00 P.M. EST.

Third Naval District (HQ, 90 Church St., New York 7, N. Y.): Sunday, 9:30–11:30 A.M. EST; Thursday, 7:00–7:55 P.M. EST.

Fourth Naval District (HQ, Naval Base, Philadelphia 12, Penna.): Friday, 7:30 P.M. EST.

Fifth Naval District (HQ, Naval Base, Norfolk 11, Va.): Sunday, 8:00 A.M. EST.

Sixth Naval District (HQ, Bldg. 4, Naval Base Charleston, Naval Base, S. C.): Sunday afternoon, Wednesday evening.

Eighth Naval District (HQ, New Federal Bldg., New Orleans 12, La.): Sunday, 8:00–9:00 A.M. CST.

Ninth Naval District (HQ, Naval Training Center, Great Lakes, Ill.): Friday, 7:00 P.M. CST.

Eleventh Naval District (HQ, 1027 W. Broadway, San Diego 30, Calif.): Monday, 6:15–7:45 P.M. PST.

Twelfth Naval District (HQ, Federal Office Bldg., San Francisco 2, Calif.): Monday, 6:30–8:30 P.M. PST.

Thirteenth Naval District (HQ, 1611 West Wheeler St., Seattle 99, Wash.): Friday, 7:00–9:00 P.M. PST.

Potomac River Naval Command (HQ, Naval Gun Factory, Washington 25, D. C.): Monday, 8:00 P.M. EST.

If you have a commercial or amateur license, your local Naval Reserve electronics unit is authorized to advance you in rating as indicated in the table below:

License Held	*Rate in Which Initially Enlisted*	*Authorized Advancement to . . .*
Radiotelegraph Commercial:		
1st Class	Seaman	Radioman 2nd Class
2nd Class	Seaman	Radioman 2nd Class
3rd Class	Seaman	Radioman 3rd Class
Radio Amateur:		
Class A or B	Seaman	Radioman 3rd Class
Class C	Seaman Apprentice	Seaman

—···—

Capt. R. R. Hay, USN, has reported to the Office of the Chief of Naval Operations (Division of Naval Communications) for duty as Head of the Naval Reserve Communication Liaison Section. Capt. Hay is ex-W1JC and ex-W3ADO. He hopes to be back on the amateur bands soon.

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Here and There: Nineteen Naval Reserve activities in the Eighth Naval District report a total of 62 radio amateurs enlisted during the year 1949. In addition, 26 Reservists associated with sixteen activities obtained their ham tickets during the year. . . . There are six amateurs in the Office of the Director of Training, Fifth Naval District: W4KQD, W4LCW, W4ODA, W4PAS, W4RMQ, and W8KOX. . . . Installation of equipment at Naval Reserve Electronics Platoon 4-6, City Hall, Bradford, Penna., is completed and this unit has joined the Fourth Naval District radio drill network. . . . Add examples of Naval Reserve-amateur radio coöperation: The Tri-City Radio Amateur Club, ARRL affiliate, has been using the facilities of the Naval Reserve Training Center (K9NRD), Moline, Ill., as regular meeting place since mid-1949. The groups work closely and effectively, particularly on ARRL Field

(*Continued on page 92*)

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Six YLs and three OMs join the Naval Reserve and enroll in Electronics Platoon 12-42, South San Francisco. *L. to r.:* Donald Johnson, ETC, USNR (W6QIE), Wendy Hale, Dorothy Rasmussen, Antonio Cappello, Dorothy Norton, Marijane Rodrigues, Ed Prather (W6GXF), Betty Chandler, C. O. Petersen, Marcella Hennager, and Cmdr. Charles I. Shields, USNR, 12th Naval District Reserve Electronics Program officer. Since becoming active in the Reserve, Wendy Hale has obtained a ham ticket, W6JGY, and Marcella Hennager and Dorothy Norton have taken the exam.

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

SEPTEMBER 6th to 9th seems destined to go down in v.h.f. history as one of the most remarkable periods of tropospheric bending on record. Conditions were close to ideal, with most of the country east of the Western Plains and north of the Gulf States under the influence of a slow-moving high-pressure area. As widely-separated points as Western New England and Eastern Iowa were linked by a 1026-mb. isobar, its shape elongated by a series of tropical hurricanes that were pumping warm moist air up from the Gulf.

The unprecedented tropospheric DX worked by W2BAV and others during this period followed the contours of this high closely. Bill had only to take his own prescription [1] to know that something hot was brewing. In addition to the scores of W8s, 9s and Øs worked by W2BAV between 10:20 P.M. on the 6th and 4:15 A.M. on the 7th, his signals were heard with good strength by W5HXK, Watonga, and W5CUH, Durham, Okla., 1270 and 1350 miles distant, respectively. WØDSR, Greenleaf, Kans., the best DX worked, about 1175 miles, was running only 12 watts input at the time. WØEMS, Adair, Iowa, nearly 1100 miles, was running low power and using a beam practically on the ground.

These facts serve to show that this latest extension of the tropospheric DX record is still well below the maximum distance that we can expect to work on 144 Mc. when conditions are right. It is labeled as the "tropospheric record" because the official two-way 144-Mc. record of 1200 miles, set last June by W5VY and W8WXV, was made under conditions that indicate the possibility that sporadic-*E* skip may have been involved. The Sept. 6th–9th period was, however, almost totally devoid of any sporadic-*E* phenomena, and nothing in the way of *E*s was observed in the v.h.f. range.

The session got under way too late in the evening for the greatest number of stations in the East to be active, but several who did stay with it found results well worth the loss of sleep. W2NLY, Oak Tree, N. J., worked W9s HKQ, De Motte, Ind., WOK, Bensenville, Ill., EQC, Aurora, Ill., W8RWW, Detroit, VE3AIB, Toronto, and W3LWN, Sigel, Penna. He heard WØs EMS, MNQ, ONQ, and DSR and W9NFK. WØEMS reported hearing W2NLY and W1HDQ, and W9HKQ and W9DXX also reported reception of W1HDQ. The best your conductor could do was several fine contacts with W8BFQ, who was the loudest W8 ever heard on 144 Mc., between 2 and 4 A.M. Our participation in the session resulted from the consideration of Bill McNatt, W9NFK, who called from Franklin Park, Ill., on the landline to alert the writer to the goings on at 1:40 A.M. We are also indebted to Bill for much of the information on what transpired at the western end of these openings. Read his *V.H.F. News* for complete coverage of the affair.

The following night the band was still hot. W2BAV found it still possible to work into W8 and W9, and Western New York W2s were working into W1 with ease. W1MNF, East Orleans, Mass., worked W8SFG, Hubbard, Ohio. W2OPQ, Glens Falls, N. Y., reports reception of WØTI, Millbank, S. Dak., around 9:45 P.M. EST. WØTI was working Wisconsin stations at the time, and was also heard calling W8BFQ. At this time W8BFQ was working WØHXY and WØJHS, the former her first Minnesota contact, for state No. 20 on 144 Mc. Beginning at 5 P.M., W9FPE, Willard, Wisc., was working as far east as W3QKI, W2RJH and VE3TN, with strong DX signals still coming in after midnight.

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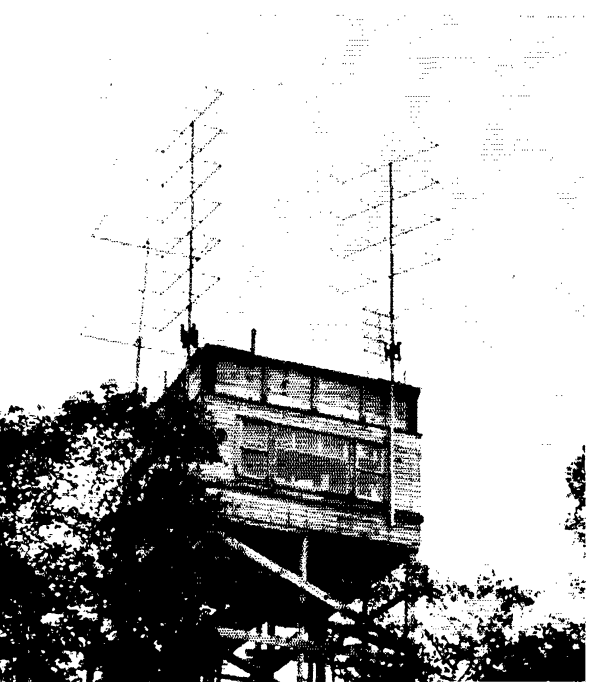


This picture hardly needs a caption. Where else but Red Hill, Claryville, N. Y., would you find a 64-foot tower with an 8-element 50-Mc. array, a 48-element horizontal for 144 Mc., and 32-element verticals for 144 and 420 Mc.? There are no long feedlines at W2BAV — the operating position is directly under the 32-element array at the right.

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

[1] "Painless Prediction of 2-Meter Band Openings," Hoisington, Oct., 1949, *QST*, p. 22.

On Friday night, the 8th, tropospheric conditions were excellent along the Atlantic Seaboard. W3OJU, Washington, D. C., was putting a solid signal into W1 on 50 Mc., and hearing W1CLS, Waltham, Mass., about 400 miles. This is about the known limit of tropospheric DX on 50 Mc. W1–W4 contacts were made easily on 144 Mc., with strong signals up to 500 miles or more. It was still going on the night of the 9th, with VE1QY, Yarmouth, Nova Scotia, putting a fine 2-meter signal down into W2 and 3, until heavy rain washed out the long-standing inversion around midnight.

The events of the 6th and 7th are unique in several ways. First, of course, the distances involved are up to 30 per cent greater than have been previously credited to tropospheric bending in amateur 2-way work. Then, it was observed that a number of operators near the midpoint were missing the signals W2BAV was working, or receiving them weaker than the same stations have been heard before. W8WRN, Columbus, Ohio, says that WØDSR was no better than S4, and that WØEMS was S5–6, in comparison to the S9-plus that he was heard last year. W8WJC, Everett, Ohio, whose location and equipment guarantee that if they can be heard or worked he will make it, says that W2BAV worked some stations that were inaudible at Everett. Jerry wonders if this may have resulted from an elevated duct.

The big excitement of the tropospheric sessions overshadowed the aurora openings of the month, but at least two appeared on schedule. On Sept. 3rd, there was a mild session in the late afternoon in the East, with things showing up better in the Middle West. As early as 11:50 A.M. CST, WØZJB, Gashland, Mo., was hearing 2-meter aurora signals, with W3QKI, Erie, Penna., the most distant. Contact was made at 1 P.M. for the best DX reported for that date, nearly 800 miles. A number of W1s, 2s, 3s and 4s were active during the late afternoon, but the signal strengths and the DX were not equal to the August sessions. Some aurora was observed on the 17th, with VY6R, Ottawa, coming in weakly during the early evening to alert 50-Mc. W1s. VE3AET worked W1ZE and W1HDQ on 50 Mc., but no 2-meter signals could be found by the latter.

September V.H.F. Party Highlights

"Best yet from the standpoint of activity and band conditions in this part of the country. Plenty of stations in the St. Louis area on 144 Mc., several of them new to the band." — *WØIHD, Overland, Mo.*

"For once, a 2-meter opening during a v.h.f. contest. Worked Illinois, Kentucky, Missouri, Texas, Ohio, Mississippi and Tennessee on 144 Mc. First Mississippi–Tennessee two-way (with W5NYH) on 220 Mc. Rotator failed just before the party, so had to climb up and down 60-foot tower every time beams had to be rotated! I'm exhausted — but it was the best yet!" — *W4HHK, Collierville, Tenn.*

"New home-station two-way record for 144 Mc. Northern and Southern California stations linked for first time!" — *W6MVK, Los Angeles.*

"Had hoped to give the East a run for its money, but conditions reeked from the beginning to late Sunday. Aurora on 2 and 6, but managed to snag only W1CGY on 50 Mc. as band was passing out. Worked 50, 144, 220, 420 and 2400 Mc." *W8BFQ, Everett, Ohio.* (Margaret's score of 2088 points and 88 contacts is the highest yet received. She *did* give the East a mark to beat! — *W1HDQ*)

"Tropospheric bending in reverse — all signals going straight up. Almost like the line-of-sight days!" — *Anyone in W1 or W2*

With reports on the September V.H.F. Party just beginning to pile up as we write it is, of course, not possible to give any conclusive report on results, but these excerpts from some of the letters that accompanied contest scores show that one man's meat is another's poison. Conditions along the Atlantic Seaboard were at an all-time low, but other sections fared better. And the East had two short breaks, in the form of mild aurora around 5 P.M. EST both days. Hogback Mountain, Marlboro, Vt., Blue Job in Farmington, N. H., a hilltop in North Caldwell, N. J., a 1500-foot elevation near Attica, N. Y., and Mt. Pinos, near Bakersfield, Calif., were the scenes of some outstanding portable work by W1CTW/1, W1KEX/1, W2IQQ/2, W2ZHB/2, and W6MVK/6 respectively. W1CTW, W2UAD-W2ZHB, and W2BAV reported the season's first snowflurries at their mountain hangouts, as the East shivered in the grip of record low temperatures for September. Complete details and scores next month.

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

Guayaquil, Ecuador — What is probably the first contact between South America and a U. S. station during the fall season was made on Sept. 16th at 4:53 P.M. EST by HC2OT

2-Meter Standings

Call	States	Areas	Miles	Call	States	Areas	Miles
W1HDQ	15	6	650	W5ML	8	3	560
W1PIV	13	5	550	W5VY	7	3	1200
W1IZY	13	5	570	W5AJG	7	2	450
W1MNF	13	5	570	W5IRP	6	2	410
W1BCN	12	4	500	W5FSC	4	2	500
W1CTW	12	4	500				
W1REZ	11	4	—	W6ZEM/6	1	1	415
W1JSM	10	4	—	W6DLR	1	1	190
W1GJO	10	3	—				
				W8WJC	20	7	775
W2BAV	19	7	1175	W8BFQ	20	7	775
W2NLY	18	6	750	W8WXV	18	8	1200
W2PAU	15	6	740	W8UKS	18	7	720
W2DFV	13	5	350	W8WRN	16	6	670
W2CET	12	5	405	W8RWW	14	7	500
W2DPB	12	5	500	W8WSE	14	6	620
W2WLS	12	4	—	W8CYE	12	6	—
W2QNZ	11	5	—	W8CPA	12	—	650
W2NPJ	11	5	500	W8FQK	11	7	—
W2FHJ	11	4	—				
W2PJA	10	4	—	W9UCH	17	7	650
W2BVU	10	3	250	W9FVJ	15	6	660
				W9JMS	13	6	600
W3RUE	16	7	760	W9FPE	11	5	800
W3LNA	13	7	720	W9GLY	10	5	525
W3KBA	13	6	—	W9PK	10	5	—
W3OWW	13	6	600	W9UIA	9	6	540
W3GKP	13	6	610	W9NFK	8	4	410
W3KWL	13	6	480	W9OBW	8	4	—
W3KUX	12	5	575				
W3PGV	12	5	—	WØNFM	14	7	660
W3NKM	12	5	—	WØEMS	13	5	1080
W3LMC	11	4	400	WØZJB	12	7	1097
				WØIHD	12	5	725
W4HHK	14	5	650	WØWGZ	11	5	760
W4JFU	13	5	650				
W4IKZ	13	5	500	VE3AIB	10	6	600
W4CLY	12	5	720	VE1QY	10	4	720
W4FJ	12	5	450	VE3BPB	6	4	—
W4MKJ	11	5	650	VE3BQN	5	4	540
W4FBJ	11	5	—	VE3EAH	4	4	380
W4JDN	11	5	—				
W4OXC	10	5	500				
W4JFV	9	5	830				
W5JTI	14	5	670				
W5ERD	8	3	570				

and W5FSC, Houston, Texas. The first 50-Mc. DX heard this fall by HC2OT came on the 14th, when Steve worked LU9EV and LU6DO, beginning at 8:40 P.M. EST. During the opening to the north on the 16th, HC2OT also worked XE1GE, Mexico City, with S9-plus signals, the strongest ever heard from XE1. W5FSC reports HC2OT as the only signal heard, fading out during his contact with Mexico City.

HC2OT reports his impression that 50 Mc. was open on Aug. 19th, though no amateur signals were heard. With the first northern opening coming just 28 days later, the probable dates for South American work on 50 Mc. are pretty well established. If conditions follow last year's pattern, there should be two periods each month, one early in the month and another around the middle. Watch W1AW for latest propagation information, and concentrate on South America during and shortly after the periods when ionospheric disturbances are predicted.

Caracas, Venezuela — The 50-Mc. DX season started for YV5AC on the 14th also. Jerry had been on the job steadily through July and August, but no signals had been heard on 50 Mc. other than a few weak unidentified ones believed to have been commercial harmonics. Beginning the 14th the band was open to the south in much the same manner as in previous seasons, LUs coming through well during the early evening hours. Contacts also were made with PY3EO, though the latter was having trouble reading YV5AC, bringing up again the possibility of one-way propagation, previously observed in Caracas. Jerry reports several YVs working on 50 Mc. regularly, with YV1AU at Maracaibo, who is not hampered by mountains to the north, as the prime candidate for the first W–YV 50-Mc. contact.

Los Angeles, Calif. — The California Coast has long been recognized as a natural set-up for tropospheric bending. Years ago v.h.f. enthusiasts discovered the almost continuous inversion that exists there during the summer months, and contacts were made between Los Angeles and San Diego with battery-powered pack sets on 112 Mc. in prewar years. One of the earliest 2½-meter records was made over the Santa Barbara to San Diego route.

But the California Coast is not like the Atlantic Seaboard. Above Santa Barbara it curves in the wrong direction, and mountains that dwarf any in the East make a seemingly impassable barrier between Northern and Southern California. But perhaps lack of coördination between the areas concerned might have something to do with the inability of northern and southern W6s to get together on 144 Mc., so W6MVK and W6ZUX decided to do something about it.

An expedition to Mt. Pinos, 40 miles south of Bakersfield, was planned for the V.H.F. Contest. Mt. Pinos is within working range of stations at the northern end of the San Joaquin Valley, as well as those in the Los Angeles area. The expedition would attempt to work DX on its own hook, of course, but the primary purpose was to promote some fixed-station work between Northern and Southern stations. This effort paid off when W6MVK/6 arranged tests between W6GGM, Santa Cruz, 60 miles south of San Francisco, and W6YYG, Redondo Beach, resulting in the first 144-Mc. work over this 300-mile path. The same methods brought about a contact between W6VLS, Fresno, and W6NLZ and W6EJL, the first 2-meter work from Fresno to L. A.

The distances involved are not remarkable figures in miles, but considering the nature of the terrain involved they are certainly front-page news. Another 300-mile contact was missed when W6BCL, Ripon, heard but was not able to work W6NLZ and W6EJL, in Los Angeles and Manhattan Beach.

East Longmeadow, Mass. — Continuing the nightly schedule with W3OJU, Washington, D. C., some 325 miles to the southwest, W1CGY reports that contacts were made on 17 of 28 nights up to Sept. 9th. Of these, nine were good enough for reasonably satisfactory communication on c.w., two of them solid on voice. At least four other nights some sign of W3OJU was heard, but no communication established because of fragmentary reception. Whenever possible, W1HDQ has joined in, and there have been few nights when it has been impossible to hear W3OJU at our location, 25 miles nearer Washington.

This sort of thing can be a very interesting endeavor, and one from which more good can develop than would be first apparent. A regular schedule gives at least two operators the incentive actually to get on the air, instead of just turning on the receiver for a check on conditions. It is surprising how far we can work, even under the worst conditions, if we will just try regularly, and have someone else at a distant point doing likewise. Since May 25th W3FZQ, Glenside, Penna., has maintained a 10 P.M. sked with W1HDQ on 50 Mc. We've not been on every night, of course, but we have yet to record a failure because of conditions on this 175-mile hop. There are times when c.w. is needed, but a high percentage of the contacts are solid on voice, with signals peaking up to S9 or better some nights. Never has there been appreciable difficulty in exchanging information on a 100-per cent basis, in more than 40 tries.

Ashland, Ohio — W8NQD is another who feels that many fellows are passing up a good bet in overlooking the consistent ground-wave range on 50 Mc. Tom has been working regularly with W8CMS at Newton Falls for more than two years. The score now stands at nearly 700 successful contacts over this 75-mile path. W8UZ at Columbus, 90 miles distant, is also worked regularly, and W3BGT, 125 miles away in Pittsburgh, is consistent at Ashland. In addition to the W8NQD sked, W8UZ is setting up regular skeds with W4RBK, W8CMS and others.

If you are experiencing a letdown in activity on 6 or 2, try arranging a regular schedule or two with stations near the limit of your working range. Let others know about the sked, and keep contacts relatively short, or check the band at intervals to see who else is around. You may be pleasantly surprised to find more fellows using the band than you thought there would be in the off season.

(*Continued on page 92*)

50 WAS Mc.

Standings as of September 25th

WØZJB	48	W5VY	47	W9HGE	47
WØBJV	48	W5JTI	44	W9PK	47
WØCJS	48	W5ML	44	W9VZP	47
W5AJG	48	W5JLY	43	W9ALU	46
W9ZHL	48	W5ONS	43	W9NJT	46
W9ZHB	48	W5JME	43	W9QKM	46
W9QUV	48	W5VV	42	W9JMS	45
W6WNN	48	W5FAL	41	W9RQM	45
W6OB	48	W5NHD	41	W9UIA	45
		W5GNQ	41	W9UNS	42
W1CLS	46	W5FSC	41		
W1HDQ	46	W5HLD	40	WØQIN	47
W1CGY	44	W5HEZ	35	WØDZM	47
W1LLL	44			WØNFM	47
W1KHL	43	W6UXN	47	WØINI	47
W1HMS	43	W6IWS	41	WØTKX	47
W1LSN	41	W6OVK	40	WØKYF	44
W1EIO	40	W6TMI	40	WØJOL	44
				WØJHS	43
W2RLV	45	W7HEA	47	WØPKD	43
W2BYM	44	W7ERA	47	WØHVW	42
W2AMJ	41	W7BQX	45	WØIPI	41
W2MEU	41	W7DYD	45		
W2IDZ	40	W7JRG	42	VE3ANY	42
W2GYV	40	W7BOC	40	VE1QZ	32
W2QVH	38	W7JPA	40	VE1QY	31
W2FHJ	37	W7FIV	40	VE3AET	29
		W7CAM	40	HC2OT	26
W3OJU	45	W7KFM	40	XE1GE	19
W3NKM	39	W7ACD	35		
W3JVI	38			Calls in **bold-face** are holders of special 50-Mc. WAS certificates, listed in order of award numbers. Others are based on unverified reports.	
		W8QYD	45		
W4FBH	46	W8NQD	42		
W4EQM	44	W8YLS	41		
W4QN	42	W8CMS	41		
W4FWH	42	W8LBH	37		
W4CPZ	39	W8RFW	37		
W4OXC	39	W8UZ	37		
W4MS	38	W8WSE	36		
W4BEN	35				

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

"GADS — what are you doing on 'phone?!"

As executive vice-president in charge of the Observation of Trends, Jeeves begs to submit a report revealing that a good many strictly-c.w. DX men have been heard of late tripping the light oral fantastic on 10- and 20-meter 'phone.

Once upon a time the assumption held true that any country one might raise on A3 could be worked more expeditiously on c.w. Faith took a nosedive so far as this belief was concerned upon the appearance of 'phone-only or 'phone-mostly gents like AR8AB, VR3C, CR5UP and several rare ZSs. The outcome was necessarily much semi-surreptitious hello-one-two-three-four-ing as the pump-handle boys screwed up their courage one by one to tackle an unfamiliar medium. With which, we might add, they are doing quite well.

Countries get pretty difficult to scrape up when you're over the 200 mark (we hear) and many of the group thus dusting off dormant Class As are switching to some 'phone to soup up their interest after long hours of fifth-layer inspection à la b.f.o. With the law of diminishing returns still on the books the dividends grow few and far between.

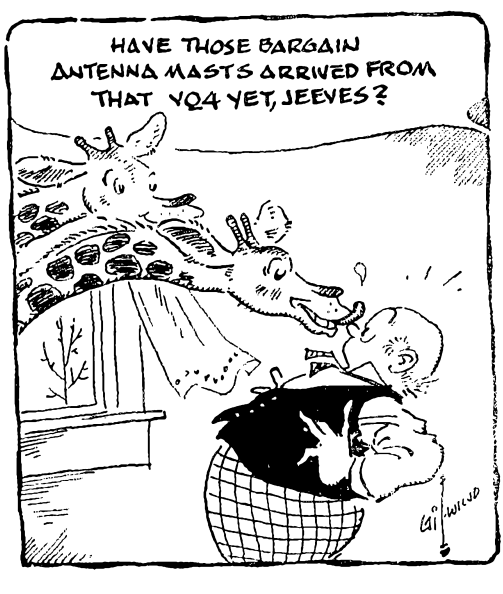
Yet not only are they knocking off nice DX in this manner but they're really giving the book a going-over in rigging up systems to modulate long-standing dot-and-dash installations.

As one veteran W6 c.w. hound puts it, "Shucks, getting out on 'phone isn't so tough. The rub lies in trying to keep from sounding as if you're enjoying it!"

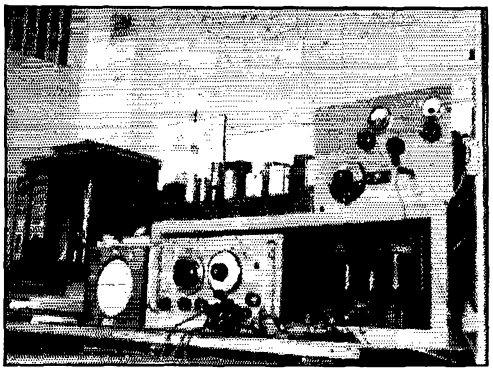
Gangway, 'phone DXCCs. . . .

What:

One of the men of the hour on *twenty* has been FQ8AC (14,010-120) as bagged by K2BU, W9ABA, and others. On April Fool's Day this year K2BU decided to crack the DX racket and hasn't done badly at all; 90 countries with 812As, a folded dipole, and a fixed-for-Asia 8JK array. New blood in the ranks keeps the old ball spinning . . . . In addition to the FQ8, W9ABA sampled **PKs** 1TC (14,095), 1TM (14,095), 4KS (14,085), SP1JF (14,045), FF8JC (14,025), **VSs** 6AC (14,050), 7NG (14,080), ZM6AK (14,080) and 9S4AR (14,005). A new HRO-50 and a VR1C confirmation raised Buzz's morale considerably . . . . Operating from a new QTH in the same state of Ohio, W8WWU would like info on HZ1CK. Bill's most recent: CS3AA, CR5AC, FY7YC, OY3IGO, ZB1AR, VP5BF (14,045) and 4X4CR . . . . W5JPC works plenty but says, "Good DX [conditions] about one day out of five." . . . . Out of town much of the time visiting DX men W2IOP, W5s ENE, GEL and KC, W5FXN yet found a chance to tuck away FO8AC (14,098), VR2BW (14,022), CR7AD (14,065), and ZD2LO (14,105). Jim has fresh cards from FP8AC, LX4CS, and YO3RF; VQ8AF (14,030) tops his stalk list . . . . These W8s are a shifty lot. W8SYC hung up a new twin-triplex in Covington, Ohio, after moving from Piqua and found himself one of the early birds in the FQ8AC reception. After two years Clint clutches a VP8AD card, plus veries from FF8MM and MD2GO. VQ4KRL and ZL1UU were in on the shackwarming shindig at W8SYC by long distance . . . . Hoping to get his wide-spaced rotary going before snow flies, W1EWF does okay with his 250THs feeding dipoles: PJ5RE (14,000), CR7CI (14,006 t8), KR6DB (14,070), VP1DR (14,005), ZK1AM (14,060 t7) . . . . W6ALQ captured PKs 1TC, 3ST, 6LN, VS2CQ, VQ2GW and YV4AX while W9ALI has broken down to join the revolving array society after some negative pile-up results with PKs 1AA and 5AA . . . . K2CC thinks time is a more stable reference than frequency these days and he may be right. Lloyd lists the following (EST) catches: HC1TM (2205), IS1BYC (1610), TI2PZ (2200), ZB1HI (1635), ZB2I (1525), OE8AN (1715), CT3AB (1635), VQ4BB (1520), FA8RJ (1625) and 4X4BX (1510) . . . . GI5UR told W2GVZ of a ducky number, one KØREA with a T6 gargle on 14,025 kc. W2GVZ has completely licked his TVI, by the way, and having made his peace with the world he is now buying one himself . . . . KS4AI may be frequently found from 1900 to 2000 (EST) on 14,100 kc. If you don't check KS4 off the want list soon it won't be Ralph's fault . . . . Aurora exasperates W4MR during his infrequent DX sessions but Al hooked goodies VR2BH, ZM6AK, UP2KBC, UAØFR, PK5AA, SP5ZPZ, VU2s GB and JP . . . . One W8 who stays put is W8YGR and we don't blame him. His Toledo QTH was good for HK4CF (14,075), OX3WJ (14,115), VP1AA (14,120), VP3TY (14,155), VP6PV (14,090), VQ4AO (14,140), OA4J (14,030), CT1PM (14,080) and KG4AT with the BC-459. Still no card from ET3AM, moans Jack . . . . MI3IM (14,050 t8), YK1AM (14,010), YN1AA (14,030), VK9MR (14,020 t8), VR5GC (14,050), FKS8AL (14,100), ZD2FAR (14,040), 4X4CL (14,100 t7), 9S4AX (14,005 t8), and LX4FS entered the log at W4BGO. Ben also caught Dutch weather ships PI1LC and PI1LS, both T8 on 14,100 kc. and located in the Channel . . . . Netherlands Timor's PK6VK (14,100) and ZD6JL (14,078) delighted W1BIH. The Nyasaland entry searches for Ws on Sundays around 0700 EST . . . . A 17-minute DX Test WAC made last February has been confirmed for W2AGO. That's really spinning the old squirter . . . . The So. Calif. DX Club's *Bulletin* mentions an LP2J on Jan Mayen (14,020) and VS4JB (14,060) as good bets . . . . W2TXB's 20-meter total stands at 213 countries and Al wonders if anyone can shade this one-



* DX Editor, *QST*. Please mail reports of DX activity to W9BRD's home QTH: 1517 Fargo Ave., Chicago 26, Ill.



One of the more popular of the new crop of EA8 stations is that of EA8LP at Las Palmas de Gran, Canary Islands. An 807 runs 50 watts and a long wire is the radiator. (*Photo courtesy A. Rugel*)

band tally. FQ8AC, CR5AC, **VS4YB** (14,100) and PK6VK were his latest newsies . . . . KP4KB reached 187 with ET9X, KC6WC, KR6CA, FP8AC, and MS4FM. Ev still awaits an Asian QSL for his 9-watt KP4K*B* WAC . . . . A personal visit from U. S.-citizen-to-be ex-G5WI may have hopped W6ZZ up for some more DXing. Miles has been one of the mainstays of the RCC since collecting his postwar DXCC in good time. Les Hill's QTH will be 49 Birch Street, Redwood City, Calif., and he'd undoubtedly like to hear from amateur buddies while there . . . . **ZK1AB** (14,028) puts in a fat 3-watt signal from Raratonga as reported by W4BGO.

Twenty-meter 'phone men may be chatting with Prince Abdullah of Saudi Arabia (HZ1AF) in the near future as HZ1KE tells W1JCX. The latter was OY3IGO's first W1 QSO using A3 . . . . W6AM finds **ZM6AK** (14,250) a task to pull through on voice but managed to score with him . . . . The aforementioned *Bulletin* specifies **FK8AB** (14,200), **CS3AA** (14,350), **SP5AB** (14,167), **KS6AA** (14,200), **KC6WC** (14,195), **ZD6JL** (14,340) and **VK1RB** (14,137) as 'phones currently interesting W6s . . . . XE1AC turns in a report of stuff worked which should raise the hopes of the 'phone gang: **FO8AB** (14,323), **ZM6AA** (14,309), **KB6AO** (14,259), **VK9MR** (14,299), **PK4DA** (14,330), **EA6AF** (14,361), **EA8AW** (14,314), **EA9AI** (14,310), **TA3GVU** (14,322), and **HI8WF** (14,199) plus many others.

On the lower frequencies, *eighty* opened early with good European and African signals reaching into WØ and W5. Gs 6GM, 8KG, GW3ZV and FA8BG were among the stronger heard and worked. W3QWX (ex-DL4AJ-W9KCI) was getting his share, including **PAØRZ** (3535) . . . . OY3IGO is scheduled to make a 3.5-Mc. appearance as soon as he procures necessary coils . . . . **PY7WS** was on during September, working KP4HU, W2PEO, W4BRB and others . . . . **W4BRB** reports the following as 3.5-Mc. prospects for this winter: **ZM6AK, VR2AS, ZS9D, ZS3K, DU1FC, PK4OO, FY7YA, PJ5RE, PZ1FM, PZ1WK,** and **ZB2I.** Gene has a new antenna to help him in rounding out his 80-meter DXCC — collinear half-waves about 70 feet high! . . . . W3LTW joined the fun on 80 and also caught a nice one in **ZE2JN** on *forty* (7016) . . . . W6ZZ found **VP7NN** (7160), **CE3AG** (7006), and **UAØFJ** (7020); and W6LVN was among those stalking **VP8AP** near 7020 kc. Jim also rang up ZD4AB . . . . EAs 4CR and 9BB were putting solid evening signals through on the low edge and **VP9ZZ** (7045 tf) gave many a new 7-Mc. country . . . . At W6GTC we find **LU3EL** (7020), **KR6CA** (7085), **FO8AG** (7070), **JA3AG** (7050) and numerous Oceania items . . . . Keeping up its reputation as an old reliable, the 7-Mc. band appeared to be the only consistent range for W use during the VK/ZL Test.

The first decent *ten* meter openings are now in progress but W2ZVS's 'phone rushed the season for ZD4AB, ZD1SW, ZE2KH, VQ4s ERR, SC, VL, EL6A, OQ5s AO, CG, ZLs 1FE and 4LS. Perhaps we'll even have some 28-Mc. c.w. patter next month, of all things, and how about some 27-Mc. reports?

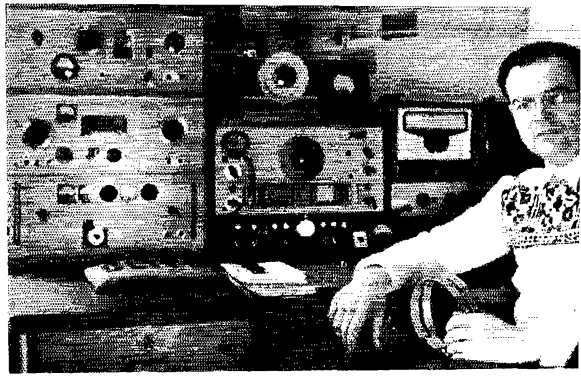
Where:

The trend in the QTH department appears inclined toward the status quo. W1DJV points out that all KG4-bound cards may be addressed to Box 35Q, Navy 115, % F. P. O., New York, N. Y. . . . . The new QSL bureau address for Argentina is: Radio Club Argentino, QSL Bureau, Avenida Libertador General San Martin 1850, Buenos Aires.

EA9BB	Carretera de Alfonso XIII, Chalet, Melilla, Spanish Morocco
FK8AH	Airport, Tontouta, New Caledonia
FKS8AL	(via REF)
FQ8AC	Box 175, Bangui, French Equatorial Africa
HC8GI	% Guayaquil Radio Club, Box 784, Guayaquil, Ecuador
HR2AD	Anthony Dabdouf, % Tropical Radio, La Lima, Honduras
I1AYX	Piero Scioli, Post Box 73, Stresa (Lake Maggiore), Italy
KP4MR	Box 885, Mayaguez, Puerto Rico
KV4AU	Albert W. Tamm, Bourne Field Housing, St. Thomas, Virgin Islands
LX4FS	Sgt. Guy L. Kane, DL4FS, B. Co., 7774 Sig. Bn., APO 403, % PM, New York, N. Y.
MB9BJ	(via RSGB)
OA4ED	Box 1138, Lima, Peru
OQ5FG	(via OQ5RA)
PK1TC	(via PARI)
PK1TM	J. Bakker, Djalan Ruysdael 4, Bandoeng, Java
PK6VK	Penfoei Airfield, Kupang, Netherlands Timor
SP1JF	(via PZK)
TI2TY	Box 2268, San Jose, Costa Rica
ex-VK1FE	A. R. Burton, VK4FE, Roseciff St., Highgate Hill, South Brisbane S. 1, Queensland, Australia
VP1DR	(via VP1AA)
VP1NW	(via VP1AA)
VP9ZZ	(via VP9D)
ex-VQ4NSH	N. Steven-Hubbard, John Jay Hall (1334), Columbia University, New York 27, N. Y.
ex-YK1AB	Saba N. Saba, Purdue University, Cary Hall, Box 790, W. Lafayette, Indiana
YK1AM	(via ARRL)
YN3CP	(via ARRL)
ZB1IH	Commander Geoffrey C. Turner, Malta
ex-ZC1AR/FN	John Berry, Cable & Wireless, Asmara, Eritrea
ex-ZE2KS	K. Ermann, ZS6ABC, P. O. Box 1642, Johannesburg, S. Africa
3A1B	(via DL4FS/LX4FS)

Among the finger men for the forerunning were W1s BIH DJV EWF IJT IKE JMY, W2s CJX QXB TXB ZVS, W3DKT, W4s BGO, PBK, W5s FXN JPC, W6s ALQ AM GTC LVN, W8s SYC WWU YGR, W9s ABA CFT KA, CN8EG, DL4FS, HC2JR, K2BU, KP4KD.

VP2GG has been the most active Windward Islands station on 28-Mc. 'phone for some time. Smitty enjoys favorable results with moderate power and is expanding his operation to include the v.h.f. bands.



Dr. A. J. Haberstein of Cuxhaven at the controls of his DXCC-member station, DL1YQ. When not prowling the DX bands with this efficient set-up, Doc performs professionally as a dental surgeon.

♦

Tidbits:

DL4s HA and LL have been nursing along an excellent idea ever since their trip to Rome to record the Pope's opening of the Holy Year for the AFN. This, of course, would be the establishment of a temporary HV ham station to enable amateurs throughout the world a crack at getting the Vatican State into the log. It won't be easy to break the ice if the negative results of many IIs are any indication. Nevertheless, DL4HA opened negotiations on a correspondence plane with the Secretary of State in that domain and we wish him a chuck of luck . _ . _ . _ 250 watts on four bands, VFO-controlled, is going to net KS4AI a DXCC or provide a reason why not. Ralph closed down W5KWY for another tour of weather duty on Swan Island. He needs but 37 more cards for the century . _ . _ . _ W4GNS scoffs at the idea that TV sets could cause more than an insignificant fraction of the QRH r.a.c. signals periodically messing up the 14-Mc. band. Claude has noticed the goings-on from locations in both Tampa and Gainesville, Fla., mainly during daylight hours . _ . _ . _ YK1AM drops us a line hoping we'll assure the boys that he's perfectly legit but "semi-undercover." He'll answer all cards sent via ARRL . _ . _ . _ "The fellow next to Jeeves must have an invisible fishing pole," postcards an anonymous reader, referring to August's cartoon. How true. But we've all at some time or other called a juicy one while neglecting to turn on the final — it happens to the best of fishermen! . _ . _ . _ Projecting from a number already received, we'll answer a lot of queries in the bud by stating that the Admiralties, Aruba and VS1 are not countries separate from Australian New Guinea, Curacao and VS2, respectively . _ . _ . _ CR4AE works as a radiotelegrapher for the Cape Verde T&T and has had his ham ticket for about a year. His recent transfer from Sao Vicente to Sao Tiago (Cape Verde Islands) means CR4AE may be closed down for a year or so. Flavio sends 73 to the entire DX gang and trusts to renew friendships at the first opportunity . _ . _ . _ Word from HC2JR informs that HC8GI was to have been active on 10- and 20-meter 'phone from the isle of Santa Cruz in the Galapagos before this appeared in print. A TBS-50 and folded dipoles were to have been employed by operator Ernesto "Bud" Divine. Let's hope the boys who had no luck with HC8GRC were able to cash in on this one . _ . _ . _ If you have your CZ-25 certificate you may now go after an endorsement for 50 KZ5s as KZ5AK tells W6AM. Don also finds that a WACE certificate (Radio Club of Chile) with a radiotelephone surcharge is available to qualifying stations; W6AM has the first one issued for c.w., dated July, 1948, and now scores with number one on 'phone . _ . _ . _ Via W1s LV and BDI, KG6FAA mentions being out of QSLs but has a large supply of stock on order. Promised cards and cards in reply to those received will be mailed as soon as possible . _ . _ . _ CN8EG submits a card of the picture type from Valletta's Chapel of Bones in Malta, stating that 'twould be an excellent spot for the exile of DX Hogs and non-QSLers. CN8EG (W1PWK) enjoyed his first month on 20 'phone and c.w. and all contacts may rest assured that their cards will be answered with neatness and dispatch. Steve reports a large turnover in active CN8s; EB, ED, and EL are QRT. CN8s EH, EJ, and ET are responsible for most of the 'phone work there while EF and EG hold the c.w. fort. CN8ET takes an occasional swing at 80 c.w. Steve is discovering just how difficult it is for a DX station to QRT. "The other night at closing-down time I sent this on the frequency: CQ DE CN8EG I AM CL WL QRT MY SENDING ARM JUST DROPPED OFF AM OUT OF QSLS MY POWER IS BEING CUT OFF I AM JUST PLAIN GETTING OFF THE AIR SK DE CN8EG. Believe it or not, when I finished there were four guys calling me!" [Wonder who the other three were, Boss — *Jeeves*] . _ . _ . _ FA8DA, one of the reliable Algerian QSLers, is off to F1- and DL5-land according to W8YGR. Jack received solace during a period of blotto conditions when a long-awaited GD3UB card plunked into the postbox . _ . _ . _ VP1NW arranged for W8-W9 QSL traffic to be handled by W8YGR but hadn't quite closed the deal up to this writing . _ . _ . _ VR1C is to head for another nifty DX spot shortly, says W9ABA. Buzz doesn't care just where it is just so it's VR3 . _ . _ . _ Excerpts from W4BGO's log: YN1AA claims to be the only c.w. Nicaraguan and ZD2FAR brands ZD2LO a pirate . _ . _ . _ W1BIH would like to catch up on VP2LA, YK1AF, and YK1VL QSLs. John made ZD6JL a happy man by becoming his first W after 6 months of effort. (How

(*Continued on page 94*)

FOURTH ALL-EUROPEAN DX COMPETITION

1) All amateurs outside Europe call "CQ EU." European amateurs call "CQ AW" (all world). Object is for Europeans to work as many other stations in the world as possible and for all other stations to work as many European stations as possible.

2) C.w. contest period is from 0001 GCT, Nov. 25th to 2400 GCT, Nov. 26th. 'Phone contest period is from 0001 GCT, Dec. 2nd to 2400 GCT, Dec. 3rd.

3) C.w. contestants will exchange six-figure numbers, each consisting of an RST report plus the three self-assigned numbers. 'Phone contestants will exchange five-figure numbers, each consisting of a readability-strength report plus the three self-assigned numbers. The self-assigned number remains the same during the whole contest period in either or both the c.w. and 'phone sections. Log forms and summary similar to ARRL DX Competition, including signed statement of adherence to rules.

4) Separate certificate awards for 'phone and c.w. to first three high scores in each country and each W and VE licensing district.

5) Points. Every European station earns 1 point for receiving acknowledgment of number sent, and 2 points upon acknowledging a number received. Stations outside of Europe earn 2 points upon receiving acknowledgment of a number sent, and 1 point upon acknowledging a number received. Thus, a maximum of 3 points per contact.

6) Final score. European stations multiply total points by a multiplier which is sum of all non-European countries worked on each band. Countries according to ARRL Countries List, except that each W and VE licensing area counts as a separate country. Stations outside of Europe multiply total points by a multiplier which is sum of all European countries worked on each band.

7) Quota. European stations, in c.w. section, may work maximum of three different stations in any country (W/VE licensing area) per band. No restrictions for countries outside Europe, and no restrictions on 'phone.

8) All entries must be single-operator stations. No 'phone-to-c.w. or c.w.-to-'phone contacts allowed. Competition on the following bands: 3.5, 7, 14, 28, and 50 Mc.

9) Logs must be postmarked not later than Dec. 31, 1950, and must be received by April 30, 1951. Logs should be mailed to SM6ID, S.S.A. Contest Committee, Postbox 609, Gothenburg 6, Sweden.

"Corkey"—A Tubeless Automatic Key

A Compact and Fully-Portable Electric Keyer

BY G. FRANKLIN MONTGOMERY,* W3FQB

At least part of the general improvement in amateur sending can be traced to the healthy sound of skillfully-handled electronic keys. Since the time of the first article on electronic keying,[1] automatic bug circuitry has advanced continuously, and two recent articles [2,3] have reduced the design of the device to such elegant simplicity that further progress in the electronic direction seems nearly impossible. Simplification of useful radio gear is an amateur principle, however, and the purpose of this article is to outline a tubeless automatic key, scarcely larger than a mechanical bug, that shares all of the desirable characteristics of its electronic ancestors.

Several features previously pointed out as mandatory in any modern automatic key are:

1) Single speed control. The circuit should not require ganged potentiometers; speed should be controlled by a single variable element, and the dot/dash and dot/space ratios should be preserved during speed adjustments.

2) Self-completion. Instantaneous contact of the key lever in either direction of its swing should result in formation of a complete dot-space or dash-space, and it should be impossible to begin another such cycle until the preceding one has been completed.

3) Simple key lever. Multiple lever contacts are a source of trouble and difficult to construct. The key lever therefore should be essentially a single-pole double-throw switch; the rotor of the lever should be grounded.

These precepts and the idea of eliminating tubes altogether guided experiments using two sensitive relays alone. (A description of one tubeless keyer [4] appeared several years ago, but this particular circuit, admirable for its simplicity, included only one of the three virtues: the simple lever.) The basic circuit shown in Fig. 1 was finally developed. Fundamentally, the operation is a direct analogue of the keyer devised by Bartlett [2] (a review of his article is strongly recommended), with the exception that the timing and keying relays, RY_1 and RY_2 respectively, are energized directly by the timing condensers rather than by tube plate currents.

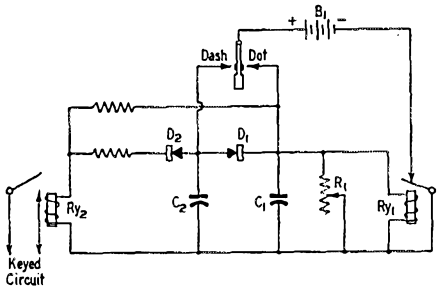
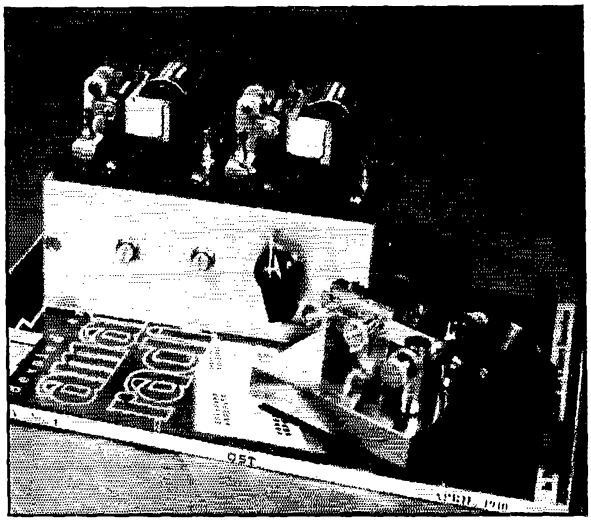


Fig. 1 — Basic circuit of the tubeless automatic key.



"Corkey," complete with battery power supply, is built in a 5¼ × 3 × 2-inch chassis. The key lever mechanism, a separate unit, was built by the author with electronic-keying requirements in mind. An ordinary bug key can be suitably modified if your mechanical ability and facilities aren't up to building your own.

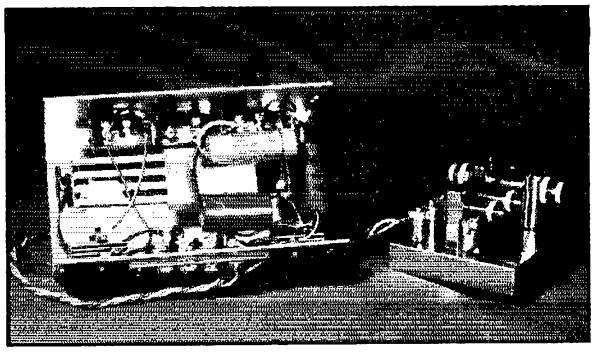
* 4557 South Chelsea Lane, Bethesda 14, Md.

[1] Harry Beecher, "Electronic Keying," *QST*, April, 1940.

[2] F. A. Bartlett, "Further Advances in Electronic-Keyer Design," *QST*, October, 1948.

[3] Richard H. Turrin, "Debugging the Electronic Bug," *QST*, January, 1950.

[4] Harris Adams, "An Electrostatic Key," Hints and Kinks, *QST*, April, 1946.



In this under-chassis view, the control with the knob is the speed control; the other potentiometers are R_4 and R_5 (Fig. 2) used in the initial key adjustment but afterwards left alone.

When the key lever connects with the dot contact, C_1 is charged almost instantaneously by the battery, and RY_2 closes to begin the dot; charging of C_2 is prevented by the two diodes, D_1 and D_2. At nearly the same time, RY_1 closes, disconnecting both battery and key lever from the circuit. C_1 now discharges slowly through R_1 and the two relay paths, and when the voltage across C_1 has decreased sufficiently, RY_2 opens. After an additional period of time equal to the dot length, during which the voltage across C_1 decreases further, RY_1 opens, reconnecting the battery. If the lever has been returned meanwhile to neutral position no further action occurs, but if the lever is still in the dot position the cycle repeats.

The action is similar for dashes. To provide a dash cycle twice as long as the dot cycle, diode D_1 effectively parallels C_1 and C_2 when the lever connects with the dash contact; diode D_2 furnishes extra current to the keying relay, closing the keying contacts for a larger fraction of the cycle and so forming a dash of proper duration. Both dot and dash speed depend on the time constant of the circuit, which is made continuously variable by means of speed control R_1.

In view of direct relay operation by the condensers, the key has been named "Corkey," an abbreviation for "condenser-operated relay key." It has all of the desirable features listed earlier.

The complete circuit is shown in Fig. 2, and the interior of the relay box is shown in the photograph. The relays used in the model need not be duplicated exactly, but they should be sensitive relays having good bearings and coil resistances of 5000 ohms or more and should be so con-

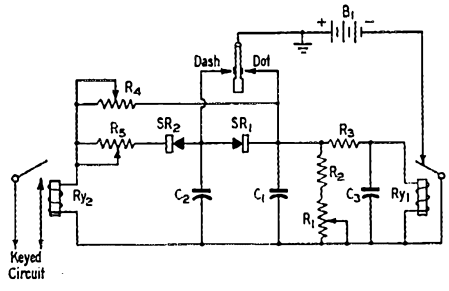


Fig. 2 — The practical keyer circuit.

C_1 — 20-μfd. electrolytic.
C_2 — 25-μfd. electrolytic.
C_3 — 2-μfd. paper.
R_1 — 10,000-ohm potentiometer (Clarostat AM-30-V).
R_2 — 2000 ohms, ½ watt.
R_3 — 10,000 ohms, ½ watt.
R_4 — 25,000-ohm potentiometer.
R_5 — 75,000-ohm potentiometer.
B_1 — 22.5-volt miniature battery (Burgess XX15E).
RY_1, RY_2 — Sensitive relay, 5000-ohm (or larger resistance) coil (Struthers-Dunn).
SR_1, SR_2 — Selenium rectifier (see text).

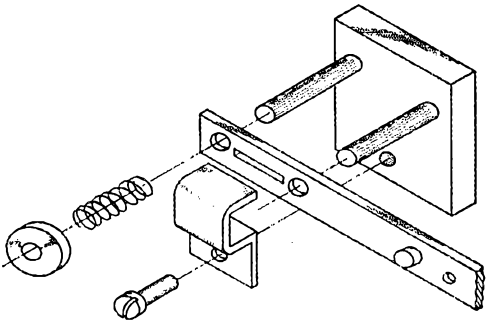


Fig. 3 — Exploded view of key lever mechanism.

structed that both armature travel and spring tension are adjustable. In lining up the circuit initially, it will be found that the relay settings affect both keying speed and dot and dash lengths, so that armature travel and tension should be adjustable to allow the keying characteristics to be brought within convenient range of the normal potentiometer adjustments. The relay settings need be made only once.

Diodes SR_1 and SR_2 are made from a single 75-milliampere selenium rectifier. The rectifier, as purchased, has six plates. It is carefully pried apart into two sections, a two-plate section being used for SR_1 and a four-plate section for SR_2. The speed control, R_1, is much more satisfactory if a tapered potentiometer is used having a fast taper at the zero end; keying speed will then be a nearly linear function of control setting. The potentiometer specified works nicely. Potentiometers R_4 and R_5 control dot length and dash length, and almost anything will serve for these.

The most difficult part of the lining-up process is proper selection of the two electrolytic condensers. Theoretically, these should have equal ca-

(*Continued on page 96*)

The Seattle A-Bomb Test

A Report on ARRL Emergency Corps Participation

BY REX M. HESS,* W7NJ

I AM NOW prepared to give a full detailed report of the NSRB project, "A-Bomb Test." It is amazing what a tremendous quantity of detail and work was required for a project of this magnitude.

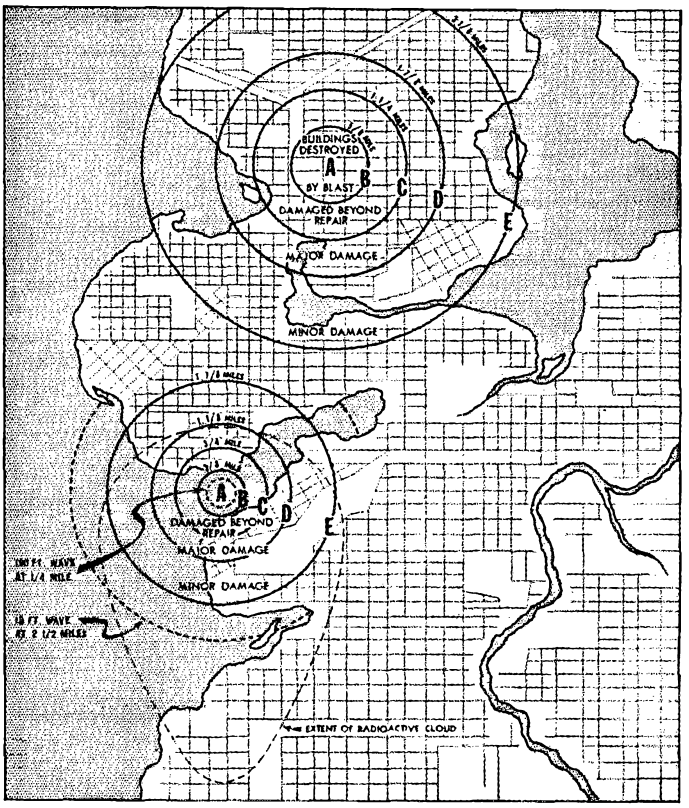
On July 1st I was requested to appear before the Seattle Civil Defense Board as a representative of the amateurs in this area. The purpose of that meeting was to form a coördinated plan for the defense of Seattle in the event of an atomic bombing. At the meeting held in the Mayor's office on July 3rd, the structure of the defense plan was formulated, with subheads under the Director and Assistant Director as follows: Mutual Aid, Communications, Transportation, Public Information, Control Center, Planning, Police, Medical, Welfare, Fire, Engineering, Utilities, and Evacuation. Of course under each of these headings were many and various duties, too numerous to mention. Needless to say, this planning took us until the early hours of the morning.

In the planning for communications, it was discovered much to the amazement of all people present that the ARRL Emergency Corps had more usable assets than all other groups combined. This immediately gave us considerable prestige, and we were given a very prominent place in this field, with assignment of *all* communications for the Engineering Dept., American Red Cross, and the Medical. General Stoner, Army Signal Corps (retired), was placed in charge of all communication, with Colonel Laurence and myself as his subordinates.

On the evening of July 5th, General Stoner, Colonel Laurence and myself, with the Director and Assistant Director, met at Police Headquarters and went into conference for the purpose of breaking down our emergency group into assignments to the various departments for the needs of this test. At a late hour we came to an agreement on this dispersal problem, with a major portion of our mobile equipment and auxiliary power in use, and a reserve of mobile, fixed stations and a pool of replacement operators. We then dispersed — or rather I should say "secured" — for further developments.

The Hypothetical Attack

The "developments" came on July 10th. At 4:30 A.M. the Mayor received a call from the Governor stating there had been a Pacific Coast explosion, and that the Seattle area was in danger of attack. The Mayor then issued a call for the Civil Defense Board to gather at control center under the yellow signal as defined for civil air raid warning. At 5:15 A.M. the Civil Defense Board was in session. At 6:18 A.M. the Mayor issued the blue signal alert for the air raid warning system.



Hypothetical attack, similar to the Seattle problem, illustrated in NSRB's Document No. 128, *United States Civil Defense.*

* ARRL Emergency Coördinator, Seattle area.

The public information section took over control of the broadcast stations and informed all people to stay inside, close all windows and doors, plug all ventilating systems to prevent as much as possible radioactive spray from a water burst entering the homes and if basements are tighter, to go there and stay until called for, but *do not leave your quarters.*

At 6:50 A.M. there was an atomic explosion (Bomb 1) in about 96 feet of water about one nautical mile north and west of the West Waterway in Elliott Bay. This bomb developed a huge "base surge" or "lethalcloud" of radioactive mist and spray, sweeping southward over the land, fatally injuring all exposed persons, driving into broken windows, and turning into rain, contaminating a large area extending about 1800 yards north, two miles east and west, and from two to five miles to the southward. This was attributable to a wind from the north. Those on ships in the harbor were either killed or fatally affected, and any ships not sunk were badly contaminated.

At 3:05 P.M. there was an atomic burst from 2500 feet in the air, approximately 500 feet west of the 15th Avenue bridge. From the effects of the air burst, for a distance of ⅝ of a mile, all buildings were in total destruction, and from this point to 1¼ miles buildings were damaged beyond repair. From 1¼ to 1⅞ miles was classified as major damage, and from there on only minor damage. The population of this affected area was 170,900.

The population affected by the underwater burst was considerably less, although casualties listed were 45,103 people.

Assignment of Emergency Equipment and Personnel

By previous arrangement, a control center was established at the Jane Adams Junior High School. This "nerve center" or command post immediately went into action, all departments starting preassigned work programs. (We will only take up the communications angle as that portion of this problem is the part that affects us as amateurs directly.)

To clarify the following dispersal of radio personnel and equipment, the points given to various operators assigned to Medical are emergency hospitals; for Engineering, their dispersal points are those for personnel and heavy equipment, none of which had any radio gear.

At 4:30 A.M. the morning of the bombing, when alerted by the Mayor's office, I immediately notified the AEC men of our Emergency Net, and informed them to assemble their members and stand by for further instructions, and for the AEC to monitor 29 Mc., our ten-meter emergency frequency, for additional instructions from my mobile.

At 5:15 A.M. the blue alert was given and I was instructed to assemble our control stations for all bands at the command post, or "nerve center."

• Although intended primarily as a report to Hq., W7NJ's description of integrating amateur facilities with community civil defense organization can well serve as a guide to other AEC groups in local planning.

Net control stations, W7NRB (10), W7NUN (80), W7LCS (2 and 40) instructed as follows:

W7NRB bring 32-V2 Collins, receiver and antenna equipment.

W7NUN bring 32-V2 Collins, receiver and antenna equipment.

W7LCS bring both transmitters, receivers and antenna equipment.

Alt. AEC W7MSI bring transmitter, receiver and antenna equipment (10-meter 'phone).

W7RT to hook onto portable 6½-kw. gas generator, and cables for several transmitters and receivers.

Engineering Dept. transmitters assigned to 29 Mc. on 10 'phone, mobile.

Medical Dept. transmitters assigned to 28,950 kc. on 10 'phone, mobile.

Red Cross transmitters assigned to 3950 kc. mobile on 75 'phone.

Another 6½-kw. gas driven generator on a trailer dispatched to medical headquarters at the Health Science Building at the University campus, to furnish auxiliary power for equipment and for lights for doctors if needed.

A 5-kw. gas generator dispatched to the Red Cross Headquarters in the Student Union Building at the University campus.

A 1500-watt gas generator to the Engineering District Headquarters, 7th St., at Charles.

All mobile stations, all channels, and all emergency members, to proceed as quickly as possible to the control center, for assignment and instructions.

At 6:50 A.M., the time of the first atomic burst, all personnel and requested equipment had reported into the control center and were standing by for instructions.

As soon as the burst reaction had subsided, by prearrangement, assignments to the various divisions as allocated were made. Following is a summary of the assignments:

Medical Division Hqrs—
W7NWI, W7JXR, W7CHX. (10-mobile.)
W7CHX, Communications Officer.

Red Cross Hqrs — W7BL, W7KZP, Officer furnished by Red Cross. (75 'phone.)

Red Cross Reserve Pool — W7LIO, W7EOP, W7LWX, W7BGZ, W7OMQ, W7JNC (75-mobile).

Medical Command Posts — W7NYB, W7NBC, W7KSV (10-mobile).

Engineers Division Hqrs. —
W7LWZ, W7MHW, W7RT, W7MPR. (10-'phone mobile.)
W7MHW with fixed station and Comm. Officer.

Engineers District Hqrs — W7AUK, W7AW, W7GRM, W7MEU

Engineers Dispersal Points — W7GNY, W7IZJ, W7JKB, W7NEH, W7ATG, W3KFI/7, W7OLD, W7KPC, W2GKD/7, W7OAB, W7NL, W7LTP, W7KYQ, W7JMI.

Medical Reserve Pool — W7OFB, W7JPC, W7JGM, W7IEE, W7AWP. (10-mobile.)

Control Nerve Center Reserve Pool — W7BAC, W7CO, W7MDS, W7FDP, W7LIA, W7NLB
(Mobile, 10 and 75.)

(*Continued on page 98*)

"Constant Modulation" of the 813

High-Power Controlled-Carrier Operation

BY GEORGE R. LIPPERT,* W8YHR

SINCE the publication of the first article on "constant modulation" [1] many letters have been received asking for information on the system when used with the 813. The purpose of this article is to describe a compact 500-watt 813 final amplifier using "constant modulation."

Readers of the earlier article will recall that the modulation system is essentially screen-grid modulation of one or more tetrodes. It differs from the usual methods, however, in that some of the audio power is rectified and used to establish the screen-grid operating level. Thus when the audio signal is low, the screen voltage is low, and the carrier output is low. When the audio signal is increased, the screen voltage is increased, and the carrier output is greater. By proper adjustment, the carrier output can be made just sufficient to give a high percentage of modulation at any audio level — hence the name, "constant modulation."

Fig. 1 shows the circuit used with an 813 in the W8ZJH transmitter. It is basically the same as the original that was used with 807s, with the exception of the bias arrangement on the screen-grid return. Bias at this point is necessary with some tubes, in order to reduce the unmodulated carrier to a sufficiently low level to realize the advantages of the system. It might be desirable to make the bias voltage adjustable, although tests on the air indicate that — 75 volts is about right for the 813 in most instances. Substitution of a VR-105 for the VR-75 will reduce the carrier to a lower level and is more efficient, but it makes receiver tuning more difficult because the residual carrier is so much weaker.

The plate circuit shown is particularly good on 10 and 20 meters, although conventional single-ended link- or pi-network circuits would be satisfactory. Condenser C_8 is used to balance out the plate-to-filament capacity of the 813 and is essential in this type of tank circuit when using tubes with a high output capacity. The r.f. choke in the screen circuit should be located as near to the tube socket as possible and was necessary to prevent oscillation caused by a long screen lead.

Fig. 2 shows an economical means for producing the bias, and it might be preferred. Grid current must be at least 15 ma. under load in this circuit, while the circuit in Fig. 1 requires slightly less.

Although the above description covers only the 813, other tubes such as the 4-125A, 4-250A, HK-257B, and similar types should work in identical circuits, with only minor changes in screen bias and modulator tube matching.

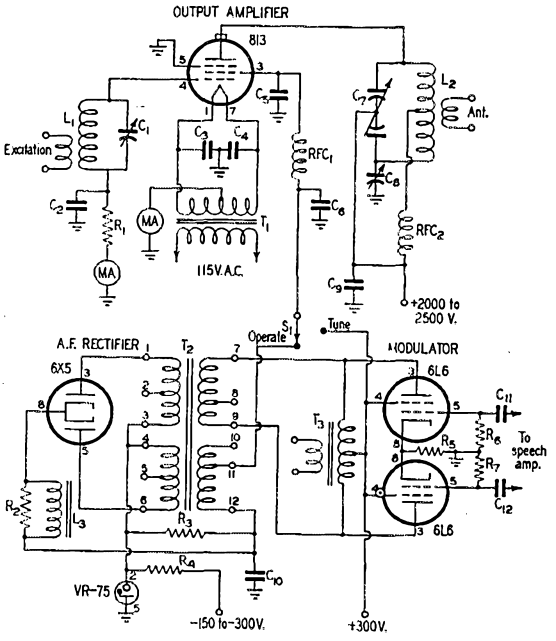


Fig. 1 — Circuit diagram of a "constant modulation" 813 amplifier.

C_1 — Grid tuning condenser, suitable for band used.
C_2, C_3, C_4 — 0.01 μfd., 600 volts.
C_5, C_6 — 0.001-μfd., 600 volts.
C_7 — Plate tuning condenser, suitable for band used, c.w. rating spacing.
C_8 — 20-μμfd. variable, spacing good for twice plate voltage.
C_9 — 0.01 μfd., 3000 volts.
C_{10} — 0.2 μfd., 400 volts.
C_{11}, C_{12} — 0.1 μfd., 400 volts.
R_1 — 10,000 ohms, 5 watts.
R_2 — 3000 ohms, 1 watt.
R_3 — 47,000 ohms, 1 watt.
R_4 — 15,000 ohms, 10 watts.
R_5 — 200 ohms, 2 watts.
R_6, R_7 — 0.22 megohm, ½ watt.
L_1, L_2 — Suitable for band used.
L_3 — 4-hy. 40-ma. filter choke.
RFC_1 — 2.5-mh. r.f. choke.
RFC_2 — 1.0-mh. r.f. choke, 300 ma.
S_1 — S.p.d.t. wafer switch.
T_1 — 10-volt 5-ampere filament transformer.
T_2 — 15-watt universal modulation transformer (Merit A-3104).
T_3 — Receiver-type output transformer, secondary not used (Merit A-2935).

* 4654 Pearl Road, Cleveland 9, Ohio.

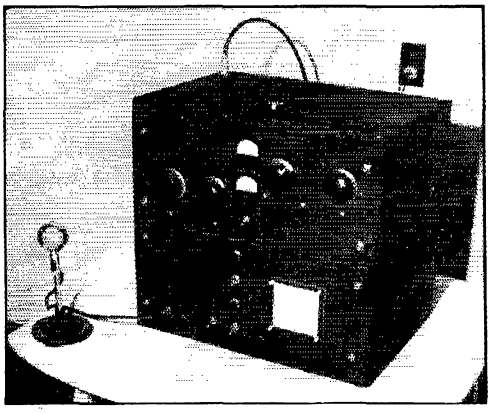
[1] Lippert, "A Constant-Modulation 'Phone System," QST, April, 1950.

With the exception of the audio input winding (Terminals 7, 9), the transformer ratios shown in Fig. 1 apply to all r.f. tubes. The audio winding will vary with audio tubes and r.f. tube screen impedance. The output secondary (Terminals 11, 12) can be considered to be terminated in an impedance equal to one-third the screen impedance, which for the 813 in this circuit is about 24,000 ohms, and the audio input will be loaded accordingly. In this circuit the output secondary looks at one-third of 24,000 or 8000 ohms. To offer the modulator tubes a plate-to-plate load of 8000 ohms, the audio input winding turns would be equal to the output secondary turns (1:1 ratio). For a modulator load of 10,000 ohms, the impedance ratio of primary to secondary should be 1.25:1, or a turns ratio of about 1.1:1. In any case, the turns ratio of the rectifier winding (Terminals 1, 6) to the output secondary should be about 2.2:1. The connections shown in Fig. 1 are correct for this ratio and a load of 10,000 ohms on the modulator. The audio power requirement for the 813 is about 5 watts minimum.

Tuning

Tuning of the final stage is conventional with switch S_1 in the "Tune" position, and no tuning should be done in the "Operate" position. If the split tank circuit is used, condenser C_8 should be adjusted before loading the antenna. This is done by applying plate voltage and excitation, tuning the plate circuit to resonance, and by using a neon bulb as an indicator, adjusting C_8 until the center of the coil shows little or no r.f. The plate tuning condenser should be kept at resonance at all times. A 15-$\mu\mu$fd. fixed condenser at C_8, such as a vacuum condenser of at least 4000 volts rating, will be satisfactory for most circuits, provided the external circuit is well balanced and of low capacity. A variable condenser will provide a better balance, however.

Loading is done in the "Tune" position also, loading to between 200 and 250 ma. with a plate voltage of between 2000 and 2500 volts. Switching to "Operate" should drop the plate current to about 40 ma. Modulation will cause the plate current to swing upward sharply, peaking at about 200 ma. under normal operation.



The 10-meter constant-modulation transmitter at W8ZJH is a "table-top half-kilowatt" using a single 813. The VFO and final amplifier are in the top half, the power supply and modulator below.

On-the-air tests of this system have proven it to be highly efficient from an over-all power standpoint and highly desirable from an interference standpoint. Contacts with DX stations have shown that it compares favorably even with higher-powered conventional a.m. transmitters. Heterodyne interference is reduced, and the audio is clearly readable over high noise levels, due to the constant high percentage of modulation. The over-all size is small, the W8ZJH half-kilowatt transmitter being a table-top rig.

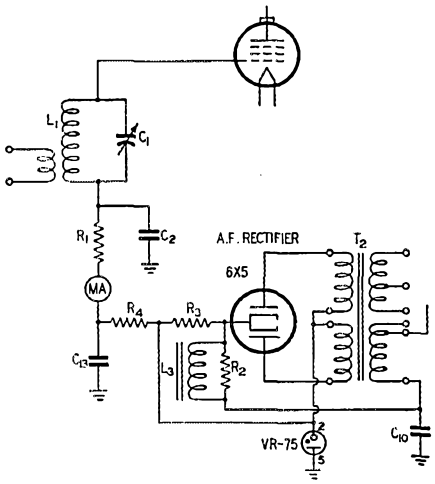


Fig. 2 — Modified circuit where fixed bias supply is not used.
C_{13} — 0.05 μfd., 400 volts.
R_4 — 500 ohms, ½ watt.
Other values same as in Fig. 1. Since no protective bias is included, plate voltage should never be applied with no excitation and S_1 in the "Tune" position.

Silent Keys

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

W1JMC, George H. Jackson, Rockland, Me.
W1LHB, William B. Rudolph, Plymouth, Mass.
W2KGP, Lester Livingston, New Hyde Park, N. Y.
Ex-2MN, Charles E. Apgar, Westfield, N. J.
W2NE, John E. Curtis, Brooklyn, N. Y.
W2PMA, Mrs. Lillian Ruocco, New York, N. Y.
W5DRF, Allen J. Christmas, Holly Ridge, La.
W5HFD, Charles N. Harrist, Karnack, Texas
W6ABF, Martin A. Brown, Burbank, Calif.
W6FEW, John S. Ross, jr., Willits, Calif.
W7MNG, Lloyd H. Wilson, Portland, Ore.
WØAOQ-WØRTP, Paul J. Chappell, North Kansas City, Mo.
WØZAT, Carilla W. Colby, Leavenworth, Kans.
FK8AD, Louis Garbe, La Tontouta, Nouvelle
KZ5PA, Arnold Pincus, Cristobal
VE1FH, James Rose, Halifax, N. S.
VE2IO, William L. McAdam, Shawinigan Falls
VE3DC, Dr. W. R. Jaffrey, Dundas

TVI-Proofing the ARC-5 V.H.F. Transmitter

BY O. W. H. JOHNSON,* W2ZYX

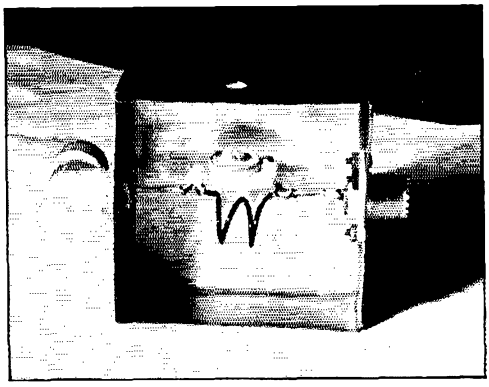
THE T-23/ARC-5 v.h.f. transmitter is second only to the SCR-522 in popularity with the v.h.f. fraternity, but as many 2-meter men have found recently it is a prolific cause of TVI. The writer's location is a typical fringe area, some 70 miles from Philadelphia, source of TV programs on Channels 3, 6 and 10. Stacked arrays and high-gain boosters are widely used in order to obtain relatively satisfactory TV reception, but that makes the looking public no more happy over the prospect of TVI than if they were in a primary service area.

It does make it easier to interfere, however, and the ARC-5 at W2ZYX was doing all too well in this respect. There was cross-hatching on Channel 3 and complete blanketing of Channel 10 on our own TV set. The former was the result of radiation of 8th harmonic energy direct from the crystal oscillator, while the trouble on the higher channel was caused by a fourth (as well as the desired third) harmonic in the plate circuit of the tripler.

The Cure

The methods followed in correcting these troubles are more-or-less standard practice, adapted to the peculiar physical characteristics of the ARC-5. First, a complete shielding job was done. This involved making a new cover for the unit, using copper window screening soldered to a framework of 16-gauge copper, as shown. The power cable was shielded, and a power-lead filter encased in a copper can was mounted on the back of the unit. The test panel on the sloping front of the case was removed and an aluminum plate substituted. A coaxial fitting and shielded line were used to connect a cathode-current meter for tune-up purposes.

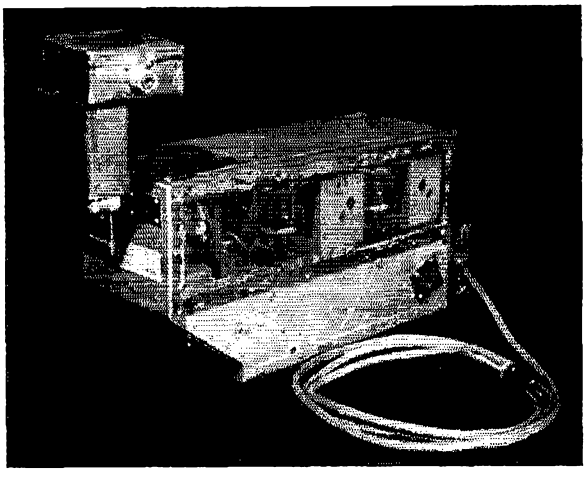
The power-lead filters consisted of Ohmite Z-50 r.f. chokes, with midget disc-type ceramics of 0.002 to 0.005 μfd. connected at the power-supply side. In the low-voltage leads an additional 500-$\mu\mu$fd. feed-through by-pass was used at the other end of the choke, but these were found to be unnecessary. For the filament leg a self-supporting choke of No. 14 enameled wire wound into a $\frac{3}{8}$-inch diameter coil 2 inches long was substituted for the Z-50. The filters were



Interior view of the Channel 10 trap, with cover removed. Any *L/C* combination to resonate at 192–198 Mc. is OK, though a later model using three turns of No. 12 wire, $\frac{3}{8}$-inch diameter, and a maximum capacity of 7.5 $\mu\mu$fd. was less critical in tuning than the high-*C* version shown.

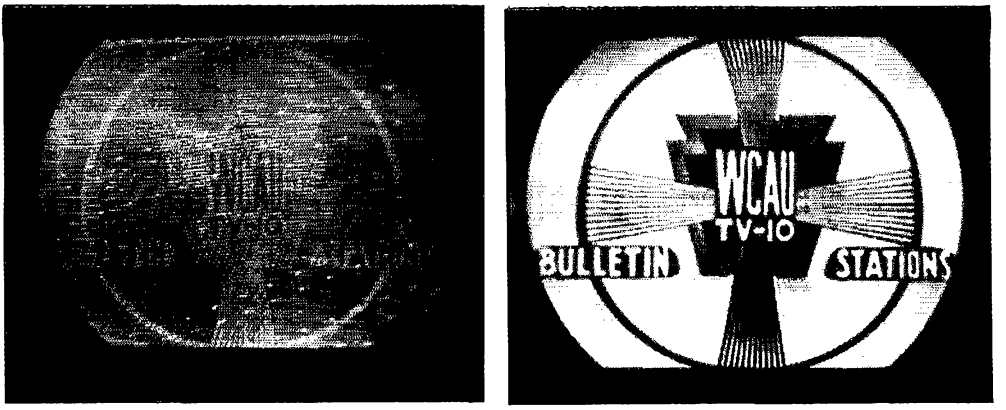
mounted in a single can, with no compartmentation.

These steps completely cleared the Channel 3 trouble, but there was enough of the fourth harmonic from the tripler going through and into the antenna to mess up Channel 10. Investiga-



The ARC-5 2-meter rig at W2ZYX, with shielding and traps installed.

* Chief Radio Electrician, USCG, Coast Guard Electronics Engineering Station, Wildwood, N. J.



Before and after views of the Channel 10 reception at W2ZYX. The high-band signal from Philadelphia is seldom strong, at this 70-mile distance.

tion showed that the plate circuit of the 832-A tripler stage had a natural resonance at approximately 194 Mc. A grid-dipper showed a fairly respectable *Q* (sharp dip) for this compared to the 144-Mc. resonance it was supposed to have. Fine thing!

The small amount of r.f. at 194 Mc. finds sufficient amplification in the following stage to allow an appreciable amount of 194-Mc. energy to go out to the antenna. Substitution of chokes *L-306* and *L-307*, changing the coupling capacitors *C-315* and *C-316*, different values of plate by-pass, *C-314*, and complete removal of the 2-$\mu\mu$fd. "drip loop" plate connection — none of these things altered or removed the bothersome resonance at 194 Mc.

Then it was discovered that an 832, substituted for the 832-A, moved the natural resonance higher to 215 Mc. and greatly attenuated the interference in Channel 10. It was then possible to trap out most of the remaining interference.

A parallel-resonant trap for Channel 10 was mounted in a 3 × 3 × 1½-inch copper box fitted with coaxial connectors. This was inserted in the antenna lead, resulting in further reduction of the interference. Another similar trap was made and the two inserted in series in the coaxial antenna lead, as shown in the large photograph. This completed the job. It is now possible to receive a satisfactory picture on Channel 10 on our own TV set, even though the 2-meter coaxial dipole is mounted on the center support of our stacked conical TV array, almost level with the upper bay. The only time interference can be seen is when the signal strength on Channel 10 is below usable picture level. The before-and-after pictures tell the story.

No attenuation is noticed in the 144-Mc. signal level, according to several on-the-air checks with and without the traps.

ANNOUNCING 10-METER WAS CONTEST
Dec. 8th–9th–10th and 15th–16th–17th

How many states and how many stations can you work on ten in two week ends? If you are located anywhere in the League's field-organization territory (see page 6 of *QST*), you are cordially invited to take part in this new operating activity. C.w. to c.w., 'phone to c.w./c.w. to 'phone, or 'phone to 'phone can be used. Certificates will be awarded the highest scorer in each section. The total available operating time will be 96 hours. The week end periods start Friday afternoon (3 P.M. PST or 6 P.M. EST) on the 8th and 15th of December and end on the same times the 10th and 17th.

Scoring is simple. One point is allowed for each contact and 1 multiplier point for each different state worked. The same station may be worked but once during the contest for credit. Total contacts multiplied by the total different states worked gives you your score. Exchange of reports and names of states are all that is necessary for scoring. For contacts that are made with other than the 48 states, for example, KP4 or VE 1 through 8, 1 contact point is allowed but no multiplier point.

A complete announcement of the contest, including the rules governing participation, will appear in December *QST*. Contest reporting forms will be sent to all amateurs who request them by mail or radiogram. It is not necessary to make advance entry or to use these forms if the report form described in the next issue of *QST* is followed. Closing date of entries is January 15, 1951.

How many states can you work, OM?

Correspondence From Members-

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

FREEDOM OF SPEECH

8 Prescott St., Cambridge 38, Mass.

Editor, *QST:*

The advice expressed in the editorial of September *QST* seems not only overcautious, but also detrimental to the country's best interests. Recall that democracy can function best where there is the most vigorous open discussion to formulate public opinion.

The part which I would object to is this: "Watch your conversations on the air, especially with voice. Steer clear of discussions about developments in the international situation; let the newspapers do that. Don't talk about your job or changes in it if at all related to mobilization. Confine international contacts strictly to technical matters and small talk. Let's have no incidents which might cause unfavorable comment."

I think that the part of this editorial relating to free discussion of the political and international situation should be challenged. The Editor of *QST* assumes that technical developments are the only aims of amateur radio; I hope this is not the case, since each one of us has his duties as a citizen as well. The League would not have opposed stiffening the technical competency required for an amateur license had it thought of the membership as consisting of technicians only. The League realizes that many amateurs are more interested in general discussion than in circuit and antenna developments.

As an American amateur, I deplore the fact that I can talk with amateurs in the Iron Curtain countries, but that they are required to "confine international contacts strictly to technical matters and small talk." The communication we achieve is therefore meaningless, since there can be no two-way exchange of ideas. Are we, as American amateurs, to be bound by chains just because the Russian satellites are?

I believe that by continuing to demonstrate to the world at large that we do have the freedom to talk about current events and the international situation — that it is they who cannot discuss these matters, not us — we will do much to bolster the cause of the free world we desire. This kind of moral ammunition will prove far more effective than the military strength we are prone to place undue reliance upon.

— *Donald C. Cronemeyer, W1AQK*

[EDITOR'S NOTE: *QST* has never urged curtailment of the discussion of political and international affairs during normal times, but leave us face it: these are not normal times. An indiscreet conversation could conceivably result in the loss of operating privileges for the whole body of hams. Our concern is that we stay on the air as long as possible, without government-imposed restrictions. This is not only our idea; our editorial accurately reflects informal advice from a number of sources in Washington.]

LEARNING THE CODE

Centreville, Md.

Editor, *QST:*

While reading your publication, *Learning the Radiotelegraph Code*, this evening, I noticed the suggested use of a metronome for rhythm. As I am a watchmaker, the thought occurred to me that, since the Big Ben alarm clock normally ticks (and loudly) 240 times a minute, the beginner like myself can use the clock — one tick for a dit and two ticks for a dah. If greater speed from the clock ticks is desired for rhythm practice, any jeweler-watchmaker can shorten the hairspring length of the clock to produce four hundred ticks or better. Should amplification of ticks be desired, set the clock in a tin dishpan.

Just a suggestion from a possible future "ham."

— *G. Myron Latshaw*

OPERATING SERIES

R.D. 2, Box 328, Jeannette, Penna.

Editor, *QST:*

I really am pleased with the new ARRL series on amateur operating. The *QST* is quite worn between pages 20 and 21 [July *QST*]. Anything in radiotelegraphy I really eat up.

— *Walter C. Downes, W3UVD*

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492 Rivenoak, Birmingham, Mich.

Editor, *QST:*

I am writing you in reference to the statement made on page 18 of the August, 1950, issue of *QST*, "a station in a parked car is a 'portable,' not a 'mobile.'" . . . This statement does not seem logical to me. Any comment would be appreciated, as the rest of the article is very fine.

— *Howard Estes, W8ELR*

[EDITOR'S NOTE: The wording in the *QST* article would have been less confusing had it read: A station in a parked car *may* be a "portable," not a "mobile." As the cartoon showed, a car-installed rig connected to an antenna, one end of which is tied to a tree, is obviously not "ordinarily used while such mobile unit is in motion"; the guy is operating portable. On the other hand, common sense dictates that when you stop for a traffic light, or draw over to the side of the road to relax a bit, you do not oscillate back and forth between portable and mobile status. So far as we can determine at Washington nobody is in danger of getting himself a citation whether he called himself portable *or* mobile in this case. However, in an informal round table on the subject with some of the boys in the Commission we found that they are willing to buy the Atlantic City definition of a mobile station as a guide: "A station in a mobile service intended to be used while in motion or during halts at unspecified points." For such halts you can still consider yourself mobile.]

5, Ferncroft Ave., London, N.W. 3, England

Editor, *QST:*

I have read your article on 'phone procedure with great interest, especially that part dealing with portable and mobile stations.

Procedure for portable stations is not standard in different countries. In Britain, mobile stations are not permitted, but portable stations are operated. The official call sign of the portable station in Britain is the normal call sign followed by "/P". While this is easily understood and easily conveyed in c.w., it is a very different story on 'phone.

On my own portable station, G3BID/P, I have found it very difficult to get the "/" across when conditions are difficult, bearing in mind that portable stations are generally low power (I daren't say "QRP" after the remarks in the article on the use of c.w. procedure in plain language!).

The "official" word laid down by our licensing authority for "/" is "stroke," but this word does not seem to be very commonly known to other countries, especially the U. S. A. where, I understand, this symbol is sometimes called "slash," sometimes "slice," and sometimes "slant." In other countries also I believe that the procedure used by portable stations varies considerably.

For the information of your readers, there is a further suffix used in call signs in this country — "/A". This is an "alternative" address station, or a station used at a second address, other than the normal address of the fixed station. I think this is equivalent to a "fixed portable" in your country.

— *E. M. Wagner, G3BID*

(*Continued on page 102*)

Hints and Kinks For the Experimenter

VERSATILE POWER SUPPLY

THE power-supply circuit shown in Fig. 1 is an ideal arrangement for any experimenter. As an example of its versatility, assume that a transformer rated to deliver 1000 volts each side of center-tap is available. With this supply, by merely throwing a couple of knife switches, the same supply may be used to obtain 500, 1000, or 2000 volts. Thus, as individual requirements change, the supply may be changed to suit without having to rebuild.

The d.c. power available at the output of the filter is as follows:

	Switch Position		*Voltage*	*Current*
Condition	S_1	S_2	*Available*	*Available*
(1)	A	B′	½	2
(2)	B	B′	1	1
(3)	B	A′	2	½

The figures in the available voltage and current columns indicate what multiple of the normal rated output may be obtained for the various switch positions. Switch position A-A' should be avoided, because with the connections thus set up, the filter condensers virtually short-circuit the transformer secondary.

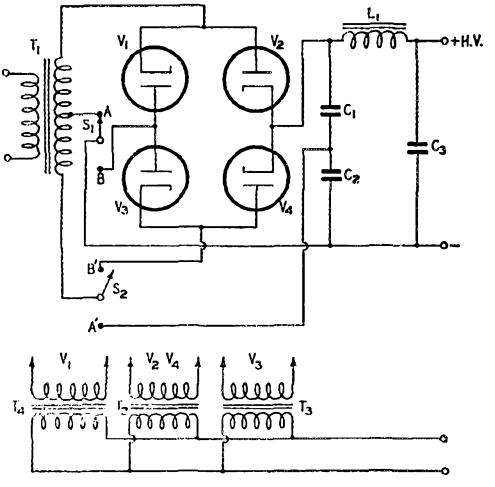

Fig. 1 — Schematic diagram of a versatile power supply for the ham shack. Values given below are for a typical supply capable of delivering 550 volts at 300 ma., 1100 volts at 150 ma., and 2000 volts at 100 ma. under various operating conditions as described in the text.

C_1, C_2 — 3 μfd., 2000 volts.
C_3 — 3 μfd., 3000 volts.
L_1 — 12 hy., 300 ma.
S_1, S_2 — S.p.d.t. knife switches.
T_1 — 1000 volts c.t., 300 ma.
T_2 — 2.5 volts, 10 amp., 10,000-volt insulation.
T_3, T_4 — 2.5 volts, 5 amp., 10,000-volt insulation.
V_1, V_2, V_3, V_4 — 866A.

Examination of the circuit reveals that for Condition 1 as tabulated above, the familiar center-tapped full-wave arrangement is produced by the knife switches. Condition 2 results in a bridge circuit, and Condition 3 results in a voltage-doubler circuit.

There is one precaution to observe in building this type of supply. The reactance of the input filter condensers C_1 and C_2 (storage capacitors under operating Condition 3) should not be so small that the peak plate-current rating of the rectifier tubes V_1 and V_2 is exceeded. This can be calculated simply from the following formula:

$$\text{Reactance } (X_c) = \frac{10^6}{377C}$$

where C is the capacity of C_1 in microfarads. This assumes a 60-cycle supply, and neglects tube drop and transformer resistance. Suffice to say that if the total transformer secondary voltage is 1000 volts, 3 μfd. can be used at C_1 and C_2 with Type 866A rectifiers. At 2000 volts total not over 2 μfd. should be used.

Under operating Conditions 1 and 2, the condensers are in series, but since the ripple frequency is doubled, the input impedance remains the same.

As a variation on the circuit shown, under Condition 3, if B' is connected to the cathode-plate junction of V_1, V_2, instead of to the similar junction at V_3, V_4, the rectifiers are connected in parallel, permitting twice the allowable peak plate current to be passed, assuming, of course, that the transformer ratings permit. A word of warning: Turn the power input off before doing any switching with S_1 and S_2! — *Ray F. Knochel, W9CO, ex-W1CM*

BROADCAST COILS FOR THE HRO-50

BROADCAST-BAND coils from earlier model HRO receivers can be used in the new HRO-50, but only after a slight mechanical modification has been performed. Trying to use the old coils without the modification described below is to be avoided, because they cannot be inserted in the HRO-50 without using force which may crack the ceramic brush board in the receiver.

Fortunately, the modification is simple to perform, as follows: (1) Remove the shield cans from the old coil set. These come off when the screws holding them are loosened. It is not necessary to remove the screws entirely. (2) Remove the three screws holding each of the coil assemblies in the shield. (3) Place one external (star) lock washer, such as General Cement No. 7350-E, between the coil assembly and the shield, under each of the

(Continued on page 104)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
JOHN E. CANN, W1RWS, Asst. Comm. Mgr., C.W.
GEORGE HART, W1NJM, Natl. Emerg. Coördinator

J. A. MOSKEY, W1JMY, Deputy Comm. Mgr.
L. G. McCOY, W1ICP, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, Administrative Aide

Operating Cautions Wise in View of UN Action in Korea. Remember our self-imposed Code of Precautions some ten years ago before we had entered the war? We were careful to limit our on-the-air discussions to amateur equipment and technique, hobby and personal matters. Even minor infractions of FCC rules and lapses of good sense can be damaging to ourselves and to amateur radio in general when there is a tense international situation. It is always important that the general tone of our amateur work be entirely above suspicion, that we watch our own bands like a hawk for any possible sign of radio activity that does not belong in our bands — subversive or otherwise — and that we report such things promptly to the Field Engineering and Monitoring Division of the FCC for investigation. Self-restraint, keeping lips buttoned, questioning and curtailing any use of amateur stations by strangers, all these things will pay us dividends.

If we are smart we will add to the strength of amateur radio by becoming interested in the use of our facility for possible civil defense communications, and in our operating will be alert to become the eyes and ears for Uncle Sam, and will advise and by example encourage brother amateurs not in such activities to help and shoulder some constructive responsibility in the name of the amateur radio service! Our traditional position of trust because of past exercise of common sense and foresight as individuals is *not* being let down at this time; that is not why we write. However, it does seem timely, while political conflicts continue between the communist and the free world, to give some reminder of the conditions under which we operate. A copy of the North Bay Amateur Radio Association (Vallejo, Calif.) *News* just at hand gives a good example of proper operating restraint. Let us pass along some excerpts from W6WXU's remarks:

> In W6BPC's shack found a covey of cute quail with their chins on his shoulders while he tried to locate their husbands via a KH6. . . . It would have been simple if he had been willing to tell the KH6 the name of their ship but in spite of the tearful entreaties of the fair ones this he steadfastly refused to do so. It pays to do your own censoring, not only of traffic accepted but of your own rag chewing. . . . Even though doing a worth-while service for families in the Armed Forces *use extreme caution* about revealing ship movements, equipment, production, etc. . . .

Sign each transmission with your assigned call . . . do not permit unlicensed operators to use equipment; contact no unlicensed stations; follow each FCC regulation with utmost care; do not discuss any happenings that might have *military intelligence significance* when the bits and pieces are added together. Limit amateur discussions to our radio technique and personal matters at the same time you contribute all you can to the handling of morale-useful traffic to trainees, the readying of mobile equipment and registration with ECs for participation in civil defense plans.

29.6–29.7 Mc. for Mobiles. Coöperation is again requested of the operators of fixed-station amateur equipment who use "ten" in keeping clear of the 29.6–29.7 Mc. section of the band to facilitate its use by mobiles. The ARRL Board of Directors has urged that 29.6–29.7 Mc. be considered a region where mobiles are given full consideration. For all other than the mobiles to keep clear will facilitate the tests of such equipment and its full utilization by mobiles in AEC and civil defense groups.

ARL-Check Messages for Holiday Use. More than 60 ARL-check messages are given on the reverse of the yellow number-sheet in the back of each ARRL logbook and a radiogram request for CD Form 3 will bring you the same list gratis, if desired. Besides prepared-text sections for emergency traffic, some are suited to Thanksgiving and Christmas holiday use to simplify message writing and facilitate the handling problem at these times. ARL? asks any ham if he has the standard text list. "C" or "ARL" indicates reply in the affirmative, and readiness for the message. ARL is sent in the check of the message to show that the text is from this list of abbreviated messages. See a full correct example of use of such messages on page 12, of the booklet *Operating an Amateur Radio Station.*

The 1950 Sweepstakes. The annual "SS" is scheduled for the week ends of Nov. 18th and 25th . . . full announcement elsewhere in this issue. It was our pleasure over 20 years ago (Jan., 1930, *QST*) to announce the first SS. This radio operating activity became an instant success. The name is taken from a 1652 custom of the Dutch in hoisting brooms symbolic of victory to show that their ships had "swept the seas." Prizes in any contest are "stakes" and our early winners' certificates carried this victory symbol. The *first* SS contest ran for 12 days while the present test has been reduced to just 40 hours of two week ends. The Sweepstakes is not a gamble; results in the way of operating pleasure and a true test of your station and operating ability are

assured if you take part. There's opportunity to advance the cause of working all sections and making WAS, and you can use 'phone or c.w. as you wish. Happy hunting in the annual SS.

— *F.E.H.*

CODE-PROFICIENCY AWARDS

Have you received an ARRL Code Proficiency Certificate yet? Twice each month special transmissions are made to enable you to qualify for the award. The next qualifying run from W1AW/WØTQD will be made on November 16th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 1887, 3555, 7215, 14,100, 28,060, 52,000 and 146,000 kc. WØTQD will transmit on 3534 kc. The next qualifying run *from W6OWP* only will be transmitted on November 4th at 2100 PST on 3590 and 7248 kc.

Any person may 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 five speeds transmitted, 15 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, Monday through Friday, at 2130 EST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. To get sending practice hook up your own key and buzzer and attempt to send in step with W1AW.

Date	Subject of Practice Text from September *QST*
Nov. 1st:	*Crystal-Controlled Converters* . . . , p. 11
Nov. 3rd:	*Crystal-Controlled Converters* . . . , p. 13
Nov. 4th:	Qualifying Run, 2100 PST, from W6OWP only
Nov. 7th:	*The "Mountaineer"* . . . , p. 17
Nov. 9th:	*A Two-Control VFO Rig* . . . , p. 29
Nov. 13th:	*A Two-Control VFO Rig* . . . , p. 31
Nov. 15th:	*Safety and Convenience in Transmitters*, p. 34
Nov. 16th:	Qualifying Run, 2130 EST, W1AW, WØTQD
Nov. 21st:	*On the Air with Single Sideband*, p. 37
Nov. 24th:	*A Dual-Crystal "Q5-er,"* p. 38
Nov. 27th:	*Working DX*, p. 40
Nov. 30th:	*Push-Button Power Control Circuits*, p. 44

W1AW OPERATING SCHEDULE

(*All Times Given are Eastern Standard Time*)

Operating-Visiting hours:

Monday through Friday: 1500–0300 (following day)
Saturday: 1900–0230 (Sunday)
Sunday: 1430–2200

W1AW will be closed from 0300 November 23rd to 1500 November 24th in observance of Thanksgiving Day.

General Operation: Refer to page 61, September, 1950, *QST*, for a chart showing W1AW general operation. This schedule is still in effect and is not reproduced herewith for space considerations. Mimeographed complete master schedules of all W1AW operation in EST, CST, MST, PST or GCT are available upon request.

On Saturdays and Sundays during which official ARRL activities are being conducted, W1AW will forego general-contact schedules in favor of participation in the activity concerned.

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

Frequencies:

C.W. — 1887, 3555, 7215, 14,100, 28,060, 52,000, 146,000 kc.

'Phone — 1887, 3950, 14,280, 29,000, 52,000, 146,000 kc.

Times:

Sunday through Friday, 2000 by c.w., 2100 by 'phone.
Monday through Saturday, 2330 by 'phone, 2400 by c.w.

Code-Proficiency Program: Practice transmissions are made on the above-listed c.w. frequencies, starting at 2130, Monday through Friday. Speeds are 9, 13, 18, 25 and 35 w.p.m. on Monday, Wednesday and Friday, and 15, 20, 25, 30 and 35 w.p.m. on Tuesday and Thursday. Approximately ten minutes of practice is given at each speed. Next certificate qualifying run from W1AW and WØTQD is scheduled for November 16th; from W6OWP, November 4th.

COUNTRIES-LIST CHANGES

From time to time, changes are made in the ARRL Postwar Countries List, with announcement of such changes appearing in *QST*. We are pleased to announce the following revision: New Amsterdam Island, FB8, is now grouped with Kerguelen Islands, FB8. This is the first Countries List revision since the complete list appeared on page 40 of February, 1950, *QST*. Make this change on your Postwar Countries List and watch the Operating News section of *QST* for further information on the Countries List and DXCC.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....236	G2PL.....226	W6ENV....223
W8HGW.....230	W2BXA....225	WØYXO....220
W6VFR.....229	W6EBG....224	W3GHD....220
	W3BES.....224	

RADIOTELEPHONE

W1FH.....195	VQ4ERR...181	W2BXA....172
XE1AC.....186	W8HGW....178	W9RBI.... 170
W6DI.....181	LU6AJ.....176	W1JCX.....170
	PY2CK.....176	

From August 15 to September 15, 1950, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued to the amateurs listed below.

NEW MEMBERS

W2IYO.....201	W2MLO....104	W5IIP.....101
PY1GJ.....178	W5JUF.....104	W5KWY....101
W6KEV.....156	W2TSL.....104	W4GHP....101
W5LVD.....142	I1NU.....103	G5IV.....100
VE7ZZ.....117	W6RJU.....103	W5NW.....100
VK5FM.....112	I1UB.....103	VE5QZ.....100
G4FN.....112	W3KMS....103	W8HRC....100
W8BNA.....107	G8ON.....103	ZS6OW.....100
W4EPA.....106	W2PXR....103	W1LQO....100
W6NGA.....106	W2ATE....101	W6CAE....100
W2AZS.....106	I1ADX.....101	W2HZN....100
W4DXI.....106	W7KSA.....101	W4BGO....100
W1LQ.....106	W4IKL.....101	

RADIOTELEPHONE

TI2RC.....143	W2SGX....110	I1AXD.....101
W4DCR.....128	ZS5CU.....108	OE5YL.....100
W5LFC.....121	ZS5GU.....108	ZS2IW.....100
TI2EV.....114	W5JUF.....101	LU4MG....100
W6GVM.....112	W5HFQ....101	

ENDORSEMENTS

W3CPV.....218	W5KUC....170	W9CYT....125
W8NBK.....212	W8DMD...170	W2PJM....125
W6AM.....210	W6VE.....170	I1BEY.....125
W3EVW.....210	KH6QH....168	W6KYT....124
W6ZCY.....201	W1LOP.....165	W2QKJ.....124
W3OCU.....195	W2CNT....162	IS1AHK....123
W2AGO.....192	W8FJN.....161	G3CBN.....120
W6TS.....190	W4LZF.....160	W5KUJ....120
VE4RO.....190	HK3CK....151	CX1BZ.....120
W6SRU.....182	ZS6BW.....151	W8NJC.....120
W2UFT.....181	W2UEI.....150	W8LAV.....120
PY2CK.....181	W1DX.....150	W2RQH....120
W8DX.....181	KH6LG.....144	G3COJ.....120
VK2NS.....180	I1AJV.....146	PA0CB.....120
W2WZ.....180	W8WWU...141	W2TUD....113
W2JVU.....176	W2CTO....135	W3MNO....112
W3KQF.....175	ZS6A.....134	W9NZZ.....111
W3JKO.....172	W4AZK.....131	W6NIG.....110
W2CSO.....171	KH6PY....131	W6KYV....110
PY1AHL 170	ZS5CU.....125	G3DOG.....110

RADIOTELEPHONE

ZS6BW.....141	W6MBD....132	W6AM.....120
ZL2GX.....140	W2ZX.....120	YV5AB.....120
W3BES.....133	W2QKJ.....120	ZS1DO.....112
	I1YJ.....120	

There are times when, in our desire to create a good impression, we are wont to paint such an optimistic picture of our abilities that the letdown when we come down to earth for an actual trial is terrific. Some AEC organizers have a tendency in this direction. As one commenting amateur put it recently, "The pen in this area is far ahead of the soldering iron."

Call it wishful thinking, "glory seeking," or what you will, the fact remains that we often make the error, in our desire to impress, of claiming we can do more than we actually can do, and even of setting up drills and simulated tests to *prove* what we can do when there is some doubt about what would happen if the simulated circumstances were not preannounced. Some ECs have conducted entirely unannounced simulated emergency drills. Usually, however, at least the date and time of the test are preannounced, and in some cases even the circumstances to be assumed. This helps to get more hams out for the test — but it doesn't necessarily serve as a measure of participation in a real emergency. On the other hand, if you "spring something" on the boys, the participation will probably be *lower* than in an actual emergency. The average of the two might give you an indication of how much you could expect in the real thing. Better to build your plans around that number than the number who turn out for preannounced drills, most of which are planned to meet the majority convenience. Old Man Disaster is not a respecter of convenience.

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Several hurricanes made passes along our Atlantic and Gulf coasts in August and September and were the cause of amateur groups alerting for possible emergency work and in some cases actually engaging in same. The first report in our file comes from W3PTZ, assistant NCS of Traffic Exchange Net (TXN), who received word of a hurricane alert for his area on August 19th. That night TXN was alerted on 7230 kc. for possible emergency traffic and stood by while the course of the hurricane was tracked by W3PTZ, who kept in touch with the Weather Bureau. Later, when it appeared that there was no immediate danger, the net was secured with instructions to report back at 0800 Sunday. On Sunday morning band conditions were very unfavorable and much difficulty was experienced in establishing communication, but from 0800 Sunday until 1315, TXN stood by on alert until it was finally determined that there was no danger. "They also serve who sit and wait." Those who participated were W3PTZ, W4KOR, W5NG, W9EBX, W9YTZ, W9ZVF, and VE3IA.

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In late August, Mississippi's Magnolia Net was alerted for possible service as a hurricane threatened but never quite developed. The net was alerted on August 30th at 1300 and remained on guard until all danger had passed. SCM W5DLA reported his pleasure at being a part of the coordinated amateur-police-fire-state highway-Red Cross-Navy disaster set-up in Gulfport, where all these services were centered for complete integration of facilities and personnel. Those participating in the Magnolia Net alert were W5s ANP AVO BSR CUU DEJ DLA ECT FFF FGE FPE FSS GIA GTJ IBO IHP ITL IVS KTE KYC LN LPG MUG NIQ NRW NTG PAF QMQ QOP WZ, W4s AOK CNK FMI OCN RTM.

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Hurricanes are an old story to the boys in Florida, and their several nets are always set up for them, especially in the late summer. Consequently, when one comes along the turnout of amateurs in Florida and vicinity is terrific, as witness the following report by W4FWZ, E. Fla. SCM:

"'Wandering Willie,' the truculent hurricane that wandered around Florida's west coast during the 3rd, 4th, 5th and 6th of September with devastating results at Cedar Keys and doing considerable damage to Gulf-edge properties brought out 171 stations logged plus innumerable stations doing a splendid job of chasing QRM from the net spots. The Florida Emergency 'Phone Net on 3910 kc. had 171 stations logged and reported by others. The Gator Net on 729 kc. received QNIs from 40 stations and the North East Florida 28-Mc. Emergency Net on 29,080 kc. reported 29 stations. The main activities were gathering weather reports for state and local hurricane weather bureaus as well as for Naval, Army, and CAA stations. W4JIP was again the official broadcast station for the Miami Weather Bureau with Chief Norton of the Bureau personally making most of the broadcasts for retransmission by any interested standard b.c. station. W4AVQ and W4LEP handled the recorded retransmissions.

"On 3910 the following stations were logged by the Eastern Florida SCM or reported to him by W4HWA: W4s AAY AFO AIS AKA AKI AOK AVQ AYP AYV AYX BB BI BOL BRM BYY CGE CJE CPG CRA DAQ DQA DQW DU DVR DZH EFG ERT FJU FS FWZ GAC GEJ GGJ GUJ GXL GZV HGO HKA HPY HUY HWA HYX IMJ IQV IYO JEP JIP JKI JLI JM JQ JV JWG JZV KHI KIX KIZ KJ KM KT KTN KTW LEP LJM LMT LT LTE LXC MBM MBR MCA MEP MFY MJU MNT NAK NEK NKD NMG NN NQP NQY NZX OCL ONF OVE OVO PEI PHL PJW PZC SY WS K4NAP K4NAR W3BHK. On 7290 we had W4s AKV ATF AYV BI BQO BYR COB DES FWI FWZ FXM GEE GXW HKI IE IEK IYT KCR KIX KIN LCF MNT NAA NVU OCQ OZC PMN RKG ZC W2CSD W3LTW W3PZA W3UF W8EIV W9EBX W9ZVF K4WBG VE3IA. On 29,080 we had W4s AKV DLL DRM EEQ EFB EGC EOF LCG LZM NFC OBB PJW PNA POF POZ PTC PUW QAS QCB QCP QCU RIA RTJ KZ5WJ KZ5AC KZ5NM KZ5PC W3UF."

— *W4FWZ, SCM E. Fla.*

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"Official Mobile Unit" cards have been requisitioned by ECs and SECs to the extent that we have just had to order a reprint. It is gratifying to know that mobile units in these numbers (over 5000 cards have been issued to ECs already) are available for receipt of these cards. We hope that ECs are issuing them discreetly, not indiscriminately to anyone who requests them.

The supply of "Emergency Radio Unit" cards (see cut) is holding out somewhat better, since our initial supply of these was larger. These are issued by the EC along with "Official Mobile Unit" cards, and are also available to any AEC member who possesses a composite unit capable of being carried about and operating off either batteries or a.c. — or any other kind of unit the EC deems worthy the term "Emergency Radio Unit." For mobile use, these cards can be mounted behind the windshield or back window of a car, where state laws permit this, over the windshield on the outside, or above license plates for ready identification on emergency assignment. Or, they can be used on any station set up to do emergency duty at the discretion of the EC. These cards have many uses. If you think any part of your station equipment merits having one of these stuck on it,

EMERGENCY RADIO UNIT

Registered with the American Radio Relay League Emergency Corps

in the Public Interest

apply to your EC for one or more. ECs: Do not issue these cards except to units you have personally inspected and judge to be of such versatility as to merit the term "Emergency Radio Unit."

MOUNT SHASTA HAMFEST

A strange title for an item on the emergency page of *QST*? Not at all. For little did the Hamfest Committee of the Mt. Shasta Amateur Radio Club realize, when making their plans, that fate had in store for them an emergency activity much more serious and impressive than the emphasis they had already planned to put on emergency units and mobiles at the hamfest. And by the time it was all over, the Mt. Shasta boys were able to boast that this year's was the "hottest" hamfest ever!

As it was, the disastrous fire which threatened to devastate the town of Mt. Shasta, in the heart of "the Shasta Wonderland," did not arrive on the scene early enough to spoil the hamfest, and provided an event which will be long remembered by all who attended. The mimeographed program had a note at the bottom which said: "This program is subject to change due to circumstances beyond our control." And change it did, through a circumstance which for a time *was* beyond control, but which attending amateurs assisted immeasurably in bringing into control before disastrous damage had been done.

The fire was first noted on Saturday (Sept. 2nd), when the hamfest program was in full swing, but seemed to be fully under control, and not much attention was paid to it. By Sunday morning, however, the blaze was out of control and racing toward City Park. Worse than that, flaming pine cones were being blown into the air by wind and draft to land and set spot fires in still-unburned sections. The hamfest program was discontinued and preparations were made to assist in the fire fighting by setting up antennae and making arrangements for a communications set-up. About this time, however, the fire chief ordered the entire area evacuated.

Undaunted, the hams set up a central communications control on the lawn of Mt. Shasta's city hall, using the club's call W6BML, and equipment purchased by the Red Cross for the club for just such emergency use. Mobiles, which were plentiful, were assigned to the fire chief, to the various fire-fighting crews throughout the area, and to the police department. The Red Cross stood by but was not needed, since there were no accidents to speak of.

As flaming pine cones dropped to start new fires, mobile units would quickly spot them and crews were summoned to extinguish them before they spread. Two spot fires located near oil and gas storage plants were reported by amateur mobiles and put out before they became dangerous. The work of amateur units as directed by W6BML/6 and W6YNM/6 on the lawn of City Hall enabled contact to be effected with various strategic points about the city, with the local radio station, and even with the Dunsmuir Fire Department. It was simply a matter of dispatching a mobile unit to the desired spot.

Brother, that fire didn't have a chance. Mobiles were already on hand from all over California and Oregon, not only ready but eager to go into action to supplement the already-existing plan for emergency communication. The hamfest facilities for dispensing food and drink were placed at the disposal of the firefighters, principally through the efforts of the XYL contingent. Twenty-two mobiles, some on 75 meters but mostly on 10, saw action during the fracas. By 5 P.M. the fire was under control, a circumstance which would have been impossible, as readily admitted by the fire chief, without the invaluable aid rendered by the amateurs, and everybody returned to the hamfest program to continue where they left off and to talk things over.

♦

A brief let-up in activity gives the operators at W6BML/6 a chance to down some chow made available by the Mt. Shasta Hamfest food committee. Members of the Mt. Shasta Amateur Radio Club and visitors to the Mt. Shasta Hamfest set up an emergency station at City Hall to direct mobiles supplying communications for the firefighters. W6OMR is here shown doing the operating while W7AMF (*left*) talks things over with the Assistant Fire Chief. (*Photo by Frank L. Scott*)

It is impossible to detail here all the incidents which took place during the height of the fire emergency. It is likewise impossible to mention the calls of everyone of the 400-odd people in attendance at the hamfest who assisted. The mobiles mentioned in the various reports received include: W6s AK CSS EJY FKI FYY GGC GOS PNY RL WGM WVS YNM YSK ZIO W7s GNJ/HHH HHQ KTG KZU LEU LWW LYT. An interesting sidelight: W6GOS was operating the complete mobile equipment he won at last year's Mt. Shasta Hamfest. Other amateurs who participated in one way or another include: W6s ABX ARR BDU BPT CAT CCJ CCY CFU CIS DDC EJA ELW EWG GOO GPV GUA HPL IEO ILY IXC IXF IZC MDQ NYS OBJ OJB OMR SXF YPV YPW W7s AMF BDU JHF MSW.

W6TDW/RAILROAD MOBILE

While conducting some v.h.f. railroad tests on one of the Western railroads recently, W6TDW operated mobile railroad on 3.9-Mc. 'phone. This may be the first time that this has been done. During the course of the run from Oroville to Salt Lake City a TBS-50 was used on the caboose in motion and several contacts were made. One QSO was made on 28 Mc. from the train to a maritime-mobile station located off the coast of Cuba.

'PHONE NET BULLETINS

There can be no doubt that present world conditions have increased the interest in civilian defense to a point past that of World War II. Amateur radio will and must play an important part in all defense planning. Amateurs have always been willing and eager to serve the public in whatever way they could. Preparedness is so important a subject that one cannot say too much about it.

'Phone operation in traffic handling has grown to much larger proportions than ever and with mobile operation constantly on the increase, it will grow more important as time goes on. Both fixed and mobile 'phone stations will have their work cut out for them in civilian defense, so careful planning is in order.

ARRL has listed all 'phone nets and, wherever possible, given as much organizational help as possible. If you are the net control station of a 'phone net or are planning on organizing one, a message to Headquarters will put you on the list to receive periodic bulletins. These bulletins discuss all the problems associated with net organization, traffic handling, message form, and also serve as an exchange point for ideas. Preparedness is the watchword; if you don't have the tools, you cannot do the job.

CODE PRACTICE PROGRAM

The following amateurs are transmitting code practice in the ARRL Code Practice Program:

W1RNN, Frank Jackson, 160 Lockwood St., Providence, R. I. 28.98 Mc., Mon., Wed., 2200–2230 EST.

W2BIV, M. J. Billings, 2114 Albemarle Rd., Brooklyn 26, N.Y.C. 29.4 Mc., Mon., Wed. 2300 EST.

WØSEF, Harold Lantow, Persia, Iowa. 3560 kc., Mon. through Fri., 2030 CST.

WØFDS, Forrest Bryant, 6840 Harriet Ave. So., Minneapolis, Minn. 29.3 Mc., Wed., Fri., 2000 CST.

Additional volunteers are needed to send code practice by radio. Schedules may be arranged to suit your convenience. Suggestions for conducting code lessons are available from the Communications Department. While 28-Mc. code practice is encouraged by ARRL, a limited number of lower-frequency stations will be acceptable. Drop us a postal indicating your interest and we'll send details.

TRAFFIC TOPICS

Seems like we forgot to summarize the six-month traffic record, which we could have done in September *QST*. Better late than never, so here are the standings, both for 1950 and for the complete postwar period up to the end of June, 1950. The figures in parentheses are BPL points (four points for making the BPL plus 1 point for each 100 points in the BPL traffic total):

1950	*Postwar*
W7CZY (178)	W7CZY (519)
W6CE (172)	W6CE (502)
W3CUL (121)	W4PL (449)
WØZJO (108)	W7CKT (335)
KG6DI (82)	W2TYU (250)
W5LSN (60)	W6REB (243)
W6JZ (53)	WØHMM (243)
WØHMM (52)	W5GZU (240)
W2CDQ (48)	W6FDR (213)
W5GZU (47)	WØZJO (209)

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We think it fitting that we should record in this column the untimely passing of Arnold Pincus, KZ5PA, RM of the Canal Zone section. Pinky was the Canal Zone's most active trafficker, and a real friend of traffic-handlers everywhere. He started operating from the Isthmus in 1932 and kept many schedules, one of which was with W1MK. He has been active in handling traffic for many expeditions, and took the key rôle for C.Z. in the last Governors-to-President relay (see picture, p. 49, April, 1949, *QST*). Pinky's sudden death, immediately following his participation in a tennis match, has left the C.Z. amateurs and his many friends in the States completely stunned. SCM KZ5AW says he "can't see how we are going to get along without him."

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History is repeating itself all too rapidly these days to suit most of us. Today, as a little under ten years ago, our military training camps are filling up with recruits, many of whom would welcome an opportunity to communicate with the folks back home. We amateurs who make traffic handling our main interest in amateur radio can do much to fulfill this demand and thus greatly enhance the morale of our brothers in the services. Some of us are already doing it. More of us should. How much more worthwhile a service to handle traffic for the boys in the service than the trashy fair and exhibit traffic which at times crowds our traffic lanes these days!

If you are located near a training camp, you might do well to investigate the possibility of establishing message originating points at various unit headquarters, or at Red Cross, U.S.O. and officers' and enlisted men's clubs. If you are in the services and stationed at a camp in which an amateur station has been established, you could help out by spending part of your spare time (if any) in operating that station in the traffic nets to clear traffic for all points.

Along the lines of the above, we'd like to take this opportunity to doff our hats to Clark Cox, KG6DI, and the personnel of the NGAFB Amateur Radio Club, KG6FAA, for their splendid work in handling traffic for military personnel in the Pacific and Far East. Much of this traffic comes from soldiers, sailors and airmen who were wounded in the Korean fighting and are on their way back to the States for treatment. Give it the fastest possible handling, gang. It's the kind of traffic we want.

Reliable routes are also needed to and from GI Germany. Who can handle this traffic, and how do we get it to you?

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Amateurs on 40 meters in midwestern states who are interested in traffic handling might find an opening in the Traffic Exchange Net (TXN). WØWAP would especially welcome participants in Minnesota, Nebraska, Wisconsin, Iowa, South Dakota and Texas. TXN operates on 7230 kc. at 1900 CST Monday through Friday.

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Elsewhere on these pages will be found the first installment of the Net Directory, consisting of registrations received up to Sept. 15th, our copy deadline. Additional registrations are coming in every day, and all received up to November 15th not included herewith will be contained in a supplementary list in January *QST*. If your net is not included, it simply means that it had not yet been registered up to Sept. 15th. See September *QST*, p. 60, for a list of information we would like to have for registration — or write us for a net registration card.

The cross-indexed mimeographed net directory will be a complete compilation of all nets registered up to December 1st, or thereabouts, and will be sent out with an Emergency and Traffic Bulletin early in December, if present plans crystallize. Past experience has indicated that not until about the first of December are all nets registered, which makes the earlier issuance of a complete net directory impractical.

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It is perhaps worthy of note that the Mid-Cities Amateur Radio Club of Compton, Calif., operating under the call of W6GAL/6, included a radio teletypewriter in its Field Day equipment. Use of this portable teletypewriter enabled the station to make BPL in what is believed to be the first instance in which anyone made BPL by radioteletype. Any challengers?

NET DIRECTORY

The following nets have been registered with ARRL Headquarters up to and including September 20, 1950. A list of nets registered subsequent to that date will appear in January *QST*. If your net is not listed below please send us the registration data requested on page 60, Sept., 1950, *QST*. Registration cards are available from ARRL Headquarters upon request.

Name of Net	*Freq.*	*Time*	*Days*
Alabama Emergency Net (AENP)	3955	1830 CST	Daily
Amateur Emergency Corps Net (AECN)	3930	2200 EST	Thurs.
Arizona Net (AZN)	3515	2000 MST	Mon.–Fri.
Arkansas Emerg. 'Phone Net	3885	0500 CST	Mon.
Atlantic Pacific Trunk Line (TLAP)	3630	2130 EST	Mon.–Fri.
Badger Emergency Net (BEN)	3950	1800 CST	Daily
Buzzards' Roost Net (Mich.)	3930	1730 EST	Mon.–Fri.
Eastern Area Net (EAN)	3705	2030 EST	Mon.–Fri.
Colo. Emerg. 'Phone Net	3890	0830 MST	Sun.
		1730 MST	Tues., Thurs.
Colo. Slow-Speed Net	3560	2030 MST	Mon.–Fri.
Davidson County Emerg. Net (Tenn.)	29,000	1900 CST	Sun., Wed.
Delta 75 'Phone Net	3905	0730 CST	Sun.
Early Bird Transcontinental Net	3865	0445 CST	Mon., Wed., Fri.
Eastern Penna. Net (EPA)	3610	1830 EST	Mon.–Fri.
Eastern Pa. 'Phone Net	28,900	1100 EST	Sun.
Eastern Shuttle Net (ESN)	7120	1030 EST	Mon.–Sat.
	7280	1030 EST	Sun.
	7280	1900 EST	Sat., Sun.
Eighth Regional Net (8RN)	3530	1945 EST	Mon.–Fri.
		2130 EST	
Fifth Regional Net (RN5)	3645	1945 EST	Mon.–Fri.
		2130 EST	
First Regional Net (1RN)	3610	1945 EST	Mon.–Fri.
		2130 EST	
Fourth Regional Net (4RN)	3615	1945 EST	Mon.–Fri.
Gloucester County Emerg. Net (GCEN)	29,120	2300 EST	Sun.
(N. J.)	146,100	1900 EST	Mon.
Gulf Coast Emerg. Net	29,600	2000 CST	Mon.
		2100 CST	Tues.–Fri.
Hit & Bounce Net	7150	0600 CST	Daily
	7200	0045 CST	Daily
Illinois C.W. Net (ILN)	3515	1845 CST	Mon.–Fri.
Illinois Emerg. Net (IEN)	3940	1900 CST	Sun.
Indiana 'Phone Net (HEN)	3905	1830 CST	Mon.–Fri.
		0900 CST	Sun.
Interstate Utility Net (IUN)	3550	1900 MST	Mon.–Fri.
Iowa 75 'Phone Emerg. Net	3970	1230 CST	Mon.–Sat.
Lake Erie Network	29,050	2130 EST	Sun.
Magnolia Net (Miss.)	3870	1930 CST	Wed.
Maine AEC Net	3588	1845 EST	Tues., Thurs.
Manitoba ARRL 'Phone Net	3760	1900 CST	Daily
Maritime Net	3830	1900 AST	Tues.
McKean County Emerg. Net (Pa.)	3525	0900 EST	Sun.
Md.-Del.-D.C. Net (MDD)	3650	1930 EST	Mon.–Fri.
Mercer Emerg. Net (N. J.)	145,900	2000 EST	Thurs.

Missouri Emerg. Net.....	3905	1930 CST	Thurs.
Missouri State Net (MON)	3580	1900 CST	Mon.-Fri.
Montana 'Phone Net.....	3995	1900 MST	Mon., Wed., Fri.
Montana State Net (MSN)	3520	2000 MST	Sun., Tues., Thurs.
Nebr. 160 Emerg. Net....	1995	1615 CST	Mon.-Fri.
Nebr. 75-Meter Emerg. Net	3983	1230 CST	Mon.-Sat.
		2000 CST	Tues., Thurs.
		0930 CST	Sun.
New Hamp. Emerg. Net (NHEN).....	3685	1830 EST	Fri.
	3890	1100 EST	Sun.
N. J. 75 Meter 'Phone Net	3900	0900 EST	Sun.
New York State Net (NYS)	3720	1900 EST	Mon.-Sat.
		2200 EST	
N. Y. State Slow-Speed Net (NYSS).....	3720	2000 EST	Mon.-Fri.
Newport Emerg. Net (R. I.)	28,900	2000 EST	Thurs.
Ninth Regional Net (9RN)	3565	1945 EST	Mon.-Sat.
No. Dakota Section Net...	1900	1900 CST	Mon., Wed., Fri.
	3670		
	3860		
No. Jersey Mobile Radio Club.....	29,400	1700 EST	Mon.-Fri.
North Texas Net (NTX)..	3657	1900 EST	Mon., Wed., Fri.
No. Tex. Section C.W. Emerg. Net (NTS).....	3830	0800 CST	Sun.
North West Texas Emerg. Net.....	3950	0800 CST	Sun.
Northern Alaska Emerg. Net.....	3892	0200 PST	Mon.-Fri.
Northern Emerg. Net (NEN) (N. Y.).....	3700	1145 EST	Sun.
Northern Net (B. C. and Alaska).....	3780	1930 PST	Daily
No. New Jersey Net (NNJ)	3630	1900 EST	Mon.-Sat.
No. N. J. Training Net (NJS).....	3630	1930 EST	Mon.-Fri.
Northland Net (Minn.)....	1910	2100 CST	Mon.-Fri.
Ohio Buckeye Net (BN)...	3730	1900 EST	Mon.-Fri.
Ohio Emergency Corps (OEC).....	3725	2030 EST	Mon.
Ohio Emergency Net.....	1815	2000 EST	Mon.
Ohio Emergency Net.....	3860	1830 EST	Thurs.
Ohio River Valley Net....	3860	0800 EST	Sun.
Okla. 'Phone Emerg. Net..	3860	0800 CST	Sun.
Oklahoma Traffic Net (OLZ).....	3682	1900 CST	Mon.-Sat.
Ontario 40 C.W. Net (QON).....	7267	1930 EST	Daily
Orange County Net (N. Y.)	145,645	1600 EST	Mon., Tues.
Oregon Emergency Net....	3865	1900 PST	Daily
		2000 PST	
		2100 PST	
Oregon Slow-Speed Net (OSN).....	3585	1930 PST	Mon., Wed., Fri.
	7170	1900 PST	
Ozark Net (Ark.).....	3695	1900 CST	Mon.-Fri.
Pelican Net (La.).....	3870	1930 CST	Thurs.
Petticoat Net (PCN).....	7200	1400 EST	Mon., Wed., Fri.
Pine Tree Net (PTN) (Me.)	3550	1900 EST	Mon., Wed., Fri.
Polecat Net (PCN) (Pa.)..	3665	1130 EST	Sun.
Potomac-Rappahannock Valley Net (PRVN)....	3935	0900 EST	Sun.
	146,800		
Quebec Net (PQN).....	3570	1900 EST	Mon.-Fri.
		2200 EST	Mon.-Fri.
Rebel Net.....	3635	1900 CST	Mon.-Fri.
Rhode Island Net.....	3540	1900 EST	Mon.-Fri.
River Forecast Net (RFN) (Ind.).....	3656	0700 CST	1st Sun. ea. Mo.
Sacramento Emerg. Net (Calif.).....	146,500	2000 PST	Thurs.
San Diego Section Net (SSN).....	3560	2000 PST	Mon.-Fri.
Sea Gull Net (Me.).....	3961	1700 EST	Mon.-Fri.
Second Regional Net (2RN)	3690	1945 EST	Mon.-Fri.
Show-Me Net (Mo.).....	7272	1600 CST	Sun.
Sixth Regional Net (RN6)	3725	1900 PST	Daily
		2150 PST	
So. Carolina C.W. Net (SCN).....	3525	1900 EST	Mon.-Fri.
So. Dakota State Net (SD)	3720	1900 CST	Mon., Wed., Fri.
Springfield Area Net (Mo.)	3995	0800 CST	Alt. Sun.
Susquehanna Emerg. Net (SEN).....	3910	0800 EST	2nd & 4th Sun.
Swing-Shift Net (SSN).....	7280	1230 EST	Mon.-Sat.
		1830 EST	Mon.-Fri.
Tall Corn Net (TLCN)....	3560	1845 CST	Mon.-Fri.
Tar Heel 'Phone Net (N. C.)	3865	1930 EST	Mon.-Fri.
Tennessee 'Phone Net.....	3980	0800 CST	Sun.
		1900 CST	Tues., Thurs.
Tennessee Section Net....	3737	1900 CST	Mon.-Fri.
Tenn. Slow-Speed Net....	3737	2015 CST	Mon.-Fri.
Tenth Regional Net.....	3735	1945 CST	Mon.-Fri.
		2130 CST	
Third Regional Net (3RN)	3590	1945 EST	Mon.-Fri.
		2130 EST	
Thirteenth Regional Net (TRN).....	3675	1945 EST	Mon.-Fri.
		2130 EST	Mon.-Fri.
Traffic Exchange Net (TXN).....	7230	1900 CST	Mon.-Fri.
Tri-States Net (Miss., Ark., La.).....	3870	2000 CST	Wed., Thurs.
Trunk Line J (TLJ).....	3635	1945 CST	Mon.-Sat.
Union County AEC Net (N. J.).....	146,700	2000 EST	Tues.
Upper Peninsula 'Phone Net (UPN) (Mich.).....	3930	1000 EST	Sun.
Vermont 'Phone Net.....	3860	0930 EST	Sun.
Virginia C.W. Net (VN)...	3680	1900 EST	Mon.-Fri.
		2200 EST	
Virginia 'Phone Net. (VFN)	3880	1930 EST	Mon.-Fri.
Wash. Amateur Radio Traffic System (WARTS)....	3970	1830 PST	Daily
Washington Section Net (WSN).....	3695	1900 PST	Mon.-Fri.
		2200 PST	
West Va. 'Phone Net.....	3890	1830 EST	Mon.-Fri.
Western Mass. Net (WMN)	3725	1900 EST	Mon.-Fri.
		2200 EST	
Western Mass. Slow-Speed Net (WMN).....	3725	1830 EST	Mon. & Fri.
W. Pa. Traffic Net (WPA)	3585	1900 EST	Mon.-Fri.
Westpark Radiops (Ohio)..	7290	2000 EST	Tues.
Wis. Slow Speed Net (WIN)	3625	1830 CST	Mon.-Fri.
Wis. State Net (WIN).....	3625	1900 CST	Mon.-Fri.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for August traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W7CZY	11	1876	1697	167	3751
W6CE	34	1769	1701	42	3546
W4PL	16	1046	918	107	2087
W9EBX	3	747	736	11	1497
W3CUL	47	740	496	124	1407
W6JZ	48	524	491	72	1135
KG6FAA	443	389	188	73	1093
W6DTW	25	461	461	15	962
WØAY	11	444	439	22	916
W7OQI	817	0	0	0	817
W6JN	700	0	0	0	700
W6BAM	8	270	390	10	678
W9BGN	18	329	168	153	668
W3UF *	35	260	295	30	620
W9DGA	155	235	164	64	618
W6GYH	30	276	98	178	582
KG6DI	272	138	123	0	533
WØZJO	9	253	157	96	515
W1QMJ	17	228	192	74	511
W9ESJ	21	245	180	65	511

The following made the BPL for 100 or more *origination-plus-deliveries:*

W6DEY/6	417	W7FIX	136	WØQXO	106
W7NZA/7	356	W2DRD	134	WØSCA	104
KR6DB	201	W6BGF	115	W8EZE/8*	100
W6LDR	159	W8AUJ	107		

A message total of 500 or more or 100 or more *origination-plus-deliveries* will put *you* in line for a place in the BPL. The Brass Pounders League is open to all operators who qualify for this monthly listing.

* July Traffic

SCM — AEC — ORS — CP — SEC — OBS — TLS — OO

Station Activities

OBS — AIOPR — EC — DXCC — CLUBS — RM — OPS — RCC

PAM — WIS — NETS — WAS

• 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, Jerry Mathis, W3BES — We regret to record the passing of a once very active ham, DNZ, of Lansdowne. EAN visited several hams in Florida, including the SCM of Eastern Florida, 4FWZ. PDJ has a new 28-Mc. mobile rig with 27 watts. Congratulations to PSW, who is engaged to be married. The Philadelphia Wireless Association's picnic came off very nicely. PST won a 304TL and a Silver wavemeter. QLI has given up 28-Mc. 'phone in favor of 7 Mc., where he is working some very good DX with 40 watts. He now has a 200-watt rig ready to go. The P.W.A. has its self-powered emergency rig in shape. ELI has a 50- and 144-Mc. receiver working. There was a dearth of reports this month and some of last month's arrived too late, so please send in some dope on your activity right after the first of each month. There are a lot of plans afoot for emergency communications. Get in touch with your local Emergency Coördinator for details. Meanwhile, make sure that any emergency gear you have access to is in operating condition. VR now is an OO and GRS is an ORS. PSH has a radio-controlled boat. QV built a 144-Mc. rig for the Jenkintown Red Cross emergency communications center. Traffic: W3CUL 1407, PDJ 14, CAU 3.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Eppa W. Darne, W3BWT — The Baltimore Amateur Radio Communications Society's new officers are KDV, pres.; BDY, vice-pres.; PSP, treas.; OMJ, secy. Meetings are held at 1714 Park Ave., Baltimore, on each first and third Monday. Its annual picnic was held Aug. 13th at Triton Beach, Md., with games, contests, and refreshments. Members brought picnic baskets and families. All had an excellent day of swimming and fun. Three prizes were awarded for the best mobile installations, also many valuable "door prizes." The Capitol Suburban Radio Club held its Aug. 3rd meeting at the home of MNR. Subject of the meeting was a "Bull Session" on the amateur's place in the present emergency. The Aug. 17th meeting was held at PZA, the American Red Cross National Headquarters disaster radio station. Members familiarized themselves with the station apparatus there. The Chesapeake Amateur Radio Club's meeting of Aug. 1st scheduled a "Symposium on Amateur Transmitter and Receiver Design," which was presided over by AFM and LXK. Subject for the Aug. 15 meeting was "Something Special." On Aug. 18th the Washington Mobile Radio Club held a drill, along with members of the mobile section of the Baltimore Amateur Radio Communications Society. Three nets were used, on different frequencies of the 28-Mc. band, and the combined drill was to demonstrate the communication possibilities by these groups between the two cities. The Washington Radio Club held its Annual Picnic-Hamboree on Aug. 20th at Meadowbrook Picnic Grounds, in Rock Creek Park. A prize awarded for the best mobile rig was won by EGI. Pony rides were enjoyed by the children, and many valuable "door prizes" were awarded to the lucky ticket holders, plus prizes for the youngsters. One of the events was a hidden transmitter hunt, with first prizes won by PPK on 28 Mc. and DZZ on 144 Mc. The YLs and XYLs held a cake-baking contest, which was won by an OM, PKN. Attendance was 150 hams and their families. The Potomac-Rappahannock Valley Net held its usual four drills in August, although one was hampered by bad conditions. Two net members, IZE and PZK, journeyed to North Carolina to provide the 144-Mc. stations contact with that State. Eight-element beams on 53-foot poles were employed. PYW reports completion of a radioteletype 144-Mc. net to New York. Plans are in progress for developing a PRVN manual of operations. The Veterans Radio Club of Baltimore has elected QXA, pres.; QCB, secy.; and Leo Roik, treas. The Club has a 60-watt rig on 28-Mc. 'phone, and the call OEU. They also operate on 14-Mc. 'phone. PLP is newly-appointed Official Observer, Class III. NIN is on 7 and 14 Mc. GEB is back on 14-Mc. c.w. and building a high-power final. IZL is building a new 3-band mobile rig, with 807W in final. EYX visited New England, Canada, and Niagara Falls during his vacation. LSX had more bad luck when her power supply burned up. NNX is back on after a vacation. LMC is active on the 144-Mc. radioteletype circuit, Washington to New York. PYW has a QTH 435 feet above sea level, and gets out well on 144 Mc. with his Brownie beam. CVE schedules 6BAM and ØDIC on 7 Mc. QCB is on 28-Mc. 'phone. PXC has antenna up again after it was damaged in storm, and is building new final. Traffic: (Aug.) W3PYW 87, PTZ 31, CVE 30, BWT 15, IZL 3. (July) W3UF 620.

SOUTHERN NEW JERSEY — SCM, Dr. Luther M. Mkitarian, W2ASG — The SJRA annual picnic was attended by more than 400. We extend our compliments to the committee for a job well done. UZV is operating mobile on 29 Mc. UKV has a brand-new Class A ticket and a brand-new rig. The N. J. State 'Phone Net (3900 kc., 0900 Sundays) has more than 45 active members. PFT, the NCS, wants a few more members from the southern counties. The C.R.C. Net (14.6 Mc., Mondays) has resumed fall activities. Now that summer vacations are over, let me have your monthly reports and other interesting news by the 1st of each month. Traffic: W2ZVW 46, PFT 30, ASG 15, HAZ 4.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — SEC: OMA. Gang, take notice of your new SEC. His job is tough and rugged and he needs everyone's coöperation, so let's give Walt a hearty welcome and congratulations on his new appointment. The Horseshoe Radio Club of Altoona sends its monthly *Hamateur News* along and the Amateurs Transmitters Assn. and the Steel City Amateur Radio Club get their reports in right on time. MTP will QSY to new QTH in Johnstown. OMY has the simplest antenna system yet. KWH was heard by your SCM on 28-Mc. 'phone. The 144-Mc. gang at the club station is going great guns. JSS has a new YL harmonic. Out Altoona way QPF is heard on 160 meters. QKE and KJU are on 144 Mc. Looks like TXQ will win the SS Contest this year by starting with a new VFO. LIV is heard on 144 Mc. Thanks, LJQ, for a nice paper. The Club Field Day total was 268 contacts for a score of 2637. GJY is going into the Army Signal Corps. AER says 14 Mc. is very dead, so he is taking a well-earned vacation in W1-Land. MLN is at State College teaching a course in TV. PPO operated MLN's rig while at school. State College station YA reports that LNW handled traffic while at Scout Camp with 48 messages. LTC, LNW, IYR, and 2YT operated 2YT/3 on Aug. 26–27 from Little Flat Mt. working 144 Mc. ODU promises activity this winter. Speaking of 144-Mc. activity, have you boys been reading the v.h.f. articles in *QST* by Ed Tilton? Have you paid particular attention to the aurora conditions that have occurred several times recently? Well, gang, there is a thrill if you haven't worked aurora and managed to get that DX on 144 Mc. Remember, when such a condition occurs, use c.w., 'phone operation is useless. Heard on 144 Mc. on these auroras are RUE, NKM, KWH, PGV, LNA, and GEG. Your SCM urges many of you to take advantage of the Official Experimental Station appointment. Let's get the v.h.f. going. Would like to see emergency nets and traffic nets going on 420, 144, and 50 Mc. Believe me, gang, it beats 28-Mc. ground wave contacts. Traffic: (Aug.) W3GJY 12, NCD 11, IYR 6, AER 5, YA 4. (July) W3GEG 214. (June) W3GEG 424.

CENTRAL DIVISION

ILLINOIS — SCM, Lloyd E. Hopkins, W9EVJ — Section Nets: IEN, 3940 kc.; ILN 3515 kc. FKV reports good contacts with his home town during his two-week vacation and many messages handled. A nice letter was received from LAX, who is new to our section and interested in traffic. IVN had a busy month visiting FKI and KJ, making WAC, and handling traffic from the *Bowdoin*. LCG, a new ham in Chicago, has a Collins 310B-1 exciter and HRO-7 receiver ready for action. The Vermilion County Amateur Radio Association reports its drive to recruit new members is meeting with success. UJ procured a new car and hopes for a mobile rig shortly. YXP is new EC for Vermilion County. IMX made the local paper with traffic handling from local auto accident. GMU is preparing for 3.85-Mc. 'phone operation. PZK went the way of most single men and tied the knot. KFI spent a week at home, vacationing from duties at K4WAG. FPD is working on 3.85-Mc. mobile job. NN is interested in Civilian Defense plans. YTZ regained his old call, ED, which call he held 31 years ago. JNC snagged nice DX like FA9, EA8, EA1, and UA9. The North Suburban Radio Club is planning wartime disaster set-up with a demonstration shortly. YIX is going VFO soon to keep from going broke buying crystals. UBP reports good DX on 14 Mc. KYO is a new ham in Geneva. NIU is spend-

ing most of his time working on his home. JMG snagged several new countries on 14-Mc. c.w. The Hamfesters Radio Club picnic was favored with excellent weather and hundreds of hams and their families attended. YIX, FFR, and KJ are new ORS appointees. Next month should find our activities in full swing. Traffic: (Aug.) W9EBX 1497, BGN 668, ED 237, YIX 145, BUK 65, APK 37, LAX 25, UBP 24, NN 18, ZQT 17, IMX 16, SYZ 16, IVN 13, JMG 9, JNC 3. (July) W9FRP 6.

INDIANA — SCM, W. E. Monigan W9RE — Any YL or XYL interested in starting an OW/CW net, please advise JUJ, Peggy Coulter, Muncie, Indiana. The Michiana Amateur Radio Club installed a booth at the local 4H Club Fair. More than two hundred messages were accepted and forwarded to their destination. The mobile section is busy planning transmitter hunts and emergency procedures. The Naval Armory has been made available to hams each Tuesday evening from 7 to 10 P.M. This includes use of the tools and test equipment available. EHU, at Evansville, now has a male harmonic. DGA, EHU, and QLW sparked the c.w. men to victory over the 'phone men by a score of 14 to 4 at the annual picnic of the Tri-State Amateur Radio Society. The New Albany Amateur Club has elected 9IYH, pres.; 7HEC/9, vice-pres.; 9JOT/9, secy.-treas.; 9EMU, act. mgr.; 9UVD, publicity mgr. The Club is planning an emergency net on either 28 or 144 Mc. and expects to have its club station, JKV, on HEN and QIN. 7HEC and 4RKF decided that after all one transmitter is cheaper than two, so —. Don't believe it, but anyhow congratulations. GPP also has a new harmonic. Muncie plans an interesting fall program. By the time this is published, it is expected that an SEC will be appointed for Indiana. Listen on HEN and QIN for announcement and mail your AEC blanks to him or to your local Emergency Coördinator. Traffic: W9DGA 618, QLW 360, BKJ 68, TT 35, ZVF 28, DOK 15, JUJ 11, RE 11, YB 7, RZS 3, NH 2.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: YYY. RMs: LFK, SZL, CWZ. PAM: ESJ. C.w. net (WIN) 3625 kc. Slow speed, 6:30 P.M.; regular, 7:00 P.M. Mon.-Fri. 'Phone net (BEN) 3950 kc., 6:00 P.M. daily. LFK visited IQW and CWZ while on vacation. CWZ renewed EC and RM appointments, and again will be in charge of the slow-speed c.w. net. Net certificates (BEN) were issued to CSU, FAD, NYS, ILR, GUE, GPU, EWC, LUQ, GCT, 8BXU. Merrill is represented on the c.w. net by IBF. FXA has been working out FB on 28-Mc. 'phone, using n.f.m. QHR presided at the annual Ground-Hog Party at Watertown Sept. 10th. IZO acquired the trophy for the coming year. With a new Class A ticket, HDZ has been active on 4-Mc. 'phone. FCF will be operating portable while attending Milwaukee State Teachers College. IQM has completed an 829B rig for 14, 28, 50, and 144 Mc. RBI went to high power, 600 watts on 'phone and 1 kw. on c.w. JM received his Class A ticket. LIK has been working out FB with his 4-Mc. mobile rig. OVO has been appointed EC for the Door County Area. By working W2, W3, and VE3 in one night recently, FPE boosted his states worked on 144 Mc. to 12. NWRC held its annual banquet on Sept. 26th at Chippewa Falls. When not on 144 Mc., NYS has been working out FB on 4-Mc. mobile. VWX is on again from Waupaca. KXK is trying to swap mobile rig for high-power final. The BEN picnic at Ripon, with MPO as host, was attended by 45. 4-Mc. mobiles were "brought in" by IVE, who operated portable at the park. Operating portable on Rib Mt., JBF worked FPE, KQM, TQ, LJV, AFT, BTI, LUQ, HDZ, EYN, HEE, AJH, HWX, EVL, TKL, and ALU on 144 Mc. NRP is EC for Watertown and vicinity. UFX has been representing the section at disaster committee meetings in Madison. Traffic: W9ESJ 511, SUF 118, CBE 32, LFK 25, FXA 24, IQW 16, UIT 12, YCV 9, HDZ 8, FCF 2, IQM 2, RSR 2.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Rev. Lawrence C. Strandenaes, WØJWY — the present schedules for all nets in the section are as follows: 160 meters on 1910 kc. at 7:00 P.M. CST, M-W-F; 3.5 Mc. on 3670 kc. at 7:00 P.M. CST, M-W-F; 3.85 Mc. on 3860 kc. at 7:00 P.M. on M-W-F. These frequencies also are hang-out frequencies in the section, and on 7 Mc. it is 7075 kc. Nets meet at the same time in order to facilitate internet emergency drills and traffic-handling. In the interest of civil defense and national or local emergency I would like to ask every ham in the section to join at least one of the above nets and check in regularly. The Mouse River Amateur Radio Club recently was formed at Minot with NVK, pres.; ZRL, vice-pres.; DOW, secy.-treas.; and BZZ, act. mgr. A report from HJK says that AZV is sporting a new SX-71, and that the Jamestown Club opened its fall and winter program with a dissertation by YIZ solving all problems of superhet receiver design. Traffic: WØPUJ 8.

SOUTH DAKOTA — SCM, J. S. Foasberg, WØNGM — PVE soon will have a teletype unit completed. After obtaining an interview by QSO, ZXW has gone to Camden, N. J., for personal interview. Apparently there were no activities at Rapid City, Watertown, Huron, or Mitchell this month. The Sioux Falls Club is hunting the cash or an angel to procure a new emergency power unit. ZIQ has been called for active duty with the National Guard.

MINNESOTA — SCM, John B. Morgan, WØRA — Acting SCM, Charles Bove, ØMXC. SEC: BOL. CWB had quite a path worn to his door by vacationing hams this past summer. A few of the visitors were RA, BGY, GBN, ANU, WAO, TSN, YKD, SZM, and 9ALG. ANU still is rebuilding his rig. QIN, TKX, and OUE have worked forty-seven states on 50 Mc. The Skroobawl Net held a very successful picnic at Colleraine. CWB and KFF were officially elected members of the Skroobawl Net. AXJ, of Crosby, is attending school in Fargo. SV, of St. Cloud, worked Indiana on 144 Mc. during a recent opening. SLK, IXR, FCC, and QYZ, of Minneapolis, were in a round table with 9REQ, NPT, and GDW, of Chippewa Falls and Eau Claire, Wis., on 28 Mc. VAF worked Duluth on 28 Mc. IXR has had a high-level clipper installed in his rig. Boy, does the battler modulate now! SII now has a new quarter-wave three-element beam on 28 Mc. BVH is a new ham in Minneapolis. The slugger, BGY, has been heard on mobile recently. QEQ is a new member of the Minnesota Net on 3.85 Mc. WEH now is the proud owner of a 32V-2. YPN is the new president of the Minneapolis Radio Club. On the 46th anniversary of the destruction of the High Bridge across the Mississippi in St. Paul by a tornado, the amateurs of this city gave an ideal demonstration of how the amateur can provide communications in event of a similar disaster. BOL, our SEC, was in charge. Carl Meyers, of the Red Cross, and Mr. Nichols, of the Civilian Defense, were present during operations. Join the ARRL Emergency Corps and register your mobile rig as an Official Mobile Unit now. PVS built a 100-watt rig for emergency work on c.w. and 'phone. Traffic: WØITQ 146, UCV 36, MXC 32, PVS 4.

DELTA DIVISION

ARKANSAS — SCM, Dr. John L. Stockton, W5DRW — QQM has moved to New Orleans, living on Marconi Drive. LUX is RM and announces new slow-speed c.w. net right after the Ozark Net finishes handling traffic. OXR is a new ORS and has a Class A ticket. DYF has a new quarter-wave vertical ground-plane antenna for 14 Mc. ONL has a home-brewed walkie-talkie for 7 Mc. running low power. EA has made a nice recovery from a major operation. RFQ has moved to Mississippi. QOD moved to Yell County from Texas and is on 7 Mc. He will attend school in Texas this year. ICE is new Class A in Little Rock. ORR is in the Navy in San Diego. GWA has been working 14-Mc. DX. All hams having mobile and/or portable stations and who haven't registered their station with the SEC, EA, please do so immediately. The information is needed by ARRL and also will help in securing the license tags for our cars with our call letters as the license number. The handling of traffic for members of the Armed Forces is a real public service. If you are not a member of the OZK Net, check into the net and you certainly will be welcomed by all members of the net. Traffic: W5ONL 13, OXR 7.

LOUISIANA — SCM, Robert E. Barr, W5GHF — Louisiana mourns the loss of two amateurs to the grim reaper. On Sept. 2nd HFD was a drowning victim in Cross Lake and DRF passed away after an extended illness. The key appointees of the State are KTE, as SEC, and CEW, as PAM. Applications for EC, ORS, RM, and other sectional appointments are solicited by the SCM. Much credit should go to HHT, KTE, CJO, K5WAG, W5UBN, AVO, and LVG for their work during the recent hurricane threat. CNG, EB, EGK, FJW, IVF, MAV, MWE, BLQ, MXI, PLQ, PRW, KUZ, MRS, HEK, and HOS are Assistant ECs in the Monroe Area. MKI has a walloping signal on 7 Mc. from Lake Charles. CEZ, of traffic fame back in the '30s in Ponca City, is a resident of Lake Charles. Our sympathy to CGC and BMM, who lost their father, and to KU, who lost a daughter during the month. GHF now has a 30-watt c.w. rig on 3.5 and 7 Mc., supplementing the big 'phone rig. Applications are being taken by the Civil Defense Commission for the establishment of emergency communication nets. IYG again is active. ZAB is planning MARS organization in the State. MAV is back on 3.85 Mc. with a powerful signal. HBY is beginning his fifth year as NCS of the popular Delta 75 'Phone Net, which covers the entire Delta Division. Nets should be organized on 3.5- and 7-Mc. c.w. for the winter. Let the SCM know if you are interested. If you are mobile, see your local EC and obtain Emergency Mobile windshield stickers and identification cards.

MISSISSIPPI — SCM, J. C. Wallis, W5DLA — A good time was had by all who attended the "Pic-Nic" sponsored by the Gulf Coast Radio Club on Sept. 3rd. RIM has new HRO-50 and new Globe King. RDA is after DX with new 28-Mc. beam. RRF and RRY are new stations in Jackson. JIP, NNZ, NLP, and RRY are in the same city block. POE has new 28-Mc. mobile. PFC was portable from fishing camp in Louisiana. RDA is putting on new 8005s. BZG soon will be 62 years young. ZVO is playing with TV beams. RGM is regular on 7250 kc. QMQ was reëlected vice-president of the Keesler Club. OMK made WAS on 28-Mc. 'phone. ANP went to the Smokies on a recent tour. MGR is new OBS at McComb. WZ has been reappointed RM and reports reactivation of the Rebel Net. The recent hurricane scare alerted many stations in this section. It looked like everybody was on the job and ready to be of assistance. Traffic: W5QMQ 67.

TENNESSEE — SCM, D. G. Stewart, W4AFI — Now

that we are in full swing with the section nets, all interested are urged to attend at least one. If your primary interest be 'phone there is the 3980-kc. emergency 'phone net. If a brasspounder, try the slow speed or regular section c.w. net, both on 3737 kc. New appointments: IYI, OJZ, and RPT as EC; AEE and PMR as OBS. Anyone interested in Official Observer appointment, Class III or IV, please contact the SCM. The Kingsport Amateur Radio Club was host to the SEC and SCM. An interesting program was arranged and included the monthly awarding of the Bull-Throwing Trophy to the most active Official Hillbilly, in this case awarded to JZG. Emergency work, net operation, and section organization were discussed by the SEC and SCM. FDF was the proud winner of a pair of PJ4s in the drawing for prizes. PL reports traffic from Guam is on the increase. FWX and HHK are ready for power failure now with new 2.5-kw. gas-driven generators. FLW is kicking around on 3.85-Mc. mobile and visited with PSN and NAN. NCS LUH reports DCTMEN active. LCB is building a new home on five-acre antenna farm. IIB is back with us after an illness. PBK was given a clean slate by the R.I. on his TVI. HHU TVI-proofed his 14-Mc. rig and now can QSO and see at the same time. The Chattanooga fellows plan on using newly-acquired pogo-stick rigs in the S.E.T. FY is mobiling on 3.85 Mc. with ten watts. Traffic: W4PL 2087, BAQ 15, AFI 2, FLW 2.

GREAT LAKES DIVISION

KENTUCKY — SCM, Dr. Asa W. Adkins, W4KWO — BAZ has resigned as RM and CDA has been appointed in his place. All stations interested in operation in KYN, please write or contact CDA by radio. KYN began operation Sept. 18th on 3600 kc. KWO is moving from the State and has resigned as SCM. On August 14th the Council for Kentucky Amateur Radio Clubs, Inc., completed its organization and elected the following officers: TFK, chairman; JEI, vice-chairman; WUR, secy.; KAM, treas. JQY has resigned as PAM because of TVI and cannot operate with the 'phone net. Traffic: W4CDA 17, IUY 13, WWT 13, MKJ 10.

MICHIGAN — SCM, Robert B. Cooper, W8AQA — Asst. SCM c.w., J. R. Beljan, 8SCW. Asst. SCM U.P., Arthur Kohn, 8TTY. SEC: GJH. RMs: UKV, TRN. PAM: YNG. New appointments: ORS to YKC and OAF; OBS and OPS to QGZ; OO Class III to EXZ. UES spent his vacation portable/mobile around the State and visited many "regular" net members. DLZ reports a very close tie between the Kent County Sheriff's office and the Grand Rapids Emergency Net. By the way, as a bit of information, all the mobile members of the AEC are full-fledged deputies with badges to substantiate any claims. The Straits Area Radio Club held its first annual picnic at Mackinac, and in spite of unfavorable weather many plans were completed with regard to the emergency set-up in that vital area. RJC reports that traffic from the West Coast and Overseas suffered from bad operating conditions during August. DAP continues to make sizeable traffic totals even during the summer lulls. YKC had a visitor in the person of BTV, of 8RN, and the regional nets were given a real working over. As the result of some medical leave WVL turned in a nice traffic total. 2LMB/8 makes his last report in this section and will be in New Jersey for the rest of the season. UKV was seen using the streetcar in Dearborn, which speaks well of the status of his recovery. FWQ reports the Port Huron AEC is using 3700 kc. for its local liaison. EGI reports very good progress on the garage construction which held net activities to a minimum. The Central Michigan Radio Club in Lansing sponsored an emergency demonstration on the lawn of the Capitol Building in Lansing and did well to show what could be done for the public in general. EXZ is back in Detroit after spending the summer in Traverse City, but obtained a 30-w.p.m. sticker and is active in MARS with A8EXZ. 9HKA/8 spent the summer in the Mackinac Area seeking relief from hay fever. OAF, with LME and CPY, assisted in reporting the positions of racing boats in the Inland Lakes Event in the Mackinac Area. 9YXW, ex-SFA, reports his plans to return to Oklahoma A. & M. and his friends in Michigan wish him the best of luck. FWF is in Detroit after a stay in Ft. Worth and is looking for his friends in Muskegon. Traffic: W8RJC 348, DAP 253, TRN 186, YKC 92, WVL 67, 2LMB/8 40, 8SWG 21, AQA 20, UKV 15, 9HKA/8 12, 8CRH 11, YMO 11, OAF 9, UES 9, FWQ 8, EGI 3, SWF 3, TQP 3.

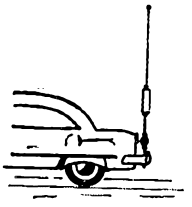
OHIO — SCM, Dr. Harold E. Stricker, W8WZ — Asst. SCMs, Charles Lohner, 8RN, and C. D. Hall, 8PUN. SEC: UPB. PAM: PUN. RMs: PMJ and DAE. I have just returned from Cleveland where I turned over the SCM files to your new SCM, Les Misch, HGW. I hope that you will give him the coöperation that you gave me. Let us all get prepared and be set to *go* on the proposed Disaster Communications Service. Get in contact with your local EC and if you haven't joined the Emergency Corps, *do it now*. This is my last request to you. Activity lagged throughout the summer, but with the coming of fall things will be buzzing again. At this time I want to thank all of you in the Ohio section for your help and for your interest. The following men reported in 100 per cent during my two-year term of office: WAB, RN, LBH, DAE, EQ, and CBI. Quite a few others were 100 per cent from the time of their appointment. This is a large section and because of my profession I could not have done all the work without the help of my Assistant SCMs, RN and PUN. To UPB, our SEC, many thanks for making those trips to various cities that I could not make and for your excellent handling of the emergency work in the State. Also my thanks to the RMs, PMJ and DAE, and the PAM, PUN, for the handling of the nets, to JRG for his work in engraving the certificates, which are beautiful to see, and to the various clubs for their bulletins, which made it possible to get material for this report. Keep your section alive! If interested in a certain field, apply for an appointment; and then after getting it, report to your SCM. It has been a pleasure to work with you and for you. Traffic: W8YCP 133, DAE 130, SG 75, RN 71, EQN 24, WE 23, GZ 16, HOX 16, AL 14, DSX 12, AJW 10, EZE/8 7, WAB 7, DXO 6, LBH 3, BEW 2.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Fred Skinner, W2EQD — SEC: CLL. NYS Net opened its new season on Sept. 18th. The frequency is 3720 kc.; time is 1900 EST. NYSS Net (slow speed) will operate on the same frequency at 2000 EST. All traffic-handlers are urged to report into one of these nets. There is a late session of NYS at 2200 EST for clearing traffic picked up during the evening. Appointments made: ISG as EC for Mamaroneck, EFU as EC for Schenectady (Industrial), FZW as EC for Schenectady County, and QGH as OBS. Endorsements: BSH as ORS and PHO as RM. Traffic: W2TYC 141, PHO 130, DXY 90, EFU 82, QGH 44, BRS 21, FZW 10, EQD 3, ESO/2 2.

NEW YORK CITY AND LONG ISLAND — SCM, George V. Cooke, W2OBU — Asst. SCM, Harry Dannals, 2TUK. SEC: BGO. RMs: BYF, PRE. PAM: GSC. Under FI, EC for Nassau County, that group is going ahead rapidly with organization with a view toward Civil Defense affiliation. New ECs have been appointed to augment the already-efficient group and further Red Cross coöperation is apparent. Suffolk County is expanding with new ECs AJF, MZB, and PDU as local control stations, and KDB as County EC. In the five boroughs of New York City all-out effort is being made to get 144-Mc. gear built and installed in cars, walkie-talkie construction taking a great deal of time. City officials have made their needs known, with 1000 units required at the outset to work with Civil Defense agencies. The city's demands are heavy on the AEC and it is up to that organization to satisfy those demands. All reports indicate success will be achieved. BO has been appointed EC for Brooklyn and has started a membership campaign to increase that borough's AEC net rolls. SJC, Bronx EC, reports many v.h.f. operators signing up in the AEC and plans are formed for regular drills. PQG has assumed responsibility as EC for Queens County and has turned over net controls to various ECs. Staten Island has a good group of AEC members drilling but no EC has been appointed to this date. IAG, Southern Queens 10 meter AEC Net EC, reports a growth in activity with 24 portable mobile, 1 emergency-powered liaison station, and 21 fixed stations in full operation on 29,520 kc., with 29,600 kc. as internet frequency, at 1900 and 2300 EST on Thursdays. BGO, NYC-LI SEC, has changed QTH to Flushing. With UZX entering the Navy and YDG, ZRR, CEV, WHB, and VOS going to college, the ranks of the NLI Traffic Net, operating on 3710 kc. Mondays through Fridays at 1900 and 2200, have been thinned. Outlets are needed all over the section to handle the volume of traffic in this large metropolitan area. Get in on the net and earn an appointment. BYF, RM for the net, will aid you in getting started. The Nassau, Mid-Island, and Lake Success Radio Clubs teamed up to place 3.5- and 144-Mc. gear in the annual Mineola Fair, giving demonstrations of 'phone work and handling a great volume of outgoing traffic, clearing through EC and the NLI Traffic Net. CJI, HAE, and ZUQ have been called up for active duty. AOD worked six 420-Mc. stations in one evening. CXF is a new licensee in Laurelton. ESD, in Huntington, and ESJ, in Cold Spring, have new tickets. UTB has joined the Mid-Island Club's Sunday morning net, with OWP as NCS, and has new NC-183 to aid in OO work. BYF got a new yacht and was issued commercial call KBYF. YYL and his XYL, PBI, duplicated contacts to earn both WAC, WAS, DXCC, WBE, and BERTA certificates. TYU has been bitten by the DX bug. VVH resumed operation on 28 Mc. using 815 final with n.f.m. and has natural beam of 15-story building directing signals east. MJL changed over from Mims to inductive-coupled three-element beam and rebuilt rig to get on 3.5 Mc. AX, YBO, NLS, and SNM are on 7150 kc. to up code, procedure, etc. KJZ reports 170 countries worked, 134 confirmed with 35 zones; he worked HZ1HZ and relayed a formula to save the life of a TB patient. KYN and KARA have new 'phone rig, 4D32 final, and signed ZED as a new member. PF has resumed MARS and NLI schedules. TLAP resumed continental schedule Oct. 1st with EC as RM, and liaisons NLI Net. TUK installed 3.85-Mc. 'phone in new Chevvie. DIC is new OPS appointee. MHE is located in new QTH in New Hyde Park and promises commercial-looking set-up. Traffic: (Aug.) W2BO 296, DRD 282, OBU 216, VNJ 203, SJC 48, MQB 18, DIC 10, IAG 8, PF 6, LGK 4, YDG 4, KVG 3, TUK 2. (July) W2ZRR 115, VNJ 85.

(Continued on page 64)



A LOT of interest has been "popping" up lately concerning mobile operation; especially since the renewed activity in emergency work, and in some cases restricted fixed station activity due to TV.

"Mobileers" are confronted with many problems not encountered in fixed station work, not the least of which, in New England at least, is trying to carry on a QSO while following the "cow paths" that have been "reclaimed" as roads and strewn with detours and traffic signs. Many hams maintain that mobile operation is a traffic hazard and they are probably right to some extent. However, in the "wide open spaces" of the west, where you can set the car on "automatic pilot" and cruise at 60, this problem is much less severe.

One other problem that confronts the "Mobileer" is what band or bands should he use. This can be summed up something like this, starting with the high frequencies:

Two meter operation does have good local contacts with occasional dx; but has to be used in sections that are active on this band. When "mobile" in lowlands of mountainous country, sometimes the results are not very gratifying.

Six meter operation seems to be out, due mostly to inactivity and the conflict between horizontal and vertical polarization of mobile and fixed installations.

Ten meters is a good band, particularly in the flat terrain of the country where you are using ground wave operation. It has good daytime operation in the winter for dx and good night time use in the summer for local contacts. However, it sure has a terrific noise problem (ignition and otherwise) to lick before we can operate successfully.

Seventy-five meters is also a very good mobile band; with local contacts during the day and the dx starting as twilight falls. It has the advantage of established traffic and emergency nets which one may break into if he has something on the "hook". It hasn't the noise problem that ten has but it has the "bugaboo" of all crowded bands, the QRM problem with heterodynes by the bucketful. This can be licked to a satisfactory degree by the use of an audio filter rather than a crystal filter.

It has been suggested by W6ALO that the SOJ makes an excellent choice for this job due to its low drain (3ma. B+ and .6 amp. filament) and its ability to reject heterodynes over 35 db.

If one attempts to use a crystal filter, instability of the receiver's high frequency oscillator would be likely to make the heterodyne wobble in and out of the notch. The Select-O-Ject does not depend on the receiver's stability for its action; it in effect utilizes the relative stability of the two interfering transmitters.

Since most hams use converters working into relatively unselective auto receiver, heterodynes are especially annoying in mobile work, and the Select-O-Ject provides the answer. Its installation is not too much of a problem, because most people have to chop into the second detectors of their auto receivers anyway, in order to install noise limiters. This is just the point in the circuit at which the Select-O-Ject should be connected.

We might add that it would be a good idea when possible, to park the car at the side of the road and hold our QSO. By doing this, we don't become road hazards trying to drive and "twiddle" dials at the same time. Of course if we must drive, keep the manual controls to a minimum. HERMAN BRADLEY, W1BAQ

P.S. Note that we haven't mentioned mobile cw. operation. It is hard for us to imagine a ham driving a car and batting out 25 w.p.m. on a key (or Vibroplex!!) at the same time. 25 mph and 25 wpm just wouldn't mix. Perhaps QLF will become practical after all!

NORTHERN NEW JERSEY — SCM, Thomas J. Ryan, jr., W2NKD — SEC: VQR. RM N.N.J. Net: CGG; RM N.J. Slow Speed Net: UWK. A few more station activity report cards came in from new appointees in the section. Please try to get them in the mail immediately after the first of the month. The combined section report must be mailed from Elizabeth on the seventh of every month. With present mail conditions, cards mailed on the fifth or sixth will miss the report. Emergency work continues to dominate our activity, and I guess almost all hams for that matter. CCS has a new Collins 32V-2. He and AOW alternately will represent N.N.J. on the new 75-meter Eastern New York Emergency Net. Maybe you know N.N.J. has a 'phone net on the air every Sunday morning at 0900. Why not call in? NNJRA has installed a portable 3.5-, and 3.85-Mc. rig in the Teaneck Red Cross Headquarters. A new station wagon belonging to the Englewood Red Cross Chapter is being completely fitted out with a Bandmaster Sr., Gon-Set 3–30, and an all-band antenna. DZA is the official 144-Mc. link in Bergen County for the 144-Mc. net of representatives of all adjacent counties in New Jersey and New York. CGG remains active on the Hit & Bounce Net on 7 Mc. with daily traffic schedules. SOX, Hudson Division Director, addressed the Morris Radio Club on Sept. 6th. The Club meets Wednesdays in Morristown. Write to WCL for further information. The Middlesex County EC Net meets on 147.1 Mc. at 1900 on Fridays. Among the members are BAI, BEP, CBT, DFV, HIA, GPV, KTX, LO, OCA, QW, VPL, and WAI. Members of the 28-Mc. gang who also come in are DMA, JOE, KMK, KZG, and WUG. PXR has been appointed OO, Class II and IV. ABL and EWZ have had ORS appointments endorsed. The following ECs were appointed or endorsed during the month: COT, Maplewood; SOY, West Long Branch; HIK, Orange; SJI, Long Branch; ENM, Monmouth County; HKY, Fairhaven; BAI, Highland Park; NIE, Interlaken; and PCX, Essex County. CWK handled Boy Scout traffic from Camp Sakawawin. CBT/2 was set up in the camp. CUI/2 was on the air all summer from Normandy Beach. LMB/8 operated from Grayling, Mich. He does a great job with traffic. OUS had a 20-minute QSO with ZL1BY on 28-Mc. c.w. ZEP reports into the Swing Shift Net. While on vacation NIY visited OHV, ZYO, and SFK in Glen Falls, N. Y. EWZ attended summer camp at Fort Monmouth. There he met 1DJV, 2BWY, CDZ, SVB, and WSS. The gang operated K2WDK at Camp Wood. AWY reports into 8RN on 3730 kc. Our SEC, on Sept. 18th, addressed a joint meeting of the Tri-County and Raritan Valley Clubs. YLG left Eatontown to attend St. Lawrence Union College, Canton, N. Y. He is prewar VE3QR. UK moved to New Brunswick. FBZ moved to South River. EWL is organizing emergency nets in Denville. What are you doing these days? Let's hear from you. Traffic: (Aug.) W2CWK 125, CGG 103, CUI 93, LMB/8 73, UWK 35, WCL 21, AWY 11, ZEP 10, OUS 9, CJX 2, JKH 2, NIY 2. (July) W2UWK 68.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — DIB visited the Cascade Radio Club at Everett, Wash., and spent eight days with 7IB and visited 7DND and IBH while on vacation. BTY is a new ham at Toddville. 1RUP/Ø reports from Cedar Rapids. Dick formerly was with Headquarters. Glad to have you with us, Dick. SCA makes BPL on deliveries. The Iowa 75 Net boasts the youngest Class A ham in WLL, who is 13. PP presented its Charter to the Marshalltown gang Sept. 3rd. The Iowa 75 Net picnic was held at Ames Aug. 20th and the OM was taken off his feet when he was presented with a fine watch in appreciation of his taking care of the Iowa 75 'Phone Net the past four years. The new NCS of the Iowa 75 Net is VCM, of Webster City, with SRR, SQQ, NXW, and AEH as alternates. WLY was elected secretary. The Council Bluffs gang had a bang-up hamfest August 6th with more than 120 attending. WIM found the hidden transmitter in 38 minutes. JRY has new super 144-Mc. beam. BBZ is back at school at Iowa City. HEX is at State Teachers. EHF, according to his neighbors, operates on channels 3 and 6. The Des Moines Club held a dinner meeting Sept. 7th. SCA, still on top in traffic, has daily schedules on TLCN and TEN and with 8RN, PAN, and OLZ. The c.w. nets are about to take off for a bigger and better year than ever, if planning makes for success. We expect reports from HMM again soon. Traffic: WØSCA 460, QVA 31, YTA 24, NYX 8.

KANSAS — SCM, Earl N. Johnston, WØICV — The Central Kansas Radio Club's reporter, ISC, informs us that BGW, YBC, CTP, INW, ATS, and MUY are active 28-Mc. mobile stations in Salina. BGW is a new licensee there. YZX has moved to the country and also has new grid-dip oscillator. STC has new standing wavemeter. MUN, Alternate NCS of the High Plains Net, reports much activity on 1995 kc. and FDJ, of Linn, reports that the Kansas-Nebraska Club has about thirty members. More 3.85-Mc. mobiles are being heard from this section. EQD, mobile, was heard reporting in on the Kansas 75 'phone net and NXJ, NSD, and FLZ are heard frequently. BNU attended picnics in Joplin and Ponca City recently. KVRC members of Topeka held a bi-ennial picnic at Morrell Pavilion at Kansas Free Fair grounds Sept. 1st. NCV and WIT, of Topeka, under the

(*Continued on page 66*)

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Heat, as an accelerating agent, is believed to be the cause of practically all electrolytic capacitor failures. At elevated operating temperatures, electro-chemical activity in an electrolytic is greatly accelerated with the result that both leakage and equivalent AC series resistance increases. With an increase of leakage current, internal heat is generated which tends to drive out the moisture from the electrolyte, resulting in increased contact resistance between the electrolyte and anode. Under these conditions, if the capacitor does not actually burn up internally, or short through, its effectiveness to operate as a capacitor is greatly reduced because of a permanent reduction of capacitance and increase in equivalent AC resistance at the ripple frequency.

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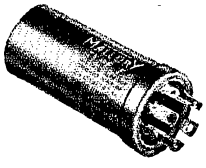

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pretense of taking their jr. operators on a camping trip, had another Field Day with a TBS-50 powered with a PE-103 and an SX-72 for receiving. Several dozen contacts were made on 3.5-, 7-, and 14-Mc. c.w. and 3.85- and 14-Mc. 'phone. The Topeka emergency net has started weekly drills each Sunday night at 2100 on 29.6 Mc. and KRZ, UPV, AAZ, and ICV are working 144 Mc. with 3C-625s and five-element beams. JLZ, of Dover, is undergoing physical check-up at Winter Hospital. ECF has new Gon-Set 3-30 converter and is planning on 3.85-Mc. mobile. WGM has rig for 3.85-Mc. mobile finished but now is working on receiver. Traffic: WØWGM 127, FDJ 28, MUN 23, LIX 12, ICV 5, BNU 2.

MISSOURI — SCM, Ben H. Wendt, WØICD — The MOARKY Amateur Radio Society's meeting and hamfest held at Poplar Bluff included pre-registration prize, prizes for ladies, mobile contest and prizes for contest winners, plus the grand banquet held at the Dunn Hotel. Under the sponsorship of KXL a publication known as the *Mo-Kan Clix* is being distributed monthly. The object of this publication is to keep Missouri and Kansas hams in closer contact with each other and to release information, ideas, and suggestions pertinent to these two states. The HARC's AEC group is proudly using the recent ARRL issues of Official Mobile Unit registration cards and the Emergency Unit placards in accordance with ARRL suggestion. AXL is increasing power on 3.85 Mc. in addition to making plans for a new sky wire. OMG attended the MOARKY meeting held at Paducah, Ky., and had a very enjoyable visit with the Kentucky gang. MTB now is operating 3.85 Mc. with an FB signal. WAP is constructing a new Clapp VFO with temperature drift elimination plus blocked grid keying in all stages. WAP reports the TXN Net is becoming better and more popular as time goes on. The Clapp VFO is popular with PME also. Since BIG and VFN have joined the Armed Forces PTG is the only active ham left in Mississippi County. PTG has joined the 144-Mc. gang with a fine haul for his first contact. He worked 4HHK. QMF is busily engaged in 144-Mc. operation. Receiver, S-meter, VFO, and 5-over-5 antenna are some of his present projects. BVC, BUB, BUC, BUQ, and BWC are new Springfield calls. QXO finds traffic conditions at a low ebb and looks forward to better conditions soon. PLJ reports several successful QSOs with 4HHK on 144 Mc. and says he is having good results contacting 9BOV and 9KH. GBJ is preparing to convert a 375-E for 3.5- and 7-Mc. c.w. We regret to have to report the death of RTP, North Kansas City High School teacher. Mr. Chappell was sponsor of the School's club station under the call of AOQ and during 15 years trained at least 100 students to become amateurs. He was a member of the Heart of America Radio Club for many years. Radio transmitters that were built under his supervision have been used in emergency work, Field Day activities and Simulated Emergency Tests. His passing will be keenly felt. Traffic: WØQXO 437, CGZ 60, WAP 36, PME 19, PTG 5, QMF 4.

NEBRASKA — SCM, Scott E. Davison, WØOED — AY made BPL with a grand total of 916. GMZ is back in the swing of things again after a long illness. CMO has moved to a new QTH. ASI has moved from Chadron to Halsey. QXR, HZE, and GJI toured Colorado, visiting hams and keeping home "on tap" with a Collins 32-V mobile. Schedules were kept with EUT and KJP. QHK is attending school in Lincoln. EAO has sold most of his equipment and now is in a reserve unit. BBX recently built an antennascope and demonstrated it at an Ak-Sar-Ben Club meeting. QXR is equipping new station wagon for mobile work. UPY has 30 watts on 3.85 Mc. IOS has new Collins 32-V. USE worked 28-Mc. mobile while in New York on business. OLI is building 813 final. GNM is attending school at Ames. NKG has moved into his new QTH. PUK has a new "dream" shack. QHG reports for the Omaha gang. LSS has joined the Navy. UVQ, UVU, LSS, and ANM are sporting new A tickets. The Lincoln and Fremont Clubs paid their debt to the Sioux City Club with a grand picnic held at Fremont. More than 150 persons were present. The Fremont Club did a bang-up job on the eats! Other get-togethers in the State during the month were held at Brainard and Norfolk. The nets are shaping up for the winter season. If you are not in one of the nets, get in the swing of it, gang. KJP made a perfect record *this summer — by* not missing one picnic or get-together over the entire State. Your SCM would appreciate more reports, fellows. See you on 3983 or 3745 kc. Traffic: WØAY 916, GMZ 224, KJP 35, DMY 6.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Walter L. Glover, W1VB — Because of a combination of circumstances, I missed last month's report. Sorry, fellows. We welcome to this section, IJT, a former Western Massachusetts net man. OJR has been scheduling MFT on 420 Mc. with fine results. APA has his postwar DXCC with 101 confirmed. BDI reports 70 vacation QSOs using his car rig from his location in Maine, mostly on 3.5 Mc.; he also reported into CN regularly. BVB now is using a 40-foot vertical with good results. RIO made his Class A. ADW and CTI handled considerable traffic for members of the National Guard at Pine Camp, N. Y., to their families. AOS has been working on equipment getting

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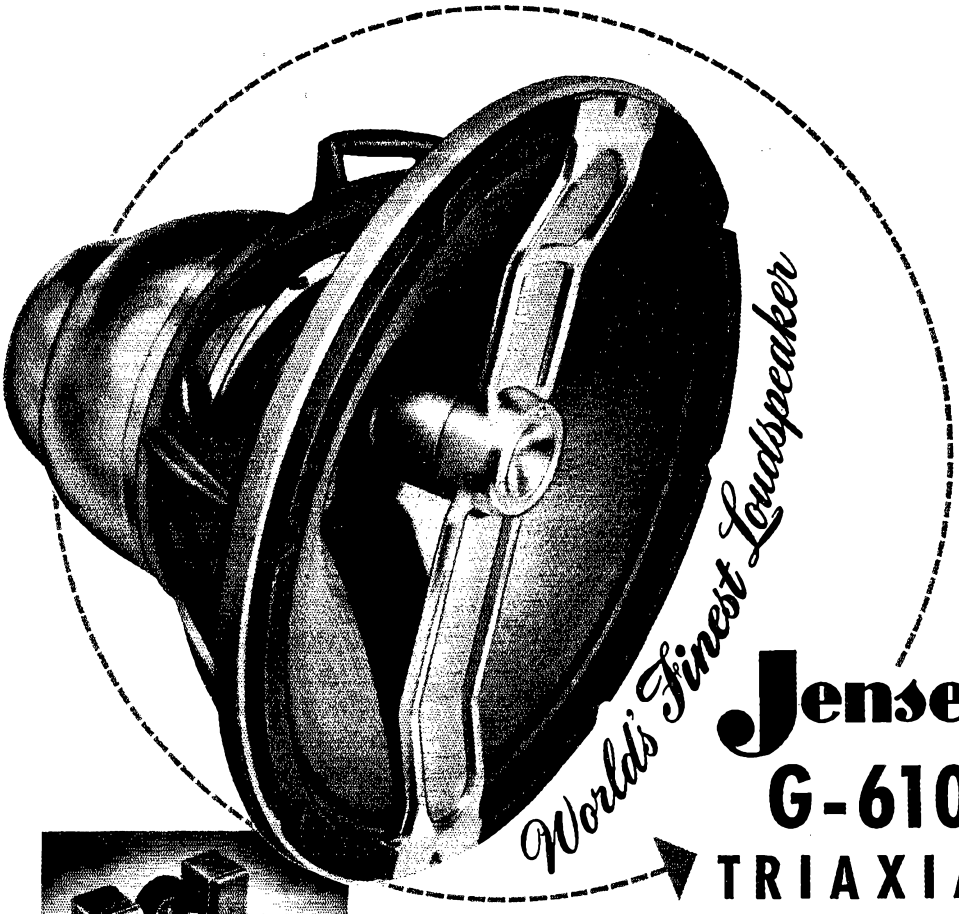

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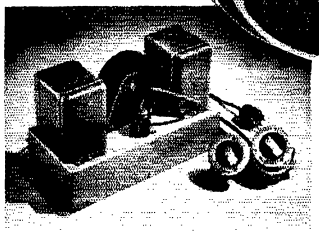

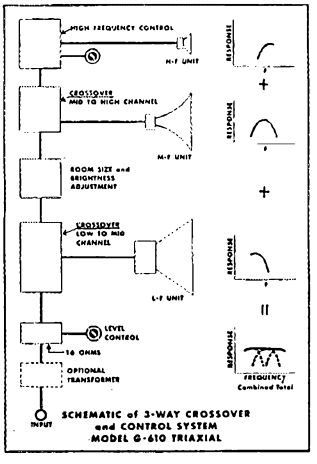

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set up at the police barracks at Westbrook. QAK is using a Bendix 7A12. New officers of the Mattatuck Amateur Radio Society of Waterbury are 1ZP, pres.; KRC, vice-pres.; SOY, treas.; and Dick Nuhn, secy. As this is written, the month of vacations has just passed, with its usual low ebb of activity. Plans are under way for what should be another successful winter season. LKF has emergency matters pretty well organized with the state-wide police net all set up. VW has the 'phone net, CPN, all ready to go. ORP has the regular fall meeting all planned. So, by the time this is read, we should be in full swing with plenty of activity of all kinds. Let's hope VB has his junk hooked up again by that time. Traffic: (Aug.) W1ADW 107, LV 95, KV 70, BDI 46, BIH 43, CTI 28, ORP 25, KYQ 23, BVB 22, HYF 10, IJT 5, APA 4, AOS 3. (July) W1BVB 64, LV 60, CTI 51, ORP 40, BIH 18, BDI 15, HYF 15, KV 15, KYQ 15, RWS 15, QVK 11, GVK 10, FOB 8, ODW 6, QAK 1.

MAINE — SCM, Manley W. Haskell, W1VV — Pine Tree Net, 3550 kc., 1900, Mon. through Fri., RM. NGV. Sea Gull Net, 3961 kc., 1700, Mon. through Fri., PAM FBJ. AEC Net, 3588 kc., Mon. through Fri., NCS QUA. Maine Shuttle Net, 3588 kc., 1430, Mon. through Fri., NCS RQR. NGV and QUA made BPL for August with 61 and 53 deliveries, respectively, the hard way — up in Maine. RM NGV announces a new net, the Maine Shuttle Net (MSN), for intrastate traffic on 3588 kc. at 1430 EST with RQR as NCS. QUA has registered the AEC net in the Net Directory after better than a year's training. PTN and SGN have resumed full operations. The Oxford County Radio Association held its annual Field Day at Kezar Lake, Center Lovell, with a barbecue dinner, hidden transmitter hunts, plane and mobile units operating, and messages to the Governor of the State. Four hamfests have been held in Maine this year. SFZ now has a final of 812s p.p. and a new VFO on order. NGV now sports a 129-X receiver and a 50-watt emergency rig — just in case. He worked 20XE/MM just to break in the new gear. QQY is one mobile that can gabble on 3.85 and 144 Mc. at the same time. ITU has developed something hot in the line of a top capacity hat for his 3.85-Mc. mobile antenna. QDO now knows why certain coils didn't hit the frequency — he sneaks up on 'em with a grid dip meter! Traffic: W1NGV 304, RQR 243, LKP 210, QUA 146, SUK 71, VV 50, SWX 33, HYH 23, QQY 12, SRQ 10, IGW 9, PTL 8, RPT 8, AMR 4, JTH 4.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — Eastern Mass. Net frequency is 3745 kc., the slow-speed section will be on 6:15 P.M. with 15 w.p.m. the limit. The faster section meets at 7 P.M., Mon. through Fri. If you are interested, write to NBS, the Route Manager. New ECs in this section: QZS, Haverhill; SS, Lincoln; JQ, Needham. The following have had their appointments endorsed for another year: CBY, MME, and NID as EC; KYO and HWE as ORS; LMB as PAM for 14-Mc. band and OPS; MME as OPS; BHW as OO; ALP as OBS. We need more ECs for many cities in this section. How about some volunteers? If you are a member of ARRL and emergency-minded you are eligible. Drop me a line. IVI has been called back into the Navy. IAE is building new QTH in Sharon. HUP is moving to Dover. JOL is in the Services again. RLA is in the Air Corps. FVD and BIO took a trip to Ohio. ACL is ex-9ACL. QJF and RD are on 144 Mc. We hear that CH is back East again. PKQ is working in the Radio Shack. Many of the gang on 3.85 Mc. were on the alert during the recent hurricane just in case it hit. A few heard here were PU, SS, and QP and some of the gang in Maine, Connecticut, etc. NXV is working in Boston and building a rig. Some of the gang on 3.85 Mc: AQK, Winchester; MDH, Greenwood; GAD, Lynn; ASN, Saugus; IXO, Marblehead; QLL, Nantucket; HHU, LYV, NSP, and OFY, Marblehead. NBT is living in No. Abington. ATX is on 3.5 Mc. LAO/1 is on 3.85 Mc. from Kingston, N. H. PCR and MZJ are on 28 Mc. CTR/1, at Neponset, for several years a spark plug on 144 Mc., has left that QTH but will be on from Everett. AOG, of Medford, has gotten his old call back after being off the air since 1926. AAL has a 522 on 144 Mc., also a rig on 1.9 Mc. SJX is going to be busy at school this year. PST has a rig in his car. BLX has a rig in the car, also ONK and AWD. HPH has rig with a pair of 813s. CTZ is TVI-ing the rig on 28 Mc. LAZ, AVY, and SSS are on daily on 28 Mc. LAZ, AVY, and CTZ are on 144 Mc. at 7 P.M. BMQ has new QTH in So. Dartmouth. AVY has 65 different QSOs with MM on 28 Mc., best DX Ceylon and Philippines. LMG and his XYL took a trip to Quebec. WI is on 7010 kc. after midnight. DFS is going to have a schedule with 6ZZ, ex-1WV, on 14 Mc. The South Shore Club held a meeting in August and an outing at Riverside Park. The T-9 Radio Club held its annual moonlight sail. SMO and SNX held a marathon QSO for 6 hours. SMO went up on Mt. Greylock. ZR is on 3.5, 7, and 3.85 Mc. from Nonquitt. RKG has new Johnson Viking transmitter. The Merrimac Valley Amateur Radio Club had a weenie roast at QWR's QTH in Salem. KYO rebuilt his rig and will be on the Eastern Mass. Net. EK renewed his EC appointment for another year. BL and EK have permanent rigs in cars. The T-9 Radio Club held a meeting at CVM's QTH. NNG and gang had a week-end Field Day at Northwood, N. H. RLT won a 28-Mc. converter at the Portland Hamfest. Traffic: (Aug.) W1QMJ 511, TY 104, SS 82, DMS 60, ZR 28, PU 27, LM 22, AVY 9, HWE 6, IH 6, WU 4. (July-Aug.)

(Continued on page 70)

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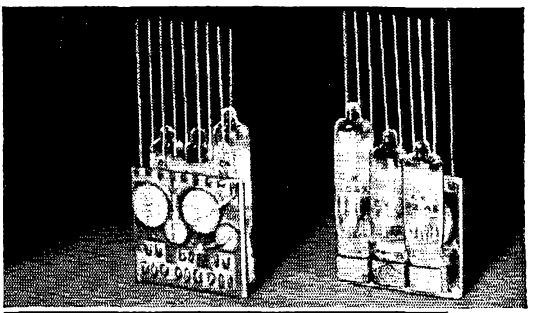

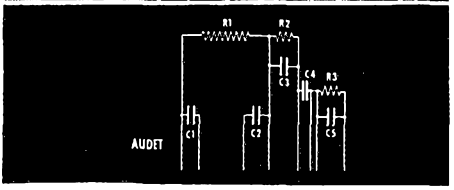

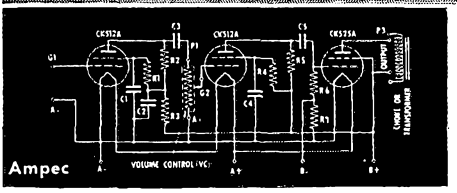

PRINTED ELECTRONIC CIRCUITS (P.E.C.) AUDET AND AMPEC Audet and Ampec represent Centralab's most advanced development of the printed electronic circuit art. They illustrate how complete circuits, or large parts of them can be produced with maximum compactness and long enduring permanence.

AUDET . . . Output Stage For AC-DC Radio Receivers

Audet — a P.E.C. audio-detector plate, with seven leads furnishes the values of all components which generally comprise output stage of AC-DC radio receivers. Where trouble occurs with old style components in this part of the set, you can replace the entire audio-detector stage with Audet.

SIZE — 1-5/16" x 7/8" x 1/8" thick.

LEADS — No. 24 tinned copper, 2½" long.

CAPACITOR RATINGS— 450 volts d.c. working, 800 v.d.c. flash test. Tolerances, 220 mmf. +50% −20%; .002 mfd. and .005 mfd. GMV.

RESISTOR RATINGS — tolerance ±20%, 1/5 watt.

CAT. NO.	TYPE	CONSISTING OF (See drawing A)
PC-150	Audet	C1 = .002 mfd. C2 = 220 mmf. C3 and C5 = 220 mmf. C4 = .005 mfd. R1 = 6.8 megohms. R2 = 470,000 ohms. R3 = 470,000 ohms.

AMPEC . . . Complete Speech Amplifier

There's never been an electronic device like Centralab's Ampec. It is one compact unit permanently bonded to a master plate with all components of an audio amplifier — tube sockets, capacitors, resistors, wiring. It's a full three tube, three stage speech amplifier.

Centralab Ampecs are widely used in hearing aids, for the most trouble-free performance ever attained. Ampec has other interesting applications, as mike pre-amplifier, etc.

SIZE — 1¼" x 1⅛" x .340" over tube sockets.

LEADS — No. 26 tinned copper, 1½" long.

CAPACITORS — 100 volts d.c. working, 150 v.d.c. flash test.

RESISTORS — Tolerance ± 20%, 1/5 watt.

RECOMMENDED TUBE COMPLEMENT — Two Raytheon type CK512AX; one Raytheon type CK525AX.

GAIN FREQUENCY PERFORMANCE — A voltage 1.2; Input voltage, 1 millivolt; B voltage 22. 50,000 ohm load. At 1000 cycles per second, the amplification factor is 4000.

RECOMMENDED VOLUME CONTROL — (not furnished) See drawing, for control marked VC. The ideal unit is Centralab Model B16 Control, Cat. No. B16-124, 3 megohms. The switch type is Cat. No. B16-224.

CAT. NO.	TYPE	CONSISTING OF (See drawing B)
PC-200	Ampec	Complete Three Stage Speech Amplifier, including three built-in sockets, less tubes.
PC-201	Ampec	Same as PC-200, but furnished complete with tubes, two CK512AX and one CK525AX.

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W1AAL 27. (July) W1JCK 133, IH 7. (June) W1JCK 237. (Apr.) W1AYG 2.

WESTERN MASSACHUSETTS — SCM, Prentiss M. Bailey, W1AZW — SEC: UD. RM: BVR. Net frequency 3725 kc., Monday through Friday, 7 P.M. By the time you read this you fellows will have a new SCM. I wish to say that I have enjoyed working with all of you for the past four years and greatly appreciate the coöperation given to me by the whole section. I extend hearty congratulations to the new SCM and I hope you will support him in his effort to make this an up-and-coming section. Don't forget the slow speed net on 3725 kc. at 6:30 P.M. on Mondays and Fridays. BVR attended the ARRL Constitution Revision Committee meeting at St. Louis, Mo. BDV is back home and renewing fall activity. MOK reports low activity at present. We hate to let a good traffic man go, but JE finds no time for traffic. COI is building 144-Mc. converter. RZG still is having transmitter trouble on 7 Mc. EOB received DXCC #1008 and picked up Cyprus for a new one. JYH went over the 200 mark with confirmations from MS4FM, VP8AO, and EA9BB. KFV, with cards from SP1SJ and FO8AC, brings his total up to 156. The HCRC picnic at Look Park was a great success. RYL spent vacation in New Jersey. PHU joined up with New England 'phone net with TBS-50. QJN is on the net with a new Harvey-Wells job. QFB spent vacation rebuilding. IZN, HAZ, DPY, and MWE are active Pittsfield Area boys on the N. E. 'phone net. HAZ and SDO work Schenectady boys often on 144 Mc. HAZ has been heard in Springfield. LIB is new EC for Webster. At a meeting held Sept. 21st, the Hilltop Amateur Radio Club elected the following officers: SPH, pres.; CLU, vice-pres.; SPF, treas.; and SAS, secy. The Club will hold classes in code and theory at the Y.M.C.A. club rooms. So long, gang, and I'll be seeing you on the air. Traffic: (Aug.) W1BVR 43, EOB 24, SIT 4, MOK 3, BDV 1. (July) W1EOB 96, RZG 20.

NEW HAMPSHIRE — SCM, Norman A. Chapman, W1JNC — RM: CRW. At this time our thanks to CRW for a mighty fine job, well done, as Acting SCM. LYA has decided to make his home in W4-Land. Pass along your call, Andy. Meet TBS, our new ham in Alton. OST moved to W. Milan. Congrats, Pete, on the new jr. operator. The Manchester Radio Club has purchased a 300-watt a.c. gas generator for emergency use. JEH looks mighty happy lately. We understand he recently was married. QYZ is looking for a frame for his new WAC certificate. The following Concord Brasspounders now are in the Services: SKU (Navy), KMH, LVG, RMY, SLK (Army). Now is the time to hook those last few county contacts for WNH certificate. Can you spare a few items for the section report? Traffic: W1CRW 223, PFU 17.

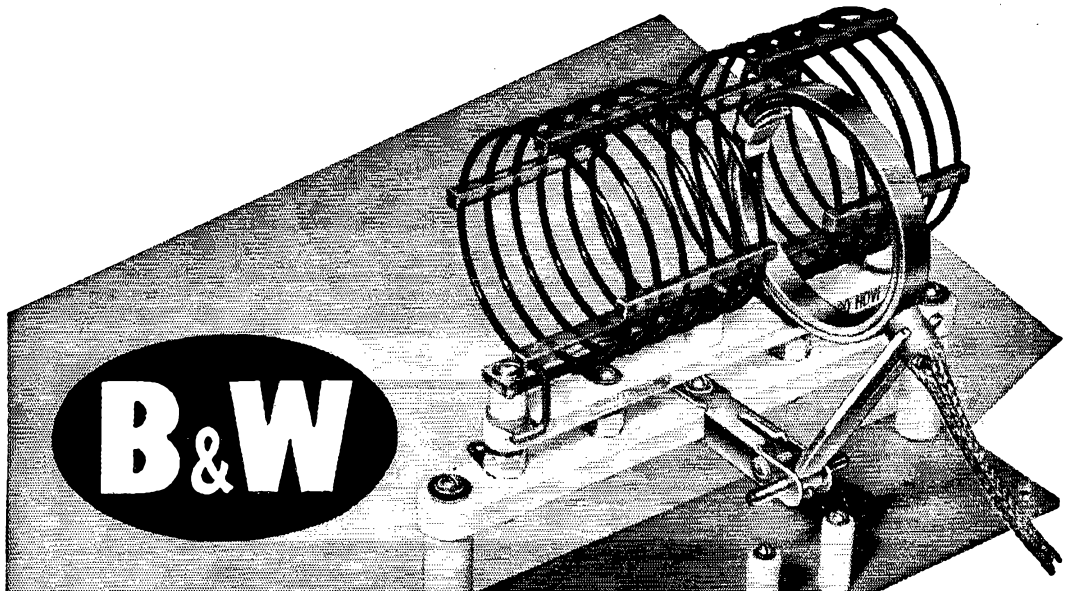
VERMONT — SCM, Burtis W. Dean, W1NLO — SEC: RNA. RM: KRV. PAM: PZX. AVP, PTB, and PZX have been issued Section Net certificates for the New England Emergency Net. MEP has all-metal square corner reflector for 420 Mc. VTN is back on winter schedule, Monday through Friday at 1900 on 3740 kc. The Vermont 'Phone Net is going full blast Sundays at 0930 on 3860 kc. New BARC officers are QQN, pres.; RMX, vice-pres.; and NLO, secy.-treas. QQN has TBS-50D installed in jeep station wagon. He is NCS (mobile) for CCEN on 29,560 kc. every Monday at 1900. JEN has been called back into the Navy. RNA has taken over as SEC. KJG has "Fireball Special" on 160-meter 'phone. SOU is rebuilding SCR-522 for 144-Mc. mobile. IDM has VFO for 160 meters. JLZ is busy handling traffic on 7 Mc. PTB has Gon-Set tri-band converter in the car. He operates 3.85-, 14-, and 28-Mc. mobile. AVP has 2-kw. generator. Traffic: W2CEV/1 12, W1RNA 4.

NORTHWESTERN DIVISION

IDAHO — SCM, Alan K. Ross, W7IWU — American Falls: DMZ finished up a busy harvesting season and now that he has the straw out of his hair finds time for radio again. Twin Falls: 6TQV moved here and is active on 7 Mc. 28 Mc. mobiles are MMO, JMX, NOG, and LNC. New hams are OUJ and OQT, both on 28 Mc. KEK moved to new QTH at San Pedro. MFC has new RME 10-20. JMX was Tex Beneke's (2CKD) first contact while the band leader was in Twin Falls. Burley: IEY and his XYL, KDC, attended Boise Hamfest. Louie is new EC for Jerome, Cassia, Minidoka, and Power Counties. You hams in those counties contact IEY for AEC membership. Boise: The Radio Club Hamfest was successful with games and prizes. A visitor to this country and to the Hamfest was HB9KM, presently living in Mountain Home. IZM, Nampa, won the 28 Mc. Hound and Hare Hunt with OCR hiding on top of a downtown garage. Traffic: (Aug.) W7GHT 49, BAA 22, IWU 6. (July) W7GHT 54.

MONTANA — Acting SCM, Ed G. Brown, W7KGJ — The Southern Montana Amateur Radio Association set up a simulated shack at the Midland Empire Fair in Billings showing hams in action. As a public service many messages were handled for the fairgoers. Scores of visitors expressed their interest and the hope to see the booth there each year. Montana State Net (MSN) 3.520 Mc. and the 'phone net, 3.995 Mc., resumed operation September 1st. OQI is the new call of the Southern Montana Amateur Radio Association in Billings. OQI also boasts two recently acquired gen-

(*Continued on page 72*)



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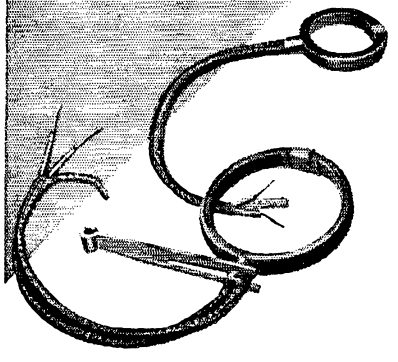

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erators, one 15 kw. and one 8 kw. Both generators are mounted on trailers and are available for immediate emergency use. Montana thanks Fred B. Tintinger, EGN, who recently resigned as SCM, for a splendid job. CPY, Northwestern Division Director, has a new QTH, 837 Park Hill Drive, Billings. Traffic: W7OQI 817, KGJ 84.

OREGON — SCM, J. E. Roden, W7MQ — ESJ, Net Manager for OSN, announces that OSN now uses 7170 kc. each net night at 1900 PST, in addition to 3865 kc. at 1930 PST. AIZ has sold his Collins equipment and now is confined to 28- and 144-Mc. mobile. NOM is very active in shaping up Ontario Emergency Corps plans. He is new EC for the Ontario Area. EJF and NQB are new OPS. HDN is busy getting lots of OPS appointees. GWE is rebuilding new rig and is eager to get back on the traffic nets. KTG now is OPS. NQB has received his Class A ticket. LJJ is rebuilding his ham shack and says "wait and see." ADX has moved into his new home in the country where he has an antenna farm. DIS also has moved into a new home. BDN returned from Detroit with a new Buick and found that his garage had shrunk. Result, he now is enlarging the garage. EX has 25 beehives that are producing, and Everett plans on retiring at an early age. FLS and JPM have been called back into the Navy. APD is planning on a new home in the Pendleton Area after years in Ranier. HHH is new Net Control on OEN 'phone net. HAZ reports a fine AEC set-up in Baker with lots of enthusiasm. AZK moved back to Oakridge to keep BSY out of mischief. AJN did a swell job keeping OSN going through the summer slump. GXO is doing a nice job keeping the *Oregon Netter* in publication. Traffic: W7MTW 186, IIV 100, HDN 94, AXJ 76, AJN 73, ESJ 69, JRU 65, MQ 58, ODI 49, BSY 41, DHX 31, FY 30, GXO 26, MLJ 13, LVN 12, NQB 8, GWE 7, KTG 7, LT 5, MBE 2.

WASHINGTON — SCM, Laurence Sebring, W7CZY — SEC: KAA, RM: JJK. The ARAB Club set up at the Kitsap County Fair and originated 356 messages. FIX is working on a new edition of the Operating Manual, after painting the inside of his house. KAA operated at the Fair with the ARAB gang. FRU has a daily schedule with 9ED. KCU is having trouble with receiving conditions in Colfax. ZU wants to get back on standard time. DRA has most of the pickles canned and hopes to be able to spend more time on the Net. JZR is unable to hear the gang on WSN because of the early hour on "monkey time." APS spends his spare time on WSN. NWP installed an 807 in the final. EYS has been appointed Red Cross communications chairman of Whatcom County Disaster Committee with KWC as vice-chairman. DDQ now is on 144 Mc. KTL is working on new 28-Mc. beam. LTK, new EC for Pullman, is organizing an emergency net for the Pullman Area. OQZ spends 12 hours a day monitoring 28 Mc. LVB is using 60 watts and is rebuilding final. CWN is in training for the bowling season. EQN is trying to find a satisfactory monitor circuit. FWR, FWD, EKW and family had a nice vacation in California. The Walla Walla Valley Radio Amateur Club publishes a weekly bulletin edited by FPP, circulation GVC, and society IXR. This club meets each Monday at 8 P.M. in the PP & L Building at the Air Base. OUC is a new ham at Freewater. AOR is working for the Navy at Bremerton. The Cascade Radio Club meets on the first and third Tuesdays at the Red Cross Chapter house in Everett. The first meeting is to work on gear and the second meeting is the business meeting. NAJ is new OO at Issaquah. BQX is too busy with television service to work any DX now. FPP and JR tested out new microwave link from Everett to Whidbey Island. Traffic: W7CZY 3751, NZA/7 356, FIX 348, KAA 156, FRU 115, KCU 110, ZU 51, DRA 47, JZR 40, APS 31, NWP 21, DDQ 10, CWN 6, EQN 6.

PACIFIC DIVISION

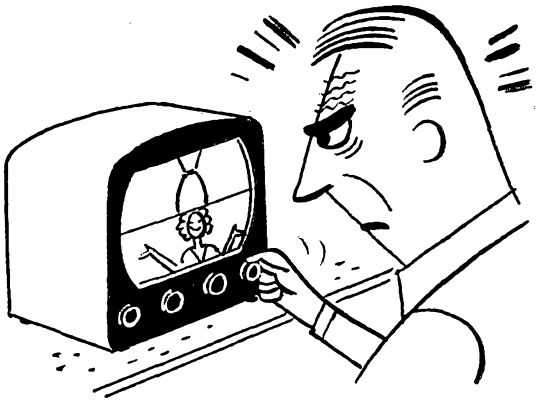
HAWAII — SCM, Dr. Robert Katsuki, KH6HJ — RU has been rebuilding to 250 watts, all bands. He will resume Official Bulletins in October. ADY, newly-appointed ORS, reports TCS about ready to go on 3.5 and 7 Mc. He has been active in MARS. Congratulations to AFC (Mrs. James Keefer — "Hazel") for winning her own ticket. She operates 28-Mc. 'phone. TI (Ardelle Johnson), formerly of Wailuku, Maui, is now out at Waikiki. A ham club social was held Oct. 6th at Queen's Surf. Traffic: KH6HJ 4.

NEVADA — SCM, Carroll W. Short, jr., W7BVZ — JVW, the Lincoln County EC, is chairman of communications for the Civilian Defense Planning Board of that County. Ditto for ZT, the Ormsby County EC. Good work, fellows! NWU works 28 Mc. mostly, has new 250-watt 7-Mc. rig and 800-watt emergency generator. KJH has tank set on 7 Mc. OGE has 500-watt Army rig on 7225 kc. with receiving position 5 miles from transmitter. NRU has 25 watts on 28-Mc. 'phone, 40 watts on 3.5- and 7-Mc. c.w. KOA checks into NSN on 3660 kc. nightly. PST is NCS for NSN. KLK is on 50 Mc., also 3.5 and 3.85 Mc. VR has new 100-foot tower and fancy beams for 14 and 28 Mc. JU reports there now are 22 EC members in Nevada. KJQ moved to W6-Land. Your SCM would like contacts with any of the Nevada gang on 7225 kc., 9 A.M. to noon, Mondays through Fridays. Traffic: W7JU 12, CX 8.

SANTA CLARA VALLEY — SCM, Roy E. Pinkham, W6BPT — Traffic: (Aug.) W6NW 316, BPT 182. (July) W6CIS 29.

(*Continued on page 74*)

HOW TO BUILD
WAVE TRAPS for TVI



THERE are many cases where the front end of a TV receiver lacks the selectivity required to eliminate very strong 14 or 28 Mc signals. These fundamental frequencies jam through the receiver front end and create many kinds of cross-modulation products which affect the viewed picture (not to mention the set-owner's temper). The only solution: each receiver affected must be treated separately, to prevent such fundamental frequencies from getting in and affecting the TV signal.

Tuned wave traps—either series, parallel, or combination types—are most commonly used to eliminate this trouble. They can be made quite effectively with Ohmite high-Q Chokes, in combination with suitable trimmer capacitors. (See diagrams below.)

Since most receivers have 300-ohm input, that type has been treated here. These designs, however, can be adapted to 72-ohm input as well. Series-tuned traps (A) are connected from the receiver terminals to ground. In some cases, however, two parallel-tuned traps (B) may prove equally satisfactory. The chokes and trimmers can be mounted on a small terminal board with binding posts or clips for easy installation.

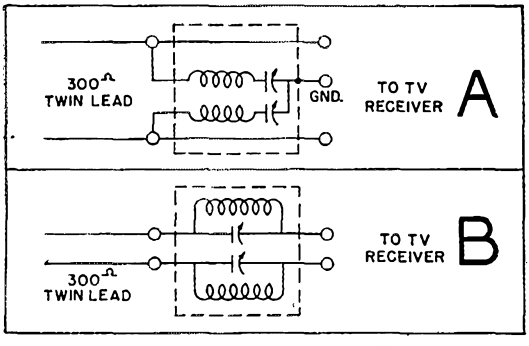


Table below shows approximate capacity necessary to resonate OHMITE Frequency-Rated Chokes at various frequencies:

OHMITE CHOKE	mmf at 3.5 Mc	mmf at 7 Mc	mmf at 14 Mc	mmf at 21 Mc	mmf at 28 Mc	mmf at 50 Mc	mmf at 56 Mc
Z-28	98	25	6.2				
Z-50		74	19	8.2	4.6		
Z-144			72	32	18	5.7	4.5
Z-235				69	39	12	9.7
Z-460						51	40

EAST BAY — SCM, Horace R. Greer, W6TI— Asst. SCM, Charles P. Henry, 6EJA. SEC: OBJ. ECs: AKB, EHS, NNS, IT, IDY, QDE, LMZ. JZ turns in another FB traffic report with another BPL award. YDI worked 3.85-Mc. mobile with FB results while on vacation. OJW is waiting for the 28-Mc. band to open. DTW turned in a large traffic report. RRH is rebuilding the rig. Because of DUB and TT, of the Electric Supply Co. of Oakland, the W6 QSL Bureau has a new filing system. Two large tables were built by Mario, which were greatly appreciated by Yours Truly. NO is having TVI trouble and latest reports are that CTL is having the same problem. We understand Bill has the old master, JK, working out the details. DUB and TT enjoyed themselves in Cleveland at the radio show. TI had a swell time at the Southwestern Division ARRL Convention at Santa Barbara over Admission Day. OT is going strong, with the chief operator keeping things running smoothly. KZF is working at KPIX. The following gang now make up the c.w. net for the Mission Trail Net: ARE, BPT, CML, DTW, EKF, FAD, FKS, GIP, HC, HQN, IAH, JIA, KVQ, NLQ, UII, VJN, VQK, YDI, ZBU, and 7NSB. LDD and PB are playing around with 28-Mc. mobile. IKQ is QRL house-building. NZ has new NC-50 receiver. AED now is living in Yuba City. OBJ wishes that summer would last forever so he could make week-end trips with his emergency gear. ATO, new San Francisco SCM, is doing a nice job and the East Bay gang wishes him great success. DYP still is working on tower. BUY is looking around for new DX worlds to conquer. August was a bad sun-spot month around these parts, along with a heavy vacation month, so ham radio took a back seat with many of the boys. With winter just around the corner things should be picking up once again. Traffic: W6JZ 1135, DTW 962, YDI 45, TI 2.

SAN FRANCISCO — SCM, R. F. Czeikowitz, W6ATO — Phone: JU 7-5561. SEC: NL. Phone PL 5-6457. The High Frequency and Mobile Society (S.F.) meets the second Friday at the Red Cross Building, 1625 Van Ness Ave. The Humboldt Radio Amateurs Club (Eureka) meets the second and fourth Fridays in the YMCA rooms, rear of Municipal Auditorium, entrance E St. The Marin Radio Amateurs Club (Kentfield) meets the second Friday in the Engineering Lecture Room, Marin College. The San Francisco Radio Club (S.F.) meets the fourth Friday at the American Legion Hall, 1641 Taraval St. The Sonoma County Radio Amateurs (Santa Rosa) meets the first Wednesday in the Tap Room of the Grace Bros. Brewery on Second St., west of the Freeway. *Sonoma Area:* The officers of the recently-organized Sonoma County Radio Amateurs are DTV, pres.; KIW, vice-pres.; and WOR, secy.-treas. The membership is about 50. Approximately ten mobiles are operated by members, who are assisting in the emergency program. BLG is the representative to the newly-organized Central California Council of Radio Clubs. Some of the mobiles are WDM, KIW, EBI, FWD, and DTV. *Guam Area:* KG6DI continues very prominent in traffic-handling to and from Guam and beyond. Clark was scheduled to be Stateside by this time, but his plans appear to be considerably altered. KG6FAA is operated by Clem, W4MXU, and Sam. They are catching up on QSL obligations by mailing an average of 25 cards per day since Aug. 10th, and hope to clear before long. This station is active on MARS nets with outlets in Japan, Okinawa, and the Philippines. *Marin Area:* EC: KNZ. The Emergency Corps is working on its 160-meter gear under the guidance of KNZ. All interested in emergency work, please contact KNZ at 168 Woodbine Drive, Mill Valley. Please furnish news for this column no later than the first of the month. (You forgot this time.) *Eureka Area:* EC: SLX. ZSE and SLX now are on 28-Mc. 'phone, while FIX is on 144 Mc. In the building and remodeling department are CWR and NAO, working on the ham shack and a summer home, respectively. BJO now is located in a new part of Loleta. AUB, formerly with KHUM, now is located in Los Angeles. Congratulations to Grandpa YUH. BWV will be QRT because of his recall to active duty. *San Francisco Area:* EC: BYS. Mr. Oliver P. Ferrell was guest speaker at the H.A.M.S. Club on the subject of V.H.F. Ionospheric Propagation. Many of the 144-Mc. emergency sets are nearing completion and will be used for mobile operation. GGC very kindly donated a number of the parts for this gear. PHF now is JA5CW and has worked some of the boys. YZP now is KL7ADQ and is located with the CAA in Nome. BIP worked 150 stations in the July CD Contest. WFL, SY, LDP, and BIP successfully moved the GE Supply Corp. family from San Francisco to Emeryville. The SFRC put on an amateur radio program from one of the local TV stations. Join the Emergency Corps — phone Bill Green, BA 1-6157. Traffic: (Aug.) KG6FAA 1093, KG6DI 533, KR6DB 205, W6SWP 71, CXO 58, BIP 11, ATO 7. (July) W6BIP 35, GXH 35, ZVB 10.

SACRAMENTO VALLEY — SCM, Ronald G. Martin, W6ZF — Asst. SCMs: Northern Area, 6YNM; Central Area, 6CKV; Southern Area, 6SUP. SEC: KME. ECs: Met. Sacramento, AUO; Walnut Grove, AYZ; Dunsmuir, JDN; Paradise (Chico Area), HBM; Roseville, GHP. RM: PIV. OBS: AF, BTY. PAM: ZYV. OES: PIV, GHE. OOs: ZYV, YNM, BTY, GDO, YV. OPS: JDN. Nets: Sac. Emergency (city), AUO NCS. SVS, 29.4 Mc., ZYV NCS, GDE ANCS. Mother Lode, WSI NCS. *Northern Area:* The gala hamfest at Mt. Shasta City was a huge success. JDN has new 75A.

(*Continued on page 76*)

W. Ben Wimberly
(W9IXD)

well-known amateur says: "For quick, accurate trouble shooting around my ham shack, the Simpson Model 240 Hammeter is indispensable. I've used Simpson equipment for many years."

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HVB has new Silver 701 on 28-Mc. 'phone. IEO is mobiling on 28 Mc. with Silver 701 and new *QST* converter. Much praise goes to OMR for his tireless efforts to make the Hamfest successful. YNM, on highway 99 at Dunsmuir, asks traveling hams to stop in. *Central Area:* WYX moved to Sacramento. TKE is working 75 mobile. CLG, on 144 with sixteen-element beam and 400 watts, is also trying 160 mobile. VZE and WCC moved to S.F. Bay Area. KUI at Willows is back on 144. ZNU is building new shack to get rid of power line QRM and BCI. HNL completed all-band job. GHE is moving to 565 East 9th Ave., Chico. *Southern Area:* PIV and MIW handled bulk of State Fair traffic from JN. HTS skeds Chile weekly for college boys at Davis. GKW, GDE, and LNN work mobile on 10. KKL and UNT supplied Southern Pacific with 28-Mc. mobiles for emergency communications in Roseville while their telephone system was out. ASE is new president of Placer Radio Club. GHP, KKL, UNT and PXB are mobiling on 28-Mc. at Roseville. IHX moved to 3210 San Jose Way, Sacramento. MYL received VSV/UOV on Mt. Diablo using TV on 420 Mc. GZY is on 144 again. Shasta National Forest Service headquarters states amateur radio's quick action prevented forest fires in that area from spreading and causing great damage. Credit goes to Mt. Shasta, Dunsmuir, Weed, McCloud, and Yreka amateurs who participated in the fire fighting and communications set-up. Traffic: W6JN 700, MIW 411, ZF 159, PIV 154, KRX 35, JDN 8.

San Joaquin Valley — SCM, E. Howard Hale, W6FYM — ECs: AJE, CQI, GJO, HIP, and HZE. OBS: GRO, EXH, and OHT. OES: PSQ. OO: GRO. OPS: GRO and IEM. HZE is the new EC for the western section of Kern County. CUA, at Sanger, has received his Class A ticket and is rebuilding. The Modesto 10-meter net remained active during the summer months and has 100 per cent AEC members. GKX has new rig on 28 Mc. waiting for the band to open. GKX, GNU, GWQ, YIN, and UOO, of Modesto, and FIP and GIW, of Turlock, are converting 522s for 144 Mc. EXH has been converting 522 receivers for many of the gang to help get them started on 144 Mc. No reports were received from Fresno and Stockton this month so the column is brief. I need your activities reports, gang, so please drop me a penny postcard the first of each month and let me know what you have done, are doing, or are planning to do. Traffic: W6BXN 128, ADB 124, DVS 102, EXH 84, GQZ 4.

ROANOKE DIVISION

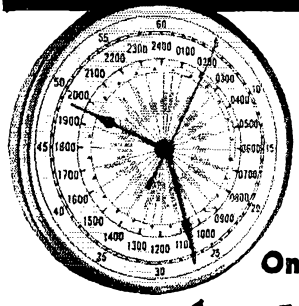
NORTH CAROLINA — SCM, Herman P. Jolitz, W4DCQ — Here is an open letter to all amateurs in the North Carolina section: As your new SCM, I want first to thank all the many amateurs who, by their efforts, were instrumental in my election to this office. By this letter, I wish to outline my plans for a unified North Carolina amateur group. Any amateur desiring an official appointment should get in touch with me for the proper blanks and questionnaires. Later I hope to put these forms in the hands of your nearest RM or PAM. The RM or PAM in your area will be notified and will arrange a schedule which will aid in his qualification of your request. Inactivity will be the prime reason for cancellation of your appointment, for we need an active rather than a paper organization. Each appointee should report his activities on or before the first of each month and, whenever possible, should enter the various CD contests available to all appointees. The SCM is only your voice in the Communications Department and he should be advised of your activities and your wishes. Help me and I will be better able to help you.

SOUTH CAROLINA — SCM, Wade H. Holland, W4AZT — The picnic in Columbia on Sept. 3rd had a large attendance of 'phone men but very few c.w. boys were there. FM is a new OPS in Greenville. ILQ, EC for Greenville, is organizing mobile emergency net. DX, Kershaw County EC, spoke before the local Red Cross group on emergency activity. NLP, in Hemingway, now is on 3.85 Mc. and is a member of the 'phone net. LIK and OWW, in Charleston, now are mobile. BWV must have developed a glass arm as he now is on 3.85 Mc. after 20 years on c.w. HTR and BIZ, of Charleston, are on the sick list and we wish them a speedy recovery. RSC and MCY, in Florence, are on 28 Mc. HXZ, in Anderson, now is net manager for 75 Emergency 'Phone Net and is sending out fine bulletins on its operation. CPZ has emergency rig in operation and so has FM. EOZ has been building a 14-Mc. tower and beam on paper for years but finally has gotten it built and is enjoying 14-Mc. DX. BPD has been renominated as Alternate Director for our Division. Station activity reports will be sent in for *QST* publication as we accumulate enough to make a fair column. At the present rate that means about every three months. Traffic: W4CPZ 4.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF — NAD, Richmond, has been appointed SEC in place of IWA, who has resigned because of lack of time to devote to the job. IWA displayed exceptional organization ability in setting up a staunch Emergency Corps of well-selected dependable hams. KYD spends some of his time on a potato farm in New Jersey. PVRC members, XYLs, YLs, and young squirts enjoyed a picnic on Chesapeake Bay with FF as host. KYD visited the shack of 2ZI and got a glimpse

(*Continued on page 78*)

RADIO SHACK 2-IN-1 BARGAIN FOR A HAM'S CHRISTMAS!



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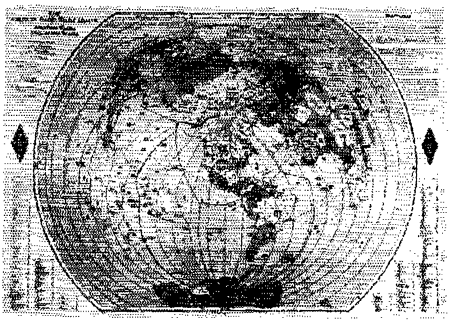

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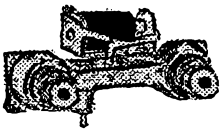

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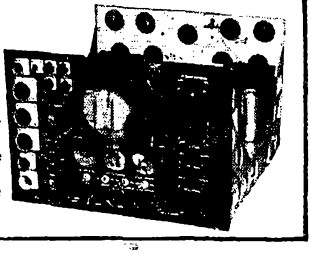

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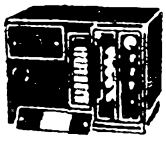

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of all that ancient radio gear being collected as a by-product hobby to ham radio. NHX, of William and Mary College Radio Club (PYN), has an NROTC Scholarship at U. of Va. PYN has been sadly depleted of the old stand-bys, NRO, MLE, RDL, 3PZD, 1PGQ, 2BWL, and 2KCM by way of graduation. JVA put up a ten-element array on 144 Mc. NH is looking for aluminum tubing for 14-Mc. rotary. FV spent the summer on DX. New AEC members are JHI, PPP, IOB, PVL, ZV, OSB, IWW, MZR, KAD, KVP, BZE, OYP, RIQ, and RJW. KRZ, MLE, KDL, NKV, and AIV are doing outstanding jobs as ECs in their respective areas. CZK has been appointed EC for Roanoke and Roanoke County. AAM is new EC for Fairfax County and has also organized a 60-station emergency 'phone net. OQX, of Norfolk, registered with the AEC. RCQ registered in Staunton and has use of the equipment of K4NBM at Fisherville. Operators available include IPC, RDJ, RUO, MVK, and NSM. ORS appointments were renewed for VE and KYD. CVO was visited by his old commanding officer, 3OSM/4, Skipper of U.S.S. *Franklin D. Roosevelt*, aircraft carrier. LMB schedules CVO nightly on 3880 kc. CVO's appointments as OPS and OO have been renewed. Pre-wedding arrangements were effected by ham radio contacts on behalf of a sailor at sea for his marriage in Atlanta, Ga. JUY built ten-element 144-Mc. beam. JVA is on 144 Mc. PWX participated on VFN during the summer. KFC had a surprise visit from 5ZU and 4MG. 5DG dropped in on the boys at a PVRC meeting. KFC knocked off VR1C for #202 DXCC. MLH is moving to Waltham, Mass., where he hopes to resume activities under his old call, 1IKT. IWA, in a late report for June, made BPL with 112 deliveries plus 6 originations. Traffic: (Aug.) W4CVO 25, KFC 9, PWX 5, MLH 2. (July) W4KFC 2. (June) W4IWA 234.

WEST VIRGINIA — SCM, Donald B. Morris, W8JM — DRU has completed WAS on 7 Mc. with his low-powered rig. YPC has moved to North Carolina. FUM, new Huntington amateur, is on 7 Mc. with 40 watts. AUJ received a letter of thanks from the Red Cross for his recent flood work. DFC operated portable from Virginia during vacation. FUU works out well on 7 Mc. with 200-watt rig. PQQ continues to snag the rare DX stations. LII visited VE3HC while on vacation. He has renewed ORS appointment. CSF visited Wheeling and Pittsburgh amateurs. BTV still is leading the traffic handlers. W8L continues to work the 28-Mc. gang. FMU, the SEC, is interested in increasing EC appointments. JM is back on 3.5 and 3.85 Mc. after receiving his DXCC certificate. OXO is readying the rig for fall operation. JKN has 50- and 144-Mc. rigs in operation. BWI is heard regularly around 3770 kc. 1RNT and 1QVF visited MARA while on vacation in West Virginia and gave several of the gang their first Doddridge County contact. I would appreciate hearing from any active amateurs in Jefferson, Morgan, Ritchie, Calhoun, Monroe, Putnam, Wayne, Pleasants, and Wirt Counties. Traffic: W8AUJ 393, BTV 282, DFC 28.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, M. W. Mitchell, WØIQZ — SEC: KHQ. RMs: ZJO and LZY. ZJO makes BPL again this month and promises to make it each month from now on. LZY still is rebuilding and announces that the Colorado slow speed net is now in full swing on the same frequency, 3560 kc. He needs a new NCS. Any volunteers? GQY has a 28-Mc. mobile in his sedan delivery and is building a 3.85-Mc. mobile for the same car — TWO mobile rigs in ONE car. Can anyone top that one? He visited W5s JMA, JMJ, QDX, and IIK while on his trip to Austin, Texas. KHQ has the big power supply finished for the new rig and is now starting on the r.f. section. Yours Truly has finished the new exciter unit and it is working FB after umpteen million bugs have been chased out of it. Report cards were very few this month, so not much news to write up. How about a few more reports of your activities? Check your appointments for expiration! If yours is near expiration, or has expired, send in your certificate at once to me for endorsement. KHQ was a visitor at IQZ this month, and attended the monthly meeting of the Denver Radio Club. Traffic: WØZJO 515, OWP 30, GQY 11, KHQ 7.

UTAH — SCM, Leonard F. Zimmerman, W7SP — The UARC Summer Outing, held at Lagoon this year, had an excellent turnout. The many YLs, XYLs, and jr. operators present really made an FB social affair out of it. KMR, EWX, and JOE handled the details and we still are wondering how they obtained the many fine prizes offered. JPN reports he again is sending Official Bulletins and that the UARC 28-Mc. Net resumed operation October 1st. MFQ says they need more S.L.C. 'phone men for the 3.85-Mc. nets. KMR reports he is set up for 420-Mc. operation and anyone wishing to test should get in touch with him. Anyone needing activity report cards, just let me know and we will see that you get a supply. We can't report it, if we don't know about it.

WYOMING — SCM, Marion R. Neary, W7KFV — MVK, the v.h.f. enthusiast, journeyed across the State to converse with JRG. ØKUB now is in W7-Land at Laramie. ABO received EC appointment. GOH vacationed down to W5-Land with 3.85-Mc. 'phone working nicely. FLO re-

(*Continued on page 80*)

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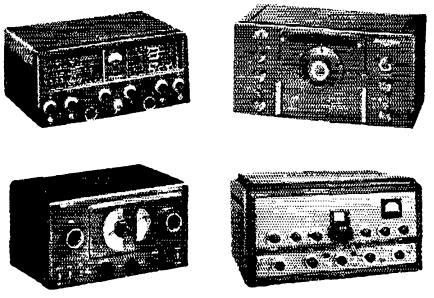

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tired the Diesel with the advent of REA to power his 304TH on 3.85 Mc. JRG found a goodly number of openings on 50 Mc. during the summer months. KFV is on mobile 3.85 Mc. with AVT-112. It works out, too. OME is working 7 Mc. with ARC-5 OJM purchased a new home with plenty of room for antennas. HRM has a new shack finished in knotty pine. Does it help your signal reports? MWS is on the sick list and absent on 3.85 Mc. We wish you a speedy recovery, Len. How about some reports from the northern and western parts of "Wonderful Wyoming"? Traffic: W7HDS 6, GS 3.

SOUTHEASTERN DIVISION

ALABAMA — Acting SCM, Percy E. Sexton, W4HFL — The Alabama Emergency Net was alerted Aug. 30th as a Gulf hurricane moved inland around the Mobile-Pensacola Area. It was active all night until 10 A.M., being handled very efficiently by LEN, DAQ, and OBV. The Birmingham gang was active during the hurricane handling some traffic for Associated Press. DID, FPB, KVY, and FXT were in the group. The Birmingham bunch has erected a beam for PXO (YL) who is in Warm Springs Hospital again. AUP is thinking seriously of 420 Mc. CYC is doing 420-Mc. experimenting and has worked 2 miles. FSW and FIG are on 144 Mc. GDU is putting up a new antenna. EAB is active on 28-Mc. 'phone. EJZ is rebuilding the rig to use 24-G final. The Andalusia gang still is on 28 Mc. MVM is new ORS in the Mobile Area. ISD is new EC in Mobile. DAQ is EC in the Demopolis Area. The Dothan Club station, ETY, was active during the recent hurricane, being on the air from 11:00 A.M. Wed. until 9:30 A.M. Thurs. LUT has been appointed Assistant EC for 28-Mc. mobile stations. MVM stood by with portable rig on MARS frequency during the hurricane. GOP has a new portable rig under construction for 3.85-Mc. 'phone. HCV, DAQ, and DPI contacted ZL2HP Aug. 24th on 3.85 Mc. CIU reports that the Walker County bunch is trying to get organized again. ADJ, BWG, CIU, HAN, and RBJ make up the group. CIU and BWG are building a new rig together. JYB and YE (former SCM) are both off to the war. OHK, HFP, and KIX are new members of the net. MFA has gone into the service from Huntsville. GYD has new Gamma match three-element beam on 28 Mc. 4KUX and 5OBU/4 are getting good contacts on 144 Mc. BFM reports new 27/28-Mc. rig under construction. Traffic: W4KIX 52, MVM 26, BFM 14, CYC 9, LEN 7.

EASTERN FLORIDA — SCM, John W. Hollister, W4FWZ — Well, you fellows can talk about that hurricane but personally I would rather talk about the weather. QNIs totaling 171 in three nets as of this writing is a lot of revenue for the electric companies and filling stations. You did a swell job, gang, and the editorial acclaims were well deserved. The big traffic season is on again and by now it is well known that OGI is Route Manager for the Palmetto Net on 3675 kc. Ed has some good plans, so everybody pitch in and help. If you can send good stuff fast or slow you are needed. George Hart, the NEC from ARRL, gave a splendid talk at a JARS meeting in Jacksonville with a goodly number of visitors, including 9CEY and 9ZEN. Clewiston: PNS is on 3.5 and 28 Mc. with 5514 and emergency power, of course. Deland: OHG and RVU are new calls. Oakland: OCG stepped up to the altar and now has to find a good QTH for the sky hook. Stuart: DOO is back from England. New EC appointments: HWA at Jacksonville and NMG at Jacksonville Beach. St. Petersburg reports good results from its 144-Mc. net during the storm, according to EYI. The N.E. Florida 28-Mc. 'phone net had RIA/4 at Jacksonville Red Cross Headquarters with representation from Jacksonville, Jacksonville Beach, Naval Air Station, Green Cove Springs, Mandarin, Orlando, and Palatka as a short skip net. Your SCM really was impressed with it and it is hoped that the idea will spread over the State. The many tireless Net Control Stations of the several storm nets get honorable mention as a closing remark. Traffic: W4OCG 96, OGI 24, OZC 24, FWZ 23, IM 1, LMT 1.

GEORGIA — SCM, James P. Born, jr., W4ZD — The Atlanta Radio Club's Hamfest was attended by approximately 300 hams, XYLs, and jr. operators. One of the highlights of the Hamfest was the talk made by George Hart, 1NJM, National Emergency Coördinator. George delivered a good, down-to-earth talk on The Hams Stake in and Responsibility to Amateur Radio. NQO won the Atlanta QSO Contest and was presented a loving cup. OPS is the new treasurer of the Atlanta Radio Club. KFL has been called to active duty with the Army Signal Corps. IZM now is 5RXC and is in Albuquerque, New Mexico. He is looking for Georgia contacts on 14-Mc. 'phone. HZG now is on 3.85-Mc. 'phone using a BC-696 and a half-wave doublet. New appointments are as follows: As OPS, HZG; as OO, IRL and HZG. The following certificates have been endorsed: As OPS, HKA and TO; as EC, BOL for Bleckley County, and KIZ for Coffee County. OHH is Assistant EC for Upson County. Assistant ECs for Fulton and Dekalb Counties are PBF for 3.85 Mc., MTS for 7 Mc., BOC for 14 Mc., OPS for 28 Mc., and KIP for 144 Mc. RPO is the new Route Manager and would like to hear from hams interested in joining a c.w. net. LYG is secretary of the Augusta Radio

(Continued on page 88)

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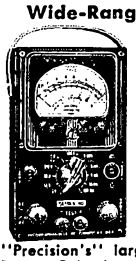

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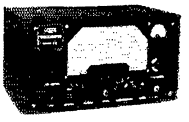

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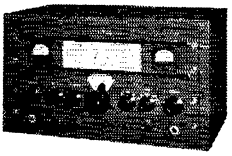

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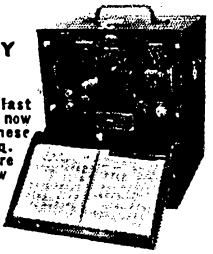

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Eldico TVR-300 for Twinex or TVR-62 for co-ax, high-pass filter, kit **$1.98**
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Club. OGS resigned as secretary when he returned to Georgia Tech. CFJ assisted Tennessee hams in relaying election results from isolated voting places. Traffic: W4MTS 9, ZD 4, IRL 1.

WEST INDIES — SCM, Everett Mayer, KP4KD — The AEC nets were activated during the two storms threatening P.R.-V.I. recently. The PRARC Hamfest was well attended, with the Ramey gang copping most of the prizes. W2CKI, HZ's sister, moved to P.R. and is on with a 32V-1. FAA is the MARS outlet at Ramey and AJ was cancelled in the shuffle. MD is active on 3.5, 7, and 14 Mc. IT does a good job on OBS. DJ turns in a nice report on the doings and is grid-dipping his antennas. EG has a brand-new jr. operator. CP and HG acquired gas-engine power plants. BARC organized a hurricane net. KV4AU writes a nice letter and reports his 6V6-807 rig is FB with 35 watts. KV4AI runs 8 watts on 28 Mc. KV4AH is active on 14-Mc. c.w. KV4AO made his regular monthly visit to KP4. GP made a trip to "W," and JE is working DX on 14 Mc. JM has a new HRO-50. Future reports should go to DJ, who is your new SCM. Traffic: KP4DJ 15, KD 7.

CANAL ZONE — SCM, Everett R. Kimmel, KZ5AW — During one of the season's hurricanes, PA fed KV4AA official weather reports for 4½ hours on 14-Mc. c.w. until the reports indicated a by-pass of the Virgin Islands. Later, when the same blow hit Florida, AC, LM, MN, PA, and PC checked into the storm nets and relayed traffic. WZ, about to enter a Stateside hospital with ten minutes to spare, wanted to talk to his XYL in the Zone. Through W8GZ and PC a 'phone patch was completed in the allotted time. Betty and the OM of HC1KX, veteran earthquake message traffickers of Quito, en route to Washington, stopped off for a two-day visit with the Canal Zone end of their circuit, NM and LM. BL will act as EC while NM is in the States. FJ moved to Gamboa. FL and WJ are on 14-Mc. 'phone with folded dipoles. GF and KO work 14-Mc. c.w. AU now has his DXCC ticket on the wall. Traffic: KZ5NM 114, FL 32, LR 24, BL 13, PC 6, RM 6.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Virge A. Gentry, jr., W6VIM — SEC: ESR. RMs: CE, CMN, DDE, FYW, IOX, and LDR. PAM: MVK. VIM finally is back on the air on 3.85-Mc. 'phone and will be on all bands as soon as antennas are up and low-pass filters completed. We welcome JKL to the Los Angeles section. Negotiations are under way for transferring Mono County from this section to the San Joaquin Valley section. That means that we will lose JQB. Al will be a great loss to us. BHG is experimenting with antennas for his 32V-1. CUF has increased his power to a kilowatt. CMN covers 3.5, 7, and 14 Mc. with three transmitters. AM buried his power lines 500 feet under the ground to reduce the noise level at his ranch station. YSK is using a top-loaded 3.5-28-Mc. mobile antenna. FSA has moved to Carissa Plains and is on 1.9 Mc. The Tri-County Amateur Radio Association held its annual picnic near Camp Baldy. IDM is on 28 Mc. HYS is back on 28 Mc. with a new modulator. JMY is a recent addition to the Pomona amateur ranks. MU is ready for the fall and winter activity. BES has a new 75A-1 and four 1-kw. finals with a 304TL each. ERN is on 28 Mc. AEE reports that the teletype net has 19 members. CMQ was called to active duty in the Navy. BUK is operating 14-Mc. n.f.m. The picnic held by the Two Meters and Down Club was a huge success. More than 200 attended and, according to MVK, it was the largest v.h.f. affair ever held. CDB is helping JEH to get on the air. WKO has a twin rhombic on 144 Mc. UFH is out of the hospital and back on the air. FEX had a heart attack. LS is active on 144 Mc. with teletype. ZWQ has an MBF on 144 and 28 Mc. ODW has a new rig. ZL mobiled on 144 and 3.85 Mc. back to his former home in W3-Land. FPV has a VT-127 on 50 Mc. and made WAS on that band. ANN finally rebuilt his 12-year-old 50-Mc. rig after visiting 5VY. The v.h.f. net has moved to 146.8 Mc. and meets every Monday at 2000. Anyone wishing to join may obtain a crystal from MCT, the NCS. The crystals must be returned if a station misses two consecutive meetings. DQO's XYL made him move his rig out of the garage to make way for the new car. CAJ has applied for membership in the Old Timers Club. We are happy to report that, after selling his rig, CTO has the bug again and is building an all-band, c.w.-'phone rig. EAL has a stacked 3-over-3-element beam and HIM has designed a stacked 3-over-3-over-3-element beam. We could use a city-lot rhombic. The San Luis Obispo Amateur Radio Club operated a station from the Boy Scout Camp in Nacimiento and handled messages for the boys to their parents. The following amateurs participated: ALQ, CNY, ENR, JE, and WMH/6. YCF has a new rig. ANN and BPD report that the following amateurs worked FG8A: BPD, CUF, LEE, YZU, GAL, TZD, BJU, and even CYI. RLN reports hearing ZB2I. TZD worked GD3UB, CR4AE, and FP8AC. FZO is blasting a hole in the 28-Mc. band with kilowatt supermodulation rig. The efforts of the Mid-Cities Radio Club, GAL/6, and MBA/6 in the 1950 Field Day paid off by winning two classes for the Los Angeles section. Traffic: W6CE 3546, GYH 582, LDR 356, ANT 187, JQB 129,

(Continued on page 84)

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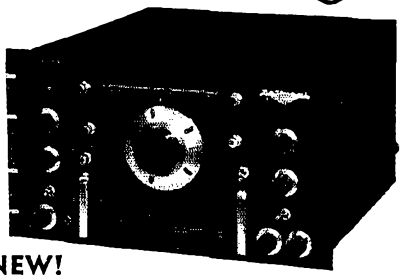

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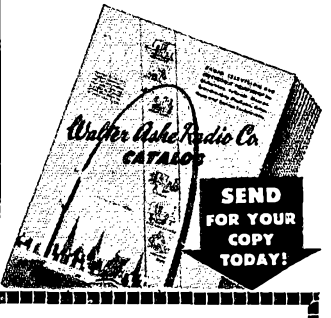

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DDE 97, BHG 40, CUF 31, CMN 19, AM 6, YSK 4, FYW 1.

ARIZONA — SCM, Jim Kennedy, W7MID — The Tucson gang welcomes a new call, 4JEX/7 on 7 Mc. FGG worked into Phoenix on 420 Mc. from Mt. Lemon. TCQ helped out the Air Force with portable operation at the site of a B-29 crash near Willcox. LUK is busy finishing up an intricate radio-controlled model boat. LVR has new antenna tuner and has been sweating out his Class A ticket. SQN reports activity on 3.5 and 7 Mc. from Clarkdale. QNO and JFT worked mobile to mobile on 28 Mc. from Phoenix to Flagstaff. KWB, QNO, and LBN have gone into the Armed Forces from Phoenix. The AZN again is operative on 3515 kc. at 8 P.M. and you're invited to check in and meet the gang.

SAN DIEGO — Acting SCM, Shelley Trotter, W6BAM — BWO has resigned as SCM as he has been unable to devote the time to do the job properly because of trying to make a living and getting things ready for his move to Northern California. I will be Acting SCM until an election is held, so please send your activity reports to the address given below by the third of each month. The Orange County Amateur Radio Club, with the coöperation of the Fullerton Radio Club, had an excellent exhibit at the Orange County Fair. Operating under the call of DEY/6 and with DEY, EOV, ETS, FCT, ICN, IMY, 1XG, LDJ, and QZQ as operators, a total of 414 messages were originated. The ARRL furnished a display of *Handbooks* and certificates. BGF makes BPL on originations and deliveries, as does DEY. For the first time in years BAM also makes BPL, thanks to traffic from the fair. SBN seems to have folded up, but ELQ is getting the San Diego Section Net started. Net call will be SSN, time of operation Monday through Friday at 8:30 P.M. on 3560 kc. CNQ is progressing slowly with his rebuilding but should be going full blast soon. He says MI has left us for Alaska. EWU is active with the AEC and holds a nightly schedule with his son, ERZ, in Berkeley. NDF is leaving for the Navy, so will be on the inactive list and asks to have his ORS appointment cancelled. ØUOC is applying for his W6 call and 9CPI soon will be signing portable 6th district when the rig is completed. YXE has left the section, so we are in need of an SEC. Anyone interested in the appointment can drop me a line at Route 1, 15952 So. Ritchey St., Santa Ana, Calif. Traffic: W6BAM 678, DEY/6 422, BGF 193.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, Joe G. Buch, W5CDU — Effective October 15th, BKH will take over the SCM position. Bill's record as a former Director and his interest and participation in amateur activities over a period of many years brings us SCM leadership well fortified with experience plus the unselfish desire to serve us for the next two-year period. Please help Bill by getting your activity reports to him promptly at the end of each month and either report by radio or use Form 1 report card and mail to 1834 University Blvd., Abilene. NNI is a new AEC member in Greenville. LXV, of Sulphur Springs, works 3.85-Mc. 'phone. RXI and RYI are new hams in Bonham. RXI is working 3.5 and 7 Mc. while RYI works 7 Mc. PER is a new Class A operator in Childress. NSN is getting in more operating time and keeps a biweekly schedule with PDY. JPM still is telescoping. PPS has a schedule with TI2TG. OLW has been called to active duty with the Navy. PWS has reported for active duty with the Marines. KKR will spend the next three years as a student at U.T. HLU is out of the hospital and on the mend. Our SEC, AAO, has issued Number 1 bulletin for AEC members. It is a much appreciated contribution to AEC members. AAO hopes to make it a regular periodical. LGY has a new antenna for 14-Mc. operation, thus eliminating feedback difficulties. III is back in the running after a serious illness. Traffic: W5ARK 85, BKH 44, PPS 18, LGY 6, NSN 5.

OKLAHOMA — SCM, Frank E. Fisher, W5AHT/AST — SEC: AGM. PAM: ATJ. Among those attending the AEC picnic at Oklahoma City were AGM, BKN, EHC, GGK, HHJ, ORH, OXJ, and RXN, all with emergency-powered equipment. JME, working for WAS on 50 Mc., has 42 out of 43 states confirmed. He is looking for ground-wave QSOs at night. LUN works mobile while on business trips and recently was of aid to the police and fire departments of El Paso. IOW, GPD, and MRK received ORS appointments. TVI is limiting MRK on 7 Mc. OQD closed down to enter active military service. Gil hopes to resume activities from his new QTH and give Oklahoma amateurs contact with her boys in the 45th. OLZ and OPEN are both preparing for a heavy traffic season. FRB now is OES. HQ now is in Stillwater. HFY is out of the hospital and on the air again. HXI now is 6IUP and is operating 3.85 and 14 Mc. DTU broke out on 3.85 Mc. and also has started reporting on OLZ. AEK is on vacation with wife and fishing pole. KL7NQ, ex-5HXU, is back in the States to stay. AGM continues his efforts to make Oklahoma 100 per cent in AEC coverage. How about some help on this work for Claude, fellows? Is your county organized? These are troublesome times and who knows when our services will be needed. Bring your AEC card up to date and get a new mobile certificate if you are qualified. Don't let your ARRL

(Continued on page 86)

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membership lapse as a few did during the summer inactivity. Remember it's your League. Traffic: W5OYP 70, K5NRJ 56, W5MRK 36, FOM 25, AHT 17, OQD 11, EHC 6.

NEW MEXICO — SCM, Lawrence R. Walsh, W5SMA — RM: ZU. PAM: BIW. PAM v.h.f.: FAG. No Section Emergency Coördinator is listed this month because of the resignation of BYX. Bill has done a fine job as SEC but the CAA is demanding more and more of his time. Our thanks, Bill, let's hope your vacation from amateur activities will not be long. UVA, BIW, DRA, and your SCM attended the West Gulf Division Convention in San Antonio. A wonderful time was enjoyed by all with UVA bringing home a prize. Two outstanding talks of the convention were Dr. Hamm's discussion of "Radioactivity and the Amateur," and Oliver Ferrell's talk on "VHF Propagation Characteristics." New appointments this month are as follows: RMJ as Class IV OO, and PAG as OBS, OPS, and OES. Remember, fellows, now is the time to get your appointments so you can be ready for the new season's activities! BYX visited NXE and SMA at Los Alamos. PLK visited SMA. Ben was driving a new station wagon which he has wired for a mobile rig. The Sandia Radio Club held a banquet at its Sept. 11th meeting. BIW and DRA are vacationing in Houston, Tex.

CANADA
MARITIME DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — Orchids to FQ, who handled our last month's report while your SCM was on vacation. Brit has gone "mobile" with new Master-mount antenna and ATR-5 in the car. Have you worked FP8AA yet? DB says to line up and stay off his (the FP) frequency if you want "in." With conditions on 14 and 28 Mc. the way they have been lately 3.5 and 3.8 Mc. have been active. Halifax stations heard in the Maritime Net include FQ, BC, LZ, and VO. UC, ex-4DO, has a nice 14-Mc. 'phone signal pushed by a pair of 813s. ET has completed a nice "all-band" portable rig for 'phone. DQ has the new 813 p.p. final going on 14 and 28 Mc. QZ and PQ should be on soon from new Q'THs. ES has been on vacation. PT has plans afoot for a new super tower. VO is back at Cross Island after a nice vacation. QG was quite active on 3.8-Mc. 'phone while doing "relief" work for Mick. NN had a nice vacation in W1-Land. TA, of 28-Mc. fame, has rebuilt to 813 final. QX had portable 3.7-Mc. 'phone rig with him while on vacation in the country. Please send in some notes for this column each month. Traffic: VE1FQ 14, DB 8.

ONTARIO DIVISION

ONTARIO — SCM, G. Eric Farquhar, VE3IA — Thanks, gang, for the response to the request for reports. With a heavy heart we record two Silent Keys: BDC, of St. Thomas, a Navy veteran, who was active on the Ontario 'Phone Net and was well liked by all who knew him and had dealings with him in his servicing business; also DC, of Dundas, who was the first honorary president and one of the founders of the Hamilton Amateur Radio Club. DC started in ham radio in 1918, was an ardent pioneer of 2 and 5 meters, was active on 3.5 Mc. for years and lately could be heard on the top end of 7 Mc., where he had many admirers. He was one of the first Canadian hams to grind his own crystals. He was a well-known dermatologist and his services in laboratory circles were of immense value to the medical fraternity. To the families of these two fine fellows we extend sincere sympathy. The Hamilton Radio Club held a successful picnic. In baseball 'phone defeated c.w.! BLY closed the month with a good total, packed his bags, and now is attending college. YR motored to Halifax and spoke on Interference at the Club there while on vacation. FZ was host to the Peninsula Radio Club's Annual stag. BCZ reports his QTH is in the garage temporarily, following a fire in his home. Congrats to BUR on becoming manager of TRN. His recent sojourn to the U. S. East Coast enabled him to meet many prominent hams and included a visit to Headquarters. BXJ has a jr. YL harmonic. The recent railroad tie-up found VE hams ready. The Frontier Radio Assn. of Windsor has a grand tie-in with Red Cross Chapter. Going DX, IA worked the Schooner *Bowdoin* off Cape York, Greenland, and F3NB on 7 Mc. Traffic: VE3IA 358, BUR 149, ATR 121, BMG 84, BLY 76, AYW 58, YJ 54, BVR 32, RL 29, CP 22, AZH 21, DBJ 10, KM 10, BBM 5.

QUEBEC DIVISION

QUEBEC — SCM, Gordon A. Lynn, VE2GL — The St. Johns Amateur Radio Club held its annual picnic at Plage Labelle on August 5th. The Annual VE2 picnic was held this year on Aug. 13th at Cap Sante, where 120 VE2s registered from all parts of the Province. QN has been busy organizing the amateurs of the South Shore as far east as the Gaspe Peninsula into the Emergency Corps. AKJ, now ORS, reports schedules with EC daily. EC reports operating under difficulties while moving the station from one room to another in the college. DR has BC-454 on 7 Mc. and is on about once a week. AOG is new in Montreal with

(Continued on page 88)

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"WORLD'S LARGEST DISTRIBUTORS OF SHORT WAVE RECEIVERS"

100 watts to 814. TH (newly-reassigned call) is new in Montreal with AT7 transmitter on 3.5, 7, and 14 Mc. and is struggling to make it perk on 28 Mc. Little news was received, hence there is little to report. Shoot along a card with your activities and the activities of those in your neighborhood so we can have a good column. Traffic: (Aug.) VE2AKJ 11, EC 4. (July) VE2QN 43.

VANALTA DIVISION

ALBERTA — SCM, Sydney T. Jones, VE6MJ — Monthly reports to your SCM are essential if this column is to appear each month. Very few such reports have been received in the past two months, hence no report. Your coöperation will be sincerely appreciated. EA had a most enjoyable trip to the West Coast. MJ visited the old stamping ground in the Okanagan and attended the International Fest at Kelowna. Congratulations to the Calgary gang on the successful hamfest. Plans are underway for a 40-meter emergency net. Contract your local Emergency Coördinator for details if you are interested. TK and PP are trying out Commander receivers. LQ and his XYL visited Great Falls. The sympathy of the Alberta gang is extended to EL and his XYL on the loss of their young daughter as a result of polio. MB took in Cadet camp in the sunny Okanagan and made a trip to Ottawa to compete in a rifle shoot. WS, EH, KF, AT, and their XYLs took in the hamfest in Calgary. NA vacationed at Elk Water Lake and operated on 3.8-Mc. 'phone. HI and TK walked off with swell prizes at the Hamfest. JG and HM had an enforced holiday as a result of the strike. CH puts out a good signal on 3.8-Mc. 'phone. Traffic: VE6MJ 6.

PRAIRIE DIVISION

MANITOBA — SCM, A. W. Morley, VE4AM — PAM: FA. FR has moved to Brandon from Killarney. RR has moved from Dauphin to The Pas. AU has a new jr. operator. KK made his first contact with new p.p 807s. RF is heard on 3.5 Mc. GB is QRL with the garden. 5EK is working portable at Dauphin. YR is building a new house. GP is changing his 813s to plate modulation. DS is mobile on 3.8 Mc. Several mobile rigs were seen at the Dauphin Hamfest and they should all belong to the AEC. PA's fist was judged the smoothest at the Hamfest. It was a swell event and about 35 amateurs and their XYLs and families had a swell time. JF, at Flin Flon, is heard on 3.8-Mc. 'phone. SR spent his holidays in WØ-Land. WØJIE visited Winnipeg. AX has a new mobile rig and it works fine. Traffic: VE4AM 78.

SASKATCHEWAN — SCM, J. H. Goodridge, VE5DW — The Regina Amateur Radio Club held a Field Day the week end of August 12th and 13th, but it was not much of a success because of poor conditions on the bands. The gang set out to the location Saturday night but found it had been rained out during the afternoon and the fellows were unable to get closer than two miles because of impassable roads. Since members of the gang were approaching from different directions they all had to be directed to another chosen location, and mobile stations saved the day. MA is running about 150 watts on s.s.s.c. and hopes to increase power to 500 with 833A final. DN has moved from Regina to take up a new job in PA. Traffic: VE5MA 46, EE 38, JI 23, JW 20, YF 11, HR 9, SE 6, DS 3, PJ 3, LL 2.

Cut-Off Frequencies

(Continued from page 85)

mately. From the quality curve in Fig. 1 this corresponds to 3.4 on the liminal unit scale. Now if we take the band 200–3000 cycles, a bandwidth of 2800 cycles, the quality curve gives 6.0 liminal units for this bandwidth. The difference is 6.0 — 3.4 = 2.6; in other words, the 200–3000 cycle band is 2.6 liminal units poorer than the 120–5000 cycle band. For the average listener this is not too bad, since it represents something under three just-detectable successive changes in quality.

In actual tests under average conditions of background noise, 90 per cent of *critical* listeners could not discern the difference between a band having a 15,000-cycle top limit and one having an 11,000-cycle top limit. Under normal home noise-level conditions (not quiet) the *average* listener could not discern any difference between the 15,000-cycle top-limit band and one with a

(Continued on page 90)

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VR-6112	60	8	$24.00
VR-6113	120	14	$31.00
VR-6114	250	25	$48.00
VR-6115	500	45	$75.00
VR-6116	1000	92	$125.00
VR-7B	2000	200	$225.00

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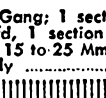

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C-83	8	C-90	3–14	300	$6.17

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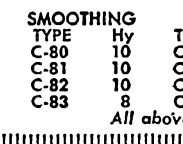

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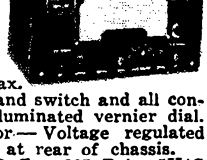

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Type No.	Sec. Rms. Volts	Sec. DC Volts	Sec. DC MA.	Dimensions H.	W.	D.	Price Each
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	550–550	400					
P 58	1080–1080	1000*	125	4⅝	3⅛	5	$9.01
	500–500	400	150				
P 59	900–900	750	225	4⅝	3⅛	5⅛	$8.82
	800–800	600					
P 67	1450–1450	1200	300	5¾	6⅛	4	$21.90
	1175–1175	1000					
P 68	2100–2100	1750	300	5¾	6⅛	4¼	$27.49
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* For dual operation with simultaneous use of both sec. ratings.
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top limit of only 8000 cycles. As for economics, a 40–15,000 cycle high-fidelity system costs approximately five times as much as a 75–8000 cycle system and twice as much as a 55–11,000 cycle system. These things are worth thinking about if you have ideas about building a high-fidelity system.

From the amateur point of view, tests have shown that most speech frequencies are situated between 200 and 3000 cycles per second, hence telephone and similar systems are designed around these limits to give good balance and naturalness.

Technical Topics

(Continued from page 26)

12-db. increase in average sideband power can be obtained without sacrificing anything, why not get it? There is some question as to whether much more clipping than this is very practicable in amateur work. The very high gains necessitated by really heavy clipping bring with them hum and troubles with acoustic background in the shack. The amplifier mentioned above, having the frequency characteristic shown by the solid curve, appears to be adequate for suppressing spurious frequencies arising from a moderate degree of clipping, and encompasses enough bandwidth to make the customers believe the "quality" is quite satisfactory. But we make no pretense of offering it as an "ideal" characteristic (if such a thing exists); there is still much to be found out. — *G. G.*

M.A.R.S.

(Continued from page 27)

control panel, and a BC-221 frequency meter. Rack No. 2 contains a Hallicrafters S-36 receiver, a Hammarlund SP600JX receiver, patching panel, Collins 32-V1, and a Plex-10 amplifier (an expander compressor amplifier) specially modified by Temco.

The master control consists of the following: a 9-position 2-channel audio mixing amplifier capable of utilizing inputs from microphones, turntables, remote lines, and recorders; two Collins 75-A receivers, each with its own Panadaptor (these may be used singly or dually); a Collins 32-V2, used as driver for local transmitter; a single-sideband selector which may be used with either of the receivers; and a control panel with controls providing beam rotation and indication, 'speaker selection (three ceiling-mounted 'speakers are in the master control room), 'speaker volume control, transmitter control (transmitters are dial-controlled through a stepper relay system), remote controls for operation of tape recorder, and other associated items such as microphone receptables, plug receptacles for keys, etc.

When an operator "takes over" in the QSO booth he has control of (although the master operator has priority control) a receiver, a panoramic adapter, recorder, beam rotator, and a key line. Each QSO studio has two microphones. 'Speakers are associated with receivers. The individual studio operator controls no audio levels.

Engineered to broadcast standards the twin stations are capable of being converted instantly for use as Armed Forces radio stations, military broadcast stations, or even as U. S.-based directionally-beamed "Voice of America" stations. Facilities were engineered for instantaneous tie-in with the Department of Defense recording and television studios. Other physical and radio tie-ins can be effected between military and commercial stations in a matter of minutes. WAR and AIR, the military call signs of K4USA and K4AIR, respectively, are geared to serve the present needs of amateur radio, but they are planned so as to be able to fit the ever-increasing requirements for flexibility which modern warfare and modern defense demand.

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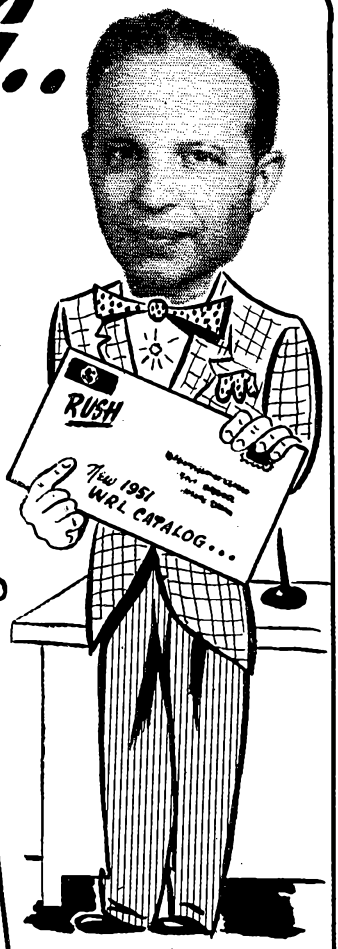

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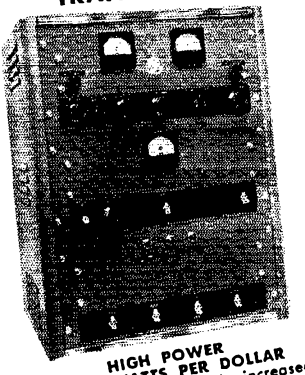

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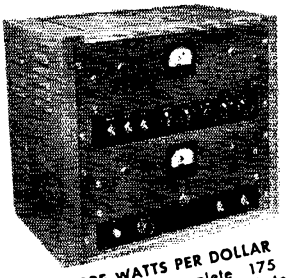

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General Operating

(Continued from page 80)

the courtesy and understanding shown us by the ham fraternity in our first contacts, and here's a chance to repay it in part by extending the same hand of welcome. He's a little shaky, but doing his best, and that's all we can ask of a newcomer. In a few weeks he'll be in there handling his station with the best of them. When he gets over that initial nervousness, he'll find ham radio as enjoyable an avocation as it has been to the rest of us these many years. OK, OM, here we come. . . .

U.S.N.R.

(Continued from page 87)

Days and in communications emergencies. The Jackson Amateur Radio Association meets at the Naval Reserve Training Center (K8NRJ), Jackson, Mich. Three portable generators and other equipment were loaned to the ham club for use on Field Day. . . . The Fremont (Nebr.) Amateur Radio Club has used Naval Reserve Electronics Facility 9-122 (KØNRG) as a meeting place for the past two years. This Reserve unit is located at Midland College. . . . Cmdr. Lewis W. Sieck, USNR, W4KMG, Arlington, Va., received an ARRL Public Service Certificate in recognition of emergency communications service following the South Amboy blast in May. Lew operated W3PZA, amateur station at the Naval Reserve Electronics Facility, National Red Cross Headquarters, Washington, D. C. . . . Through the enterprise of Fred Chapman, RMN2, USNR, W8CHT, radiomen and electronic technicians at the Naval Reserve Training Center (K8USN), Cleveland, Ohio, engage in weekly tests of portable equipment. Each drill night W8CHT assembles a group, packs a battery-operated transmitter and receiver, and heads for a near-by suburb. On location, the equipment is set up and operated on the regular Naval Reserve training circuit. Upon completion of drill, the rig is shifted to the 160-meter band for a period of ham contacts. An interesting variation to these field exercises occurred one drill night when a group of 15 trainees was taken for a cruise on Lake Erie aboard a 36-foot cabin cruiser. In addition to contact with the training center on Navy frequencies, ham operations were conducted on the 10-, 75- and 160-meter bands. Naval Reserve amateurs aboard were W8CHT, W8BWC, and W8LZO. . . . During a test of Air-Sea Rescue facilities in Cleveland, Naval Reservists set up a portable rig aboard a private yacht, Army Reserves set up a shore station at a yacht club, and Coast Guard Auxiliary personnel installed radio gear in a plane. Successful communications were conducted on the amateur 75- and 10-meter 'phone bands. . . . The following amateurs are members of Volunteer Electronics Company 1-2 (K1NRA), Malden, Mass., which was awarded the First Naval District Trophy for the best electronics company in the District for 1950: W1DPH, W1GHB, W1IAE, W1PSG, W1RH, W1RXS.

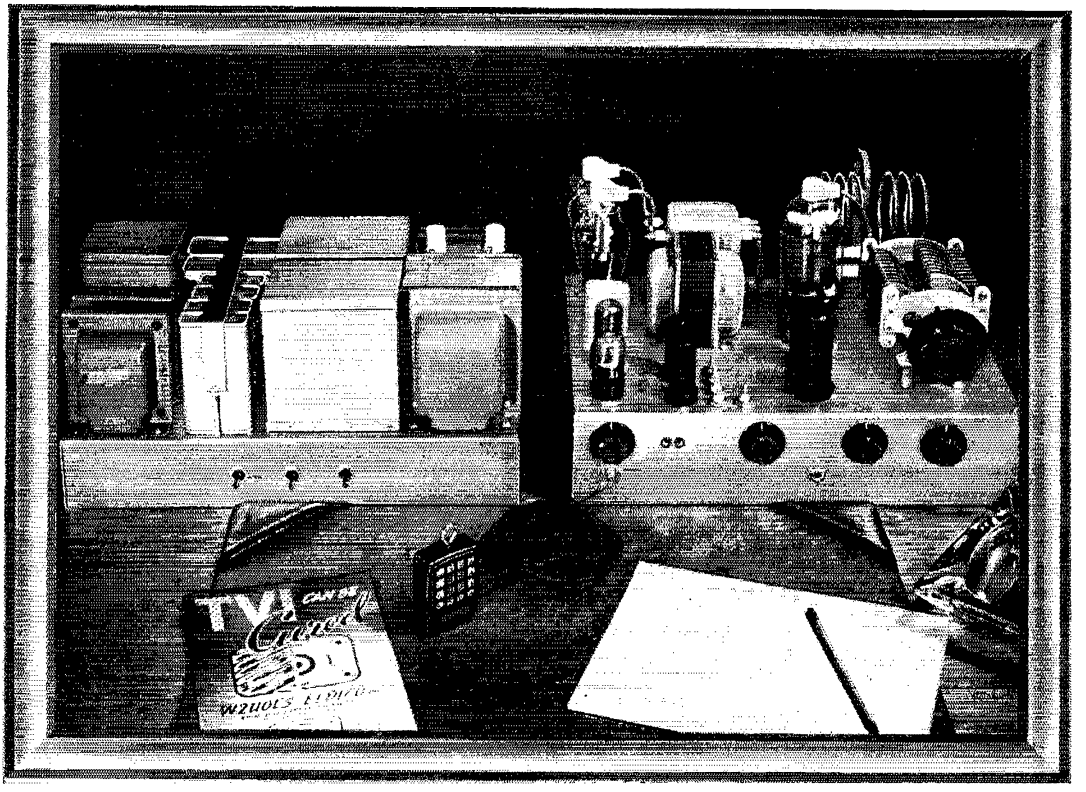
50 Mc.

(Continued from page 40)

Bennington, Vt. — This town, like others in the Green Mountain State, is deep in a valley, with hills rising up steeply on all sides. You'd never think, to look at the home location of W1MEP, that it would be a place to work anything on 6 or 2, yet Chet manages contacts on both bands now and then. It's 65 miles down to Springfield, Mass., with nothing but hills all the way (your conductor can vouch for that — he negotiated the trip on a bicycle back in 1942!) yet W1MEP is having successful skeds on 144 Mc. with W1CCH in Springfield Mondays and Thursdays at 9:30 P.M. Other stations in the Springfield area and down into Connecticut are worked when conditions are right.

Hudson, Ohio — The contest served to demonstrate to W8FKC that it is possible to work out to 100 miles or more, even with low power, on 144 Mc. Ralph is running only 15 watts yet he has been able to work quite a few fellows who are remote from Hudson, when they take the trouble to point their beams over his way. He heard 47 stations during the party, but was able to raise only 13, yet some of those

(Continued on page 84)



Signals with Wanderlust

EVERY once in a while a piece of amateur transmitting gear seems to put out the kind of signals that just "get up and go." And it makes no difference whether the rig is being handled by an old-timer or a young squirt. Eldico's TR-1 transmitter kit is that sort of a rig . . . performance is so good that it is almost as if the signals start out with a little wanderlust of their own.

What makes the TR-1 so outstanding? 300-watts c.w.—250-watts AM phone . . . razor sharp emission from conservatively designed circuits built around components that loaf at rated power. The lineup consists of a 6V6 crystal-oscillator; 6V6 frequency doubler; 6L6 buffer-amplifier; 813 power amplifier. A 6L6 keyer tube provides clean, clickless, electronic keying. For phone a 6SL7GT high-gain input into a 6V6GT drives RCA 811s.

Features of Eldico's TR-1, too numerous to detail completely, include broad-band r-f driver circuits; band-switching in all stages except the amplifier; metering of all important circuits through use of meter switching; rust-proof plated chassis; detailed instructions; isolantite change-over relay; all miscellaneous parts; power supplies in separate chassis; 5U4G medium-voltage rectifier; 866A high-voltage rectifiers. All components and tubes carry standard manufacturers warrenty.

To sit back and really find out what it means to "get out" order yourself a TR-1 today—at a cost far below your own duplication price for the basic components alone. Delivered price at your nearest Eldico distributor $199.50. Where no distributor serves your area order directly from the Eldico factory.

FREE — **A complete free booklet for de-TVIing your rig and a complete list of other Eldico kits including the famous grid dip oscillator and a full line of essential accessories.**

WRITE to W2UOL of Eldico.

ELDICO OF NEW YORK
INCORPORATED
44-31 DOUGLASTON PARKWAY
DOUGLASTON L. I., NEW YORK

worked were the most distant heard. He often hears the higher-powered stations off the back or side of the other's beam, and it is hard to attract attention with low power. All the more reason for turning that array around and probing in *all* directions. You can't be sure there's nobody there!

Sacramento, Calif. — Consistent 144-Mc. communication is maintained over distances of 175 miles or more during the warmer months, with occasional contacts up to 250 miles or so, according to W6PIV. Ken says that W6HBM at Paradise works regularly out to 175 miles from his 3000-foot elevation. W6MYL at Camino, up at 3500 feet, works W6PJF at Stockton and W6VNI in Oakland on a weekly schedule, relaying the two over the rough Stockton-Oakland path. Down in Fresno, W6VLS has been making himself heard over the 160 miles to W6s YMZ, AUO and PIV with a 10-watt rig. W6CLG at Chico, with 450 watts and a 16-element array 80 feet in the air, is heard regularly in the Sacramento area 89, and often gets through to Fresno, a distance of 240 miles. These are really creditable distances, in view of the extremely mountainous terrain involved.

Los Angeles, Calif. — Here's an idea for maintaining activity in club-sponsored v.h.f. nets. The Two Meters and Down Club has purchased a number of spot-frequency crystals and is distributing them free of charge to club net members. The only provision is that the crystal must be returned if the user fails to show up for two consecutive net sessions.

The World Above 420 Mc.

"U.H.F. — Applications and Techniques." This is the theme of the second annual Regional Papers Conference of the Kansas City Section of IRE, to be held at the President Hotel in Kansas City Nov. 3rd and 4th. Five sessions will cover the topics of transmitters, receivers, antennas, television and test equipment.

Considerable experimental work on plate tank circuits has been done by G5BY. Using a pick-up dipole and field-strength indicator to check the radiation from his 420-Mc. beam, Hilton has found that a quarter-wave tank circuit delivers more power to his antenna than does a half-wave line arrangement. This is probably the result of greater radiation from the latter. The tank circuit presently in use at G5BY, in a remote amplifier mounted just under his 420-Mc. array, is a U-shaped loop of 3/16-inch copper tubing, silver plated. It is 7/8 inch long and the same width, center to center. Contact to the plate pins of his QQVO6-40 (equivalent of our AX-9903) is made with clips from an acorn tube socket, mounted on the inner edges of the plate loop. Some adjustment is obtained by sliding the clips along the plate pins of the tube. Tuning is done with a 1-inch copper disc, as described by W6OVK in June, 1948, *QST*. A word of caution: In using such a tank, be *very* careful, particularly if the tube is one of those having no base support for the tube plates. The glass breaks very easily. Your conductor speaks from sad personal experience!

Since the appearance of the television story in *QST* for June, 1950, many reports have been received of amateur work on TV gear. It appears that fellows in many parts of the country are getting set for TV transmitting. We hope that all will keep us informed of progress, in order that the story of amateur work in this field can be duly recorded in *QST*.

How's DX?

(*Continued from page 43*)

tin-eared can we get or was he using an underground antenna?) ._._._. "I am very concerned about QSL cards . . . sent 940 VK1FE cards and to date have received only 23." This appears to be a new all-time low in comeback percentage but we feel some basic bottleneck is at fault in this case. Ex-VK1FE (VK4FE) still has a few cards left for those who have not received theirs. VK1FE did not receive one of W6LVN's three pasteboards which were sent to the designated address over a span of 20 months until VK3XO delivered one personally! ._._._ DE W1IKE: N. Steven-Hubbard, VQ4NSH, past-president of the Radio Society of East Africa, is now studying anthropology and political science at Columbia University. He'll be there for a year and would like to meet as many W hams as possible, especially those he worked on 10 and 20 'phone. He also has a hatful of extra QSLs with him which he'll be glad to fill out and send to those who missed his cards previously (QSO data required). For his QTH, see "Where" ._._._

(*Continued on page 96*)

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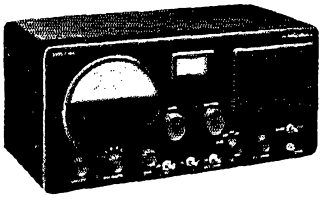
HERE'S your chance to get the sensational Hallicrafters receivers you've been trying so hard to find. THEY'RE ALL HERE . . . *in stock at* Newark . . . FOR IMMEDIATE DELIVERY ! Order Now . . . While They Last !



WORLD FAMOUS S-40B RECEIVER

$89.95

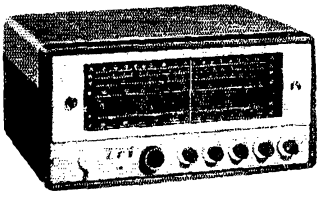
No. A2060. Shpg. wt., 33 lbs. A great receiver known by hams everywhere for excellent performance. Has Automatic Noise Limiter, Variable BFO, enclosed PM speaker. Exceptionally good signal-to-noise ratio and selectivity. Four bands cover 540 kc to 43 mc. A terrific buy at this price!

SX-71 5-BAND RECEIVER

$189.50

No. A2095. Shpg. wt., 33 lbs. Expressly designed for hams and SWL's. 538 kc to 35 mc, 46–56 mc coverage. Has all the latest refinements in receiver engineering . . . double-conversion circuit, high-image rejection . . . at moderate price!
No. A2073. Matching spkr. for above. Wt., 19 lbs. **$19.95**

SX-62 ALL WAVE RECEIVER



$269.50

No. A2066. Shpg. wt., 77 lbs. World-wide reception. High-fidelity. Ultra-selective and supersensitive. For the ultimate in every performance quality.
No. A2075. Bass Reflex Spkr. for above. 30 lbs. **$34.50**

NEWARK STOCKS THE COMPLETE HALLICRAFTERS LINE. WRITE US ABOUT EQUIPMENT NOT LISTED ON THIS PAGE . . . OR VISIT OUR MODERN SALESROOM FOR A DEMONSTRATION OF THE LATEST HALLICRAFTERS EQUIPMENT

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for merchandise $75.00 or over. Write for Time Payment Order Blank

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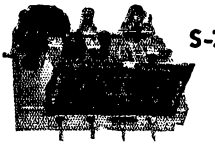
Low-Priced S-38B Receiver

$49.50

No. A2068. Shpg. wt., 14 lbs. By far the biggest dollar value in a four band receiver. Quality workmanship and features usually found in receivers sold at twice the price. AC-DC superhet circuit, covers 540 kc to 32 mc.



The New S-78 FM-AM Chassis

$79.95

A2059. Shpg. wt., 23 lbs. Precision built FM-AM chassis for those "custom-tailored" jobs that demand the ultimate in performance. Features include Automatic Frequency Control and phono input.

ST-74 FM-AM Tuner Chassis

A2058. Shpg. wt., 13 lbs. Hallicrafters famous engineering is at its best in this new low-cost high-fidelity FM-AM tuner. Affords superb reception over the entire 88–108 mc FM band and the 540–1650 kc AM band. Efficient circuit gives high performance with low power consumption. **$54.50**

S-72 Portable 4-Band Receiver

$99.95

No. A2079. Shpg. wt., 16 lbs. Operates on AC, DC, or batteries. Features RF gain control for CW, Automatic Noise Limiter, phone jack on front panel. Typical Hallicrafters quality throughout. Covers 540 kc to 31 mc. The ideal portable for the ham, the SWL, and the entire family to enjoy. Less batteries.
No. 19286. Battery pack for above. 7 lbs. **$4.03**

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Full of the best buys in Amateur equipment. Real savings . . . large selection . . . prompt mail order service. Send for your free copy now.

ORDER TODAY DIRECT FROM THIS AD.

See that section also for YK1AB's new address. Saba N. Saba is now a student of electrical engineering at Purdue U. and an interested observer at W9YB. During his six-month stay in London, YK1AB attended the IARU Congress while visiting, among others, Gs 2MI and 6ZO. A BC-348 has already been acquired here for future Syrian service. If you're still shy your YK1AB card, full QSO particulars sent to the listed QTH will do the trick . . . . . Ex-ZC1AR/-ZC1FN also stands ready to QSL 100 per cent for past contacts if QSO details are sent to the "Where" location. John hasn't yet fired up a rig in Eritrea but we hope he elects to give it a whirl . . . . . DL4ND's return to the States will put the quietus on 3A1A but DL4FS (LX4FS) is primed to go into action as 3A1B. Every one of Guy's 500 LX4FS contacts was QSLd via listed bureaus, incidentally. "If there still is any interest in an LX contact, I will try to get back to Luxembourg to put LX4FS back on 20 and 40," he writes. Gosh, sure still is, OM. The appearance of 3A1B on the air will likely have to be unannounced in advance but we'll pass the word if possible . . . . . Ex-ZE2KS drew one of the new three-letter South African labels in ZS6ABC and KP4KD hears that SP1JF is ex-SP5ZPZ . . . . . We are notified that LU8BF has resigned as DX Editor for *Radio-Onda* magazine. Write concerning DX awards to: Editor, Radio-Onda, calle Florida 259, Buenos Aires, Argentina . . . . . A letter appearing in the So. Calif. DX Club *Bulletin* throws light on matters FF8. FF8JC pens that the Hertz is still the favorite skywire there, all active stations sticking to 10 and 20 (just two on c.w.). The spot seems a good radio location to work all areas of the world save W7 — Anatol has hooked only one, this being W7CME. 807s dominate as finals in FF8 but FF8JC will shortly crank up an 813 replete with suppressor modulation . . . . . Also from this journal is an interesting Madiera item. CT3AA is retired after 36 years on the engineering staff of Western Telegraph Co. Ltd. but still teaches at a local Tech School. He is one of the old old-timers, having first tasted ether in 1912.

— • • • —

Dialog of the times or we'll bet you think we're kidding:

Sultry melodious voice modulating a kw. on 10 'phone: "CQ DX CQ DX from WØ - - - ."

Next, bedlam — calls from all continents.

Male voice: "ZD6ZZ from WØ - - -. You're five by nine, thanks for the call. Please QSL for DXCC. ZD6ZZ from WØ - - -, go ahead."

"WØ - - -, this is ZD6ZZ. Thanks for report and you are forty over nine. I should like to converse with the young lady there one moment, old man. WØ - - -, come in please."

"ZD6ZZ from WØ - - -. Roger and now I have my beam on you. Sorry regarding young lady. That was the only recording she made for me. . . ."

"Corkey"

(*Continued from page 45*)

pacities to make the dot cycle just one-half as long as the dash cycle, but the voltage drop in SR_1 during charging requires that C_2 be somewhat larger than C_1. The values given are representative, and final adjustment in any particular case must be made experimentally.[5]

The battery is a small hearing-aid type that was chosen because it would fit conveniently inside the relay box. Even at maximum speeds the current drain is only a few milliamperes, and in normal use the battery should last nearly as long as its shelf life. Some constructors may wish to dispense with the battery and substitute some form of external power supply. While operation should be satisfactory under these conditions, part of the convenience and portability of the

(*Continued on page 98*)

[5] Newly-purchased electrolytics, or those that have seen infrequent use, may change capacity appreciably for a time after being put into service. To minimize this change it will be helpful, before trying them in the key, to "form" the condensers by connecting them across a 25-volt supply for about half an hour.

GONSETS? HARRISON HAS 'EM!

AND HOW!!

Super-Bandspread TRI-BAND Converter

The Ultimate in Mobile Reception on 10-11, 20, and 75 Meters!

- Low noise, high gain RF stage for "big receiver" sensitivity!
- High stability oscillator for minimum frequency drift!
- Over eight linear inches of bandspread (Five complete revolutions of large tuning knob!) Proportionately wide spread of 11, 20, and 75 meter bands! Covers 15 Mc SWL band for good daytime BC reception in isolated areas.
- Edge illumination, plus color band, insures maximum dial readability. Calibration accuracy better than 1/10 of 1%!!
- Adjustable antenna trimmer for signal peaking.
- Four tubes: 6CB6-RF Amplifier, 6BH6-High Gain IF, 6AT6-Low Noise Triode Mixer, and 6C4-Clapp Type Oscillator.

Finest, most versatile, multi-band converter available for amateur mobile use. Also FB for use with any ham or BC receiver for "hot", dual conversion. 10, 20, or 75 meter reception! Same size cabinet as famous 10-11 and 3-30 Gonsets.

New Gonset Tri-Band Converter — $47.60

BARGAIN MOBILE CONVERTER PACKAGE!

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You get —

A Brand New, latest model Gonset Noise Clipper

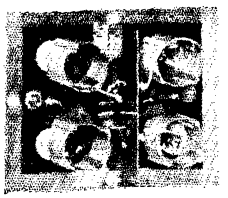
and

A very nice, used 6, 10-11, or 20 meter Gonset Converter, checked and in perfect operating condition, complete with tubes. (For 3 - 30, add $3.00). Specify choice.

This deal puts efficient mobile reception within the reach of everyone! Get the best in a converter and a noise limiter at minimum cost. (Total new cost $54.20) For converters only prices and "as is" bargains, send for list.

We fill all orders at lowest prices in effect at time of shipment.

"HARMONIKER"



Here's the most sensational TVI filter — as described in GE Ham News and December QST, page 36. Unlike 40 MC low pass filters, this half-wave filter attenuates ALL harmonics (as much as 110 DB for the TV band harmonics of an 80 meter xmitter!) Negligible insertion loss. For flat, untuned line with low SWR. Simple to construct! Nothing to tune or adjust, when using our factory guaranteed 2% accurate condensers!

Special! Special! Special! Special!

Harrison Harmoniker kits contain B and W Miniductors, (no coils to wind!), ground posts, indicated condensers, connectors, full instructions, and special metal boxes with all holes punched, shield welded in place, then copper plated — ready to assemble. Makes building a cinch! All you need, is a screwdriver, pliers and soldering iron — less than 20 minutes to finish!

For 50 to 100-ohm coaxial cable (Includes coaxial fittings): With 1000 Volt (2000V Test) SILVER MICA condensers for stabilized tuned circuits. Will handle 1 KW CW or 250 W AM Fone RF output.

80 Meters — FI-85 $5.99 — 40 Meters — FI-45 $4.99
20 Meters — FI-25 $4.29 — 10 Meters — FI-15 $3.79

Same with 2500 Volt (5KV Test), 2% Transmitting Mica Condensers to handle a full KW Fone:

80 Meters — FI-86 $9.95 — 40 Meters — FI-46 $8.41
20 Meters — FI-26 $7.21 — 10 Meters — FI-16 $6.65

For 200 to 600-ohm twin lead or spaced open wire. (Includes feed-thru insulators): With 1000 Volt (2000 V Test) SILVER MICA condensers. Will handle 1 KW CW or 250 Watts AM Fone.

80 Meters — FI-83 $6.71 — 20 Meters — FI-23 $5.87
40 Meters — FI-43 $5.47 — 10 Meters — FI-13 $5.35

Same with 2500 Volt (5KV Test) 2% Transmitting Mica Condensers to handle a full KW Fone.

80 Meters — FI-84 $13.25 — 20 Meters — FI-24 $12.27
40 Meters — FI-44 $12.51 — 10 Meters — FI-14 $11.75

½ PRICE SPECIAL!

GONSET "100%'r"

Modulation Indicator

Be a good neighbor! Operate without fear of splattering! Gonset "100%'r" allows accurate check of modulation. Indicates 85% and 100% modulation to enable setting maximum gain for proper signal. Warning light flashes on overmodulation. Works on any AM rig! Once you use it — you'll find it indispensable! Regular net price — $19.95

While a few last — Yours for ½ price!! **Only $9.95**

Harrison Has Everything In Gonset!

Universal steering post mount for all Gonsets	$ 3.90
Gonset Noise Clipper, Latest Model "G"	9.25
Continuous Coverage, 3 to 30 MC Converter	44.75
Famous 6, 10-11, 20 or new 75 meter Converter	44.75
New! Marine Band Converter — 1.6 to 4.0 MC	44.75
Gonset Low Loss, Open Wire Transmission Line	12¢ ft.

Complete stock of all mobile gear! • MASTER MOBILE Mounts, Whips and All Band Antennas • PREMAX Mounts and Antennas • LYSCO Transmitters and Mobile VFO'S • SUBRACO Transmitters, Dynamotors and AC Packs • STANCOR Mobile Transmitters • HARVEY-WELLS Transmitters • ADVANCE 6V DC Coax Relays • MALLORY Vibrapacks • EVERYTHING FOR THE MOBILE HAM!

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LAST CHANCE! AMAZING BEAM VALUE!

Don't miss this opportunity to get the famous Premax three-element, 10 meter beam at Harrison's low, low price. Only 30 pieces left! No more will be available at this price when they're gone! Aluminum dual boom, fully adjustable seamless dural elements, T-match, hardware and instructions. ALL ELEMENTS INSULATED — NOT A PLUMBER'S DELIGHT!!! Feed with coax, twin-lead or open line! Makes DX hunting a pleasure! Current list price is $49.50. Hurry! Rush your order now!

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HURRY! DON'T MISS OUT ON THIS TERRIFIC BUY!

keyer stems from the absence of extra wires dangling from the rear, and this advantage is lost if the battery is eliminated in favor of an external supply. [6]

As work on the circuit progressed, it was felt that a new key lever would be an attractive companion for the electrical part, and the "paddle" shown in the photograph is the result. The armature of the lever, as shown in Fig. 3, uses two edges of a vertical block as fulcrums, while two compression springs furnish the restoring force tending to keep the lever in a neutral position. The tongue, a sliding fit in the armature slot, acts as a bearing and positions the armature so that the holes at each end of the slot will clear the spring-support screws. All metal parts except the contacts were made of brass and were nickel plated afterwards at a local plating shop. Making the key lever requires some machine work, but the mechanism is straightforward, and the finished key has a satisfactory "feel" that is difficult to achieve in the usual homemade design.

[6] Inasmuch as the speed and spacing depend on maintaining rather exact voltage relationships, a regulated supply probably would be necessary.

A-Bomb Test

(*Continued from page 47*)

Control Nerve Center Reserve Operators — W7AXS, W7APT, W7CVI, W7DPU, W7DXF, W7EBA, W7EVM, W7FIM, W7GHW, W7GPS, W7GUL, W7GWA, W7HUL, W7HXA, W7JNI, W7JWS, W7JXY, W7LAW, W7LEI, W7LJH, W7LVI, W7LVW, W7LVZ, W7MOZ, W7MPU, W7MQB, W7NAN, W7NFN, W7NGE, W7NIT, W7NJQ, W7NM, W7NSE, W7NSY, W7NUI, W7OJJ, W7OJK, W7QA, W7CWN.

Mobile cars available for service at nerve center, held as reserve, property of W7NJ (EC), W7NRB (AEC), W7NUN (AEC).

Summary of emergency equipment in use, or reserve, as follows:

At command headquarters, often referred to as "nerve center," 4 complete stations, 6½-kw. power plant.

Medical — 11 mobiles with reserves; 6½-kw. power plant.
Red Cross — 8 stations fixed and mobile (75 'phone); 5-kw. power plant.
Engineering — 22 mobile and fixed; 1500-watt power plant.
Command headquarters — 9 reserve mobiles, 40 reserve operators.

Two channels on the ten-meter 'phone band were used for the Medical and Engineers during this test, and the 75-meter 'phone band was used for the Red Cross. While we were equipped to put into immediate use both 40 and 80 c.w., it was not considered as necessary by the Board.

This entire test was a matter of paperwork and no equipment was ever moved from point to point. However there is talk among the committee meetings that a real trial run may be conducted. I truly hope so, for I believe we can do a better job than any of the other services by far, and it would be excellent training for the real thing.

There was no use made of the six- or two-meter

(*Continued on page 100*)

bands, and I am sorry to state that I have found very little interest among the fellows in these higher frequencies. I have tried to explain to them that it would be more advantageous to use either of these higher frequencies, due to jamming of the channel on ten meters during the winter months, when ten really opens up. Maybe this winter, to prove my point, we will try conducting a couple of tests during the daylight hours on a Sunday, when everyone and his brother is in there bucking the QRM — Ii!

In the meetings that were held for the solution of this "mock test," I was knee-deep in the thing for over one hundred hours. That and trying to hold down a job at the same time just about threw me for a fall. If there ever was a doubt in my mind as to the value of the time expended in this complex problem, I can assure you it has been paid in full by a splendid letter from the Mayor of this City, extending his gratitude for our earnest and effective work with his committee:

> Please accept this personal note of appreciation for your splendid contribution to our Civil Defense exercises.
>
> I feel that we have made substantial progress as a result of our labors, and I am quite sure that our planning has gained at least a year in the past few weeks. It would not have been possible without the kind of enthusiasm which you so generously contributed.
>
> Thank you very much.
>
> Sincerely,
>
> WM. F. DEVIN, *Mayor*

We now have approximately 150 members in our Emergency Corps and we are growing steadily all the time. When I took this job about eight months ago, we had a registered membership of 17, and not a single one active in *any* net. It has been a hard battle, but now the road seems much smoother, and the gang has developed into a smooth-operating Corps.

Correspondence

(*Continued from page 52*)

QSLs

General Delivery, Millington, Tenn.

Editor, *QST:*

I normally QSL 100 per cent, and like the job to be as easy as possible. I would like to offer a suggestion for the exchange of QSL cards for contest contacts such as the SS or any other contest whereby numbers are used. Please indicate the number received so that it will be easy to look up the necessary info for answering QSL cards.

— *C. W. Wade, W4NNJ*

TVI

Hillsdale, N. J.

Editor, *QST:*

Having recently gotten my DXCC certificate, there has been a decided lull in DX at W2JA. Instead, I have been working a lot of our own stations. Just rag chewing, which I have wanted to get caught up on ever since we reopened.

My attention has thereby been centered on what I think is an appalling situation within our own ranks. Almost every night I get at least one QSO terminated at about eight o'clock their local time. They have to stop because of TVI.

Now, this is all very nice, and the hams have always leaned over backwards to be obliging. Articles have been written and published about the elimination of TVI. My own transmitter is clean in that respect and I run a full gallon. We have done everything we can, even to the extent of furnishing the TV listener with filters for his receiver, which I think is magnanimous. I'm not talking about the guys with the lousy signals and harmonics.

A lot of these fellows have told me that their transmitter is doctored until it is clean in their own TV set, but still bothers the neighbors. Therefore, to avoid hard feelings, they shut down for the entire evening — SEVEN NIGHTS A WEEK. To most, that is the only time they have for their hobby. (One gave it up and is raising tropical fish.)

It seems to me this is a shame. I don't have a TV set but my transmitter is clean and does not bother my nearest neighbor. Not the least sign that I am operating. I have had no complaints. BUT — if my transmitter was rigged up to the extent that it was clean in my own TV set, and a neighbor complained of interference in his, I would show him mine and tell him to go get his fixed the same way. If it can't be done, he needs another set. We hams are taking too much of a Caspar Milquetoast attitude toward this thing. There is no reason for it, and I hate to see my brother hams having to give up their wonderful hobby so that some jerks can watch the antics of "Hopalong Cassidy" and such. I think our hobby is more useful to the world at large than the widely-publicized Mr. Cassidy and his ilk.

Why should it be incumbent upon us to furnish filters and traps and things to all our neighbors? That can run into money if you have a lot of neighbors. Friendship is all right in its way, but why can't they do something themselves about it, or see that the manufacturer does. Or a service company.

Me? I don't want friends of this kind. See if you can't talk this up. We have a right to exist.

— *David Carruthers, W2JA*

CQ DX

311 Fountain St., Pullman, Wash.

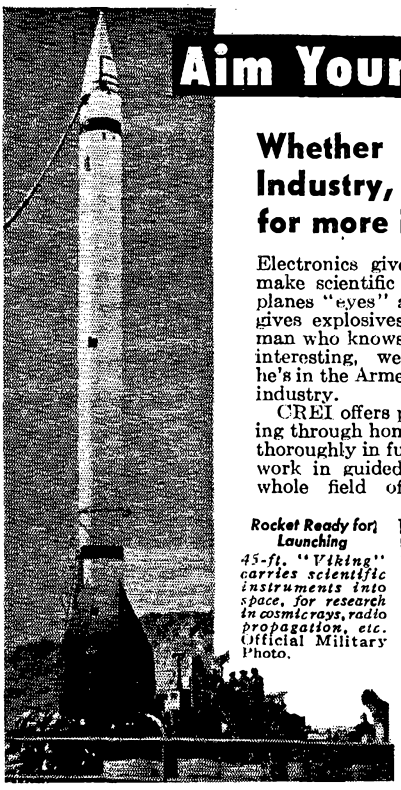
Editor, *QST:*

I'm guilty, but I don't like to be so considered — you see, I call CQ DX quite often, and yet the editorials seem to consider me a criminal; so a word in my defense. Many others call CQ DX too, and I feel sure most do it for reasons other than to "clutter up" the band as so often accused.

The simple reason, contrary to common preachings, is that CQ DX, judicially used, does get results. Perhaps some of the rarest DX stations seldom answer CQs by W stations, but there are many reasons why stations elsewhere in the world will answer W stations. For one, many are searching out specific states for WAS. That seems to be the main attraction of the W7 call I now hold. Some have low power and have difficulty cutting QRM so turn to answering CQs by

(*Continued on page 104*)

Aim Your Electronics Career HIGH!



Rocket Ready for Launching
45-ft. "Viking" carries scientific instruments into space, for research in cosmicrays, radio propagation, etc. Official Military Photo.

Whether you're in the Armed Services or in Industry, CREI Technical Training qualifies you for more interesting jobs at BETTER PAY!

Electronics gives rockets "brains" to make scientific observations, gives airplanes "eyes" and "ears" to navigate, gives explosives target directions. The man who knows electronics is sure of an interesting, well-paid career whether he's in the Armed Services or in essential industry.

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Prepare now to accept a responsible position in Commercial Radio. New developments will demand technicians with thorough basic training, plus a knowledge of new techniques discovered during the war. Training open to high school graduates, or those with high school equivalency. Courses 6 to 18 months' duration in RADIO AND ELECTRONICS. Approved Veteran training in Radio. Write for Particulars.

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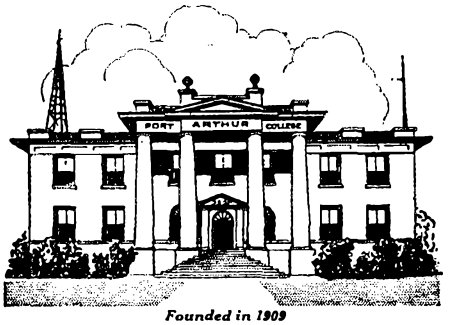

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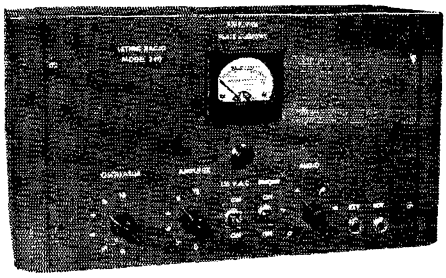
Approved for G. I. training

BUY OF A LIFETIME!

TRIED AND PROVEN THE WORLD OVER

LETTINE MODEL 240



This beautiful transmitter originally sold for $98. Buy it direct from our factory for only $69.95, complete with instructions for TVI reduction. Even if you already have a transmitter of your own, this rig makes an excellent standby. You can't afford to miss this opportunity.

The 240 is a complete 40 watt Phone-CW rig, working all bands from 160 to 10 meters; complete with (8 x 14 x 8) cabinet, self contained power supply, meter, tubes, crystal and coils for 40 meters. Tube line-up: 6V6 osc., 807 final, 6SJ7 mike amp., 6N7 phase inverter, 2 61.6s mod., 5U4G rect. — weight 30 lbs. — 90 day guarantee. PRICE **$69.95** $20 deposit with order — the balance C.O.D.

Coils for 80, 20 and 10 meters $2.42 per set. Coils for 160 meters $3.00.

LETTINE RADIO MFG. CO.
62 Berkley St. Valley Stream, N. Y.

W stations. Many want to rag chew and when they find a W station in the clear, they call. In fact, from my own personal experience, those who answer CQs are much more apt to want a rag chew than those I happen to call, and rag chewing with fellows across the pond is the highlight of DX to me. These rag chews and resulting friendships with hams over there are my most cherished experiences in ham radio.

As a W2, a W6 and a W9, CQ DX has worked very well for me. Once as a W2 I worked 5 continents on a single CQ followed by QRZ DX. Over half the countries I have worked have been on CQ DX, and that includes all continents. Can you blame me for continuing the practice? Remember that for every unscheduled QSO someone calls CQ. We would never find each other if someone didn't call CQ, and that goes for intercontinental QSOs as well as those within W-land.

— *Robert E. Wallace, W7KIL*

[EDITOR'S NOTE: Shucks, nobody's going to be branded a criminal merely because he calls "CQ DX." As pointed out on page 42 of September *QST*, the use of "CQ DX" requires common sense and an evaluation of your chances of raising the kind of DX you want to work.]

Hints & Kinks

(Continued from page 53)

three screws. These will act as spacers and will lower the contact points on the coil assembly enough to permit its safe use in the HRO-50. (4) Reassemble the coil units, first tightening the three screws holding the coil assemblies inside the shield, and then replace the shield. (5) Place the coils in the receiver and realign according to the instructions in the operating manual. — *Lieut. John H. Parrott, jr., W5QOQ*

COMPACT ANTENNA FOR LOW-POWER TRANSMITTERS

ILLUSTRATED in Fig. 2 is a compact antenna that can be used in lieu of more elaborate affairs in cases where space limitations make it necessary to get by with the absolute minimum. At W2CEI this antenna has been used with gratifying success even though it is merely run under the rug on the floor!

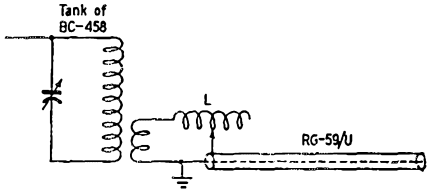


Fig. 2 — A makeshift antenna for installation where space is at a premium. Loading coil *L* may be omitted if the full electrical quarter wavelength is available.

A length of RG-59/U coaxial cable is used as a quarter-wave antenna, capacity loaded. Note that the inner conductor of the cable is grounded, while the outer braid is "hot," being connected to the antenna terminal of the BC-458 transmitter. In the usual antenna, a quarter of a wavelength at 7 Mc. works out to something over thirty feet, but when the arrangement shown here is used, the length required shrinks noticeably because of the low velocity factor of the cable. RG-59/U was selected because it has the lowest velocity factor of most readily-available cables. The theoretical

(Continued on page 106)

length required using this cable is 23 feet, but the added capacity gained by running the antenna under the rug caused the resonant length to be shorter by about two feet. Half of the theoretical length can be used if a variable inductance is used as a loading coil as shown in the diagram. Thus, an "under-the-bed" antenna for shut-ins could be made.

At W2CEI, with 100 watts input to the transmitter, current into the line measures 10 amperes, and while it is not known whether more power than this could be used, the antenna performs well at this and lower power.

— *Maurice Basal, W2CEI*

HUM REDUCTION IN THE HQ-129-X

A RATHER high hum level in my HQ-129-X receiver was cured by the simple expedient of rotating the output transformer 90 degrees so that its core was no longer parallel to that of the power transformer.

Only two small holes for mounting the transformer need be drilled. The leads will still pass through the original set of holes. — *William E. Buehrle, jr., WØGUN*

Strays

Recent Silent Keys listings bring to mind the meritorious wartime service of two amateurs:

Charles E. Apgar, ex-2MN, won pre-World War I prominence for his experiments with advanced receiving circuits and the recording of wireless signals. He had worked out an elaborate mechanical junction between the diaphragm of a telephone receiver and that of a Dictaphone, achieving a practically perfect transfer of energy. At the request of the U. S. Secret Service Bureau and the local Radio Inspector, Apgar in 1915 made recordings of the nightly transmissions of the German Telefunken station WSL, at Sayville, L. I., N. Y. Each night 2MN's recordings were hurriedly dispatched to a Secret Service office for checking, and it soon became apparent that the station was violating U. S. neutrality by sending information concerning Allied and neutral shipping to submarines at sea. The station was subsequently closed down, its personnel interned. Mr. Apgar's work was hailed in the daily press as "the most valuable service ever rendered by a radio operator to this country."

William B. Hollis, W6FDR, was a veteran of World Wars I and II. In the latter conflict he served aboard the U.S.S. *Cabot* as a combat pilot and twice was seriously wounded. On one occasion he saved a ship and its crew by jumping into the water and pushing a mine into the clear, for which he was awarded the Congressional Medal of Honor. During this feat of bravery a second mine some 150 feet away exploded, resulting in an injury to Bill's heart which led to his recent death. W6FDR's other decorations include the Navy Cross with two stars and the Distinguished Flying Cross.

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.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th 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 and is placed and signed by a member of the American Radio Relay League. 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, if by a member of the American Radio Relay League takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him 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.

(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.

Please note the 7¢ rate on Ham ads is available to ARRL members only.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

QSLs, 100, $1.25 up. Stamp for samples. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore 29, Md.

QSL's, SWL's. Finest stock. Fairest prices. Faster service. Dossett, W9BHV QSL Factory, 855 Burlington, Frankfort, Ind.

QSLS! Kromkote cards at a fair price. Dauphinee, W1KMP, Box 219, Cambridge 39, Mass.

SUBSCRIPTIONS. Radio publications a specialty. Earl Mead, Huntley, Montana, W7LCM.

QSL's high quality, fair prices. Samples? W7GPP, R. D. Dawson, 1308 F. Street, The Dalles, Oregon.

10-METER Beams, $19.50. Send Card for free information, Riverside Tool Co., Box 87, Riverside, Illinois.

CRYSTALS: Bassett Type 100A precision low-drift units made to your exact specified frequency within the 80 or 40 or 20 amateur bands, at $1.50 each, plus postage. Rex Bassett, Inc., Bassett Building, Ft. Lauderdale, Fla.

QSLS. Very attractive. Best in printing and prices. Kromekote or any other stocks. Stamp for samples. W4LXJ, Roop, Radford, Va.

MOTOROLA dispatchers, new, $350.00. Used: $250.00. W5BCO, Hicks, 204 E. Fairview, Tulsa, Okla.

PHONE patch schematic, practical discussion. $2.00. Nichols, W1MRK.

QSLS. The W5RV Press. Cards and stationery for the discriminating amateur and SWL. 643 Eagle Avenue, Jackson, Mississippi.

QSLS: Have you seen them yet? Samples today. Your best bet: Larry's QSL's, Opportunity, Washington, P. O. Box 59.

WANTED: Marconi Coherer Magnetic detector. Multiple tuner; DeForest responder and other gear prior to 2910. Franklin Winegard, Rock Island, Ill.

QSLS! TAprint, Sumrall, Mississippi.

WOULD like to get in touch with anyone with Call Books earlier than 1919. W4AD, Box 793, Rome, Ga.

C. FRITZ for better QSL's. 1203 Briargate, Joliet, Illinois.

QSLS: Uncle Fred's QSLs. Three colors and up. Rainbow map QSLs. Special DX QSLs. Bargain QSLs. Samples, 20¢. Uncle Fred, Box 86, Lynn, Penna.

SELL Collins 75A1, two months old, $295.00. BC-610D converted, $575.00. W4ELL, 495 Lightfoot Road, Louisville, Ky.

SPECIALIZED QSL's, SWL's! Samples! Ace Print Shop, Jeppesen, WØQFZ. 2705 South 7th, Council Bluffs 1, Iowa.

QSLS-SWLS. High quality. Reasonable price. Samples. Bob Teachout, W1FSV, 40 Elm Street, Rutland, Vt.

WANTED: APR-4 receiver and tuning units. State condition and price. W2DB, 274 Boulevard, Scarsdale, N. Y.

QSL'S, SWL'S. Meade, WØKXL, 1507 Central Avenue, Kansas City, Kansas.

SELL: QSTS: Feb., Mar., Apr., May, 1917; June, July, 1919; Vol. 3 Aug. 1919 to July 1920 bound and in perfect condition. Miscellaneous copies 1920 to 1928. Write to Mrs. Tefft Hewitt, 3974 Highgate Rd., Muskegon, Mich.

QSLS? SWLS? Modernistic? Cartoons? DeLuxe? Photographic? QSL samples 3¢.
Subscriptions, renewals to radio magazines. Free list. (CQ $3.00). Sakkers, W8DED, 53 East 7th St., Holland, Michigan.

QSLS. The W5RV Press. Cards and stationery for the discriminating amateur and SWL. 643 Eagle Ave., Jackson, Mississippi.

PERSONAL service backed by 25 years amateur experience is available when you trade with W1BFT, Evans. Evans Radio, Concord, N. H.

MEISSNER 8C FM tuner; Long Duplex Trig slide rule; RME VHF-152A; L. C. Smith #5 typewriter; 3-in. modulation oscilloscope; plate dipper; Millen frequency meter set; W9DPL, 2924 Station Street, Indianapolis 18, Ind.

TBV8 Complete. Antenna, tubes, phones, mike. ECO. $30.00. Phil Slipakoff, W5LXX, Schriever, La.

WANTED: AN/APR-4 receivers and tuning units; ARC-1, ARC-3, R-89B/ARN-5A, TS-174/U (and other "TS-" equipment), ARR-5, ARR-7, RBL-3, BC-348, ART-13, radar and other surplus; General Radio, Boonton, Ferris, other top quality equipment wanted, particularly for 100–6,000 Mc. region; also 707B tubes, other special-purpose types, maggies, klystrons. Cash or trade. Describe, price in first letter. Littell, Farhills, Box 26 Dayton 9, Ohio.

FOR Sale: All parts needed for a 400-watt phone xmitter, all of the best quality. $150.00. C. J. Baldwin, Triplex Plating, Inc., Corymbo Rd., Michigan City, Ind.

LA Hams! For sale: ART-13 Autotune transmitter complete with power supply, $175.00. BC-348 converted 110 VAC, $50.00; ARR-5 receiver with power supply, $50.00. 4518 Simpson Ave., No. Hollywood, California. Phone SU 3–0259.

SWAP! Complete $400 photographer's outfit, including precision camera, lights, enlarger, printers, dryer, and other darkroom equipment for fone/cw transmitter. W9JQJ, 555 Sheridan Road, Glencoe, Ill.

FOR Sale: Hallicrafters S-53 receiver. In good condition. $55.00. Write to Dick Bruce, 1171 Union Street, Manchester, N. H.

NEW Crystals for all commercial services at economical prices, also regrinding Motorola, Link, G-E and other commercial crystals. Over fourteen years of satisfaction and fast service! Eidson Electronic Company, 1802 North Third, Temple, Texas. Phone 3901.

BARGAINS: New and reconditioned Collins, Hallicrafters, National, Hammarlund, RME, Millen, Meissner, Gonset, others. Reconditioned S-38, $29.00; S-40A, $59.00; National NC-57, $59.00; NC-173, $139.00; NC-183, $199.00; HRO, $99.00; RME-84, $59.00; HF-10–20, $59.00; RME-45, $89.00; HQ-129-X, $129.00; BC-221, $49.00; SX-42, SX-43, SX-25; SX-28, SX-28A, SX-62, S-39, NC-200, NC-240D, HRO-7, HFS, VHF-152A, HT-18, HT-9, BC-610, 32V, 75A1, others. Terms. Shipped on trial. We will pay cash for receivers and transmitters or make big allowance on new equipment. Write for our free list. Henry Radio, Butler, Mo.

WANT an outstanding mobile rig? 1949 Nash Ambassador, many extras, under 30,000 miles, ARR7 receiver, two ART-13's, adequately powered. No gasoline generators. Winner two National contests, 62 countries worked. Intend duplicate in Cadillac. $2750 cash or trade on new Cadillac. Priced trade-in value plus radio equipment. Enjoy yourself! Wanted: Model 50 or 51 G-E navy wire recorder and playback. WØNFA.

QSLS, modern. Sample booklet 12¢. Stamps okay. Westerners see samples at leading Ham stores. W6GFY, van Groos, 1436 N. Serrano, Hollywood 27, California.

FOR Sale: Gonset 3–30 Mc. Converter. In excellent condition, almost new. Best offer above $22.50. Julius Galin, W1LOP, 182 Blue Hills Ave., Hartford, Conn.

FOR Sale or trade: Complete ham station. 225 watt xmitter NBFM/-CW, 4–65A final, HT-18 VFO control, 22" x 14" x 29" aluminum cabinet, Mon-key and xtal mike. SX-43 revr with matching speaker and DB-20. Deliver 100 miles. Want $325.00 or 75A-1 with speaker. W5RIQ, Box #705, Barksdale Air Force Base, La.

SELL: New Harvey-Wells Bandmaster Deluxe with APS-50 power supply in original cartons. Sell or swap: BC-348 unconverted and Howard Model 450 receivers. Want: Receiver HQ-129X, SX-28, or equivalent. Best offers accepted. Arien Bossen, W1SDQ, 41 Langdon Street, Springfield, Mass.

FOR Sale: Collins 75A-1 receiver. Like new and in perfect condition. Price: $200.00. Dr. L. J. Friedman, W2IO, 77 Park Ave., New York City.

QSL's-SWL's. New designs. Crystalon or regular stock. Samples. W2DEE, Franzen, Maple Shade, New Jersey.

MILLEN Model 90711 VFO like new, $40.00. Gon-Set 10/11 meter converter, in excellent condition, $20.00. C. Rohrer, W9EKL, 314 W. Lakewood, Peoria, Illinois.

SELL: RA-34 rectifier, TCS-12 with power supply, BC-654, I-222-A signal generator. TCS 110 VDC, power supply. T. Howard, 46 Mt. Vernon St., Boston 8, Mass.

SELL: ART-13 good untampered condition, not converted, $100.00. Bruce Ebert, W7KDV, Oakesdale, Washington.

NEW YORK CITY: Sell 200-watt rack and panel, fone/cw transmitter, standard parts thruout. Mike, bug, wave meter, 20M half-wave antenna 80 ft. coax cable, all for $125.00. Call W2VG, Bill Tannenbaum, FO 5-1326.

SELLING out: Meissner signal shifter, NC-173 receiver, 50-watt rig, many bargains. Send for list. W8WFV, 1753 Kensington Ave., Youngstown, Ohio.

FOR Sale: Almost new Collins 310-B1 PTO exciter VFO. See any catalog for full description. Cash price, $150.00. F.o.b. Omaha, Nebraska. Write WØIOS, 3332 N. 57th St., Omaha 4, Nebraska.

WANTED: Will pay $175.00 for Collins 32V2. Box 104, Dyker Station, Brooklyn 28, N. Y.

10 and 20 meter beams, $19.25, up. Aluminum tubing, etc. Willard Radcliff, Fostoria, Ohio.

RCA, AVT-15A, 6 volt, 7½ watts, aircraft transmitter, 2500–6700 Kc., ideal for 75-meter mobile use, no conversion necessary, ready to go, complete cables and tubes, less crystals, $50.00. RCA AVA-126 mobile vibrator power supply; input 6, 12 or 24 volts, output 300 volts at 100 Ma. Ideal for auto or boat. 250 volts, 50 Ma. available for receiver operation, also control relays. $15.00. Navy LM frequency meter power supply, $14.50. George W. McCauley, 155 First St., Mineola, N. Y.

FOR Sale: BC-348Q converted, perfect. New Elmac 5 x 400, $20.00 each; 4–125, $10.00. Box 42, Holden, Mass.

RME 9 rcvr with speaker, two ACN dials, less cabinet, $15.00. Gray Par-metal cabinet, 26" panel space, $7.00. W9DSV, Box 261, Webster, Wisconsin.

FOR Sale: SX-28 with speaker in 30" cabinet, RME's, LF-90 converter, and RAK-7 15–600 Kc. rcvr and power supply, also box of parts and tubes. Best offer over $135.00. Robert F. Duren, 726 Michigan Avenue, South Milwaukee, Wis.

FOR Sale: Navy ART-13 10-meter stage added, crystal mike input, D.C. filament and relay supply. Best offer. Richard Gridler, 101 Orchard Ave., Scottdale, Penna.

FOR Sale: Collins 75A receiver, in perfect condition: $275.00. Major Colvin, AFF Board 1, Fort Bragg, N. C.

FOR Sale: Stancor 203 xmitter, Gonset noise clipper, Gonset 27–30 Mcs. converter, Gonset 3–30 Mcs. converter, PE-103, 8 ft. whip with flexible mount, mike and all cordage, $100.00. W4MSJ.

SELL Sonar 680, $45.00, or swap what have you. David Adlerblum, W2QAI, 14 Caryl Ave., Yonkers, N. Y.

SELL: Millen exciter with six coils, two tubes. All in A-1 condition. $25.00. A. D. Johnson, W1RKB, 60 Norwood Ave., Whalom, Fitchburg, Mass.

BARGAINS: New and Used transmitters-receivers-parts: Globe King, $299.00; HT9, $225.00; Temco 75GA, $250.00; Collins 75A1, $295.00; new 150-watt phone $199.00; SX-42, $189.00; NC-173, HQ-129X, $139.00; Sonar SRT75, $129.00; SX-43, $129.00; ART-13, $119.00; RME-45 $99.00; SX-25, $89.00; HT6, $85.00; Meck T-60, $85.00; RME-69, $69.50; VHF-152A, $69.00; NC-100, $59.00; Globe Trotter, $57.50; New Bud VFO, $39.50; New Meissner signal calibrators, $29.95; S-38 $29.95; 3–30 or 10–11 converters, $25.00; S4IG $22.50; and many others. Large stock of trade-ins. Free trial. Terms financed by Leo, WØGFO. Write for catalog and best deal to World Radio Laboratories, 740–44 West B'way, Council Bluffs, Iowa.

SELL: NC-173 with speaker, like new, used very little. Best offer over $140.00. N. P. Stephan, W3FVK, Manchester, Maryland.

FOR Sale or trade HT-9. Need 5-in. 'scope, Kodak II, Rollieflex or etc. Levern Glau, Route One, Sioux City, Iowa.

SELLING out: Famous HT-9 transmitter with ten, eleven, twenty, forty and eighty meter coils; fifteen crystals; Turner Model C.D. mike and stand. Also HQ-129X receiver, all in first class operating condition. Is $625.00 value, but first $360.00 takes the lot. Charles H. Vincent, W8RD, Avoca, Michigan.

SELL: Assorted surplus equipment including BC-191 with AC power supply and ART-13. W4JWG, Box 186, Eau Gallie, Fla.

BC-348H, two, unconverted, $55.00 each. One BC-348J fils rewired, $55.00. Frequency meter BC-906-C with carrying case, $25.00. All the above good shape and complete, shipped postpaid California, collect elsewhere. W6HCX, Box 578, China Lake, Calif.

GI Recorder-playback assembly; Master Teleplex, Instructograph; ten small AC-DC motors; BC-603 rcvr and BC-684 xmitter; wire recorder; or will trade in electronic key-monitor; 4X5 copy camera, kodak or gun. W6QBO, 197 North 14th St., San Jose 12, Calif.

NEW BC-221P, converted to 110; $80.00. Vibroplex $6.00, unconverted 522, $39.00; BC-459 $10.00 or best offer. W2OHE, 1156 E. 40th St. Brooklyn 10, N. Y.

QSLS-SWLS by W1HJI (Cushing). Samples. Box 32A, Manchester, N. H.

SELL: Super Pro. Excellent condition. $175.00. Don DeLalla, 620 Russell St., Bellmore, N. Y.

FOR Sale: Standard six-foot relay rack including dolly, $10.00. One Kw. final R.F. amplifier. Pair 250TH's with a spare 250TH. B&W coils for all bands, also B&W butterfly tank condenser, Weston plate and grid meters. Very neat and works perfect. Won't ship. Price $50.00. John Savonis, W1DBS, 11 Dwight Court, New Britain, Conn.

WANTED: Complete or nearly complete files of Eastern, Western, and Southern Editions of QST. These contain only the particular regional Operating Department Reports, down to late 1942, and omit reports from other areas. Begin with January, 1935 issue, and end with December, 1942, both inclusive. Must have both covers and be in good condition. Sumner B. Young, WØCO, Route 3, Wayzata, Minn.

RA-34 rectifier power supply and BC-348 receiver wanted. State price and condition. Van Breems, Colonial Road, New Canaan, Conn.

COMPLETE 40-watt phone/cw xmitter, exciter kit (Radio Handbook); ECO crystal. BC-610 tuning units, 6AG7, 6L6, 807 metered stages. 6SJ7, 6V6, 815 forty-watt modulator already constructed on 4 in. panel. PE10B converted power supply, JK crystals. Diagrams, instructions, only the best parts. $55.00. Medical practice taking all of my time. Delivery 150 miles from Toledo, Ohio. Robert V. Beltz, M.D., Delta Clinic, Delta, Ohio.

FOR Sale: Collins 32V2. Used for about ten hours. $400.00. Will not ship. W2EWL, 54 Valley Road, Montclair, New Jersey.

SENSATIONAL Sub-miniatures! CK5702, identical 6AK5, $7.50 retail, only 98¢; CK5703, 800 Mc oscillator, $2.50 retail, only 79¢; CK5744, UHF converter/oscillator, $6.80 retail, only 98¢; 1N34 crystals, 75¢. Write for free "Tabogram". "TAB", 109 Liberty St., NewYork, N. Y.

SELL or swap: Hallicrafters S-72L, new last April; excellent condition; no reasonable offer refused; will trade for National FM tuner, NC-108. Lee Joyner, W8DZA, Box 41, Oxford, Ohio.

SELL: QSTs 1917 through 1925; Pink slip supplement "Ban Off", Oct. 1919 QST; old catalogs. Want: Marconi magnetic detector; Wireless Specialty IP76 tuner. Any Electro-Importing Co. apparatus, old wireless books. L. Rizoli, W1AAT, 100 Bay View, Salem, Mass.

SELL: BC-221, modulation, power supply, complete, $75.00. 120-watt fone/c.w., all bands, rack mounting, with mike, key, $110.00. BC-696, BC-459A, converted with power supply, all for $40.00. SX-25 w/speaker, $70.00. A. Brocato, 767 Piedmont Ave., N.E., Atlanta, Ga.

SELL: BC-457, ARC-5 xmitters with power supply and 80-40 meter Command receivers. Power supply, etc. Write for full details. WØZTU, Summit, So. Dakota.

FOR Sale: Prop-pitch motors, brand new in cases: $11.00. F.o.b. New York City. B. N. Gensler, 50–37 Newtown Rd. Woodside, L. I.

CALL-Letters painted on ties, color? $2.50. T-shirts. Size? $1.75. W. F. Yates, W9LIQ, Box 347, Heyworth, Ill.

SELL Meissner Signal Shifter, latest postwar model, factory assembled. Cost me $120.00, sell for $50. W1IKE, Henry St., Avon, Conn.

HF10-20 for sale. New condition. Will ship collect, $50.00, transportation paid. M. G. Morgan, W1HDA, Thayer School of Engineering, Hanover, N. H.

WANTED: BC-312, BC-342 and BC-348 receivers. Good used or new surplus. SCR-284 complete, original packing. Advise, stating price, condition, any modification made. G. & M. Equipment Co., Inc. 7315 Varna Ave., North Hollywood, Calif.

MILLEN exciter, filter, etc. Send for list. W8PUF, 646 Budlong, Adrian, Mich.

SELL: HT-18 with xtal mike, in excellent condition, $75.00. 28 Mc. mobile transmitter, also homemade converter, $30.00. Everything for $95.00. W6KEK.

BC-610 extra 250TH, 100TH, SX-28 with speaker, all in excellent condition. Purchaser pick up preferred. $600.00. W8AOG, 972 Washtenaw Ave., Ypsilanti, Mich.

FOR Sale: SX-42, with R42 spkr, $160.00. Also Lysco xmitter with tubes, $20.00. Both in excellent condition. M. Hart, 87 Sherman Ave., Jersey City 7, N. J.

WILL sell unused copy of Terman's "Radio Engineering". Best offer? H. Roberts, W1KUK, 71 Elm Street, West Haven, Conn.

FOR Sale: Complete radio station: 20, 10, 2 meters. Original cost over $500.00. Includes NC-173; VHF 152A, ARC5 2 meters; 829B 20, 10 meters; common modulator and power supply. Also mic., extra 829B's, xtals. Sale price $375.00 cash f.o.b. R. J. Dowling, W1LPO, 1041 Broad Street, Providence 5, R. I.

Index of Advertisers

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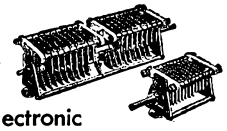
VARIABLE CONDENSERS

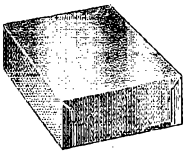


High quality Johnson condensers are available in a wide variety of types, sizes and capacities to meet every electronic need. Of special interest are the new Johnson Type L variables which feature ceramic soldering for stability and strength, and a line of miniature air variables which are the smallest ever built. Illustrated top right are the types E and F condensers, bottom right is a butterfly miniature air variable. Complete line described in Johnson Condenser Catalog No. 701.

TUBE SOCKETS

Johnson tube sockets need no introduction. They are used by many of America's leading electronic manufacturers; come in many styles to meet a wide range of needs. They are available in various bayonet, miniature, wafer, acorn and special types. Illustrated is the 122–101, a popular socket for VHF uses with tubes such as the 826, 829, 832, and 4D32.

CHASSIS



Johnson chassis are smoother, better fitted, more rigid. There are no raw metal edges or openings at corners nor overlapping metal at any point. All sizes available in aluminum, or in steel with permanent bright alloy plating —no dulling zinc or cadmium. The ONE outstanding chassis line! Standard 19″ notched panels, too.

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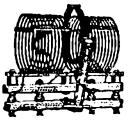

No compromises necessary with Johnson inductors. There are two types for most bands, for either high voltage low current, or low voltage high current tubes; as well as several choices of plug-in links to match accurately into any transmission line. Most sizes wound with larger wire than others, yet they fit the same mountings. Fully described in Air Wound Inductor Catalog.

INSULATORS

Johnson insulators offer more actual value: genuine steatite rather than inferior porcelain for many styles, best ceramic design with good proportions and clean-cut accurate molding, and high grade nickel plated brass hardware. Illustrated is the 135–42J steatite thru-panel insulator.

SPEED-X KEYS

Speed-X manual and semi-automatic keys, buzzers and code practice sets are among the finest made—designed and manufactured to rigid specifications and approved by experienced professional and amateur code operators. Many models from which to choose. Illustrated is the 114–515 "bug."

OTHER JOHNSON PRODUCTS

Johnson also manufactures the renowned Viking 1 transmitter kit, Rotomatic beam antennas, pilot lights, plugs and jacks, shaft couplings, etc., as well as highly engineered industrial and broadcast transmitting equipment.

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July 11, 1950

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W2JSW

HDB:gld

Read what Harry Belock, W2JSW, has to say about the Eimac 4-400A. It's another example of Eimac tetrode performance . . . proven by another outstanding operator.

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Eimac TUBES

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NC-125TS (matching spkr.)	**11.00**	
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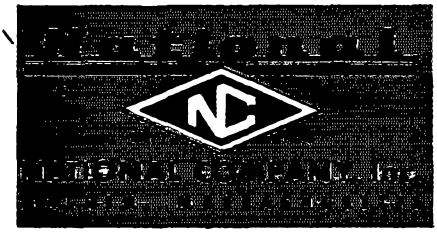

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RCA-866-A	two-tube	2390	250
		3180	500

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